

TECHNICAL MANUAL

**AVIATION UNIT AND AVIATION
INTERMEDIATE MAINTENANCE MANUAL**

CH-47D HELICOPTER

This manual together with TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-6, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, TM 55-1520-240-23-11, supersedes TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, 10 May 1983, and TM 55-1520-240-23-6, 6 May 1983, including all changes.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

**CHANGE
NO. 1**

**HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 SEPTEMBER 2003**

**Aviation Unit and Aviation Intermediate
Maintenance Manual**

CH-47D HELICOPTER

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TM 55-1520-240-23-3, 19 September 2002, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

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3-27 and 3-28
3-33 through 3-36
3-81 and 3-82
3-123 and 3-124
3-219 and 3-220
4-11 and 4-12
4-29 and 4-30
4-111 and 4-112
4-185 and 4-186
4-207 and 4-208
4-303 and 4-304
4-409 and 4-410
4-457 and 4-458
4-483 and 4-484

Insert pages

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4-303 and 4-304
4-409 and 4-410
4-457 and 4-458
4-483 and 4-484

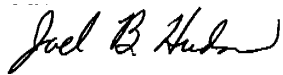
2. Retain this sheet in front of the manual for reference purposes.

TM 55-1520-240-23-3

C1

By Order of the Secretary of the Army:

Official:



JOEL B. HUDSON

Administrative Assistant to the
Secretary of the Army

0320910

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

DISTRIBUTION:

To be distributed in accordance with Initial Distribution Number (IDN) 311199, requirements for TM 55-1520-240-23-3.

WARNING AND FIRST AID DATA

For artificial respiration and other first aid data refer to FM 21-11.

Personnel performing instructions involving operations, procedures, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings and precautionary information can cause serious injury, illness, death, or an aborted mission.

**WARNING**

An operating procedure, practice, etc., which if not correctly followed, could result in personal injury or loss of life.

**CAUTION**

An operating procedure, practice, etc., which if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

**WARNING**

Cleaning Solvents

Those areas of skin and clothing that come in contact with cleaning solvents should be thoroughly washed immediately.

Saturated clothing should be removed immediately.

Areas in which cleaning solvents are used should be adequately ventilated to keep vapors to a minimum.

If cleaning solvents contact the eyes, nose, or ears, flush them with generous quantities of water, and then seek medical attention immediately.

**WARNING**

Electrical and Electronic Equipment Maintenance

Do not wear rings, watches, or metal jewelry when working around electrical equipment. Serious burns can result.

Be careful when working on 150 and 300 vdc circuits and on ac generator 115 and 200 vac outputs. Serious burns can result.

WARNING

Dangerous Static Charges

Ground the helicopter during parking, fueling, or defueling. Sparks can cause fuel vapor to ignite.

WARNING

Dangerous Voltages at Antenna Terminals

Be careful when working near antenna or antenna terminals. Radio frequency (rf) voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

WARNING

Poisonous Carbon Monoxide Fumes

Toxic carbon monoxide fumes may be present inside the helicopter whenever engines or APU are operating with cargo ramp open. Ventilate the cockpit.

WARNING

Corrosive Battery Electrolyte (Potassium Hydroxide)

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide which is a caustic substance.

Contact with skin or eyes will cause burns.

Use rubber gloves, rubber apron, and protective eye covering or face shield when handling battery.

If personal contact with electrolyte occurs, flush immediately with large amounts of only clean water. Get medical attention immediately.

WARNING

Explosive Battery Hazard

Before removing or installing battery, make sure battery switch is OFF and battery has cooled down if overheated.

Connecting or disconnecting battery connector while battery is under load may cause explosion or electrical arcing resulting in injury to personnel.

WARNING

Electrolyte Contamination

Separate nickel-cadmium batteries and lead-acid type batteries as far as possible from each other.

Do not let anything associated with a lead-acid battery, including air, come in contact with a nickel-cadmium battery or its electrolyte. Sulfuric acid fumes from a lead-acid battery could result in damage to a nickel-cadmium battery leading to battery failure and a hazard to personnel.

Do not use same tools or protective clothing for both types of batteries.

If sulfuric acid has been somehow mixed with electrolyte in the battery, the upper areas of the battery cells will appear green in color indicating battery failure or damage and potential danger to personnel unless replaced.

WARNING

Acids and Alkalines

Do not add water to acid. A violent action will result. Add acid to water in small quantities.

Rust stripper is an alkaline solution.

Avoid skin contact. Wear protective clothing. Wash thoroughly after using.

WARNING

Windshield Rain Repellent

Do not let windshield rain repellent contact open flame. Deadly hydrogen fluoride gas could be generated.

Wash hands with soap and water after handling repellent.

WARNING

Antiseize Compounds

Some antiseize compounds are irritants. Avoid inhaling fumes and contact with skin.

Wear protective clothing. Wash thoroughly after using.

WARNING

Paints, Varnishes, Dopes, Thinners, and Lubricants

These materials are generally highly flammable and may be irritants. Work in a well-ventilated area away from open flames.

Avoid inhaling fumes and prolonged contact with skin. Wash thoroughly after using.

WARNING

Epoxy Resins, Cements, and Adhesives

These materials may contain toxic or irritating substances. They may also be flammable. Work in a well-ventilated area away from open flames.

Wear protective clothing. Avoid contact with skin. Wash thoroughly after using.

WARNING

Radiation Hazard

Some instruments contain radioactive material. Do not try to disassemble these instruments. They present no radiation hazard unless seal is broken.

If you think seal is broken, do not remove instrument from helicopter before consulting Base Radioactive Protection Officer (AR 40-15).

Use a beta-gamma radiac meter AN/PDR-27 or equivalent to determine if instrument contains radioactive material (radium).

WARNING

Fire Extinguishing Agents

Monobromotrifluoromethane (CF_3Br) is highly volatile but is not easily detected by smell. It is not toxic, but reduces oxygen available for proper breathing.

If liquid CF_3Br contacts skin, it can cause frostbite or low temperature burns.

If agent touches eyes or skin, immediately flush affected area with running water. Get medical attention.

WARNING**Noise**

Sound pressure levels in this helicopter during some operating conditions exceed the Surgeon General's hearing conservation criteria (TB MED251).

Hearing protection devices, such as aviator helmet or ear plugs, shall be worn by all personnel in and around the helicopter during operation.

WARNING**FOD**

Make sure area is clear of foreign objects before closing access doors, panels, and fairings.

If area is not clear, damage to components or systems could result in personal injury or death.

WARNING**JP-4/JP-5/JP-8 Fuel MIL-T-5624**

Fuel is flammable. Do not use near welding areas, open flames, or on very hot surfaces.

Use only with adequate ventilation.

Avoid prolonged or repeated contact with skin. Prolonged contact may cause drying and irritation of skin.

Remove saturated clothing immediately.

Do not smoke when handling fuel.

Do not take internally.

Store in approved, metal safety containers.

WARNING**Lubricating Oils MIL-L-23699 or MIL-L-7808**

If oil is decomposed by heat, toxic gases are released.

Prolonged contact with liquid or mist may cause dermatitis and irritation.

If there is prolonged contact with skin, wash affected area with soap and water. If oil contacts eyes, flush with water immediately. Remove saturated clothing.

If swallowed, do not try to vomit. Seek immediate medical attention.

When handling liquid oil, wear rubber gloves. If prolonged contact with mist is likely, wear approved respirator.

WARNING

Lifting Components With Hoist

Lifting or hoisting of components shall only be done by designated personnel.
The load capacity rating shall be clearly marked on hoist. Do not exceed load rating.
Inspection and testing for cracks or defects in hoist system shall be performed on a regular basis.
Before lifting, alert personnel in immediate areas.
Before lifting, balance the load.
Do not stand under load while it is being moved from one area to another on a hoist.
Do not stand under load to do maintenance work.

WARNING

Hydraulic Pressures

High pressures used in testing hydraulic components can cause line rupture or component failure.
Only qualified personnel shall operate, service, and maintain hydraulic test equipment.
Use heavy plastic shielding at least 1/2 inch thick when applying pressures over 250 psi to prevent injury to personnel.

WARNING

Hydraulic Fluid

Hydraulic fluid is toxic. It can irritate skin and eyes and cause burns. When fluid is decomposed by heating, it releases toxic gases.
Avoid inhaling. Use only with adequate ventilation. If prolonged contact with mist is likely, wear an appropriate respirator.
Avoid contact with skin, eyes, or clothing. Wear rubber gloves if handling liquid.
In case of contact with skin, immediately wash skin with soap and water. In case of contact with eyes, flush them immediately with clear water and get medical attention.
If liquid is swallowed, do not induce vomiting; get immediate medical attention.

WARNING**Compressed Air**

Do not use more than 30 psi compressed air for cleaning purposes. Debris propelled under pressure can cause injury to eyes.

Use eye protection to prevent injury to personnel.

WARNING**Flare Dispenser**

Flares can accidentally fire, sometimes from stray voltage. Injury or death can result.

Remove all electrical power from helicopter before installing loaded payload module on dispenser assembly.

Keep hands and face away from end of payload module during installation.

WARNING**Maintenance Platforms/Workstands**

Use only authorized maintenance platforms/workstands, or other approved locally procured stands and restraint equipment, when working above 10 feet on helicopters in a nontactical environment. Otherwise, personnel injury could result from accidental falls.

WARNING**Black Light Inspection Eyewear**

Do not wear eyeglasses having light sensitive lenses while performing magnetic particle (black light) or fluorescent penetrant inspections.

Such lenses have a 16 to 45 percent light transmission loss.

Wearing them can result in failure to detect flaws and cracks under ultraviolet light.

WARNING**Cadmium-Plated Tools**

Use only chrome-plated or unplated steel tools when working on the helicopter.

Cadmium or zinc-plated tools are not permitted, since these platings are prone to chipping and flaking. The chips and flakes could cause corrosion or fluid contamination.

All tools, regardless of plating type, shall be serviceable and free of chipping.

LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original	19 September 2002
Change 1	30 September 2003

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Title	0	4-113 through 4-185	0
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A	1	4-208	1
B blank	1	4-209 through 4-243	0
i	1	4-244 blank	0
ii blank	1	4-245 through 4-273	0
3-1 through 3-27	0	4-274 blank	0
3-28	1	4-275 through 4-302	0
3-29 through 3-33	0	4-303 and 4-304	1
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4-12	1		
4-13 through 4-29	0		
4-30	1		
4-31 through 4-110	0		
4-111 and 4-112	1		

*Zero in this column indicates an original page.

**AVIATION UNIT AND AVIATION
INTERMEDIATE MAINTENANCE MANUAL
CH-47D HELICOPTER**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028. For the World Wide Web use: <https://amcom2028.redstone.army.mil>.

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*This manual together with TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-6, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, TM 55-1520-240-23-11, supersedes TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, 10 May 1983, and TM 55-1520-240-23-6, 6 May 1983, including all changes.

CHAPTER 3

ALIGHTING GEAR

SECTION I

LANDING GEAR DESCRIPTION AND OPERATION

There are four high-flotation landing gear assemblies, two forward and two aft. The two forward assemblies have dual wheels. Each aft assembly has a full-swivel single wheel. The aft wheels can be locked in trailing position. A power steering unit is installed on the aft right landing gear assembly.

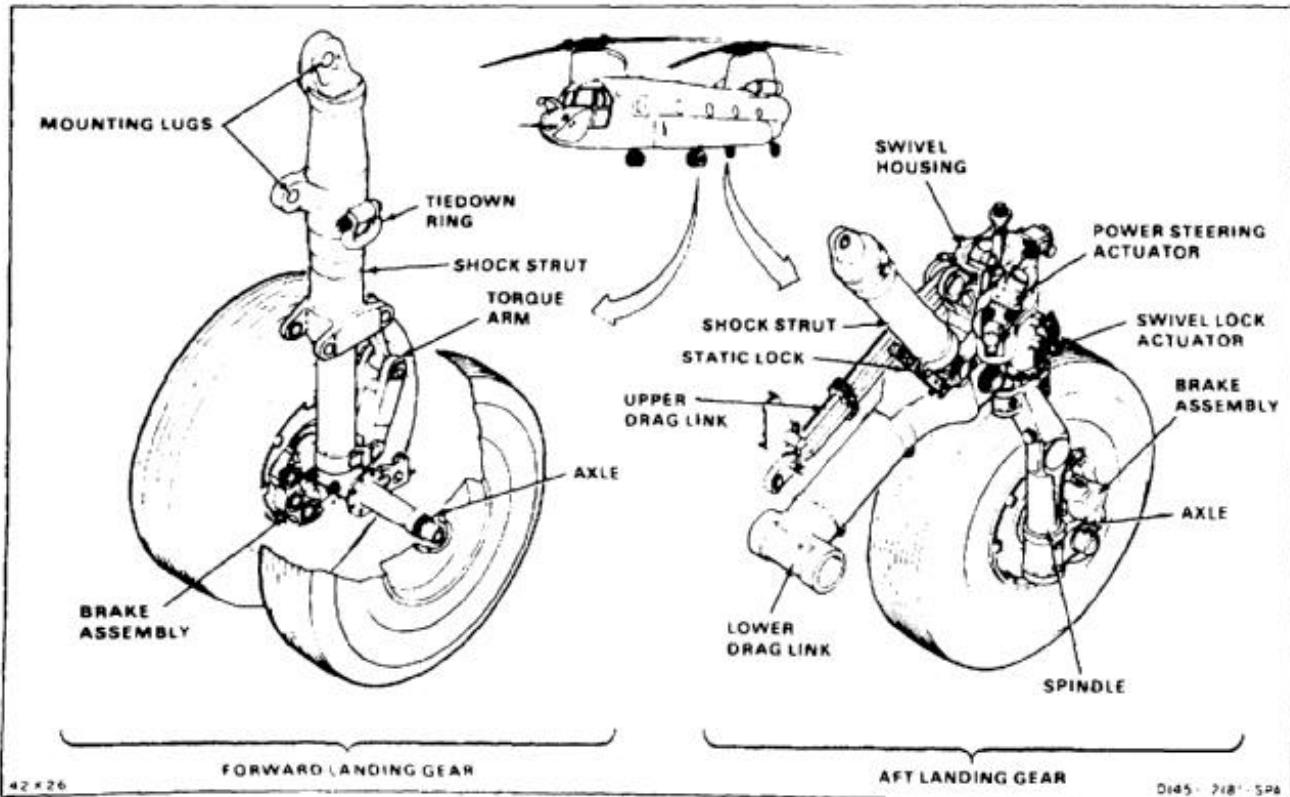
FORWARD LANDING GEAR

The forward landing gear dual wheels are installed on a fixed axle. The axle is mounted on an air-oil shock strut bolted to the fuselage support structure. A torque arm keeps the assembly aligned. A disk and brake unit are provided for each wheel. Hinged panels allow access to the forward landing gear assemblies. Each assembly has a towing and tiedown fitting. The wheels can be raised at jacking points on the lower torque arms. Left and right landing gear assemblies can be converted for use in either forward position.

AFT LANDING GEAR

Aft landing gear assembly is installed on each side of the fuselage. Each aft wheel is mounted on an axle supported by a spindle. The spindle rides on bearings in

the swivel housing. Upper and lower drag links support the swivel housing. Both drag links are connected to fuselage fittings. A shock strut is mounted between the lower drag link and a fuselage fitting. The shock strut has a static lock mechanism to prevent strut extension during helicopter jacking. A disk and brake unit are installed on each wheel. The aft wheels can be free to swivel, or they can be locked in trailing position. A centering cam in the swivel housing centers each wheel in trailing position. A hydraulically-operated swivel lock secures the wheel in this position. The power steering actuator is connected to the aft right landing gear swivel housing. A towing and tiedown fitting is also attached to this housing. Static ground wires are installed on each landing gear axle housing. A proximity switch is mounted on the forward bulkhead of each aft landing gear compartment. Linkage from the upper drag link is connected to a target which is sensed by each switch. The switches are operated as the helicopter takes off or lands. Extensions on the aft axles are used for connecting a tow bar. An aft landing gear assembly can be installed on either side of the helicopter. This requires disassembly and repositioning of certain components.

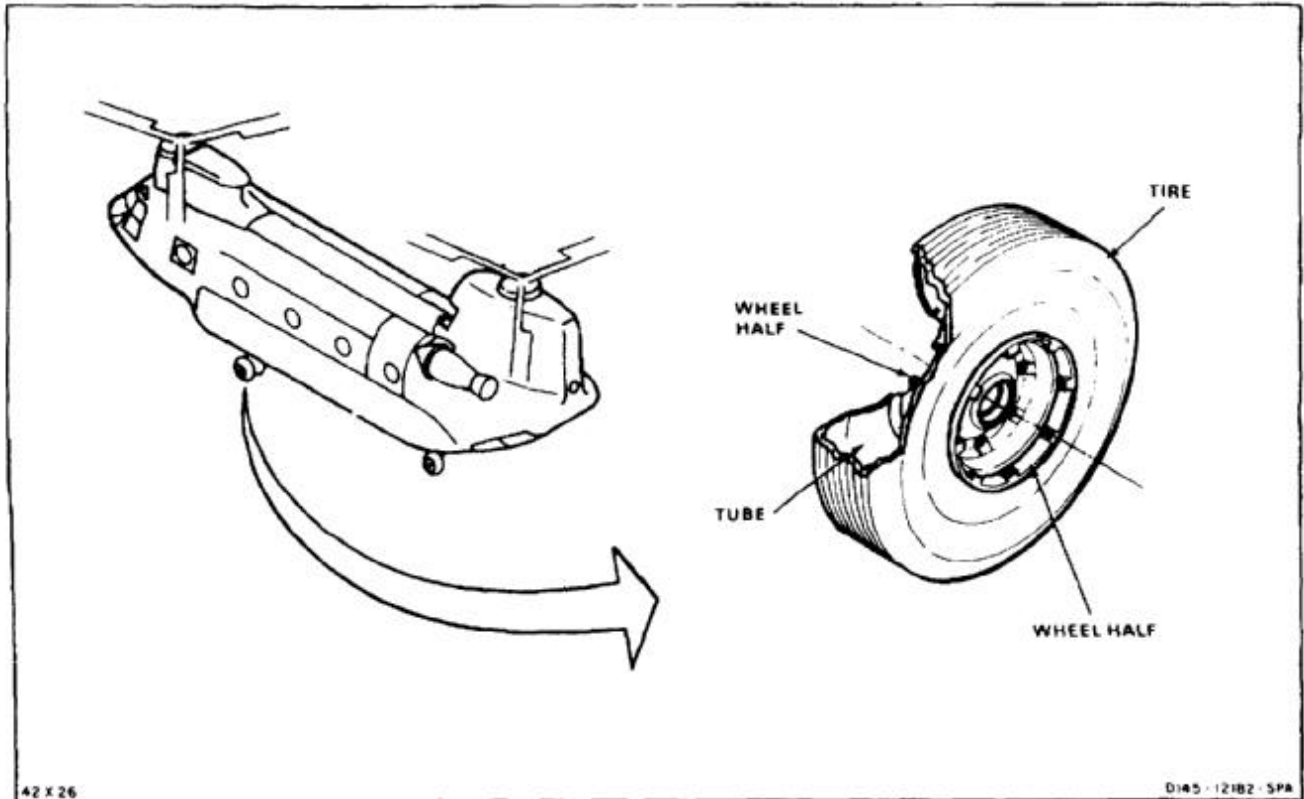


TIRES AND TUBES

Tires are interchangeable on all six wheels. The tires are 10-ply or 10-ply rating. Tubes are required for both tubeless and tube-type tires.

WHEELS

The wheels consist of two halves. Moisture-proof seals protect the bearings. Wheels are separated for removing or mounting tire or tube.



AXLES

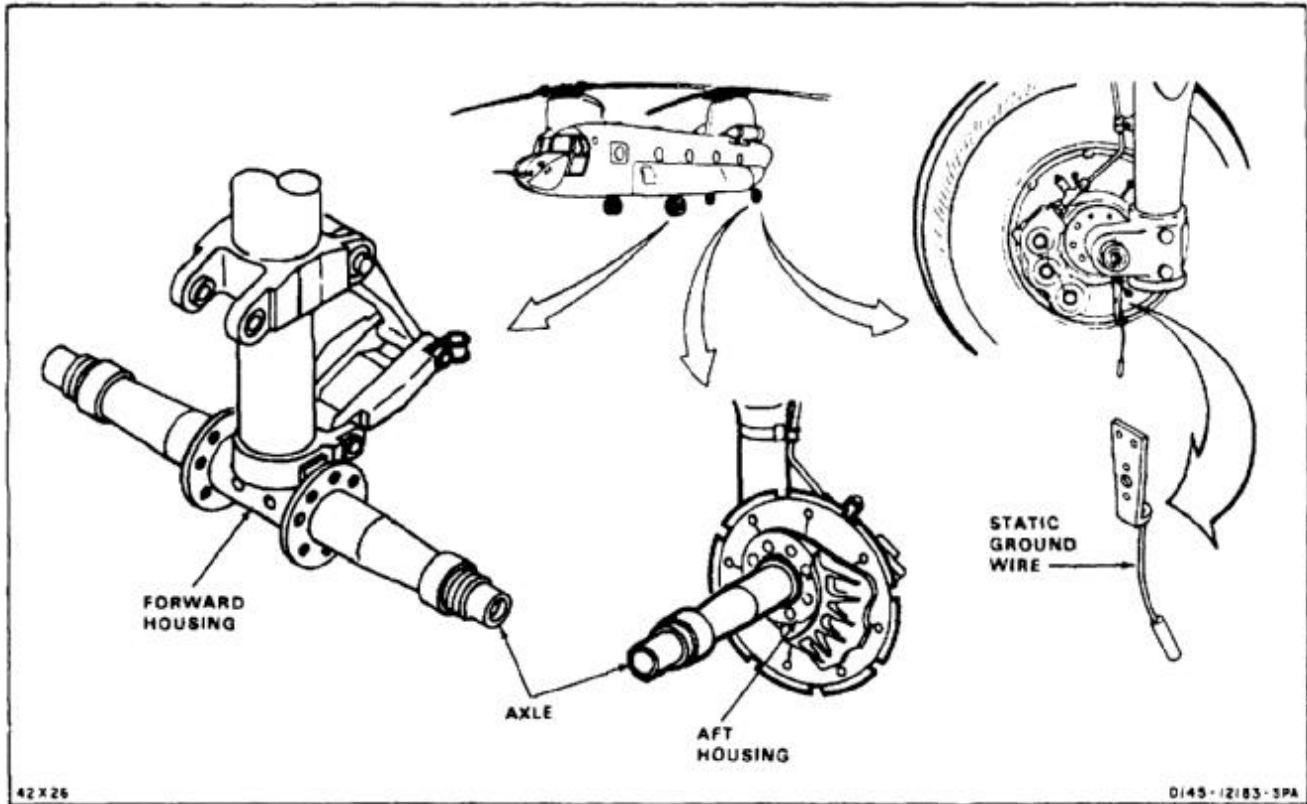
Forward and aft axles are removable and can be used on either forward or aft landing gear. Each axle is secured to the axle housing by a bolt which passes thru the axle.

SHOCK STRUTS

All landing gear shock struts are air-oil units. Compressed air absorbs shock, and hydraulic fluid dampens up and down movements.

STATIC GROUND WIRE

A static ground wire is installed on the aft left landing gear. The wire consists of a cable and tube attached to a mounting bracket. Three holes on the mounting bracket provide for wire length adjustment. The mounting bracket is installed on a clip on the axle housing.



PROXIMITY SWITCHES

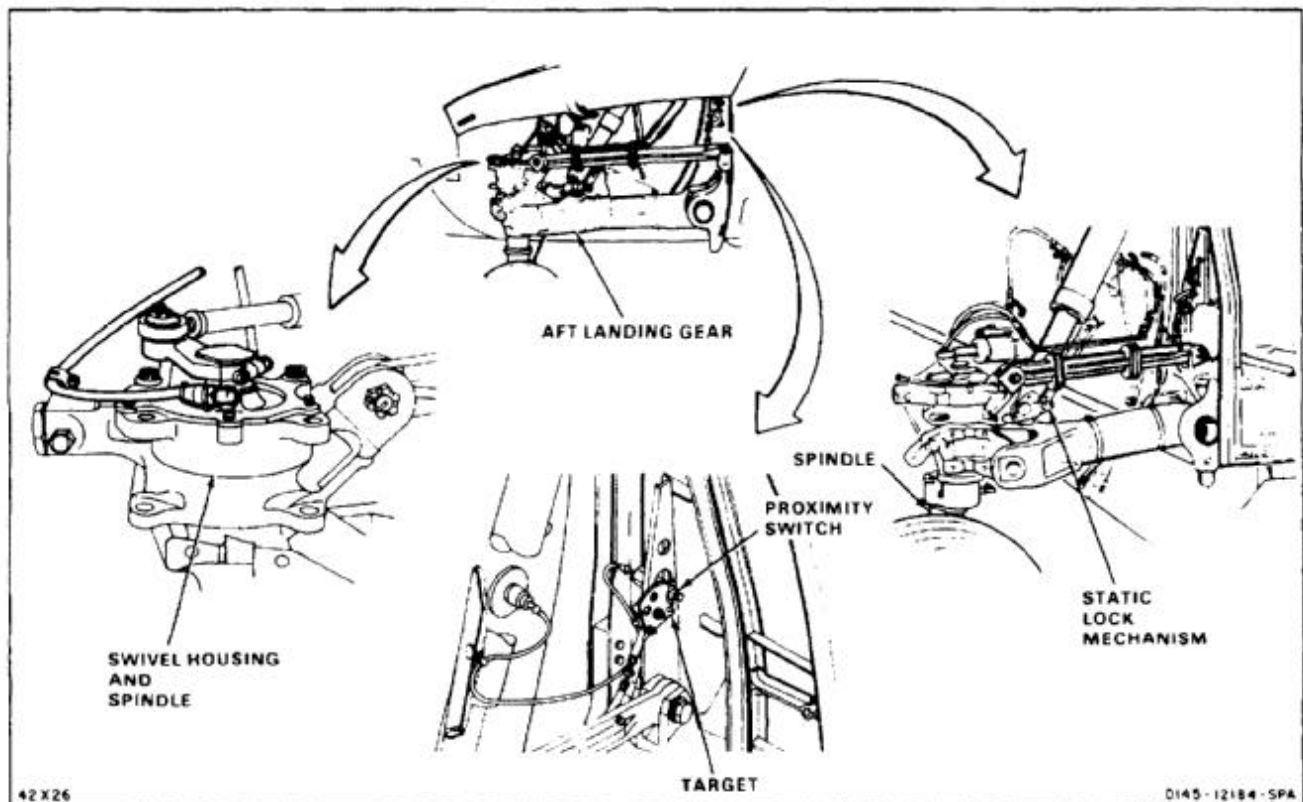
Linkage from the aft landing gear upper drag link is connected to a target. The target is set so the proximity switch is open when the helicopter is in flight. When the helicopter is on the ground, the switch is closed. The switches prevent DASH actuator input during lift-off to hover. They also reduce AFCS sensitivity **50 percent** until lift-off. The right switch turns off the IFF when the helicopter is on the ground.

STATIC LOCK MECHANISM

The static lock mechanism is a link attached to aft landing gear shock strut. It is operated by hand to lock the shock strut in the up position when the helicopter is jacked.

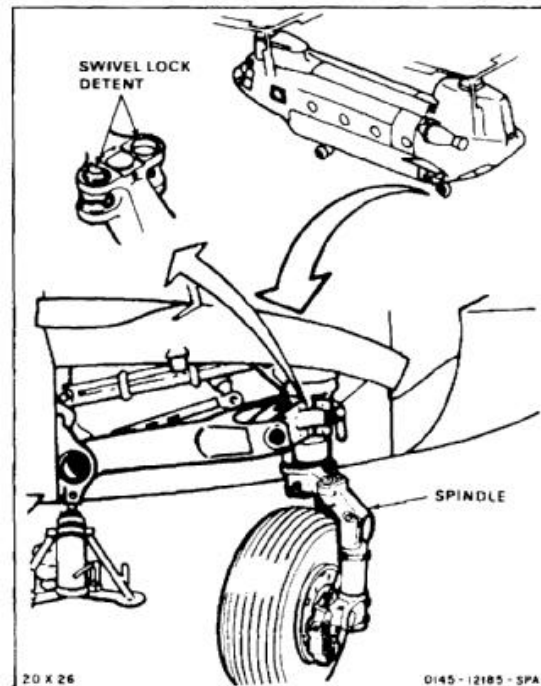
SWIVEL HOUSING AND SPINDLE

A swivel housing is supported by the two drag links and shock strut of each aft landing gear. The housing allows the spindle and wheel to swivel **360°**. A centering cam in the housing centers the wheel in the trailing position for taxiing or flight. The swivel locking pin can lock the wheel in this position.



SWIVEL LOCK DETENTS

Two spring-loaded swivel lock detents are mounted in each spindle. The spring permits the detent to move down allowing the swivel locking pin to pass for centering.



END OF TASK

SECTION II LANDING GEAR

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Jack 1228-31
- Socket, 1-3/16 Inch
- Socket, 1-3/8 Inch
- Socket, 1-1/16 Inch
- Extension, 9 Inch
- Breaker Bar, 3/4 Inch Drive
- Tiedown Chain
- Container, 2 Quart

Materials:

Cloths (E135)

Personnel Required:

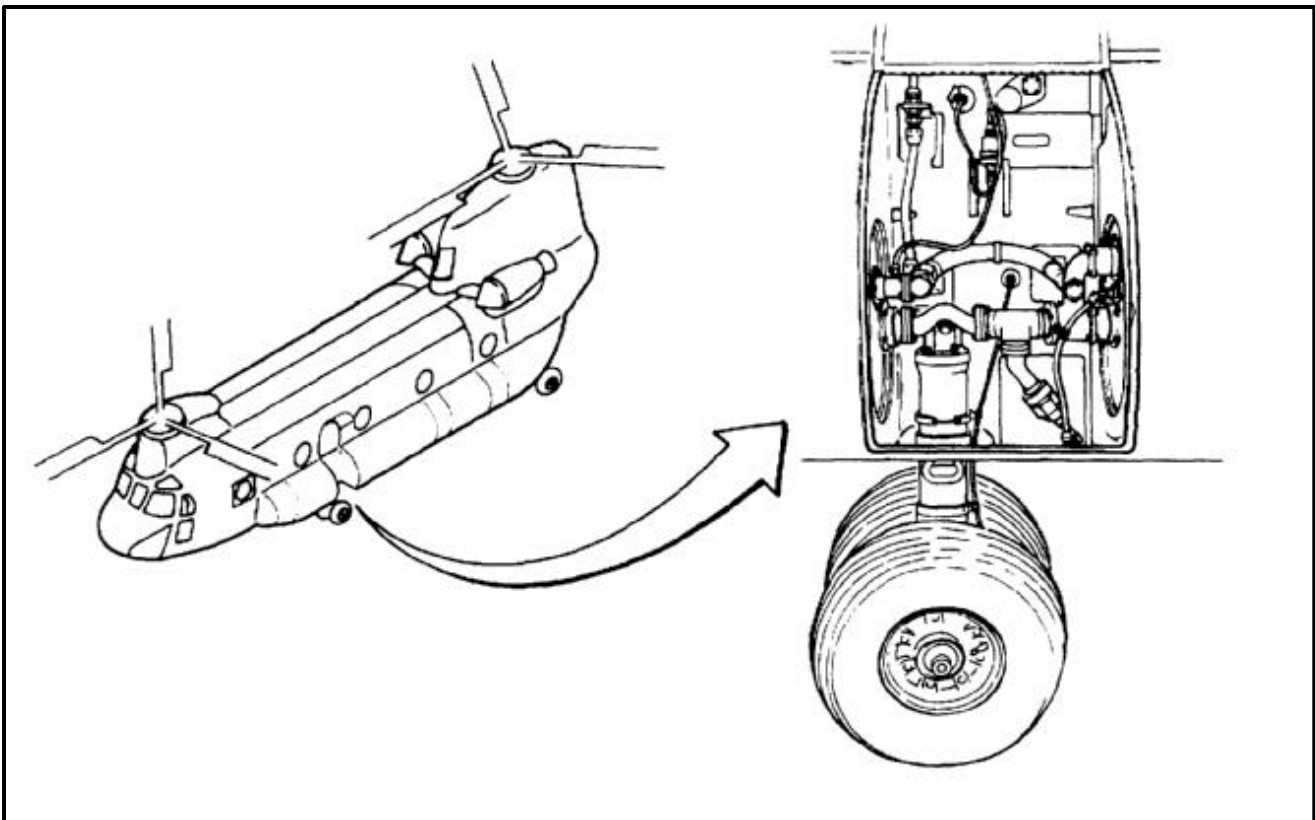
Medium Helicopter Repairer (2)

References:

- Task 1-22
- Task 2-2
- Task 10-88.1

Equipment Condition:

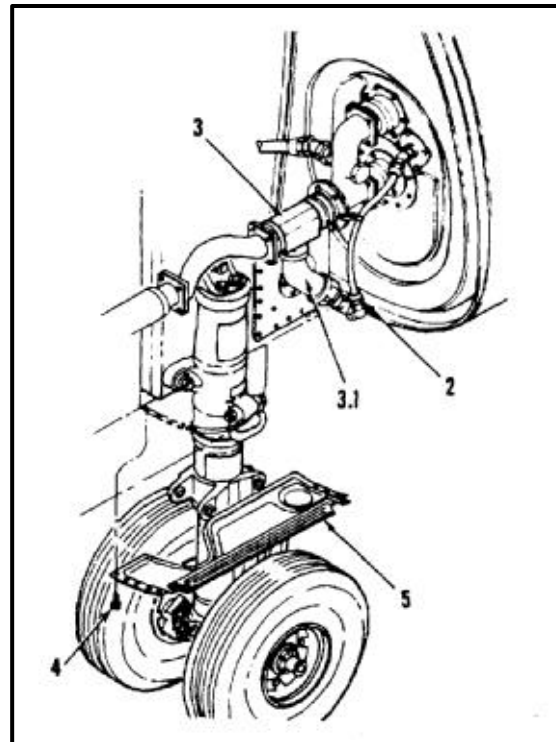
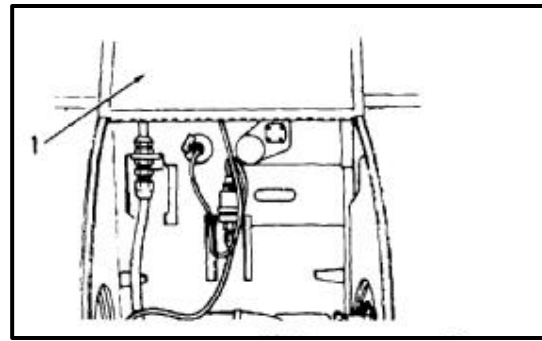
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Landing Gears Chocked
- Parking Brake Released
- Defuel Helicopter (Task 10-35)



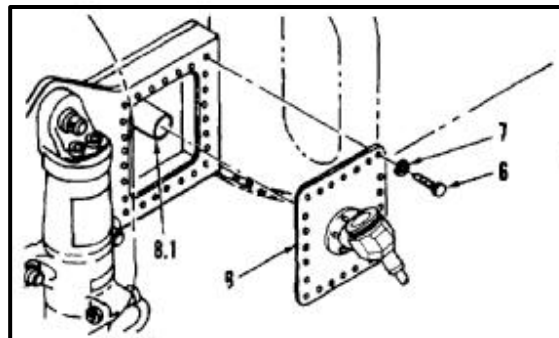
3-2 REMOVE FORWARD LANDING GEAR (Continued)**3-2****REMOVE ACCESS PANELS****NOTE**

Forward landing gear can be removed with wheels and brakes installed or removed. This procedure is shown with wheels and brakes installed.

1. Open hinged access panel (1) (Task 2-2).
2. Disconnect fuel fitting (2) and install protective caps.
3. Remove 10 screws (4).
4. Remove lower panel (5).
- 4.1. Remove tee (3) and elbow (3.1). (Refer to Task 10-88.1.)



- 4.2. Disconnect cross over hose (8.1). (Refer to Task 10-88.1.)
5. Remove 26 bolts (6) and washer seals (7). Take off panel (8).



CAUTION

Do not use masking tape or gum backed paper of any type to plug or seal any hydraulic brake line or hose. Gummy particles can block small hydraulic passageways.

6. Disconnect brake hose (9) at brake fitting (10).
7. Catch leaking fluid in a container or cloths. Use cloths (E135).
8. Remove two nuts (11), washers (12), and screws (13) from clamps (14).
9. Remove two clamps (14) from hose (9).
10. Pull brake hose (9) through ferrule (15).
11. Remove chocks and place jack at forward fuselage jack pad (Task 1-22).

CAUTION

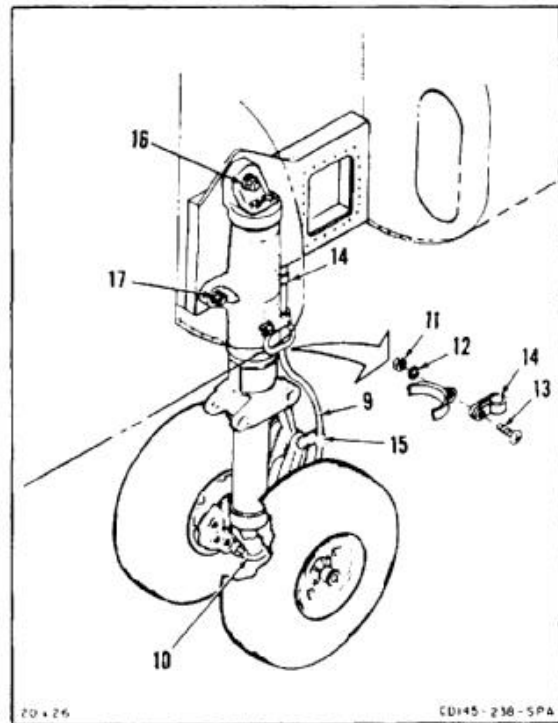
Jacking can cause structural damage if gross weight exceeds **24,500 pounds**. Before jacking helicopter make sure gross weight does not exceed this limit.

12. Extend jack until it begins to take weight of helicopter (Task 1-22). Turn down jack locking collar.

NOTE

Torque is broken at this point to avoid rocking helicopter when wheels are off ground.

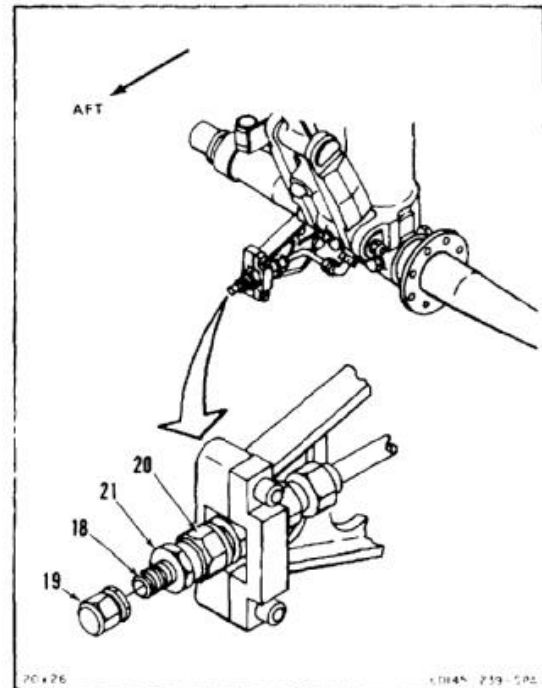
13. Break torque on nuts (16 and 17).



REMOVE BOLTS**WARNING**

High pressure air valve cap can be blown off causing injury to personnel. Loosen cap **one or two turns** to allow trapped air to escape before removing cap.

14. Release air pressure from shock strut through high pressure air valve (18) as follows:
 - a. Remove cap (19) from high pressure air valve (18).
 - b. Hold valve body (20) with wrench and turn outer nut (21) counterclockwise **1/2 to 1-1/2 turns**.
 - c. Allow air pressure to discharge completely.

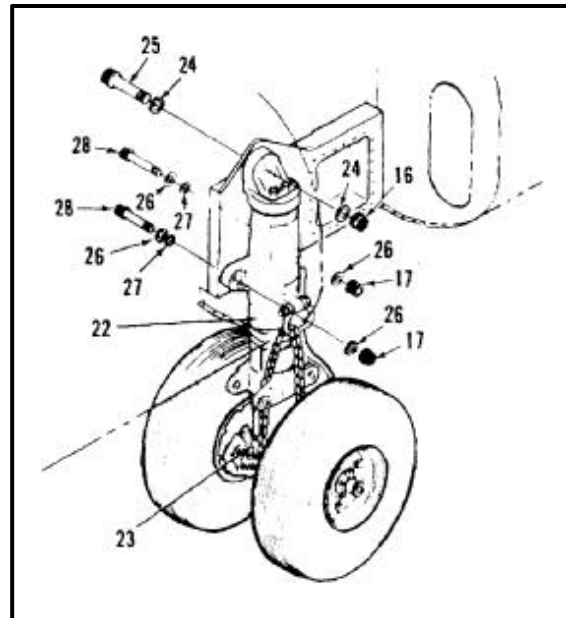
**WARNING**

Position tiedown chain clear of tubing. Otherwise, damage to tubing can cause a malfunction.

15. Collapse shock strut and tie upper cylinder (22) to lower piston (23) in collapsed position. Use tiedown chain.
16. Lower jack slowly until wheels touch floor.
17. Have assistant support shock strut.
18. Remove nut (16), two washers (24), and bolt (25).
19. Remove two nuts (17), four washers (26), two seals (27), and bolts (28).
20. Move landing gear away from helicopter.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

None

Personnel Required:

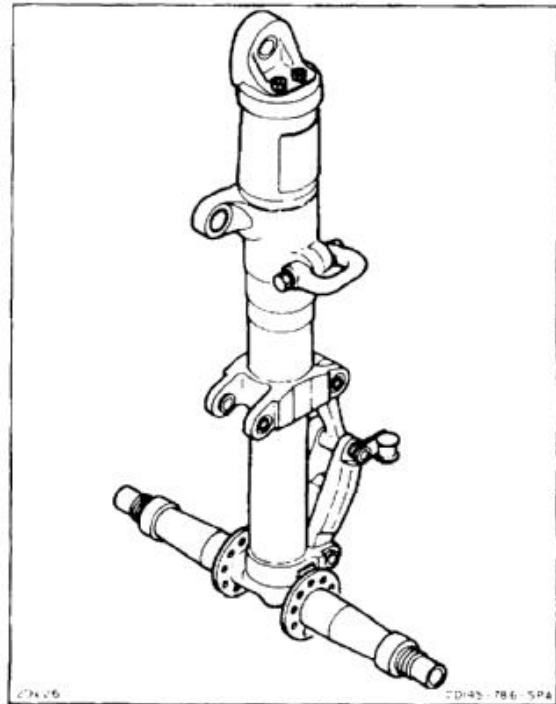
Medium Helicopter Repairer
Inspector

References:

Task 1-70
Task 1-72

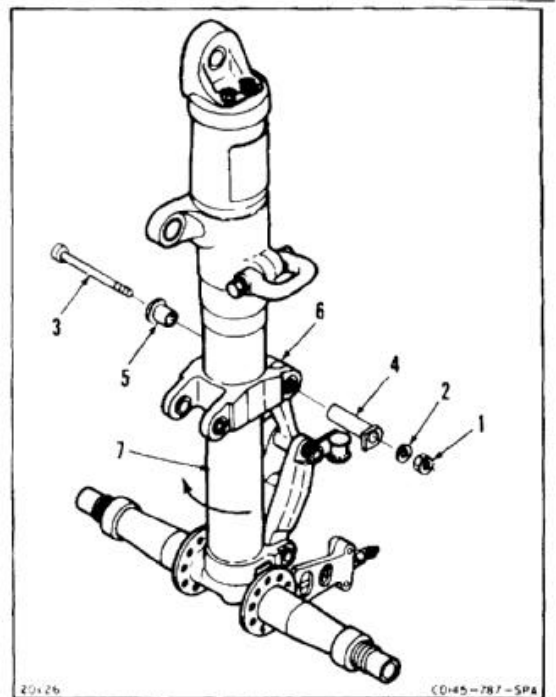
Equipment Condition:

Off Helicopter Task

**NOTE**

Procedure shown is for converting issued forward left gear to a forward right gear.

1. Remove nut (1), washer (2), bolt (3), shaft (4), and bushing (5) from upper end of torque arm (6).
2. Move torque arm (6) away from shock strut (7).
3. Rotate lower end of strut (7) 180°.



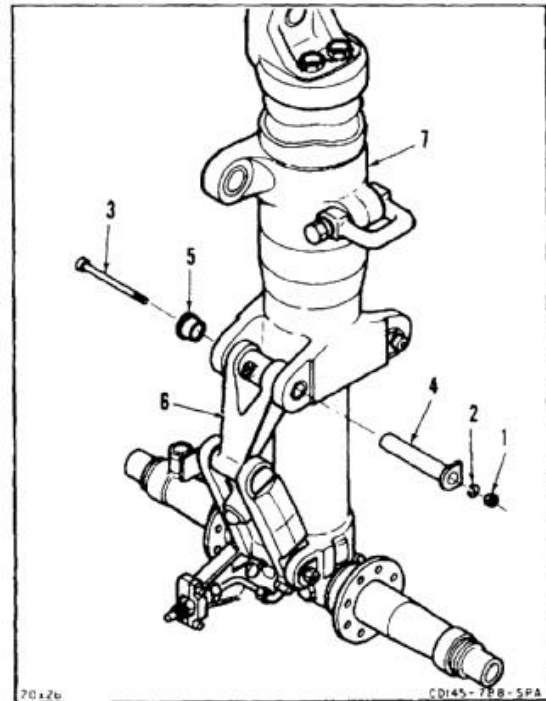
3-3 CONVERT FORWARD LANDING GEAR (Continued)

3-3

4. Position upper end of torque arm (6) on strut (7).
5. Install shaft (4), bushing (5), bolt (3), washer (2), and nut (1).
6. Torque nut (1) to **60 inch-pounds**.
7. Service shock strut (Tasks 1-70 and 1-72).

INSPECT**FOLLOW-ON MAINTENANCE:**

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

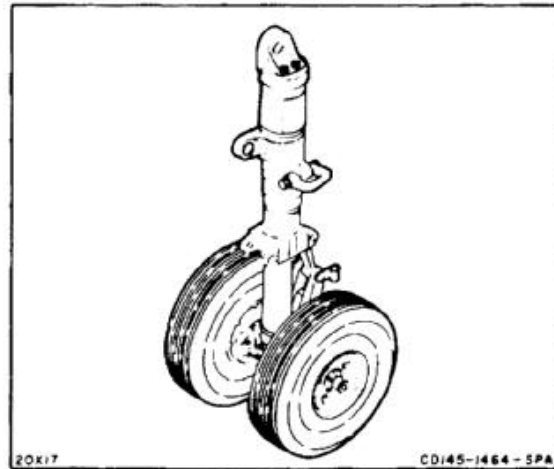
Medium Helicopter Repairer

References:

Task 3-9
Task 3-14
Task 3-17
Task 3-25
Task 3-77

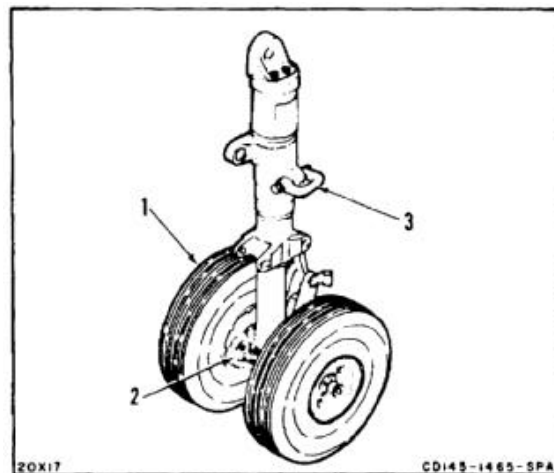
Equipment Condition:

Off Helicopter Task

**NOTE**

Procedure is same for left and right gear.

1. Remove both wheels (1) (Task 3-9).
2. Remove both brakes (2) (Task 3-77).
3. Remove shackle (3) (Task 3-25).

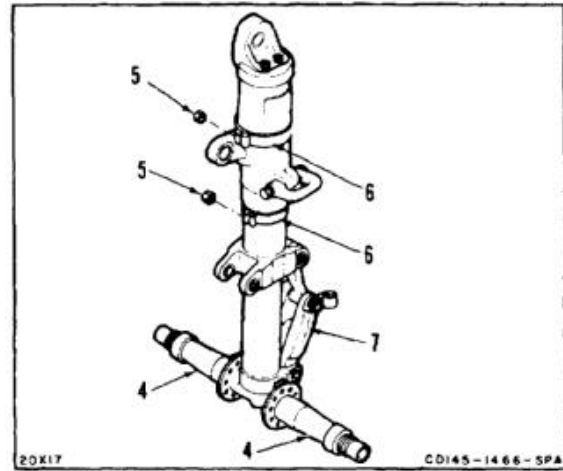


3-4 DISASSEMBLE FORWARD LANDING GEAR (Continued)**3-4**

4. Remove both axles (4) (Task 3-14).
5. Remove lockwire and two nuts (5).
6. Remove two clamps (6).
7. Remove torque arm (7) (Task 3-17).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Tiedown Chain

Materials:

Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

Task 2-18
Task 3-12
Task 3-15
Task 3-26
Task 3-83
TM 55-1520-240-23P

Equipment Condition:

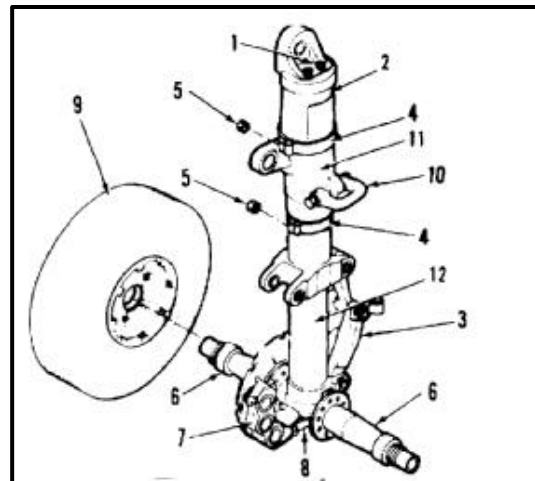
Off Helicopter Task

NOTE

Procedure is same for left and right gear. Left gear is shown here.

If a replacement gear is being installed, drain preservative fluid from shock strut.

1. Remove lockwire and filler plug (1). Turn shock strut (2) upside down to drain fluid from strut.
2. Install torque arm (3) (Task 3-18).
3. Install two clamps (4) with nuts (5). Safety wire nuts with lockwire (E231).
4. Install both axles (6) (Task 3-15).
5. Install both brakes (7) (Task 3-83).
6. Install tube (8) in brake (7).
7. Install both wheels (9) (Task 3-12).
8. Install shackle (10) (Task 3-26).

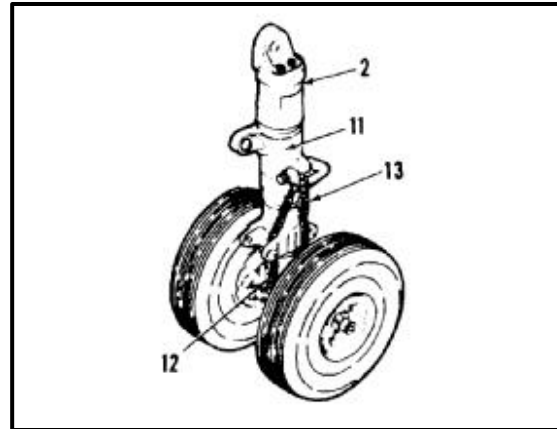


3-5 ASSEMBLE FORWARD LANDING GEAR (Continued)**3-5**

9. With shock strut (2) collapsed, tie upper cylinder (11) to lower piston (12). Use tiedown chain (13).

INSPECT**FOLLOW-ON MAINTENANCE:**

Lubricate torque arm (Task 1-89).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Floor Hoist
 Torque Wrench, 0 To 600 Foot-Pounds
 Socket, 1-3/16 Inch
 Socket, 1-3/8 Inch
 Socket, 1-1/16 Inch
 Extension, 9 Inch
 Eddy Current Inspection Unit

Materials:

Antiseize Compound (E75)
 Cloth (E120)
 Dry Cleaning Solvent (E162)
 Gloves (E186)

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

References:

Task 2-8
 Task 3-3
 Task 7-7
 Task 7-70
 Task 7-72
 Task 7-330
 Task 10-56
 Task 10-88.2
 TM 55-1520-240-23P
 TM 1-1520-253-23

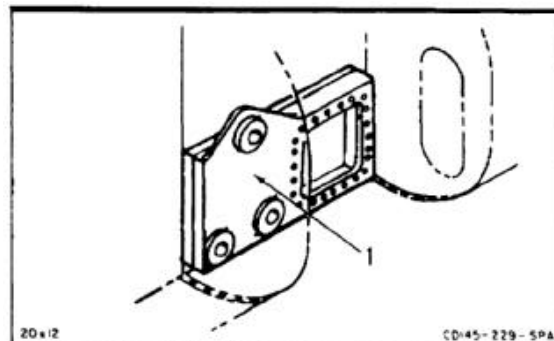
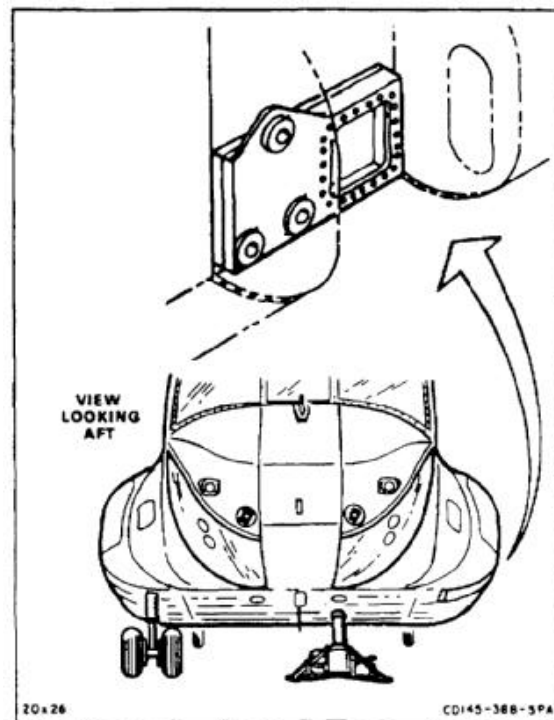
INSTALL LEFT OR RIGHT GEAR**WARNING**

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may irritate skin and cause burns. Use only in well-ventilated area away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

To convert a forward landing gear to an opposite assembly, refer to Task 3-3.

1. Clean landing gear support structure (1) with solvent (E162). Wear gloves (E186).



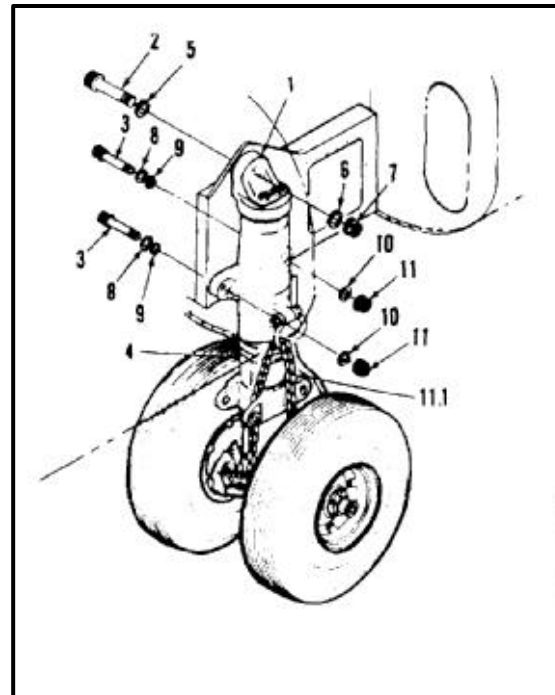
3-6 INSTALL FORWARD LANDING GEAR (Continued)**3-6**

2. Inspect structure for cracks, corrosion, and distortion. If structure is defective, refer to Task 2-8 for repair. If a crack in the forward landing gear support structure is suspected, refer to TM 1-1520-253-23.

WARNING

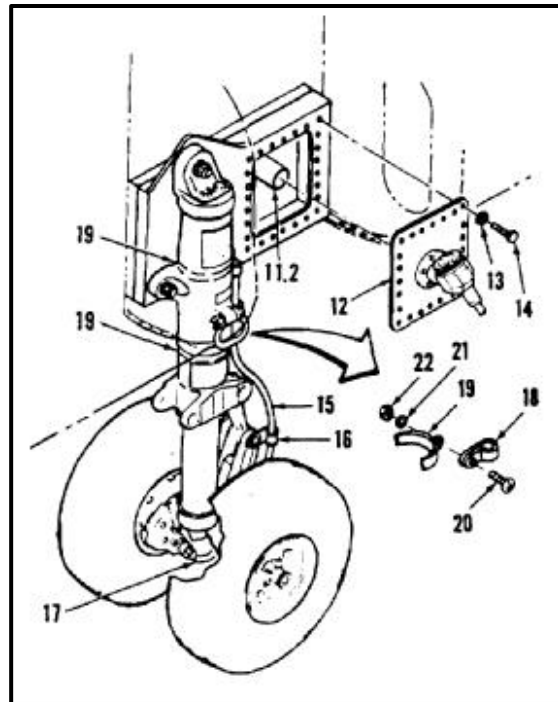
Antiseize compound (E75) may form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

3. Lubricate thread and shank of attaching bolts (2 and 3) with antiseize compound (E75).
4. Using a helper, position landing gear (4) on structure (1) using portable floor hoist.
5. Install bolt (2), head inboard, with countersunk washer (5) under bolt head and washer (6) under nut (7).
6. Install two lower bolts (3), heads inboard with countersunk washers (8) and seals (9) under bolt head, and washer (10) under nuts (11).
7. Torque nut (7) to **540 foot-pounds**. Torque nuts (11) to **430 foot-pounds**.
8. Remove tiedown chain (11.1).

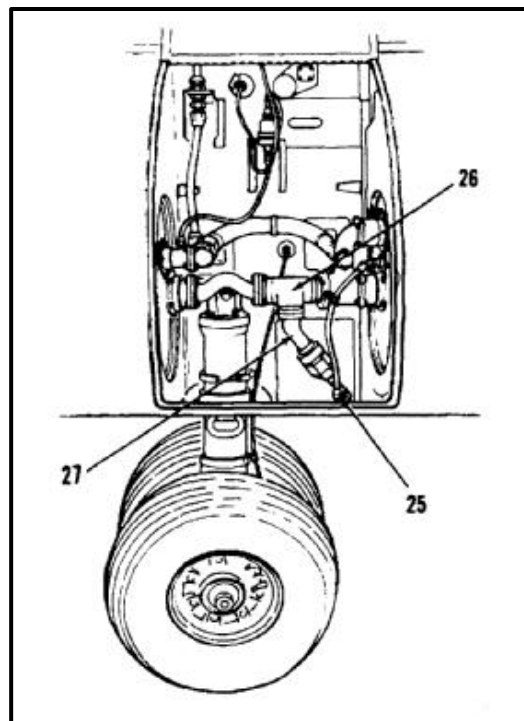


INSTALL PANELS AND BRAKE HOSE

- 8.1. Install cross over hose (11.2). (Refer to Task 10-88.2.)
9. Install panel (12). Secure with washer seals (13) and bolts (14).
10. Remove protective caps and plugs from brake port and hose.
11. Route hose (15) through torque link ferrule (16) and connect hose to brake connection (17).
12. Install two clamps (18) on hose (15).
13. Install two clamps (18) to two clamps (19) with screws (20), washers (21), and nuts (22).



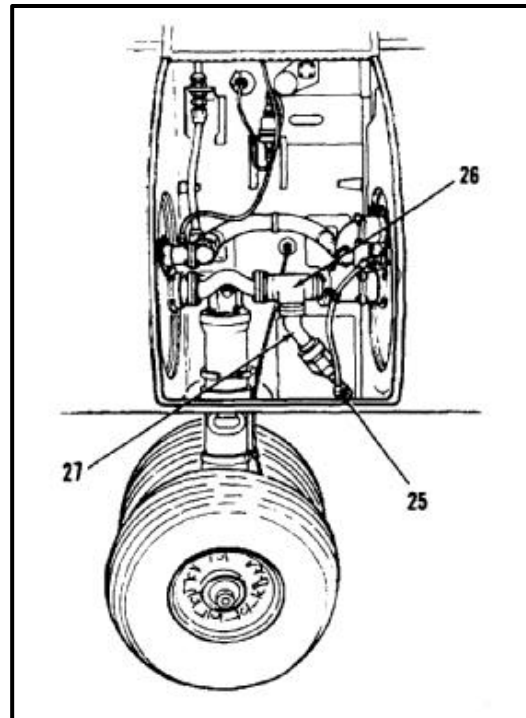
14. Install lower panel (23) with 10 screws (24).



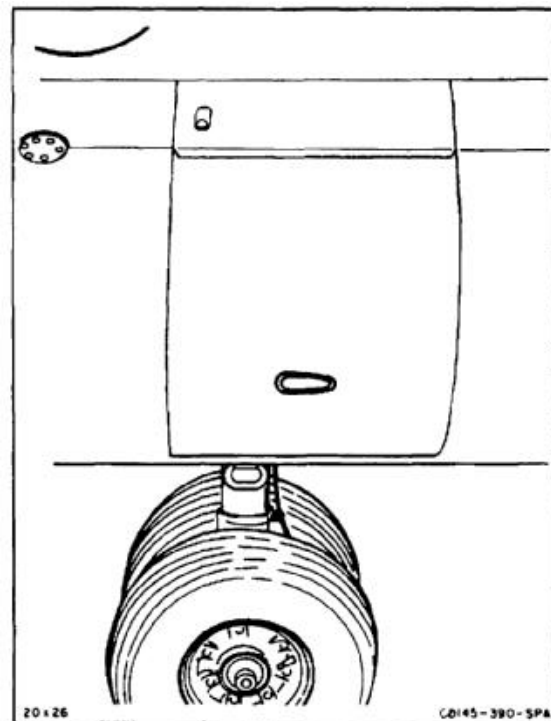
3-6 INSTALL FORWARD LANDING GEAR (Continued)

3-6

15. Connect fuel fitting (25).
- 15.1. Install tee (26) and elbow (27). (Refer to Task 10-56.)
16. Bleed brakes (Task 7-330).
17. Service shock strut (Tasks 1-70 and 1-72).
18. If required, refer to Task 7-7 for leakage.

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Lower and remove jack (Task 1-22).
- Close access panel (Task 2-2).
- Fuel helicopter (Task 1-51) as required.



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Pneumatic Tire Valve Repair Tool
- Crowfoot Wrench, 2 Inch
- Retaining Ring Pliers

Materials:

- Cloth (E120)
- Dry Cleaning Solvent (E162)
- Gloves (E186)

Personnel Required:

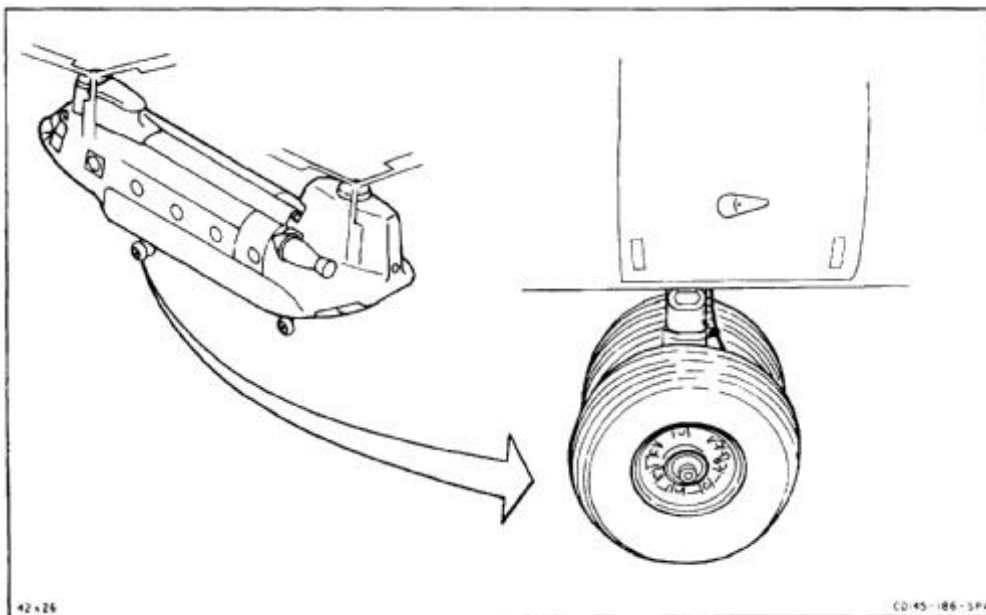
Medium Helicopter Repairer (2)

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Parking Brake Released (Task 7-239)
- Helicopter at Forward Landing Gear Jack Pad (Task 1-23)

References:

- TM 1-1500-204-23
- TM 55-1500-322-24



INSPECTION OF WHEELS

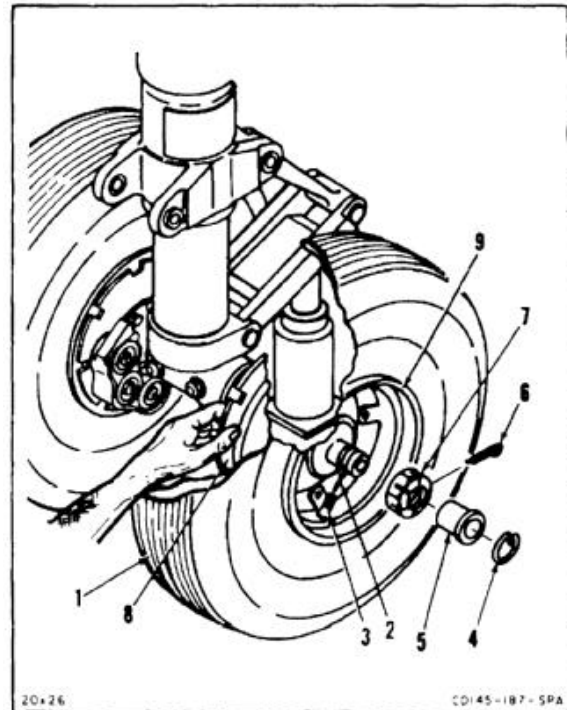
1. Before removing landing gear and wheel assembly, inspect wheel for the following conditions:
 - a. Cracks, corrosion, and deterioration of finish.
 - b. Security of hardware holding wheel halves together.
 - c. Two cap plugs in outer wheel half.
 - d. Loose or deteriorated sealant.
 - e. Inspect the wheel for general condition. (Refer to TM 1-1500-204-23.)

WARNING

Wheel can explode if axle nut is removed while tire is inflated. Deflate tire fully before starting removal procedure.

NOTE

Procedure is same for removing inboard or outboard wheels on right or left gear. Left forward outboard wheel is shown here.

**REMOVAL**

- 1.1. Let air out of tire (1) by slowly removing valve core (2) from valve (3).
2. Remove retaining ring (4), sleeve bushing (5), cotter pin (6), and axle nut (7).

CAUTION

Seal can be cut on axle thread. Do not drag seal on thread while removing wheel.

Bearing and seal may fall out when wheel is removed.

3. Hold brake disk (8) so it does not drop. Remove wheel (9).

4. Remove two seals (10) and bearings (11).
5. Clean two seals (10) with dry cloths (E120).

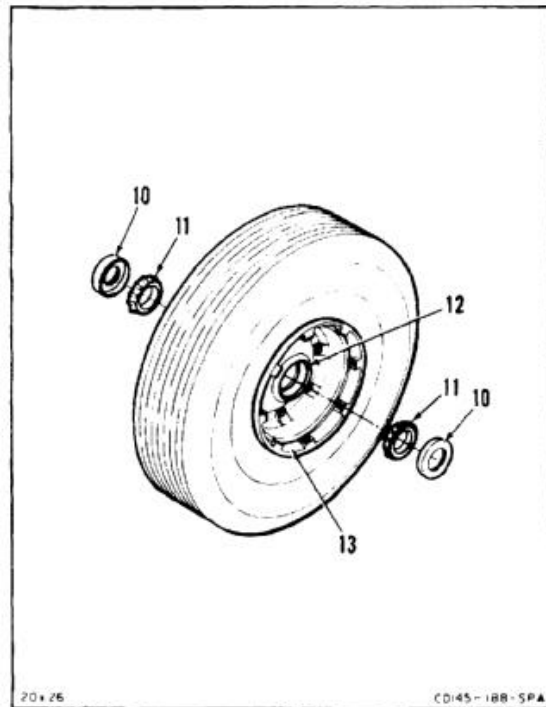
WARNING

Solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

6. Clean bearings (11) and two cups (12) in wheel (13). Use dry cleaning solvent (E162). Dry with cloth (E120).
7. Check bearings (11) and cups (12) for corrosion, nicks, burrs and cracks (TM 1-1500-204-23, TM 55-1500-322-24).
8. Check seals (10) for damaged sealing lip.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-7.1 REMOVE AFT LANDING GEAR WHEEL AND TIRE ASSEMBLY**3-7.1****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Pneumatic Tire Valve Repair Tool
 Crowfoot Wrench, 2 Inch
 Retaining Ring Pliers

Materials:

Cloth (E120)
 Dry Cleaning Solvent (E162)
 Gloves (E186)

Personnel Required:

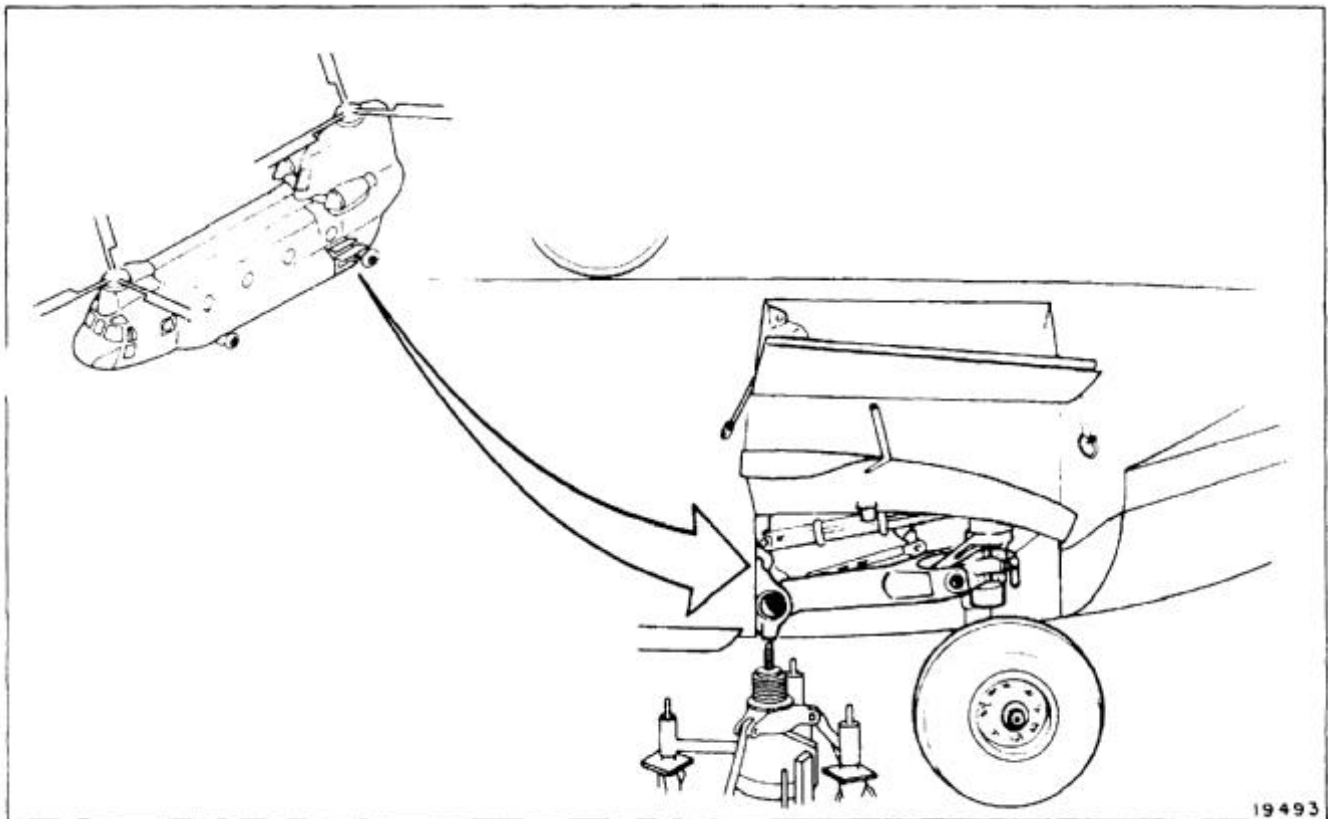
Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Parking Brake Released (Task 7-236)
 Jack Helicopter at Aft Fuselage Jack Pad (Task 1-24)

References:

TM 1-1500-204-23
 TM 55-1500-322-24



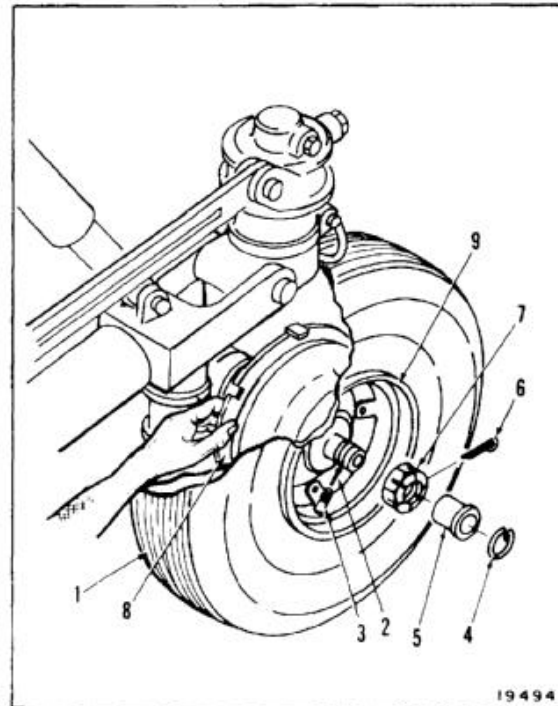
1. Before removing landing gear and wheel assembly, inspect wheel for the following conditions:
 - a. Cracks, corrosion, and deterioration of finish.
 - b. Security of hardware holding wheel halves together.
 - c. Two cap plugs in outer wheel half.
 - d. Loose or deteriorated sealant.
 - e. Inspect the wheel for general condition. (Refer to TM 1-1500-204-23.)

WARNING

Wheel can explode if axle nut is removed while tire is inflated. Deflate tire fully before starting removal procedure.

NOTE

Procedure is same for removing wheel from left or right gear. Left wheel is shown here.



- 1.1. Removal let air out of tire (1) by slowly removing valve core (2) from valve (3).
2. Remove retaining ring (4), sleeve bushing (5), cotter pin (6), and axle nut (7).

CAUTION

Seal can be cut on axle thread. Do not drag seal on thread while removing wheel.

Bearing and seal may fall out when wheel is removed.

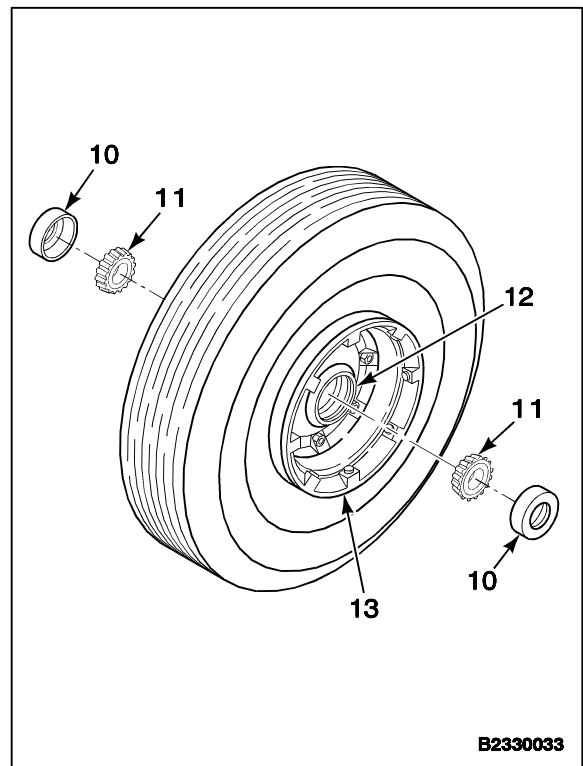
3. Hold brake disk (8) so it does not drop. Remove wheel (9).

4. Remove two seals (10) and bearings (11).
5. Clean two seals (10) with dry cloths (E120).

WARNING

Solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

6. Clean bearings (11) and two cups (12) in wheel (13). Use dry cleaning solvent (E162). Dry with cloth (E120).
7. Check bearings (11) and cups (12) for corrosion, nicks, burrs, and cracks (TM 1-1500-204-23, TM 55-1500-322-24).
8. Check seals (10) for damaged sealing lip.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Tire Bead Breaker
- Pneumatic Tire Valve Repair Tool
- Eddy Current Inspection Unit

Materials:

None

Personnel Required:

- CH-47 Helicopter Repairer

References:

- TM 1-1520-253-23
- TM 55-2620-200-24

Equipment Condition:

Off Helicopter Task

General Safety Instructions:

WARNING

Tire and wheel can explode if air pressure is not released, causing injury to personnel and damage to equipment. Do not attempt to work on tire, tube and wheel before releasing pressure.

NOTE

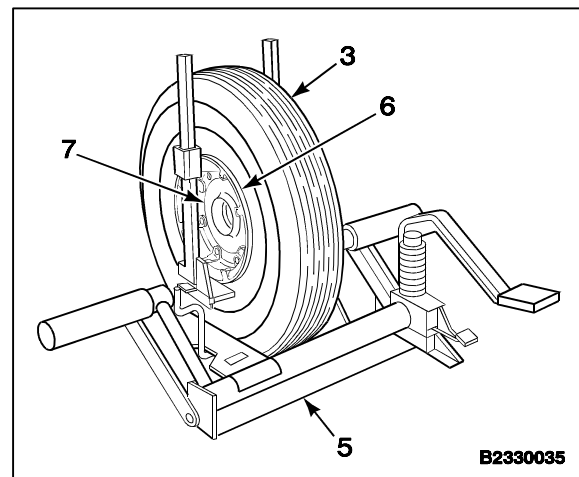
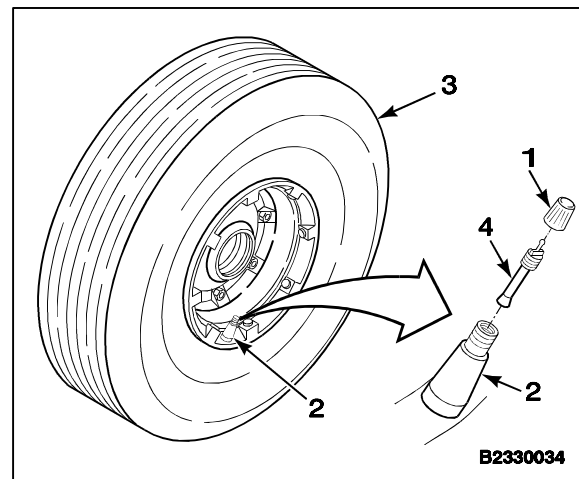
Procedure is same for removing all landing gear tires and tubes.

1. Remove cap (1) from valve (2).
2. Let all air out of tire (3) by removing core (4) from valve (2).

CAUTION

Do not pry with sharp tool between wheel rim and tire bead. Damage to tire and wheel can result. Use bead breaker with care. Make sure that valve is not damaged by bead breaker.

3. Install tire (3) in tire bead breaker (5).
4. Break tire bead (6) from wheel (7).
5. Remove tire (3) from tire bead breaker (5).

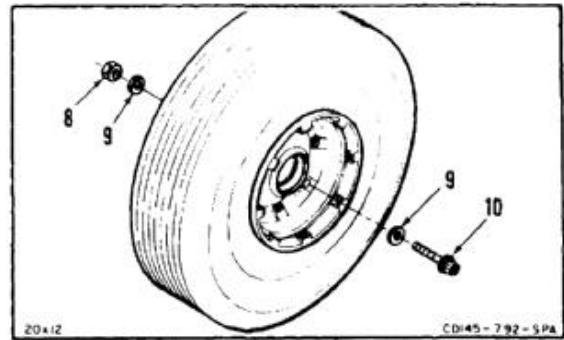


3-8 REMOVE LANDING GEAR TIRE AND TUBE (Continued)**3-8**

6. Remove sealant and remove eight nuts (8), 16 washers (9), and eight bolts (10).

NOTE

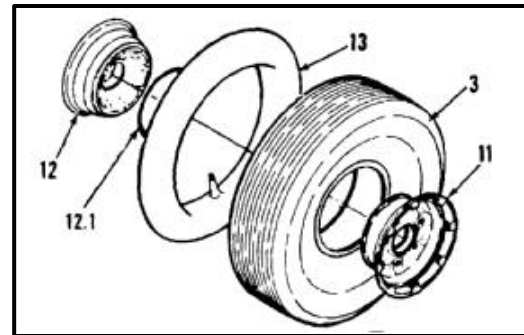
If a crack in the landing gear wheel is suspected, refer to TM 1-1520-253-23.



7. Separate wheel halves (11 and 12).
- 7.1. Remove packing (12.1).
8. Remove tube (13) from tire (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Container to Hold Wheel and Boil Water
 Source of Heat to Boil Water, or Oven

Materials:

Carbon Dioxide (Dry Ice) (E92)
 Kevlar Gloves (E187)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task
 Tire and Tube Removed From Wheel (Task 3-8)

1. Remove eight screws (1) and keys (2) from inboard wheel half (3).

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns (frost bite) and gives off toxic fumes. Use only in well-ventilated area. Do not get in eyes, on skin, or clothing. In case of contact, immediately flush with plenty of water. Get medical attention for eyes.

WARNING

Wear Kevlar gloves (E187) when handling heated or chilled parts. Injury to personnel can result.

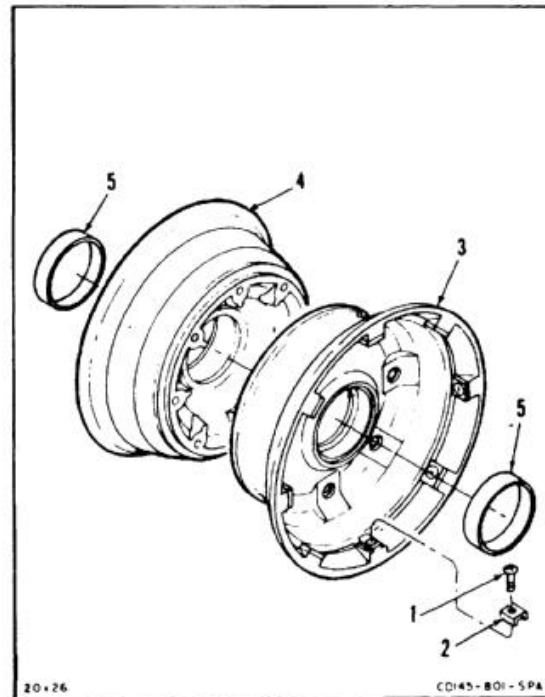
NOTE

Bearing cups are a shrink fit. Wheel must be expanded to remove them.

2. Expand wheel halves (3 and 4) by boiling in water for **30 minutes** or heating in an oven. Do not exceed **300°F (149°C)** in oven. Pack cups (5) with dry ice (E92).
3. Remove bearing cups (5).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-10 INSTALL LANDING GEAR WHEEL CUPS AND KEYS**3-10****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 30 to 150 Inch-Pounds
 Container to Hold Wheel and Boil Water
 Oven, or Source of Heat to Boil Water
 Ball Staking Tool, 3/32 Inch, Rockwell Hardness C60,
 32 RMS Finish

Materials:

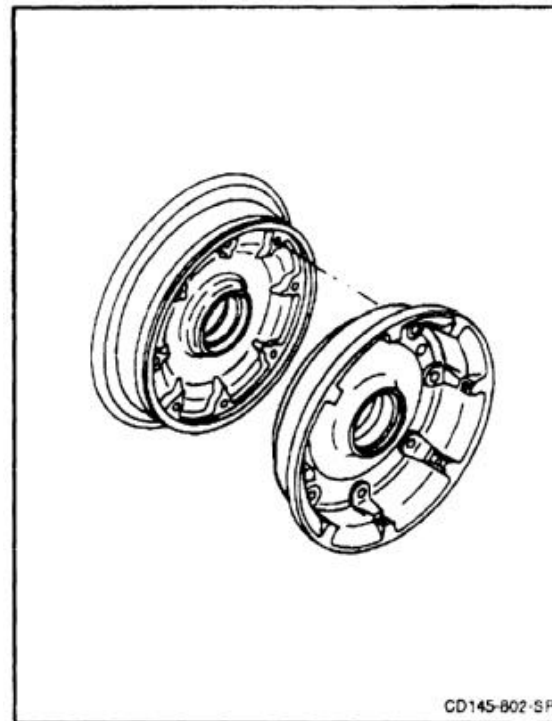
Kevlar Gloves (E187)
 Gloves (E186)
 Antiseize Compound (E77)
 Acetone (E20)
 Sealant (E336)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

TM 55-1520-240-23P



CD145-802-SP

WARNING

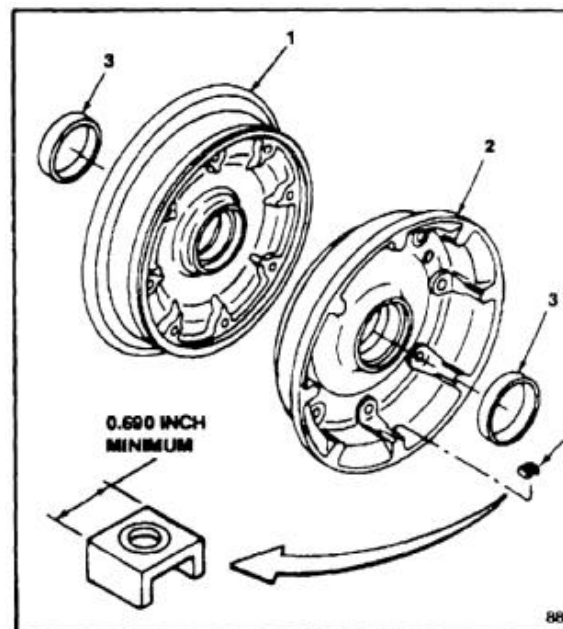
Wear Kevlar gloves (E187) when handling heated or chilled parts. Injury to personnel can result.

NOTE

Bearing cups are a shrink fit. Wheel must be expanded to install them.

Keep bearing cups in refrigerator or freezer until needed.

1. Expand wheel halves (1 and 2) by boiling in water for **30 minutes** or heating in an oven. Do not exceed **300°F (149°C)** in oven.
2. Install two bearing cups (3).
 - 2.1. Allow wheel halves (1 and 2) to cool.
 - 2.2. Measure width of eight wheel keys (4). Width of key shall not be less than **0.690 inch**.



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3. Install eight wheel keys (4) on bosses (5) in wheel half (2). Tap each key lightly if needed to firmly seat it on boss.

WARNING

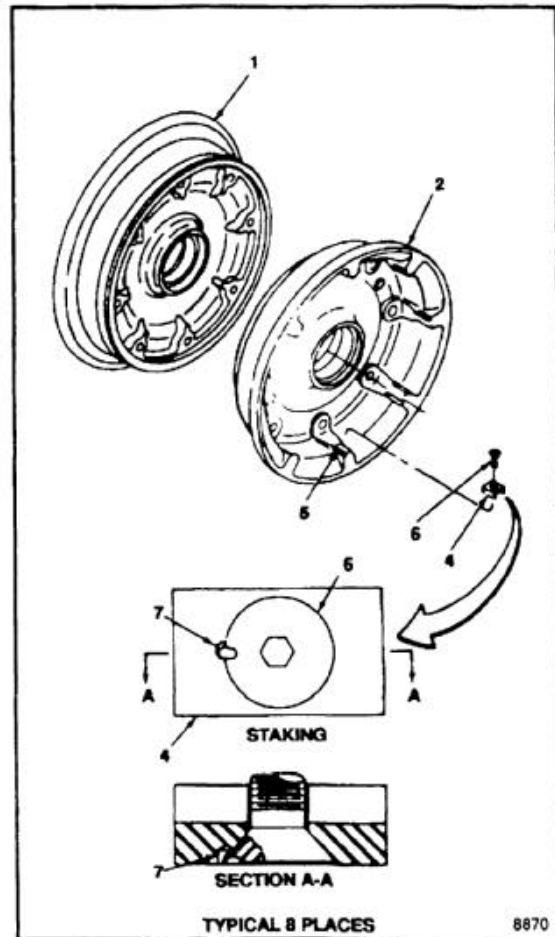
Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

4. Clean screws (6) and keys (4). Use acetone (E20). Wear gloves (E186).

WARNING

Antiseize compound (E77) is extremely toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

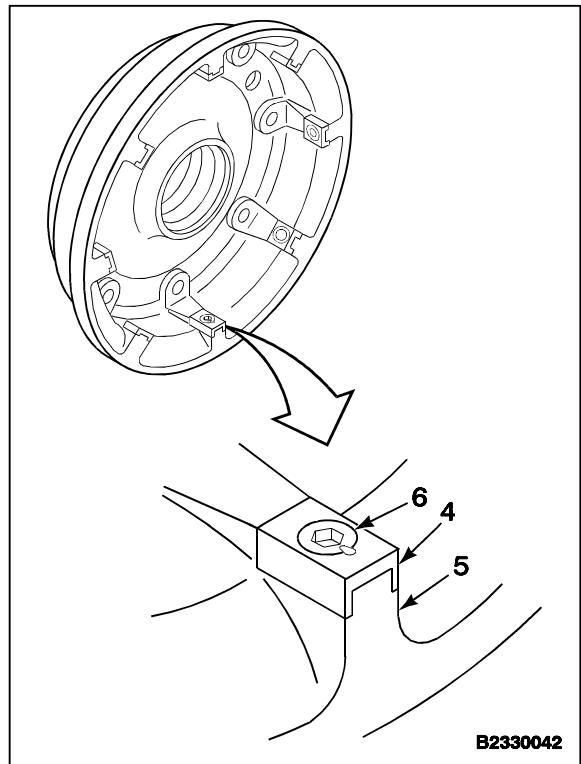
5. Lubricate thread of eight screws (6). Use antiseize compound (E77).
6. Install screws (6) in keys (4). Torque screws to **70 inch-pounds**.
7. Using a **3/32 (0.0937) inch (2.38 mm)** ball staking tool with a hardness of Rockwell 060 and surface finish of 32 RMS or item E-312, stake each screw (6) to slot (7) in key (4) as follows: Start the stake on the outboard side of the screw centerline. Initially hold the staking tool vertically and apply a series of sharp blows with a hammer. The screw material should flow outward toward the slot. Once a clean ball depression is established, angle the staking tool to provide a **15° to 20°** outboard component to complete the stake. Insure enough material is displaced on the screwhead to resist loosening. The staked lip will fill approximately (1/3) of the staking slot.



WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

10. Apply a fillet of sealant (E336) around outside joint edges of each key (4) and key boss (5). Coat entire head of each screw (6) with sealant.

**INSPECT****FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Inflator Kit, NSN 6685-00-124-4336
Torque Wrench, 100-750 Inch-Pounds
Pneumatic Tire Valve Repair Tool

Materials:

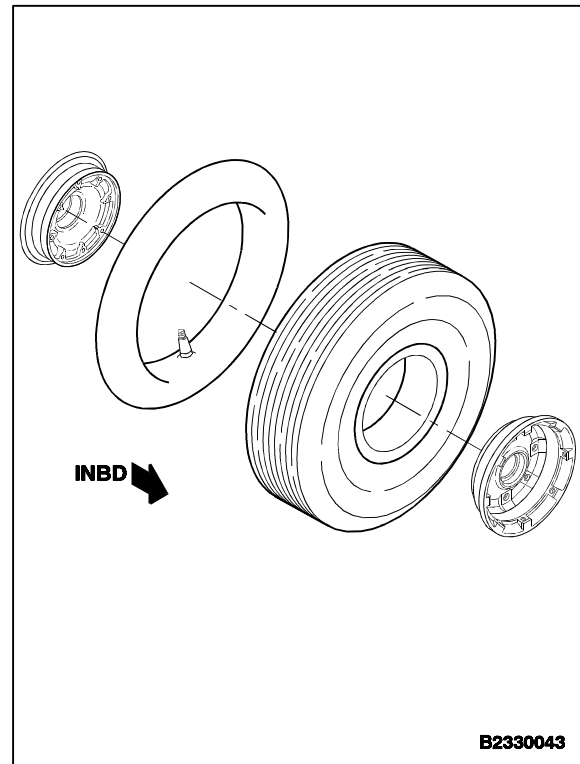
Antiseize Compound (E75)
Cloth, Cleaning (E120)
Dry Cleaning Solvent (E162)
Naphtha (E245)
Parting Agent (E307)
Sealant (E336)
Gloves (E184.1)
Goggles (E473)

Personnel Required:

CH-47 Helicopter Repairer
Inspector

References:

Task 1-73
TM 1-1500-204-23
TM 55-1520-240-23P
TM 55-2620-200-24



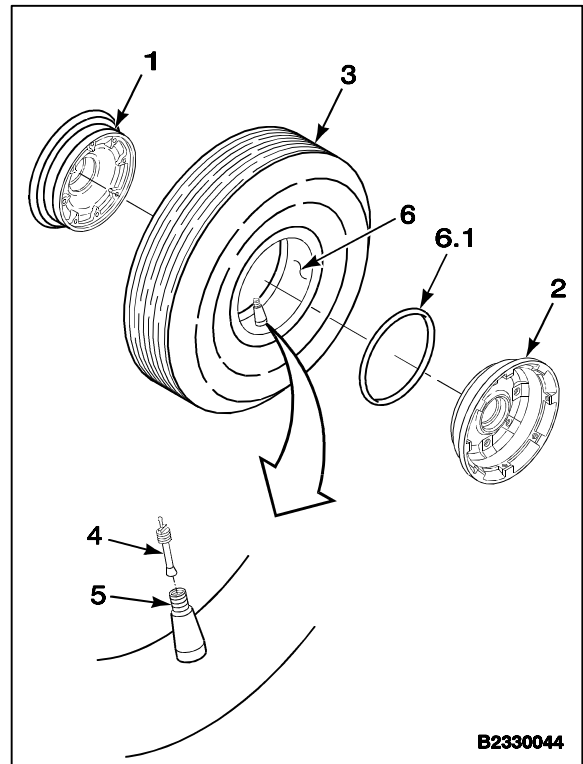
WARNING

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Procedure is same for installing all landing gear tires and tubes.

1. Clean wheel halves (1) and (2) with solvent (E162) and cloths (E120). Wear gloves (E184.1). Wipe rims dry.
2. Clean dust and foreign materials from inside of tire (3). Use cloths (E120).
3. Install valve core (4) in valve (5).
4. Inflate tube (6) part way. Insert tube in tire (3).
- 4.1. Install packing (6.1) in groove of outer wheel half (2).





Make sure tube is clear at wheel halves. Tube can be pinched causing damage to tube.

5. Place tire (3) and tube (6) between outer wheel half (1) and inner wheel half (2). Air valve (5) must be inserted through hole in outer wheel half (1). Do not pinch tube.



Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

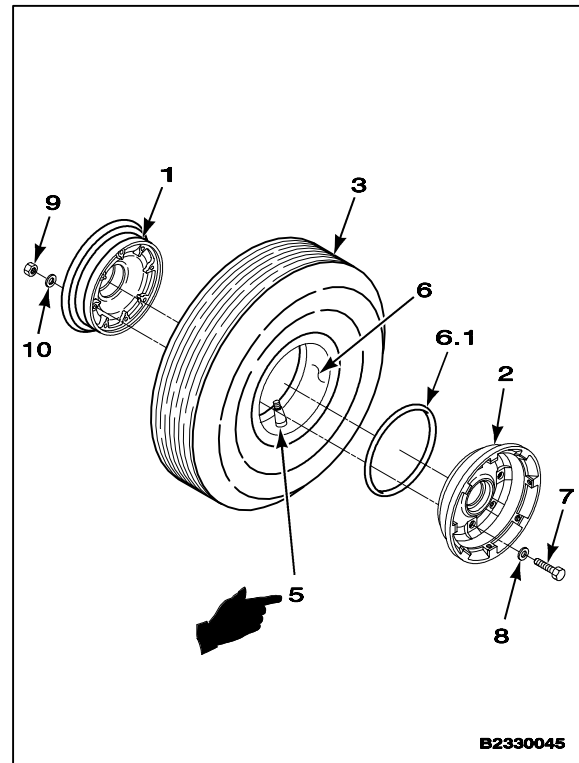
6. Lubricate thread and shank of bolt (7) and washers (8 and 10). Use antiseize compound (E75). Wear gloves (E184.1).

NOTE

Brake keys are on inner wheel half.

7. Install four bolts (7) and washers (8), with countersunk side toward bolt head, **90°** apart in inner wheel half (2). Compress both wheel halves (1 and 2) with packing (6.1) and install four washers (10) and nuts (9) (TM 1-1500-204-23).
8. Install other four bolts (7) and washers (8), countersunk side toward bolt head, through inner wheel half (2). Install four washers (10) and nuts (9). Tighten nuts (9) evenly until wheel halves seat.
9. Torque eight nuts (6) in a criss-cross pattern to **120 inch-pounds**.
10. Maintaining criss-cross pattern, torque eight nuts (9) again to **200 inch-pounds**.
- 10.1. Apply final torque of **300 inch-pounds** to nuts (9).

INSPECT



WARNING

Naphtha (E245) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

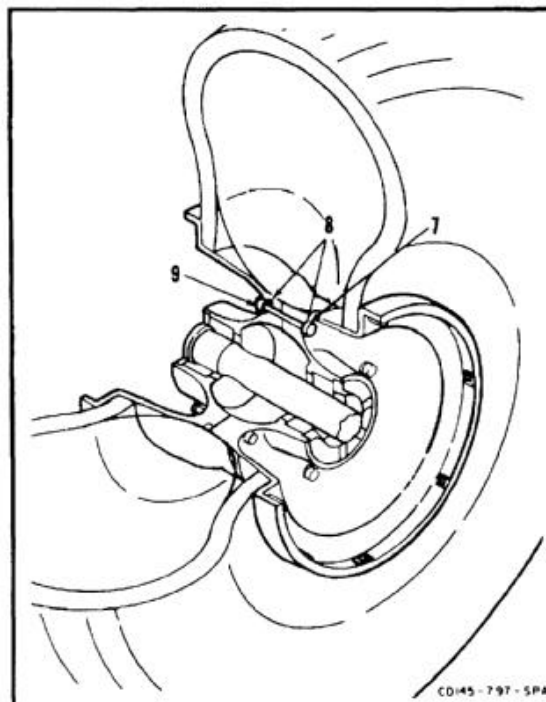
11. Clean bolt heads (7), washers (8), nuts (9), and nearby surface with naphtha (E245). Wear gloves (E184.1).

WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

Parting agent (E307) can form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin, or eyes with water for at least **15 minutes**. Get medical attention for eyes.

12. Coat exposed surfaces of bolts (7), washers (8), and nuts (9) with parting agent (E307). Cover coated area with sealant (E336). Wear gloves (184.1).
13. Apply sealant (E336) around head of bolt (7) and washer (8). Wear gloves (E184.1).



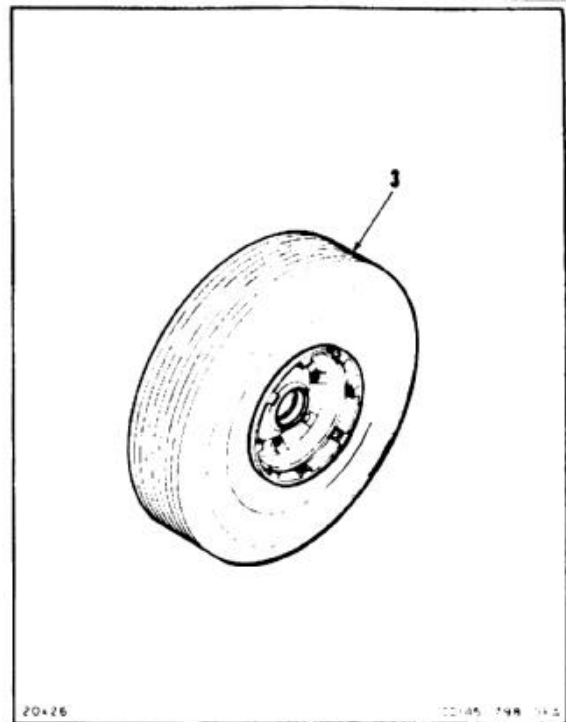
WARNING

Tires can explode when being inflated, causing injury to personnel and damage to equipment. Inflate tire in safety cage. Use a remote tire inflator.

- Inflate tire (3) to **88 psi**. Remove tire inflator (Task 1-73).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY

3-12

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Inflator Kit, NSN 6685-00-124-4336
 Torque Wrench, 100 to 750 Inch-Pounds
 Crowfoot Wrench, 2 Inch
 Retaining Ring Pliers

Materials:

Acetone (E20)
 Cleaning Cloth (E120)
 Dry Cleaning Solvent (E162)
 General Purpose Grease (E190)
 Lubricating Oil (E254/E254.1)
 Parting Agent (E307)
 Sealant (E336)
 Sealing Compound (E350)
 Gloves (E186)

Parts:

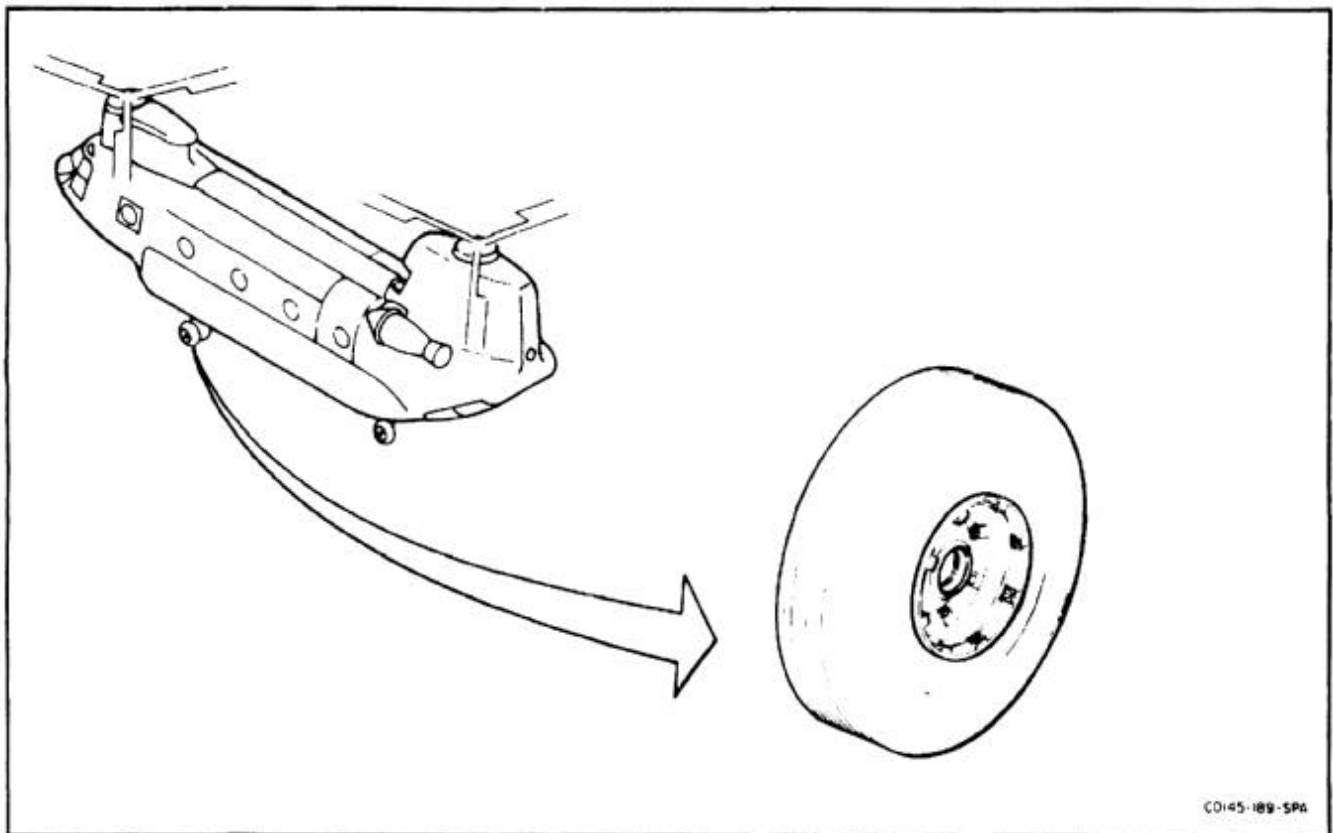
Cotter Pin
 Spacer

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

References:

TM 55-1520-240-23P
 Task 1-73



CO145-189-5PA

WARNING

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

Never stand facing sidewall of tire being serviced. Stand facing tire tread.

WARNING

Oil (E254/E254.1) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

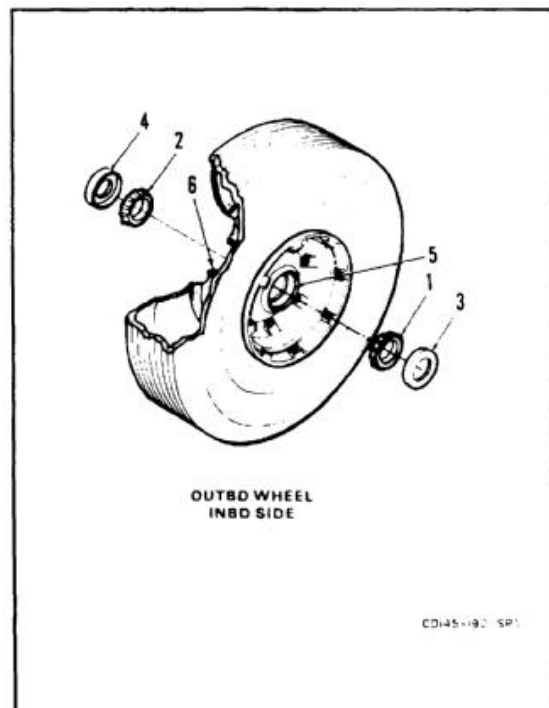
CAUTION

Dirt and mixed greases on bearings and bearing surfaces can cause damage to wheels. Clean bearings and surfaces before packing.

NOTE

Procedures are same for installing inboard and outboard wheels. Outboard wheel is shown here.

1. Clean bearings (1 and 2), and wheel surfaces thoroughly with dry cleaning solvent (E162). Wear gloves (E186).
2. Clean seals (3 and 4) with dry cloths (E120).
3. Pack bearings (1 and 2) with grease (E190).
4. Install bearing (1) in bearing cup (5).
5. Insert seal (3) over bearing (1).
6. Install bearing (2) in bearing cup (6).
- 6.1. Install seal (4) over bearing (2).



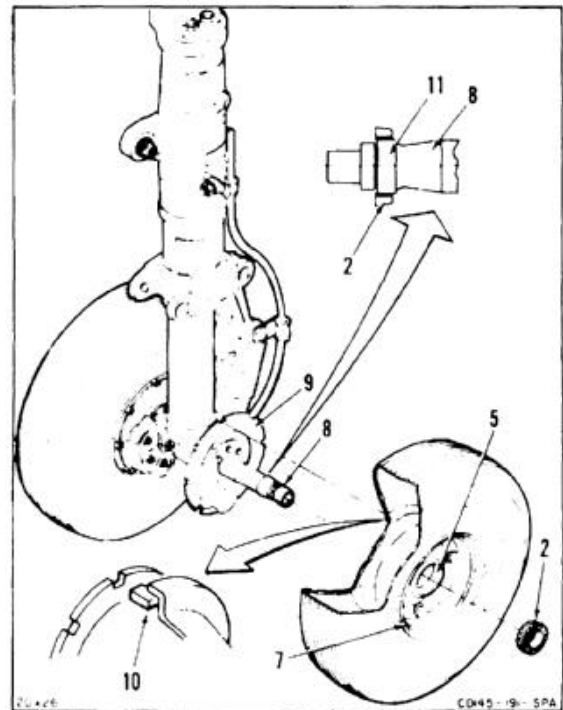
3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

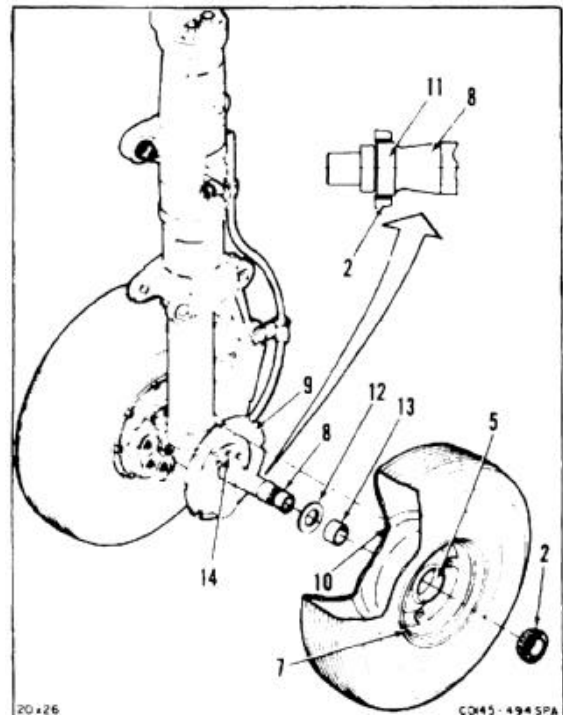
7. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
8. Check that outboard bearing (2) hangs over edge of journal (11) on axle (8).
9. If bearing (2) hangs over journal (11), go to step 11.

WARNING

Sealing compound (E350) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



10. If bearing (2) does not hang over edge of journal (11) add spacer (12) as follows:
 - a. Remove bearing (2), wheel (7), and sleeve bushing (13).
 - b. Install spacer (12) between sleeve bushing (13) and axle housing (14). Do not use more than one spacer per wheel.
 - c. Apply sealing compound (E350) to bore of sleeve (13). Install sleeve bushing on axle (8) while sealant is still wet. Wear gloves (E186).
 - d. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
 - e. Install bearing (2) in bearing cup (5).



WARNING

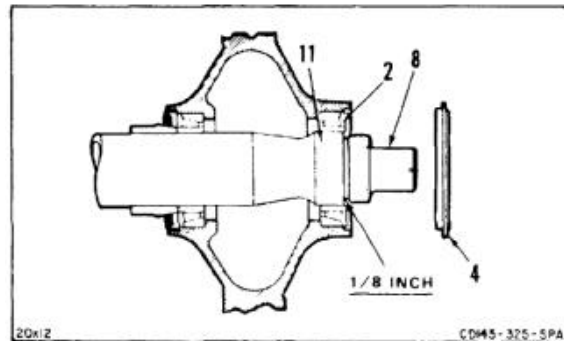
Acetone (E20) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

11. Clean around axle (8) and in gap formed where bearing (2) hangs over journal (11). Use acetone (E20). Wear gloves (E186).

WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

12. Apply **1/8 inch** bead of sealant (E336) around axle (8) in gap formed where bearing (2) hangs over journal (11).
13. Install seal (4) over outboard bearing (2).



3-12 INSTALL FORWARD LANDING GEAR WHEEL AND TIRE ASSEMBLY (Continued)

3-12

14. Apply grease (E190) or oil (E254) to threads and bearing surface of nut (15).
15. Install wheel bearing nut (15) as follows:
 - a. Install nut (15) on axle (8).
 - b. Have helper turn wheel and torque nut (15) to **300 inch-pounds**.
 - c. Back off nut (15) to **0 inch-pounds**. Make sure nut and outer bearing (2) are still in contact.
 - d. Turn wheel and torque nut (15) to a minimum of **120 inch-pounds**. Continue torquing until first slot aligns with hole in axle (8). Do not exceed **300 inch-pounds**.
 - e. Install new cotter pin (16).
16. Install sleeve (17) and retaining ring (18).

WARNING

Tires can explode or wheel halves can separate under pressure. Injury to personnel can result. Use remote tire inflator.

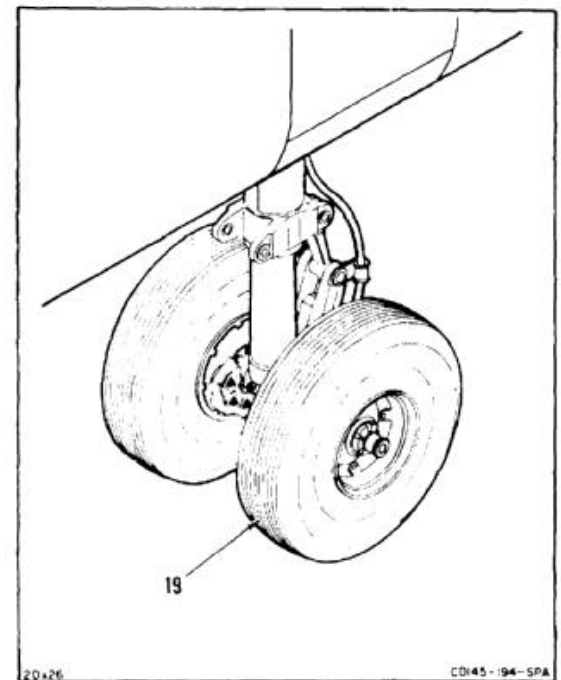
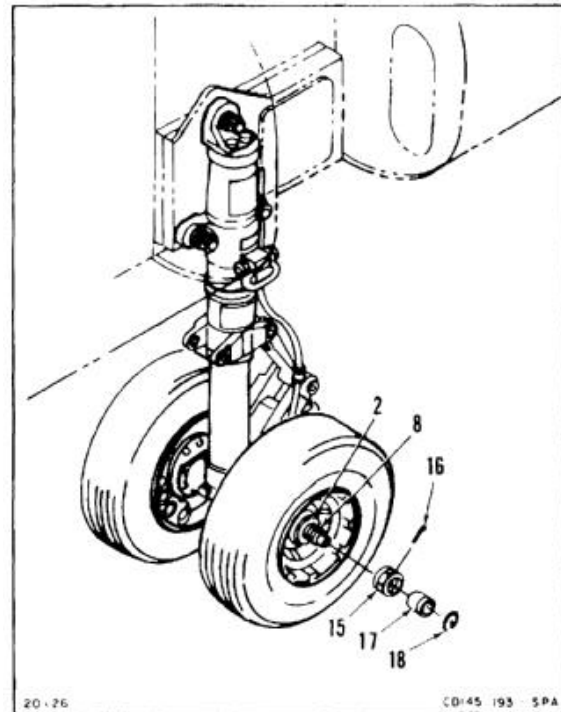
CAUTION

Inflate tire before lowering jack. Helicopter can be damaged by lowering too far.

17. Inflate tire (19) to correct pressure (Task 1-73). Use remote tire inflator.

INSPECT**FOLLOW-ON MAINTENANCE:**

Lower and remove jack (Tasks 1-23 or 1-24).
Set parking brake (Task 7-239).
Install access panel (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Inflator Kit, NSN 6685-00-124-4336
Torque Wrench, 100 to 750 Inch-Pounds
Crowfoot Wrench, 2 Inch
Retaining Ring Pliers

Materials:

Acetone (E20)
Cleaning Cloth (E120)
Dry Cleaning Solvent (E162)
General Purpose Grease (E190)
Lubricating Oil (E254/254.1)
Parting Agent (E307)
Sealant (E336)
Sealing Compound (E350)
Gloves (E186)

Parts:

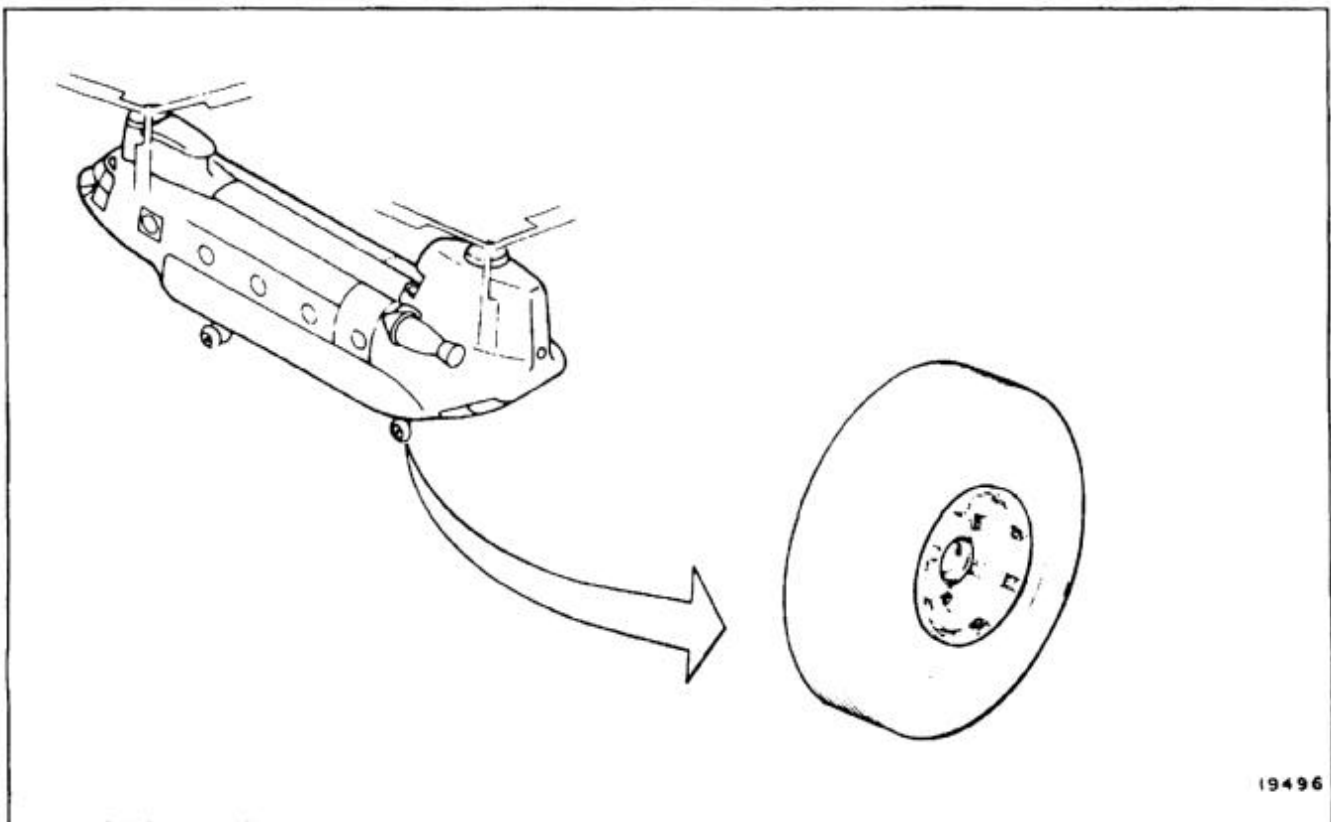
Cotter Pin
Spacer

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 1-73



WARNING

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

Never stand facing sidewall of tire being serviced. Stand facing tire tread.

WARNING

Oil (E254/E254.1) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

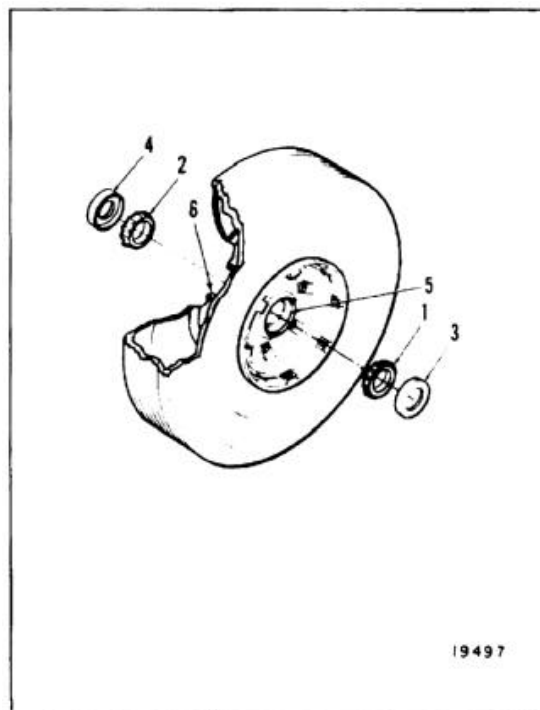
CAUTION

Dirt and mixed greases on bearings and bearing surfaces can cause damage to wheels. Clean bearings and surfaces before packing.

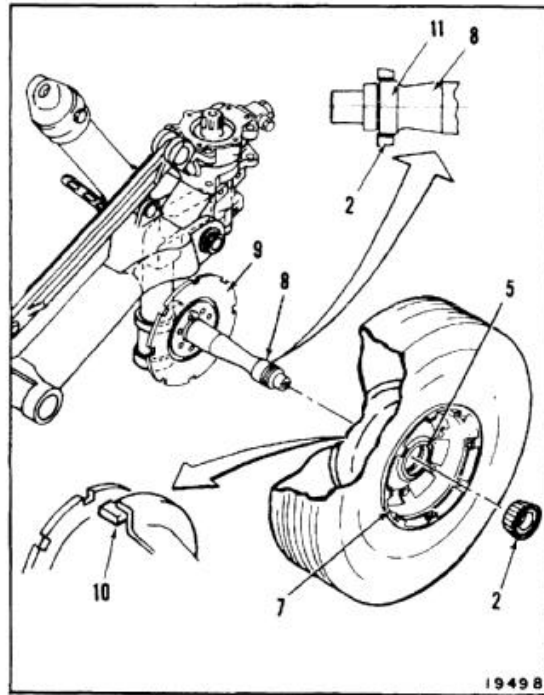
NOTE

Procedures are same for installing left or right wheel. Left wheel is shown here.

1. Clean bearings (1 and 2) and wheel surfaces thoroughly with dry cleaning solvent (E162). Wear gloves (E186).
2. Clean seals (3 and 4) with dry cloths (E120).
3. Pack bearings (1 and 2) with grease (E190).
4. Install bearing (1) in bearing cup (5).
5. Insert seal (3) over bearing (1).
6. Install bearing (2) in bearing cup (6).
7. Insert seal (4) over bearing (2).



8. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
9. Check that outboard bearing (2) hangs over edge of journal (11) on axle (8).
10. If bearing (2) hangs over journal (11), go to step 11.

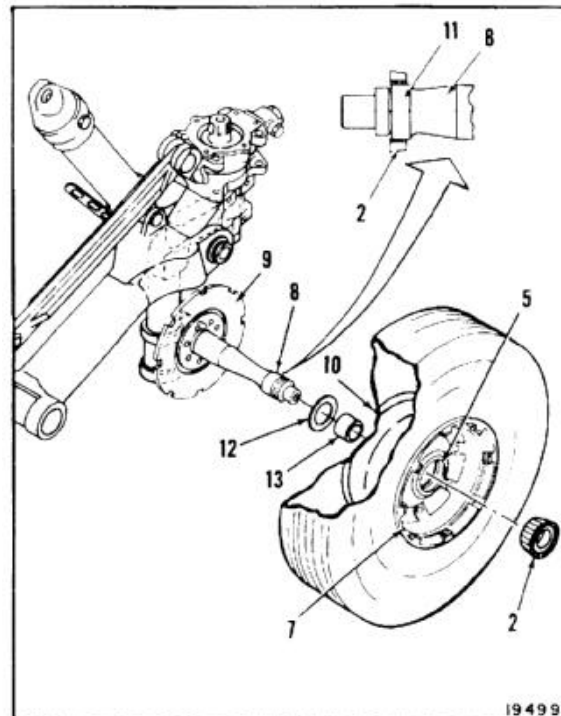


11. If bearing (2) does not hang over edge of journal (11) add spacer (12) as follows:
 - a. Remove bearing (2), wheel (7), and sleeve bushing (13).
 - b. Install spacers one or two (12) between sleeve bushing (13) and axle (8).

WARNING

Sealing compound (E350) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

- c. Apply sealing compound (E350) to bore of sleeve bushing (13). Install sleeve bushing on axle (8) while sealant is still wet. Wear gloves (E186).
- d. Install wheel (7) on axle (8). Align brake disk (9) with keys (10) on wheel. Seat wheel on axle.
- e. Install bearing (2) in bearing cup (5).



WARNING

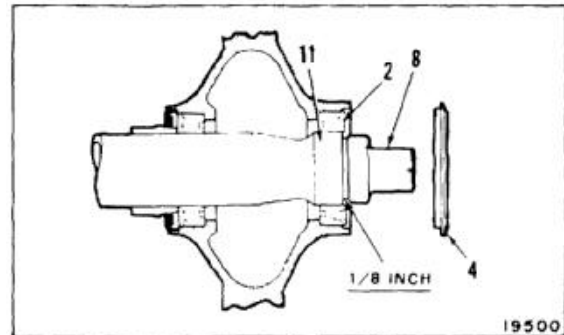
Acetone (E20) is flammable and gives off toxic fumes. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

12. Clean around axle (8) and in gap formed where bearing (2) hangs over journal (11). Use acetone (E20). Wear gloves (E186).

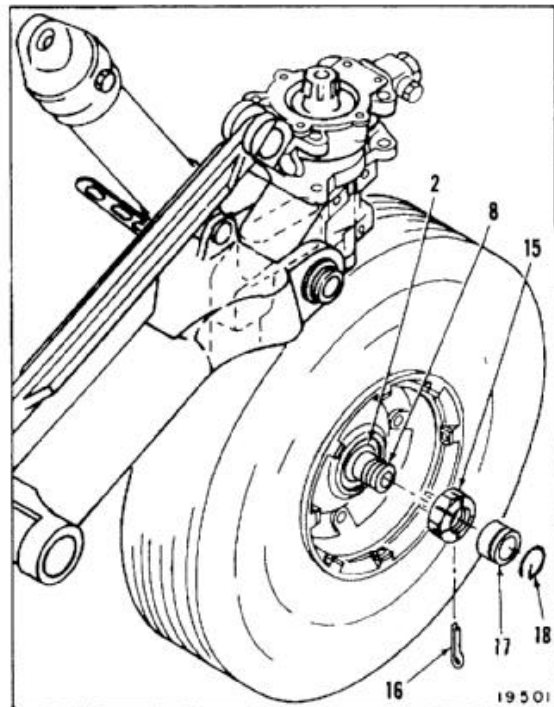
WARNING

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

13. Apply **1/8 inch** bead of sealant (E336) around axle (8) in gap formed where bearing (2) hangs over journal (11).
14. Install seal (4) over outboard bearing (2).



15. Apply grease (E190) or oil (E254) to threads and bearing surface of nut (15).
16. Install wheel bearing nut (15) as follows:
 - a. Install nut (15) on axle (8).
 - b. Have helper spin wheel and torque nut (15) to **300 inch-pounds**.
 - c. Back off nut (15) to **0 inch-pounds**. Make sure nut and outer bearing (2) are still in contact.
 - d. Spin wheel and torque nut (15) to a minimum of **120 inch-pounds**. Continue torquing until first slot aligns with hole in axle (8). Do not exceed **300 inch-pounds**.
 - e. Install new cotter pin (16).
17. Install sleeve (17) and retaining ring (18).

**WARNING**

Tires can explode or wheel halves can separate under pressure. Injury to personnel can result. Use remote tire inflator.

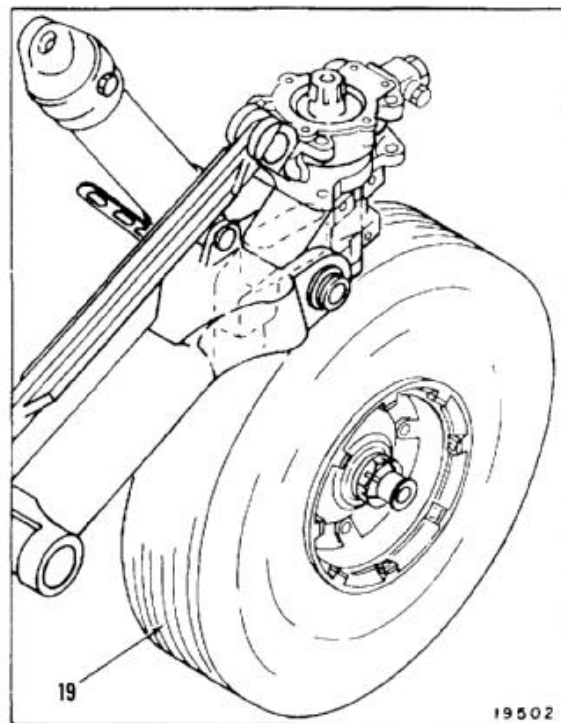
CAUTION

Inflate tire before lowering jack. Helicopter can be damaged by lowering too far.

18. Inflate tire (19) to correct pressure (Task 1-73). Use remote tire inflator.

INSPECT**FOLLOW-ON MAINTENANCE:**

Lower and remove jack (Task 1-24).
Set parking brake (Task 7-239).
Install access panel (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Outside Micrometer, 1 to 2 Inch
Depth Gage 0 to 0.125 Inch

Materials:

None

Personnel Required:

Inspector

References:

TM 1-1520-253-23

Equipment Condition:

Off Helicopter Task

NOTE

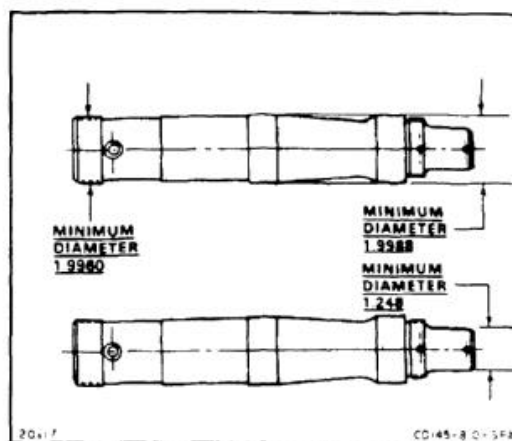
Procedure is same for all axles.

Replace axle if criteria is not met.

1. Check axle for cracks and bends. There shall be no bends or cracks. If a crack is suspected on the surface of the landing gear axle, refer to TM 1-1520-253-23.
2. Check axle for corrosion.
3. Check axle for wear. Measure axle as shown. Dimensions shall be no less than **1.9960 inches** diameter shown at axle housing end, or **1.9988 inches** diameter and **1.248 inches** diameter at the wheel nut end.
4. Check axle for scratches. Accept a maximum of four scratches up to **0.015 inch** wide, **0.015 inch** deep and **1 inch** long. Blend smoothly within **0.03 inch** on either side of scratch.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Soft-Faced Mallet

Materials:

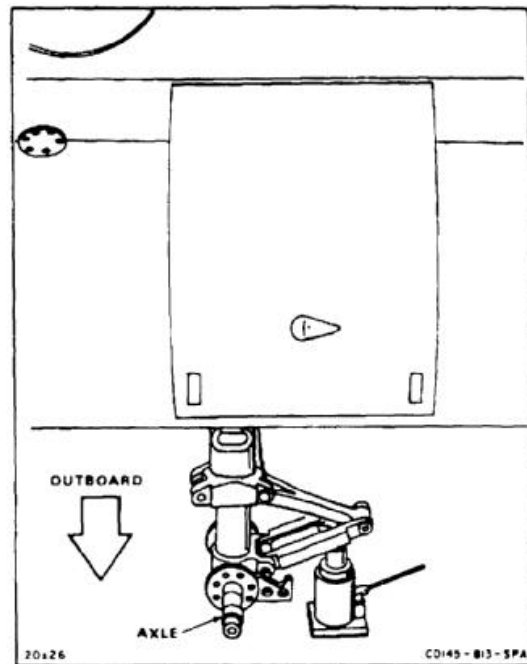
Cloth (120)
Dry Cleaning Solvent (E162)
Gloves (E186)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Brake Removed (Task 3-77)
Helicopter Jacked at Forward Landing Gear (Task 1-23)
Electrical Power Off
Hydraulic Power Off
Forward Landing Gear Wheel and Tire Assembly Removed (Task 3-9)



WARNING

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

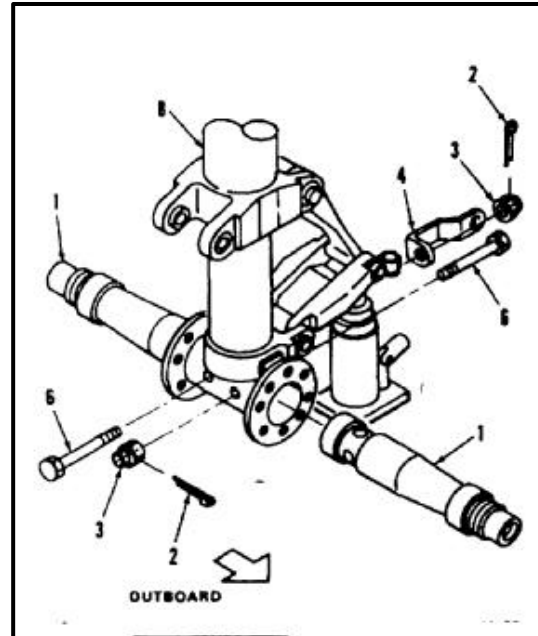
NOTE

Procedure is same for removing left or right inboard or outboard forward landing gear axle. Left side outboard is shown here.

1. Clean grease from axle (1) with solvent (E162) and cloths (E120). Wear gloves (E186).
2. Remove two cotter pins (2) and nuts (3).
3. Remove bracket (4) from inboard axle (1).
4. Remove bolts (6).
5. Remove two axles (1) from shock strut (8). Use mallet.

FOLLOW-ON MAINTENANCE:

Inspect axle (Task 3-13).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4892

Materials:

None

Parts:

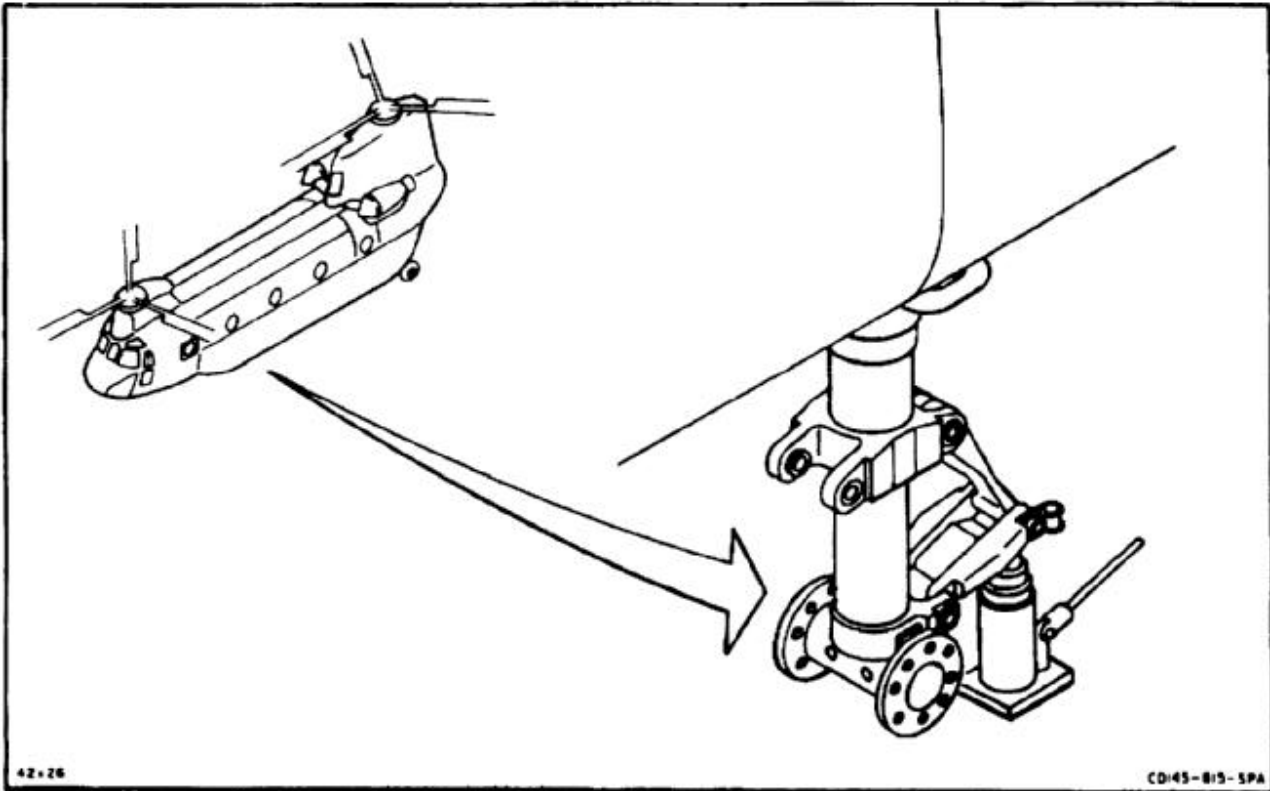
Cotter Pins

Personnel Required

Medium Helicopter Repairer
Inspector

Reference:

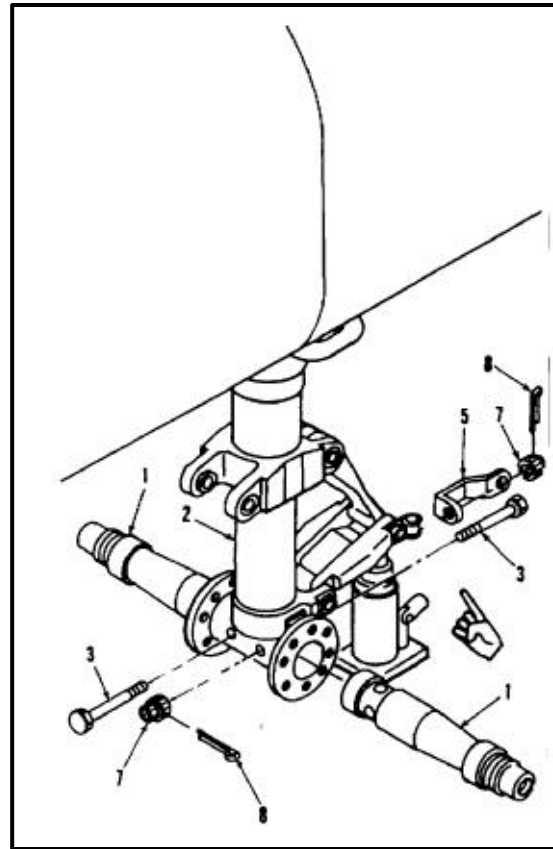
TM 55-1520-240-23P



NOTE

Procedure is same for installing left or right inboard or outboard landing gear axle. Left side outboard is shown here.

1. Install two axles (1) and align bolt hole with bolt hole in shock strut (2).
2. Install two bolts (3) through shock strut (2) and axle (1).
3. Install bracket (5) on inboard axle (1).
4. Install two nuts (7) and cotter pins (8).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Install brake (Task 3-83).
- Bleed brakes (Task 7-330).
- Install landing gear wheels (Task 3-12).
- Lower and remove jack (Task 1-23).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Technical Inspection Tool Kit, NSN 5180-00-323-5114
Magnetic Particle Method

Materials:

None

Personnel Required:

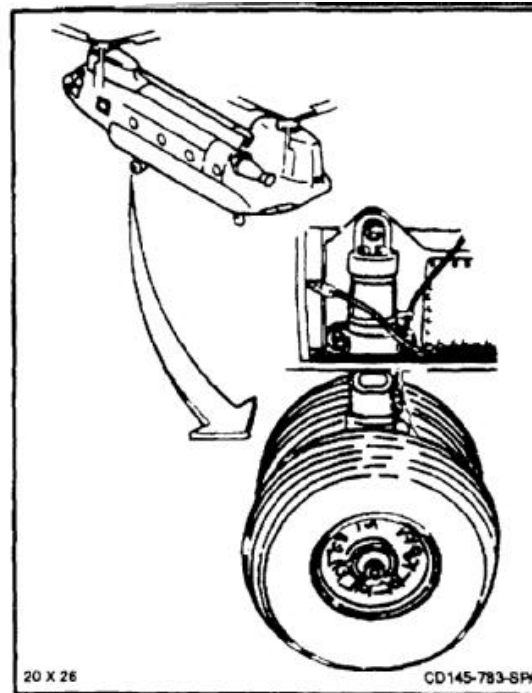
Inspector

References:

TM 1-1520-253-23
Task 1-72

Equipment Conditions:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Access Panel Open (Task 2-2)

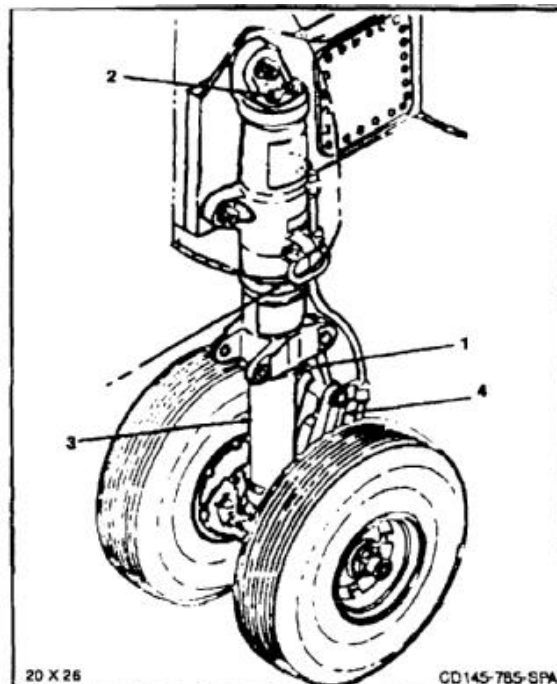
**NOTE**

This procedure is same for left or right forward gear.

1. Check seal of shock strut (1) for hydraulic leaks. There shall be no leaks.
2. Check shock strut (1) air pressure and extension (Task 1-71).
3. Inspect shock strut piston tube (3) for corrosion.
4. Inspect tube (3). There shall be no cracks, scoring or pitting. If a crack on the surface of the strut piston is suspected, refer to TM 1-1520-253-23.
5. Inspect torque arm (4). There shall be no cracks or excessive play. Permit up to **0.015 inch** axial play after lubrication. This play will not affect the normal operation of the landing gear. If a crack on the surface of the torque arm is suspected, refer to TM 1-1520-253-23.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-54

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Tiedown Chain
 Aircraft Towbar, AA1730-1251

Materials:

Barrier Material (E81)

Personnel Required:

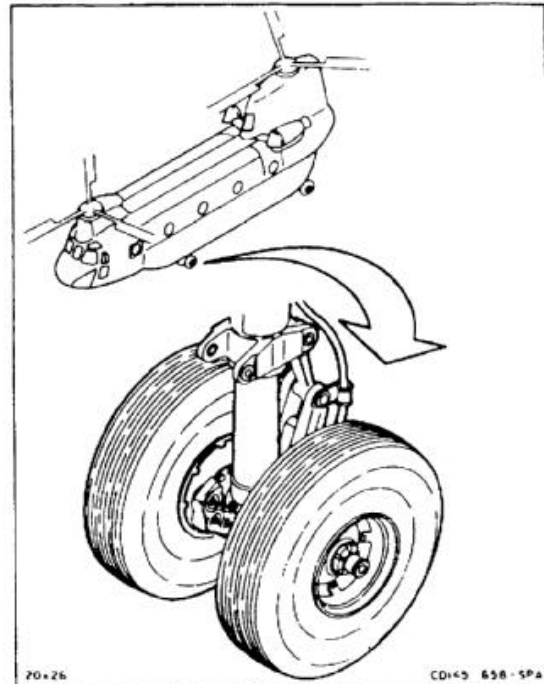
Medium Helicopter Repairer (2)

References:

Task 3-9
 Task 3-77

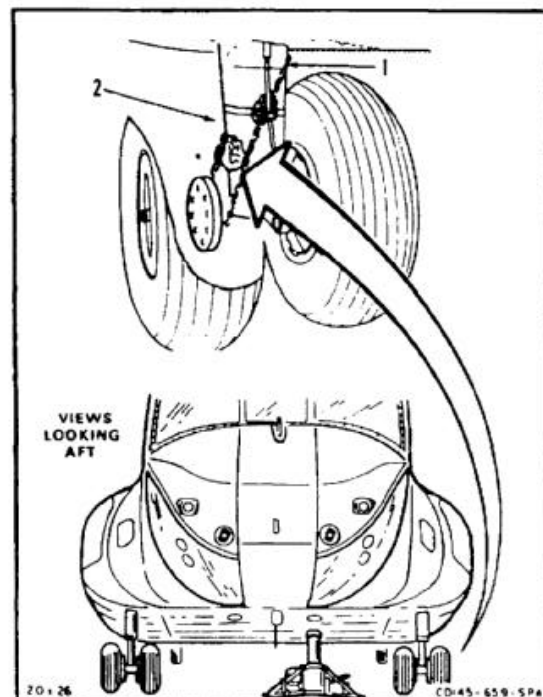
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Release Air Pressure From Both Forward Shock
 Struts (Task 1-71)
 Helicopter Jacked at Forward Fuselage Point (Task
 1-22)

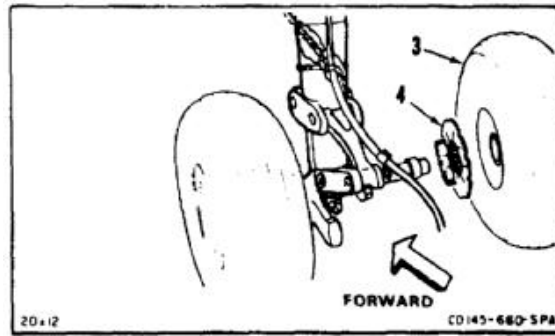
**NOTE**

Procedure is same for removing left or right landing gear torque arm. Left torque arm is shown here.

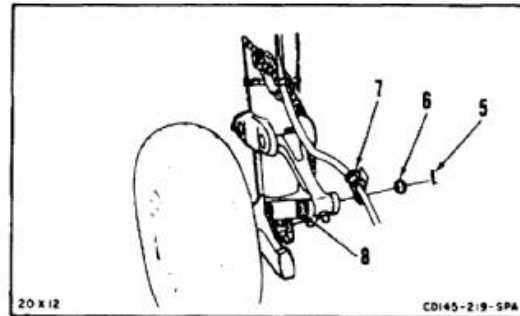
1. Tie up shock strut (1) from shackle to axle flange with chain (2). Position barrier material between chain (2) and shock strut (1).



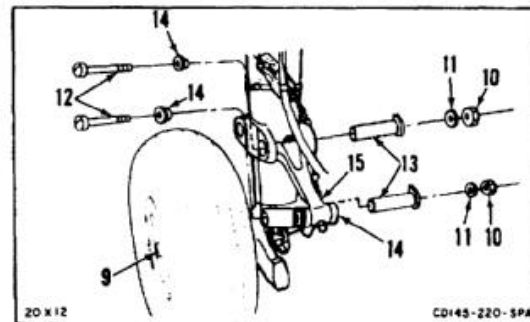
2. Remove inboard forward landing gear wheel (3) (Task 3-9).
3. Remove inboard forward brake (4) (Task 3-77).



4. Remove cotter pin (5), washer (6), and guide (7) from hinge bolt (8).



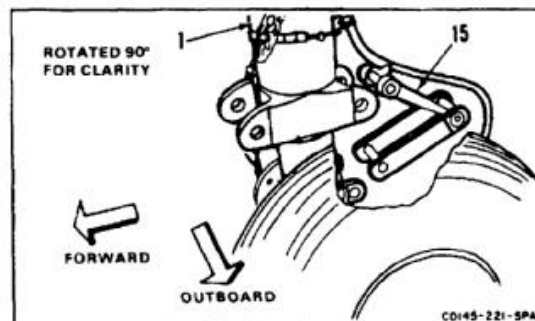
5. Prevent axle (9) from moving. Use helicopter towbar. Remove two nuts (10), washers (11), bolts (12), shafts (13), and bushings (14) from both ends of torque arm (15).



6. Remove torque arm (15) from shock strut (1).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 30 to 150 Inch-Pounds
 Aircraft Towbar, AA1730-1251

Materials:

None

Parts:

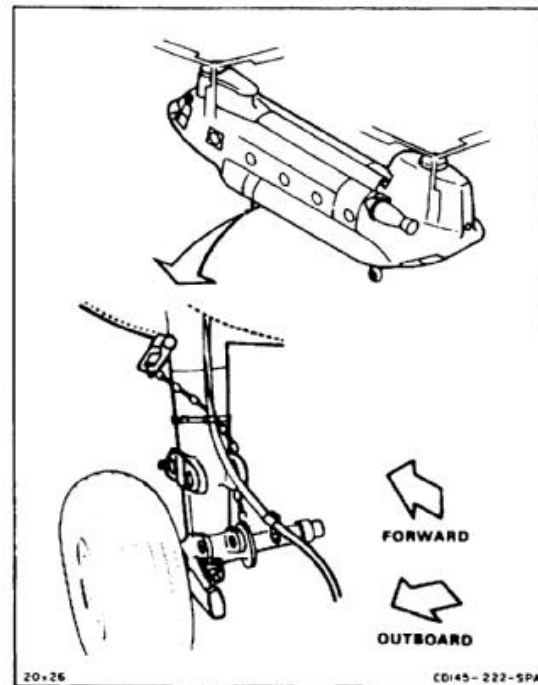
Cotter Pin

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

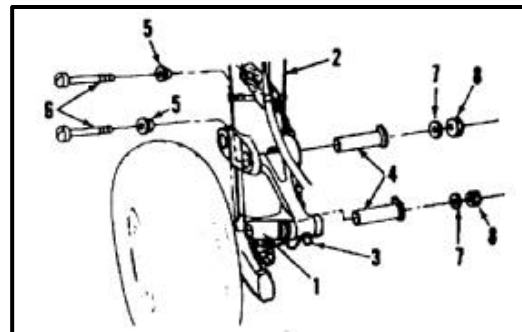
References:

TM 55-1520-240-23P
 Task 1-88
 Task 3-12
 Task 3-83

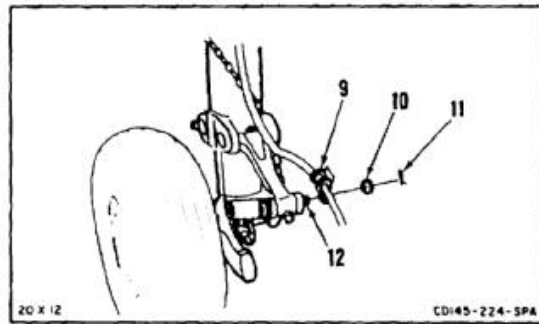
**NOTE**

Procedure is same for installing left or right landing gear torque arm. Left torque arm is shown here.

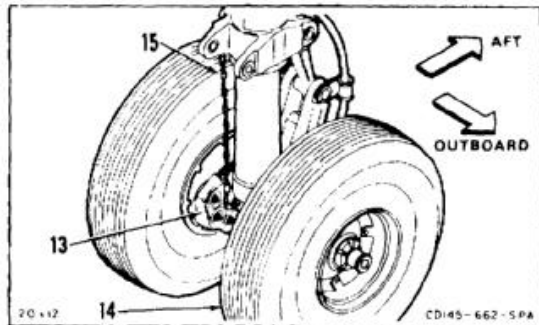
1. Position torque arm (1) on shock strut (2).
2. Check that jack pad (3) is on bottom of torque arm (1).
3. Align torque arm (1). Use helicopter towbar. Install two shafts (4), bushings (5), bolts (6), washers (7), and nuts (8) on both ends of torque arm (1).
4. Torque nuts (8) to **60 inch-pounds**.

INSPECT

5. Install guide (9), washer (10), and cotter pin (11) on center hinge bolt (12).



6. Install forward brakes (13) (Task 3-83).
7. Install forward landing gear wheels (14) (Task 3-12).
8. Remove chain (15) and barrier material.
9. Lubricate torque arm (Task 1-88).



FOLLOW-ON MAINTENANCE:

- Lower jack (Task 1-23).
- Service both forward shock struts (Task 1-71).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off

Forward Landing Gear Jacked (Task 1-23)

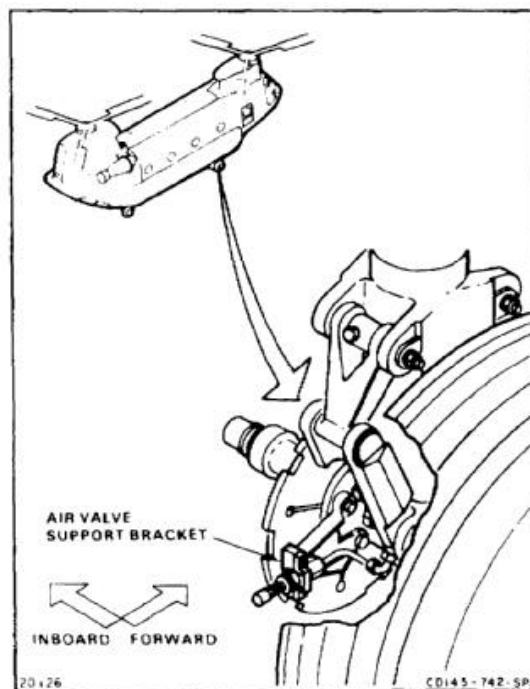
Inboard Wheel Removed (Task 3-7) To Access Right

Landing Gear Air Valve Bracket (Shown Here) or

Outboard Wheel Removed (Task 3-7) To Access Left

Landing Gear Air Valve Bracket

Forward Brakes Removed (Task 3-77)

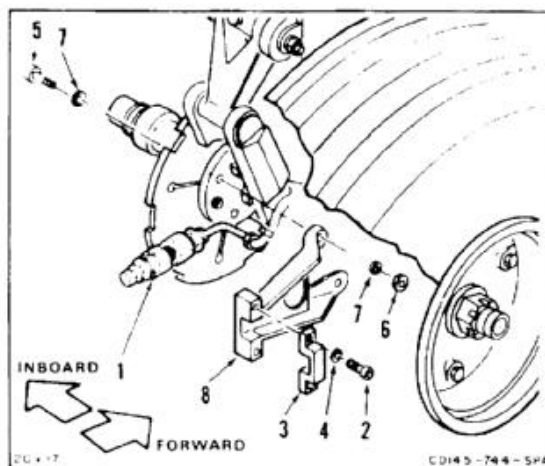
**NOTE**

Procedure is same for removing left or right air valve bracket. Right bracket is shown here.

1. Remove lockwire from air valve (1), screws (2), and clamp (3).
2. Remove two screws (2) and washers (4).
3. Remove clamp (3).
4. Remove two bolts (5), nuts (6), and four washers (7).
5. Remove bracket (8).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

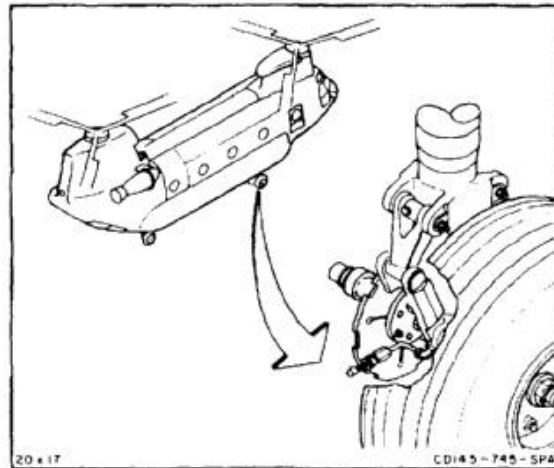
Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

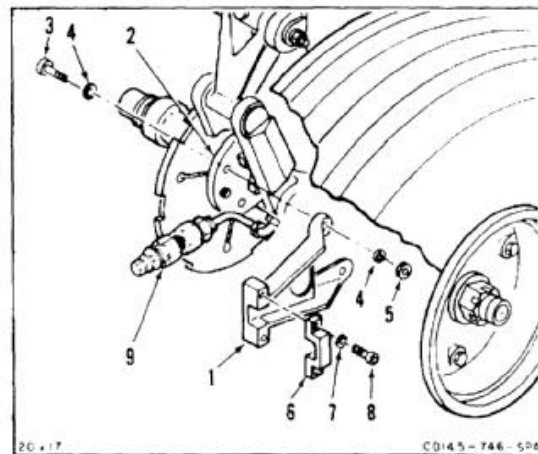
References:

TM 55-1520-240-23P

**NOTE**

Procedure is same for installing left or right air valve bracket. Right bracket is shown here.

1. Position air valve bracket (1) on axle flange (2).
2. Install two bolts (3), four washers (4), and two nuts (5).
3. Torque nuts (5) to **107 inch-pounds**.
4. Position clamp (6).
5. Install two washers (7) and screws (8).
6. Lockwire screws (8) to clamp (6). Lockwire air valve (9) to screw. Use lockwire (E231).

**INSPECT****FOLLOW-ON MAINTENANCE:**

Install forward brake (Task 3-83).
Install wheel (Task 3-12).

END OF TASK

3-21 REMOVE FORWARD LANDING GEAR AIR VALVE

3-21

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

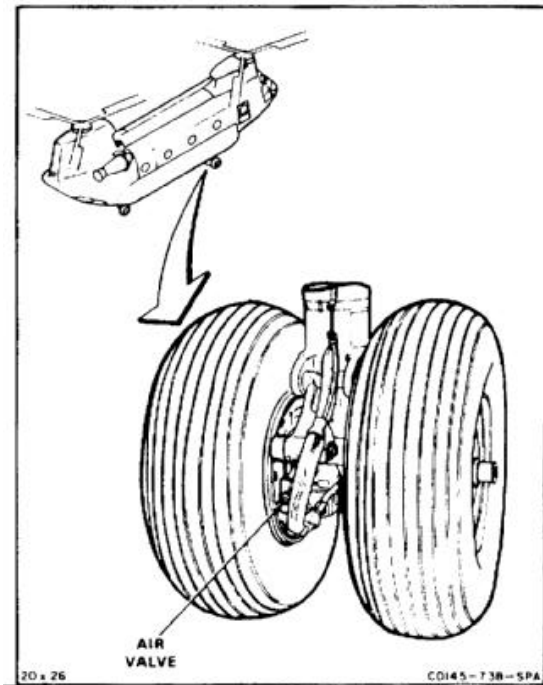
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Deflate Shock Strut (Task 1-72)

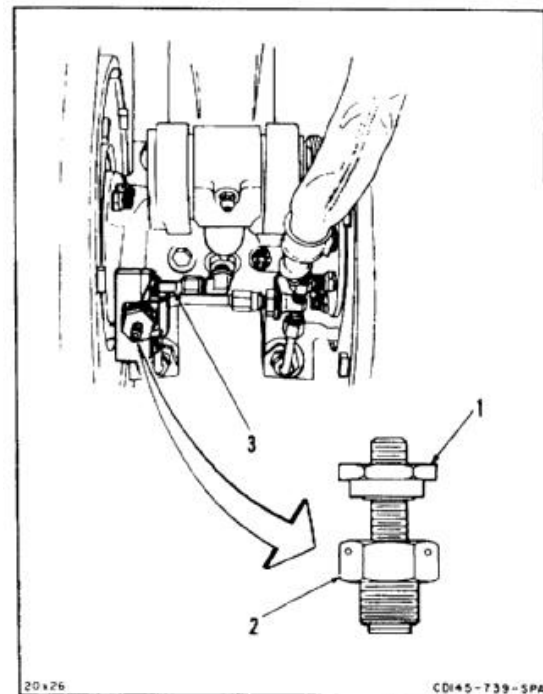
**NOTE**

Procedure is same for removing left and right forward landing gear air valve. Right air valve is shown here.

1. Remove lockwire from high pressure air valve (1).
2. Remove body (2) of valve (1) from tube (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 30 to 150 Inch-Pounds
 Crowsfoot, 3/4 Inch

Materials:

Lockwire (E231)

Parts:

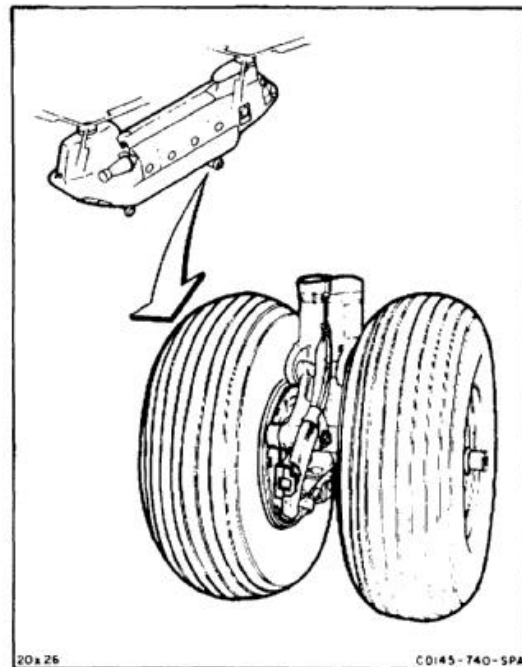
Preformed Packing

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

TM 55-1520-240-23P-1

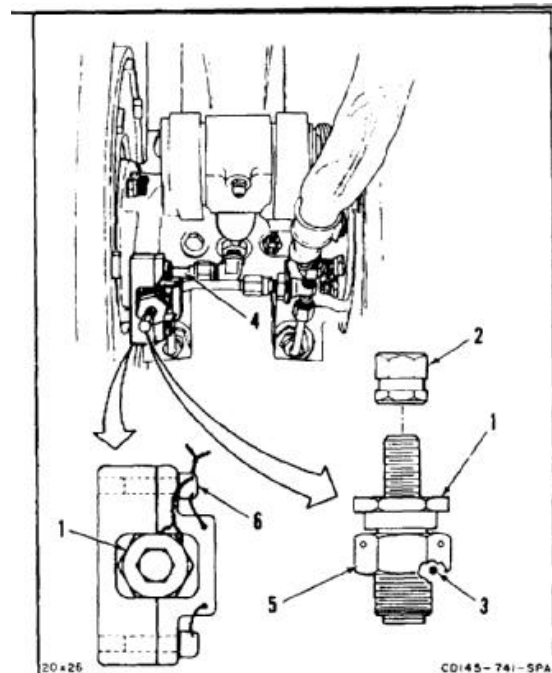
**NOTE**

Procedure is same for installing left and right forward landing gear air valve. Right valve is shown here.

1. Check that air valve (1) has cap (2) and packing (3).
2. Install air valve (1) into tube (4).
3. Torque valve body (5) of valve (1) to **115 inch-pounds**.
4. Lockwire valve (1) to screw (6). Use lockwire (E231).

INSPECT**FOLLOW-ON MAINTENANCE:**

Service shock struts with air (Task 1-72).



END OF TASK

3-23 REMOVE FORWARD LANDING GEAR LUBRICATION FITTING

3-23

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

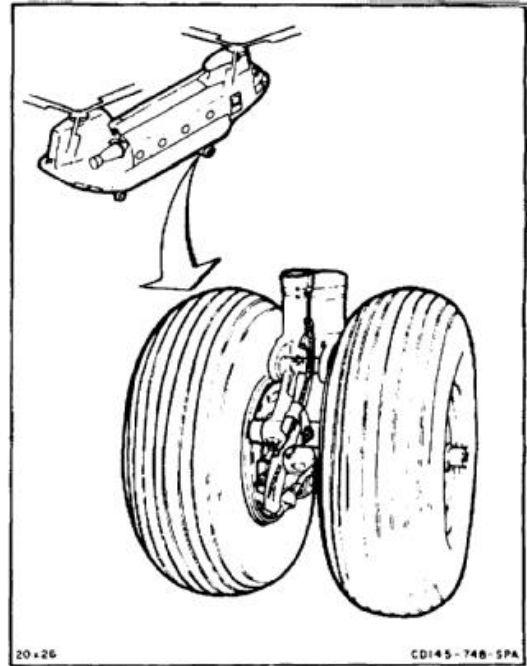
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

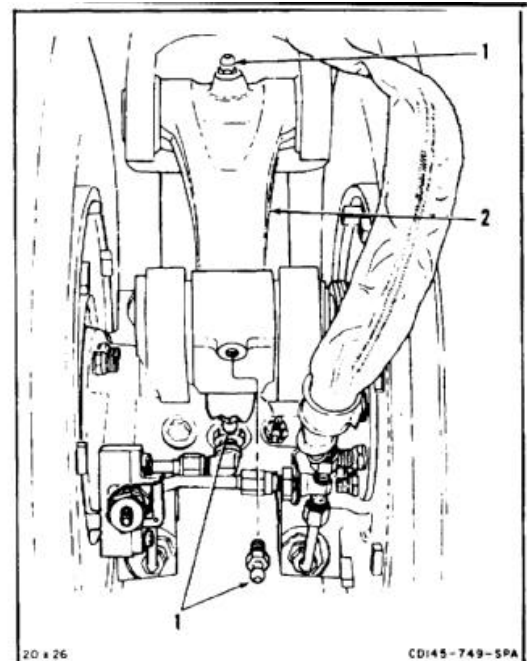
**NOTE**

There are three lubrication fittings on each forward landing gear torque arm. All forward landing gear lubrication fittings are removed in the same way.

1. Remove fitting (1) from torque arm (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

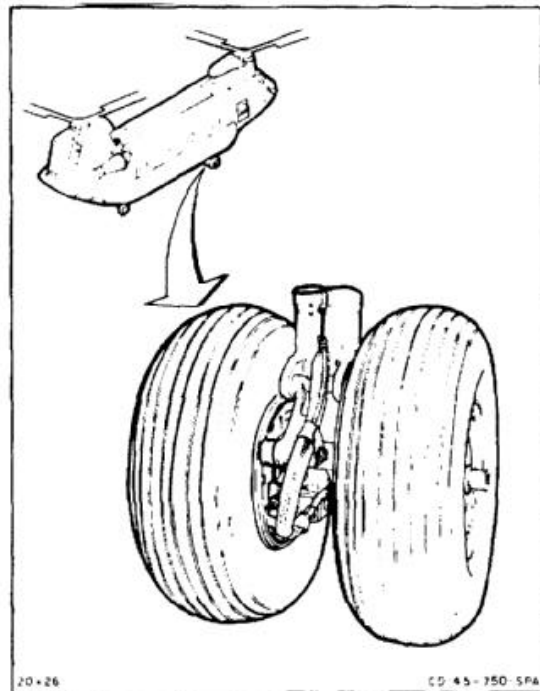
None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-23P

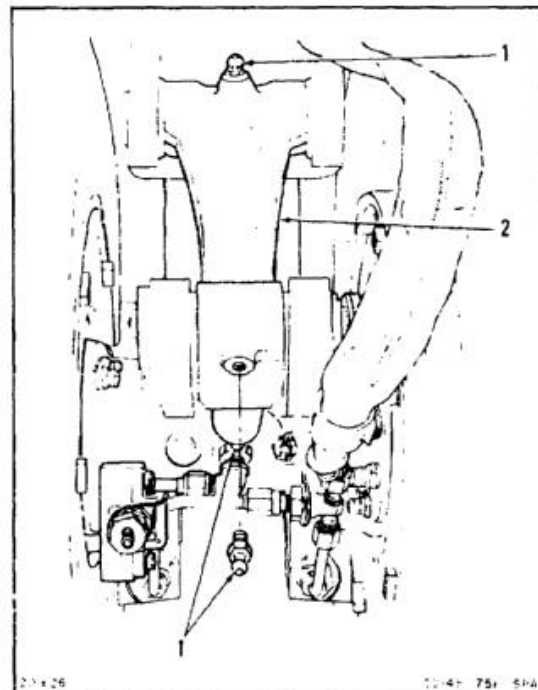
**NOTE**

There are three lubrication fittings on each forward landing gear torque arm. All forward landing gear lubrication fittings are installed in the same way.

1. Install fitting (1) in torque arm (2).

FOLLOW-ON MAINTENANCE:

Lubricate torque arm (Task 1-88).



END OF TASK

3-25 REMOVE FORWARD LANDING GEAR TOWING SHACKLE

3-25

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

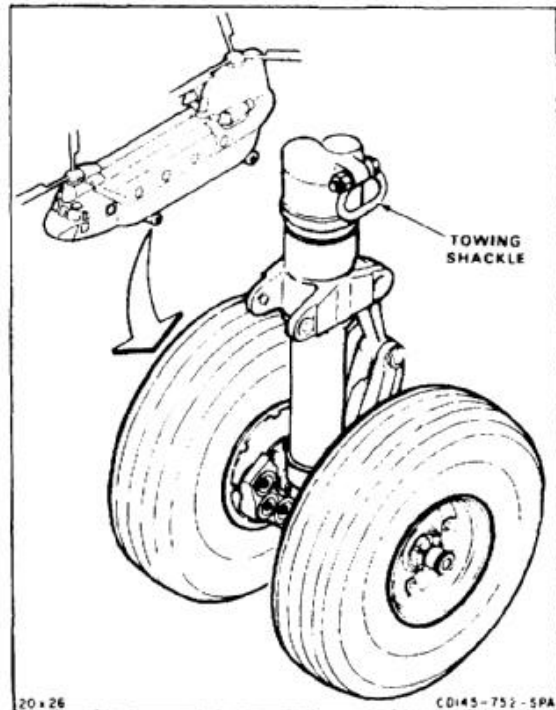
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

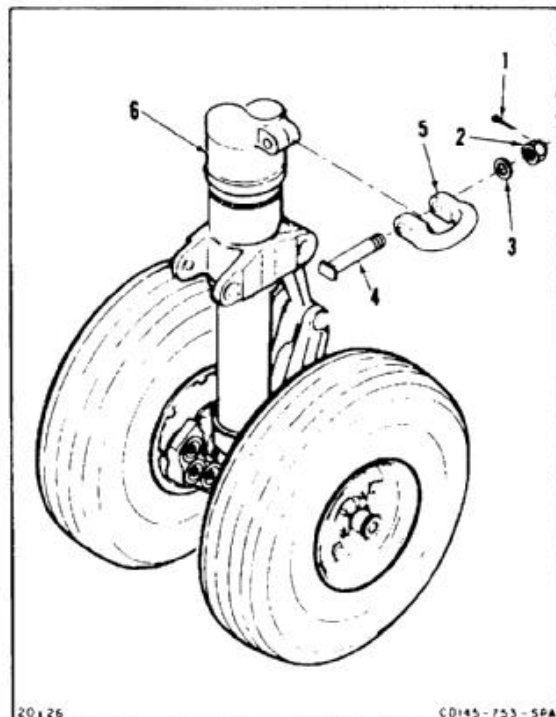
**NOTE**

Procedure is same for removing left or right forward landing gear towing shackle. Left shackle is shown here.

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4).
2. Remove towing shackle (5) from shock strut (6).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

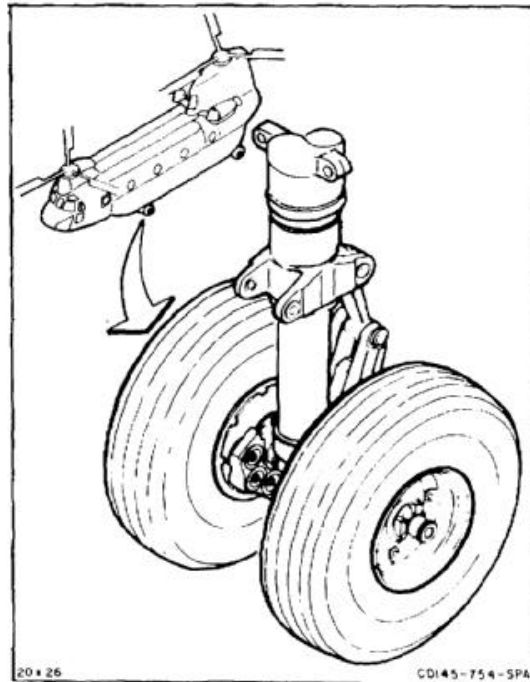
Cotter Pin

Personnel Required:

Medium Helicopter Repairer

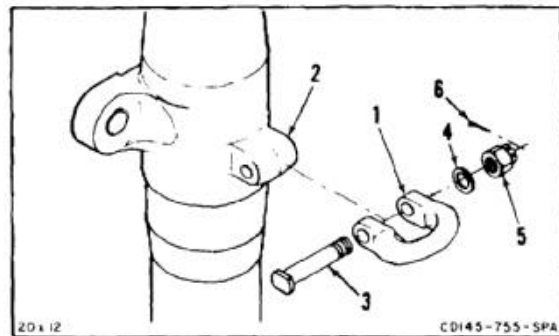
References:

TM 55-1520-240-23P

**NOTE**

Procedure is same for installing left or right forward landing gear towing shackle. Left shackle is shown here.

1. Place towing shackle (1) over shock strut mounting lug (2).
2. Install bolt (3), washer (4), and nut (5).
3. Torque nut (5) to **480 to 600 inch-pounds**.
4. Install new cotter pin (6).

**INSPECT****FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Socket, 1-1/16 Inch
 Socket, 1-1/8 Inch
 Socket, 1-1/2 Inch
 Slide Hammer
 Container, 2 Quart

Materials:

Cleaning Cloth (E120)
 Chock Blocks

Personnel Required:

Medium Helicopter Repairer (2)

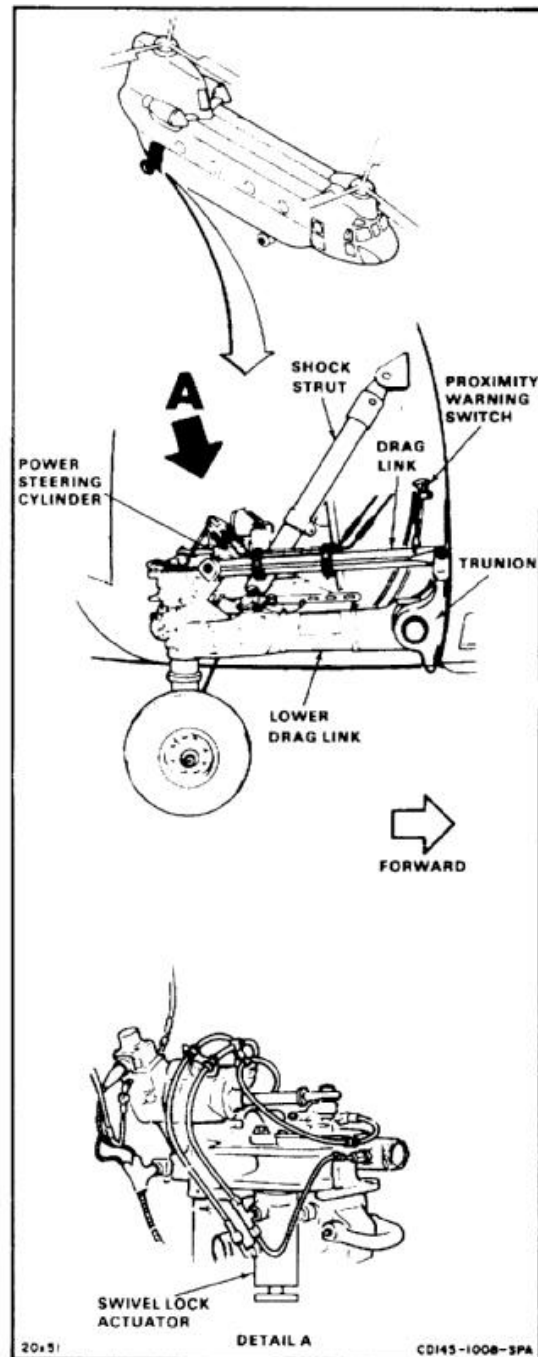
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Utility Hydraulic Pressure Released (TM
 55-1520-240-T)
 Access Panels Opened (Task 2-2) (Left or Right as
 Needed)
 Helicopter Jacked at Aft Fuselage Jack Pad (Task
 1-24)
 Shock Strut Deflated (Task 1-72)

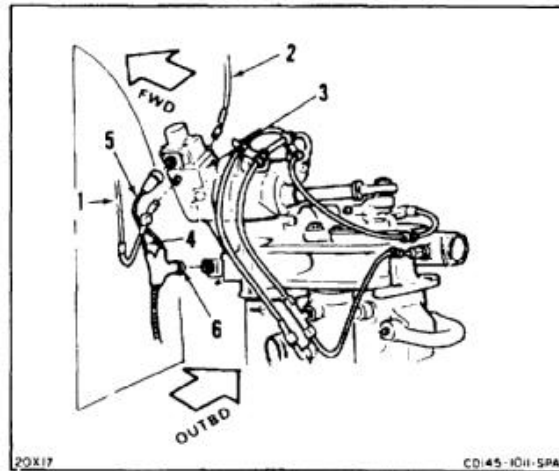
NOTE

This procedure can be used for left and right gears, except for differences noted in task. Right gear is shown here.

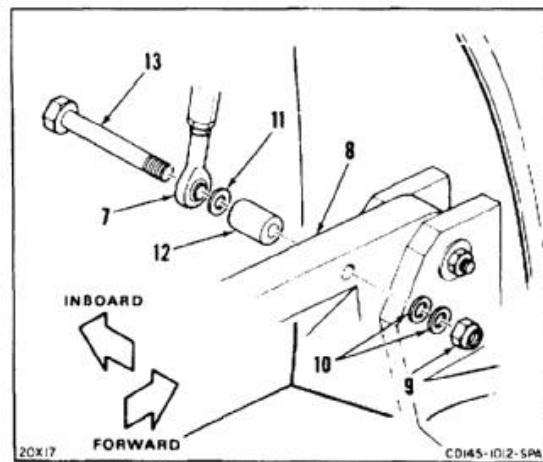
If aft left gear is being removed, go to step 5. If aft right gear is being removed, perform steps 1 thru 4.



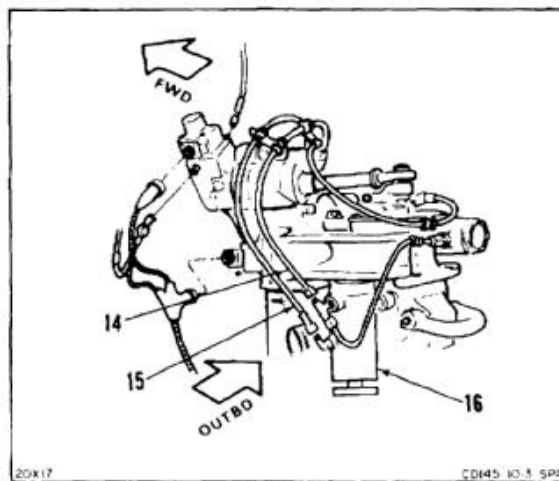
1. Disconnect two hydraulic hoses (1 and 2) from power steering actuator (3). Use container to catch fluid.
2. Disconnect three cables (4, 5, and 6) from power steering actuator (3).



3. Disconnect proximity switch rod end (7) from upper drag link (8). Remove nut (9), washers (10 and 11), spacer (12), and bolt (13).
4. Move rod end (7) free of drag link (8).

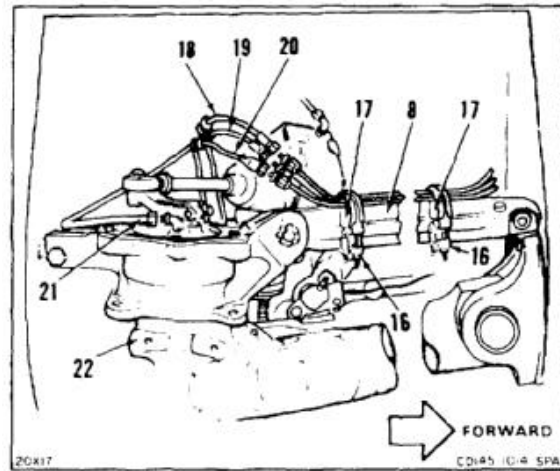


5. Disconnect two hydraulic hoses (14 and 15) from swivel lock actuator (16).

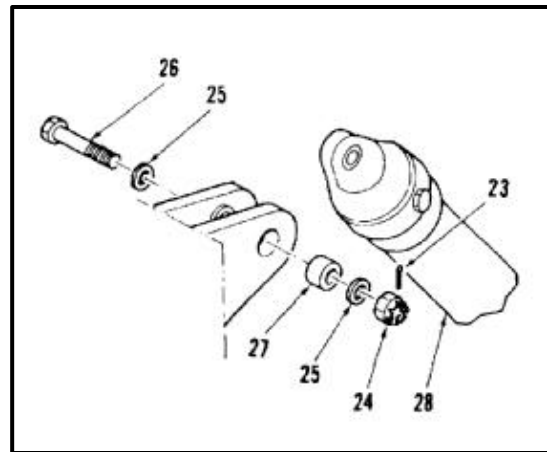


3-27 REMOVE AFT LANDING GEAR (Continued)

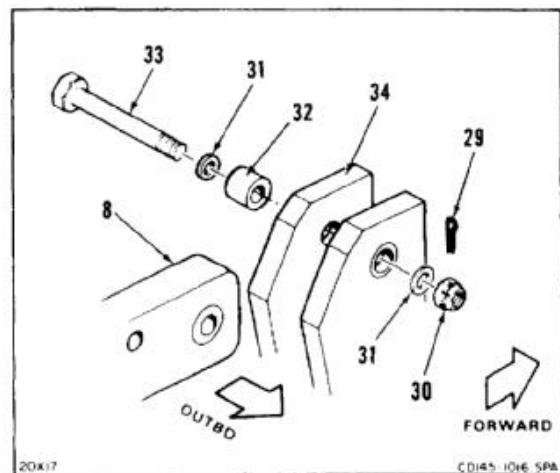
6. Remove lockwire from clamps (16).
7. Remove clamps (16), support blocks (17), and hydraulic hoses and tubing (18, 19, and 20) from drag link (8).
8. Disconnect brake hydraulic hose (21) from elbow at top of landing gear (22).



9. Remove cotter pin (23), nut (24), two washers (25), bolt (26), and bushing (27) from top of shock strut (28) at fuselage attach point.



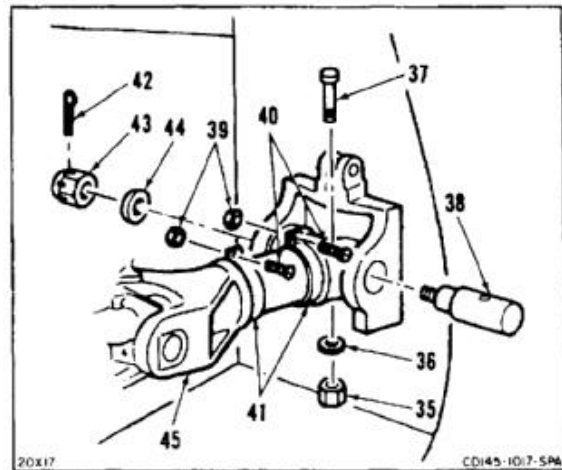
10. Have helper chock and support gear so it will not move when components are removed.
11. Remove cotter pin (29), nut (30), washers (31), bushing (32), and bolt (33) from upper drag link (8) at fuselage attach point (34).



NOTE

To remove bolt, it may be necessary to jack aircraft higher.

12. Remove nut (35), washer (36), and bolt (37) from lower drag link trunnion pin (38).
13. If a right gear is being removed, remove two nuts (39), screws (40), and clamps (41).
14. Remove cotter pin (42), nut (43), and washer (44) from trunnion pin (38).
15. Drive trunnion pin (38) outboard while helper supports lower drag link (45). Use slide hammer.
16. Remove lower drag link (45) from fuselage attach point.
17. Remove blocks and roll landing gear away from helicopter with aid of helper.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-28 CONVERT AFT LEFT TO AFT RIGHT LANDING GEAR**3-28****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Screwdriver, 0 to 50 Inch-Pounds

Materials:

Lockwire (E231)

1. Remove end cap (1) and sleeve spacer (2) from spindle spline (3).
2. Remove lockwire. Remove six screws (4) and cover plate (5) from top of housing (6).
3. Remove lockwire. Remove two screws (7) from cam control (8).
4. Rotate spindle (9) **180°** so axle (10) points outboard. Make sure cam (8) does not turn. Make sure holes for screws (7) are aligned.
5. Check that cam follower (11) rides in cam recess. Secure cam (8) to spindle (9) with two screws (7). Torque screws to **35 inch-pounds**. Secure screws with lockwire (E231).
6. Install new packings (12 and 13). Make sure they are correctly installed in grooves of cover plate (5).
7. Position plate (5) on swivel housing (6). Install six screws (4). Install lockwire (E231).
8. Install sleeve spacer (2) and end cap (1) over spindle spline (3). Do not engage end cap insert with spindle.

Parts:

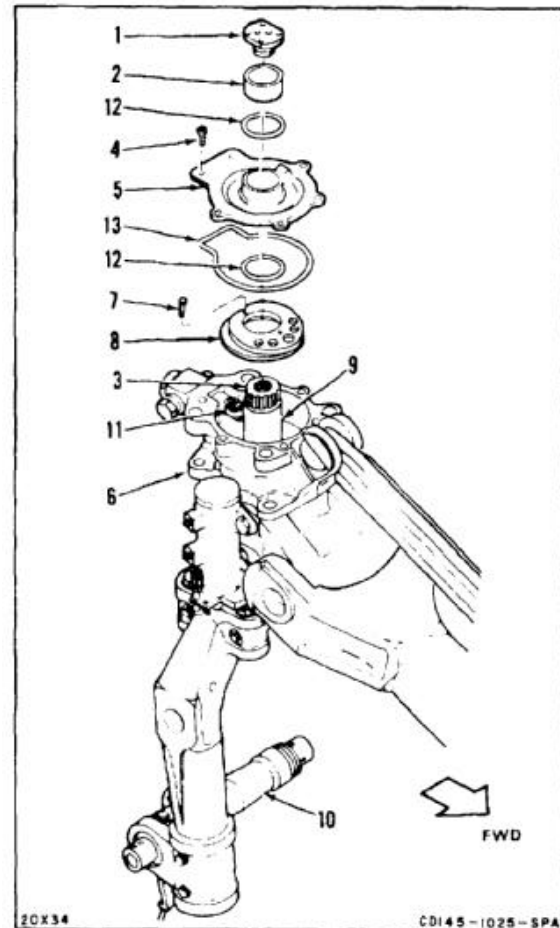
Cotter Pin
Packing

Personnel Required:

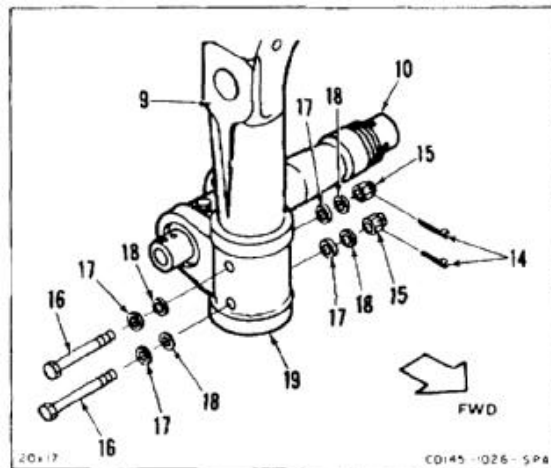
Medium Helicopter Repairer
Inspector

Equipment Condition:

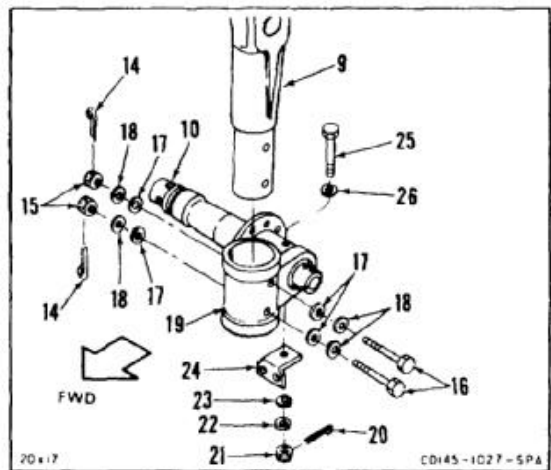
Off Helicopter Task
Aft Landing Gear Disassembled (Task 3-30)



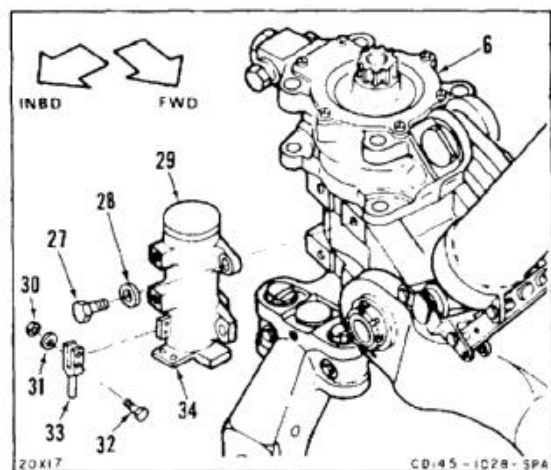
9. Remove two cotter pins (14), nuts (15), bolts (16), packing retainers (17), and washers (18) from axle housing (19).
10. Remove axle housing (19) from spindle (9).



11. Rotate axle housing (19) **180°** so axle (10) is on aft side of spindle (9).
12. Position axle housing (19) on spindle (9). Make sure bolt holes are aligned.
13. Install two bolts (16), four packing retainers (17), four washers (18), nuts (15), and two cotter pins (14).
14. Remove cotter pin (20), nut (21), washer (22), packing retainer (23), bracket (24), bolt (25), and packing retainer (26).
15. Rotate bracket **180°** and install bolt (25), new packing retainers (26), bracket (24), new packing retainer (23), washer (22), nut (21), and cotter pin (20).

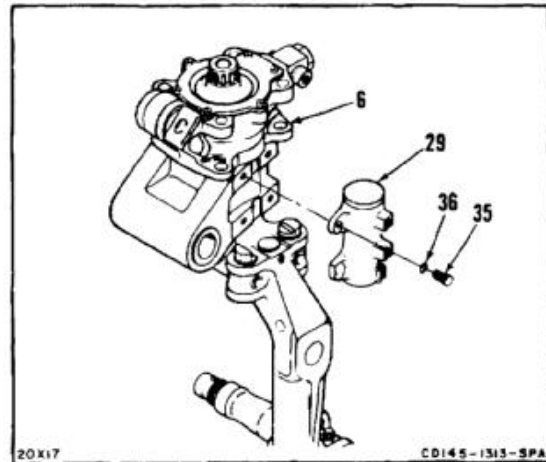


16. Remove four bolts (27) and washers (28). Remove swivel lock actuator (29).
17. Remove two nuts (30), washers (31), and bolts (32). Remove clevis rod end (33).
18. Position clevis rod end (33) in other hole in actuating piston rod (34). Install two bolts (32), washers (31), and nuts (30).



19. Position swivel lock actuator (29) on inboard side of swivel housing (6). Secure with four bolts (35) and washers (36).

INSPECT



FOLLOW-ON MAINTENANCE:

Assemble aft landing gear (Task 3-31).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Inspector

Equipment Condition:

Off Helicopter Task

NOTE

Procedure converts left shock strut, as issued, for use in right installation.

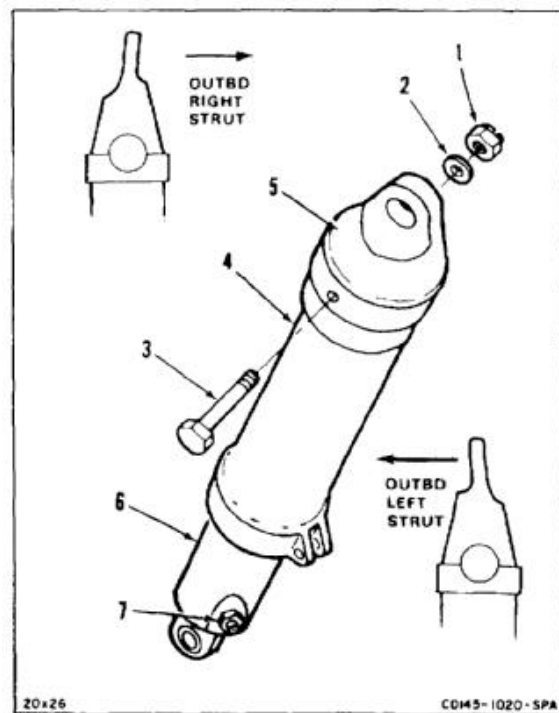
1. Remove nut (1), washer (2), and bolt (3) from upper end of shock strut (4).
2. Turn cap (5) **180°** on shock strut (4).
3. Install bolt (3), washer (2), and nut (1). Torque nut to **225 inch-pounds**.
4. Rotate piston (6) **180°** in shock strut (4) so air valve (7) is outboard when strut is installed.

INSPECT**FOLLOW-ON-MAINTENANCE:**

None

END OF TASK

3-74



INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

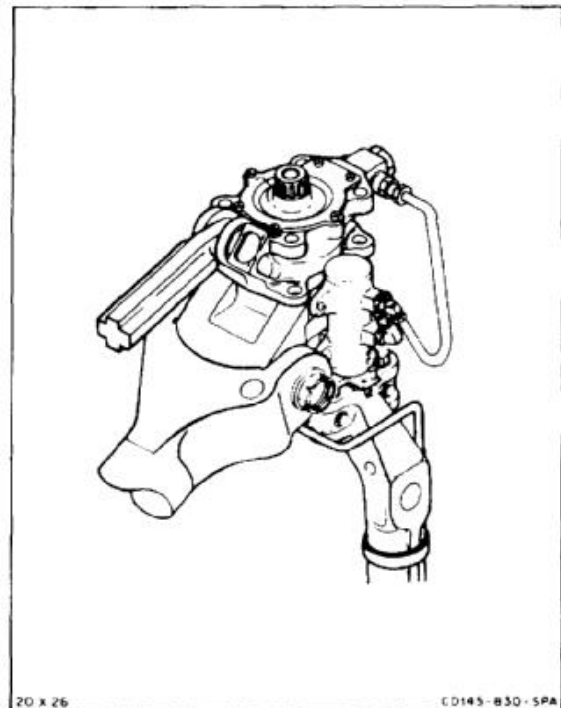
None

Personnel Required:

Medium Helicopter Repairer

References:Task 3-37
Task 7-296**Equipment Condition:**

Off Helicopter Task

**NOTE**

Power steering is installed on right gear only.

1. Remove power steering (1) (Task 7-299) if removing right gear.

NOTE

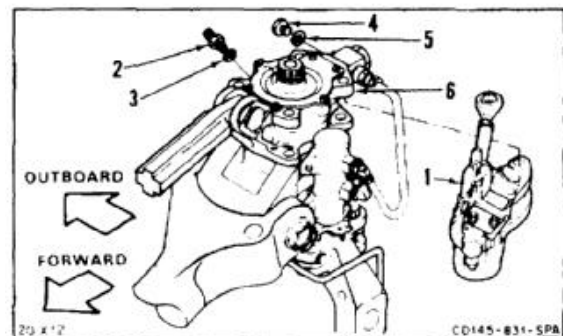
Procedure is same for disassembling right and left gear. Right gear is shown here.

- 1.1. Remove landing gear wheel and tire assembly (Task 3-7).

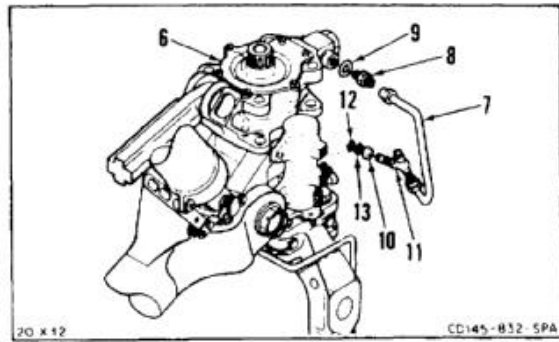
NOTE

Procedure is same for removing forward or aft wheel.

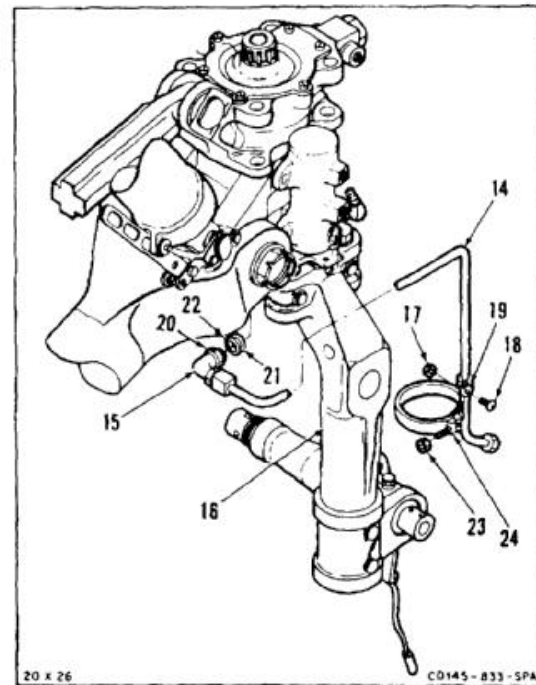
2. Remove union (2), packing (3), plug (4), and packing (5) from swivel housing (6).



3. Remove pressure line (7), union (8), and packing (9) from housing (6).
4. Loosen nut (10) and remove tee (11), packing (12), and retainer (13).
5. Remove nut (10) from tee (11).



6. Remove brake line (14) from elbow (15) on spindle (16).
7. Remove nut (17), screw (18), and clip (19).
8. Loosen nut (20) and remove elbow (15), packing (21), and retainer (22).
9. Remove nut (20) from elbow (15).
10. Remove nut (23) and clamp (24).



3-30 DISASSEMBLE AFT LANDING GEAR (Continued)**3-30**

11. Loosen nut (25) and remove elbow (26), packing (27), and retainer (28).
12. Remove nut (25) from elbow (26).

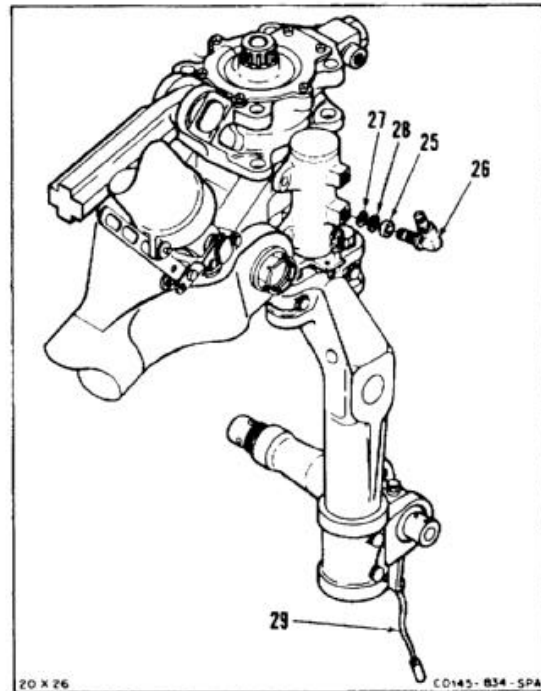
NOTE

Static ground wire is installed on left gear only.

13. Remove static ground wire (29) if working on left gear (Task 3-37).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

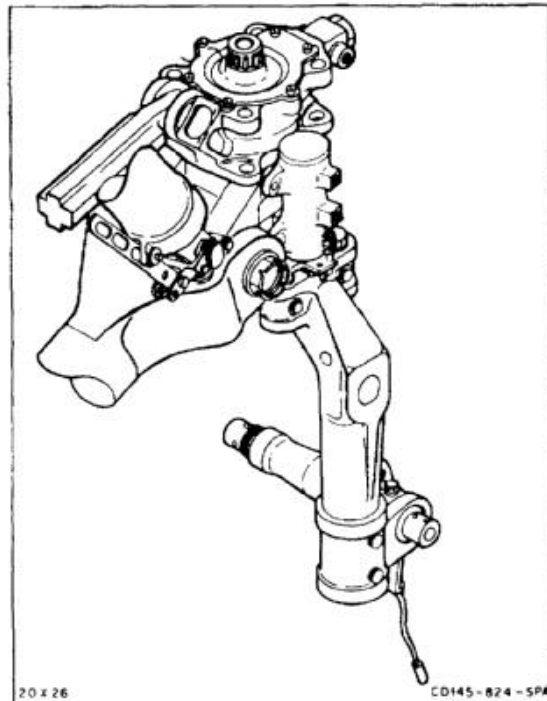
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Parts:

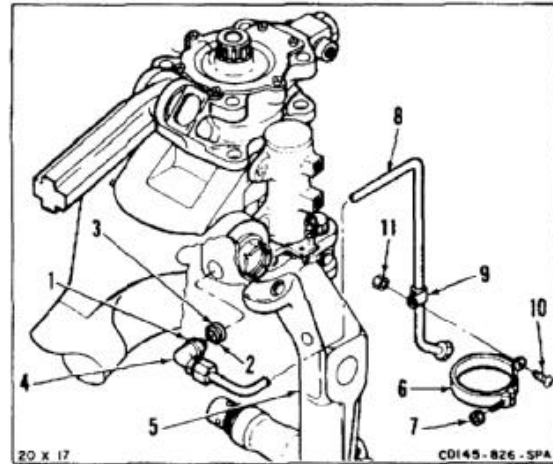
Preformed Packing

Personnel Required:Medium Helicopter Repairer
Inspector**References:**TM 55-1520-240-23P
Task 3-38
Task 7-297**NOTE**

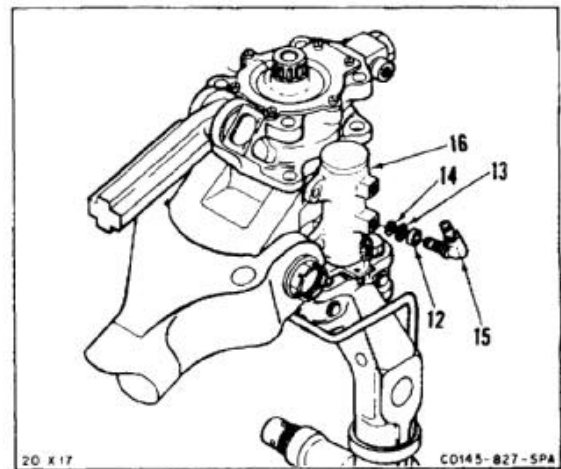
This procedure is same for left or right landing gear except as noted in steps 15 and 16.

1. Drain preservative hydraulic fluid from any new landing gear components to be installed.

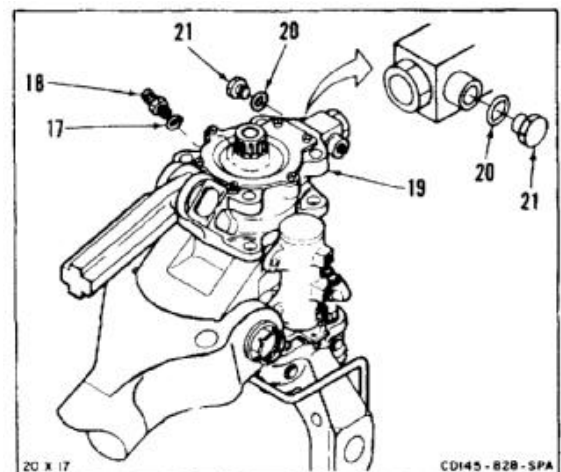
2. Install nut (1), retainer (2), and packing (3) on elbow (4).
3. Install elbow (4) on spindle (5).
4. Install clamp (6) and nut (7).
5. Connect brake tube (8) on elbow (4).
6. Install clip (9) on brake tube (8) and secure to clamp (6) with screw (10) and nut (11).



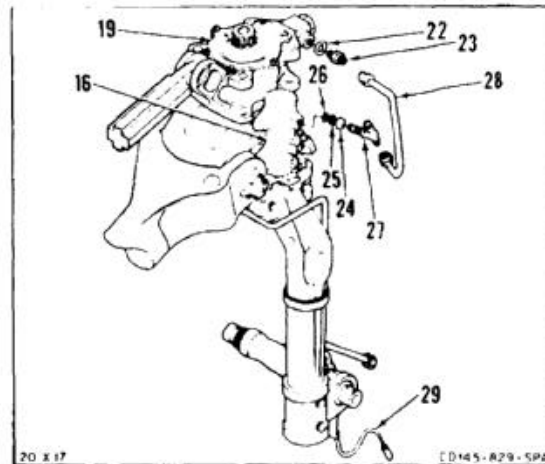
7. Install nut (12), retainer (13), and packing (14) on elbow (15).
8. Install elbow (15) in swivel lock actuator (16).



9. Install packing (17) on union (18).
10. Install union (18) in swivel housing (19).
11. Install packing (20) on plug (21). Install plug in swivel housing (19).



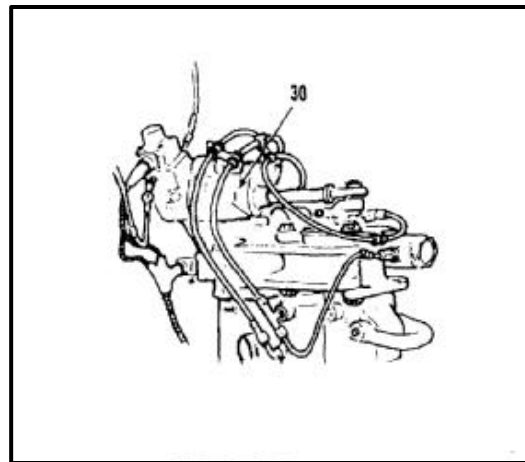
12. Install packing (22) and union (23) in swivel housing (19).
13. Install nut (24), retainer (25), and packing (26) on tee (27). Install tee in actuator (16).
14. Install swivel housing pressure tube (28) on union (23) and tee (27).
15. Install static ground wire (29) on left gear (Task 3-38).



16. Install power steering assembly (30) on right gear (Task 7-300).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 0-160 Foot-Pounds
 Torque Wrench, 30-150 Inch-Pounds
 Torque Wrench, 100-750 Inch-Pounds
 Socket, 1-1/16 Inch
 Socket, 1-1/8 Inch
 Socket, 1-1/2 Inch
 Blocks
 Eddy Current Inspection Unit

Materials:

Dry Cleaning Solvent (E162)
 Grease (E190)
 Cloth, Cleaning (E120)
 Gloves (E186)
 Goggles (E473)

Parts:

Cotter Pins

Personnel Required:

CH-47 Helicopter Repairer (2)
 Inspector

References:

Task 1-24
 TM 1-1520-253-23
 TM 55-1520-240-23P

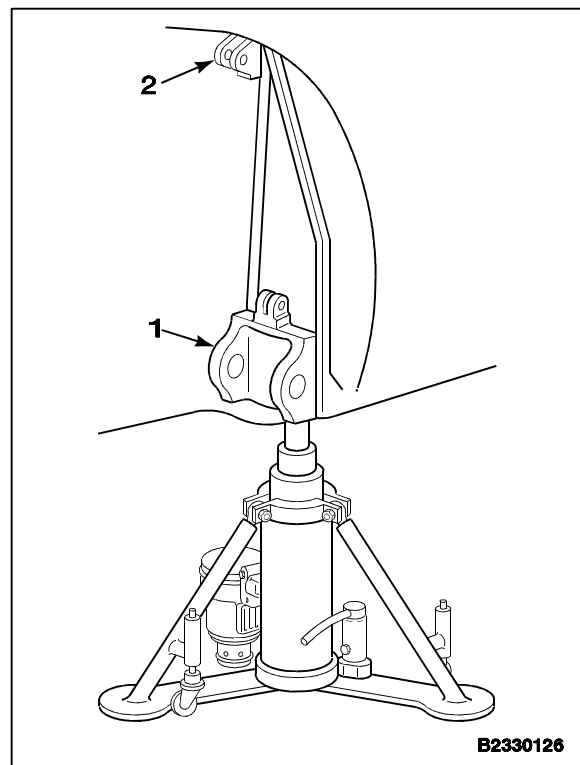
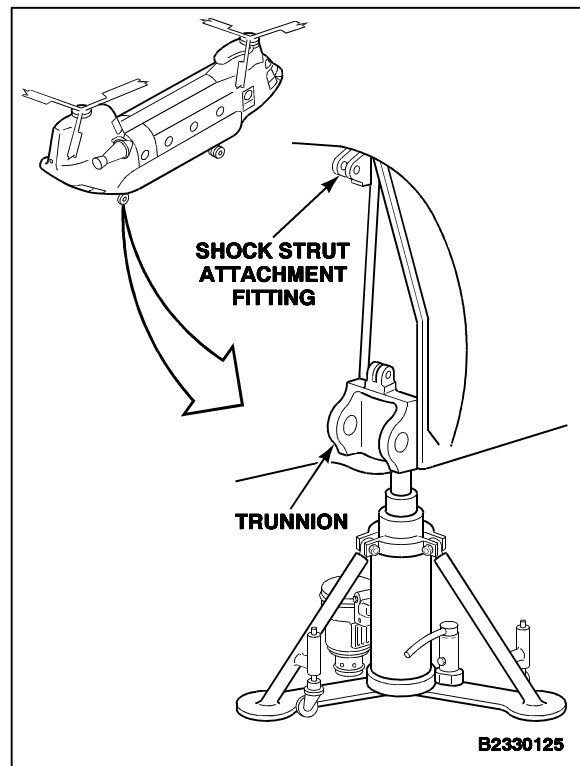
WARNING

Dry cleaning solvent (E162) is flammable and gives off toxic fumes. It may irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

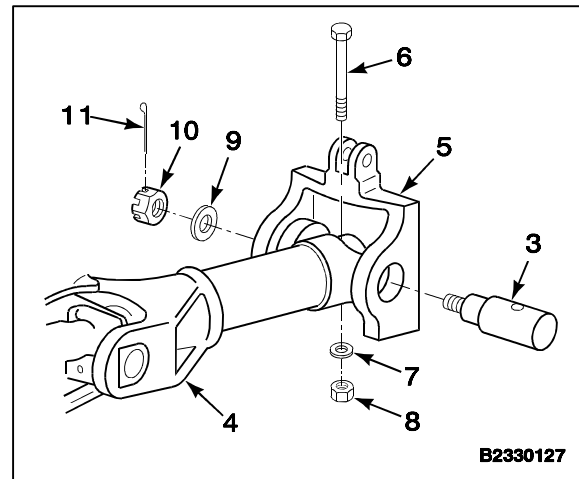
NOTE

This procedure can be used for left and right gear. Except for differences noted in task. Right gear is shown here.

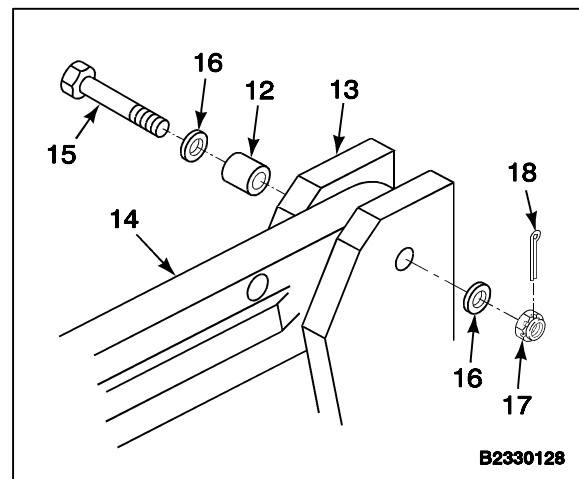
1. Clean trunnion (1) and shock strut attachment fitting (2). Use cloth (E120) damp with dry cleaning solvent (E162). Use gloves (E186).



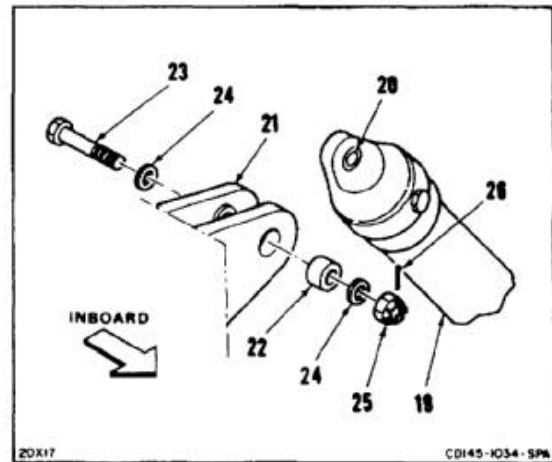
2. Inspect structure for cracks, corrosion, and distortion. If structure is damaged, repair it. If a crack on the structure, shock strut attachment fitting, or the trunnion is suspected, refer to TM 1-1520-253-23.
3. Lubricate trunnion pin (3) with grease (E190).
4. Have helper, using blocks, support aft landing gear in wheel well and position lower drag link (4) in trunnion (5).
5. Install pin (3) through trunnion (5) and drag link (4).
6. Install bolt (6) through drag link (4) and pin (3). Secure bolt with washer (7) and nut (8). Torque nut to **100 inch-pounds**.
7. Install washer (9) and nut (10) on pin (3). Torque nut to **25-35 foot-pounds**. Install cotter pin (11).



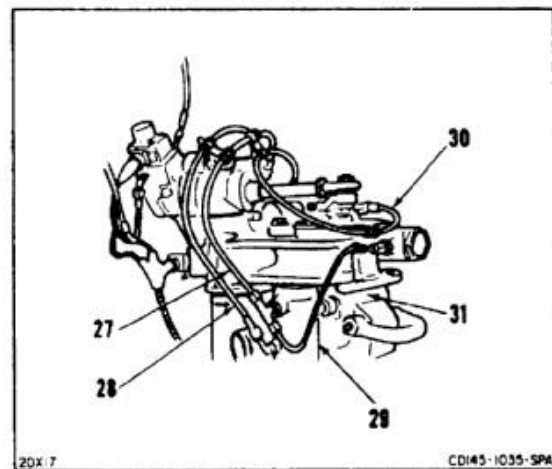
8. Install bushing (12) in fitting (13).
9. Align link (14) with fitting (13). Install bolt (15), washers (16), and nut (17). Torque nut to **50-100 foot-pounds**. Install cotter pin (18).



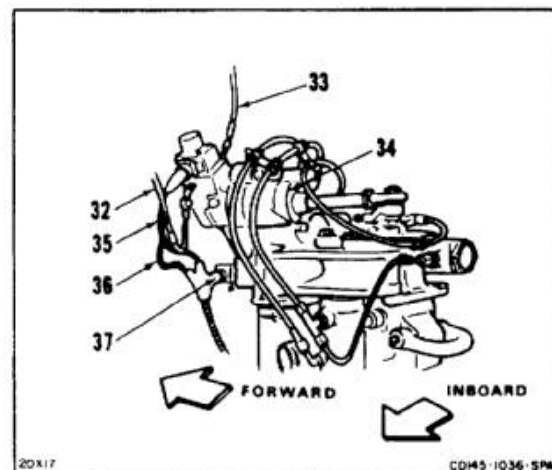
10. Extend shock strut (19).
11. Align bearing (20) in strut (19) with holes in fitting (21).
12. Position bushing (22) and bearing (20) in fitting (21). Install bolt (23), two washers (24), and nut (25). Torque nut to **25 to 35 foot-pounds**. Install cotter pin (26).



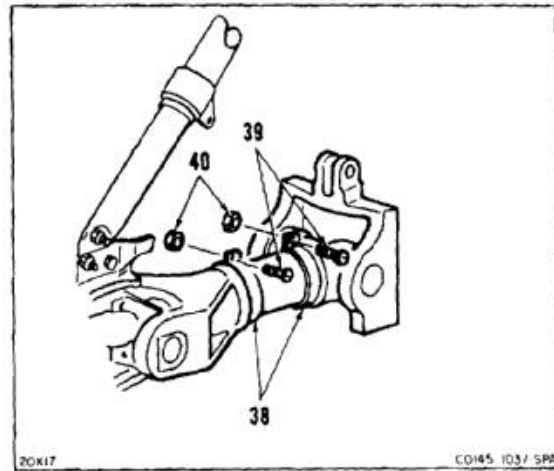
13. Connect two hydraulic hoses (27 and 28) to swivel lock actuator (29).
14. Connect hydraulic brake tube (30) to elbow on top of landing gear (31).



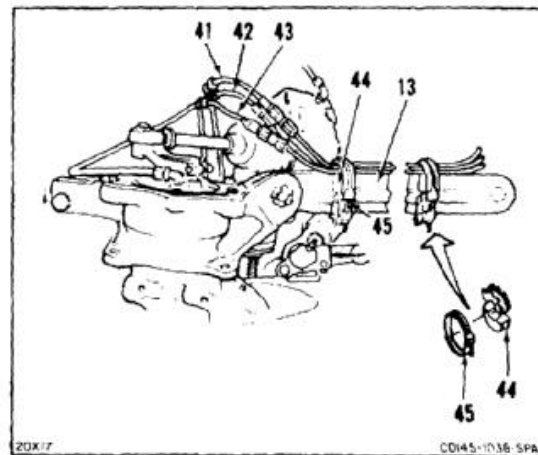
15. For a right gear, connect two hydraulic hoses (32 and 33) to power steering assembly (34).
16. For a right gear plug electrical connectors (35, 36, and 37) into power steering assembly (34).



17. Secure two wire harness clamps (38) to lower drag link with screws (39) and nuts (40).
18. Remove landing gear chock blocks and lower helicopter (Task 1-24).



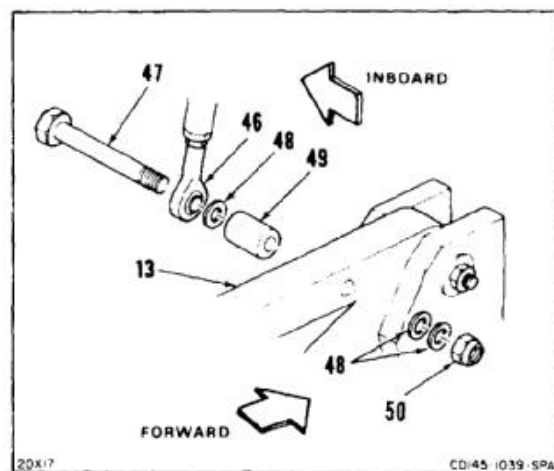
19. Secure hydraulic tubes (41, 42, and 43) to upper drag link (13) with support blocks (44) and clamps (45).



20. Connect proximity switch rod end (46) to upper drag link (13). Use bolt (47), washer (48), spacer (49), and nut (50).

FOLLOW-ON MAINTENANCE:

- Service shock strut (Tasks 1-71 and 72).
- Bleed aft brakes (Task 7-330).
- Functionally test aft landing gear system components (TM 55-1520-240-T).
- Functionally test power steering (TM 55-1520-240-T) (right gear only).
- Close aft landing gear access panels (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Inspector's Tool Kit, NSN 5180-00-323-5114

Materials:

Cloths (E120)

Personnel Required:

Inspector

References:

TM 55-1500-322-24

Equipment Condition:

Off Helicopter Task
 Wheel Bearings Removed and Cleaned (Tasks 3-7,
 3-9, and 3-10)

NOTE

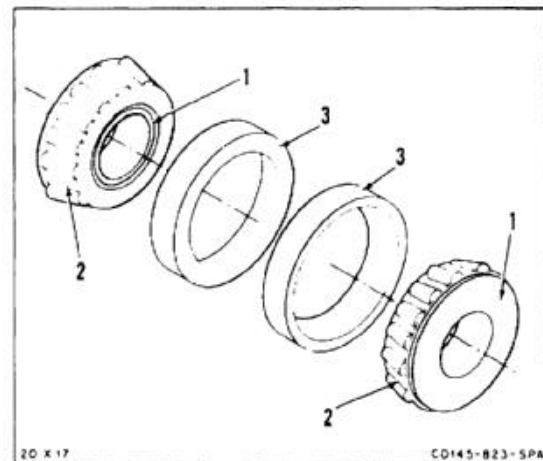
Procedure is same for all landing gear
 wheel bearings.

Replace bearings if any of conditions
 in steps 1 and 2 are found.

1. Check bearings (1) for corrosion, nicks, burrs, cracked cage (2), and free rotation (TM 55-1500-322-24).
2. Check bearing inner cups (3) for corrosion, nicks, burrs, and cracks.
3. Cover bearings (1) and cups (3) with a cloth (E120) until needed.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Retaining Ring Pliers

Materials:

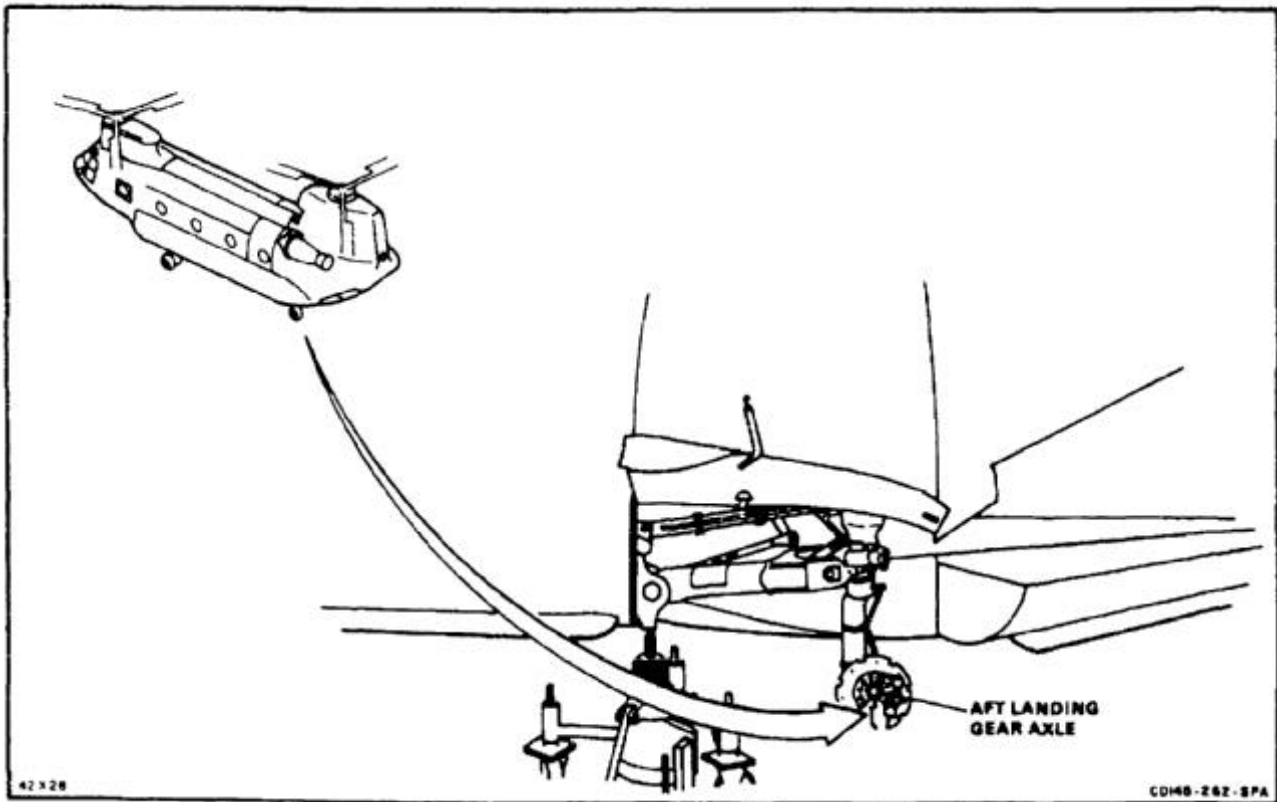
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

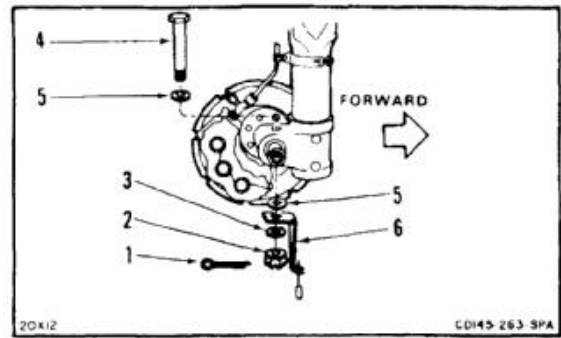
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Access Panel Opened (Task 2-2)
Helicopter Jacked at Aft Fuselage (Task 1-24)
Wheel Removed (Task 3-7)



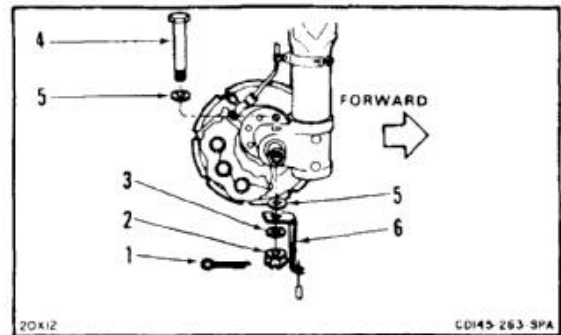
REMOVE AXLE**NOTE**

Procedure is same for left or right axle.
Left side is shown here. Static ground
wire is installed on left side only.

1. Remove cotter pin (1), nut (2), washer (3), bolt (4), two packings (5), and bracket (6).



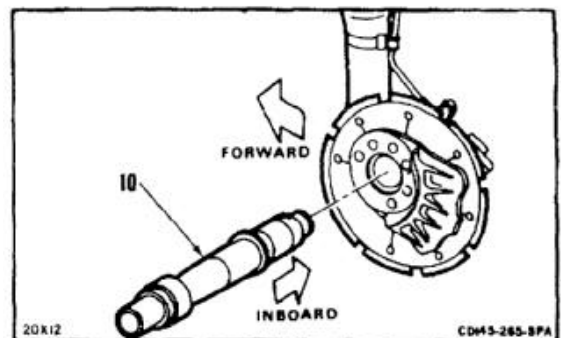
2. Remove retaining ring (7) and sleeve (8).
3. Remove axle extension (9).



4. Remove axle (10).

FOLLOW-ON MAINTENANCE:

Inspect axle (Task 3-13).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Retaining Ring Pliers

Materials:

None

Parts:

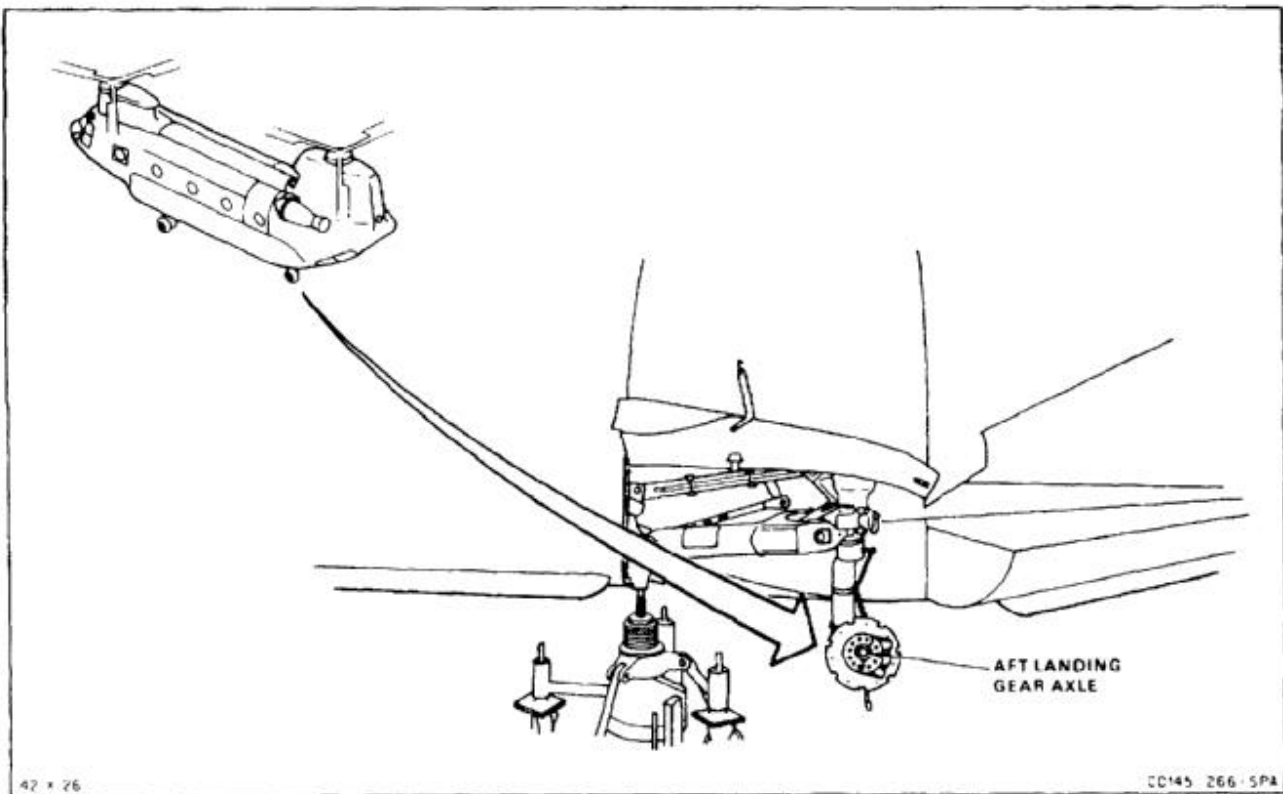
Cotter Pin
Preformed Packing

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P



INSTALL AXLE

NOTE

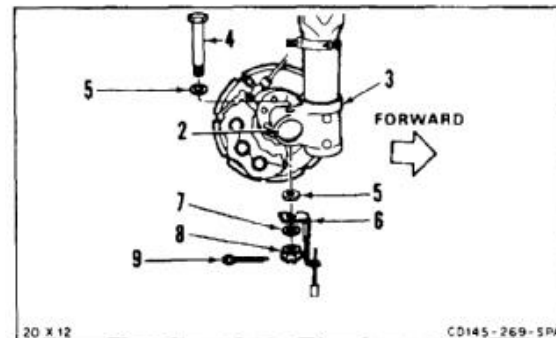
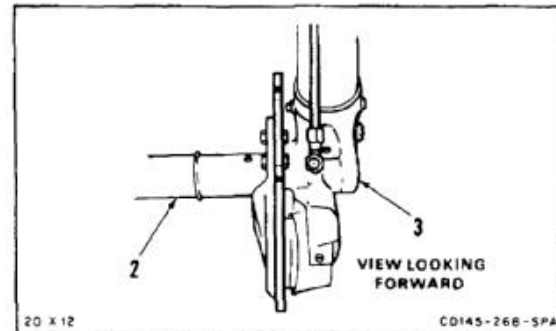
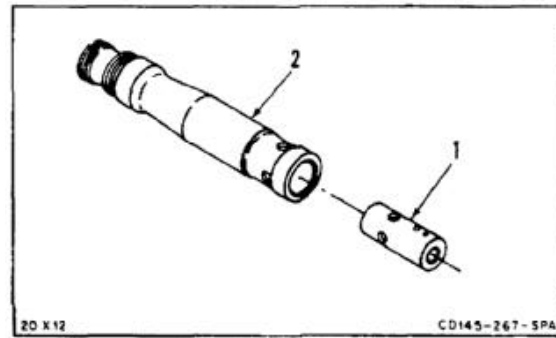
Procedure is same for left and right axle. Left side is shown. Static ground wire is installed on left side only.

1. Install axle extension (1) in axle (2) and align bolt holes.

2. Install axle (2) in housing (3) and align bolt holes.

3. Install bolt (4) with packing (5) through axle (2) and housing (3).
4. Install packing (5), bracket (6), washer (7), nut (8), and new cotter pin (9).

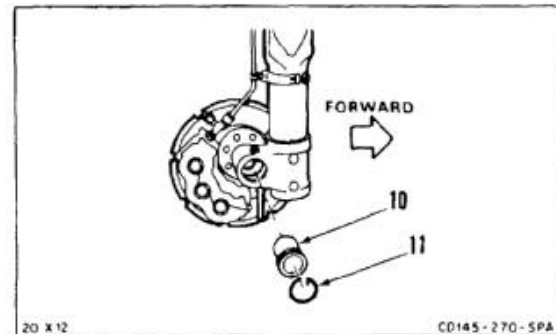
5. Install sleeve (10) and retaining ring (11).



INSPECT

FOLLOW-ON MAINTENANCE:

- Install wheel (Task 3-12.1).
- Lower and remove jack (Task 1-24).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

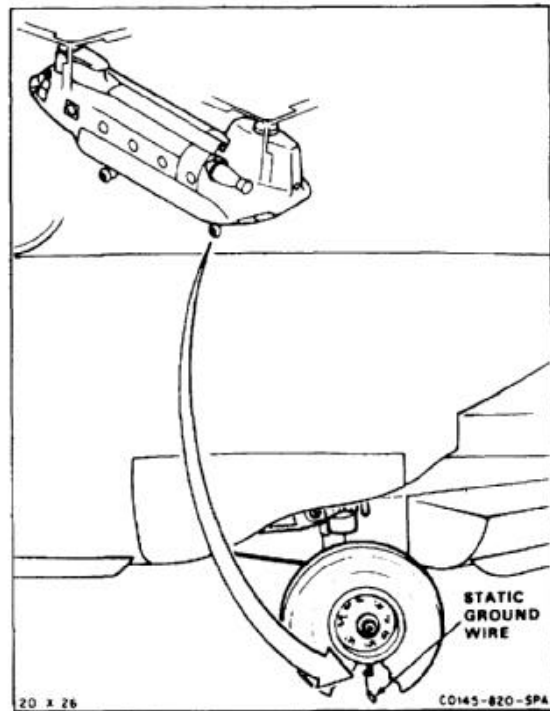
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

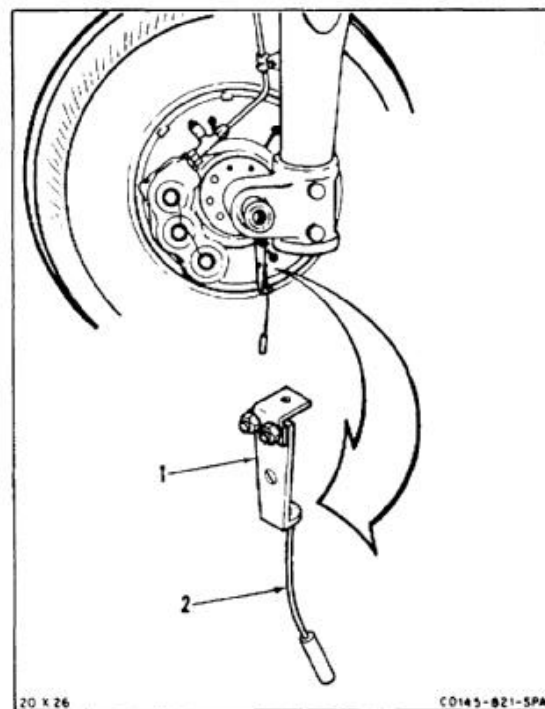
**NOTE**

This procedure is for left gear only.

1. Check bracket (1) and attaching hardware for cracks and corrosion.
2. Check wire (2) for fraying and positive ground contact.
3. Replace wire which is frayed. Replace wire which does not contact ground. Check wire (2) for pitting and burn marks from lightning strike damage.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-37 REMOVE AFT LANDING GEAR STATIC GROUND WIRE

3-37

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

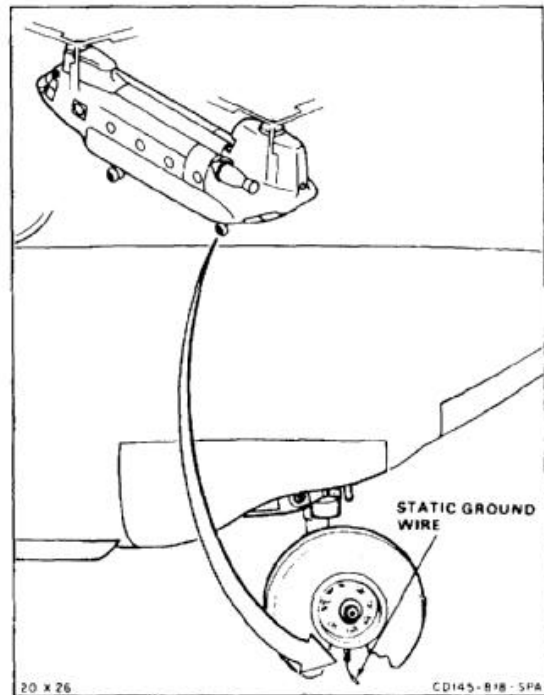
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

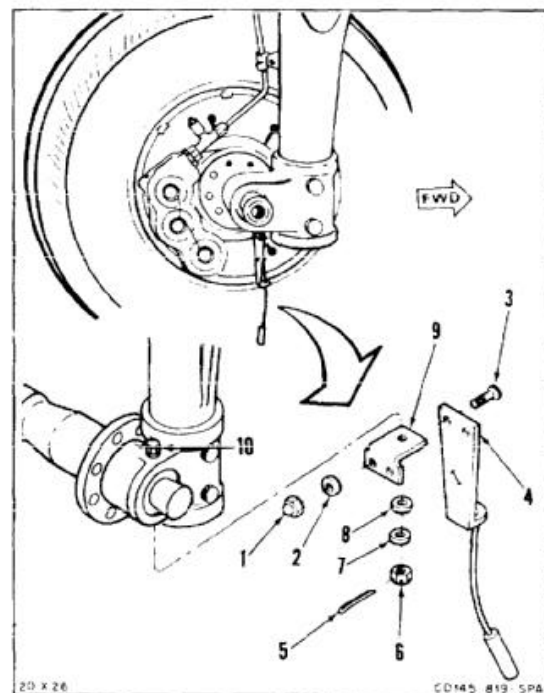
**NOTE**

This procedure is for aft left gear only.

1. Remove nuts (1), lockwashers (2), and screws (3).
2. Remove static ground wire assembly (4).
3. Remove cotter pin (5), nut (6), lockwasher (7), washer (8), and clip (9). Do not remove bolt (10).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

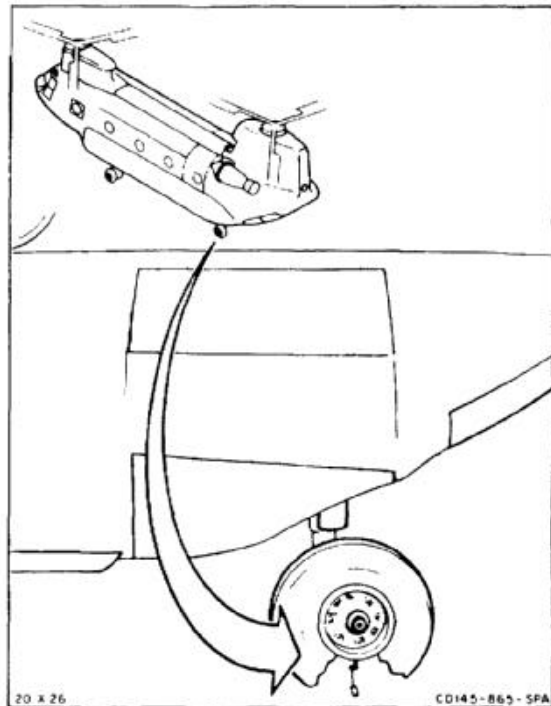
None

Parts:

Cotter Pin

Personnel Required:Medium Helicopter Repairer
Inspector**References:**

TM 55-1520-240-23P

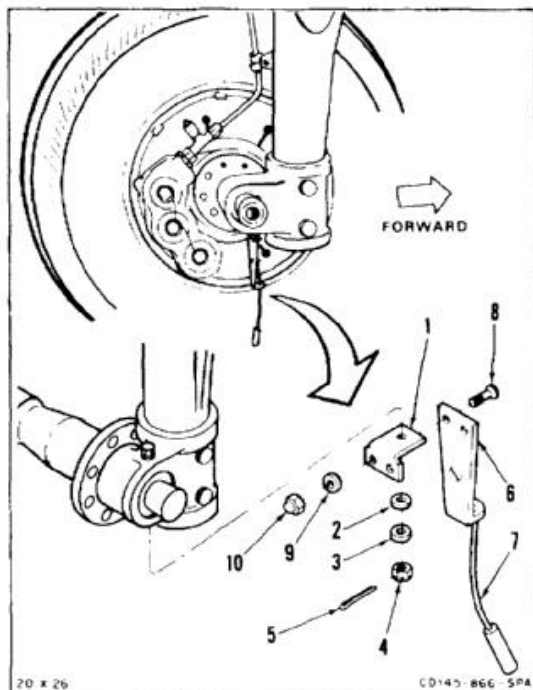
**NOTE**

This procedure is for left gear only.

1. Install clip (1), retainer (2), washer (3), nut (4), and new cotter pin (5).
2. Install static ground wire assembly (6). Make sure ground wire (7) is bent by its contact with the ground.
3. Install screws (8), washers (9), and nut (10).

INSPECT**FOLLOW-ON MAINTENANCE:**

None



END OF TASK

3-38.1 REMOVE AFT LANDING GEAR LUBRICATION FITTING**3-38.1****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

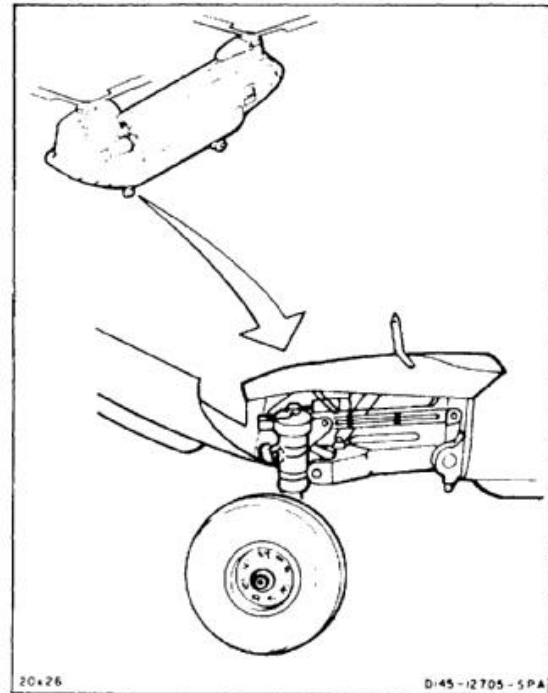
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

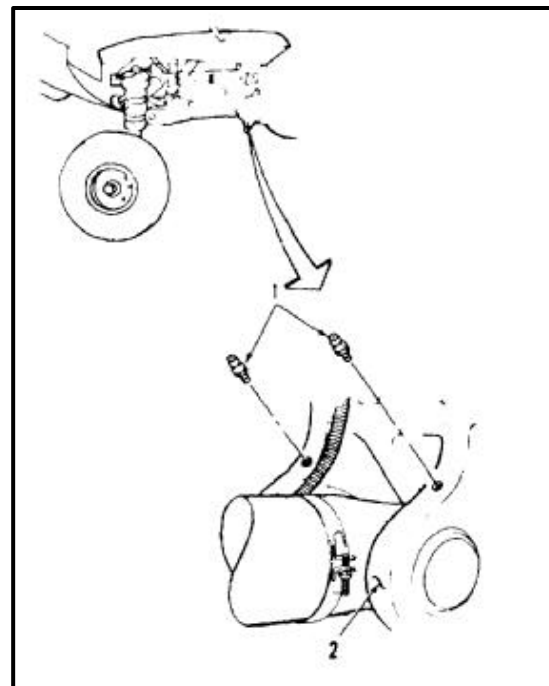
Hydraulic Power Off

Aft Landing Gear Access Panel Open (Task 2-2)

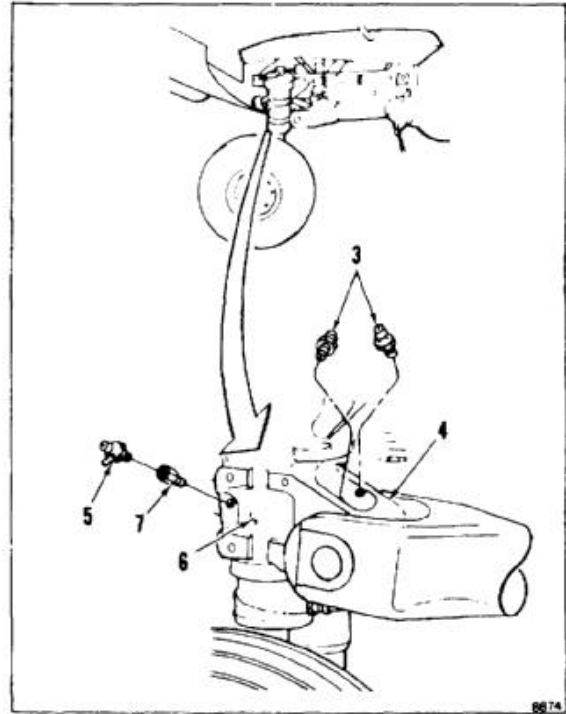
**NOTE**

There are five lubrication fittings on each aft landing gear assembly. All fittings are removed in the same way.

1. Remove two fittings (1) from forward trunnion (2).



2. Remove two fittings (3) from aft trunnion (4).
3. Remove fitting (5) from swivel housing (6).
4. If fitting (5) is broken off or adapter (7) is defective, remove adapter from swivel housing (6).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-38.2 INSTALL AFT LANDING GEAR LUBRICATION FITTINGS**3-38.2****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

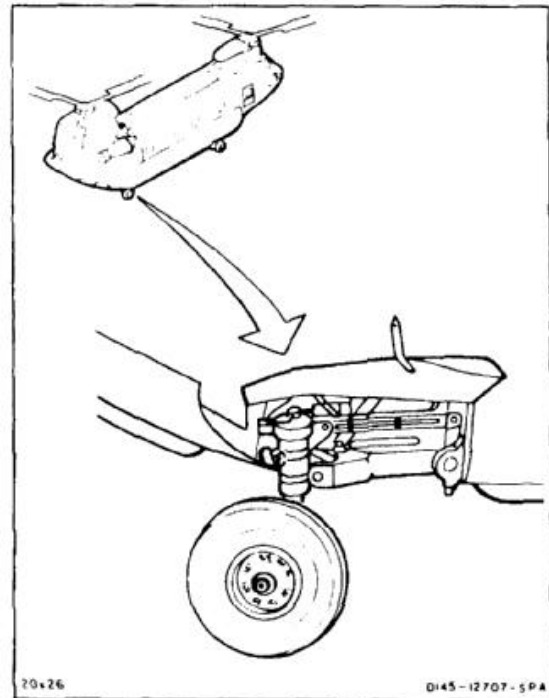
Sealant (E345.1)

Personnel Required:

Medium Helicopter Repairer

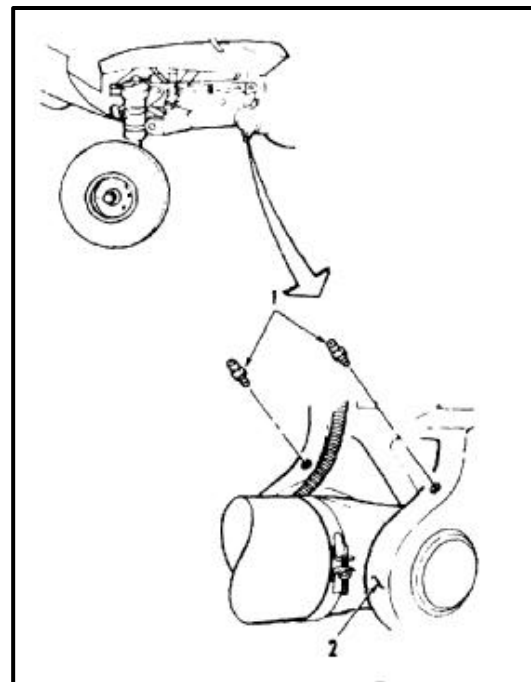
References:

TM 55-1520-240-23P

**NOTE**

There are five lubrication fittings on each aft landing gear assembly. Four are installed in the same way.

1. Install two fittings (1) on forward trunnion (2).

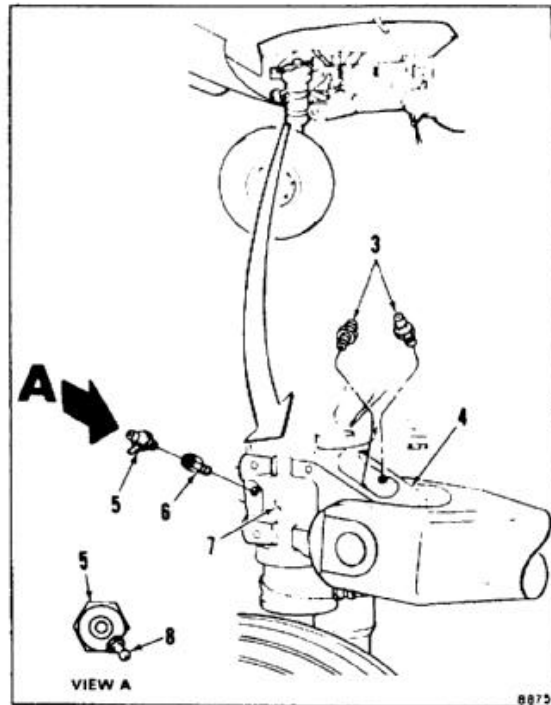


2. Install two fittings (3) in aft trunnion (4).

WARNING

Sealant (E345.1) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

3. Apply sealant (E345.1) to thread of fitting (5) and, if being installed, adapter (6).
4. If required, install adapter (6) in swivel housing (7).
5. Hold adapter (6) with wrench. Install fitting (5) in adapter. Final position of fitting shall leave nipple (8) between **4 and 5 o'clock** position.



FOLLOW-ON MAINTENANCE:

- Lubricate aft landing gear (Task 1-88).
- Close aft landing gear access panel (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

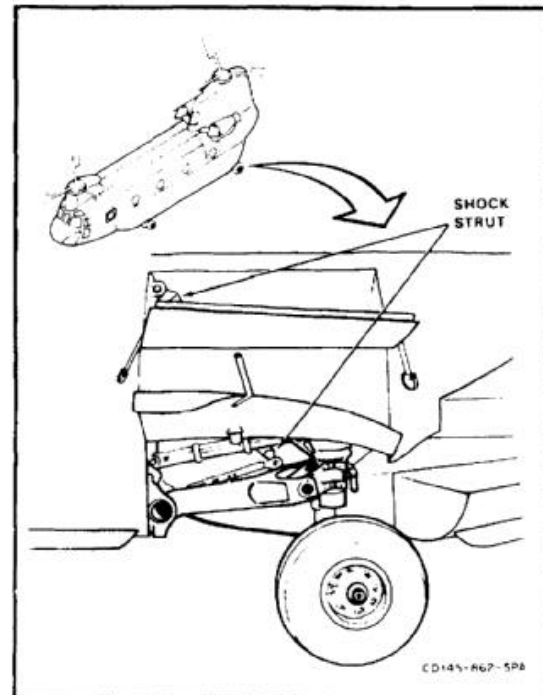
Inspector

References:

TM 55-1520-240-23P
 Task 1-70
 Task 2-18
 Task 2-19
 Task 2-343

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electric Power Off
 Hydraulic Power Off
 Aft Landing Gear Access Panels Open (Task 2-2)

**NOTE**

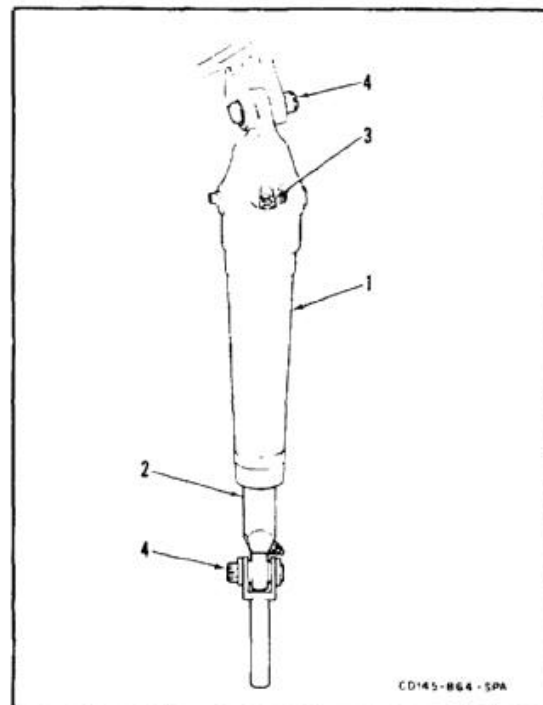
Damage other than minor, requires replacement of attachment fitting (Tasks 2-78 and 2-19).

Procedure is same for left and right gear, left gear is shown.

1. Inspect shock strut (1) for leaking seals. Fluid will be visible on piston (2), or use hand to feel for fluid.
2. Inspect shock strut (1) and piston (2) for corrosion. If there is corrosion, clean or repair as needed (Task 2-343).
3. Inspect shock strut (1) and piston (2) for fluid level at filler plugs (3) (Task 1-70).
4. Check piston (2) is extended and not bottomed in strut (1).
5. Inspect attaching bolts (4) at both ends of strut (1) for looseness.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Socket, 1 Inch
- Wrench, 1-1/16 Inch
- Wrench, 1-1/8 Inch

Materials:

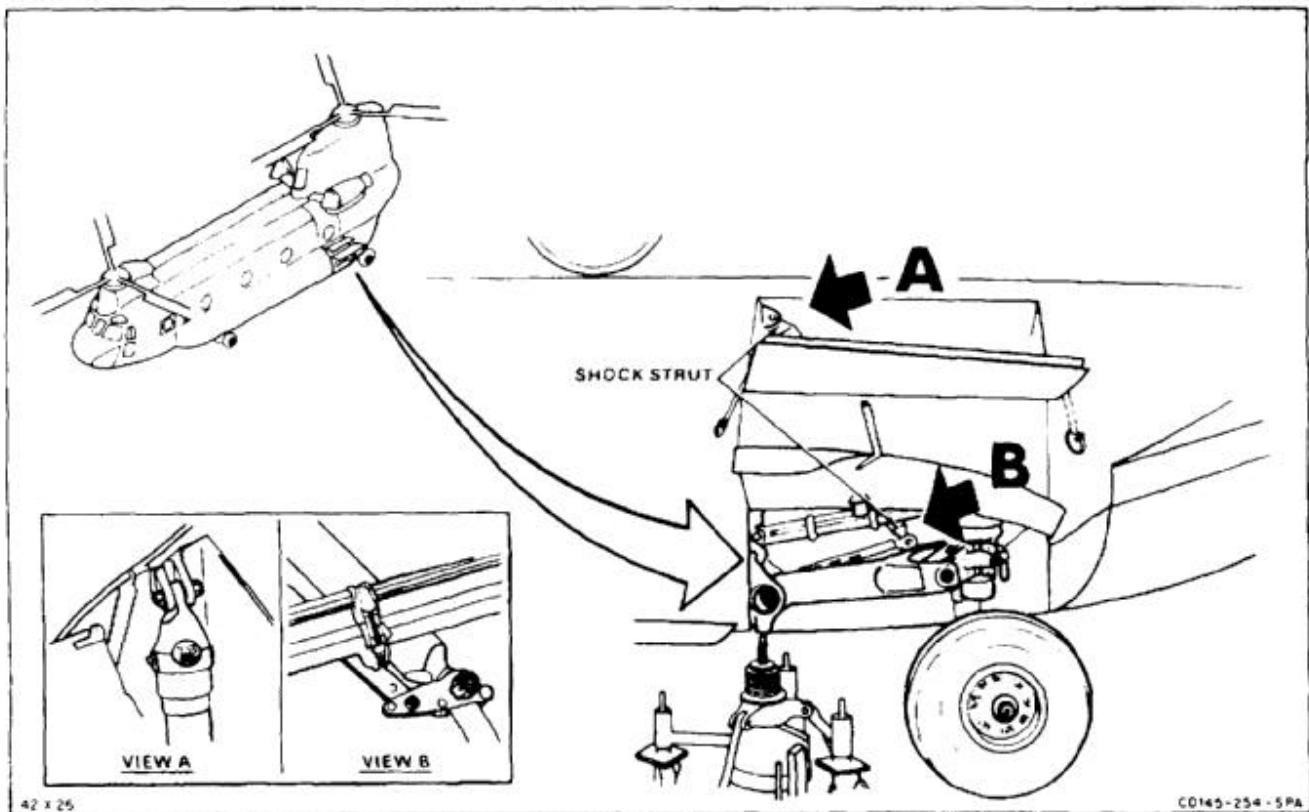
None

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

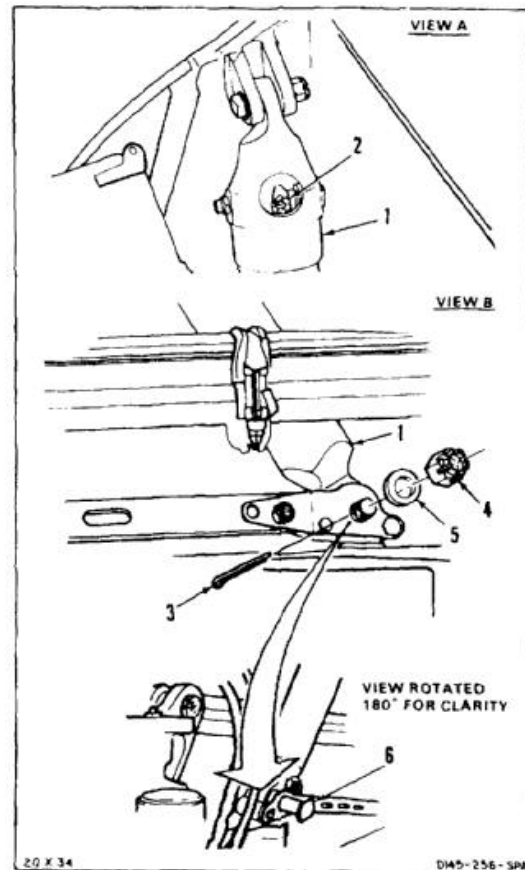
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Aft Landing Gear Access Panel Open (Task 2-2)
- Shock Strut Deflated (Task 1-72)
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)
- Engine Work Platform Opened (Task 2-2)



NOTE

Procedure is same for left or right strut. Left strut is shown here.

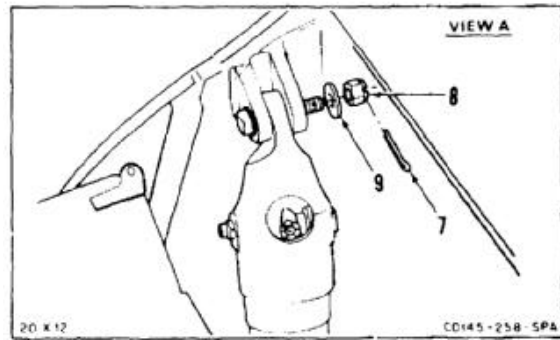
1. Make sure weight is off shock strut (1). Do not lock shock strut.
2. Remove lockwire and loosen filler plug (2) at top of shock strut (1). Leave plug loose until strut can be compressed enough to remove bolt (6). Do not remove filler plug (2).

**REMOVE LOWER ATTACHING BOLT**

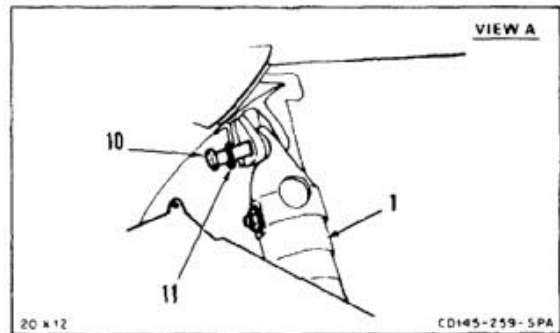
3. With aid of helper, remove cotter pin (3), nut (4), and washer (5) at bottom of shock strut (1).
4. Remove lower bolt (6).

REMOVE UPPER ATTACHING BOLT

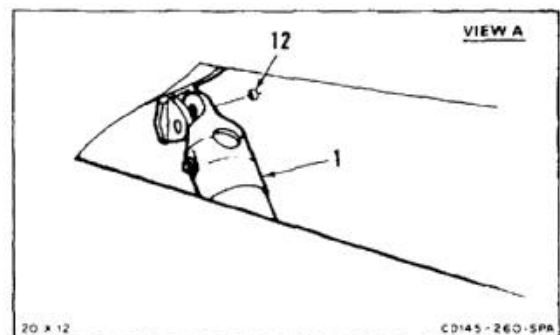
5. Remove cotter pin (7), nut (8), and washer (9).



6. With aid of helper, remove bolt (10) and washer (11) holding upper end of strut (1) to structure.



7. Remove shock strut (1) and bushing (12).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set, NSN 4920-00-405-9279
Arbor Press
Roller Staking Kit (T169)

Materials:

Crocus Cloth (E122)
Epoxy Primer (E292)
Polyurethane Paint (E285.3)
Acetone (E20)
Gloves (E184.1)
Sealant (E345.1)

Parts:

Bearings
Liners (APP E-53)

Personnel Required:

Machinist
Inspector

References:

TM 55-1520-240-23P
TM 55-1500-322-24
MIL-R-46082

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

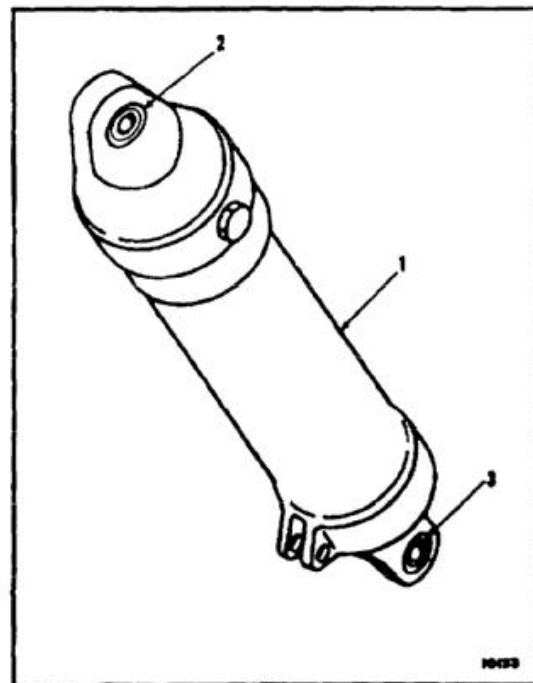
Acetone (E20), epoxy primer (E292) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Same procedure is used to repair left or right shock strut.

REPAIR STRUT SURFACE

1. Remove minor nicks, burrs, scores, scratches, and pits on shock strut (1). Use crocus cloth (E122).
2. Touch up reworked areas with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).
3. Check condition of bearings (2 and 3). If bearings are good, go to Follow-On Maintenance. If either bearing must be replaced, go to step 4.

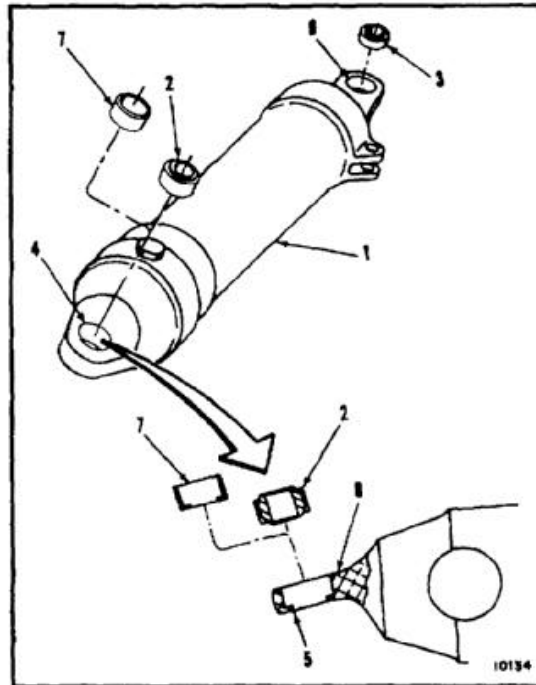


REMOVE BEARINGS

4. Place strut (1) in an arbor press. Use the press to remove bearing (2 or 3) (TM 55-1500-322-24). Note that cap bore (4) has a shoulder (5) that requires bearing (2) to be removed in one direction only.
5. Clean cap bore (4) and piston bore (6). Use acetone (E20) and clean cloths (E120). Wear gloves (E184.1).

REPAIR BEARING BORE

6. Measure diameter of bore (4) at several places. If all measured diameters of bore are **1.3745 inches** or less, go to step 9. If diameter at any one place is over **1.3745 inches**, repair bore as in step 8.
7. Measure diameter of bore (6) at several places. If all measured diameters of bore are **1.4378 inches** or less, go to step 9. If diameter at any one place is over **1.4378 inches**, reject strut (1).
8. Repair cap bore (4) as follows:
 - a. Drill out cap bore (4) to **1.4940 to 1.4945 inches**.
 - b. Chamfer both sides of bore (4) **0.022 to 0.042 inch by 45°**.

**INSPECT**

- c. Coat liner (7) (E-55) with epoxy primer (E292). Wear gloves (E184.1).



Liner must be installed as shown.
Otherwise, it may fail in use.

- d. Install liner (7) wet with primer in bore (4), with shoulder (5) as shown. Use arbor press, (TM 55-1500-322-24). Press liner in flush with cap lug (8).

INSTALL BEARINGS

NOTE

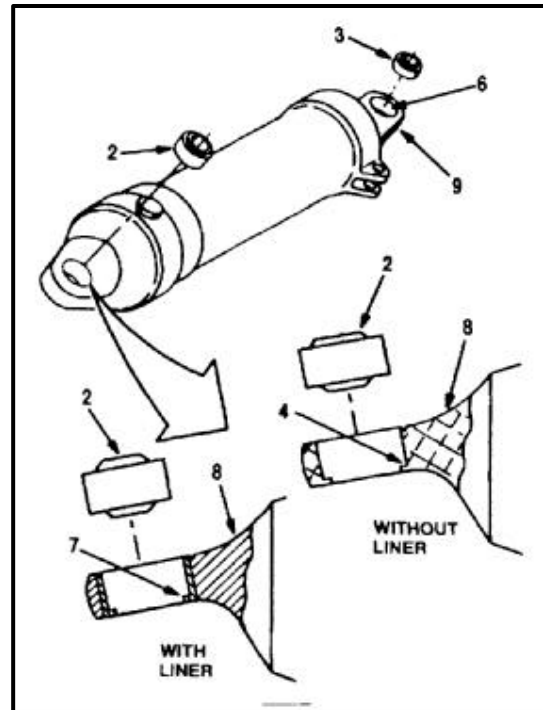
Cap lug bearing may be installed within liner or directly within cap lug bore. Piston bearing is installed directly within piston lug bore.

9. Clean bearings (2 and 3) and mating surfaces of cap bore (4) or liner (7) and piston bore (6). Use acetone (E20). Wear gloves (E184.1).

WARNING

Sealant (E345.1) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

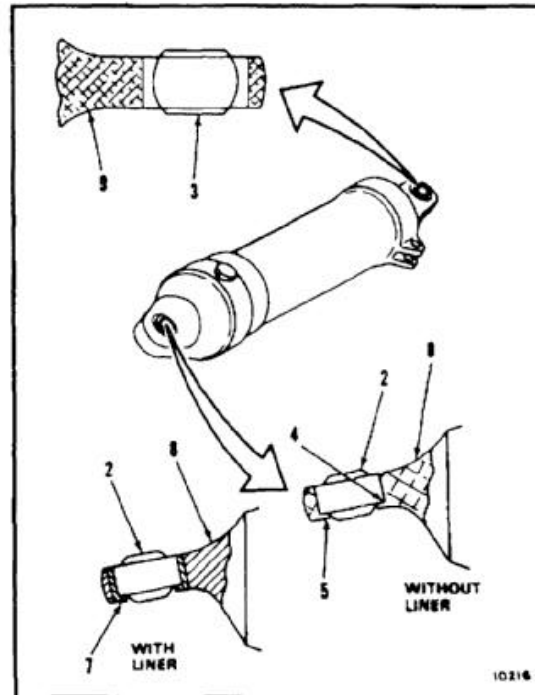
10. Apply sealant (E345.1) to mating surfaces of bearings (2 and 3), bore (4) or liner (7) and bore (6) (MIL-R-46082). Wear gloves (E184.1).
11. Install bearing (2) in bore (4) or liner (7). Install bearing (3) in bore (6). Use arbor press (TM 55-1500-322-24). Installed bearings shall be flush with lugs (8 and 9).



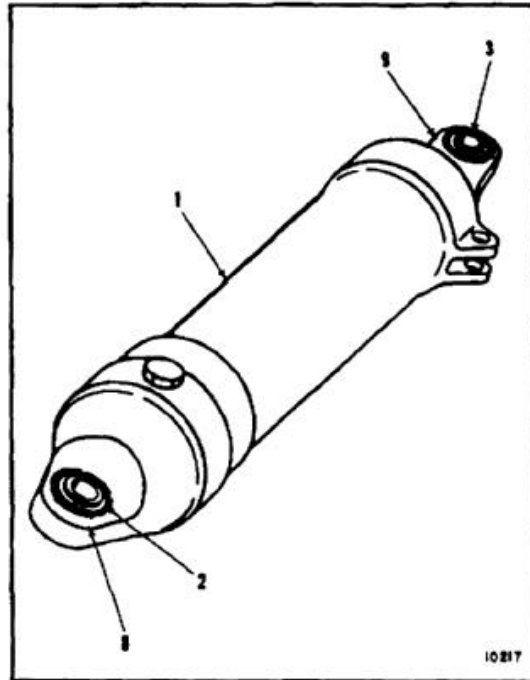
INSPECT

12. Stake bearing (2) or liner (7) to cap lug (8) as follows:
 - a. Bearing (2) in bore (4): Roller stake cap lug (8) over bearing on side opposite shoulder (5) only. Use Roller Swaged Housing Staking method (TM 55-1500-322-24). Use roller staking kit (T169).
 - b. Bearing (2) in liner (7): Roller or impression stake liner to cap lug (8) on side with shoulder in liner (7). On opposite side, swage liner to both bearing and cap lug. Use Roller Swage Sleeve Staking method or Circumferential Line Impression Staking method (TM 55-1500-322-24). Use roller staking kit (T169) where applicable.
13. Stake bearing (3) to piston lug (9) with Outer Ring Groove Staking method (TM 55-1500-322-24).

INSPECT



14. If bearing (2 or 3) was staked directly into lug (8 or 9), stamp an "X" into the lug near the staking.
15. Touch up reworked areas of strut (1). Use primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-104

3-41.1 REMOVE BUSHING FROM UPPER AFT LANDING GEAR MOUNT STRUCTURE

3-41.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Bushing Removal/Installation Tools (APP E-40)

Materials:

None

Personnel Required:

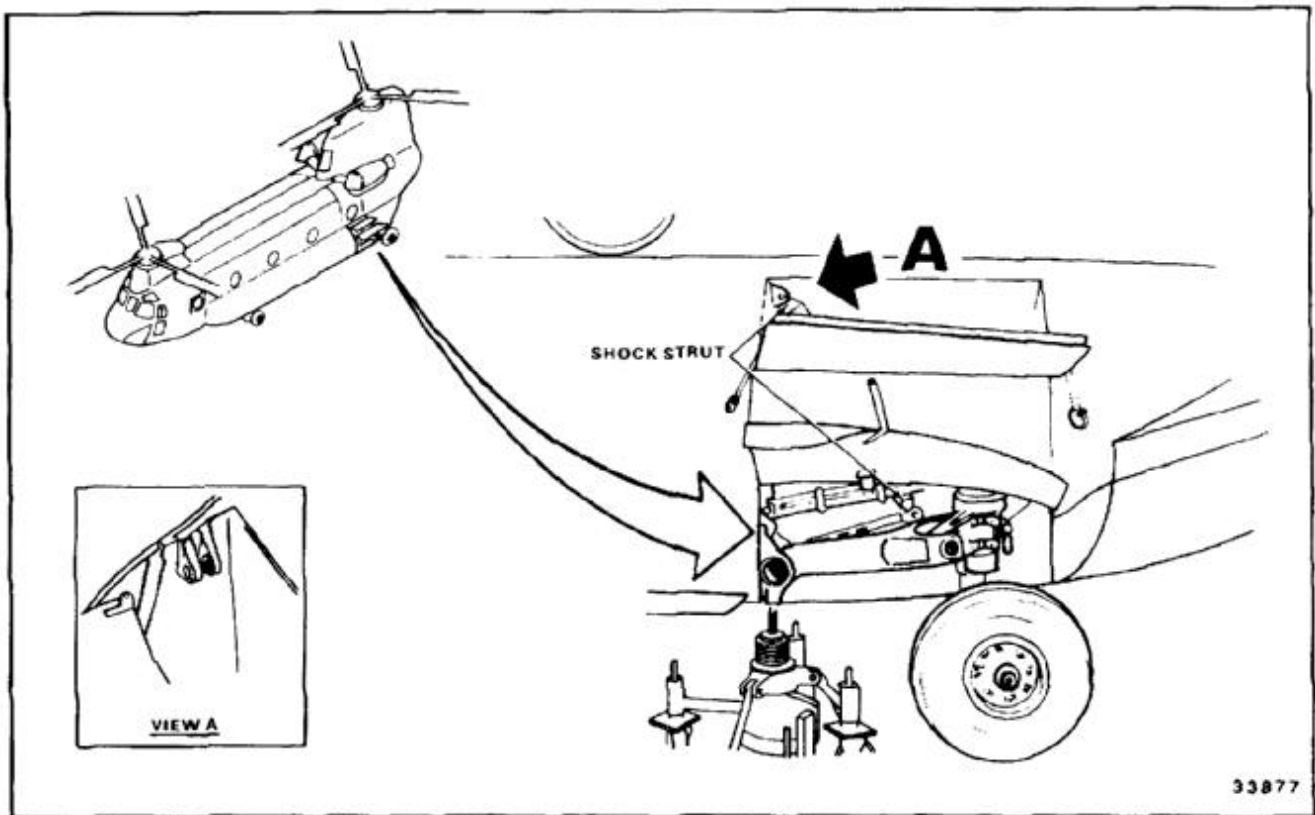
Medium Helicopter Repairer

References:

None

Equipment Condition:

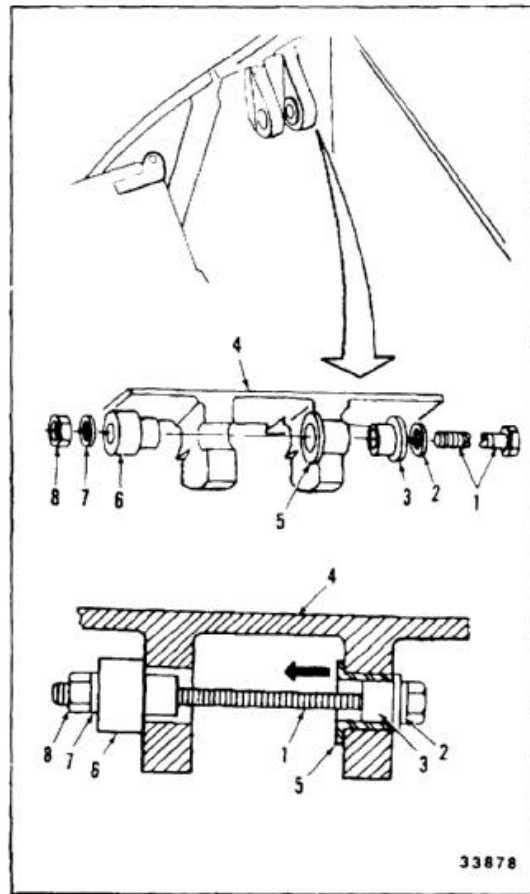
Battery Disconnected (Task 1-39)
 Electrical Power Off
 Aft Landing Gear Shock Strut Removed (Task 3-40)



3-41.1 REMOVE BUSHING FROM UPPER AFT LANDING GEAR MOUNT STRUCTURE (Continued)

3-41.1

1. Install removal tool bolt (1), with washer (2), and sleeve plate (3) through fitting (4) at lug with bushing (5) to be removed.
2. Install spacer (6), washer (7), and nut (8) on bolt (1).
3. Hold bolt (1) from turning. Turn nut (8) to pull bushing (5) out of fitting (4).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

3-41.2 INSTALL BUSHING IN UPPER AFT LANDING GEAR MOUNT STRUCTURE

3-41.2

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Bushing Removal/installation Tool (APP E-40)
 Container, 2 Quart

Materials:

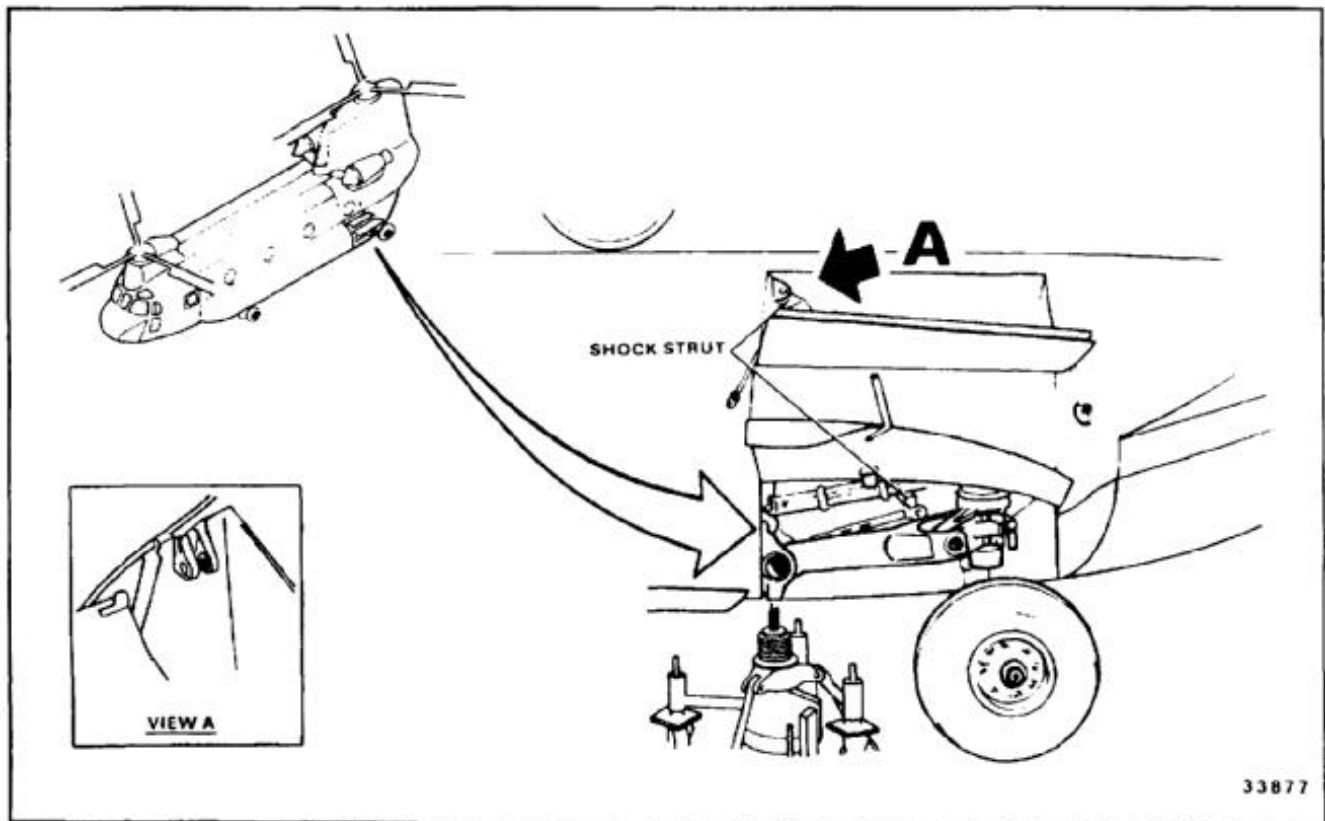
Cloths (E120)
 Gloves (E186)
 Methanol (E243)
 Kevlar Gloves (E187)
 Dry Cleaning Solvent (E162)
 Zinc Chromate Primer (E291)
 Carbon Dioxide (Dry Ice) (E92)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

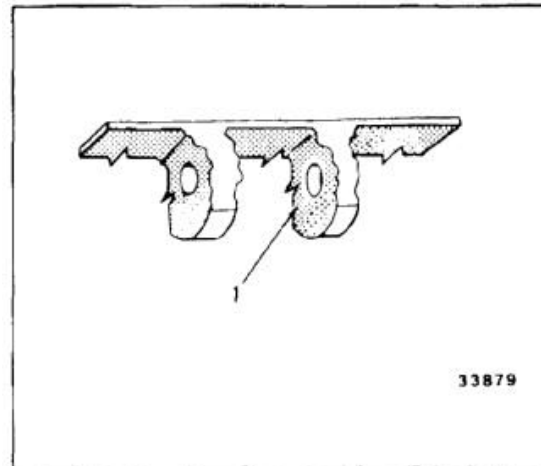
TM 55-1520-240-23P



PREPARE BEAM AND BUSHING**WARNING**

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean bushing mating surfaces of fitting (1). Use solvent (E162) and cloths (E120). Wear gloves (E186).

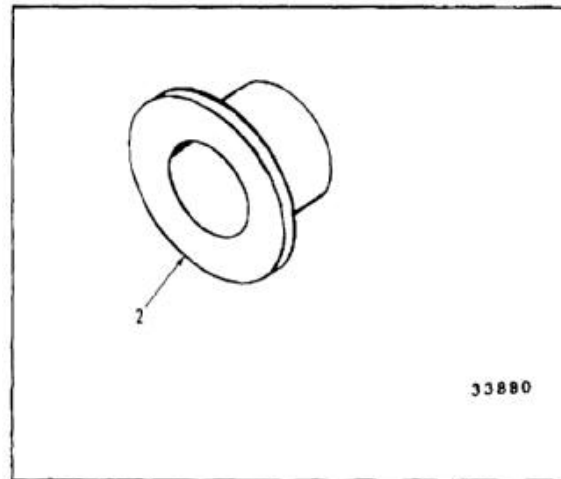
**WARNING**

Carbon dioxide (dry ice) (E92) causes severe burns (frost bite) and gives off toxic fumes. Use only in well-ventilated area. Do not get in eyes, on skin, or clothing. In case of contact, immediately flush with water. Get medical attention for eyes.

Methanol (E243) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

Dry ice (E92) in methanol (E243) has a temperature of **120°F (49°C)**. Observe all safety measures when working with dry ice (E92) and methanol (E243), and when handling chilled parts. Avoid breathing carbon dioxide vapor.

2. Place bushing (2) in carbon dioxide (dry ice) (E92) and methanol (E243). Wear gloves (E187). Wear goggles to protect eyes. Allow bushing to cool.



3-41.2 INSTALL BUSHING IN UPPER AFT LANDING GEAR MOUNT STRUCTURE (Continued)

3-41.2

WARNING

Zinc chromate primer (E291) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

3. Coat bushing bore (3) of fitting (1) with zinc chromate primer (E291). Wear gloves (E186).

INSTALL BUSHING**WARNING**

Wear gloves (E187) when handling chilled bushing.

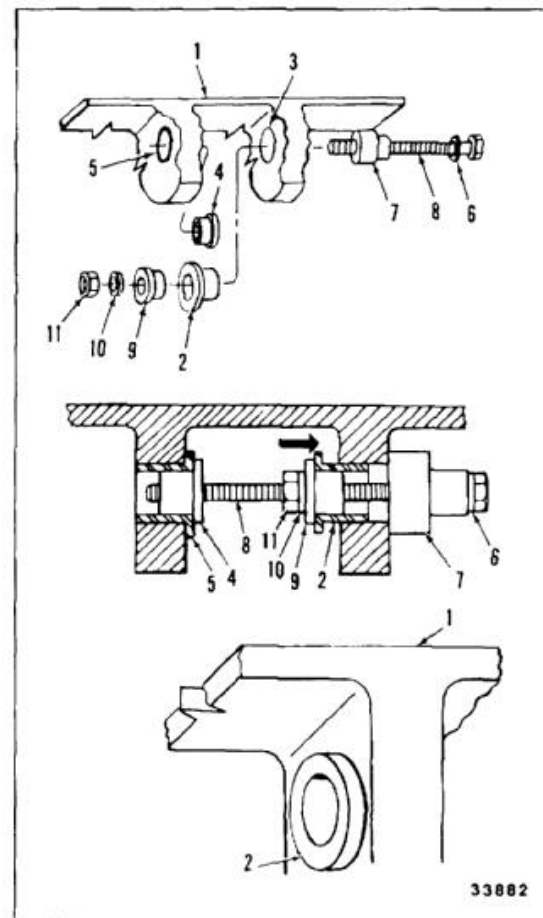
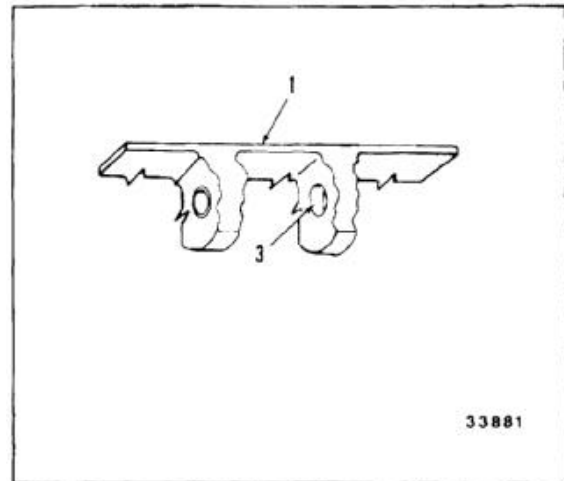
NOTE

Work quickly with chilled bushing. Bushing must be installed before it warms.

4. Remove bushing (2) from dry ice. Wear gloves (E187). Wear goggles to protect eyes.
5. While primer is wet, press bushing (2) into fitting (1) as follows:
 - a. Install one sleeve plate (4) in bore of bushing (5). Install washer (6) and spacer (7) on bolt (8), small end of spacer toward bolt head.
 - b. Install bolt (8) through bore (3). Install new bushing (2) and second sleeve plate (9) over bolt. Install washer (10) and nut (11) on bolt.
 - c. Insert end of bolt (8) in sleeve plate (4).
 - d. Hold bolt (8) from turning. Turn nut (11) to press bushing (2) into fitting (1) until shoulder touches fitting (1).
6. Remove nut (11), washers (6 and 10), spacer (7), sleeve plates (9 and 4), and bolt (8).

FOLLOW-ON MAINTENANCE:

Install aft landing gear shock strut (Task 3-42).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Torque Wrench, 0 to 160 Foot-Pounds
- Torque Wrench, 100 to 750 Inch-Pounds
- Socket, 1 Inch
- Wrench, 1-1/16 Inch
- Wrench, 1-1/8 Inch
- Container, 2 Quart

Materials:

None

Parts:

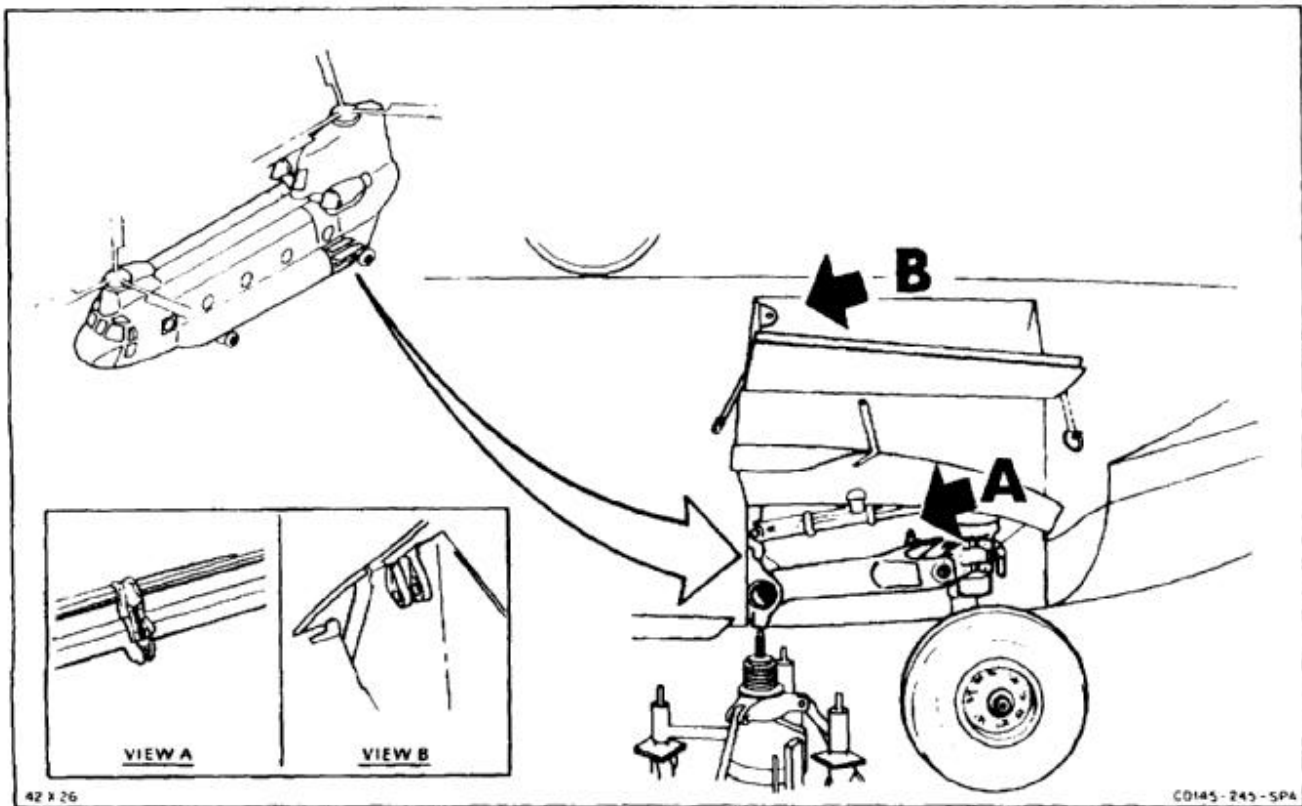
Cotter Pins

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P



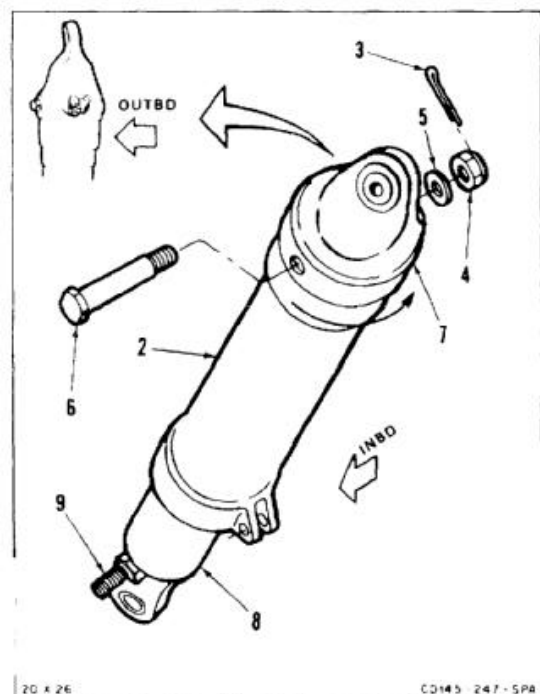
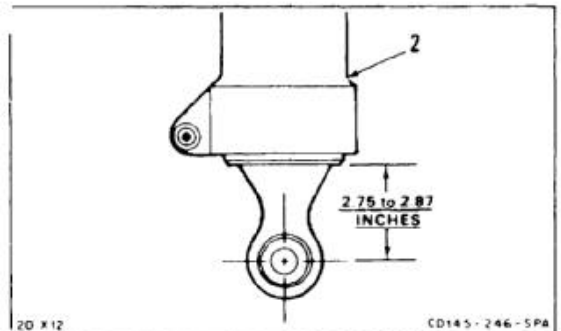
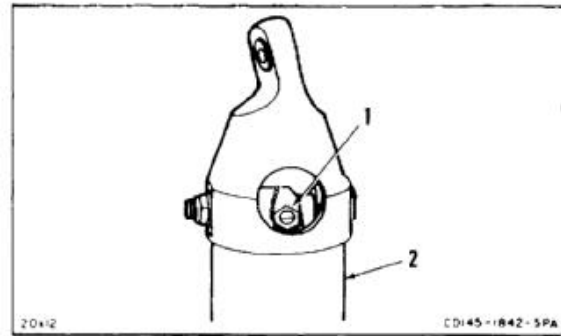
NOTE

Procedure is same for left or right shock strut. Left strut is shown here.

PREPARE SHOCK STRUT**NOTE**

If replacement shock strut is to be installed, drain preservative fluid from strut.

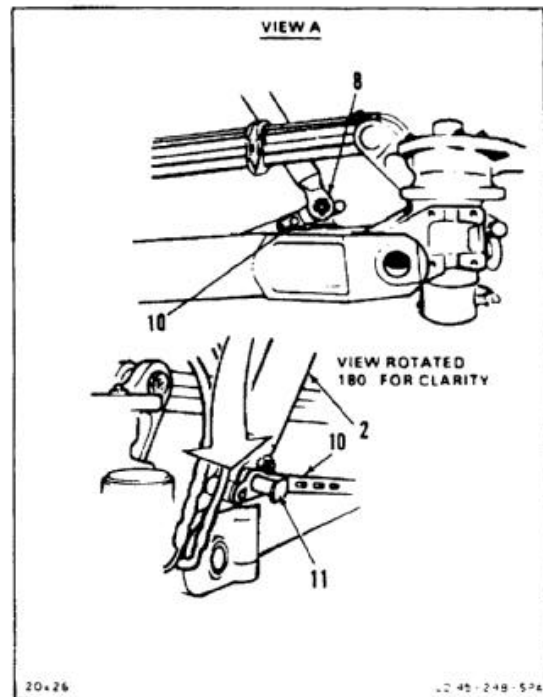
1. Remove lockwire and filler plug (1). Turn shock strut (2) upside down to drain fluid from strut. Use container for fluid.
2. Collapse shock strut (2) to be installed. Check dimension of strut as shown. Dimension of strut shall be within **2.75 to 2.87 inches**.
3. If shock strut (2) is to be installed on right gear, remove cotter pin (3), nut (4), washer (5), and bolt (6) from cap (7). Turn cap **180°** on shock strut.
4. Install bolt (6), washer (5), and nut (4). Torque nut to **200 to 250 inch-pounds**. Install new cotter pin (3).
5. On left gear, turn piston (8) in strut (2) so air valve (9) is on inboard side with strut installed.
6. On right gear, turn piston (8) in strut (2) so air valve (9) is on outboard side with strut installed.



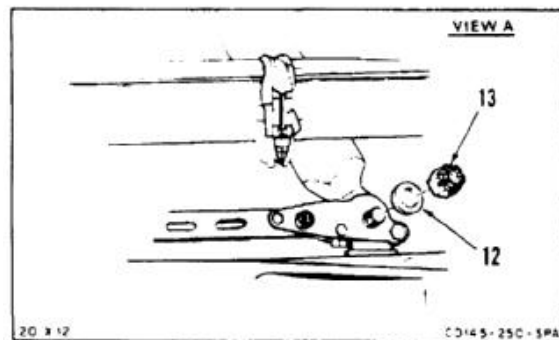
7. Install piston (8) in static lock mechanism (10).

INSTALL SHOCK STRUT BOLTS

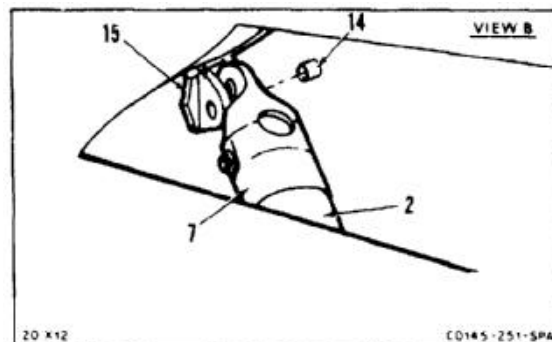
8. Install bolt (11) through static lock mechanism (10) and strut (2) from inboard side.



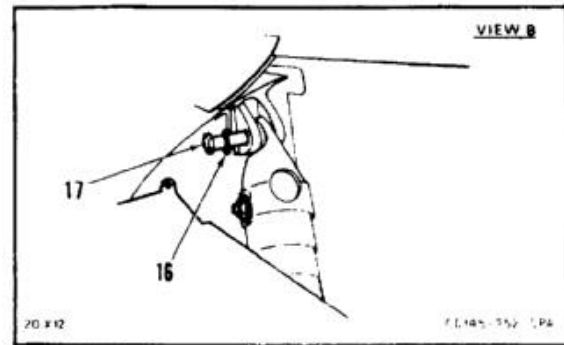
9. Install washer (12) and nut (13). Do not tighten nut.



10. Install bushing (14) in upper attach fitting (15).
11. Extend strut (2). Align cap (7) with upper attach fitting (15).



12. Install washer (16) and bolt (17).

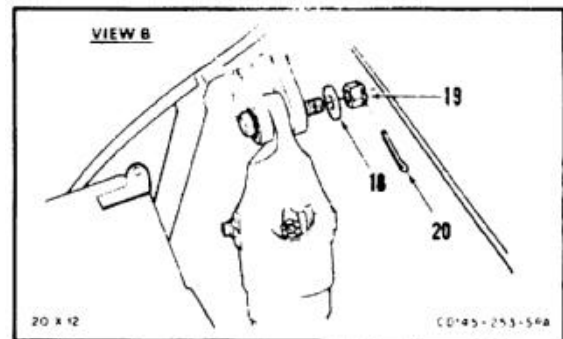


INSTALL AND TORQUE NUTS

13. Install washer (18) and upper nut (19).
 14. Torque upper nut (19) to **25 to 35 foot-pounds**.
 15. Install cotter pin (20).

NOTE

Clearance must exist between shock strut and attachment fitting. Damage other than minor requires replacement of fitting.

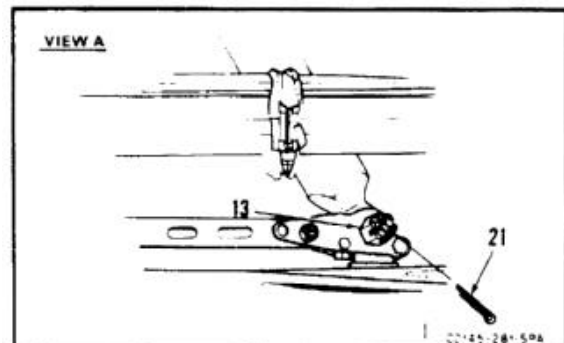


16. Torque lower nut (13) to **25 to 35 inch-pounds**.
 17. Install cotter pin (21).

INSPECT

FOLLOW-ON MAINTENANCE:

Service shock strut (Task 1-72).
 Lower and remove jack (Task 1-24).
 Close access panels (Task 2-2).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

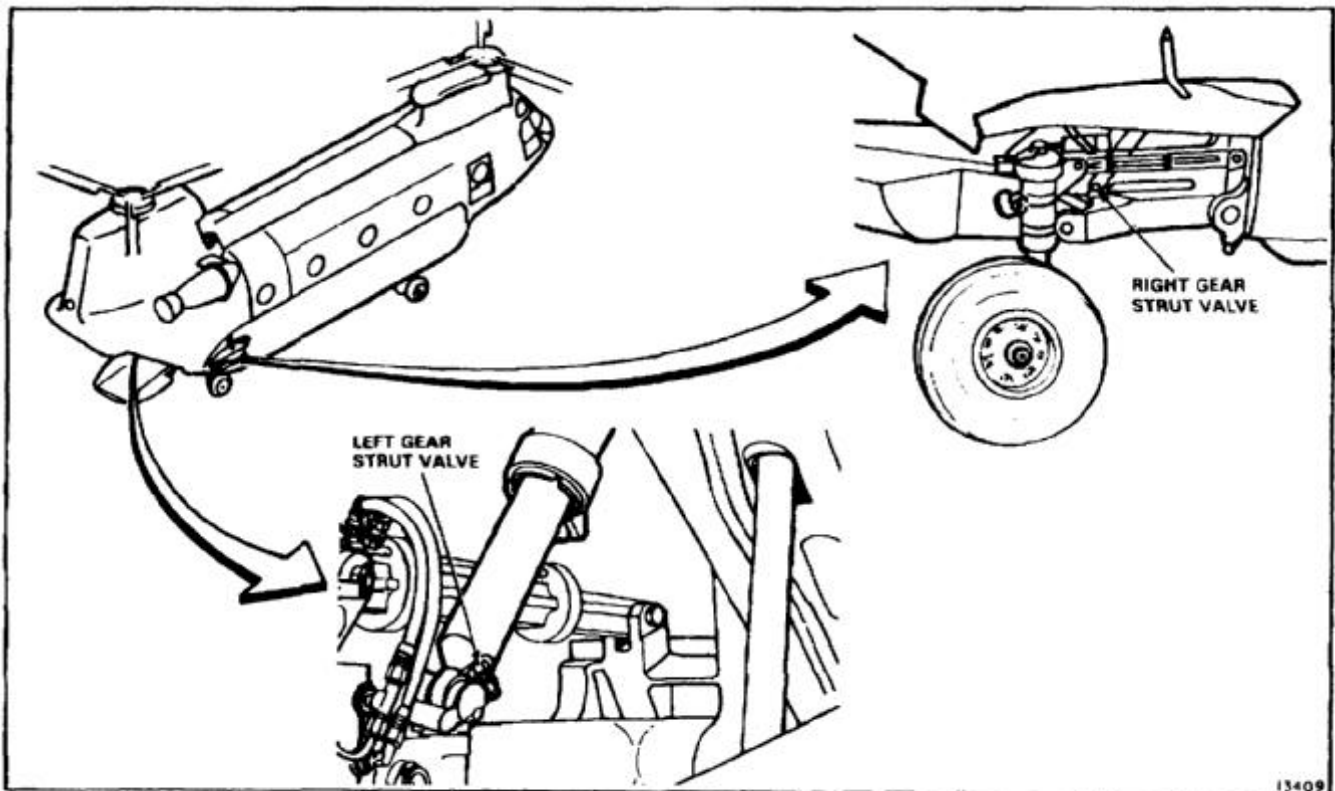
TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open (TM 55-1520-240-T)
Aft Right Landing Gear Access Panel Open (Task 2-2)
Weight Supported on Jack and Static Lock
Mechanism Engaged (Task 1-24)

NOTE

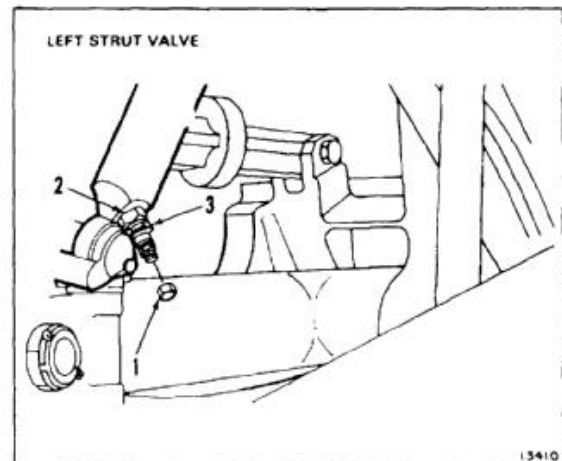
Procedure is same for aft left and right shock strut valves.



WARNING

High pressure air trapped under valve cap can be a hazard. Remove cap slowly or it may pop off and cause injury.

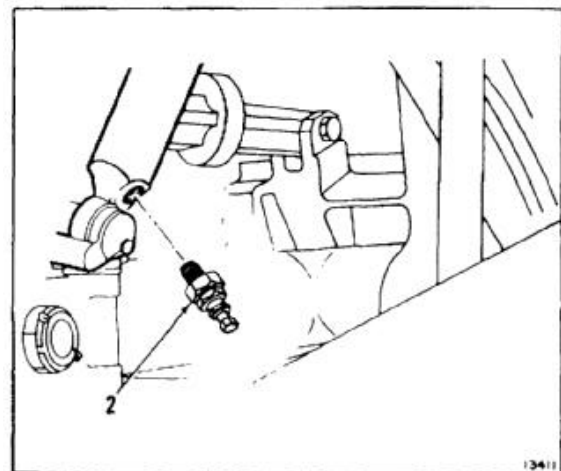
1. Loosen valve cap (1) slowly. Remove cap from valve (2).
2. Hold body of valve (2) stationary with wrench. Turn nut (3) counterclockwise **one half to one and one half turns**.
3. Allow air pressure to discharge completely.



4. Remove lockwire from valve (2).
5. Turn valve (2) counterclockwise and remove.

NOTE

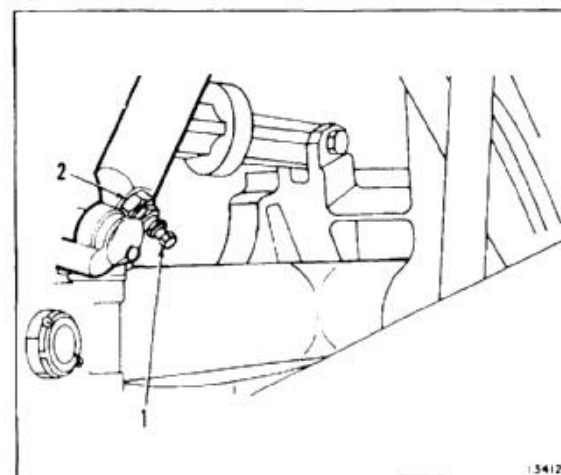
Check that replacement valve contains packing in groove next to thread.



6. Install replacement valve (2).
7. Torque valve (2) to **115 inch-pounds**.
8. Lockwire (E231) valve (2).
9. Install cap (1).

INSPECT**FOLLOW-ON MAINTENANCE:**

Service aft landing gear shock strut (air) (Task 1-72).
Disengage static lock mechanism and remove jack (Task 1-24).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Slide Hammer
 Socket, 2-1/8 Inch
 Socket Wrench Handle, 3/4 Inch Drive
 Box End Wrench, 1-1/2 Inch

Materials:

Chock Blocks

Personnel Required:

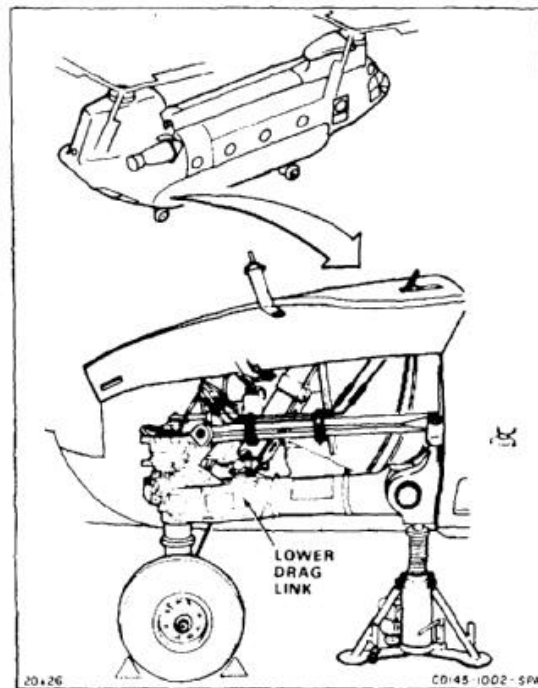
Medium Helicopter Repairer (2)

References:

Task 3-61

Equipment Condition:

Battery Disconnected (Task 1-39)
 Aft Landing Gear Access Panels Open (Task 2-2)
 Electrical Power Off
 Hydraulic Power Off
 Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)
 Shock Strut Deflated (Task 1-72)
 Static Lock Unlocked

**NOTE**

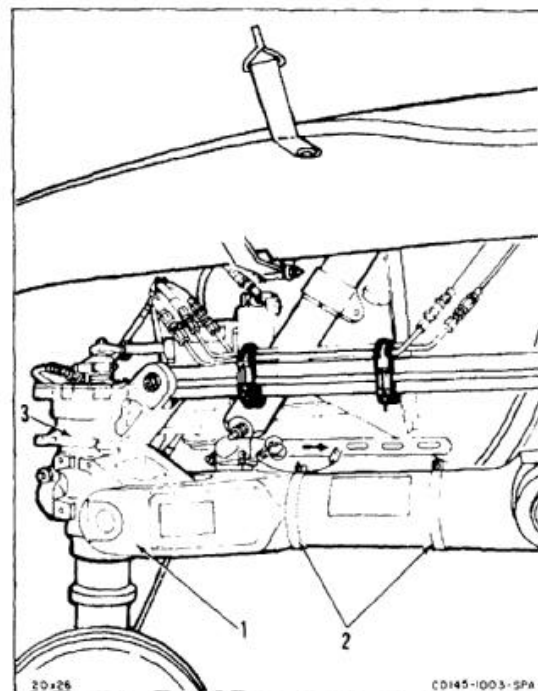
Procedure is same for left or right gear except for differences noted in task. Right gear is shown here.

1. Chock wheels fore and aft to prevent any movement.
2. If a right drag link (1) is being removed, remove two clamps (2).

NOTE

Do not remove wheel or brake for this procedure.

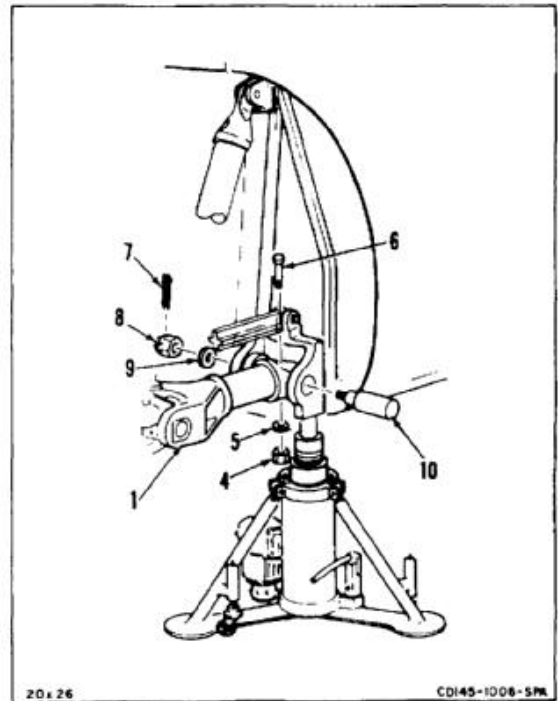
3. Remove swivel housing and spindle (3) (Task 3-61).



3-43 REMOVE LOWER DRAG LINK (Continued)

3-43

4. Remove nut (4), washer (5), and bolt (6).
5. Remove cotter pin (7), nut (8), and washer (9) from trunnion pin (10).
6. Have a helper hold link (1).
7. Using a slide hammer, drive trunnion pin (10) from link (1). Remove link.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set, NSN 4920-00-405-9279
 Arbor Press
 Gun Heater

Materials:

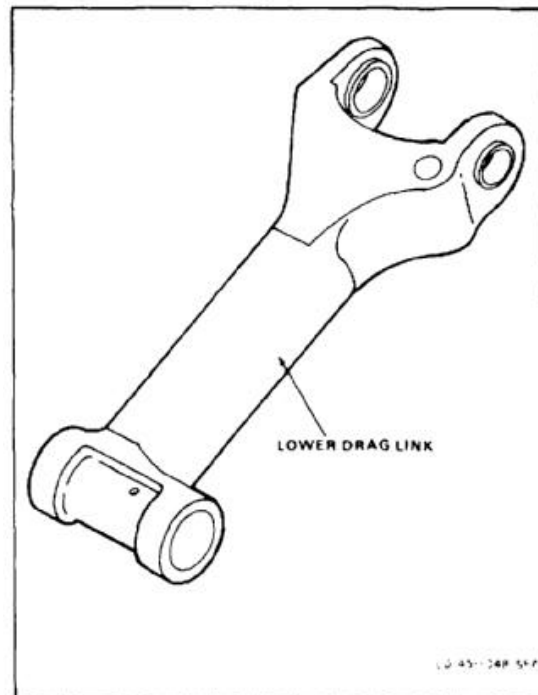
Kevlar Gloves (E187)
 Temperature Indicating Strips (E413)

Personnel Required:

Machinist

Equipment Condition:

Off Helicopter Task

**NOTE**

Procedure is same for left or right landing gear lower drag link.

1. Position lower drag link (1) in arbor press. Press bushings (2) from link.

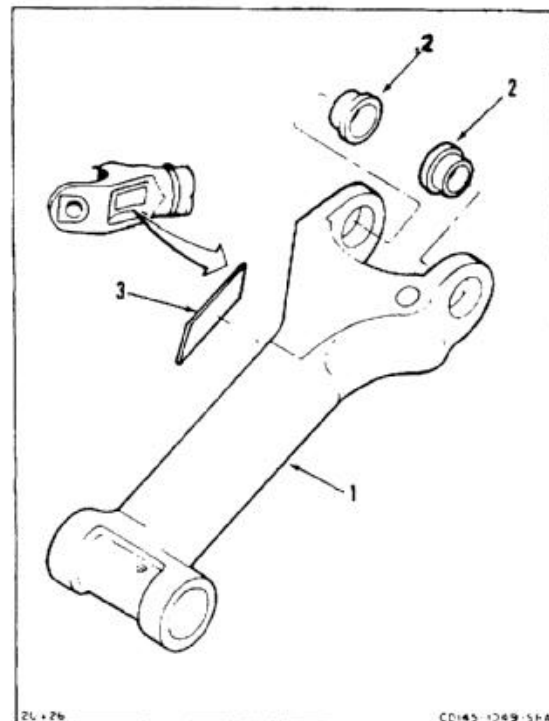
WARNING

Wear Kevlar gloves (E187) when handling heated parts. Injury to personnel can result. If burned, flush with water. Get medical attention.

2. If press is not available, heat link (1) to **230° to 250°F (110° to 120°C)**. Use gun type heater. Monitor temperature. Use temperature indicating strips (E413).
3. If necessary, drive bushings (2) from link, use hammer and blunt punch.
4. If instruction plate (3) is damaged or plate cannot be read, remove plate from strut.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-118

3-45 INSPECT LOWER DRAG LINK PARTS (AVIM)**3-45****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Technical Inspection Tool Kit, NSN 5180-00-323-5114
Magnetic Particle Method

Materials:

None

Personnel Required:

Inspector

References:

TM 1-1520-253-23

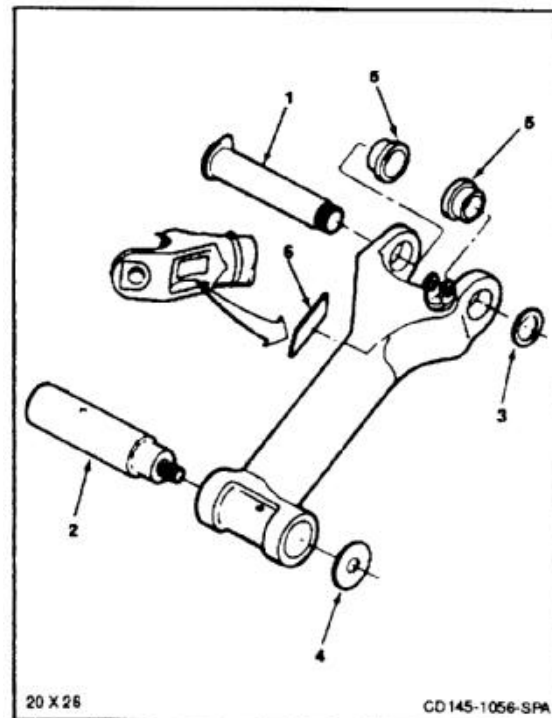
Equipment Conditions:

Off Helicopter Task
Lower Drag Link Disassembled (Task 3-44)

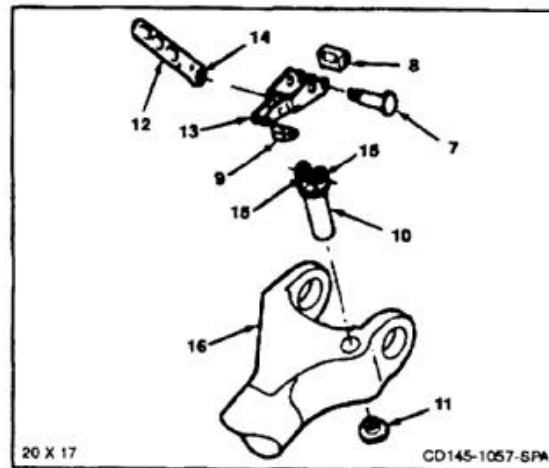
NOTE

Inspection is same for left or right lower drag link. Right link is shown here.

1. Check fulcrum pin (1) and trunnion pin (2). There shall be no distortion, cracks, severe nicks, scoring, or damaged thread. If a crack in the pin is suspected, refer to TM 1-1520-253-23.
2. Check washers (3 and 4) and two bushings (5). There shall be no cracks, scratches, nicks, scoring, or pitting.
3. Check instruction plate (6). If plate is damaged or cannot be read, replace plate.



4. Check bolt (7). There shall be no distortion, cracks, nicks, scoring, or damaged thread. If a crack in the bolt is suspected, refer to TM 1-1520-253-23.
5. Check shock strut attachment spacer (8) and static lock spacer (9). There shall be no cracks, distortion, scratches, nicks, scoring, or pitting.
6. Check fitting (10) and retainer (11). There shall be no cracks, scratches, scoring, or damaged thread. If a crack in the fitting or retainer is suspected, refer to TM 1-1520-253-23.
7. Check static lock mechanism (12) and fork (13). There shall be no cracks or distortion. If a crack in the static lock mechanism fork is suspected, refer to TM 1-1520-253-23.
8. Check bearing (14) and bushing (15). There shall be no cracks, scratches, nicks, or scoring.
9. Check lower link (16). There shall be no cracks, scratches, nicks, scoring, or excessive play. Play that will not affect the normal operation of the landing gear is acceptable. If a crack in the lower drag link is suspected, refer to TM 1-1520-253-23.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set, NSN 4920-00-405-9279

Materials:

Crocus Cloth (E122)
 Epoxy Primer (E292.1)
 Polyurethane Paint (E285.3)
 Gloves (E184.1)

Personnel Required:

Machinist
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

NOTE

Procedure is same to repair left or right lower drag link.

1. Remove minor nicks, burrs, scoring, scratches, or pitting on parts (1 thru 10) with crocus cloth (E122).

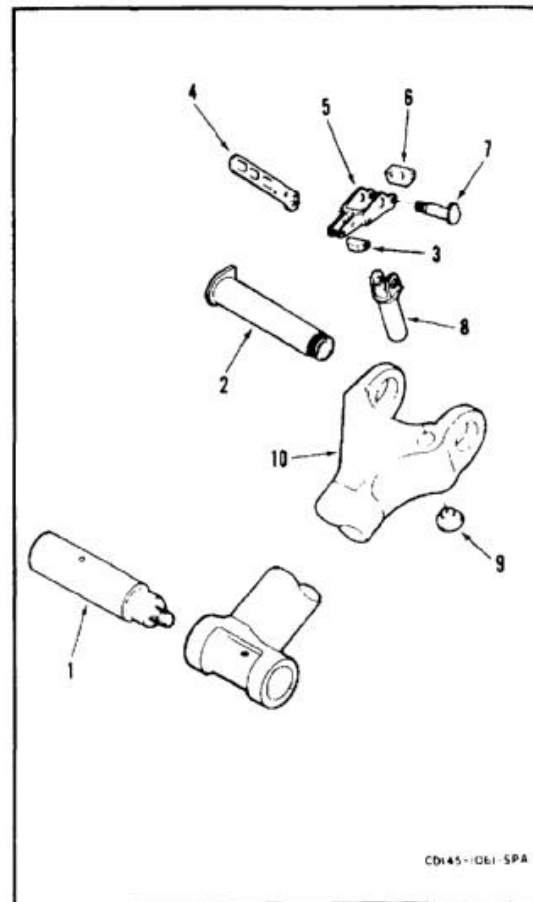
WARNING

Epoxy primer (E292.1) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

2. Touch up damaged finish with primer (E292.1) and polyurethane paint (E285.3). Wear gloves (E184.1).

INSPECT**FOLLOW-ON MAINTENANCE:**

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set, NSN 4920-00-405-9279
 Arbor Press
 Reamer with 1.876 to 1.877 Inch Capability
 Vernier Caliper, 24 Inch
 Gun Type Electric Heater

Materials:

Epoxy Primer (E292)
 Adhesive (E43)
 Temperature Indicating Strips (E413)
 Gloves (E184.1)
 Kevlar Gloves (E187)

Parts:

Bushings
 Instruction Plate

Personnel Required

Machinist
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

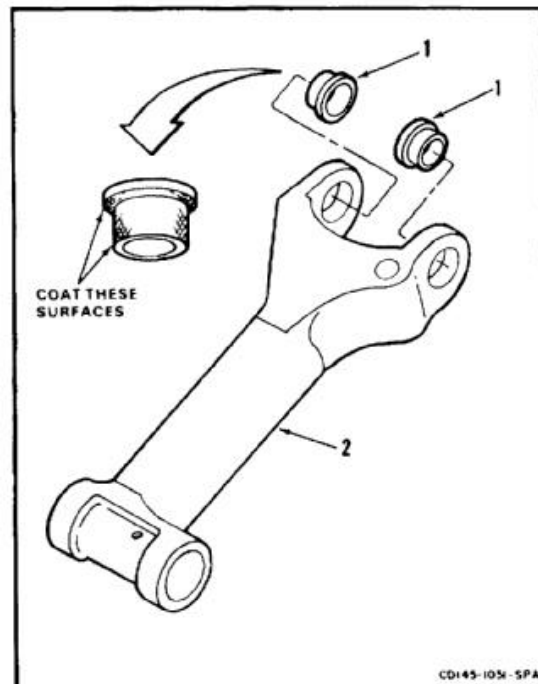
WARNING

Epoxy primer (E292) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Procedure is same for left or right landing gear lower drag link.

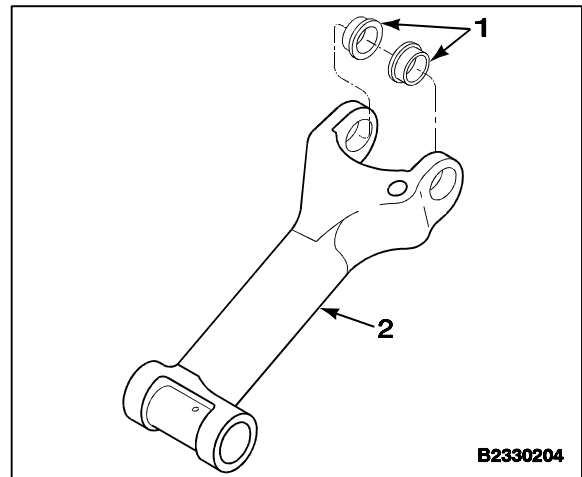
1. Coat contact surfaces of new bushings (1) with primer (E292). Wear gloves (E184.1).
2. While primer is wet, install bushings (1) in drag link (2). Use arbor press.



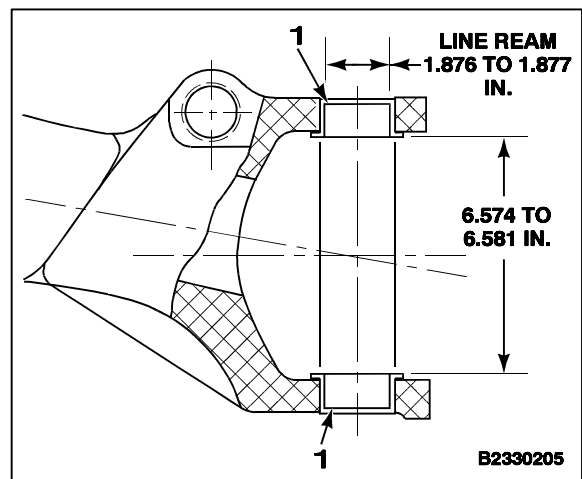
WARNING

Wear Kevlar gloves when handling heated parts. In case of burn, immediately flush with plenty of water. Get medical attention immediately.

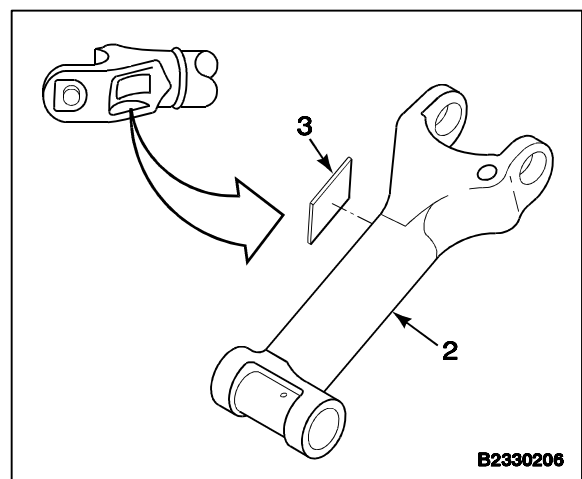
3. If a press is not available, heat lower link (2) to **230° to 250°F (110° to 120°C)**. Use gun type heater. Monitor temperature. Use temperature indicating strips (E413). Install bushings (1) in drag link (2). Use hammer and blunt punch.



4. Line ream bushings (1) to an inside diameter of **1.876 to 1.877 inches**.
5. Check that measurement of **6.574 to 6.581 inches** is maintained between bushings (1).



6. If instruction plate (3) has been removed, install on lower link (2) using adhesive (E43).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 30-150 Inch-Pounds
 Torque Wrench, 100-750 Inch-Pounds
 Socket Wrench Handle, 3/4 Inch Drive
 Socket, 2-1/8 Inch

Materials:

Grease (E190)

Parts:

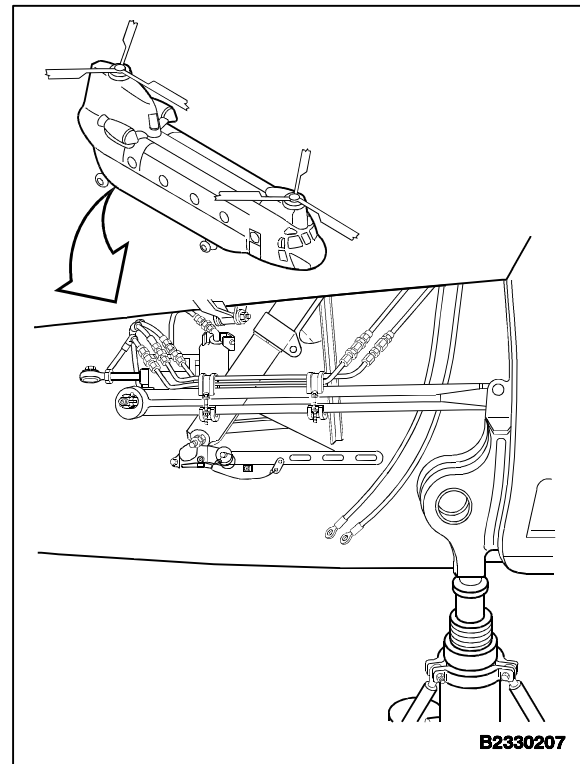
Cotter Pins

Personnel Required:

CH-47 Helicopter Repairer (2)

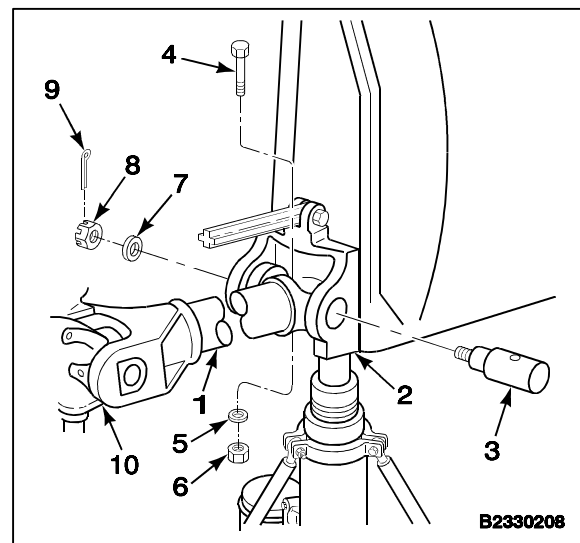
References:

Task 3-66
 TM 55-1520-240-23P

**NOTE**

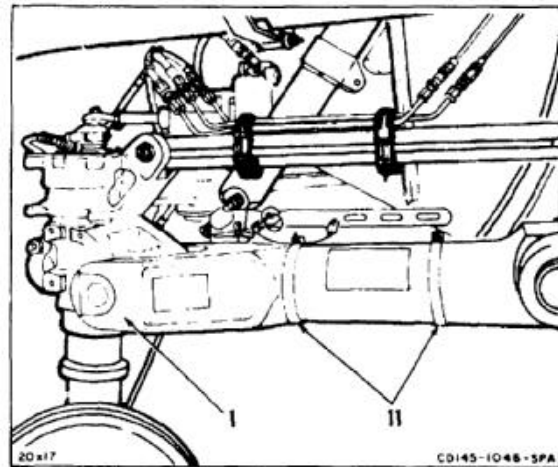
Procedure is same for left and right gear except for differences noted in task.

1. Have helper position lower drag link (1) in trunnion (2).
2. Lubricate trunnion pin (3) using grease (E190). Install pin through trunnion (2) and link (1).
3. Have helper lift and support link (1) at angle required to install bolt (4). Install bolt through link (1) and trunnion pin (3). Secure bolt with washer (5) and nut (6). Torque nut to **100 inch-pounds**.
4. Install washer (7) and nut (8) on pin (3). Torque nut to **300-420 inch-pounds**. Install cotter pin (9).
5. Install swivel housing and spindle (10) (Task 3-66).



3-48 INSTALL LOWER DRAG LINK (Continued)**3-48**

6. If right drag link (1) is being installed, install two clamps (11) and wiring harness on link (1).
7. Remove chocks from wheel.

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Remove jack (Task 1-24).
- Inflate shock strut (Tasks 1-71 and 1-72).
- Lubricate lower drag link (Task 1-88).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

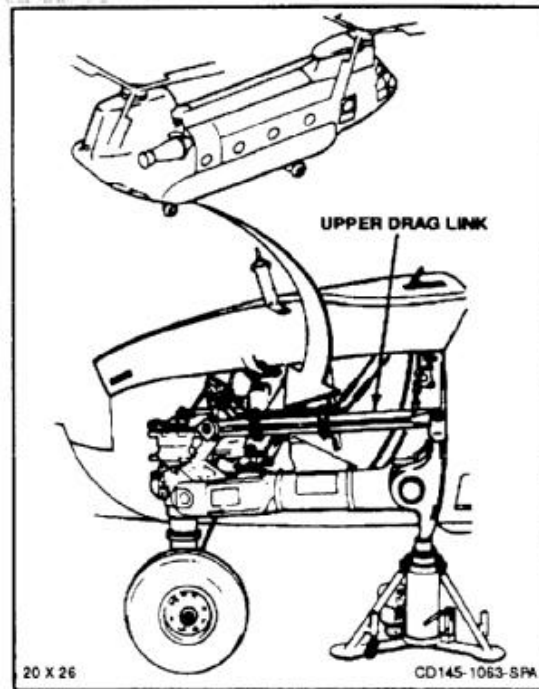
Twine (E433)

Personnel Required:

Medium Helicopter Repairer

Equipment Conditions:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Helicopter Jacked at Aft Jack Pad (Task 1-24)
- Access Panels Open (Task 2-2)



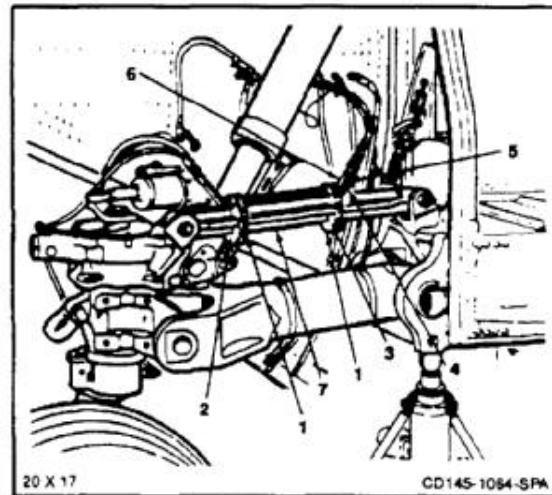
NOTE

Procedure is same for aft left or right landing gear except for differences noted in task. Right gear is shown here.

NOTE

Do not disconnect hydraulic tubes.

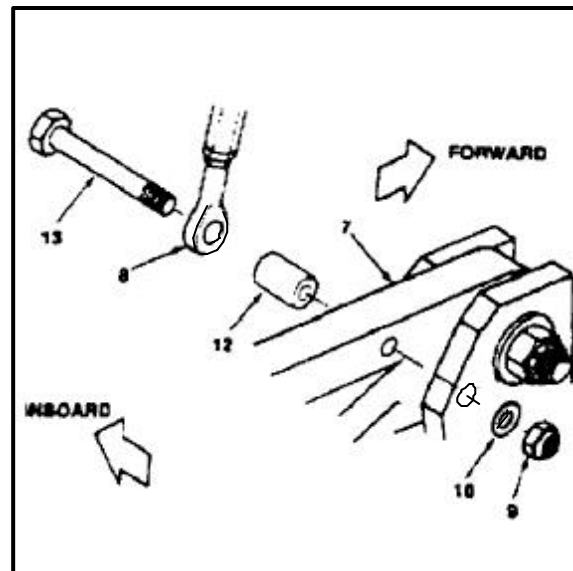
1. Remove two clamps (1) and support blocks (2 and 3) securing hydraulic tubes (4, 5, and 6) to upper drag link (7).
2. Tie hydraulic tubes (4, 5, and 6) out of way. Use twine (E433).



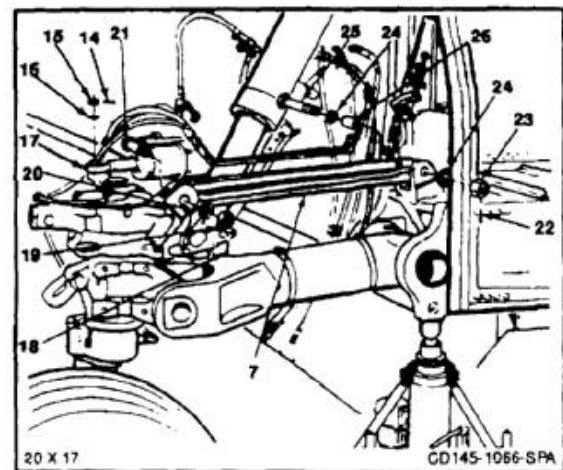
3-49 REMOVE UPPER DRAG LINK (Continued)

3-49

3. Disconnect switch rod end (8) from drag link (7) by removing nut (9), washer (10), spacer (12), and bolt (13).



4. On right gear only, remove cotter pin (14), nut (15), and washer (16).
5. On right gear only, lift rod end (17) and move away from drag link (7).
6. Remove cotter pin (18), nut (19), washer (20), and bolt (21).
7. Remove cotter pin (22), nut (23), washers (24), bolt (25), and bushing (26).
8. Remove drag link (7).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Machine Shop Set, NSN 4920-00-405-9279
 Roller Staking Kit (T169)

Materials:

Abrasive Cloth (E1)
 Epoxy Primer (E292)
 Polyurethane Paint (E285.3)
 Acetone (E20)
 Gloves (E184.1)
 Cloths (E120)
 Sealant (E345.1)

Parts:

Bearings
 Liners (APP E-53)

Personnel Required:

Machinist
 Inspector

References:

TM 55-1520-240-23P
 TM 55-1500-322-24
 MIL-R-46082

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

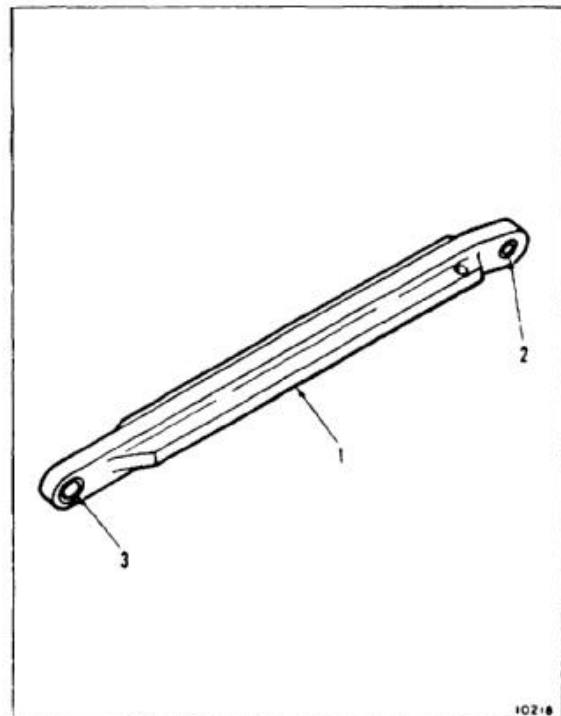
Acetone (E20), epoxy primer (E292) and polyurethane paint (E285.3) are flammable and toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Same procedure is used to repair left or right upper drag link.

REPAIR LINK SURFACE

1. Remove minor nicks, burrs, scores, scratches or pits on shock strut (1). Use abrasive cloth (E1).
2. Touch up reworked areas with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).
3. Check condition of bearings (2 and 3). If bearings are good, go to Follow-On Maintenance. If either bearing must be replaced, go to step 4.

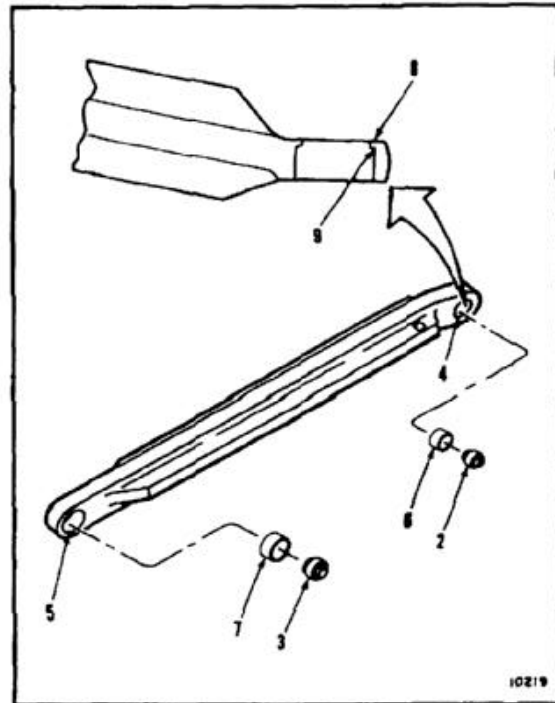


REMOVE BEARINGS

4. Place link (1) in an arbor press. Use the press to remove bearing (2 or 3) (TM 55-1500-322-24).
5. Clean bores (4 and 5) of link (1). Use acetone (E20) and clean cloths (E120). Wear gloves (E184.1).

REPAIR BEARING BORE

6. Measure diameter of bore (4 and 5) at several places. If all measured diameters are **1.376 inches** or less, go to step 7. If diameter at any one place is greater than **1.376 inches**, replace bearing as follows:
 - a. Enlarge bore (4 or 5) to **1.4995 to 1.5000 inches**.
 - b. Counterbore bore (4) to **1.4995 to 1.5000 inches**, to within **0.005 inch** of shoulder (8). Radius (9) at shoulder shall be **0.010 to 0.015 inch**.
 - c. Chamfer edges of enlarged bore (5) and counterbore end of bore (4) **0.032 inch** by **45°**.
 - d. Coat liner (E-53) (6 or 7) with epoxy primer (E292). Wear gloves (E184.1).
 - e. Install liner (6 or 7), wet with epoxy primer (E292), in bore (4 or 5). Use arbor press (TM 55-1500-322-24). Press liner in flush with link (1).

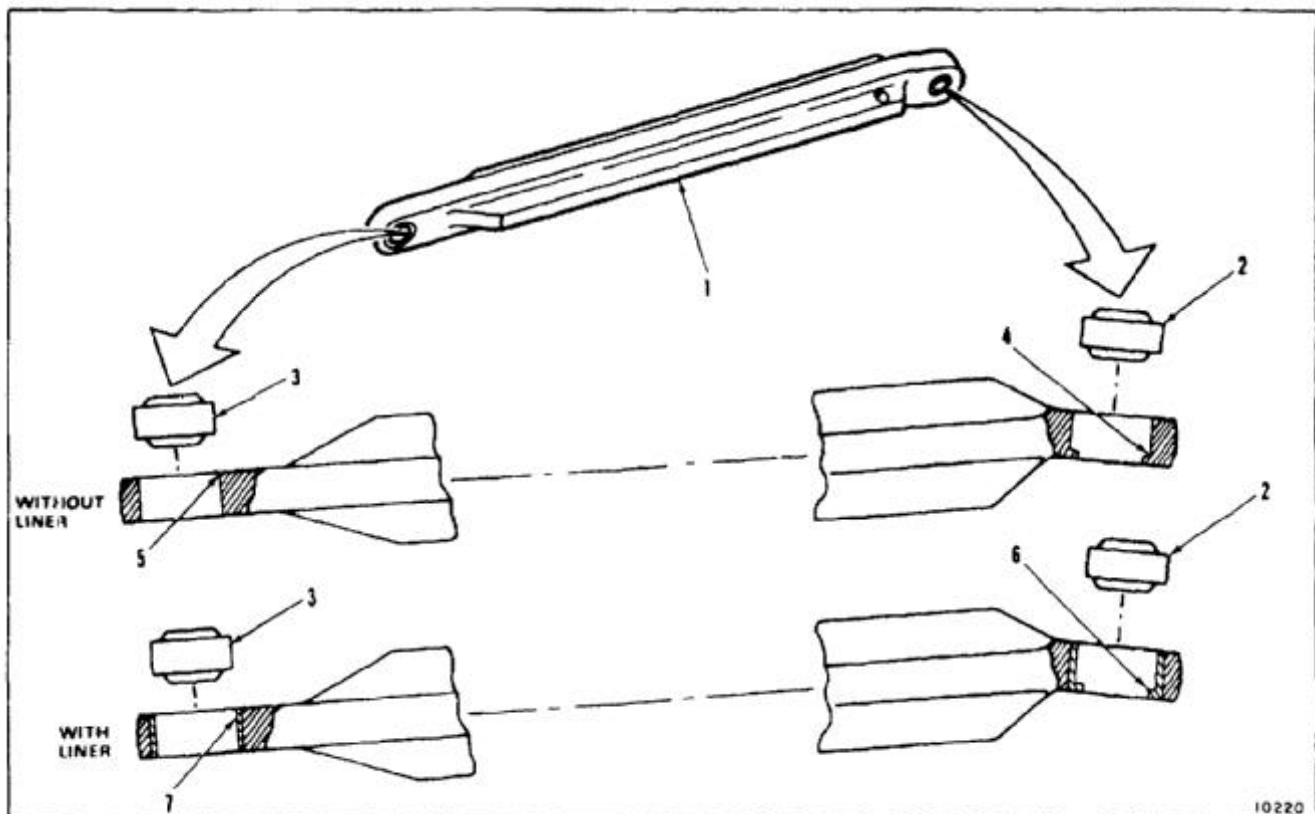


10219

INSTALL**NOTE**

Bearing may be installed within liner or directly against bearing bore.

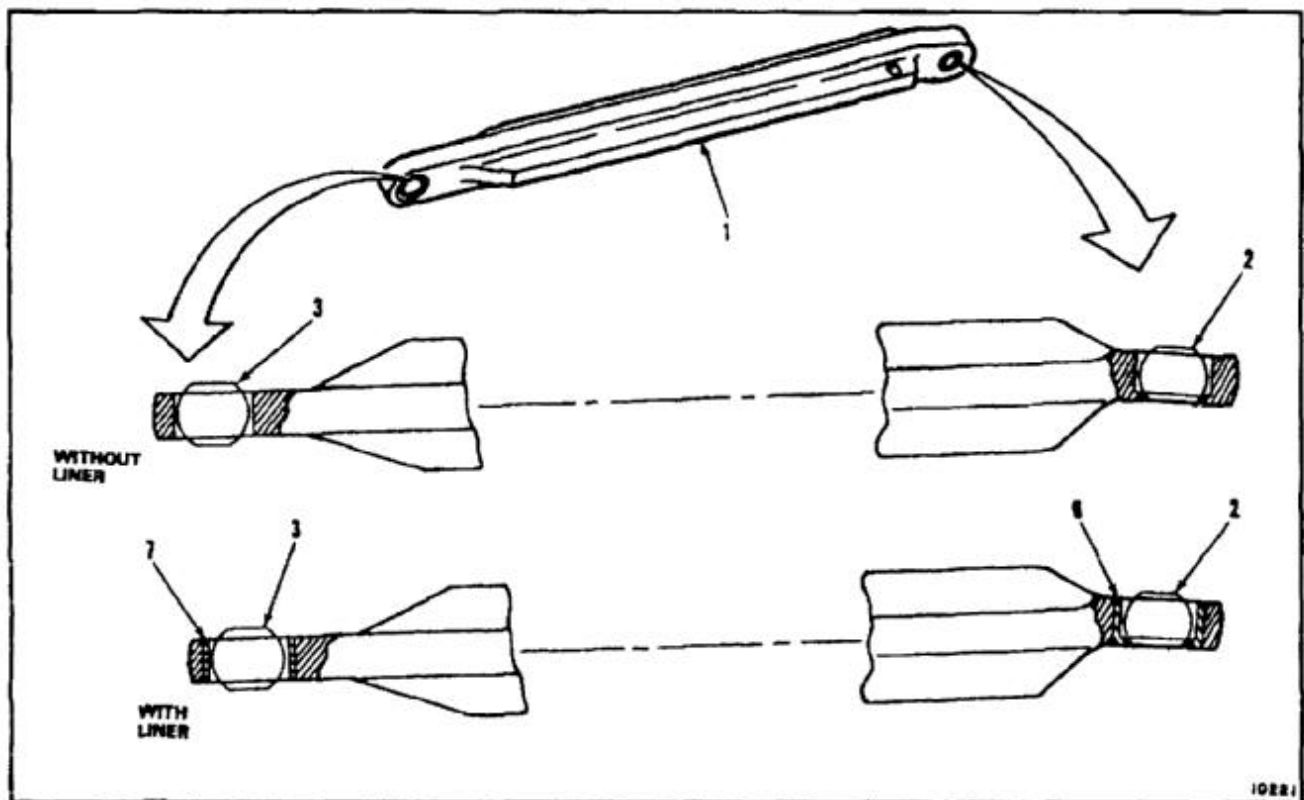
7. Clean bearings (2 and 3) and mating surfaces of bore (4 or 5) or liner (6 or 7). Use acetone (E20) and cloths (E120).
8. Apply sealant (E345.1) to mating surface of bearings (2 or 3), bore (4 or 5) or liner (6 or 7) (MIL-R-46082).
9. Install bearing (2 or 3) in bore (4 or 5) or liner (6 or 7). Use arbor press (TM 55-1500-322-24). Installed bearings shall be flush with link (1).



10. Stake link (1) to bearing (3) or liner (7) to link (1) and bearing (3), as applicable, on both sides. Use roller or impression method (TM 55-1500-322-24). Use roller staking kit (T169), where applicable.
11. Stake link (1) to bearing (2) or liner (6) to link (1) and bearing (2), as applicable, on one side only. Use roller or impression method (TM 55-1500-322-24). Use roller staking kit (T169), where applicable.

INSPECT

12. Touch up reworked areas of link (1) with primer (E292) and polyurethane paint (E285.3). Wear gloves (E184.1).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 0 to 160 Foot-Pounds
 Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

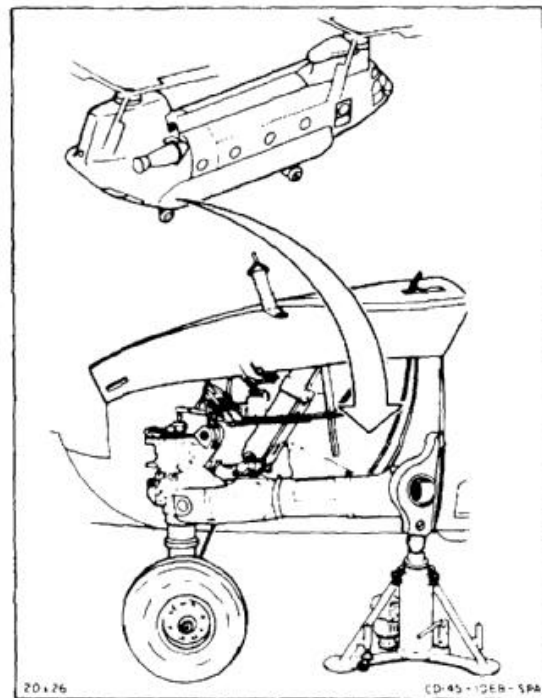
Cotter Pins

Personnel Required:

Medium Helicopter Repairer
 Inspector

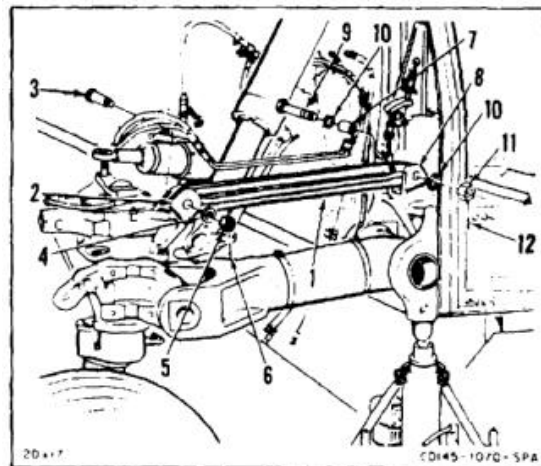
References:

TM 55-1520-240-23P
 Task 3-54

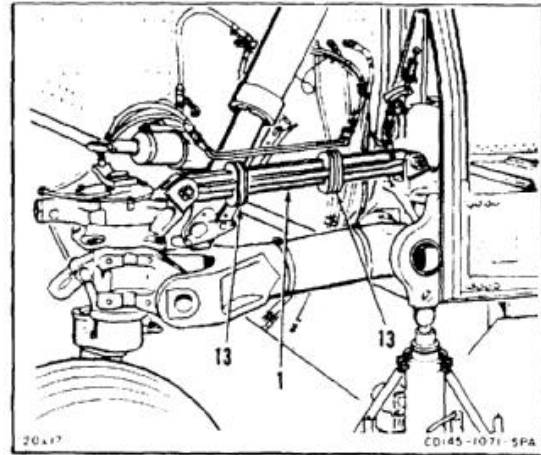
**NOTE**

Procedure is same for left and right upper drag link.

1. Position offset end of upper drag link (1) into swivel housing fitting (2).
2. Install bolt (3) (head inboard with flat of head matching flat of fitting), washers (4), and nut (5). Torque nut (5) to **350 to 500 inch-pounds**. Install cotter pin (6).
3. Install bushing (7) in trunnion fork (8).
4. Position straight end of link (1) in structure and align with trunnion fork (8).
5. Install bolt (9), washers (10), and nut (11). Torque nut (11) to **50 to 100 foot-pounds**. Install cotter pin (12).

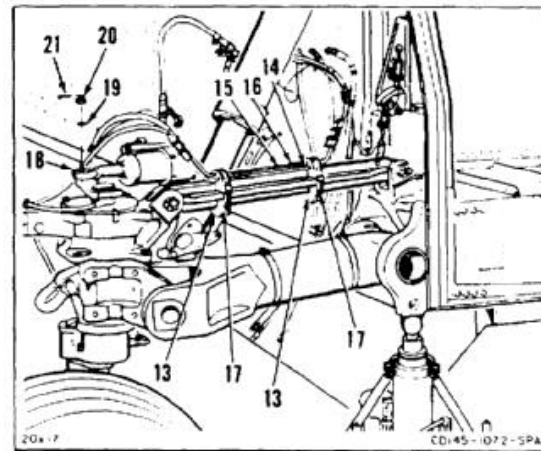


6. Place support blocks (13) on drag link (1).



7. Untie hydraulic tubes. Place tubes (14, 15, and 16) on support blocks (13). Secure to support blocks with two clamps (17).

8. Connect rod end (18). Use washer (19) and nut (20). Torque nut to **290 to 410 inch-pounds**. Install cotter pin (21).



9. Connect switch rod end (22) to drag link (1), with washer (23), spacer (24), bolt (25), and nut (26).

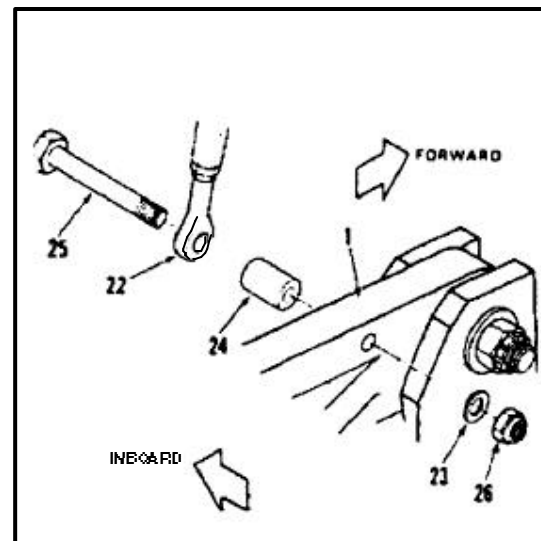
10. Check adjustment of switch (Task 3-56).

11. Remove chock blocks from wheel.

INSPECT

FOLLOW-ON MAINTENANCE:

Lower and remove jack (Task 1-24).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

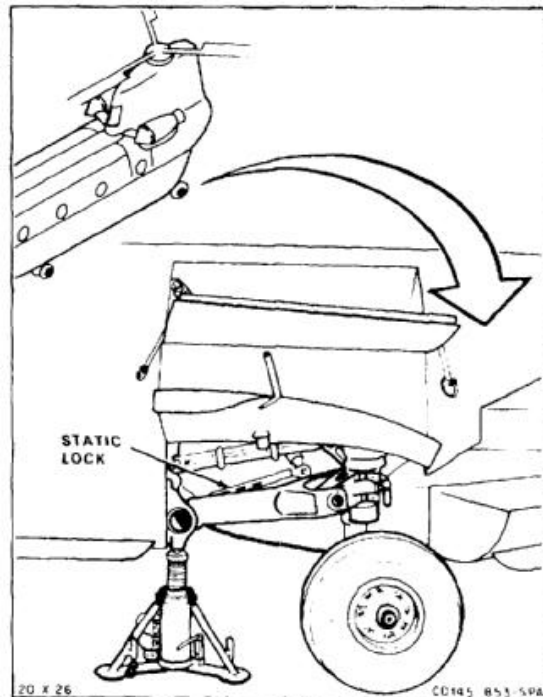
None

Personnel Required:

Medium Helicopter Repairer

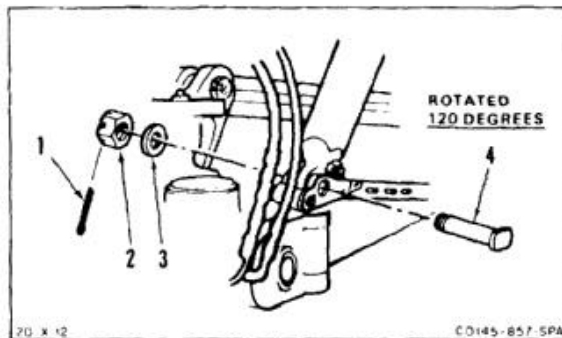
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Access Panels Open
 Helicopter Jacked at Aft Fuselage Jack Pad (Task
 1-24) (Static Lock Not Engaged)
 Shock Strut Deflated (Task 1-72)

**NOTE**

This procedure is same for left or right gear. Left gear is shown here.

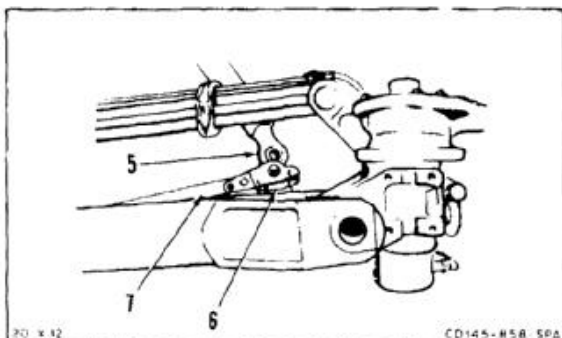
1. Remove cotter pin (1), nut (2), and washer (3).
2. Remove bolt (4).



3. Collapse shock strut (5) to remove strut from lower attach fitting (6).
4. Remove static lock mechanism (7).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Socket, 1 Inch

Materials:

None

Parts:

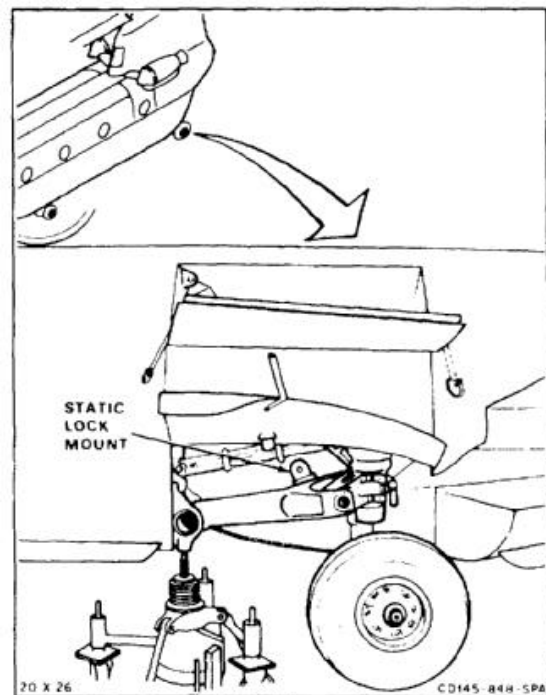
Cotter Pin

Personnel Required:

Medium Helicopter Repairer
 Inspector

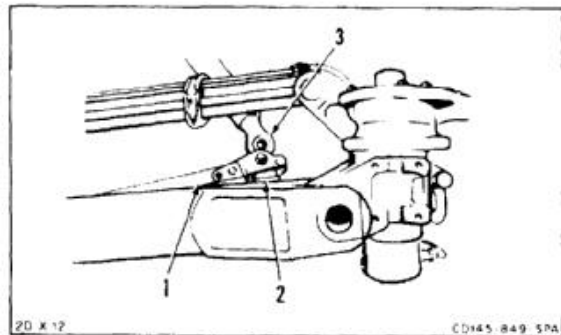
References:

TM 55-1520-240-23P

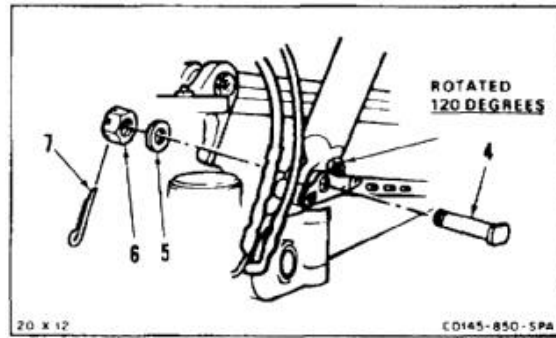
**NOTE**

This procedure is same for left or right gear. Left gear is shown here.

1. Position static lock mechanism (1) over lower attach fitting (2).
2. Place shock strut (3) in fitting (2).



3. Install bolt (4), washer (5), and nut (6).
4. Torque nut (6) to **350 to 500 inch-pounds**.
5. Install cotter pin (7).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Lower and remove jack (Task 1-24).
- Service shock strut (Tasks 1-71 and 1-72).
- Close access panels (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

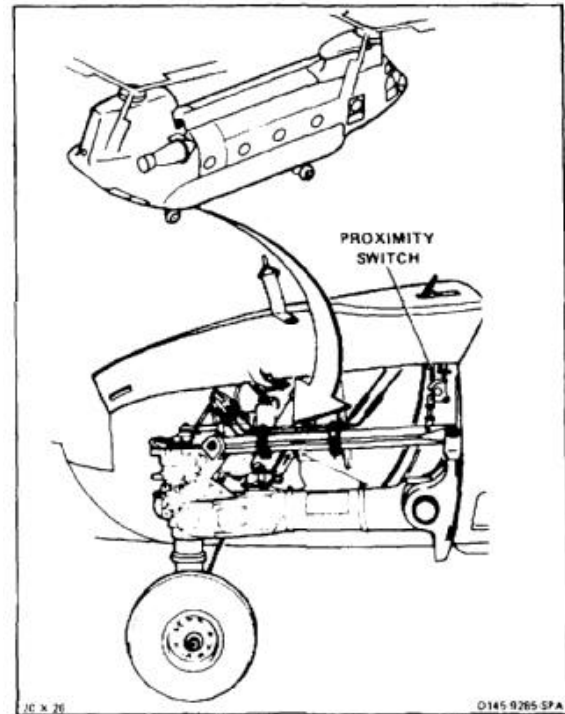
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

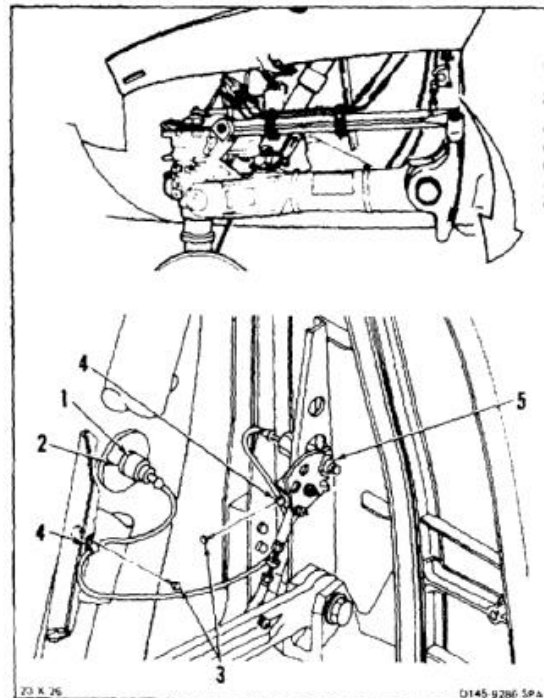
Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Aft Landing Gear Access Panels Open (Task 2-2)

**NOTE**

Procedure is same for left or right proximity switch. Right switch is shown here.

REMOVE PROXIMITY SWITCH

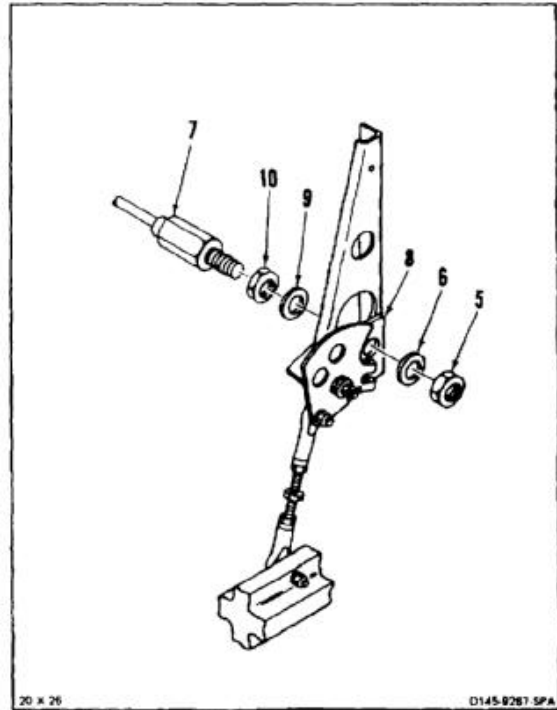
1. Remove lockwire from connector (1).
2. Disconnect connector (1) from bulkhead receptacle (2).
3. Remove two screws (3) and two cable clamps (4).
4. Remove lockwire from switch adjuster nut (5).



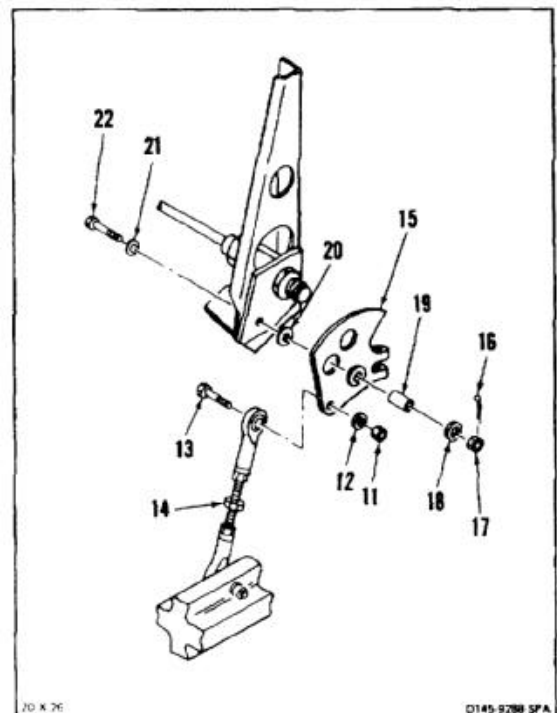
3-54 REMOVE AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)

3-54

5. Remove outer nut (5) and washer (6) from switch (7).
6. Remove switch (7) from bracket (8). Remove washer (9) and nut (10) from switch.


REMOVE TARGET

7. Remove nut (11), washer (12), and bolt (13). Move target adjuster link (14) away from target (15).
8. Remove cotter pin (16), nut (17), and washer (18).
9. Remove target (15), bushing (19), washers (20 and 21), and bolt (22).

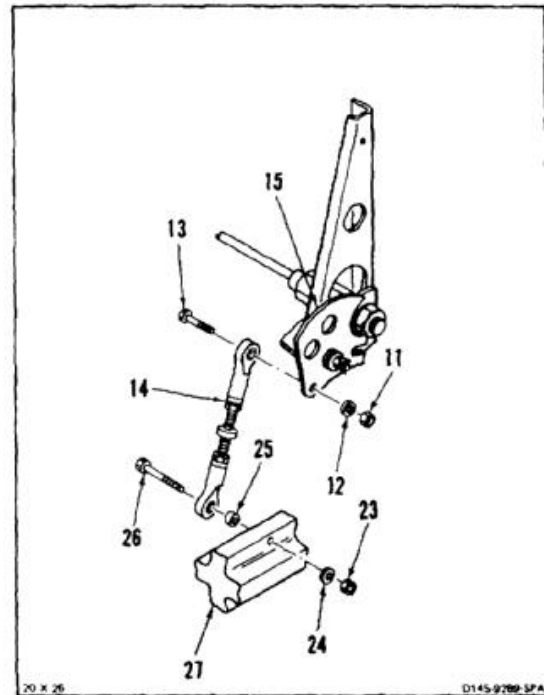


3-54 REMOVE AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)

3-54

REMOVE ADJUSTER LINK

10. Remove nut (11), washer (12), and bolt (13) from adjuster link (14) and target (15).
11. Remove nut (23), washer (24), spacer (25), and bolt (26) from upper drag link (27).
12. Remove link (14).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Repairer's Tool Kit, NSN 5180-00-323-4876
Bracket Locating Fixture, 145G0059-1

Materials:

None

Parts:

Rivets

Personnel Required:

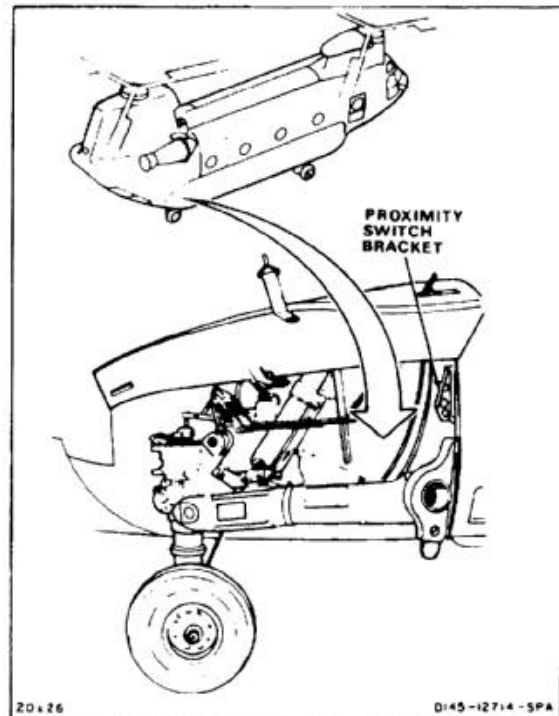
Aircraft Structural Repairer
Inspector

References:

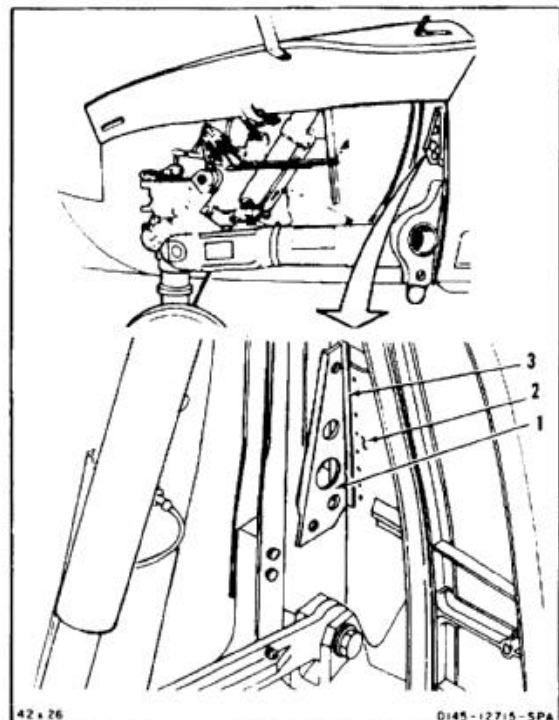
TM 55-1520-240-23P

Equipment Condition:

Proximity Switch Removed (Task 3-54)
Upper Drag Link Removed (Task 3-49)
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

**REMOVE BRACKET**

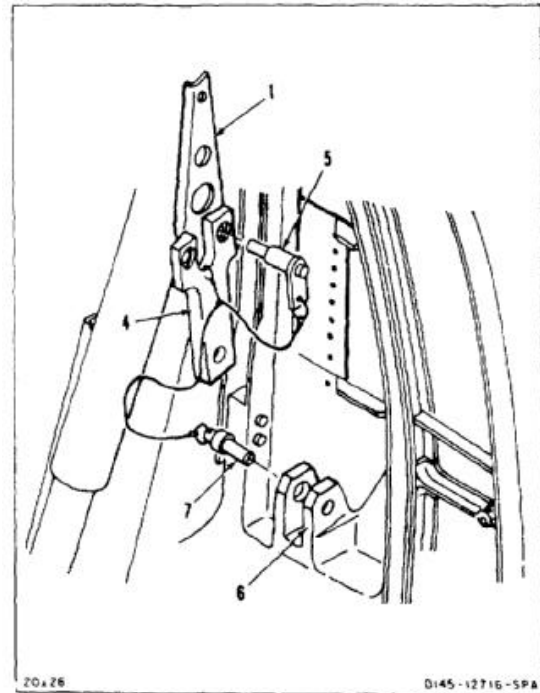
1. Remove rivets holding bracket (1) to airframe (2).
2. Remove bracket (1) and filler (3).



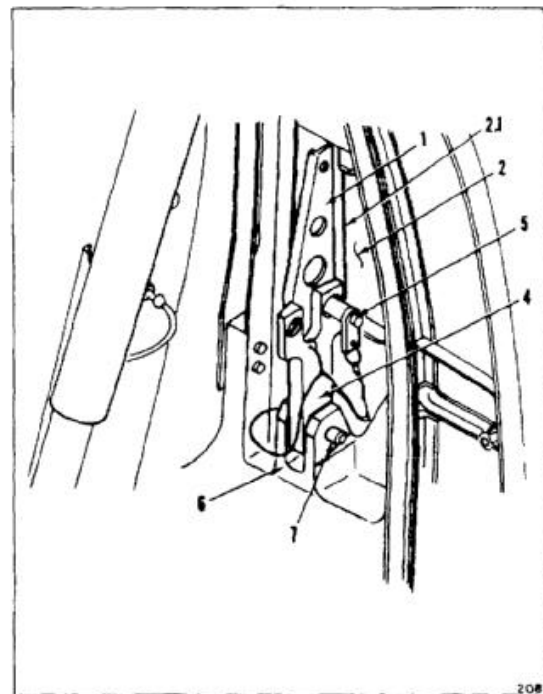
INSTALL BRACKET**NOTE**

Procedure for installing left or right bracket is similar. Right side shown here.

3. Align hole in fixture 145G0059-1 (4) marked **RIGHT SIDE** with **0.624 inch** hole in bracket (1). Install pin (5) through holes.
4. Align lower hole in fixture (4) with two holes in trunnion (6). Install pin (7) through holes.



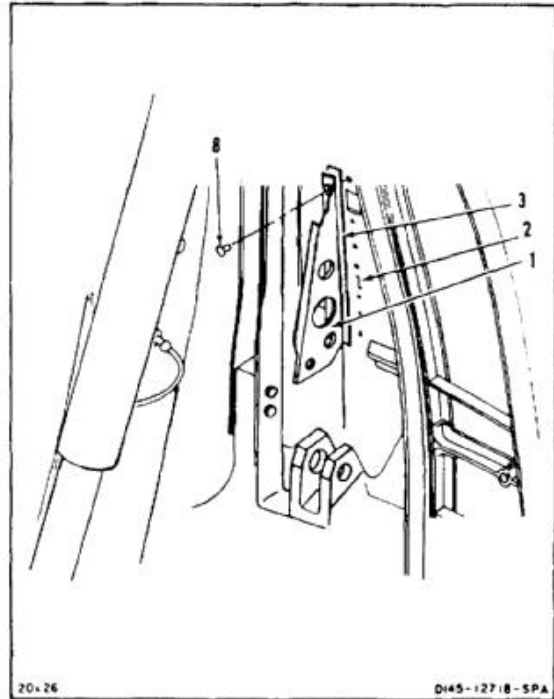
5. Pivot bracket (1) against airframe (2). Drill holes in bracket (1) and filler (2.1) to match holes in airframe (2).
6. Remove pin (5) from fixture (4) and bracket (1). Remove bracket.
7. Remove pin (7) from trunnion (6) and fixture (4). Remove fixture.



8. Align holes in bracket (1), filler (3), and airframe (2). Install rivets (8).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install upper drag link (Task 3-51).
Install proximity switch (Task 3-55).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 5 to 50 Inch-Pounds

Materials:

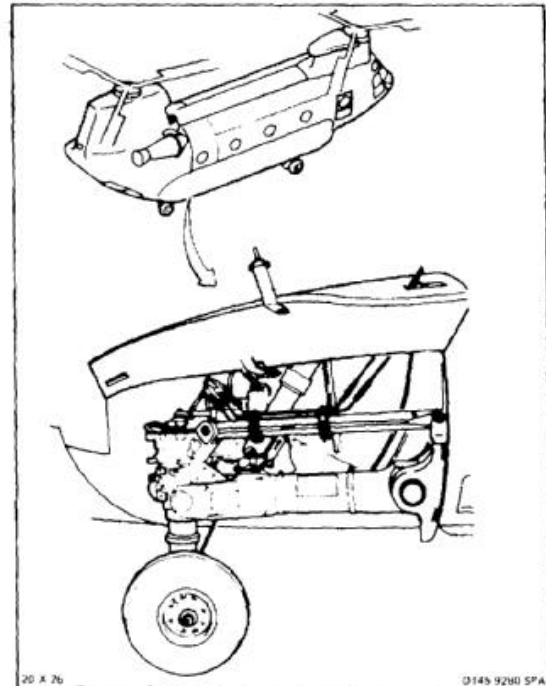
Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

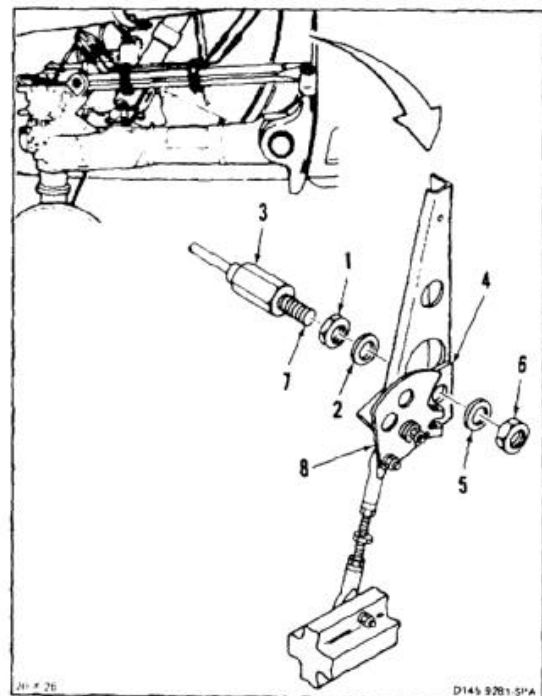
TM 55-1520-240-23P
Task 3-56

**NOTE**

Procedure is same for left or right proximity switch. Right switch is shown here.

INSTALL PROXIMITY SWITCH

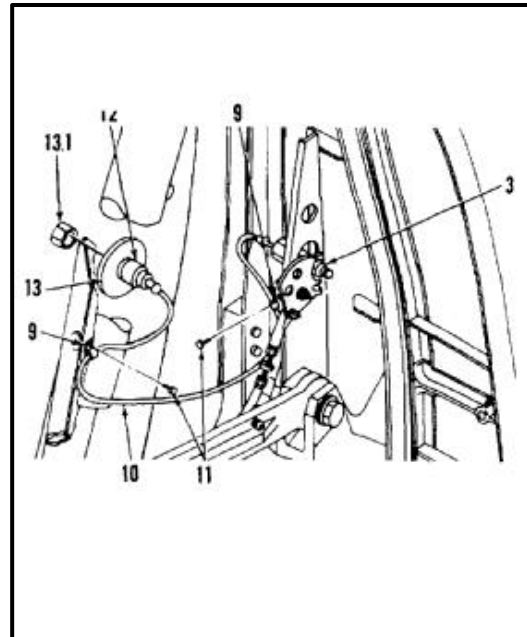
1. Install nut (1) and lockwasher (2) on proximity switch (3).
2. Position switch (3) in bracket (4). Install keying washer (5) and nut (6).
3. Adjust gap between switch face (7) and face of target (8) to **.030 inch to .035 inch**. Use thickness gage (Task 3-56).
4. Tighten nuts (1 and 6). Check gap.
5. Install lockwire (E231) between nuts (1 and 6).



3-55 INSTALL AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)

3-55

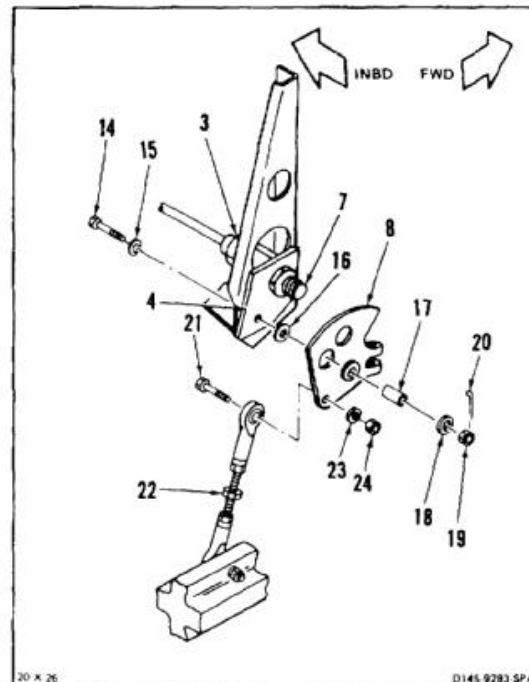
6. Position two cable clamps (9) on cable (10) of proximity switch (3).
7. Attach clamps (9) to structure with two screws (11).
8. Connect connector (12) to receptacle (13). Lockwire receptacle retaining nut (13.1). Use lockwire (E231).

INSPECT**INSTALL TARGET**

9. Install bolt (14), head inboard, and washer (15) through bracket (4).
10. Install washer (16), bushing (17), target (8), washer (18), and nut (19) on bolt (14).
11. Torque nut (19) to **25 to 35 inch-pounds**. Install cotter pin (20).

INSPECT

12. Rotate target (8) past face (7) of switch (3). Measure gap between switch face and target. If gap is not **.030 to .035 inch**, adjust switch (Task 3-56).
13. Install bolt (21) through adjuster link (22) and target (8). Install washer (23) and nut (24).

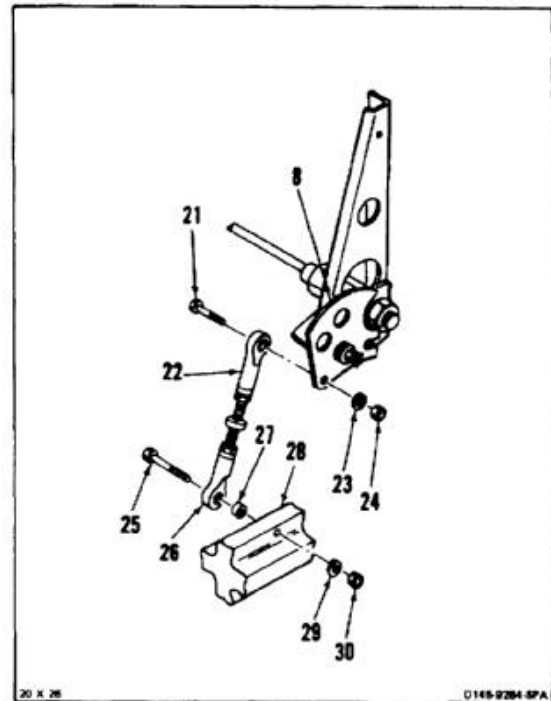
INSPECT

3-55 INSTALL AFT LANDING GEAR PROXIMITY SWITCHES, TARGET, AND ADJUSTER LINK (Continued)

3-55

INSTALL ADJUSTER LINK

14. Install bolt (21), head inboard, through adjuster link upper rod end (22) and target (8). Install washer (23) and nut (24).
15. Install bolt (25), head inboard through adjuster link lower rod end (26), spacer (27), and upper drag link (28). Install washer (29) and nut (30).

INSPECT

FOLLOW-ON MAINTENANCE:

- Adjust aft landing gear proximity switch (Task 3-56).
- Close aft landing gear access panel (Task 2-2).
- Proximity switch operational check (TM 55-1520-240-T).
- Perform AFCS interface test (Task 11-280, Tests 25 and 26).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

Lockwire (E231)

Personnel Required:

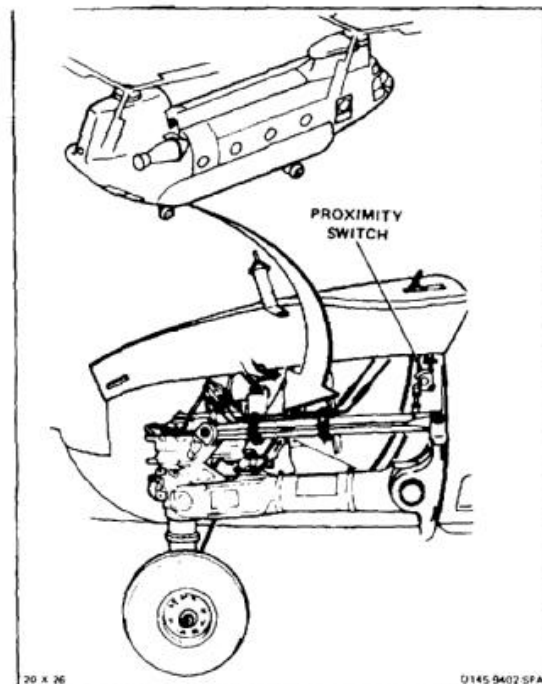
Medium Helicopter Repairer
Avionics Mechanic
Inspector

References:

Task 1-24

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access Panels Open (Task 2-2)

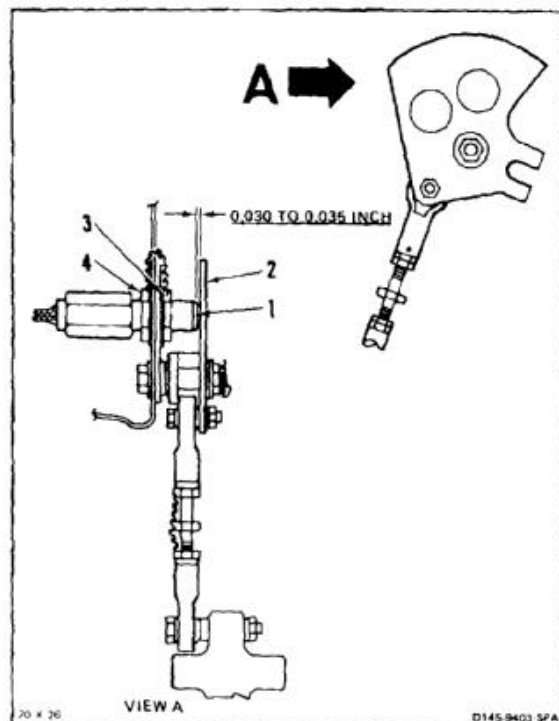
**NOTE**

Procedure is same for left or right proximity switch. Right switch is shown here.

1. Measure gap between face of switch (1) and target (2). Use thickness gage.
 - a. If gap is less than **.030 inch** or greater than **.035 inch**, go to step 2.
 - b. If gap is not less than **.0300 inch** and not greater than **.035 inch**, go to step 6.
2. Remove lockwire from nuts (3 and 4).
3. Loosen nuts (3 and 4). Adjust gap to correct dimension.
4. Tighten nuts (3 and 4). Check gap is within correct limits.

INSPECT

5. Install lockwire (E231) between nuts (3 and 4).



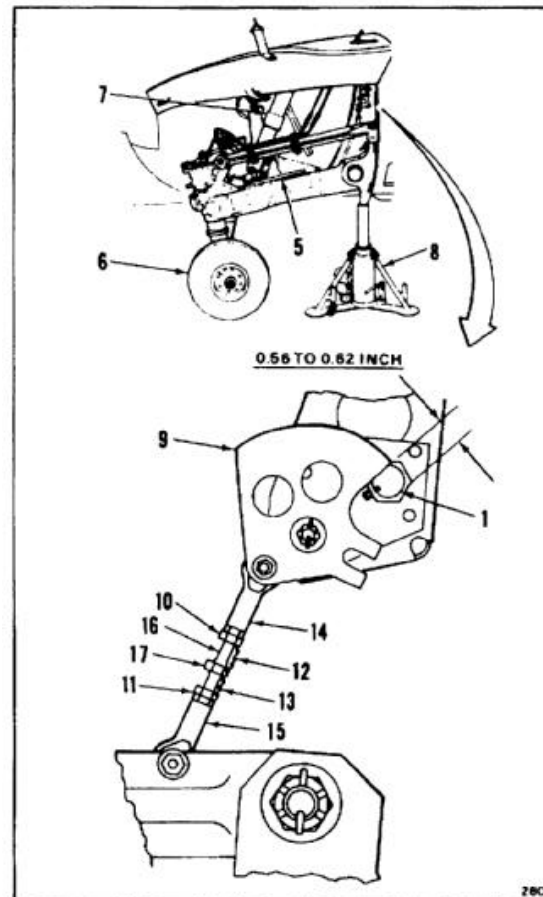
6. Raise aft end of helicopter (Task 1-24), but do not install static lock (5). Jack helicopter until wheel (6) is off ground and shock strut (7) is fully extended.
7. Measure distance from edge of target (9) to edge of proximity switch (1).
 - a. If distance is less than **0.56 inch** or greater than **0.62 inch**, go to step 8.
 - b. if distance is **0.56 inch to 0.62 inch**, go to step 15.
8. Remove lockwire from jam nuts (10 and 11) and rod-end locks (12 and 13). Loosen jam nuts until rod-end locks are disengaged from slots in rod-ends (14 and 15) of adjuster link (16).
9. Turn stud (17) until distance from edge of target (9) to edge of switch (1) is **0.56 to 0.62 inch**.
10. Tighten jam nuts (10 and 11) until rod-end locks (12 and 13) engage in slots in rod-ends (14 and 15).
11. Check **0.56 to 0.62 inch** dimension.
12. Lower jack (8) until shock strut (7) retracts about **1.0 inch**.
13. Repeat steps 6 and 7.

INSPECT

14. Tighten jam nuts (10 and 11). Install lockwire (E231).
15. Lower jack (8) until clear of helicopter (Task 1-24). Remove jack.

FOLLOW-ON MAINTENANCE:

- Close aft landing gear access panel (Task 2-2).
- Proximity switch operational check (TM 55-1520-240-T).
- Perform AFCS interface test (Task 11-280, Tests 25 and 26).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

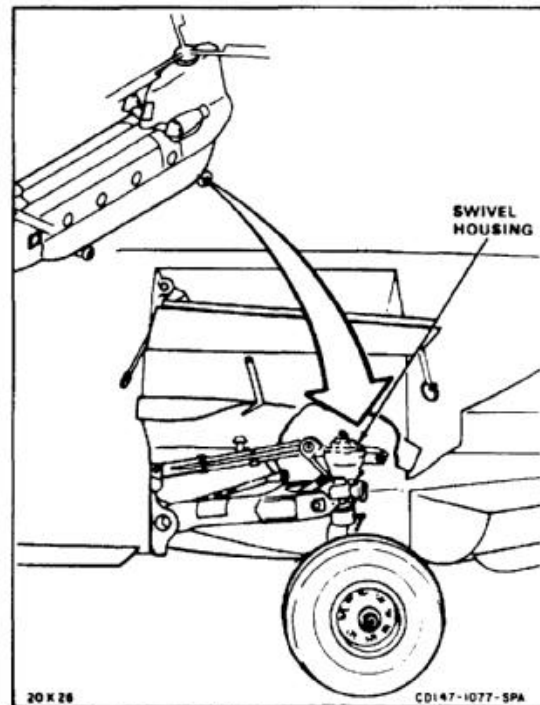
Medium Helicopter Repairer

References:

Task 3-69

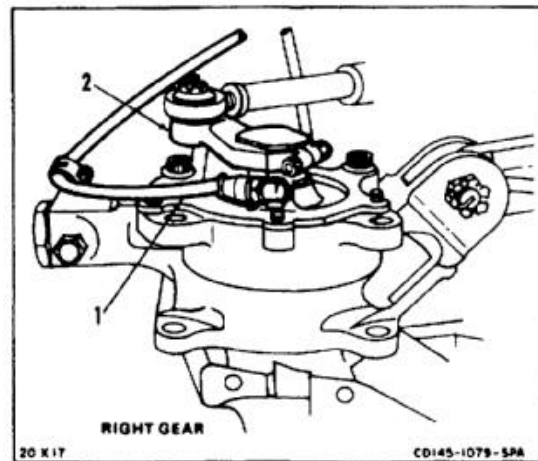
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Utility Hydraulic System Depressurized (TM 55-1520-240-T)
 Parking Brake Released
 Access Panels Opened (Task 2-2)

**NOTE**

Except as noted, seal removal for left or right gear.

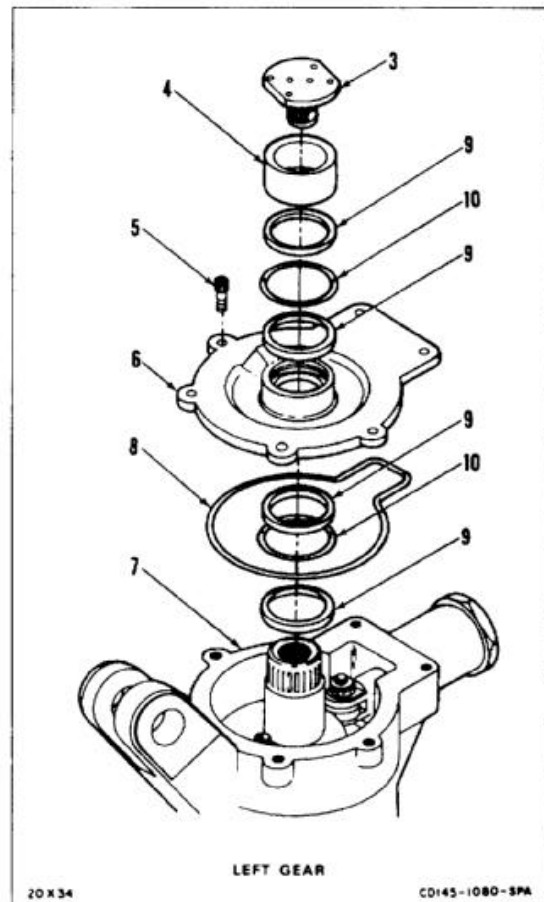
1. Use container to catch hydraulic fluid. Disconnect hydraulic tube (1).
2. For an aft right landing gear remove steering lever (2) (Task 3-69).



NOTE

Right gear has steering lever in place of spacer.

3. Remove end cap (3) and sleeve spacer (4).
4. Remove lockwire and six screws (5) and cover plate (6) from swivel housing (7).
5. Remove packing (8), retainers (9), and seals (10).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

- Cleaning Cloth (E120)
- Grease (E190)
- Hydraulic Fluid (E199)
- Lockwire (E231)

Parts:

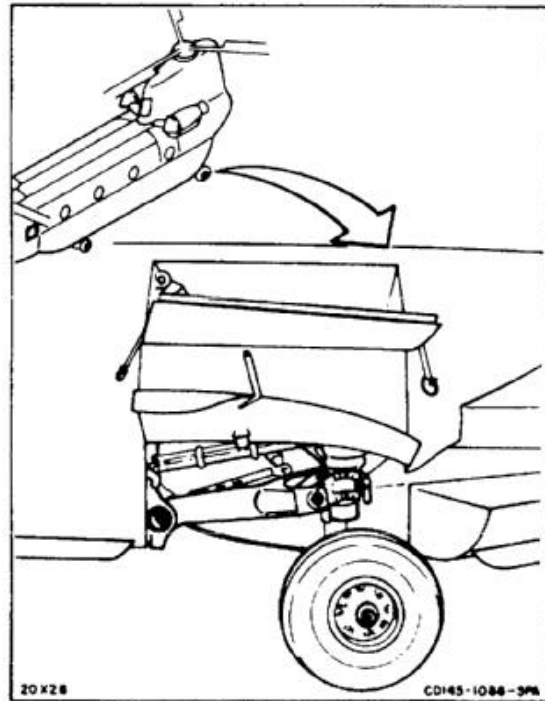
- Packings
- Seals

Personnel Required:

- Medium Helicopter Inspector

References:

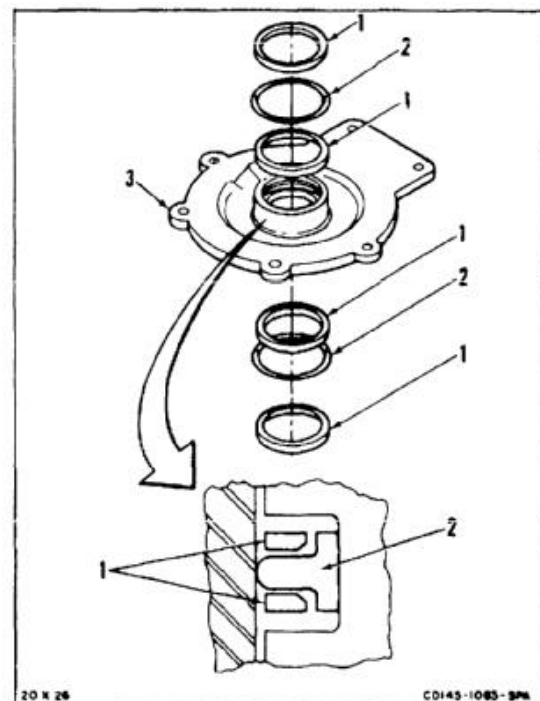
- TM 55-1520-240-23P
- Task 3-70



NOTE

Spindle seal assembly is a set consisting of a rubber seal and two retainers.

1. Coat retainers (1) and seals (2) with hydraulic fluid (E190).
2. Install retainers (1) and seals (2) in grooves of plate (3). Make sure chamfer on retainers is against seals. (See detail.)

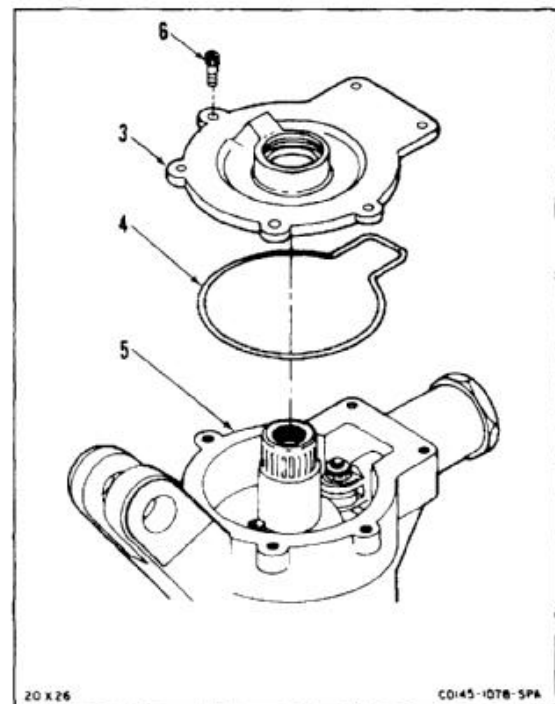


3. Coat packing (4) with grease (E190). Install packing in groove of plate (3).

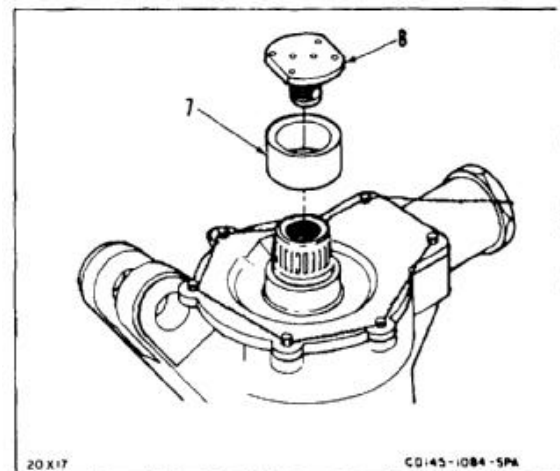


Moisture in swivel housing can cause corrosion and lead to cracks.

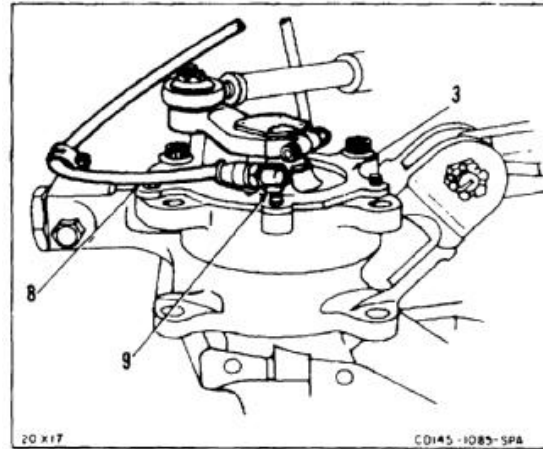
4. Wipe inside of swivel housing (5) dry. Use cloth (E120).
5. Position plate (3) on housing (5). Make sure packing, retainers, and seals stay in place.
6. Install six screws (6) to secure plate. Lockwire screws together. Use lockwire (E231).



7. For an aft left gear, install sleeve spacer (7), and end cap (8). Torque end cap to **31 to 37 inch-pounds**. Check that sleeve spacer has slight end play.
8. For an aft right gear, install steering lever (Task 3-70).



9. Connect hydraulic hose (8) to union (9) on plate (3).



INSPECT

FOLLOW-ON MAINTENANCE:

Bleed swivel lock system (Task 7-331).

END OF TASK

3-59 REMOVE AFT LANDING GEAR TOWING SHACKLE**3-59****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

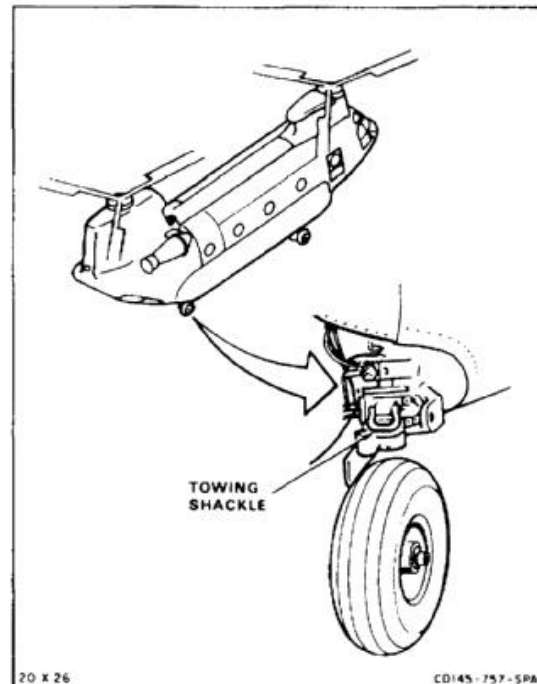
None

Personnel Required:

Medium Helicopter Repairer

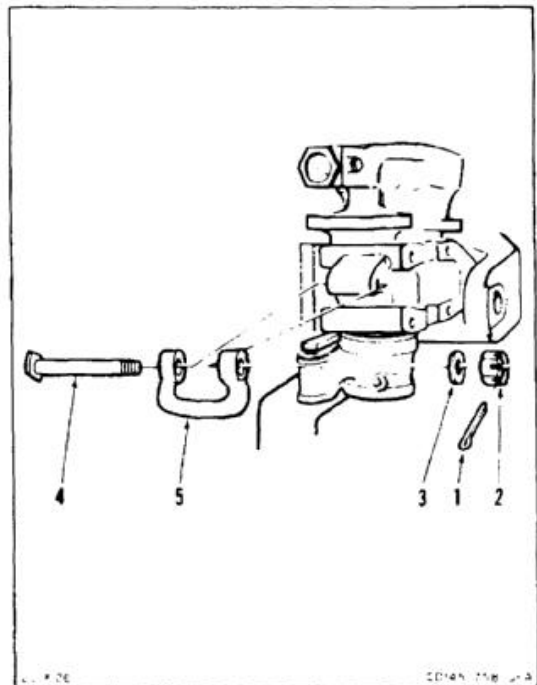
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

**NOTE**

Procedure is same for removing right or left aft landing gear towing shackle. Right shackle is shown here.

1. Remove cotter pin (1), nut (2), washer (3), and bolt (4).
2. Remove towing shackle (5).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 100 to 750 Inch-Pounds

Materials:

None

Parts:

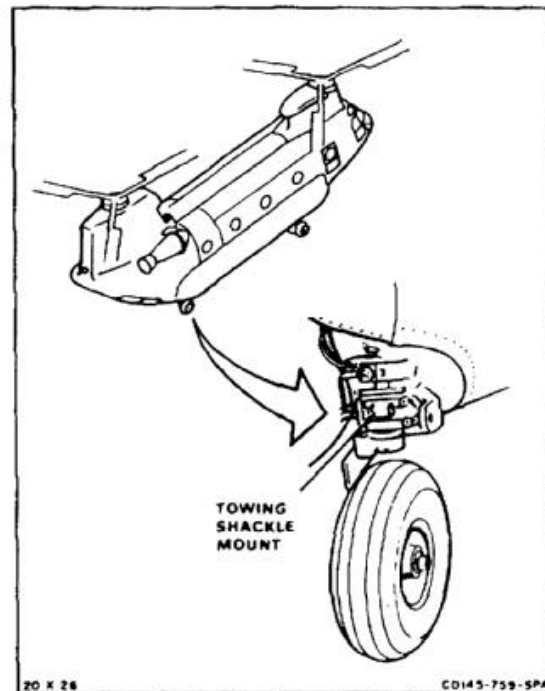
Cotter Pin

Personnel Required

Medium Helicopter Repairer
Inspector

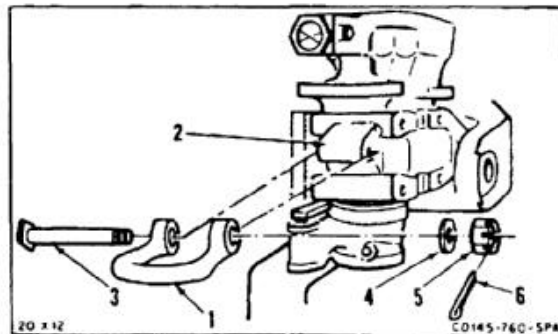
References:

TM 55-1520-240-23P

**NOTE**

Procedure is same for installing left or right aft landing gear towing shackle. Right shackle is shown here.

1. Place towing shackle (1) over mounting lug (2) in trailing position.
2. Install bolt (3), washer (4), and nut (5).
3. Torque nut (5) to **480 to 600 inch-pounds**.
4. Install new cotter pin (6).

**INSPECT****FOLLOW-ON MAINTENANCE:**

None

END OF TASK

3-154

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Socket, 1 Inch
- Socket, 2-1/8 Inch

Materials:

Twine (E433)

Personnel Required:

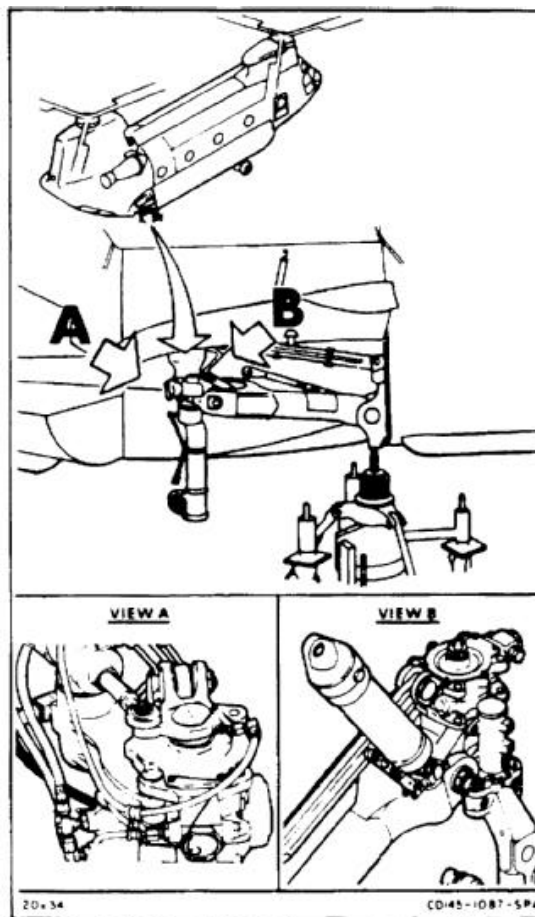
Medium Helicopter Repairer (2)

References:

- Task 3-37
- Task 3-69

Equipment Condition:

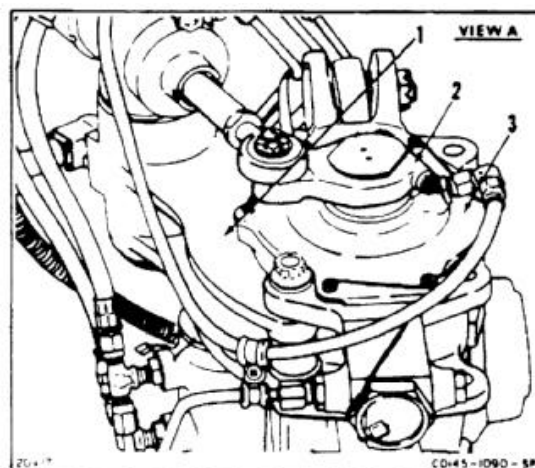
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Access Panels Opened (Task 2-2)
- Depressurize Utility Hydraulic System (Task 7-135.1)
- Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-22)
- Wheel Removed (Task 3-7)
- Brake Removed (Task 3-84)



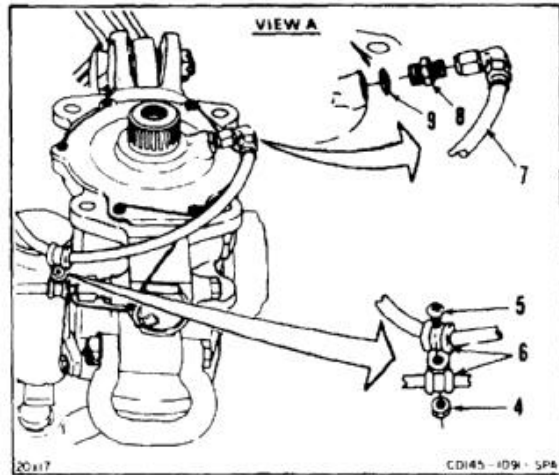
NOTE

Procedure is same for aft right or aft left landing gear except as noted in task.

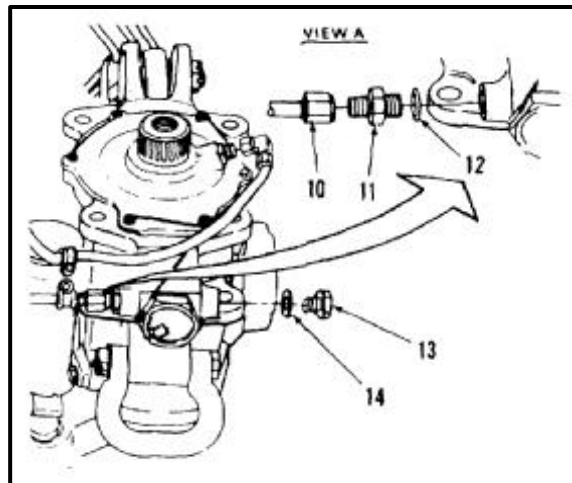
1. On right gear only, remove steering assembly (1) and steering lever (2) from swivel housing (3) (Task 3-69).



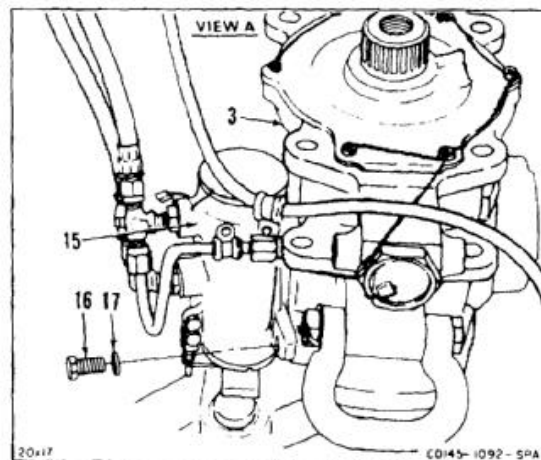
2. Remove nut (4) and screw (5) from two clamps (6). Disconnect clamps.
3. Disconnect brake tube (7) from union (8).
4. Remove union (8) and packing (9).



5. Disconnect swivel actuator pressure tube (10) from union (11).
6. Remove union (11) and packing (12).
7. Remove plug (13) and packing (14).



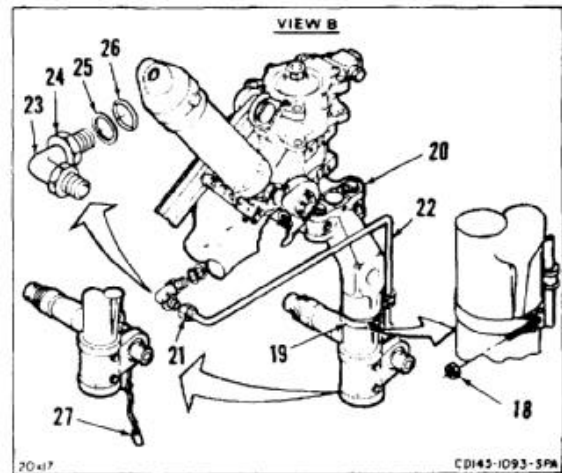
8. Remove lockwire from support swivel lock actuator (15). Remove four bolts (16) and washers (17). Disconnect actuator (15) from swivel housing (3).
9. Tie actuator (15) out of way. Use twine (E433).



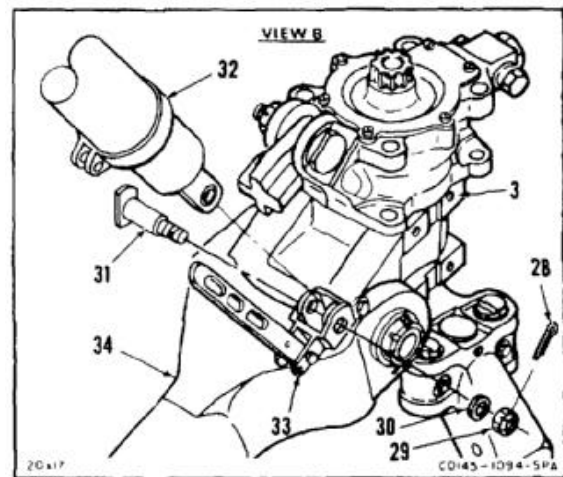
3-61 REMOVE SWIVEL HOUSING AND SPINDLE (Continued)

3-61

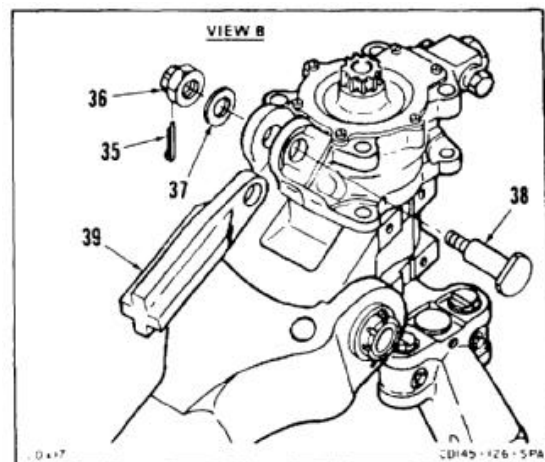
10. Remove lockwire, nut (18), and clamp (19) from spindle (20)
11. Loosen nut (21), and disconnect brake tube (22) from elbow (23).
12. Loosen nut (24) and remove elbow (23), retainer (25), and packing (26).
13. On left gear only, remove static ground wire (27) (Task 3-37).



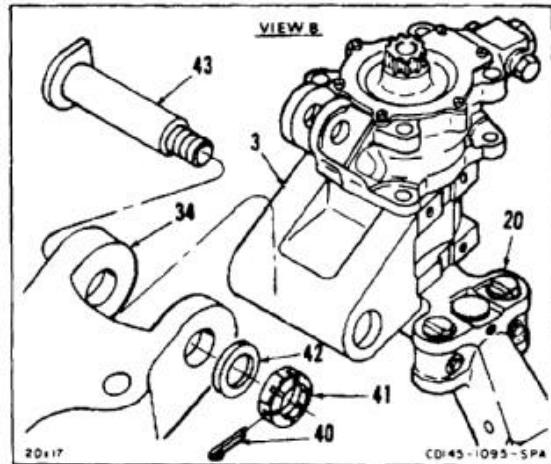
14. Have helper hold swivel housing (3).
15. Remove cotter pin (28), nut (29), washer (30), and bolt (31). Remove shock strut (32) from fitting (33) on lower drag link (34).



16. Remove cotter pin (35), nut (36), washer (37), and bolt (38) from upper drag link (39).
17. Disconnect and tie drag link (39) out of way. Use twine (E433).



18. Have helper hold swivel housing (3), spindle (20), and lower drag link (34).
19. Remove cotter pin (40), nut (41), washer (42), and pin (43).
20. Remove swivel housing (3) and spindle (20) from lower drag link (34). Tie link out of way.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Twist Drill Set, NSN 5133-00-293-0983
 Aft Landing Gear Bearing Drift (T97)
 Arbor Press
 Electric Drill

Materials:

None

Personnel Required:

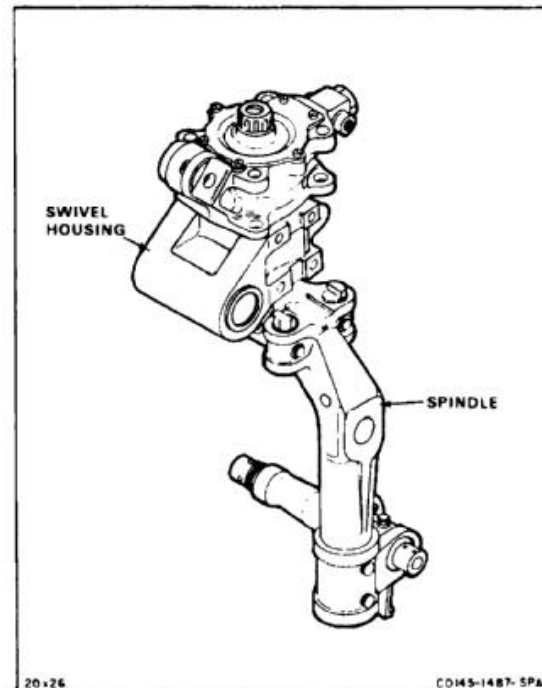
Machinist
 Medium Helicopter Repairer (2)

References:

Task 3-34
 Task 3-57
 Task 3-59
 Task 3-65
 Task 3-66

Equipment Condition:

Off Helicopter Task

**NOTE**

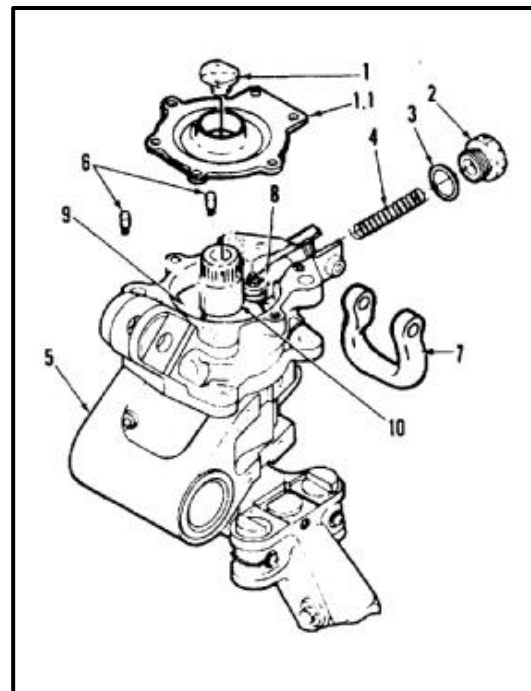
Procedure is same for left or right gear. Right gear is shown here.

1. Remove end cap (1) and cover plate and seals (1.1) (Task 3-57).

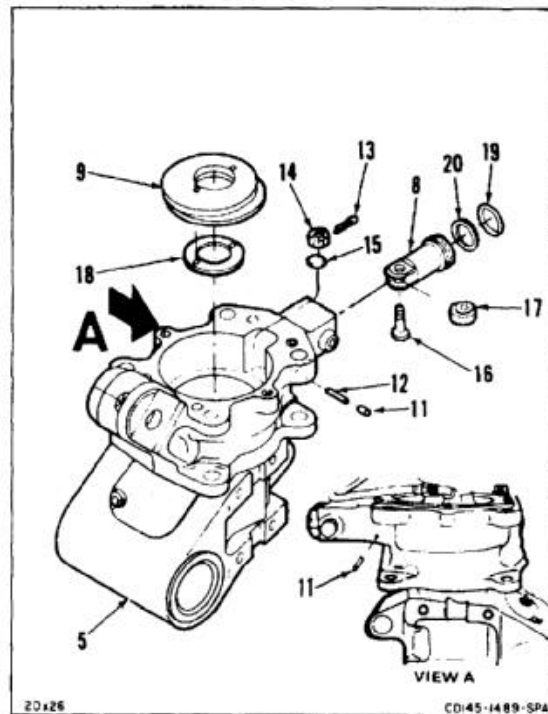
WARNING

Plug is spring loaded. Remove plug carefully to prevent injury to personnel.

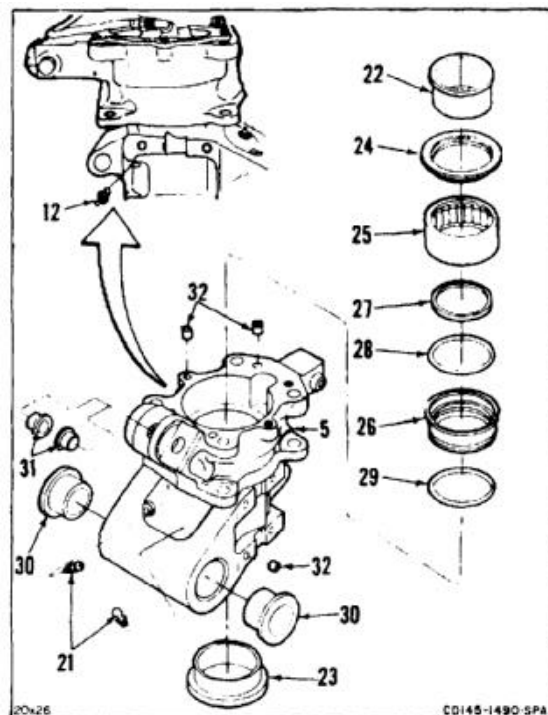
2. Remove lockwire, plug (2), packing (3), and cam centering spring (4) from swivel housing (5).
3. Remove lockwire and two shoulder screws (6).
4. Remove towing shackle (7) (Task 3-59).
5. Push cam follower piston (8) away from control cam (9) and remove swivel housing (5) from spindle (10).



6. Have machinist remove two plugs (11) and pin (12) as follows:
 - a. Drill out plug (11) on one side of housing (5).
 - b. Drive out pin (12) and other plug (11).
7. Rotate piston (8) and attached parts so cotter pin (13), nut (14), and washer (15) can be removed.
8. Remove cotter pin (13), nut (14), and washer (15).
9. Rotate piston (8) **180°**. Remove bolt (16).
10. Push piston (8) in and remove bearing (17).
11. Remove piston (8).
12. Remove packing (19) and retainer (20) from piston (8).
13. Remove control cam (9) and washer (18).

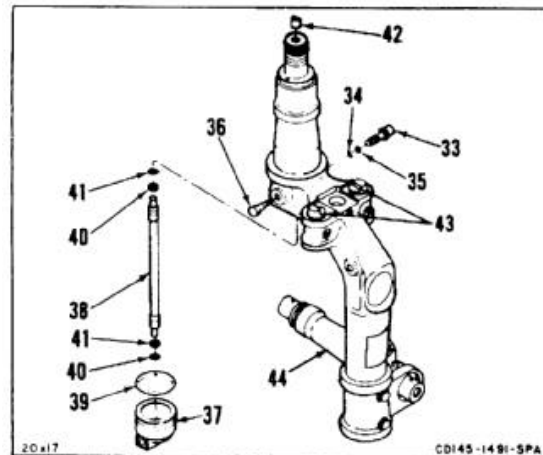


14. Remove three lubrication fittings (21).
15. Remove sleeve bushing (22).
16. Remove sleeve bushing (23).
17. Remove shouldered washer (24), needle bearing (25), and sleeve (26) as follows:
 - a. Position swivel housing (5) upside-down on support of bearing drift (T97).
 - b. Insert drift pin of bearing drift in swivel housing (5) until shoulder of drift pin contacts sleeve (26).
 - c. Position bearing drift and swivel housing (5) in an arbor press and push shouldered washer (24), bearing (25), and sleeve (26) from housing (5).
18. Remove special packing (27) and packing (28) from inside of sleeve (26).
19. Remove packing (29) from outside of sleeve (26).
20. Remove two sleeve bearings (30) and two sleeve bushings (31). Use arbor press.
21. Remove 14 thread inserts (32).

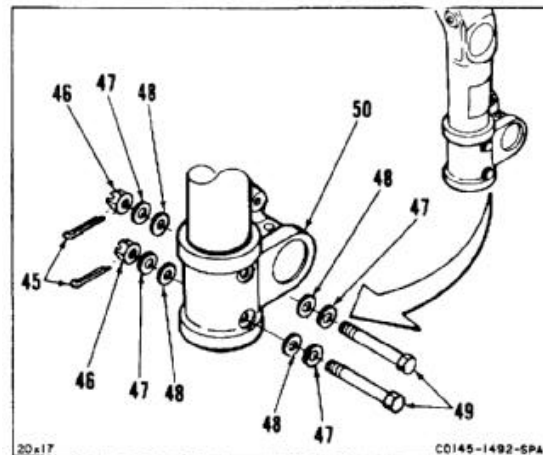


3-62 DISASSEMBLE SWIVEL HOUSING AND SPINDLE (AVIM) (Continued)

- 22. Remove lockwire and remove spindle fitting (33).
- 23. Remove packing (34) and retainer (35).
- 24. Remove shoulder bolt (36). Remove lower spindle fitting (37) and brake tube (38).
- 25. Remove packing (39).
- 26. Remove two packings (40) and retainers (41).
- 27. Remove healing plug (42).
- 28. Remove two spindle locks (43) (Task 3-66).
- 29. Remove axle (44) (Task 3-34).



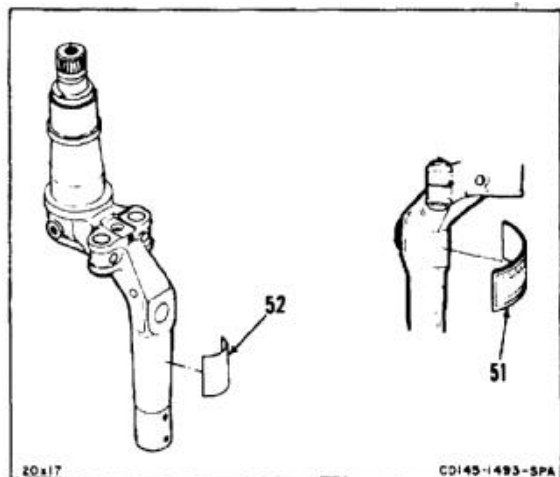
- 30. Remove cotter pins (45), nuts (46), washers (47), packing (48), and bolts (49).
- 31. Remove axle housing (50).



- 32. Remove identification plate (51), if damaged or illegible (Task 3-65).
- 33. Remove instruction plates (52), if damaged or illegible (Task 3-65).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Machine Shop Set, NSN 4920-00-405-9279
 Vernier Caliper, 0 to 24 Inches
 Aft Landing Gear Bearing Drift (T94)
 Hand Lubricating Gun
 Arbor Press or Oven

Materials:

Grease (E190)
 Lockwire (E231)
 Epoxy Primer (E292)
 Gloves (E184.1)
 Kevlar Gloves (E187)

Parts:

Packings
 Cotter Pins
 Retainers

Personnel Required:

Machinist
 Medium Helicopter Repairer (2)
 Inspector

References:

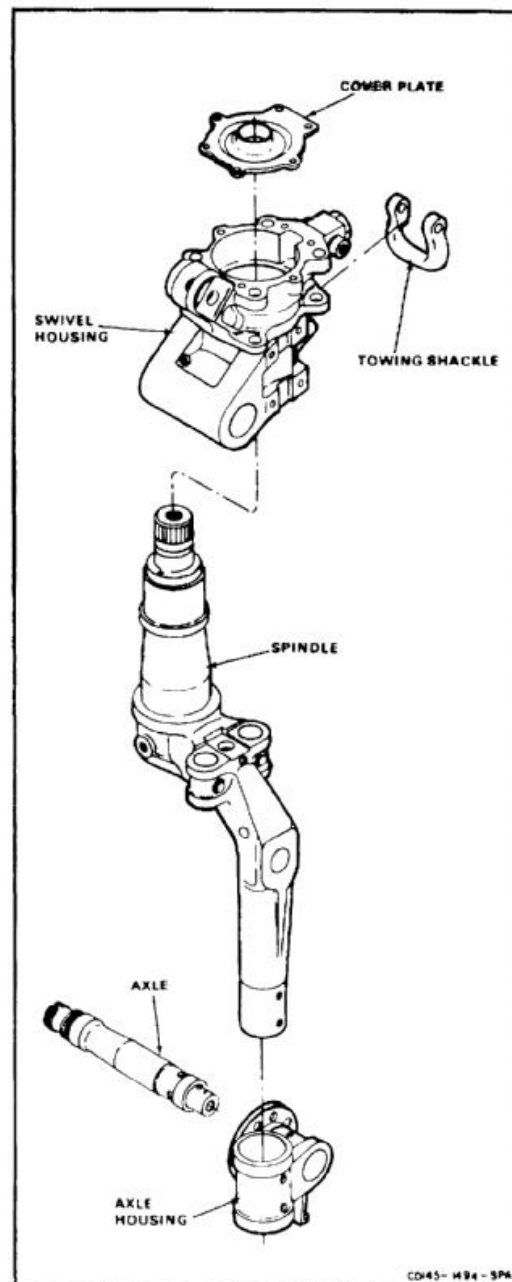
TM 55-1520-240-23P
 Task 3-35
 Task 3-58
 Task 3-60
 Task 3-65
 Task 3-68

General Safety Instructions:**WARNING**

Wear Kevlar gloves (E187) when handling heated parts. Injury to personnel could result.

WARNING

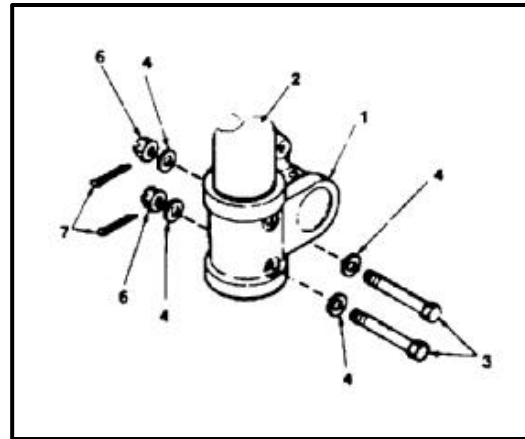
Epoxy primer (E292) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame, avoid contact with skin, eyes, or clothing, in case of contact immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



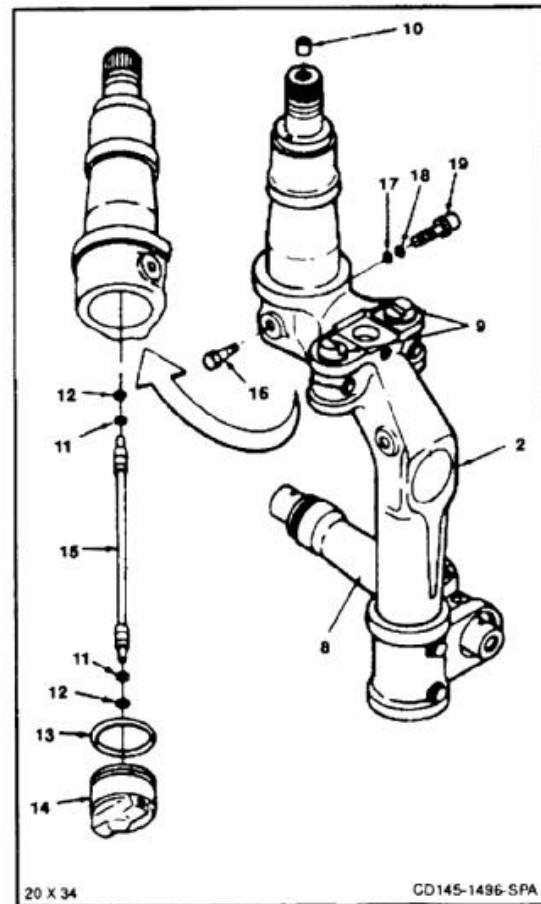
NOTE

Procedure is same for left or right gear. Right gear is shown here.

1. Install axle housing (1) on spindle (2).
2. Install bolts (3), washers (4), nuts (6), and cotter pins (7).



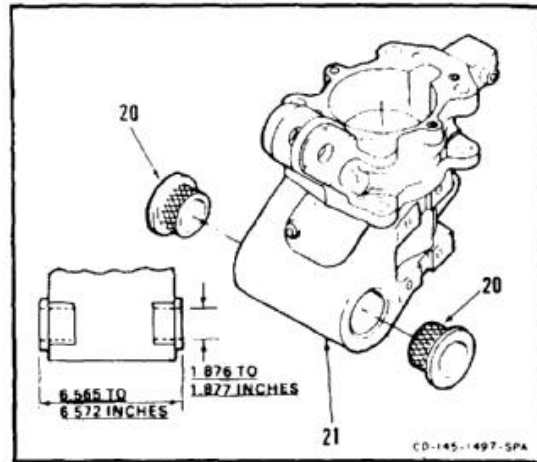
3. Install axle (8) (Task 3-35).
4. Install two swivel locks (9) (Task 3-68).
5. Deleted.
6. Install two packings (11) and retainers (12).
7. Install packing (13) on lower spindle fitting (14).
8. Install brake tube (15) and lower spindle fitting (14) into spindle (2).
9. Install shoulder bolt (16), packing (17), retainer (18), and spindle fitting (19). Install lockwire on bolt and spindle fitting. Use lockwire (E231).



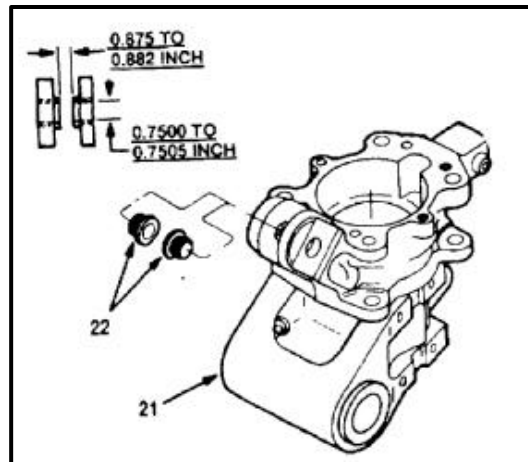
20 X 34

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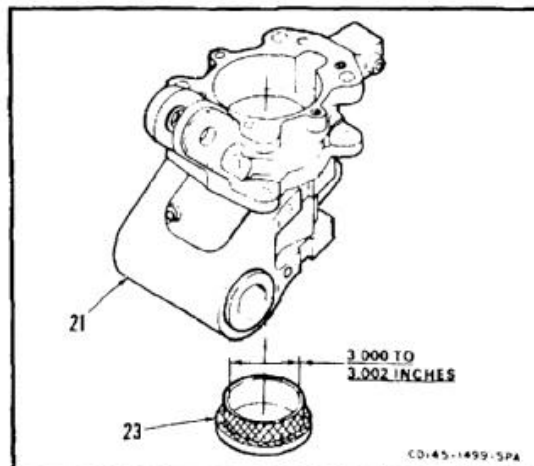
10. Install two sleeve bearings (20) in housing (21) as follows:
 - a. Coat contact surfaces (shaded area) of bearings (20) with primer (E292). Wear gloves (E184.1).
 - b. While primer is still wet, install bearings (20). Use arbor press.
 - c. If arbor press is not available, heat housing (21) in an oven to **230° to 250°F (110° to 120°C)**. Using driftpin and light force, install bearings (20).
 - d. Line ream bearings (20). Inside diameter shall be **1.876 to 1.877 inches**.
 - e. Measure across faces of bearings (20). Distance shall be **6.565 to 6.572 inches**.



11. Install two sleeve bushings (22) in housing (21) as follows:
 - a. Coat contact surfaces (shaded area) of bushing (22) with primer (E292). Wear gloves (E184.1).
 - b. While primer is still wet, install bushings (22). Use arbor press.
 - c. If arbor press is not available, heat housing (21) in an oven to **230° to 250°F (110° to 120°C)**. Using driftpin and light force, install bushings (22).
 - d. Line ream bushings (22). Inside diameter shall be **0.7500 to 0.7505 inch**.
 - e. Measure between flange at sleeve bushing (22). Distance shall be **0.875 to 0.882 inch**.



12. Install sleeve bushing (23) in housing (21) as follows:
 - a. Coat contact surfaces (shaded area) of bushing (23) with primer (E292). Wear gloves (E184.1).
 - b. While primer is still wet, install bushing (23). Use arbor press.
 - c. If arbor press is not available, heat housing (21) in an oven to **230° to 250°F (110° to 120°C)**. Using driftpin and light force, install bushing (23).
 - d. Measure sleeve bushing (23). Bushing shall have an inside diameter of **3.000 to 3.002 inches**. Bushing shall be concentric with existing bore within **0.001 inch**.



13. Install packing (24) and retainer (25) on cam-follower piston (26).
14. Install piston (26).
15. Install packing (27) on swivel housing sleeve (28). Install sleeve in swivel housing (21).
16. Install packing (29) and special packing (30).
17. Pack needle bearing (31) with grease (E190).

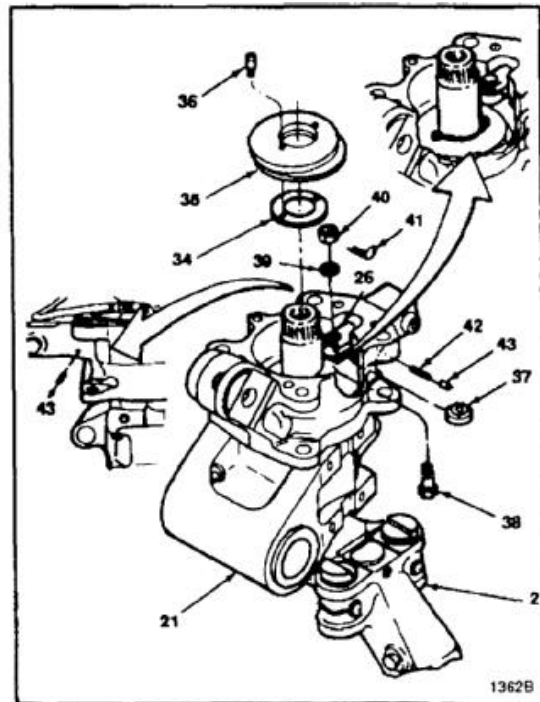
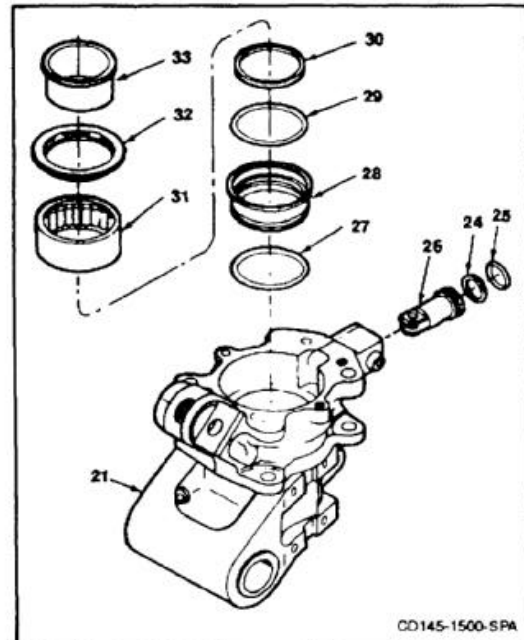
NOTE

Install bearing with standard bearing numbers facing up.

18. Install shouldered washer (32) and bearing (31) in swivel housing (21). Use bearing drift (T94).
19. Install sleeve bushing (33) in swivel housing (21) as follows:
 - a. Coat contact surfaces of shoulder washer (32) with primer (E292). Wear gloves (E184.1).
 - b. While primer is still wet, install bushing (33). Use arbor press.
 - c. If arbor press is not available, heat housing (21) in an oven to **230° to 250°F (110° to 120°C)**. Using driftpin and light force, install bushing (33).
20. Install swivel housing (21) on spindle (2).
21. Install washer (34) and control cam (35) on spindle (2). Install two shoulder screws (36). Lockwire screws with lockwire (E231).

INSPECT

22. Pack bearing (37) with grease (E190).
23. Rotate piston (26) so that flat side of piston is up.
24. Install bearing (37) and bolt (38).
25. Rotate piston (26) until thread of bolt (38) is up (bolthead down) and flat side of piston is down.
26. Install washer (39), nut (40), and cotter pin (41).
27. Install pin (42) and two plugs (43) in swivel housing (21).

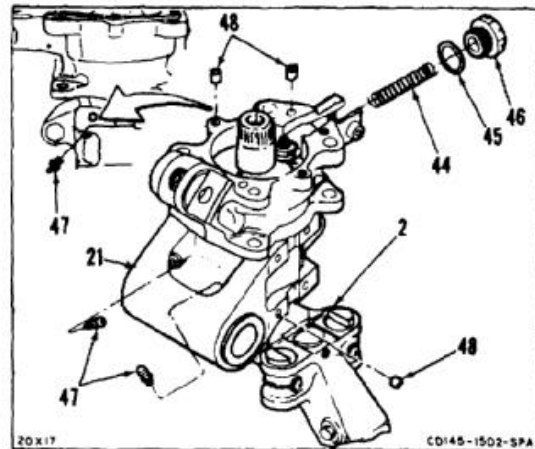


28. Install cam centering spring (44) in swivel housing (21).

WARNING

Plug will be under pressure and should be installed carefully to prevent injury to personnel.

29. Install packing (45) and plug (46). Lockwire plug with lockwire (E231).
30. Install three lubrication fittings (47).
31. Install 14 thread inserts (48).
32. Lubricate fittings (47). Use grease (E190). Force grease into fittings until bead of grease appears between swivel housing (21) and spindle (2).

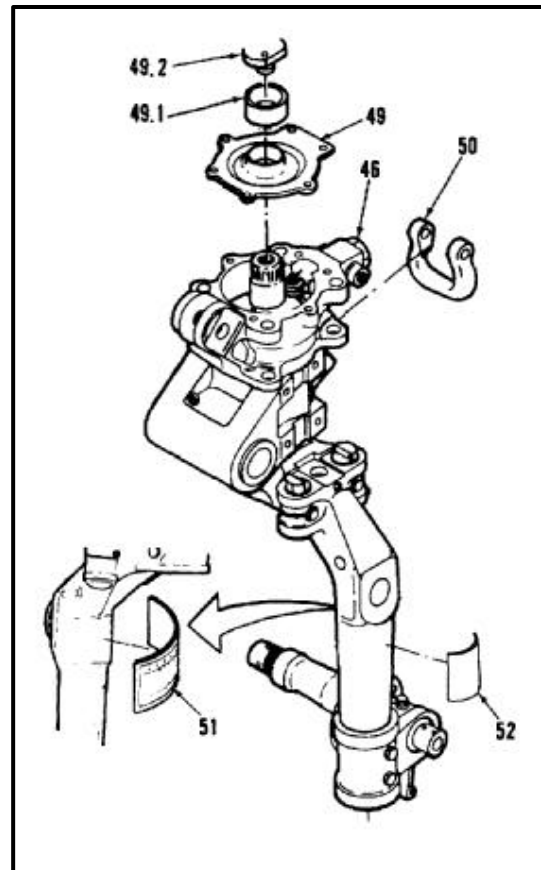


33. Install cover plate and seals (49). Lockwire plug (46) to cover plate (3-58).
- 33.1. For an aft left gear, install sleeve spacer (49.1) and end cap (49.2). Torque end cap to **31 to 37 inch-pounds**. Check that sleeve spacer has slight end play.
34. Install towing shackle (50) (Task 3-60).
35. Install identification plate (51) if removed (Task 3-65).
36. Install instruction plate (52) if removed (Task 3-65).

INSPECT

FOLLOW-ON MAINTENANCE:

Test swivel housing and spindle (Task 3-64).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Repairer's Tool Kit, NSN 5180-00-323-4891
 Hydraulic Test Stand, Type D6A, D5A, or Equivalent,
 0 to 4500 psi, 3-Micron Filter
 Shatterproof Shield
 Technical Inspection Tool Kit, NSN 5180-00-323-5114
 Pressure Restrictor Valve
 Hydraulic Pressure Gage, 0 to 500 psi
 Shutoff Valve

Materials:

None

Parts:

Packings
 Seals

Personnel Required:

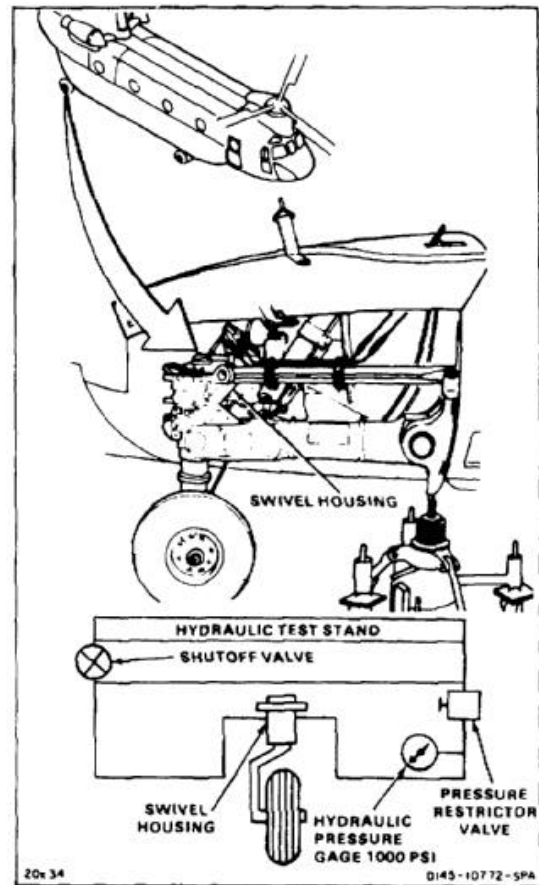
Aircraft Pneudraulics Repairer (2)
 Inspector

References:

Task 3-58
 Task 3-70

Equipment Condition:

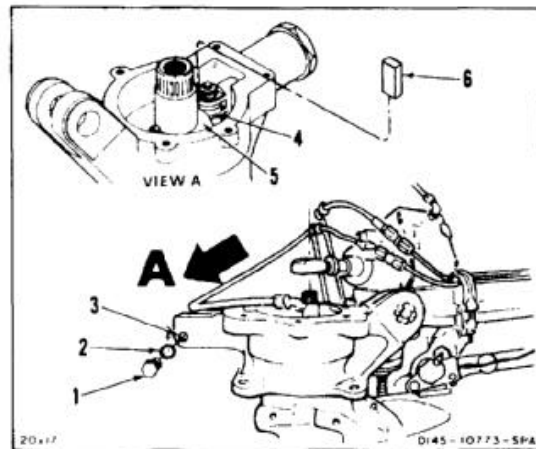
Battery Disconnected (Task 1 -39)
 Electrical Power Off
 Hydraulic Power Off
 Access Panels Opened (Task 2-2)
 Bleed Brake and Utility System (Task 7-330)
 Helicopter Jacked at Aft Landing Gear (Task 1-24)
 Test Setup
 Steering Lever Removed (Task 3-69)
 Swivel Housing Cover Removed (Task 3-57)



WARNING

Do not test until all connections are checked for security, and component is properly assembled. Use shatterproof shield to protect personnel. Hydraulic fluid sprayed under high pressure can cause serious injury to personnel.

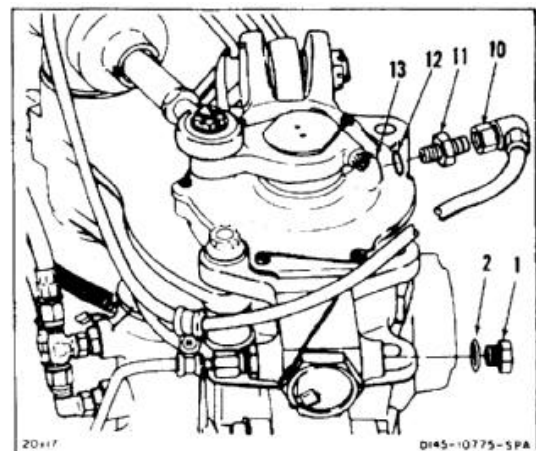
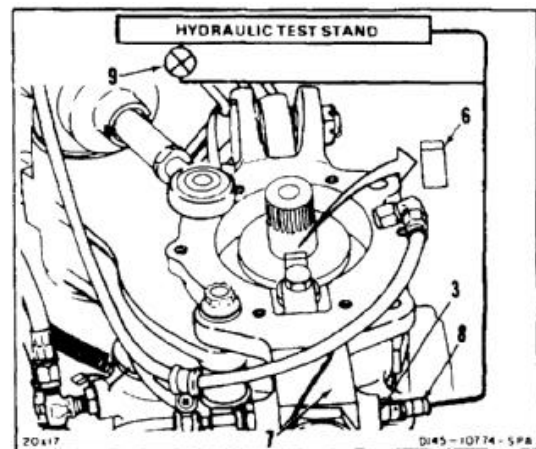
1. Remove plug (1) and packing (2) from cam follower port (3).
2. Have helper move bearing (4) away from cam (5) far enough to install aluminum bar (6). Position bar between cam and bearing. Release bearing.



NOTE

To operate hydraulic test stand, refer to applicable manual.

3. Proof pressure test cam follower (7) as follows:
 - a. Connect test stand hose fitting (8) to cam follower port (3).
 - b. Close shutoff valve (9).
 - c. Apply **4500 psi** to cam follower port (3) for **5 minutes**.
 - d. Check cam follower (7). There shall be no external leakage, distortion, or malfunction.
 - e. Open shutoff valve (9).
 - f. Remove aluminum bar (6).
4. Install packing (2) and plug (1).
5. Install swivel housing cover (Task 3-58).
6. Install steering lever (Task 3-70).
7. Install packing (2) and plug (1).
8. Remove elbow (10), union (11), and packing (12) from brake pressure port (13).

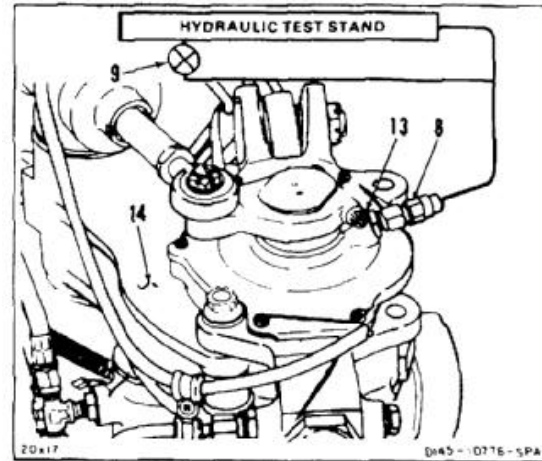


9. Proof pressure test swivel housing (14) at brake pressure port (13) as follows:
 - a. Connect test stand hose fitting (8) to brake pressure port (13).
 - b. Close shutoff valve (9).
 - c. Apply **4500 psi** hydraulic pressure to brake pressure port (13) for **2 minutes**.
 - d. Check test stand gage. There shall be no pressure drop.

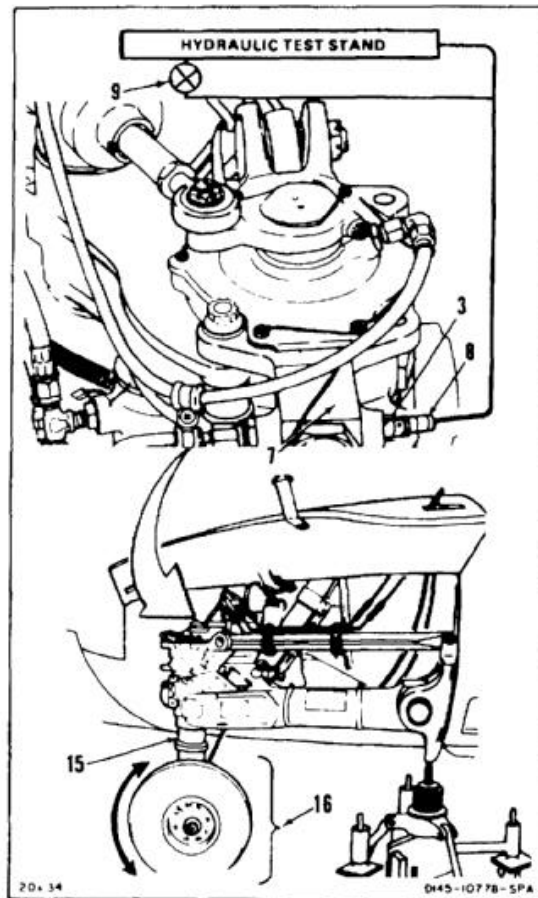
NOTE

Leakage is indicated by gradual pressure drop.

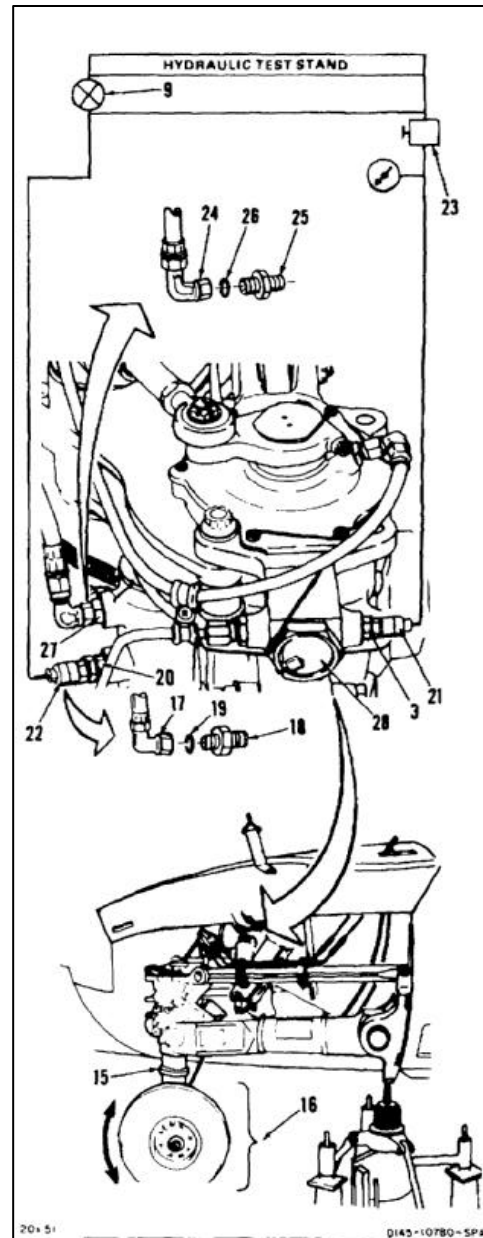
- e. Open shutoff valve (9).
10. Remove test stand hose fitting (8).
 11. Install packing (12), union (11), and elbow (10) in brake pressure port (13).
 12. Remove plug (1) and packing (2) from cam follower port (3).



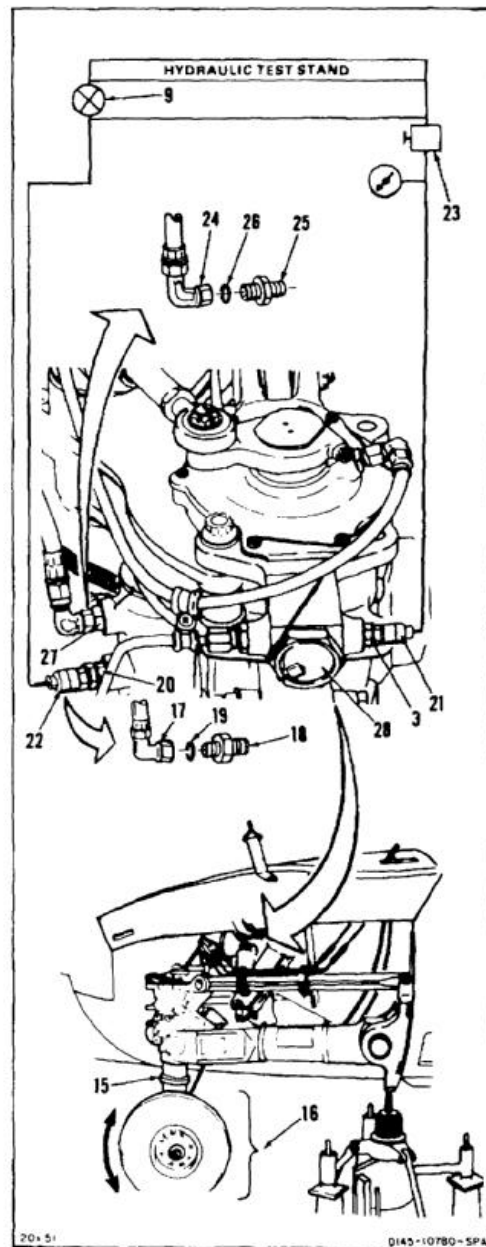
13. Check that cam follower (7) returns spindle (15) to center as follows:
 - a. Connect test stand hose fitting (8) to cam follower port (3).
 - b. Check that aft landing gear (16) is centered and trailed aft.
 - c. Close shutoff valve (9).
 - d. Apply **300 psi** hydraulic pressure to cam follower port (3).
 - e. Turn spindle (15) through **38°** in either direction. Release spindle. Check that spindle returns to center.
 - f. Open shutoff valve (9).
 - g. Remove test stand fitting (8) from port (3).



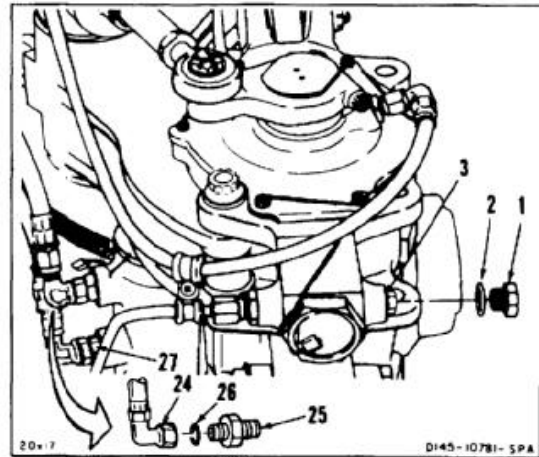
14. Remove elbow (17), union (18), and packing (19) from lower locking actuator port (20).
15. Check locking and centering as follows:
 - a. Connect test stand to test setup.
 - b. Connect fitting (21) on test setup reduced pressure hose to cam follower port (3).
 - c. Connect fitting (22) on other test setup hose to lower locking actuator port (20).
 - d. Close pressure restrictor (23).
 - e. Close shutoff valve (9).
 - f. Apply **3000 psi** pressure to lower port (20). This unlocks aft landing gear (16). Open restrictor (23) slowly and apply **300 psi** pressure to cam follower port (3).
 - g. Turn spindle (15) through **30°**. Release spindle. Check that spindle returns to center smoothly without binding.
 - h. Open shutoff valve (9).



- i. Remove elbow (24), union (25), and packing (26) from upper port (27) of locking actuator (28).
 - j. Remove fitting (22) from lower port (20), and install in upper port (27).
 - k. Install packing (19), fitting (17), and elbow (18) in unlock port (20).
 - l. Close shutoff valve (9).
 - m. Apply **3000 psi** hydraulic pressure to upper port (27) to lock aft landing gear (16).
 - n. Open shutoff valve (9).
16. Remove test setup hose fittings (21) and (22) from upper port (27) and cam follower port (3).



17. Install packing (2) and plug (1) in cam follower port (3).
18. Install union (25), packing (26), and elbow (24) in upper port (27).

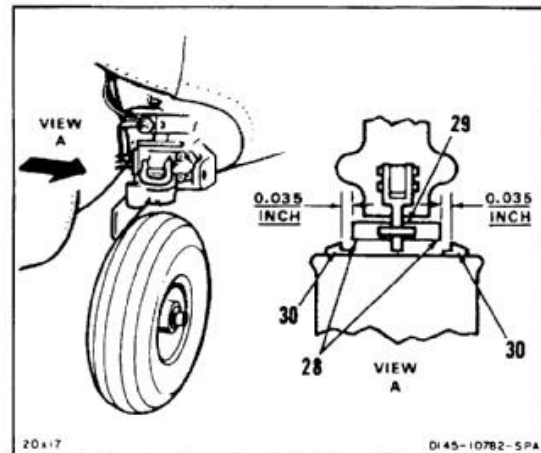


19. Measure distance between faces (28) of swivel lock (29) and swivel lock detents (30). Distance shall not exceed **0.035 inch**.

INSPECT

FOLLOW-ON MAINTENANCE:

- Remove jack (Task 1-24).
- Close access panels (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Metal Stamp Die Sets (Alphabetic and Numeric)

Materials:

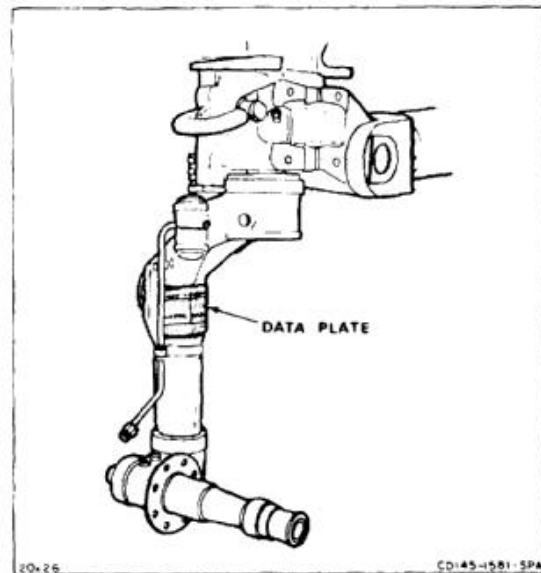
Cloths (E120)
Methyl-Ethyl-Ketone (E244)
Gloves (E186)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task



Scraping actions may scratch, nick or gouge spindle. Do not damage spindle when removing data plate.

NOTE

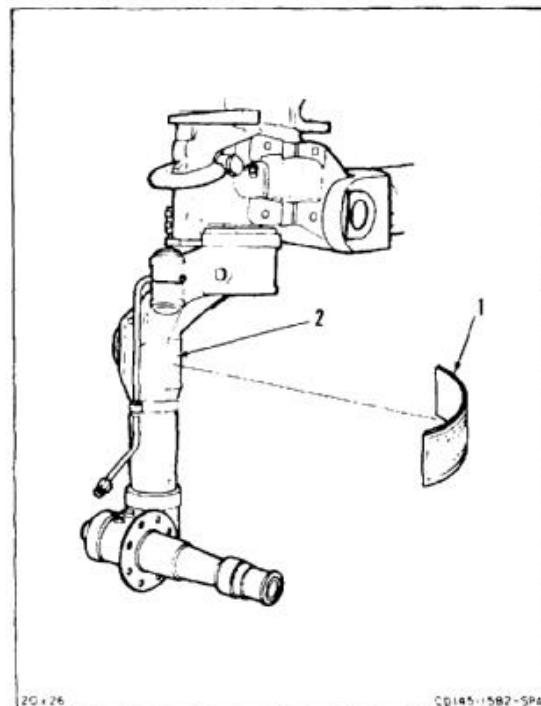
Procedure is same for left or right aft landing gear.

1. Remove data plate (1) from spindle (2). Lift up corner of data plate with a knife or equivalent sharp instrument. Peel data plate off with pliers.

WARNING

Methyl-ethyl-ketone (E244) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

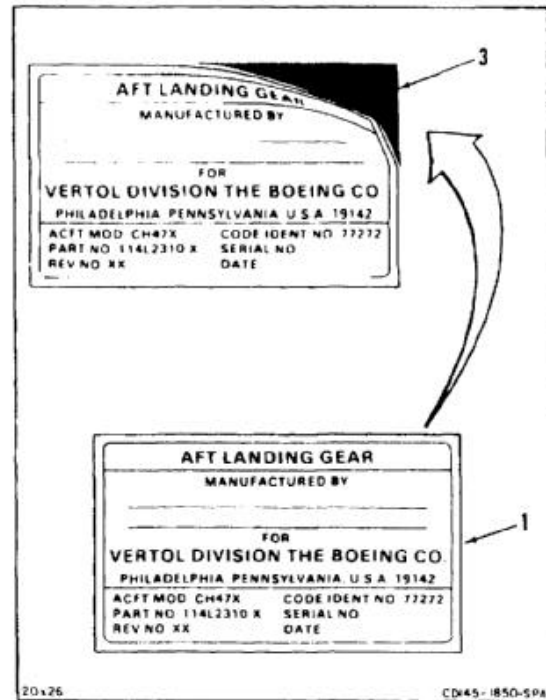
2. Wearing gloves (E186), clean area of spindle (2) where data plate (1) will be installed. Wipe spindle dry. Use cloths (E120) and methyl-ethyl-ketone (E244).



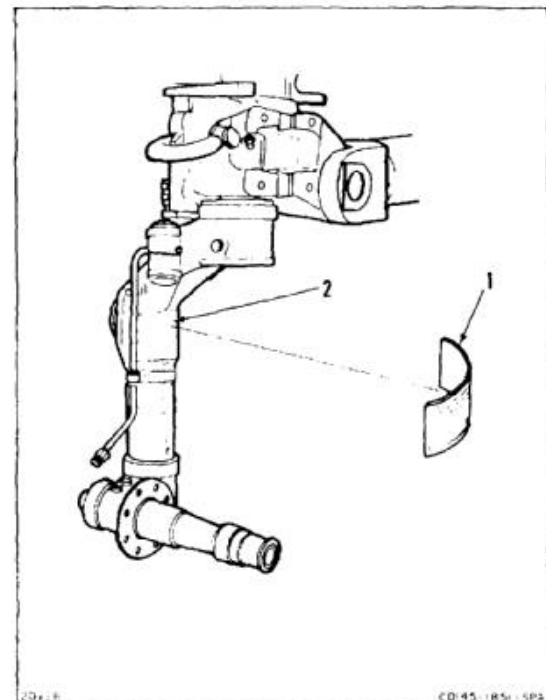
- Transfer information from removed data plate to new data plate (1).

INSPECT

- Remove paper backing (3) from data plate (1). Remove moisture, if present, from adhesive on back of data plate.



- Position data plate (1) on spindle (2). Press data plate onto spindle so that all edges of plate adhere to spindle.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Socket, 1 Inch
 Socket, 2-1/8 Inch

Materials:

Grease (E190)
 Lockwire (E231)

Parts:

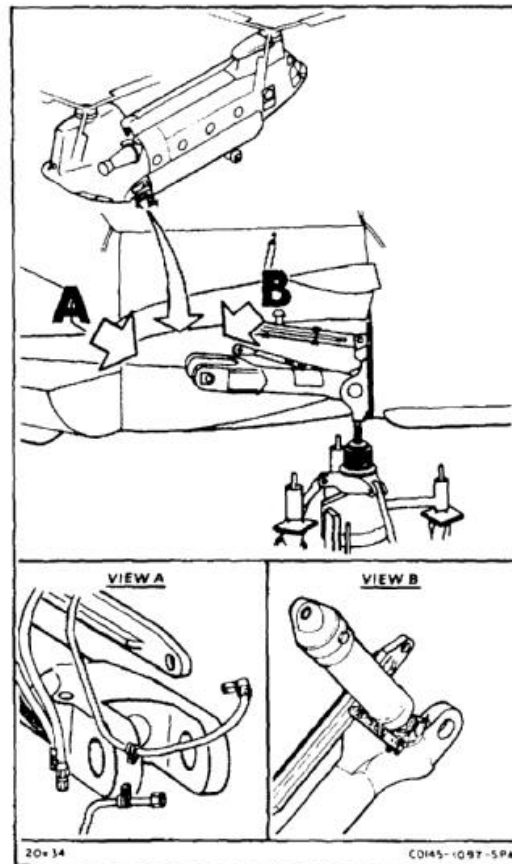
Cotter Pins

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

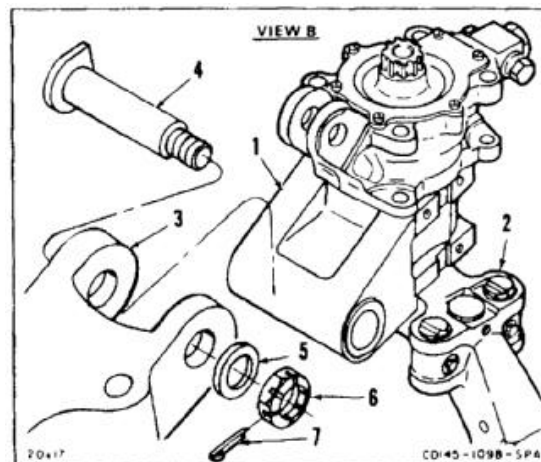
References:

TM 55-1520-240-23P
 Task 3-38
 Task 3-70

**NOTE**

Procedure is same for aft right or aft left landing gear except as noted in task.

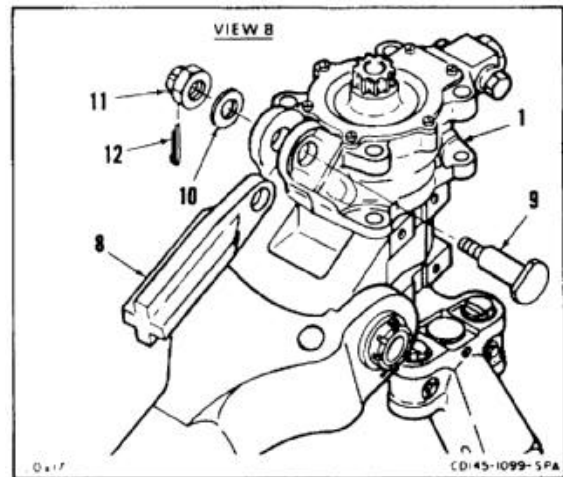
1. Have helper align swivel housing (1) and spindle (2) with lower drag link (3). Untie drag link.
2. Coat pin (4) with grease (E190). Install pin through housing (1) and drag link (3).
3. Install washer (5) and nut (6). Torque nut to **350 to 500 inch-pounds**. Install cotter pin (7).



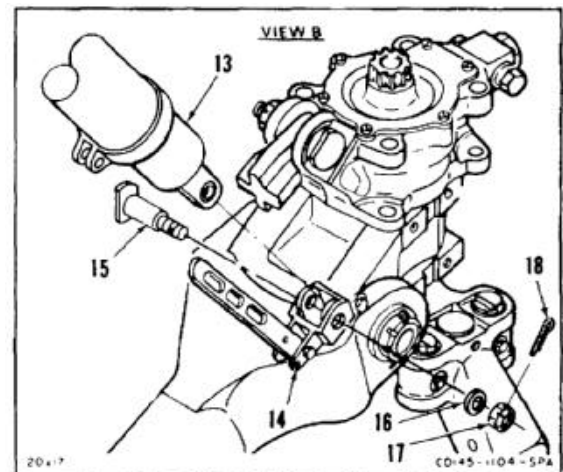
3-66 INSTALL SWIVEL HOUSING AND SPINDLE (Continued)

3-66

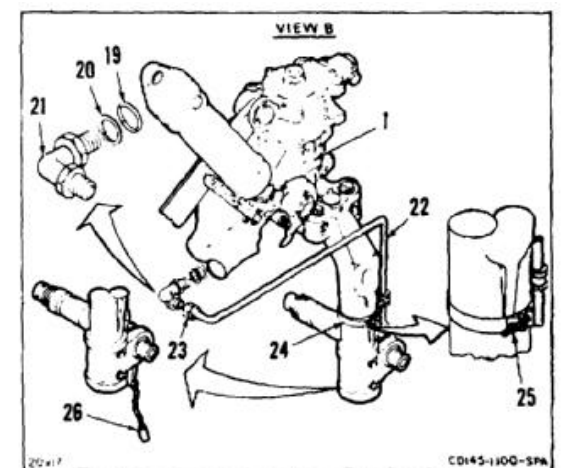
4. Untie drag link (8). Position drag link in housing (1) as shown.
5. Install bolt (9), washer (10), and nut (11). Torque nut to **350 to 500 inch-pounds**. Install cotter pin (12).



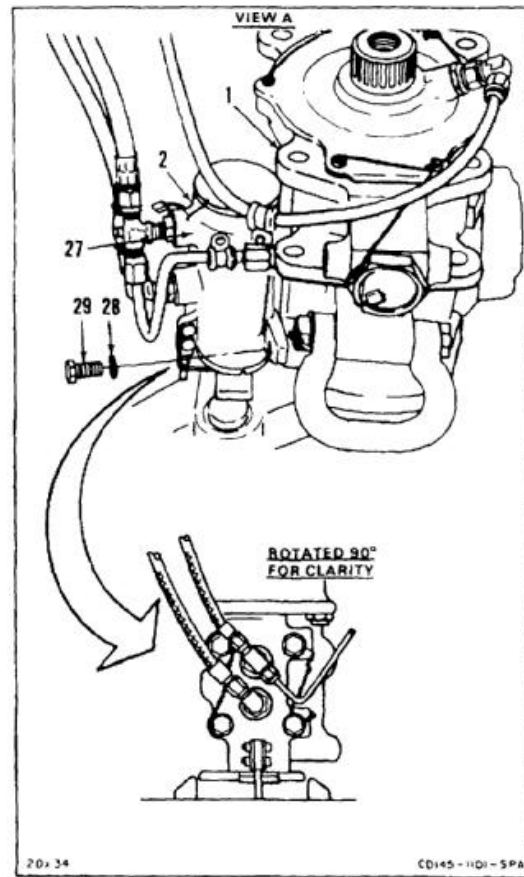
6. Pull down shock strut piston (13) and align hole in piston with hole in attach fitting (14).
7. Install bolt (15), washer (16), and nut (17). Torque nut to **25 to 35 inch-pounds**. Install cotter pin (18).



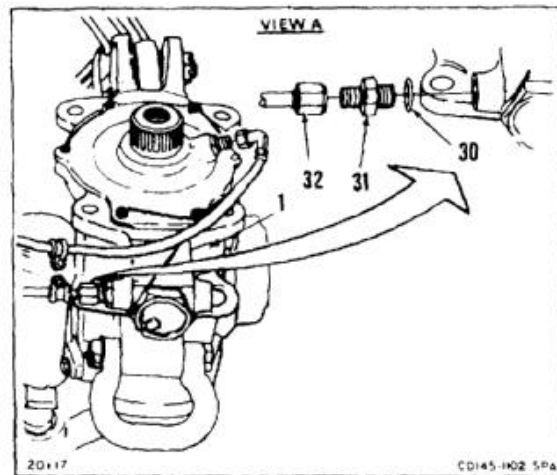
8. Install packing (19), retainer (20), and elbow (21) on swivel housing (1).
9. Connect brake tube (22) to elbow (21). Tighten nut (23).
10. Install clamp (24), and nut (25). Lockwire clamp with lockwire (E231).
11. On left gear only, install static ground wire (26) (Task 3-38).



12. Untie swivel lock actuator (27). Position actuator on swivel housing (1).
13. Install four washers (28) and bolts (29). Lockwire four bolts as shown with lockwire (E231).



14. Install packing (30) and union (31) in swivel housing (1).
15. Connect swivel actuator pressure tube (32) to union (31).

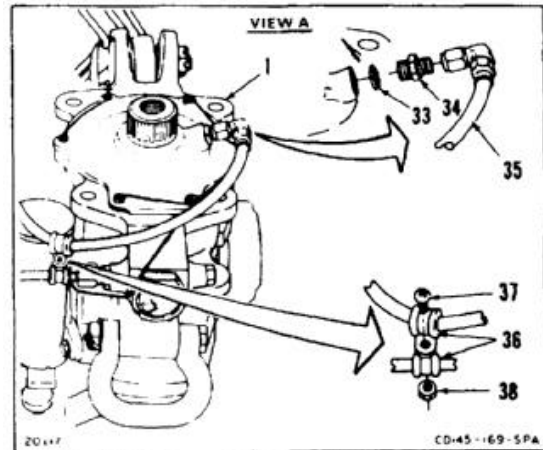


16. Install packing (33) and union (34) in swivel housing (1).



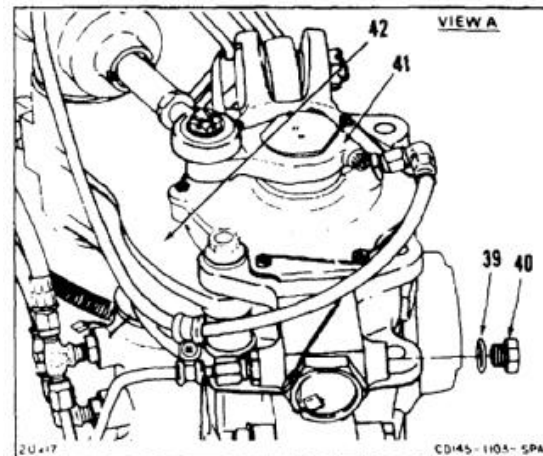
Elbow end of brake tube must be horizontal on right landing gear. Otherwise, it can interfere with steering and brake tube can be damaged.

17. Connect brake tube (35) to union (34). Make sure elbow end of brake tube is horizontal.
18. Position two clamps (36) as shown. Install screw (37) and nut (38).



19. Install packing (39) and plug (40).
20. On right gear only, install steering lever (41) and power steering assembly (42) (Task 3-70).

INSPECT



FOLLOW-ON MAINTENANCE:

- Install brake (Task 3-85).
- Install wheel (Task 3-12).
- Service shock strut (Tasks 1-71 and 1-72).
- Lubricate lower drag link (Task 1-88).
- Bleed swivel lock system (Task 7-331).
- Bleed power steering (right gear only) (Task 7-332).
- Perform functional test of swivel and spindle housing (Task 3-64).
- Perform functional test of power steering (TM 55-1520-240-T Right gear only).
- Close access panels (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

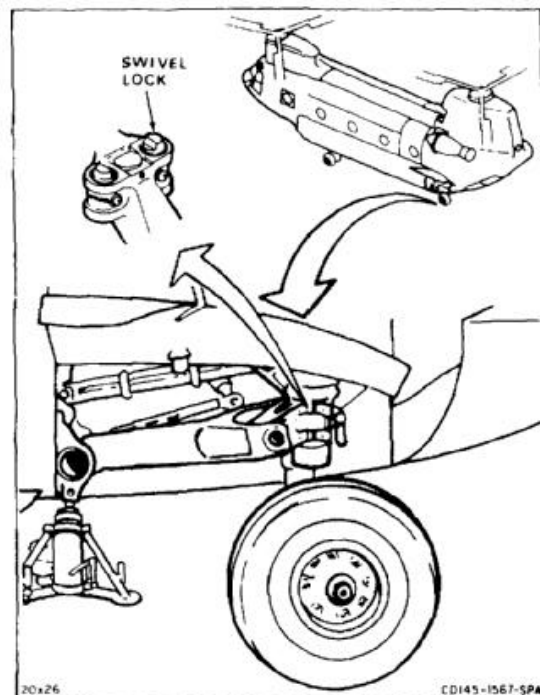
Electrical Power Off

Hydraulic Power Off

Helicopter Jacked at Aft Fuselage Jack Pad (Task 1-24)

Aft Landing Gear Access Panels Open (Task 2-2)

Utility Hydraulic System Depressurized (TM 55-1520-240-T)

**NOTE**

Procedure is same for both locks on aft left and right gear. Left gear is shown here.

1. Position wheel (1) **90°** from swivel locked position as shown.

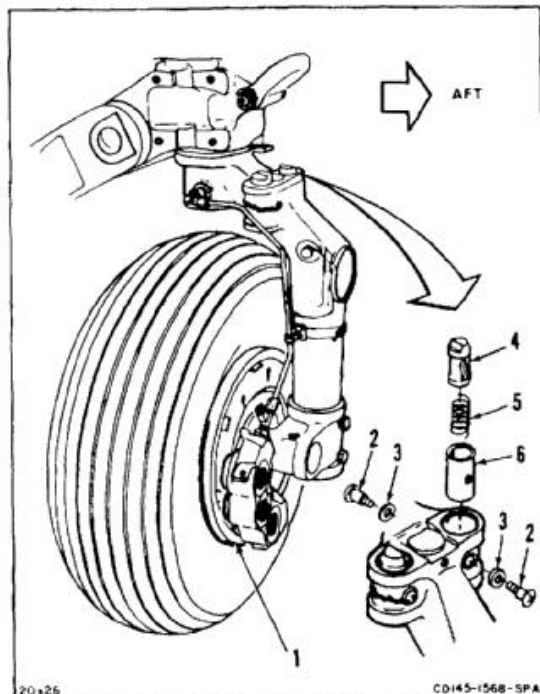
NOTE

Lock can drop out of bottom. Hold hand under opening to catch spacer.

2. Remove lockwire. Remove two screws (2) and washers (3).
3. Remove lock (4), spring (5), and sleeve spacer (6).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-180

INITIAL SETUP

Applicable Configurations:

All

Tools:

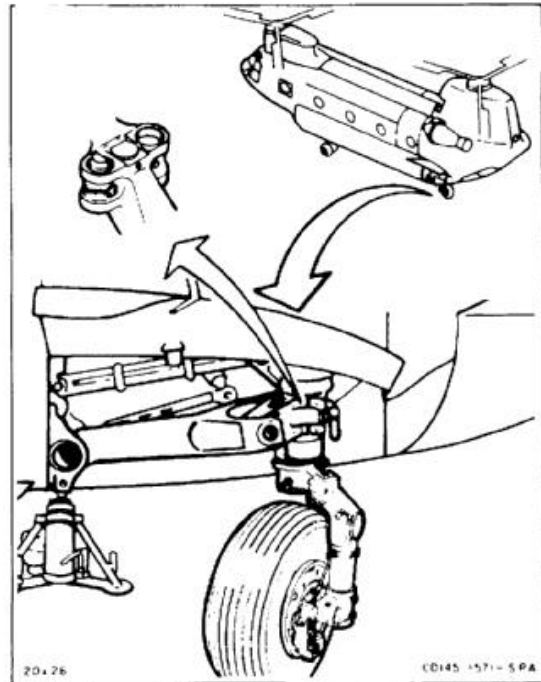
Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

Lockwire (E231)

Personnel Required:Medium Helicopter Repairer
Inspector**References:**

TM 55-1520-240-23P

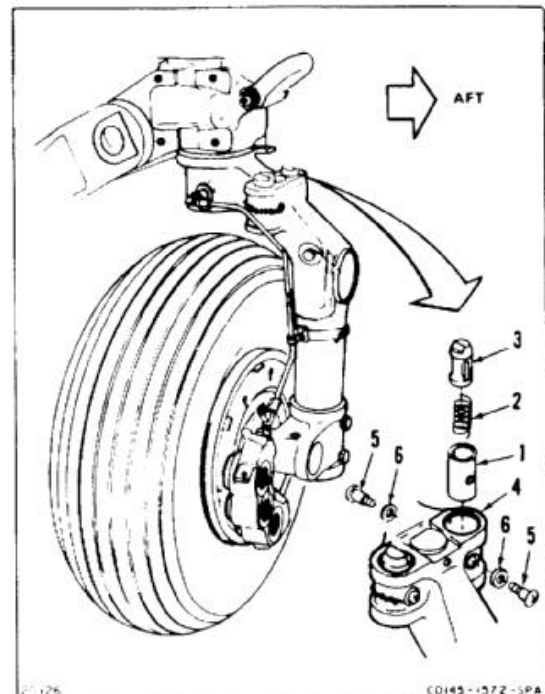
**NOTE**

Procedure is same for both locks on aft left and right gear. Left gear is shown here.

NOTE

Lock can drop out of bottom. Hold hand under opening to catch spacer.

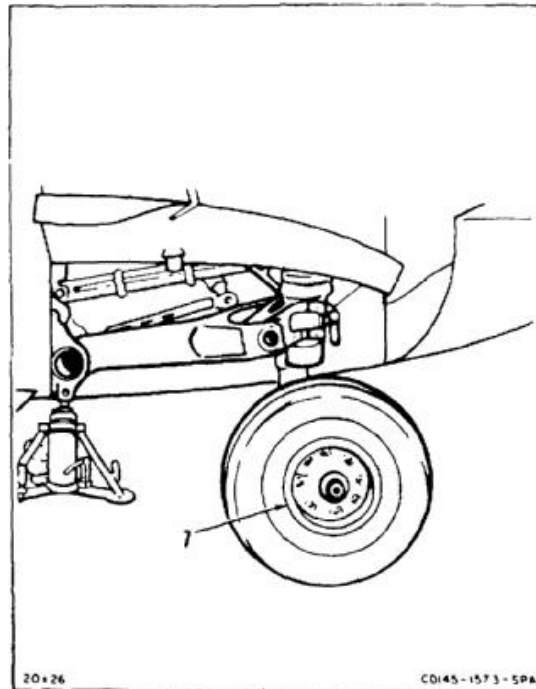
1. Install sleeve spacer (1), spring (2), and lock (3) in spindle (4). Align holes with threaded holes in spindle. Make sure flats of lock face each other.
2. Install two screws (5) and washers (6) in spindle (4). Lockwire screws with lockwire (E231).
3. Depress lock (3). Make sure lock springs back.

INSPECT

4. Position wheel (7) **90°** to swivel locked position.

FOLLOW-ON MAINTENANCE:

- Lower and remove jack from aft fuselage jack pad (Task 1-24).
- Close aft landing gear access panels (Task 2-2).



END OF TASK

3-69 REMOVE STEERING LEVER**3-69****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

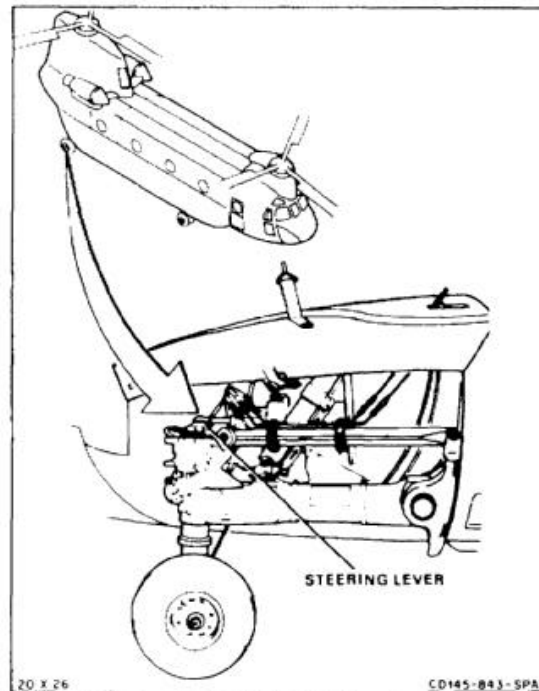
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Hydraulic Power Off

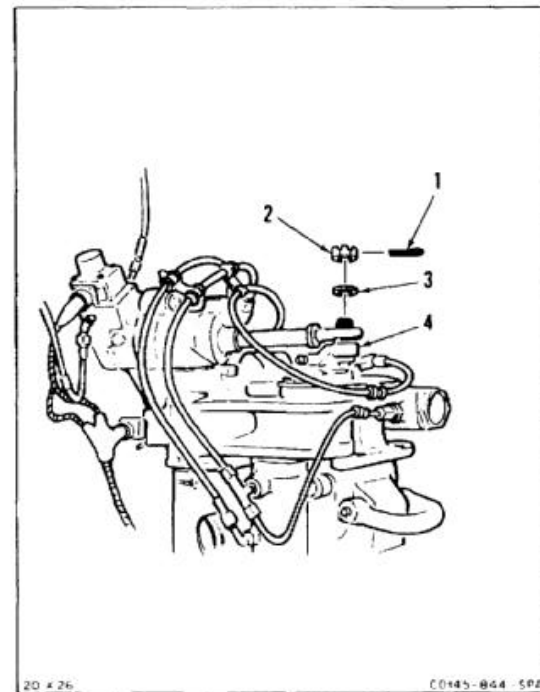
Aft Landing Gear Access Panels Open (Task 2-2)



20 X 26

C0145-843-SPA

1. Remove cotter pin (1), nut (2), and washer (3) from stud on steering lever (4).



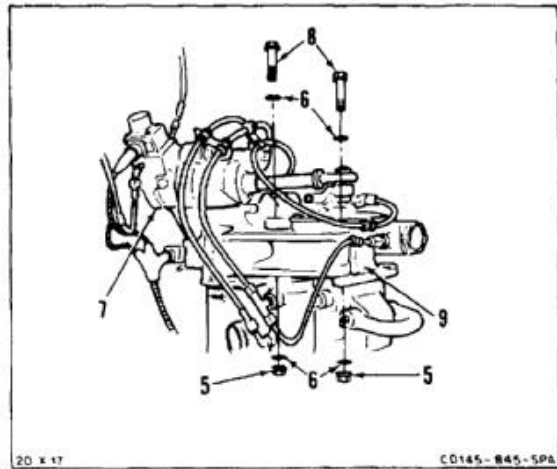
20 X 26

C0145-844-SPA

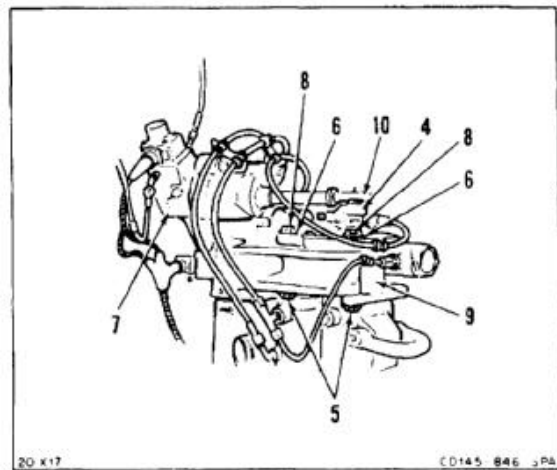
CAUTION

Do not let power steering assembly fall when attaching bolts are removed. Equipment could be damaged.

2. Remove two nuts (5) and lower washers (6).
3. Have helper hold power steering assembly (7) in place. Remove two bolts (8) and upper washers (6).
4. Move power steering assembly (7) out of lugs on swivel housing (9).



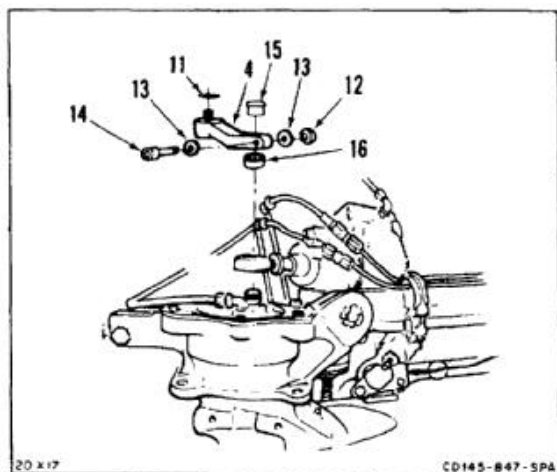
5. Lift power steering actuator rod-end (10) off stud on lever (4). Push rod-end (10) into power steering assembly (7).
6. Position power steering assembly (7) in lugs on swivel housing (9). Install bolts (8), washers (6), and nuts (5) loosely to hold it in place.



7. Remove spacer (11) from steering lever (4).
8. Remove nut (12), two washers (13), and bolt (14).
9. Remove end cap (15).
10. Remove steering lever (4) and spacer (16).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-70 INSTALL STEERING LEVER**3-70****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 700 to 1600 Inch-Pounds
 Torque Wrench, 100 to 750 Inch-Pounds

Materials:

Antiseize Compound (E75)

Parts:

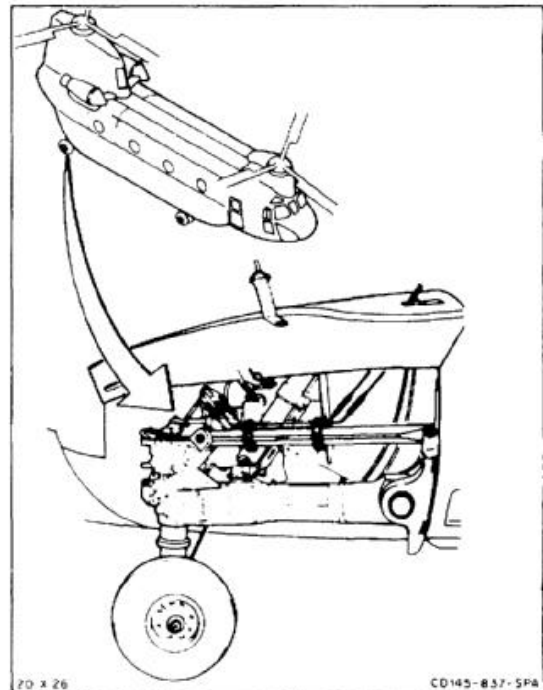
Cotter Pin

Personnel Required:

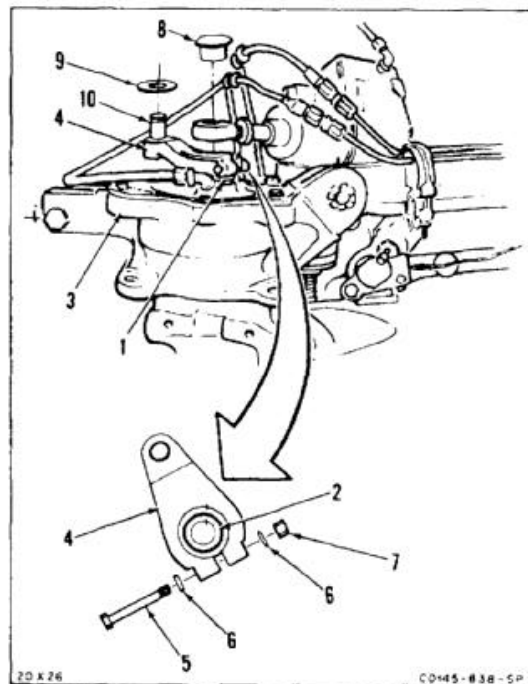
Medium Helicopter Repairer (2)
 Inspector

References:

TM 55-1520-240-23P



1. Install spacer (1) over spline (2) on swivel housing (3).
2. Align index marks on steering lever (4) and spline (2). Install lever on spline.
3. Install bolt (5), two washers (6), and nut (7).
4. Install end cap (8). Torque cap to **31 to 37 inch-pounds**. Check that sleeve spacer has slight end play.
5. Install spacer (9) on steering lever stud (10).

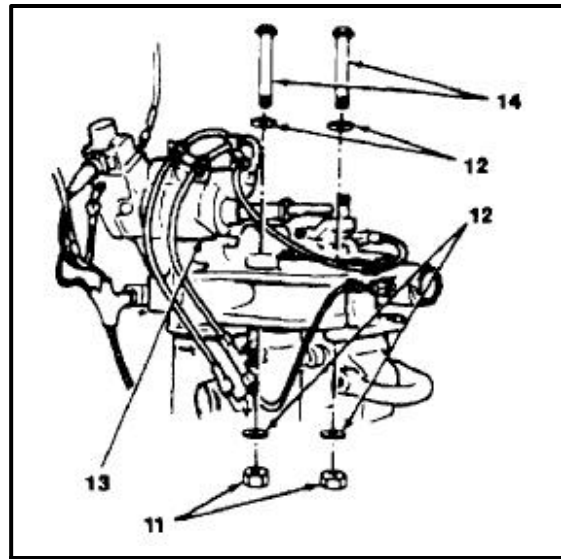


6. Remove two nuts (11) and lower washers (12).



Do not let power steering assembly fall when attaching bolts are removed. Equipment could be damaged.

7. Have helper hold power steering assembly (13). Remove two bolts (14) and washers (12).

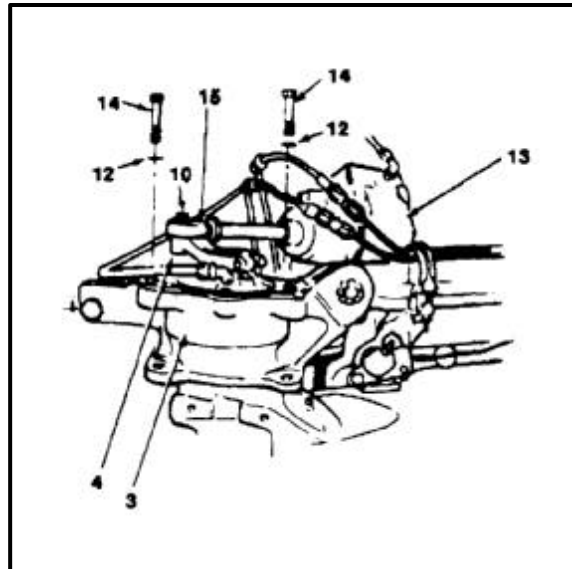


8. Install power steering rod-end (15) over stud (10) on steering lever (4).

WARNING

Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

9. Apply antiseize compound (E75) to shank of bolts (14). Align holes in power steering assembly (13) and swivel housing (3). Install two bolts (14) and washers (12).

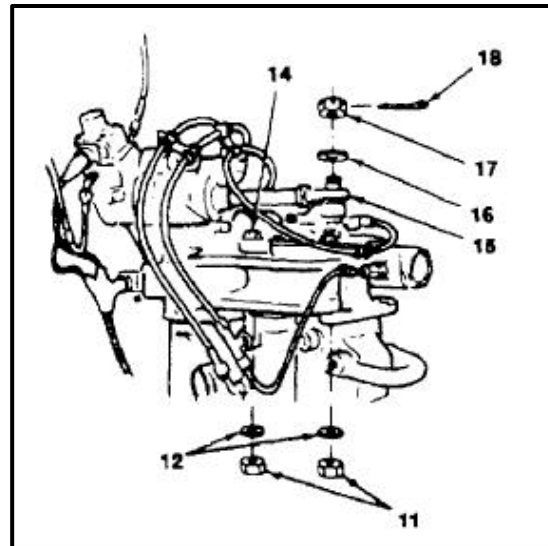


3-70 INSTALL STEERING LEVER (Continued)**3-70**

10. Install two washers (12) and nuts (11) on bolts (14).
11. Torque two nuts (11) to **35 inch-pounds** above run-on torque.
12. Install washer (16) and nut (17).
13. Torque nut (17) **290 to 410 inch-pounds**.
14. Install cotter pin (18).
15. Make sure rod-end (15) is free on stud and that rod is not bent.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close aft landing gear panels (Task 2-2).
- Perform operational check of power steering (TM 55-1520-240-T).



END OF TASK

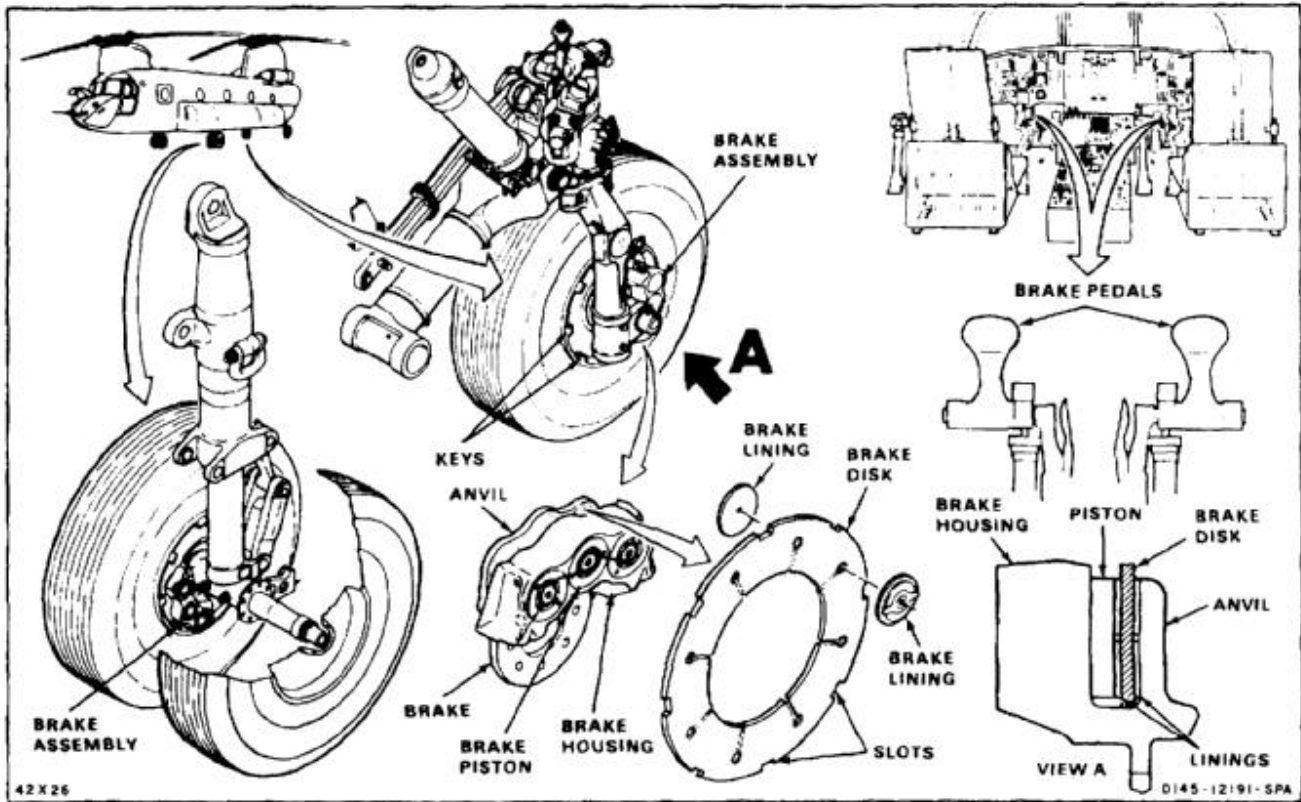
SECTION III
BRAKES DESCRIPTION AND OPERATION

A brake is installed on the axle flange of each of the six wheels. All wheels are equipped with a single brake disk and a three-piston brake unit. The brake unit does not move. The disk floats inside of the wheel rim, and rotates between the brake linings when the wheel is turning. Keys inside the wheel rim match with key slots in the brake disk. When the wheel turns, the keys drive the disk around with the wheel. The brakes are operated by hydraulic pressure applied by toe pedals. When the right and left pedals are pressed at the same time, hydraulic pressure pushes the pistons and brake linings

against the brake disk. The linings trap the disk and slow it down on all wheels. When the right pedal or left pedal only is pressed, brakes are applied only to that side of the helicopter. This aids ground maneuvering.

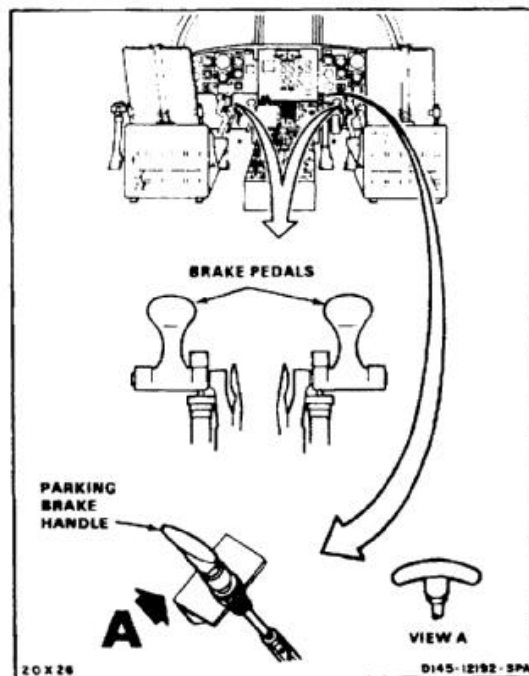
BRAKE ASSEMBLY

The brake is made up of a housing, three pistons, three brake linings, and parts to seal, adjust, and bleed the brake. Three brake linings are on the pistons, and three are on the anvil part of the housing.



PARKING BRAKES

All landing gear assemblies have parking brakes. These are applied mechanically by a handle at the pilot's side of the console. Pressure is trapped in the brake by the parking brake valve when it is applied. An advisory light on the caution/advisory panel comes on to indicate that the parking brake is engaged.



END OF TASK

SECTION IV BRAKES

INITIAL SETUP

Applicable Configurations:

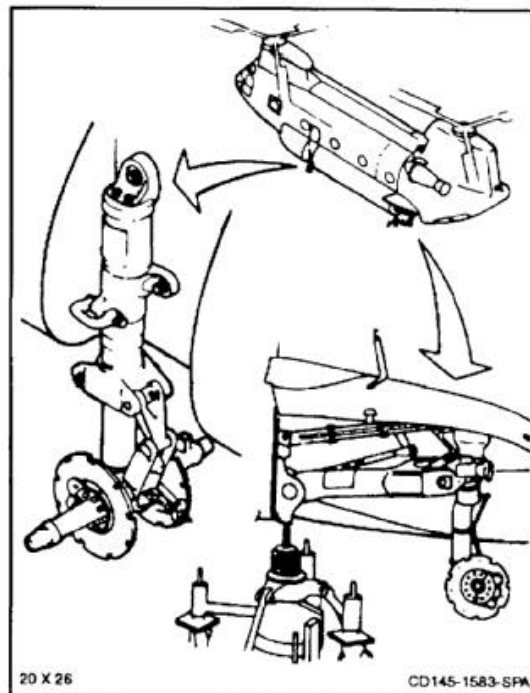
All

Tools:

Aircraft Inspection Tool Kit, NSN 5180-00-323-5114

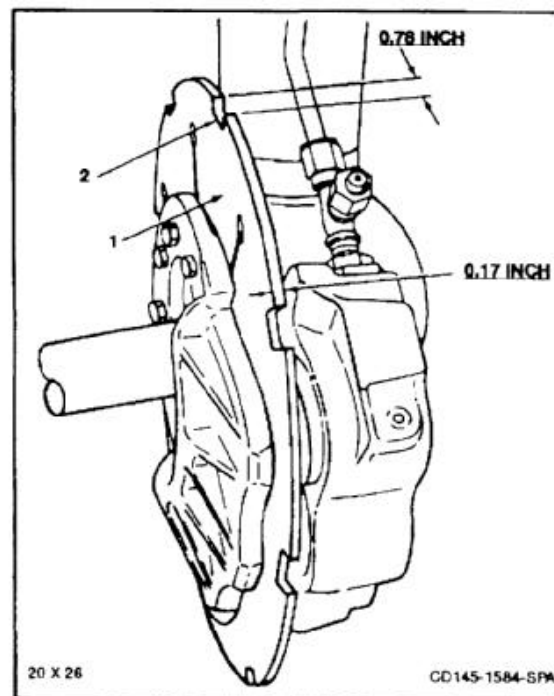
Materials:

None

Personnel Required:Medium Helicopter Repairer
Inspector**Equipment Conditions:**Battery Disconnected (Task 1-39)
Electrical Power Off
Forward or Aft Landing Gear Jacked as Required
(Tasks 1-23 and 1-24)
Wheel Removed (Task 3-7 or 3-7.1)**NOTE**

Procedure is same for all brakes except as noted in task. Aft brake is shown here.

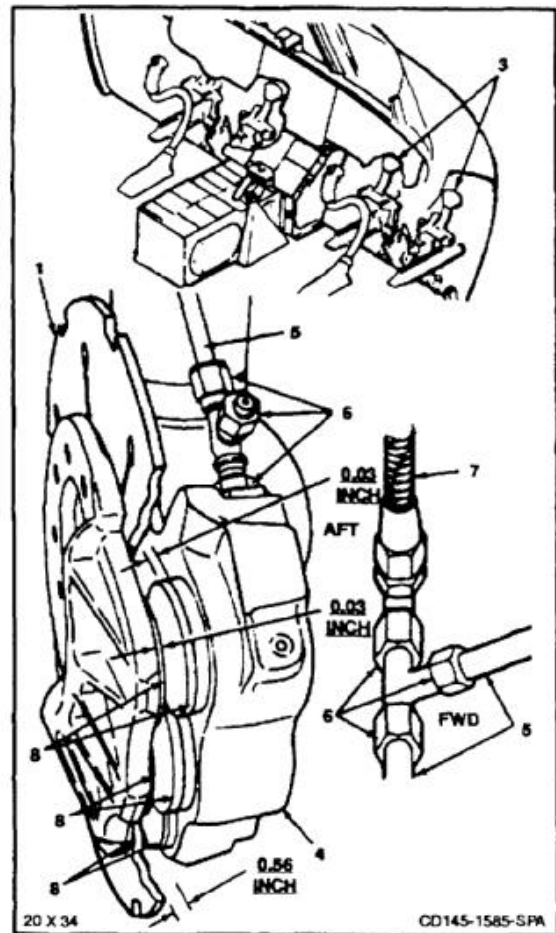
1. Measure thickness of brake disk (1). Disk shall not measure less than **0.17 inch**.
2. Measure width of key slots (2). Slots shall not measure more than **0.78 inch**.
3. Check brake disk (1) for distortion. Disk shall not be dished so that brake drags.



3-72 INSPECT BRAKES (DISKS AND LININGS) (Continued)

3-72

4. Have helper apply pressure to brake pedals (3).
5. Measure distance between brake housing (4) and disk (1). The distance shall not be greater than **0.56 inch**.
6. Check for leaks. There shall be no leaks at housing (4), tube (5), fittings (6), or forward brake hose (7).
7. Have helper release brake pedals (3).
8. Check tube (5), fittings (6), and forward brake hose (7) for damage. There shall be no gouges, pinching, and chafing.
9. Measure outer edge thickness of each brake lining (8). No measurement shall be less than **0.03 inch**.

**FOLLOW-ON MAINTENANCE:**

- Install wheels (Task 3-12 or 3-12.1).
- Remove jacks from helicopter (Task 1-23 or 1-24).
- Close access panels (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Spanner (APP E-35)

Materials:

None

Personnel Required:

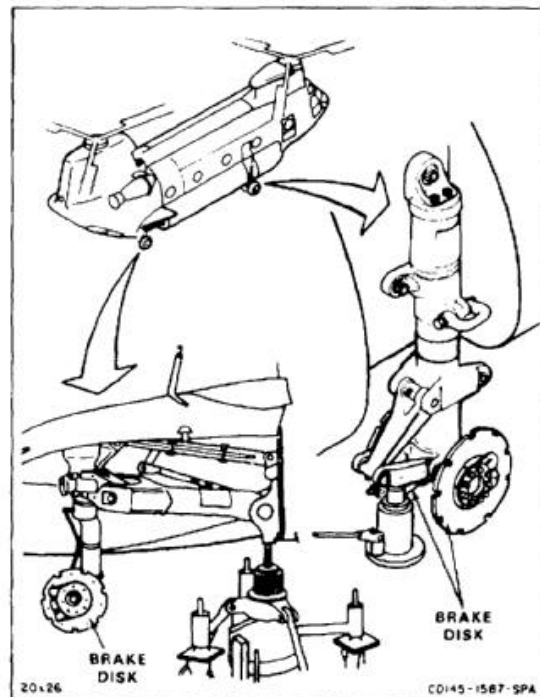
Medium Helicopter Repairer

References:

Appendix E

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Utility Hydraulic System Depressurized (TM
55-1520-240-T)
Parking Brake Released
Forward or Aft Landing Gear Jacked as Required
(Task 1-23 or 1-24)
Wheel Removed (Task 3-7)
Axle Removed (Task 3-14 or 3-34)

**NOTE**

Procedure is same for all brake disks.

1. Remove lockwire from nuts (1).

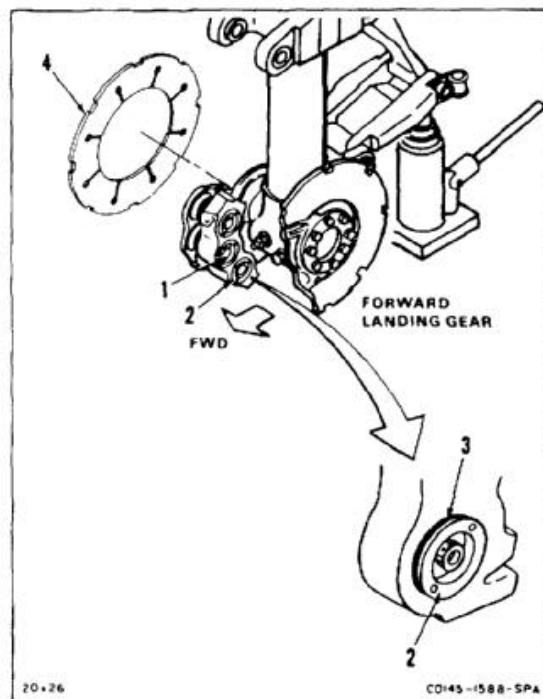


Do not back out cylinder head to expose more than half of packing. Damage to packing can result when heads are turned in.

2. Back out each cylinder head (2) full turns until half of packing (3) is exposed. Use spanner (APP E-35).
3. Remove brake disk (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692
Spanner (APP E-35)

Materials:

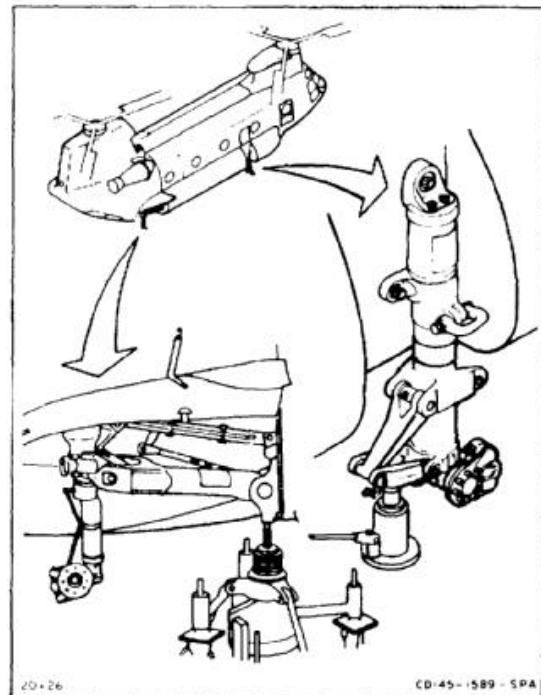
Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P
Appendix E

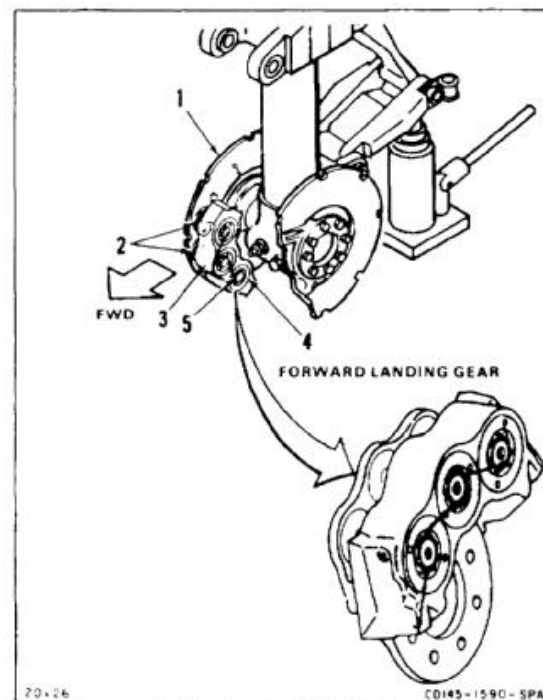
**NOTE**

Procedure is same for all brake disks.

1. Position brake disk (1) between brake linings (2) in brake (3).
2. Turn cylinder head (4) into brake (3) until head is flush with brake. Use spanner (APP E-35).
3. Lockwire nuts (5). Use lockwire (E231).

INSPECT**FOLLOW-ON MAINTENANCE:**

Install axle (Task 3-15 or 3-35).
Install wheel (Task 3-12).
Lower and remove jack (Task 1-23 or 1-24).
Pressurize utility hydraulic system (TM 55-1520-240-T).
Set parking brake.



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Spanner (APP E-35)

Materials:

Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)

Personnel Required:

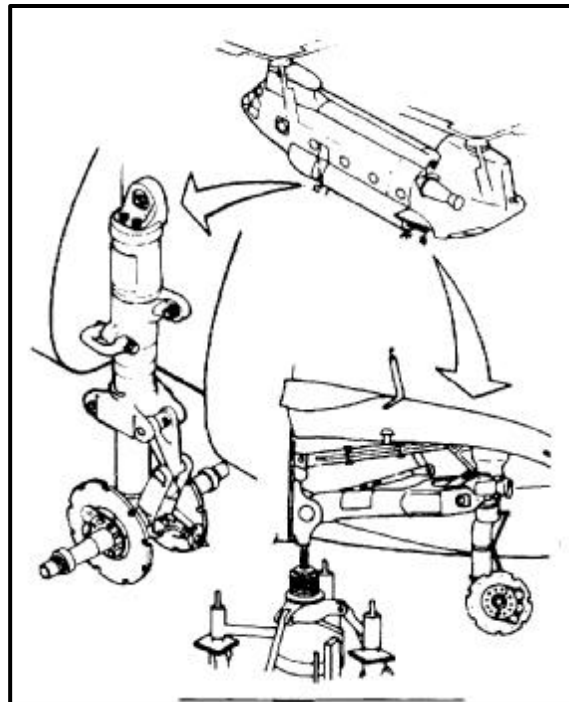
Medium Helicopter Repairer

References:

Appendix E

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Utility Hydraulic System Depressurized (TM 55-1520-240-T)
Parking Brake Released
Forward or Aft Landing Gear Jacked As Required (Task 1-23 or 1-24)
Wheel Removed (Task 3-7)



NOTE

Procedure is same for all brakes.

WARNING

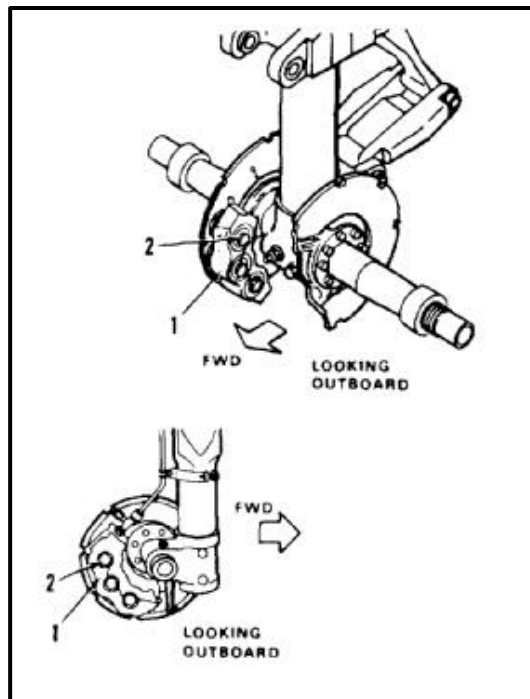
Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean brake (1). Use solvent (E162). Dry with cloth (E120). Wear gloves (E186).

CAUTION

Do not loosen locknuts. Loosening of locknuts could change adjustment of bushing and cause brake to lock.

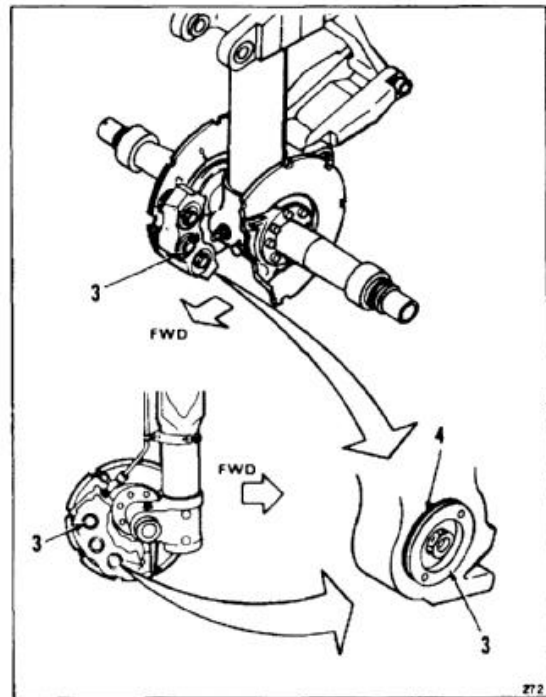
2. Remove lockwire from locknuts (2).



CAUTION

Do not back out cylinder head to expose more than half of packing. Damage to packing could result when heads are turned in.

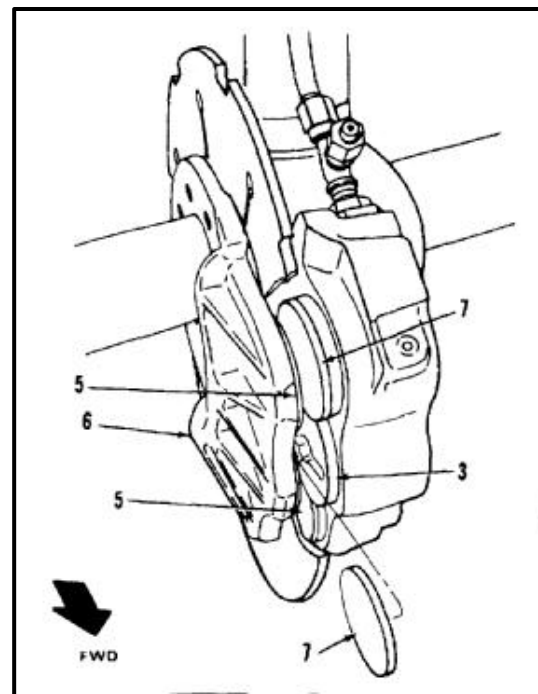
3. Back out three cylinder heads (3) **two full turns** until half of packing (4) is exposed. Use spanner (APP E-35).



4. Remove three inboard linings (5) from anvil (6).
5. Remove three remaining brake linings (7) from brake pistons (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Spanner (APP E-35)

Materials:

Adhesive (E31)
Cloths (E120)
Gloves (E186)
Lockwire (E231)
Methyl-Ethyl-Ketone (E244)

Parts:

Shim, 0.040 Inch Thick

Personnel Required:

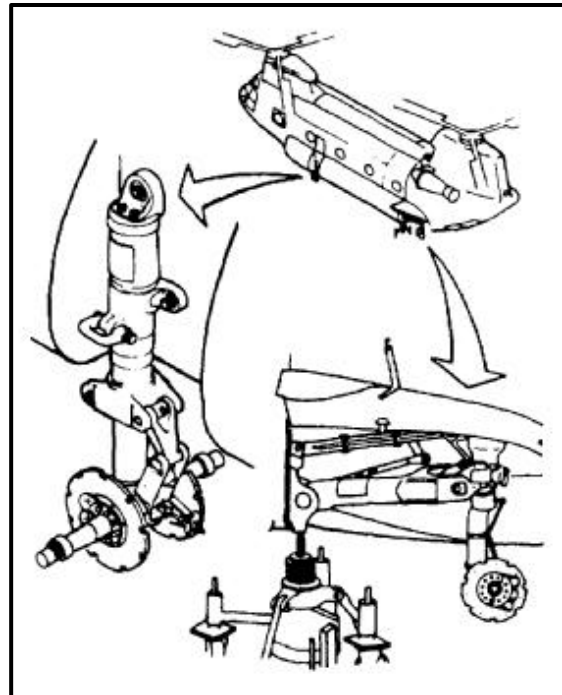
Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P
Task 1-38
Task 3-12
Task 7-330
Appendix E

General Safety Instructions:**WARNING**

Adhesive (E31) and methyl-ethyl-ketone (E244) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



NOTE

Procedure is same for all brakes.

1. Clean old adhesive from anvil (1) and piston (2). Use methyl-ethyl-ketone (E244). Wipe anvil dry with cloth (E120). Wear gloves (E186).



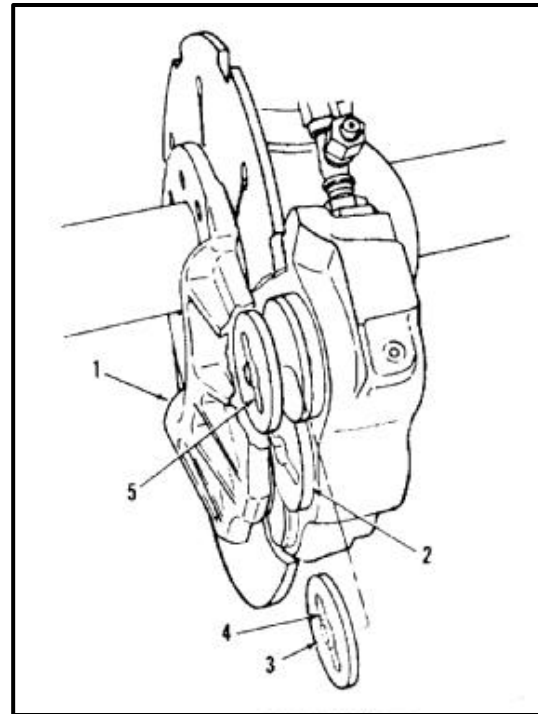
Replace brake linings as complete set of six. Partial replacement will result in uneven wear and make brakes unreliable.

Use all asbestos or all non-asbestos brake linings in any single brake assembly. Brake assemblies containing asbestos linings and brake assemblies containing non-asbestos linings may be used on the same aircraft.

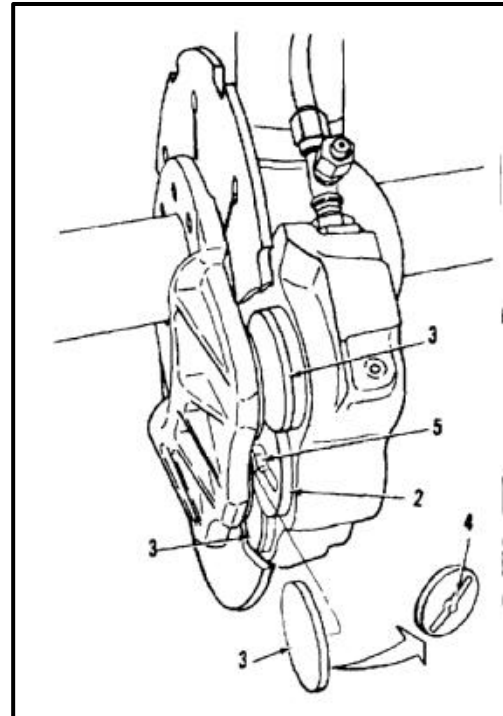
NOTE

Adhesive will hold lining in place during assembly.

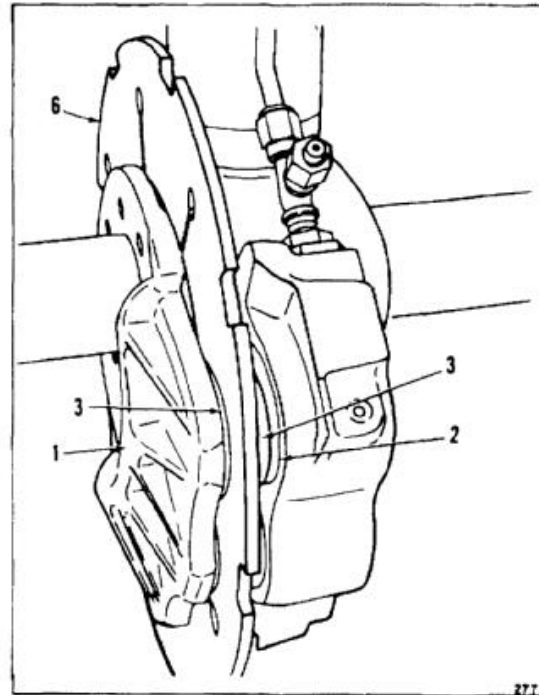
2. Apply adhesive (E31) to back of three new linings (3) around raised key (4). Wear gloves (E186).
3. Install three linings (3) in anvil (1). Make sure keys (4) on linings fit keyway (5) in anvil.



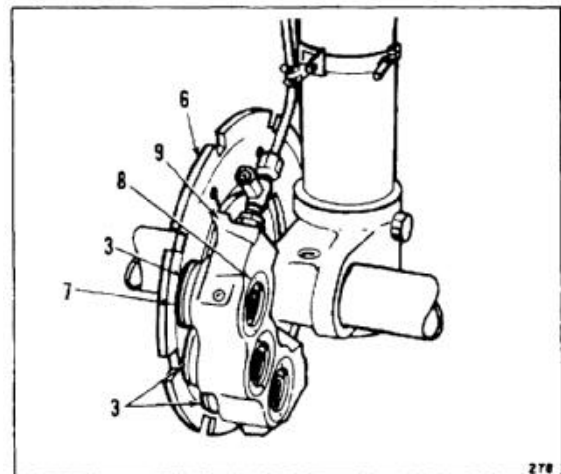
4. Apply adhesive (E31) to back of one new lining (3) around raised key (4). Wear gloves (E186).
5. Install lining (3) in piston (2). Make sure key (4) on lining fits keyway (5) of piston.
6. Repeat steps 4 and 5 to install two remaining linings (3).



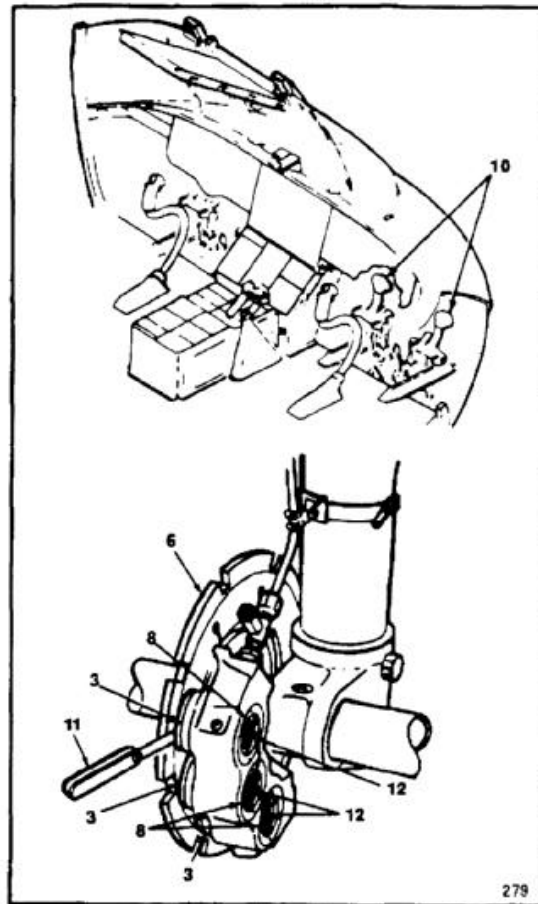
7. Check that linings (3) are correctly positioned in keyway. Check for **0.040 inch** maximum clearance without backing out cylinder heads more than **two full turns** (Task 3-75).



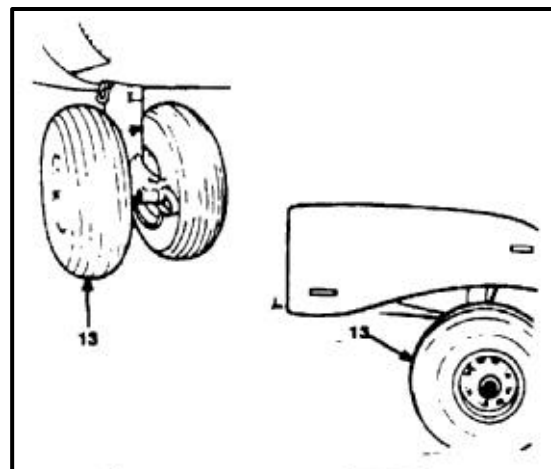
8. Insert **0.040 inch** shim (7) between disk (6) and lining (3).
9. Turn cylinder head (8) into housing (9) until head is flush with housing.
10. Back out cylinder head (8) until shim (7) can be removed. Use spanner (APP E-35).
11. Repeat steps 8 thru 10 for two remaining linings (3).
12. Turn cylinder heads (8) into housing (9) until heads are flush with housing.



13. Pressurize utility hydraulic system (Task 1-38).
14. Bleed brakes (Task 7-330).
15. Press brake pedals (10) fully and hold.
16. Check clearance between linings (3) and disk (6). There shall be no clearance and no lateral play.
17. Release brake pedals (10).
18. Insert feeler gage (11) between disk (6) and lining (3). Clearance shall be **0.010 to 0.033 inch**.
19. Lockwire nuts (12) on cylinder heads (8). Use lockwire (E231).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Install wheels (13) (Task 3-12).
- Remove jack from helicopter (Task 1-23 or 1-24).
- Closed access panels (Task 2-2).



END OF TASK

3-77 REMOVE FORWARD BRAKES**3-77****INITIAL SETUP****Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692
Container, 2 Quart

Materials:

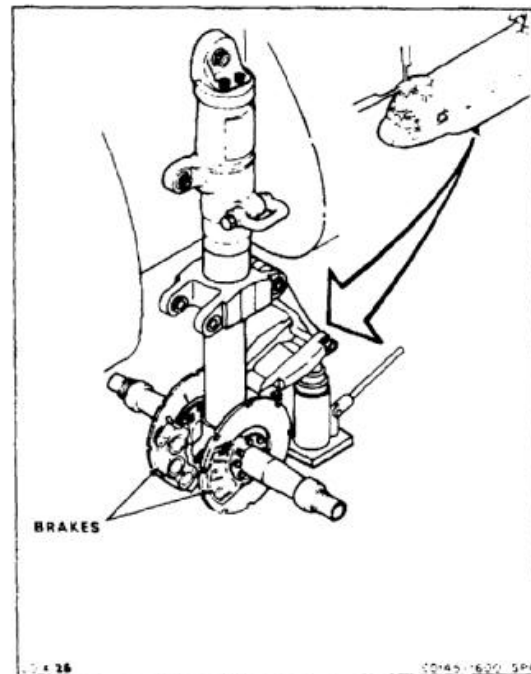
Cloths (E120)

Personnel Required:

Medium Helicopter Repairer

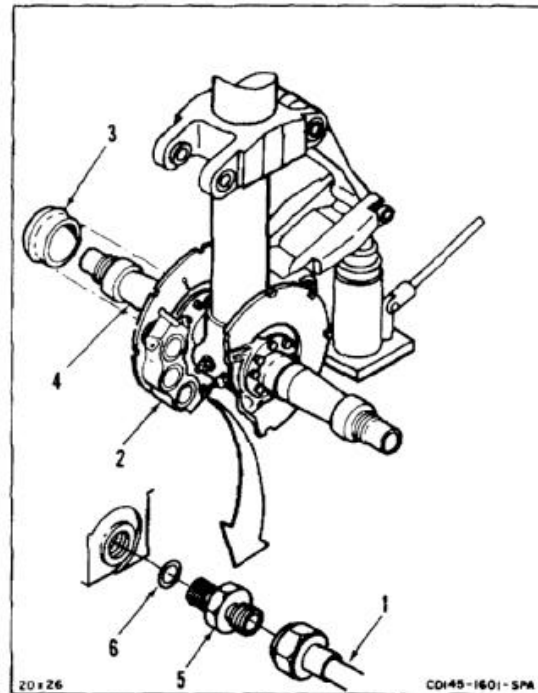
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility Hydraulic System Depressurized (TM
55-1520-240-T)
Helicopter Jacked at Forward Landing Gear (Task
1-23)
Forward Wheels Removed (Task 3-7)
Parking Brake Released

**NOTE**

Procedure is same for left and right
inboard and outboard brakes. Left
forward landing gear is shown here.

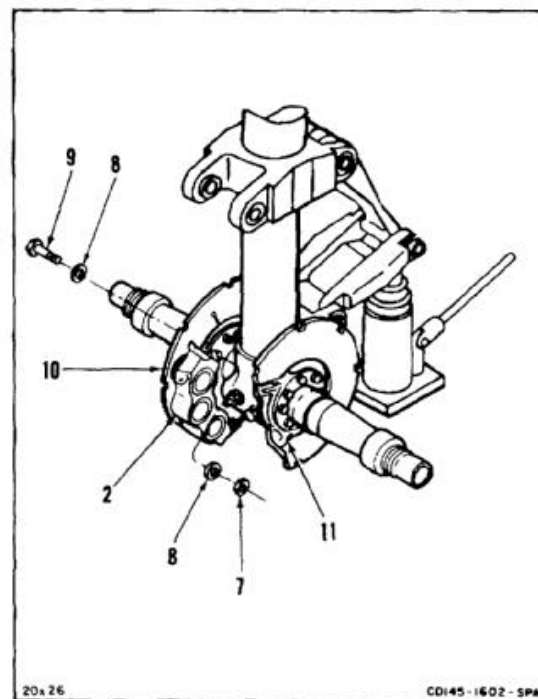
1. Disconnect hydraulic tube (1) at brake (2). Use container and cloth (E120) to catch hydraulic fluid.
2. Remove bushing (3) from axle (4).
3. Remove nipple (5) and packing (6).



4. Remove eight nuts (7), 16 washers (8), and eight bolts (9).
5. Remove brake (2) with brake disk (10).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692
 Spanner (APP E-35)
 Arbor Press

Materials:

None

Personnel Required:

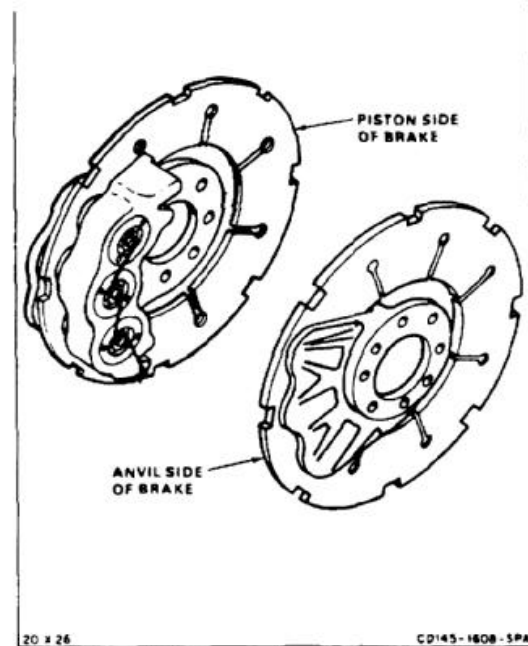
Medium Helicopter Repairer

References:

Appendix E

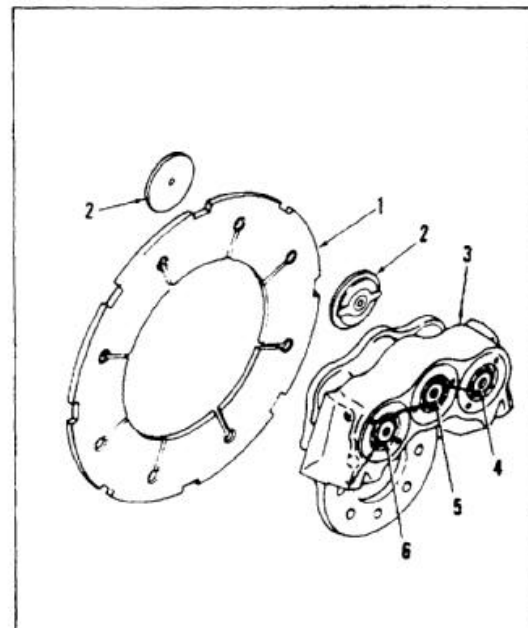
Equipment Condition:

Off Helicopter Task

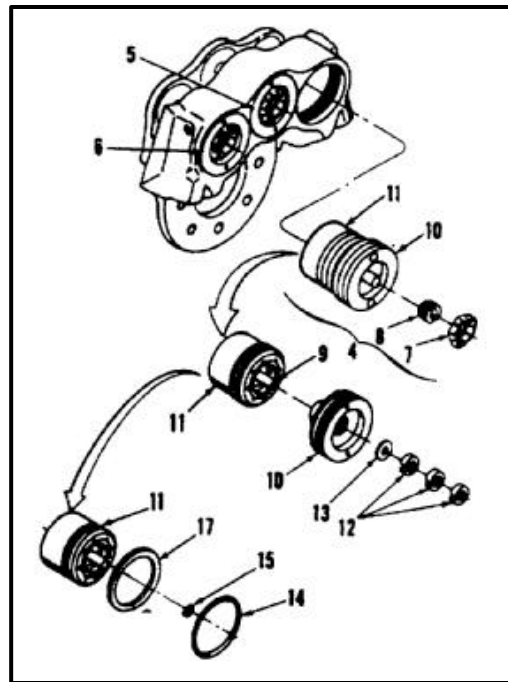
**NOTE**

Procedure is same for all brakes.

1. Remove disk (1) and linings (2) from brake housing (3).
2. Remove lockwire from cylinder head assemblies (4, 5, and 6).
3. Remove cylinder head assemblies (4, 5, and 6) from brake housing (3). Use spanner (APP E-35).



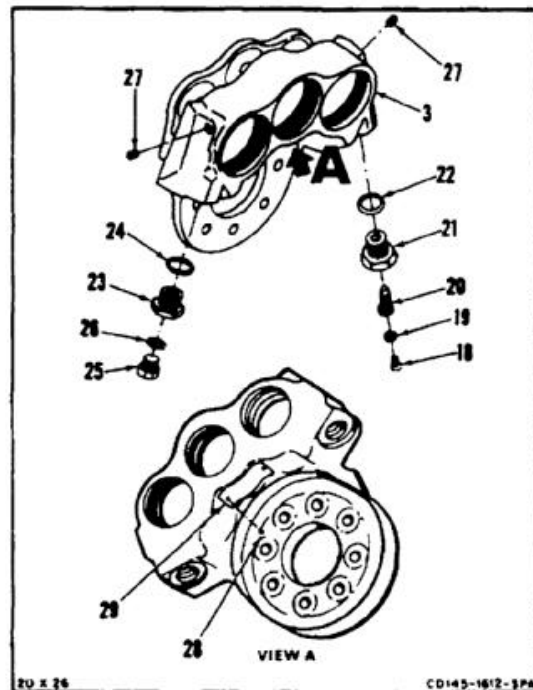
4. Remove nut (7) and bushing (8).
5. Apply pressure to adjustment pin (9) and remove cylinder head (10) from piston (11). Use arbor press.
6. Remove three grips (12) and washer (13) from cylinder head (10).
7. Remove packings (14 and 15) and retainer (17) from piston (11).
8. Repeat steps 4 and 5 for two cylinder head assemblies (5 and 6).



9. Remove screw (18), washer (19), valve (20), adapter (21), and packing (22) from brake housing (3).
10. Remove lockwire, bushing (23), and packing (24).
11. Remove plug (25) and packing (26) from bushing (23).
12. Remove two expansion plugs (27) from brake housing (3).
13. Remove two drive screws (28) and plate (29) from brake housing (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

Cleaning Solvent (E162)
 Cloth (E120)
 Gloves (E186)

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

Brake Disassembled (Task 3-78)
 Off Helicopter Task

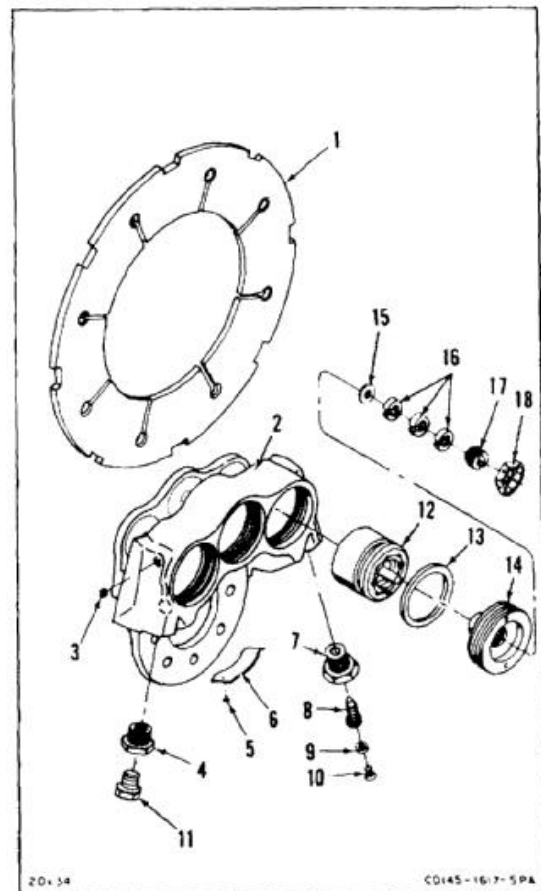
WARNING

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean all metal parts (1 thru 18) with cleaning solvent (E162). Wear gloves (E186).
2. Wipe all parts dry with cloth (E120).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Inspection Tool Kit, NSN 5180-00-323-5114

Materials:

None

Personnel Required:

Inspector

References:

TM 55-1520-240-23P

TM 1-1500-204-23

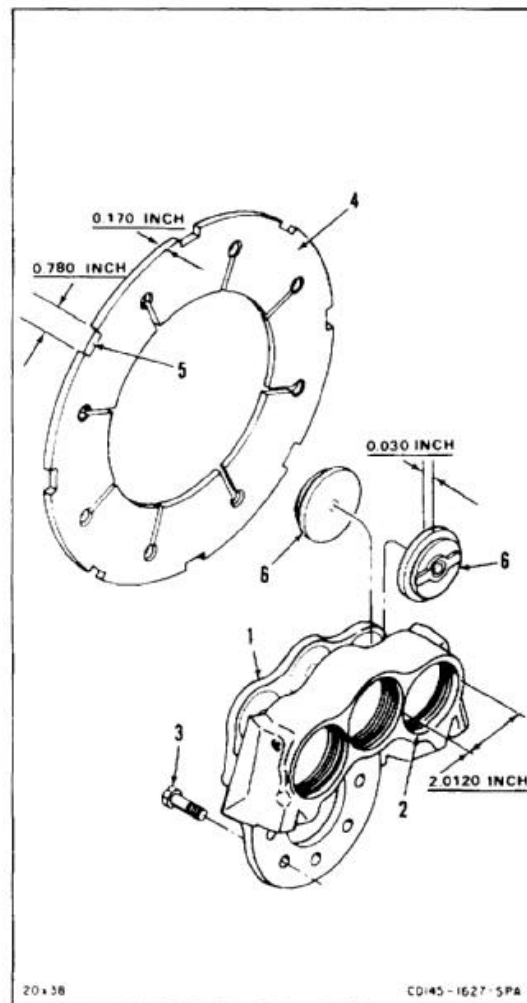
Equipment Condition:Off Helicopter Task
Brake Parts Cleaned (Task 3-79)**NOTE**

Procedure is same for all brakes.

1. Check housing (1). There shall be no cracks (TM 1-1500-204-23).
2. Check housing cylinder walls (2) for wear or scoring. Diameter shall not be greater than **2.0120 inches**. There shall be no scoring.
3. Check bolts (3). There shall be no stripped thread.
4. Check brake disk (4) for thickness. Disk thickness shall not be less than **0.170 inch**.
5. Measure key slots (5). Slots shall not be worn to width greater than **0.780 inch**.
6. Check brake lining (6) for thickness. Lining shall not be less than **0.030 inch**.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

3-210

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692
 Spanner (APP E-35)
 Arbor Press

Materials:

Lockwire (E230)

Parts:

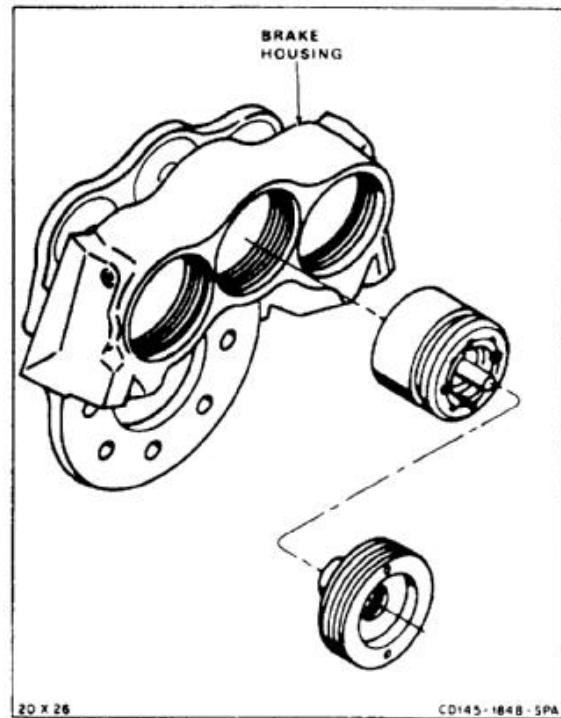
Packing
 Brake Linings (6)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

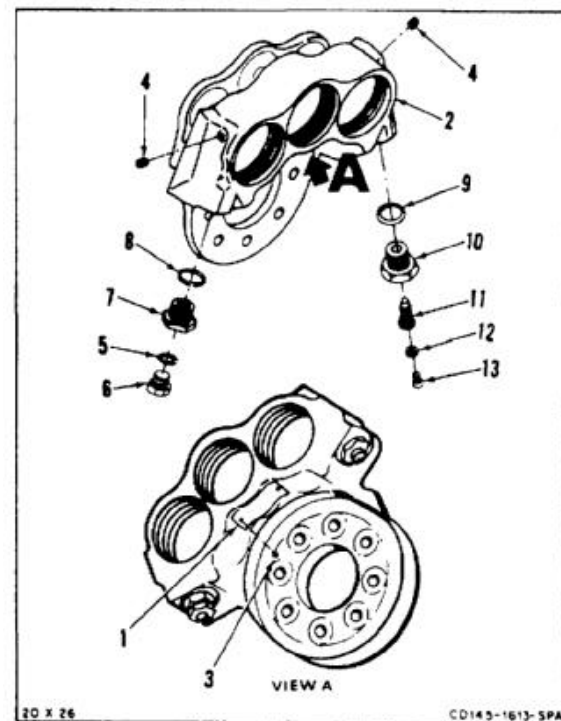
TM 55-1520-240-23P
 Task 3-74
 Task 3-76
 Appendix E



NOTE

Procedure is same for all brakes.

1. Position plate (1) on brake housing (2). Install two drive screws (3).
2. Install two expansion plugs (4).
3. Install packing (5) and plug (6) into bushing (7). Install bushing and packing (8) into brake housing (2).
4. Install packing (9), adapter (10), valve (11), washer (12), and screw (13) into brake housing (2).

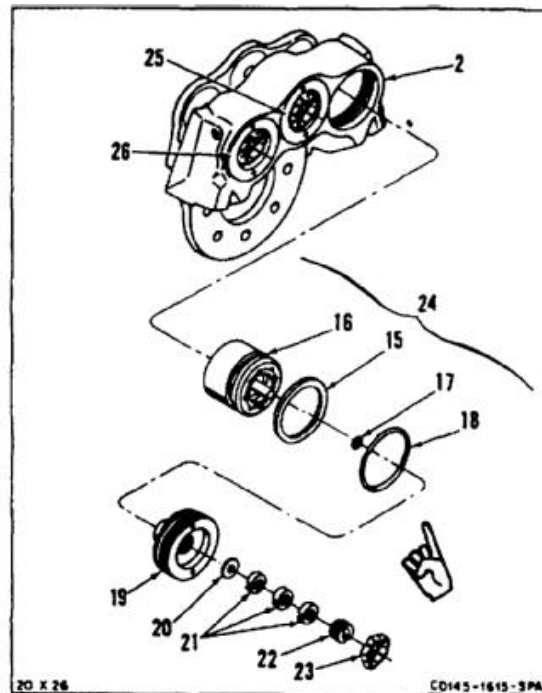


5. Install retainer (15) on piston (16).
6. Install packings (17 and 18) on cylinder head (19).
7. Position and hold cylinder head (19) against piston (16). Using arbor press, install washer (20) and three grips (21) on pin of piston. Make sure grips are against cylinder head.

NOTE

Hold cylinder head in position on piston until nut is installed.

8. Install bushing (22) on cylinder head (19). When bushing bottoms, back off **1/2 turn**.
9. Install nut (23) on pin of piston (16).
10. Install cylinder head assembly (24) in brake housing (2) with cylinder head flush with housing. Use spanner (APP E-35).
11. Repeat steps 5 thru 10 for the remaining two cylinder head assemblies (25 and 26).

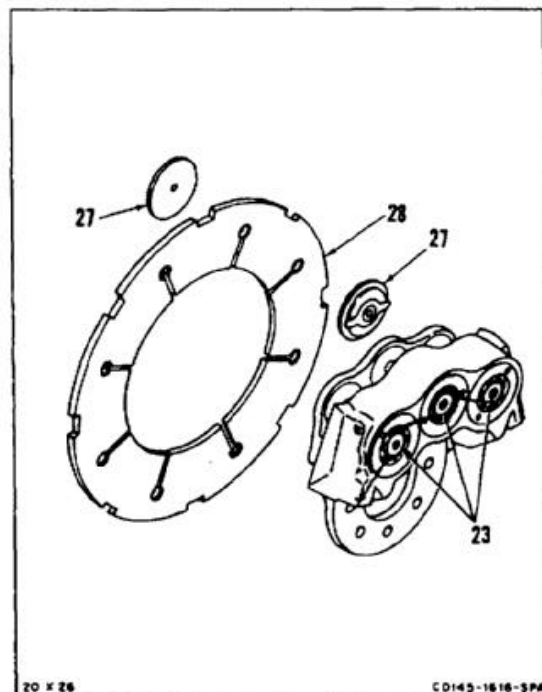
**CAUTION**

Use all asbestos or all non-asbestos brake linings in any single brake assembly. Brake assemblies containing asbestos linings and brake assemblies containing non-asbestos linings may be used on the same aircraft.

12. Install linings (27) (Task 3-76).
13. Install disk (28) (Task 3-74).
14. Lockwire nuts (23) together. Use lockwire (E230).

INSPECT**FOLLOW-ON MAINTENANCE:**

None



END OF TASK

3-212

INITIAL SETUP

Applicable Configurations:

All

Tools:

Hydraulic Test Stand Type D6A, D5B, or Other Source of 1000 Psi

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

Task 3-74

Equipment Condition:

Off Helicopter Task

WARNING

High pressures used in testing hydraulic components can cause line rupture or component failure. Only qualified personnel shall operate, service and maintain hydraulic test equipment. Use heavy plastic shielding, **1/2 inch** thickness or more, when applying pressures over **250 psi**, to prevent injury to personnel.

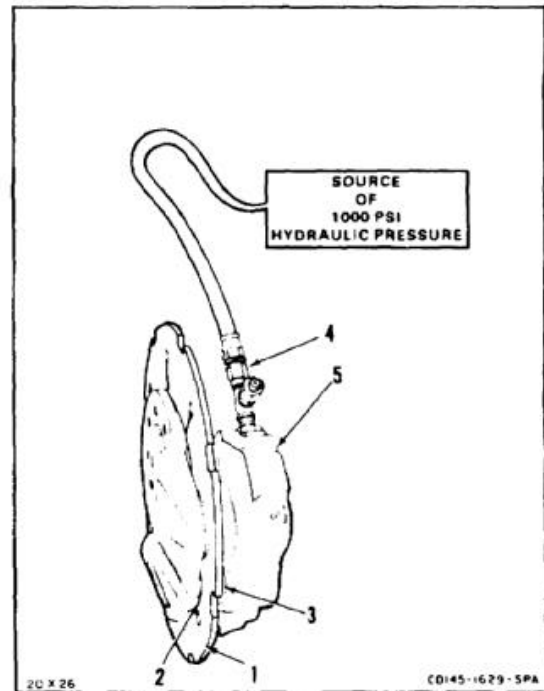
NOTE

Procedure is same for all brakes.

1. Install brake disk (1) between brake linings (2 and 3) (Task 3-74).
2. Connect test stand hose fitting (4) to brake (5).
3. Apply **935 psi** to brake (5) for **2 minutes**. There shall be no leaks.
4. Apply and release pressure **10 times**. Check that brake disk is free when pressure is released.
5. Keep brake in static condition for **2 minutes**. There shall be no static leaks.
6. Disconnect test stand hose fitting (4) from brake (5).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Antiseize Compound (E75)
Acid Swabbing Brush (E86)
Sealing Compound (E350)
Epoxy Primer (E292.1)
Gloves (E184.1)

Parts:

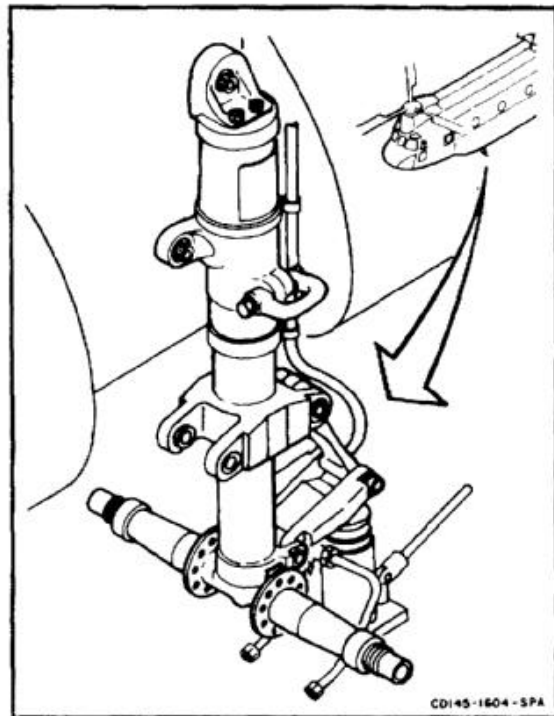
Packing

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

**NOTE**

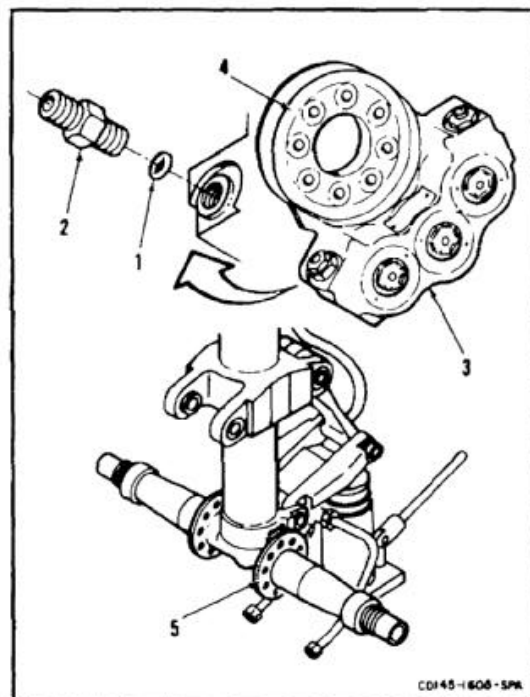
Procedure is same for left and right inboard and outboard brakes except as noted. Left forward landing gear is shown here.

1. Install packing (1) and union (2) on brake (3) if brake is being replaced.

WARNING

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame, avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

2. Apply epoxy primer (E292.1) to brake mating surface (4) and axle flange (5). Wear gloves (E184.1).



3. Position brake (3) with brake disk (6) on axle flange (5) as follows:
 - a. Brake (3) must be on forward side of axle (7).
 - b. Union (2) must be horizontal.
 - c. Brake (3) bolt holes must align with holes in axle flange (5).

WARNING

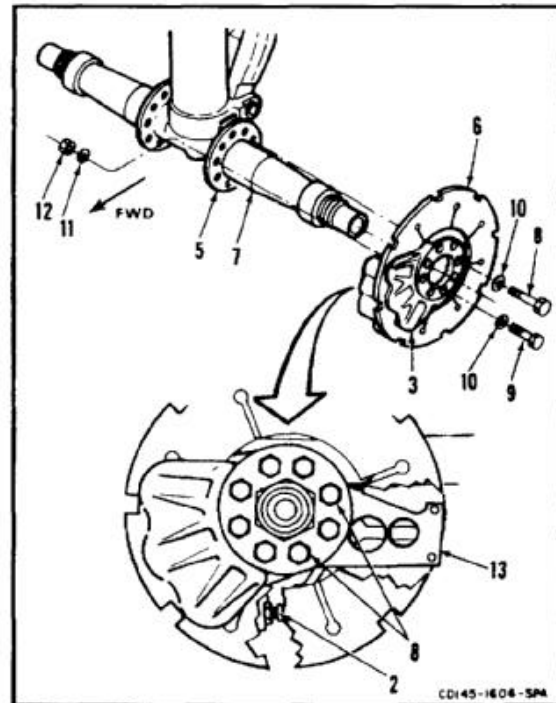
Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

4. Apply antiseize compound (E75) to shanks of bolts (8 and 9). Use brush (E86). Wear gloves (E184.1).

NOTE

Longer bolts are installed on forward left outboard and right inboard brakes. To install bolts in left outboard or right inboard brakes, perform steps 5 and 7. To install bolts in left inboard or right outboard brakes, perform steps 6 and 7.

5. Install two long bolts (8), six shorter bolts (9), 16 washers (10 and 11), and eight nuts (12) on forward left outboard or right inboard brake (3) only. Make sure long bolts go through air valve bracket (13).
6. Install eight bolts (9), washers (10), washers (11), and nuts (12) on forward left inboard or right outboard brake (3) only.
7. Torque eight nuts (12) to **105 inch-pounds**.



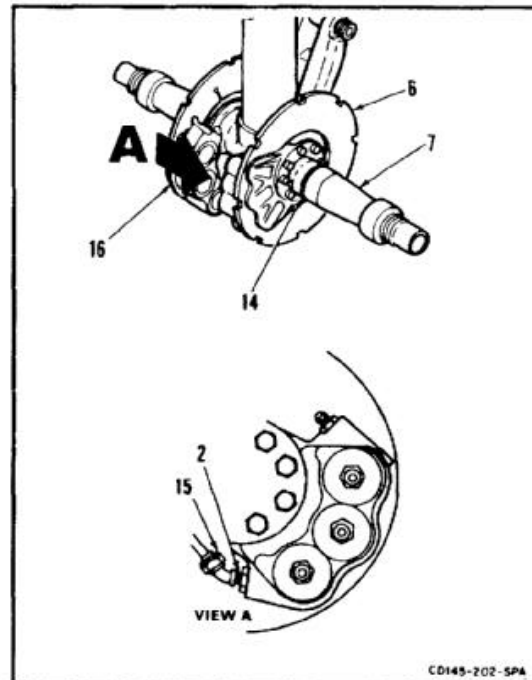
WARNING

Sealing compound (E350) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

8. Apply sealing compound (E350) to bore of bushing (14). Install bushing on axle (7) while sealant is wet. Make sure shoulder of bushing faces away from disk (6). Wear gloves (E164.1).
9. If axle (7) was removed, install axle (Task 3-15).
10. Connect tube (15) to union (2).
11. Repeat steps 1 thru 10 to install other brake (16).

INSPECT**FOLLOW-ON MAINTENANCE:**

Install forward wheels (Task 3-12).
 Remove jack from forward landing gear (Task 1-23).
 Bleed brake system (Task 7-330).



END OF TASK

3-216

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Container, 2 Quart

Materials:

Cloths (E120)

Personnel Required

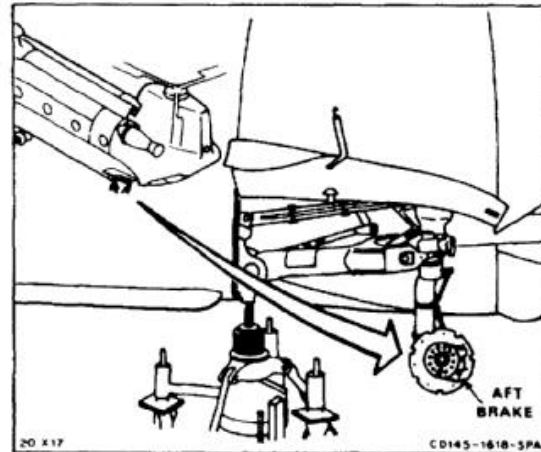
Medium Helicopter Repairer

References:

Task 3-34

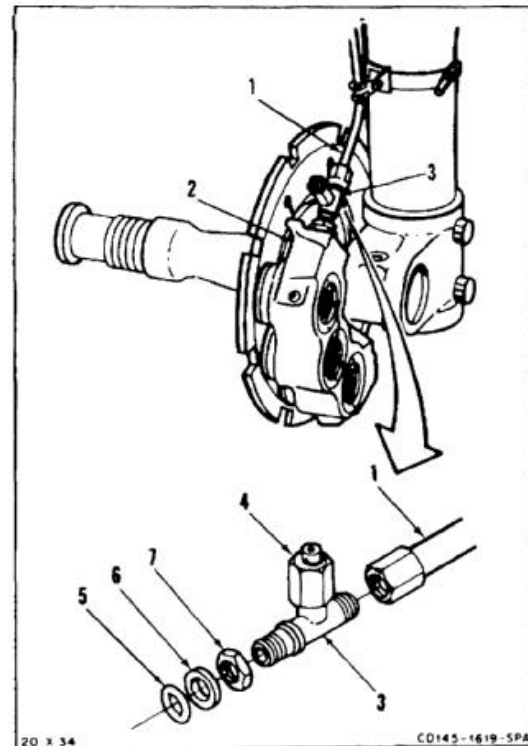
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Parking Brake Released
Utility Hydraulic System Depressurized (TM
55-1520-240-T)
Helicopter Jacked at Aft Fuselage Jack Pad (Task
1-24)
Wheel Removed (Task 3-7)
Swivel Locks Unlocked (TM 55-1520-240-T)

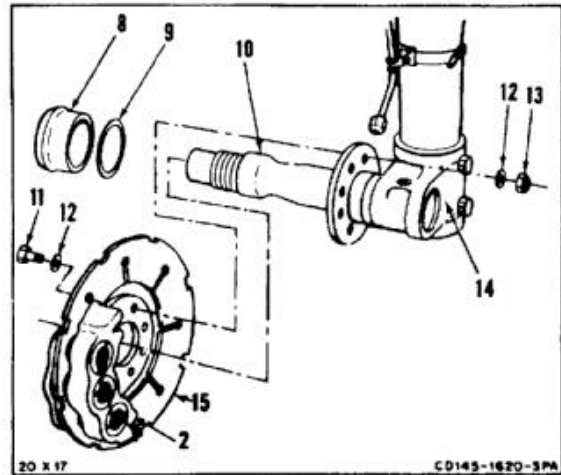
**NOTE**

Procedure is same for left or right gear. Left gear is shown here.

1. Disconnect hydraulic tube (1) from tee (3). Use container to catch hydraulic fluid when fittings are disconnected. Use cloths (E120) to wipe up spilled fluid.
2. If brake (2) is to be replaced, remove tee (3), with cap (4), packing (5), washer (6), and locknut (7).



3. Remove sleeve bushing (8) and one or two spacers (9), if installed, from axle (10). If sleeve bushing is tight on the axle, remove axle from housing. Remove sleeve over opposite end of axle (Task 3-34).
4. Remove six bolts (11), 12 washers (12), and six nuts (13) securing brake (2) to housing (14).
5. Remove brake (2) and brake disk (15).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

3-218

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 100-750 Inch-Pounds

Materials:

Antiseize Compound (E75)
Sealing Compound (E336)
Epoxy Primer (E292.1)
Gloves (E184.1)
Goggles (E473)

Parts:

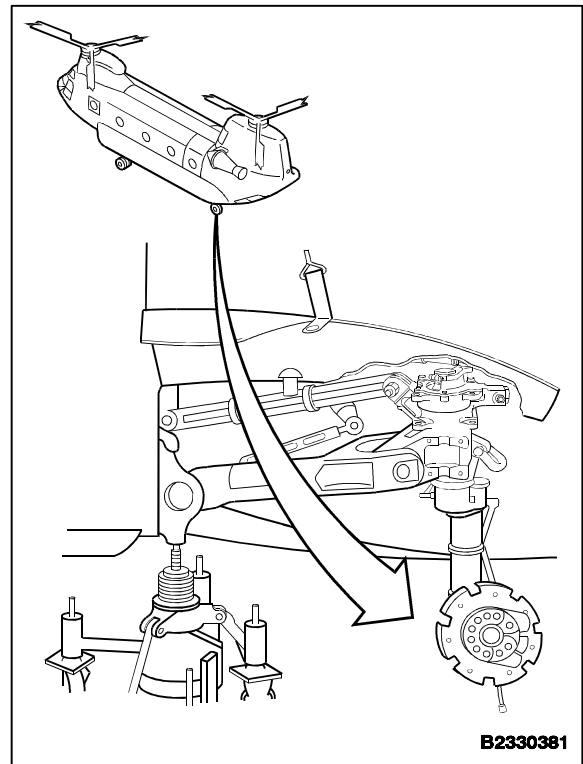
Packing

Personnel Required:

CH-47 Helicopter Repairer
Inspector

References:

Task 3-35
TM 55-1520-240-23P

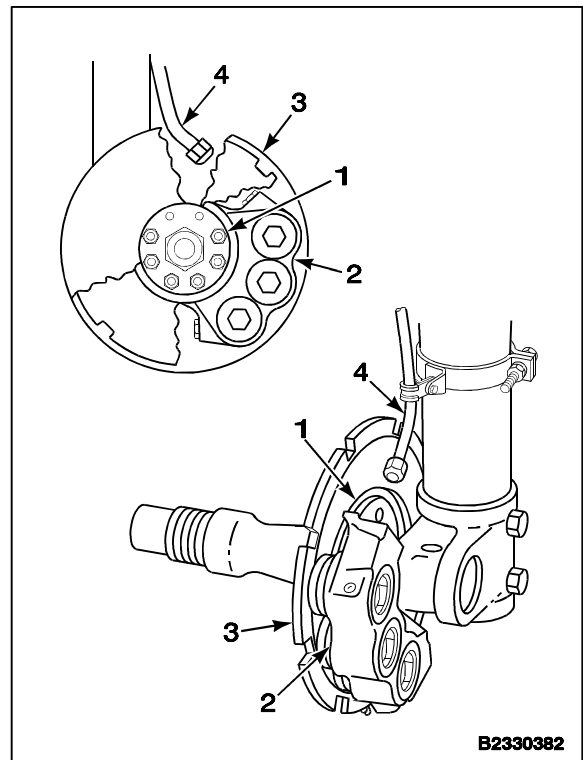
**WARNING**

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Procedure is same for left and right brakes. Left gear shown here.

1. Apply primer (E292.1) to mating surfaces of axle flange (1) and brake (2). Wear gloves (E184.1).
2. Position brake (2) with disk (3) on axle flange (1).
3. Align bolt holes of brake (2) and flange (1). Make sure brake is in position to match brake tube (4).



WARNING

Antiseize compound (E75) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

CAUTION

Use only high-shear bolts for this installation.

NOTE

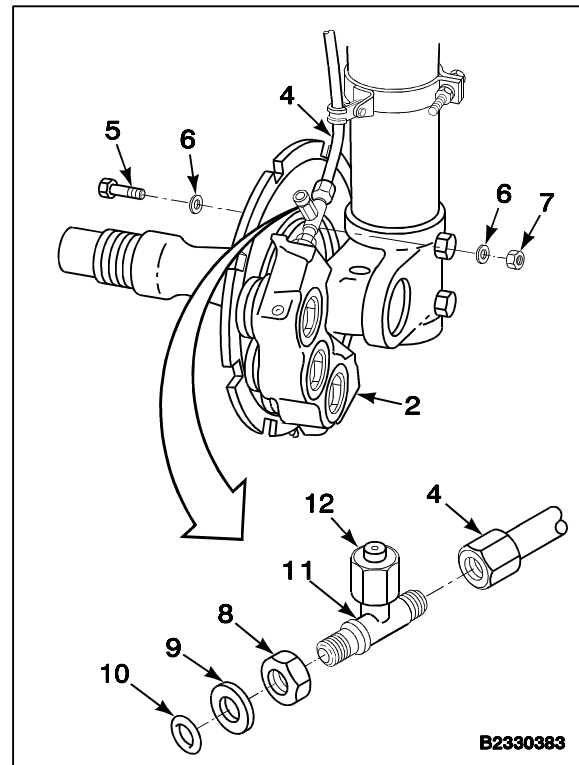
The axle flange has eight bolt holes but only six are used.

4. Apply antiseize compound (E75) to shanks of six shear bolts (5). Install six bolts (5), 12 washers (6), and six nuts (7). Wear gloves (E184.1).
5. Torque six nuts (7) to **190 inch-pounds**.

NOTE

If a new brake is being installed, perform step 6. If not, go to step 7.

6. Install nut (8), washer (9), packing (10), and tee (11) with cap (12) in brake (2). Tighten nut.
7. Connect tube (4) to tee (11).



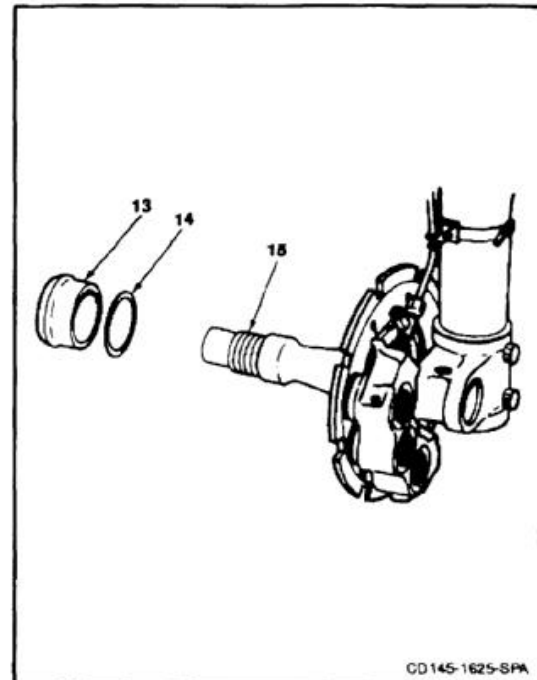
8. If axle (15) was removed, install axle (Task 3-35).

WARNING

Sealing compound (E336) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

9. Apply a coat of sealing compound (E336) to the bore of sleeve bushing (13) and one or two spacers (14).
10. Install one or two spacers (14) if removed, and sleeve bushing (13). Install bushing while sealant is still wet. Wear gloves (E184.1).

INSPECT



CD145-1625-SPA

FOLLOW-ON MAINTENANCE:

Install wheel (Task 3-12).
 Bleed brakes (Task 7-330).
 Remove jacks (Task 1-24).
 Set parking brake.

END OF TASK

CHAPTER 4

POWERPLANT

SECTION I

POWERPLANT DESCRIPTION AND OPERATION

There are two powerplant assemblies, one mounted externally on each side of the pylon. They supply torque to power the drive and rotor systems.

Accessories on each powerplant include a starter, tachometer generator, fire detection system, tubing, engine controls, forward and aft engine mount adapter, engine transmission and fairing, air inlet fairing, with **74** a water wash system, powerplant cover, exhaust cone, electrical cable, and an air inlet screen.

Fuel, hydraulic, and electrical connections to the powerplant have quick-disconnect couplings at the fuselage for ease in changing powerplants.

Each engine has two sections, a gas producer section consisting of a compressor and compressor turbine, and a power turbine section. Hot combustion gases flow from one section to the other although the sections are not mechanically connected.

The powerplant is started by a hydraulically powered starter. The starter provides power to motor the seven-stage compressor section. Air is inducted at the front of the engine through the air inlet housing. The housing is protected by an air inlet fairing and an air inlet screen.

Inducted air is compressed, mixed with fuel, and ignited in the combustion chamber. Combustion gases drive four rotors. The first two rotors drive the seven-stage compressor turbine after the engine is started. The last two rotors drive the power turbine output shaft with the final power output taken off the front of the engine by the engine transmission.

Exhaust gases are expelled through the exhaust cone at the rear of the powerplant.

The powerplant assembly includes the following systems:

- Ignition
- Air Induction
- Engine Wash With **74**
- Oil
- Cooling
- Engine Power Controls
- FADEC Power Controls With **74**
- Exhaust

IGNITION SYSTEM

Separate start and ignition systems are provided for each engine. The ignition system consists of an ignition lockswitch, ignition unit, igniter plugs, ignition lead assembly, engine start switch, start caution lights, start fuel solenoid valve, engine start solenoid, and two relays.

AIR INDUCTION SYSTEM

The air induction system is made up of the engine transmission fairing, air inlet screen and bypass panels, air inlet fairing, and air inlet housing. The air inlet screen protects the engine from inducting foreign objects. Aircraft with **40** are also equipped with fine mesh screen mounted over the coarse screen material of the air inlet screen only. The bypass panels are not equipped with fine mesh screen material and are removed when flight in icing conditions is anticipated, to make sure that proper air flow to the engine is maintained.

ENGINE COMPRESSOR CLEANING AND PRESERVATION SYSTEM HELICOPTERS WITH **74**

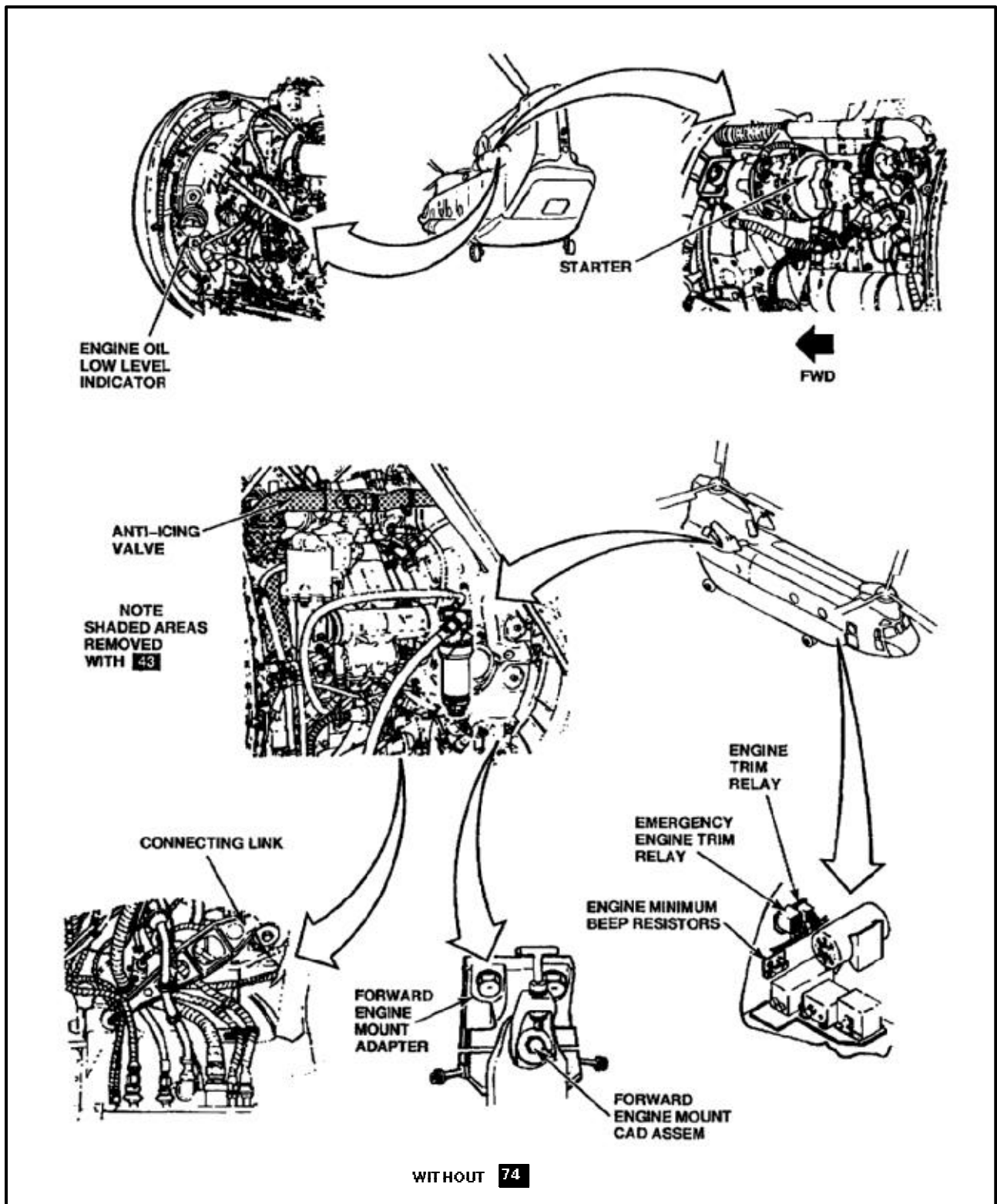
The helicopter is equipped with an engine compressor cleaning system for each engine. Fluid and air line connections are installed inboard of each engine work platform. Fluid lines and hoses are installed for solvent and rinse delivery to a series of spray nozzles that are installed on the engine air inlet fairing. Air lines and hoses are routed to the bleed band, to open and close the bleed band during engine cleaning and preservation. The engine wash system is controlled by a universal cleaning and corrosion prevention ground unit. This unit provides solvent, water rinse, preservation and air for engine cleaning and preservation procedures. The engine compressor cleaning and preservation procedures consist of:

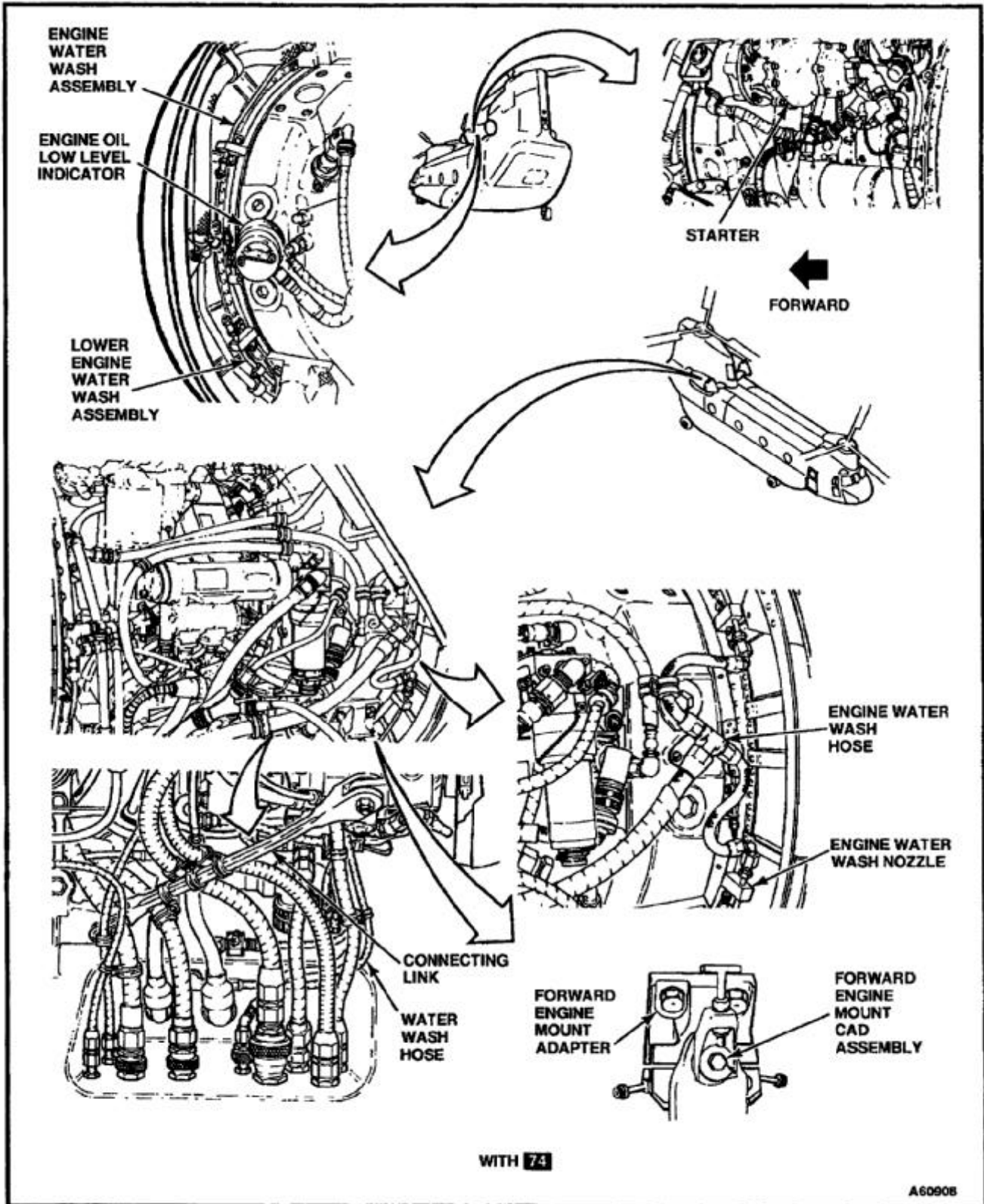
- a. Spraying the compressor with a cleaning solvent.
- b. Washing the solvent off the compressor.
- c. Preserving the compressor to prevent corrosion.

The use of engine compressor cleaning and preservation procedures will extend the life of the engine compressor and internal components.

OIL SYSTEM

The oil system is an integral part of the engine with no external tank. System protection is provided by chip detectors, oil temperature indicator, filters, and a low oil level warning system.





COOLING SYSTEM

The powerplant cooling system is a three-part cover which protects the powerplant and directs the flow of air through the powerplant compartment. Two side covers are hinged to the upper cover and fit flush to the lower access door when latched. The third cover is an upper cover supported by two hinge link assemblies at the front and at the aft end by a former which also serves as a firewall. Lower access door covers the quick-disconnect shelf and is hinged to the fuselage.

POWER CONTROL SYSTEM HELICOPTERS WITHOUT 74

The engine power or engine condition control system has two subsystems. The compressor or gas producer (N1) system, and the combustor, or power turbine (N2) systems. Both systems are powered by **28 vdc**.

1. The N1 system controls the gas producer section of the powerplant. It has two circuits in the engine condition control quadrant, a control box, a control actuator, linkage, and ENG N1 COND light.
2. The N2 control system controls the power turbine section of the powerplant. The system includes two ENGINE BEEP TRIM switches, two EMERG ENG TRIM switches, two droop eliminator resistors, two engine trim relays, two emergency engine trim relays, two remote positioning control boxes, a control actuator, and linkage.

FADEC CONTROL SYSTEM HELICOPTERS WITH 74

Each engine is controlled by a separate power control system. This power system, Full Authority Digital Electronic Control system (FADEC), provides:

- a. Twin engine load sharing.
- b. Power turbine speed governing.
- c. Transient load anticipation.
- d. Transient torque smoothing.
- e. Emergency power capability.
- f. Acceleration and deceleration control.
- g. Engine temperature limiting.
- h. Surge avoidance.
- i. Compressor bleed valve control.
- j. Fuel flow limiting.
- k. Engine fail detection.
- l. Power Assurance Test (PAT).
- m. Engine history/fault recording.
- n. Engine to engine communication.
- o. Automatic switchover to reversionary backup in event of primary error.

The FADEC system incorporates a digital electronic control unit (DECU), a hydromechanical fuel metering unit (HMU), a thrust control position transducer, Np and Ng speed pickups, and a signal conditioning unit. Cockpit controls for the FADEC are mounted in the overhead console. The overhead console consists of the engine condition control quadrant and FADEC control panel.

Engine historical data can be uploaded and downloaded from the DECU using EMC-32T-2, Engine Historical Recording Terminal (EHRT).

ENGINE MOUNTS

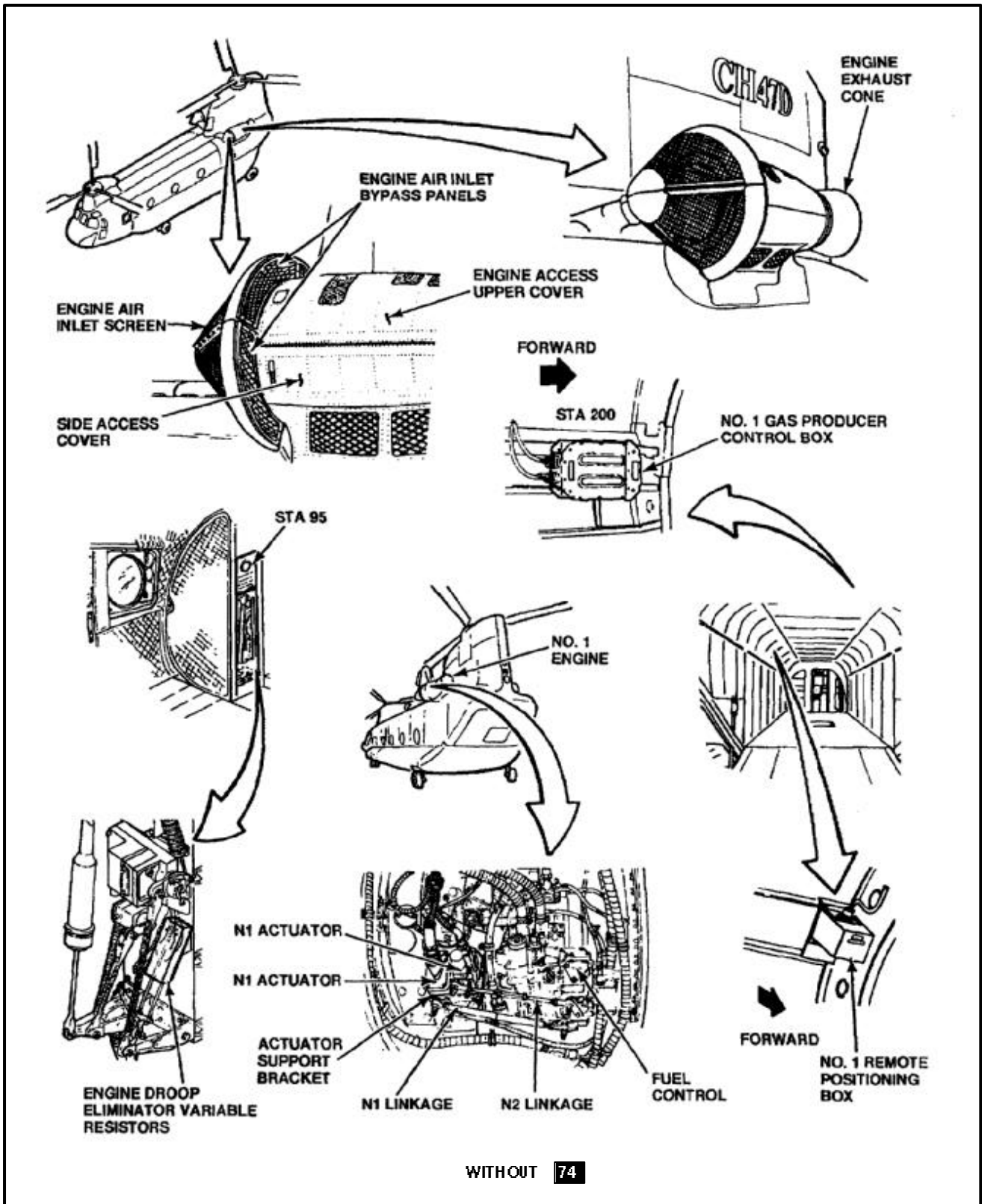
The engine mounts provide a 3-point support, two forward and one aft. A connecting link on the outboard side of each powerplant provides restraint in the event of an impact. Engine mount adapters are bolted to the engine and fit the three structural mounts.

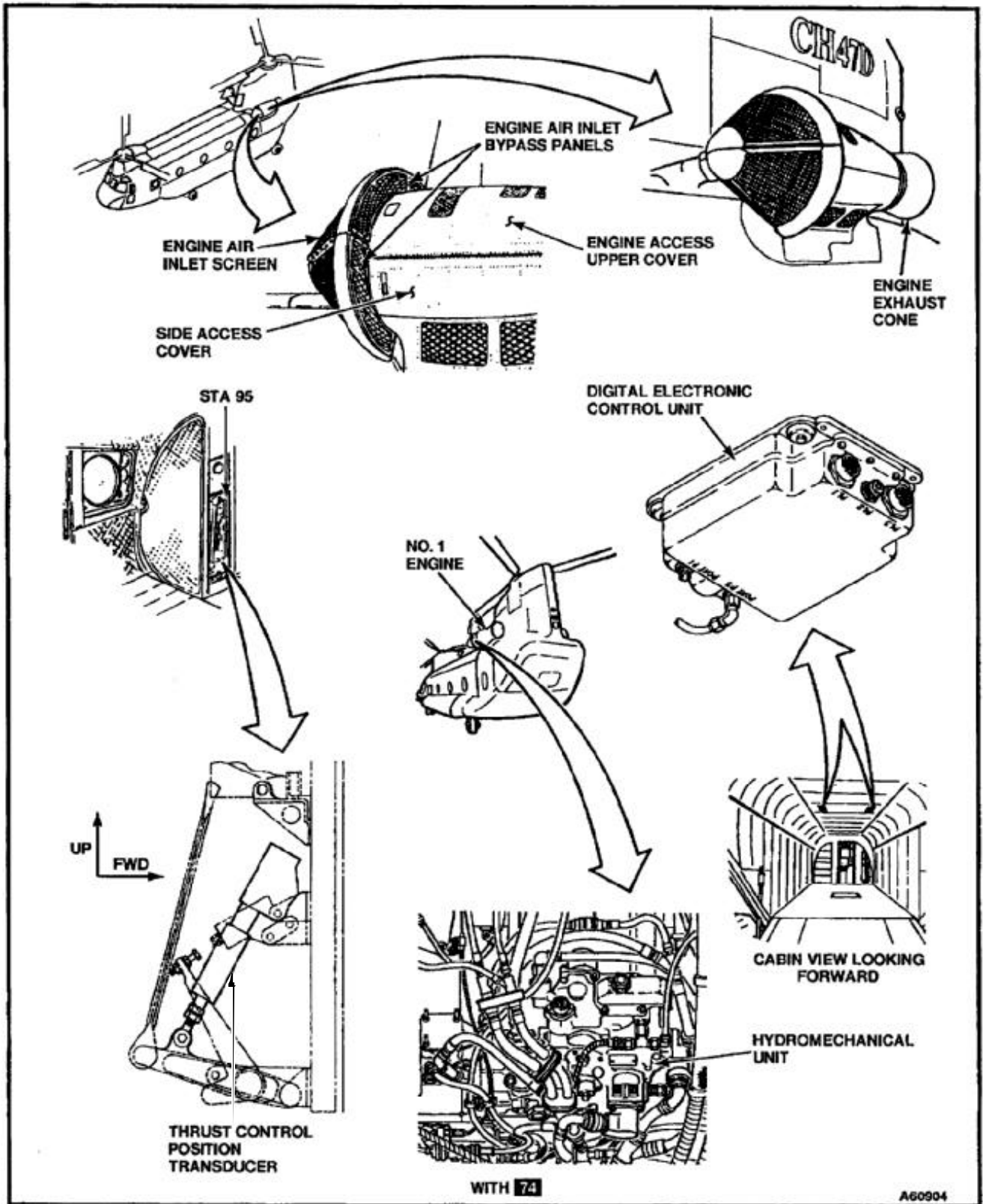
Refer to:

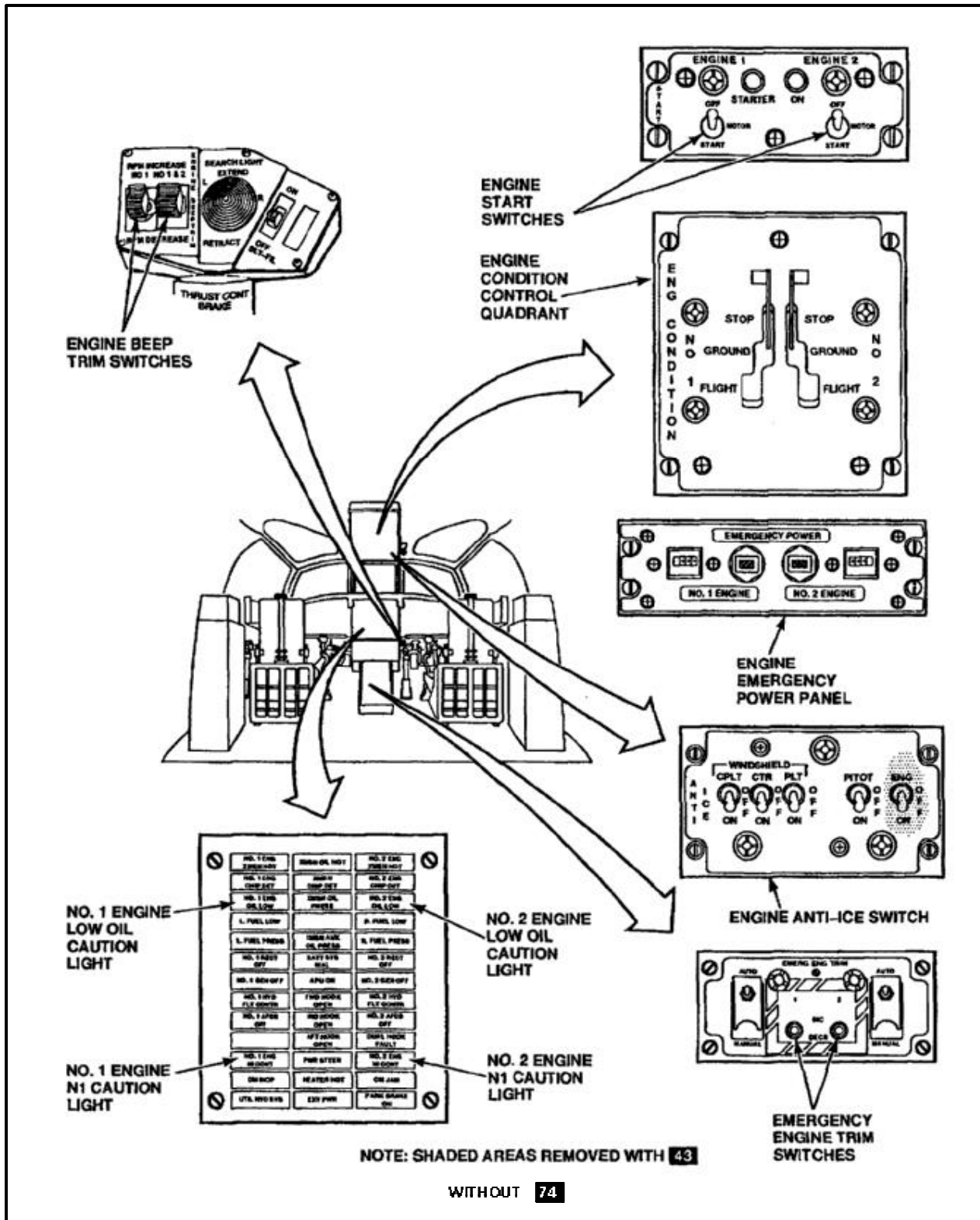
- Chapter 6 for engine transmission.
- Chapter 7 for engine starter.
- Chapter 8 for tachometer generator (without 74).
- Chapter 12 for fire detection system.
- TM 55-2840-254-23 for basic engine (without 74).
- TM 1-2840-265-23 for basic engines (with 74).

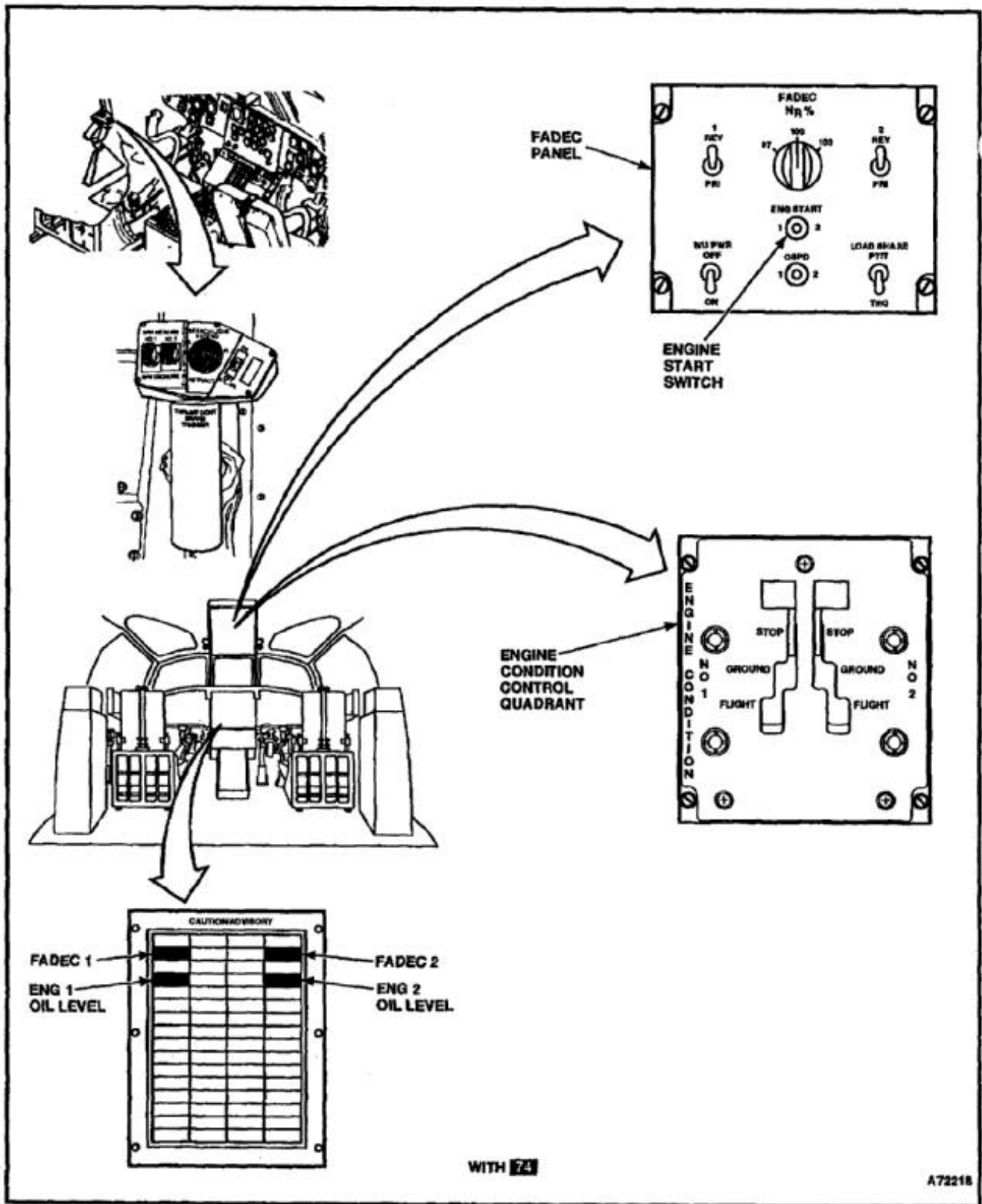
EXHAUST SYSTEM

The exhaust system conducts the exhaust gases in a smooth flow from the engine to the atmosphere. This smooth flow is desirable for efficient engine operation. The exhaust cone (tailpipe) is connected to the aft end of the engine by a coupling.









END OF TASK

**SECTION II
POWERPLANT**

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Stopwatch

Materials:

None

Personnel Required:

Inspector
Army Rotary-Wing Aviator (2)

References:

TM 1-1520-240-MTF
TM 55-1520-240-T

Equipment Condition:

Battery Connected (Task 1-39)
HIT Baseline PTIT Established (Worksheet)(Task 4-2.1)

NOTE

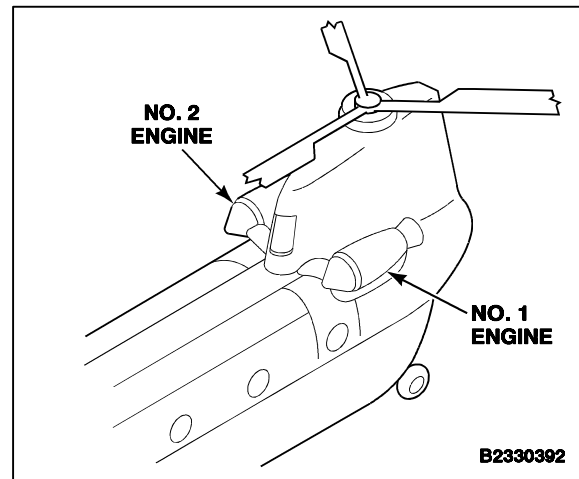
A new baseline Health Indicator Test (HIT) is required following replacement of a major engine component that affects airflow/performance (such as a hot end).

1. Face aircraft into wind and operate engines until PTIT and oil temperature have stabilized.
2. Record free air temperature (FAT).
3. Set NO. 2 ENGINE CONDITION lever to GROUND.

NOTE

N2, rotor RPM may be lowered in cold temperatures to achieve an N1 relative to FAT. Under no conditions may N2 rotor RPM be lowered below **88 percent**.

4. Maintain **100 percent** rotor rpm.
5. Read temperature in FAT C which is closest to FAT recorded in step 2 (HIT PTIT LOG).
6. Set N1 percent to number in N1 percent column next to FAT found in step 6.
7. Read temperature in BASELINE PTIT column next to N1 percent found in step 7.
8. Allow indicated PTIT to stabilize.
9. Record indicated PTIT and compare with BASELINE PTIT found in step 8.
10. Record aircraft hours in ACFT row and difference between indicated PTIT and BASELINE PTIT found in step 10 in difference from BASELINE PTIT row.



4-2 PERFORM HEALTH INDICATOR TEST (HIT) (Continued)

- 11. If indicated PTIT is **20-29°C** less than or greater than BASELINE PTIT, make entry on DA Form 2408-13.



When the indicated PTIT is **30°** greater or less than the BASELINE PTIT, do not fly the aircraft until TEAC has been accomplished (Task 4-3).

- 12. If indicated PTIT is **30°C** less than or greater than BASELINE PTIT, do the following:

- a. Ground aircraft until operational check of PTIT and emergency power indicating system is performed (TM 55-1520-240-T).
- b. Make entry on DA Form 2408-13.
- 13. Set NO. 2 ENGINE CONDITION lever to FLIGHT. Do not exceed **100 percent** rotor rpm.
- 14. Set NO. 1 ENGINE CONDITION lever to GROUND.
- 15. Repeat steps 4 thru 13 on No. 2 engine.
- 16. Shut down engines.

FOLLOW-ON MAINTENANCE:

None

ACFT S/N	CH 47D (T88 L 712)																				ENG S/N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
FAT °C	75.9	76.2	76.5	76.8	77.1	77.4	77.7	78.0	78.3	78.6	78.9	79.2	79.5	79.8	80.1	80.4	80.7	81.0	81.3	81.6	81.9	82.2	82.5	82.8	83.1	83.4	83.7	84.0	84.3	84.6	84.9	85.2	85.5	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.9	88.2	88.5	88.8	89.1	89.4	89.7	90.0	90.3	90.6	90.9	91.2	91.5	91.8	92.1	92.4	92.7	93.0	93.3	93.6	93.9	94.2	94.5	94.8	95.1	95.4	95.7	96.0	96.3	96.6	96.9	97.2	97.5	97.8	98.1	98.4	98.7	99.0	99.3	99.6	99.9	100.2	100.5	100.8	101.1	101.4	101.7	102.0	102.3	102.6	102.9	103.2	103.5	103.8	104.1	104.4	104.7	105.0	105.3	105.6	105.9	106.2	106.5	106.8	107.1	107.4	107.7	108.0	108.3	108.6	108.9	109.2	109.5	109.8	110.1	110.4	110.7	111.0	111.3	111.6	111.9	112.2	112.5	112.8	113.1	113.4	113.7	114.0	114.3	114.6	114.9	115.2	115.5	115.8	116.1	116.4	116.7	117.0	117.3	117.6	117.9	118.2	118.5	118.8	119.1	119.4	119.7	120.0	120.3	120.6	120.9	121.2	121.5	121.8	122.1	122.4	122.7	123.0	123.3	123.6	123.9	124.2	124.5	124.8	125.1	125.4	125.7	126.0	126.3	126.6	126.9	127.2	127.5	127.8	128.1	128.4	128.7	129.0	129.3	129.6	129.9	130.2	130.5	130.8	131.1	131.4	131.7	132.0	132.3	132.6	132.9	133.2	133.5	133.8	134.1	134.4	134.7	135.0	135.3	135.6	135.9	136.2	136.5	136.8	137.1	137.4	137.7	138.0	138.3	138.6	138.9	139.2	139.5	139.8	140.1	140.4	140.7	141.0	141.3	141.6	141.9	142.2	142.5	142.8	143.1	143.4	143.7	144.0	144.3	144.6	144.9	145.2	145.5	145.8	146.1	146.4	146.7	147.0	147.3	147.6	147.9	148.2	148.5	148.8	149.1	149.4	149.7	150.0	150.3	150.6	150.9	151.2	151.5	151.8	152.1	152.4	152.7	153.0	153.3	153.6	153.9	154.2	154.5	154.8	155.1	155.4	155.7	156.0	156.3	156.6	156.9	157.2	157.5	157.8	158.1	158.4	158.7	159.0	159.3	159.6	159.9	160.2	160.5	160.8	161.1	161.4	161.7	162.0	162.3	162.6	162.9	163.2	163.5	163.8	164.1	164.4	164.7	165.0	165.3	165.6	165.9	166.2	166.5	166.8	167.1	167.4	167.7	168.0	168.3	168.6	168.9	169.2	169.5	169.8	170.1	170.4	170.7	171.0	171.3	171.6	171.9	172.2	172.5	172.8	173.1	173.4	173.7	174.0	174.3	174.6	174.9	175.2	175.5	175.8	176.1	176.4	176.7	177.0	177.3	177.6	177.9	178.2	178.5	178.8	179.1	179.4	179.7	180.0	180.3	180.6	180.9	181.2	181.5	181.8	182.1	182.4	182.7	183.0	183.3	183.6	183.9	184.2	184.5	184.8	185.1	185.4	185.7	186.0	186.3	186.6	186.9	187.2	187.5	187.8	188.1	188.4	188.7	189.0	189.3	189.6	189.9	190.2	190.5	190.8	191.1	191.4	191.7	192.0	192.3	192.6	192.9	193.2	193.5	193.8	194.1	194.4	194.7	195.0	195.3	195.6	195.9	196.2	196.5	196.8	197.1	197.4	197.7	198.0	198.3	198.6	198.9	199.2	199.5	199.8	200.1	200.4	200.7	201.0	201.3	201.6	201.9	202.2	202.5	202.8	203.1	203.4	203.7	204.0	204.3	204.6	204.9	205.2	205.5	205.8	206.1	206.4	206.7	207.0	207.3	207.6	207.9	208.2	208.5	208.8	209.1	209.4	209.7	210.0	210.3	210.6	210.9	211.2	211.5	211.8	212.1	212.4	212.7	213.0	213.3	213.6	213.9	214.2	214.5	214.8	215.1	215.4	215.7	216.0	216.3	216.6	216.9	217.2	217.5	217.8	218.1	218.4	218.7	219.0	219.3	219.6	219.9	220.2	220.5	220.8	221.1	221.4	221.7	222.0	222.3	222.6	222.9	223.2	223.5	223.8	224.1	224.4	224.7	225.0	225.3	225.6	225.9	226.2	226.5	226.8	227.1	227.4	227.7	228.0	228.3	228.6	228.9	229.2	229.5	229.8	230.1	230.4	230.7	231.0	231.3	231.6	231.9	232.2	232.5	232.8	233.1	233.4	233.7	234.0	234.3	234.6	234.9	235.2	235.5	235.8	236.1	236.4	236.7	237.0	237.3	237.6	237.9	238.2	238.5	238.8	239.1	239.4	239.7	240.0	240.3	240.6	240.9	241.2	241.5	241.8	242.1	242.4	242.7	243.0	243.3	243.6	243.9	244.2	244.5	244.8	245.1	245.4	245.7	246.0	246.3	246.6	246.9	247.2	247.5	247.8	248.1	248.4	248.7	249.0	249.3	249.6	249.9	250.2	250.5	250.8	251.1	251.4	251.7	252.0	252.3	252.6	252.9	253.2	253.5	253.8	254.1	254.4	254.7	255.0	255.3	255.6	255.9	256.2	256.5	256.8	257.1	257.4	257.7	258.0	258.3	258.6	258.9	259.2	259.5	259.8	260.1	260.4	260.7	261.0	261.3	261.6	261.9	262.2	262.5	262.8	263.1	263.4	263.7	264.0	264.3	264.6	264.9	265.2	265.5	265.8	266.1	266.4	266.7	267.0	267.3	267.6	267.9	268.2	268.5	268.8	269.1	269.4	269.7	270.0	270.3	270.6	270.9	271.2	271.5	271.8	272.1	272.4	272.7	273.0	273.3	273.6	273.9	274.2	274.5	274.8	275.1	275.4	275.7	276.0	276.3	276.6	276.9	277.2	277.5	277.8	278.1	278.4	278.7	279.0	279.3	279.6	279.9	280.2	280.5	280.8	281.1	281.4	281.7	282.0	282.3	282.6	282.9	283.2	283.5	283.8	284.1	284.4	284.7	285.0	285.3	285.6	285.9	286.2	286.5	286.8	287.1	287.4	287.7	288.0	288.3	288.6	288.9	289.2	289.5	289.8	290.1	290.4	290.7	291.0	291.3	291.6	291.9	292.2	292.5	292.8	293.1	293.4	293.7	294.0	294.3	294.6	294.9	295.2	295.5	295.8	296.1	296.4	296.7	297.0	297.3	297.6	297.9	298.2	298.5	298.8	299.1	299.4	299.7	300.0	300.3	300.6	300.9	301.2	301.5	301.8	302.1	302.4	302.7	303.0	303.3	303.6	303.9	304.2	304.5	304.8	305.1	305.4	305.7	306.0	306.3	306.6	306.9	307.2	307.5	307.8	308.1	308.4	308.7	309.0	309.3	309.6	309.9	310.2	310.5	310.8	311.1	311.4	311.7	312.0	312.3	312.6	312.9	313.2	313.5	313.8	314.1	314.4	314.7	315.0	315.3	315.6	315.9	316.2	316.5	316.8	317.1	317.4	317.7	318.0	318.3	318.6	318.9	319.2	319.5	319.8	320.1	320.4	320.7	321.0	321.3	321.6	321.9	322.2	322.5	322.8	323.1	323.4	323.7	324.0	324.3	324.6	324.9	325.2	325.5	325.8	326.1	326.4	326.7	327.0	327.3	327.6	327.9	328.2	328.5	328.8	329.1	329.4	329.7	330.0	330.3	330.6	330.9	331.2	331.5	331.8	332.1	332.4	332.7	333.0	333.3	333.6	333.9	334.2	334.5	334.8	335.1	335.4	335.7	336.0	336.3	336.6	336.9	337.2	337.5	337.8	338.1	338.4	338.7	339.0	339.3	339.6	339.9	340.2	340.5	340.8	341.1	341.4	341.7	342.0	342.3	342.6	342.9	343.2	343.5	343.8	344.1	344.4	344.7	345.0	345.3	345.6	345.9	346.2	346.5	346.8	347.1	347.4	347.7	348.0	348.3	348.6	348.9	349.2	349.5	349.8	350.1	350.4	350.7	351.0	351.3	351.6	351.9	352.2	352.5	352.8	353.1	353.4	353.7	354.0	354.3	354.6	354.9	355.2	355.5	355.8	356.1	356.4	356.7	357.0	357.3	357.6	357.9	358.2	358.5	358.8	359.1	359.4	359.7	360.0	360.3	360.6	360.9	361.2	361.5	361.8	362.1	362.4	362.7	363.0	363.3	363.6	363.9	364.2	364.5	364.8	365.1	365.4	365.7	366.0	366.3	366.6	366.9	367.2	367.5	367.8	368.1	368.4	368.7	369.0	369.3	369.6	369.9	370.2	370.5	370.8	371.1	371.4	371.7	372.0	372.3	372.6	372.9	373.2	373.5	373.8	374.1	374.4	374.7	375.0	375.3	375.6	375.9	376.2	376.5	376.8	377.1	377.4	377.7	378.0	378.3	378.6	378.9	379.2	379.5	379.8	380.1	380.4	380.7	381.0	381.3	381.6	381.9	382.2	382.5	382.8	383.1	383.4	383.7	384.0	384.3	384.6	384.9	385.2	385.5	385.8	386.1	386.4	386.7	387.0	387.3	387.6	387.9	388.2	388.5	388.8	389.1	389.4	389.7	390.0	390.3	390.6	390.9	391.2	391.5	391.8	392.1	392.4	392.7	393.0	393.3	393.6	393.9	394.2	394.5	394.8	395.1	395.4	395.7	396.0	396.3	396.6	396.9	397.2	397.5	397.8	398.1	398.4	398.7	399.0	399.3	399.6	399.9	400.2	400.5	400.8	401.1	401.4	401.7	402.0	402.3	402.6	402.9	403.2	403.5	403.8	404.1	404.4	404.7	405.0	405.3	405.6	405.9	406.2	406.5	406.8	407.1	407.4	407.7	408.0	408.3	408.6	408.9	409.2	409.5	409.8	410.1	410.4	410.7	411.0	411.3	411.6	411.9	412.2	412.5	412.8	413.1	413.4	413.7	414.0	414.3	414.6	414.9	415.2	415.5	415.8	416.1	416.4	416.7	417.0	417.3	417.6	417.9	418.2	418.5	418.8	419.1	419.4	419.7	420.0	420.3	420.6	420.9	421.2	421.5	421.8	422.1	422.4	422.7	423.0	423.3	423

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

None

Materials:

None

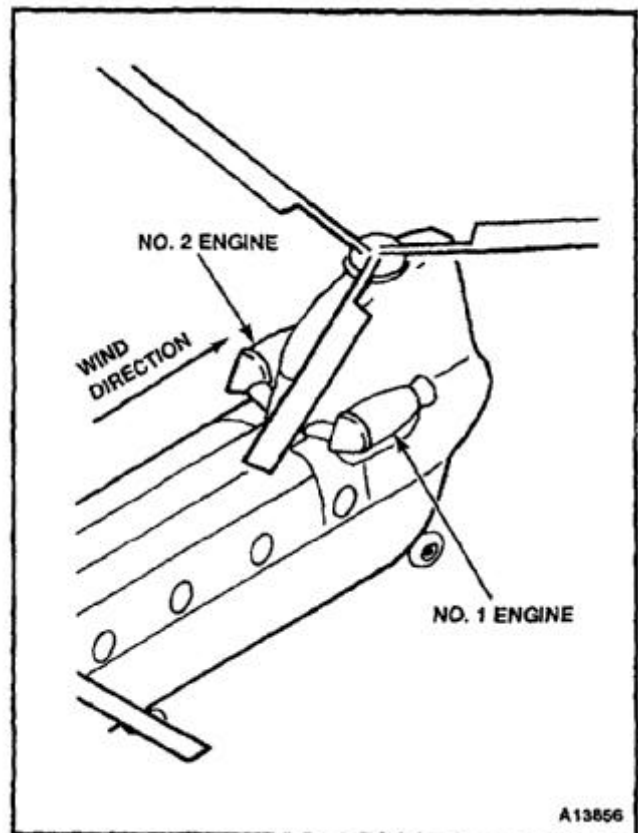
Personnel Required:Inspector
Army Rotary Wing Aviator (2)**References:**TM 55-1520-240-MTF
TM 55-1520-240-T**Equipment Condition:**

Battery Connected (Task 1-39)

NOTE

A new baseline Health Indicator Test (HIT) is required following replacement of a major engine component that affects airflow/performance (such as a hot end).

1. Face aircraft into wind and turnoff all bleed air. Insure that PTIT temperatures have stabilized.
2. Adjust engine not being HIT checked to GROUND.
3. Trim rotor speed to **100 percent**.
4. Enter line 1 at FAT nearest free air temperature.
5. Set N1 percent at value indicated in line 2.
6. Allow indicated PTIT to stabilize for **2 minutes** while maintaining rotor speed set in step 3 above.
7. Read PTIT from indicator.
8. Apply — PTIT A correction factor in line 3 to indicated PTIT and record result in open space in line 4.
9. Apply — PTIT B correction factors in line 5 to PTIT in line 4 and record result in line 8 for corresponding columns.
10. Enter baseline information in the respective columns of the HIT PTIT LOG (4-2).
11. Enter aircraft or engine hours and word "BASELINE" in log section at bottom of HIT PTIT LOG (4-2).



FOLLOW-ON MAINTENANCE:

Perform Health Indicator Test (HIT) (4-2).

END OF TASK

4-2.2 PERFORM IN-FLIGHT HEALTH INDICATOR TEST (HIT)**4-2.2****INITIAL SETUP****Applicable Configurations:**Without **74****Tools:**

Stopwatch

Materials:

None

Personnel Required:Army Rotary Wing Aviator (2)
Army Aircrew Member**References:**TM 55-1520-240-MTF
TM 55-1520-240-T**Equipment Condition:**In-Flight HIT Baseline PTIT Established
(Worksheet) (Task 4-2.3)**NOTE**

The In-flight (HIT) check may be used on the return flight of the last flight of the day. This will count for the next days (HIT) check. If any engine maintenance has been performed since the last return flight, a ground (HIT) check must be performed prior to flight. If an in-flight (HIT) was not completed on the previous flight, a ground or in-flight (HIT) check must be performed. This in-flight (HIT) check may be deferred to the last flight of the day.

1. With aircraft in cruise flight at **110-120 knots**, record free air temperature (FAT).
2. Maintain **100 percent** rotor RPM.
3. Read temperature in FAT C, which is closest to FAT recorded in step 1.
4. Use the emergency beep to set N1 percent to number in N1 percent column next to FAT found in step 3 on engine being HIT checked while leaving the other engine online.
5. Read temperature in in-flight baseline PTIT column next to N1 percent found in step 4.
6. Allow indicated PTIT to stabilize for a minimum of **30 seconds**.
7. Record indicated PTIT and compare with in-flight baseline PTIT found in step 5.
8. Record aircraft hours in aircraft row and difference between indicated PTIT and in-flight baseline PTIT found in step 7 in difference from in-flight baseline PTIT row.
9. If indicated PTIT is **20-29°C** less than or greater than in-flight baseline PTIT, make an entry on DA Form 2408-13
10. If indicated PTIT is **30°C** or more less than or greater than in-flight baseline PTIT, do the following:
 - a. Make an entry on DA Form 2408-13.
 - b. Upon return to base, ground aircraft until operational check of PTIT and emergency power indicating system is performed (TM 55-1520-240-23-T)
11. Repeat steps 4 thru 10 for number 2 engine.

ACFT S/N	CH 47D (T88 L 712)																ENG S/N															
FAT °C																																
N1%																																
IN-FLIGHT BASELINE PTIT																																

INSTRUCTIONS

1. ESTABLISH AIRCRAFT IN CRUISE FLIGHT AT 110-120 KTS
2. RECORD FREE AIR TEMPERATURE FROM FAT GAGE
3. TRIM ROTOR TO 100%
4. ENTER FAT LINE AT VALUE NEAREST TO FREE AIR TEMPERATURE
5. USE THE EMERGENCY BEEP TO SET N1 AT VALUE INDICATED IN N1% LINE
6. MAINTAIN ROTOR AT 100% RPM AND STABILIZE INSTRUMENTS
7. READ PTIT FROM INDICATOR
8. COMPARE PTIT WITH VALUE INDICATED IN LINE LABELED IN-FLIGHT BASELINE PTIT
9. RECORD AIRCRAFT OR ENGINE HOURS AND DIFFERENCES BETWEEN INDICATED PTIT AND IN-FLIGHT BASELINE PTIT IN LOG SECTION BELOW
10. MAY BE REPRODUCED LOCALLY

ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)

IN-FLIGHT HIT PTIT LOG

4-2.3 ESTABLISH IN-FLIGHT (HIT) BASELINE**4-2.3****INITIAL SETUP****Applicable Configurations:**Without **74****Tools:**

None

Materials:

None

Personnel Required:Army Rotary Wing Aviator (2)
Army Aircrew Member**References:**TM 55-1520-240-MTF
TM 55-1520-240-T**Equipment Condition:**

None

NOTE

The In-flight (HIT) check may be used on the return flight of the last flight of the day. This will count for the next days (HIT) check. If any engine maintenance has been performed since the last return flight, a ground (HIT) check must be performed prior to flight. If an in-flight (HIT) was not completed on the previous flight, a ground or in-flight (HIT) check must be performed. This in-flight (HIT) check may be deferred to the last flight of the day.

1. With aircraft in cruise flight at **110-120 knots**, record free air temperature (FAT).
2. Maintain **100 percent** rotor RPM.
3. Enter line 1 at FAT nearest free air temperature.
4. Use the emergency beep to set N1 percent to value indicated in line 2 on engine being (HTIT).
5. Allow indicated PTIT to stabilize for a minimum of **30 seconds**.
6. Read PTIT from indicator.
7. Apply — PTIT A correction factor in line 3 to indicated PTIT and record result in open space in line 4.
8. Apply — PTIT B correction factors in line 5 to PTIT in line 4 and record result in line 8 for corresponding columns.
9. Enter baseline information in the respective columns of the (HIT) PTIT log (Task 4-2.2).

ACFT S/N	CH 47D (T85 L 712)																				ENG S/N																								
FAT °C	75.9	80	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	88.6	118	88.7	118	88.8	118	88.9	118	89.0	118	89.1	118	89.2	118	89.3	118	89.4	118	89.5	118	89.6	118			
N1%	75.9	80	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	78.7	84	88.6	118	88.7	118	88.8	118	88.9	118	89.0	118	89.1	118	89.2	118	89.3	118	89.4	118	89.5	118	89.6	118			
IN-FLIGHT BASELINE PTIT																																													

INSTRUCTIONS

1. ESTABLISH AIRCRAFT IN CRUISE FLIGHT AT 110-120 KTS
2. RECORD FREE AIR TEMPERATURE FROM FAT GAGE
3. TRIM ROTOR TO 100%
4. ENTER FAT LINE AT VALUE NEAREST TO FREE AIR TEMPERATURE
5. USE THE EMERGENCY BEEP TO SET N1 AT VALUE INDICATED IN N1% LINE
6. MAINTAIN ROTOR AT 100% RPM AND STABILIZE INSTRUMENTS
7. READ PTIT FROM INDICATOR
8. COMPARE PTIT WITH VALUE INDICATED IN LINE LABELED IN-FLIGHT BASELINE PTIT
9. RECORD AIRCRAFT OR ENGINE HOURS AND DIFFERENCES BETWEEN INDICATED PTIT AND IN-FLIGHT BASELINE PTIT IN LOG SECTION BELOW
10. MAY BE REPRODUCED LOCALLY

ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)	ACFT OR ENG HRS (-13)	DIFF FROM BASELINE PTIT (±)

IN-FLIGHT HIT PTIT LOG

END OF TASK

4-2.4 PERFORM POWER ASSURANCE CHECK

4-2.4

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Stopwatch

Materials:

None

Personnel Required:

Army Rotary Wing Aviator (2)
Flight Engineer

References:

TM 55-1520-240-MTF
TM 55-1520-240-T

Equipment Condition:

Aircraft Operating at 100 Percent RPM
Power Assurance Test Completed and Trigger Value
Computed



Performance of the in-flight PAC is restricted to temperatures of **-40°C to +54°C**, pressure altitude of sea level to **14,000 feet**. Airspeed of **80 KIAS to 100 KIAS** and torque between **60 and 70 percent**. The in-flight PAC may be performed only in extreme environmental conditions, such as sand, dust or snow.

NOTE

The Power Assurance Check (PAC) may be performed on the ground, at a hover, or in-flight.

1. On the ground:
 - a. Face aircraft into wind and operate engines until PTIT and engine oil temperatures have stabilized.
 - b. Move the NO. 2 ENGINE CONDITION lever to GROUND position.
 - c. Adjust the THRUST CONTROL lever to establish a torque setting between **60 and 70 percent** on the NO. 1 engine. Stabilize for **15 seconds**.

- d. Activate the DECU PAC switch to the NO. 1 engine position and release. Note the last hexadecimal digit series displayed. Determine the appropriate PACN adjustment value from figure 1 for the current FAT. Combine the PACN FAT adjustment value to the DECU hexadecimal display. Record this value in the PAC LOG, figure 2.
- e. Adjust the THRUST CONTROL lever to the ground detent position.
- f. Move the NO. 2 ENGINE CONDITION lever to FLIGHT position.
- g. Repeat steps 1b thru 1f for the opposite engine.



If the PAC value logged or the adjusted PACN is **BELOW** the established PAC trigger value during the ground PAC, do not fly the aircraft. If the PAC trigger value logged or the adjusted PACN is **BELOW** the established PAC trigger value during the hover or flight PAC, abort the mission and return the aircraft to the maintenance facility. Troubleshoot the engine indicating systems, inspect engine for FOD, check PTIT thermal couples, and check for cleanliness. If needed, perform engine compressor wash. If the engine shows no signs of damage and the indicating systems are operating correctly, complete a MCP or MPC PAT and establish a new trigger value IAW TM 55-1520-240-MTF.



Do not rapidly move the engine condition levers during the hover PAC. If the aircraft begins a descent, abort the procedure by increasing the thrust control lever.

NOTE

If the engine torque is at **60 to 70 percent** when the aircraft is established at a hover, adjustment of the engine condition levers are not required.

2. At a hover:
 - a. Establish a **10 to 15 foot** hover. Thrust must be stable during the maneuver.

4-2.4 PERFORM POWER ASSURANCE CHECK (Continued)

4-2.4

- b. Move the NO. 2 ENGINE CONDITION lever to a position between FLT and GND until the NO. 1 engine torque is stabilized between **60 and 70 percent**. Stabilize for **15 seconds**.
 - c. Activate the DECU PAC switch to the NO. 1 engine position and release. Note the last hexadecimal digit series displayed. Determine the appropriate PACN adjustment value from figure 1, current FAT. Combine the PACN FAT adjustment value to the DECU hexadecimal display. Record this value in the PAC LOG.
 - d. Move the NO. 2 ENGINE CONDITION lever to FLT position.
 - e. Repeat steps 2b thru 2d for the opposite engine.
3. In-Flight:
 - a. Establish aircraft at **80 to 100 KIAS, PA - SL to 14,000 FT** and FAT of **-40°C to +54°C**.
 - b. Move the NO. 2 ENGINE CONDITION lever to a position between FLT flight and GND ground until the NO. 1 engine torque is stabilize for **15 seconds**.
 - c. Activate the DECU PAC switch to the NO. 1 engine position and release. Note the last hexadecimal digit series displayed. Determine the appropriate PACN adjustment value from figure 1 for the current FAT. Combine the PACN FAT adjustment value to the DECU hexadecimal display. Record this value in the PAC LOG.
 - d. Move the NO. 2 ENGINE CONDITION lever to the FLT position.
 - e. Repeat steps 3b thru 3d for the opposite engine.



If the PAC value logged or the adjusted PACN is BELOW the established PAC trigger value during the ground PAC, do not fly the aircraft. If the PAC trigger value logged or the adjusted PACN is BELOW the established PAC trigger value during the hover or flight PAC, abort the mission and return the aircraft to the maintenance facility. Troubleshoot the engine indicating systems, inspect engine for FOD, check PTIT thermal couples, and check for cleanliness. If needed, perform engine compressor wash. If the engine shows no signs of damage and the indicating systems are operating correctly, complete a MCP or MPC PAT and establish a new trigger value IAW TM 55-1520-240-MTF.

NOTE

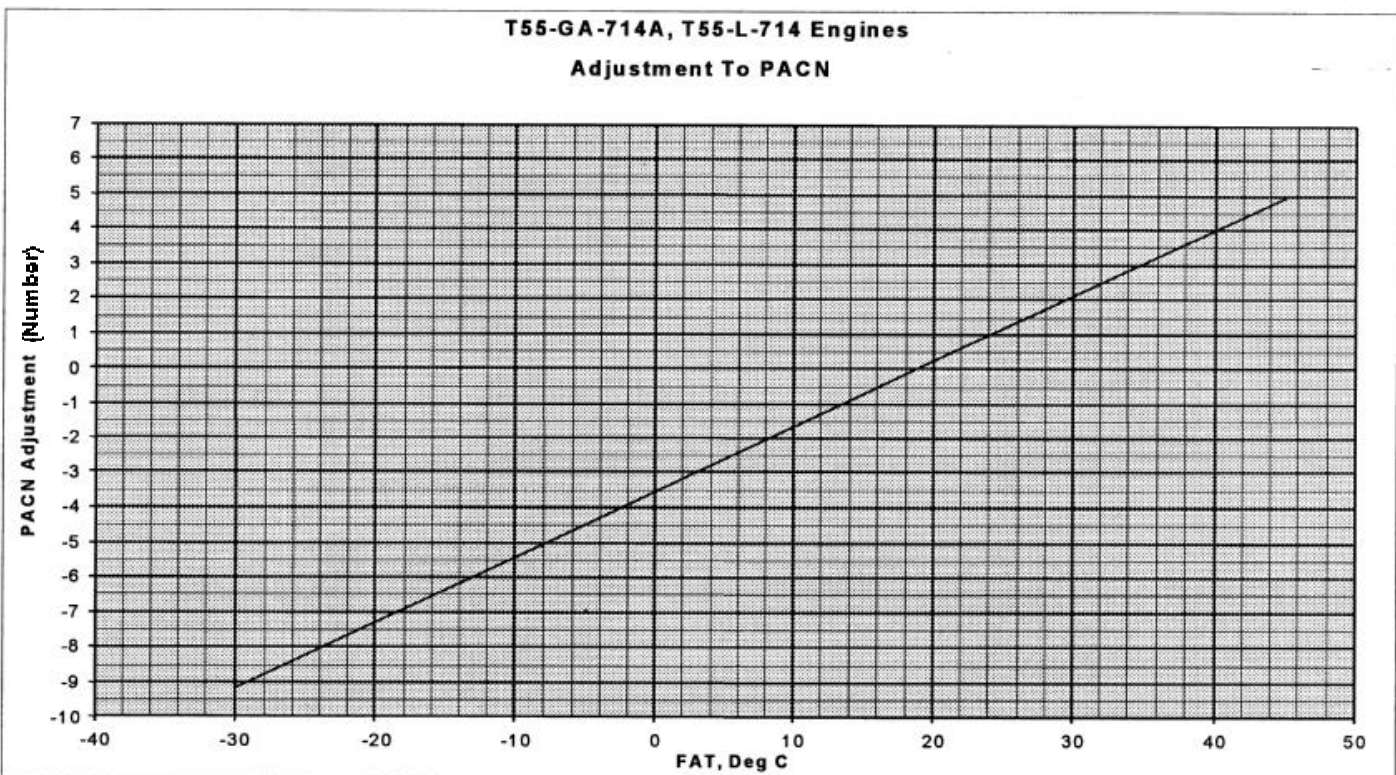
The in-flight PAC should be performed prior to or at the beginning of mission execution.

NOTE

If the engine torque is between **60 and 70 percent** when the aircraft is established in flight at an airspeed between **80 KIAS to 100 KIAS**, adjustment of the engine condition levers are not required.



If the PAC value logged or the adjusted PACN is BELOW the established PAC trigger value during the ground PAC, do not fly the aircraft. If the PAC trigger value logged or the adjusted PACN is BELOW the established PAC trigger value during the hover or flight PAC, abort the mission and return the aircraft to the maintenance facility. Troubleshoot the engine indicating systems, inspect engine for FOD, check PTIT thermal couples, and check for cleanliness. If needed, perform engine compressor wash. If the engine shows no signs of damage and the indicating systems are operating correctly, complete a MCP or MPC PAT and establish a new trigger value IAW TM 55-1520-240-MTF.



PAC Number Margin to FAT Chart
Figure 1.

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Stopwatch

Materials:

Lockwire (E320)

Personnel Required:

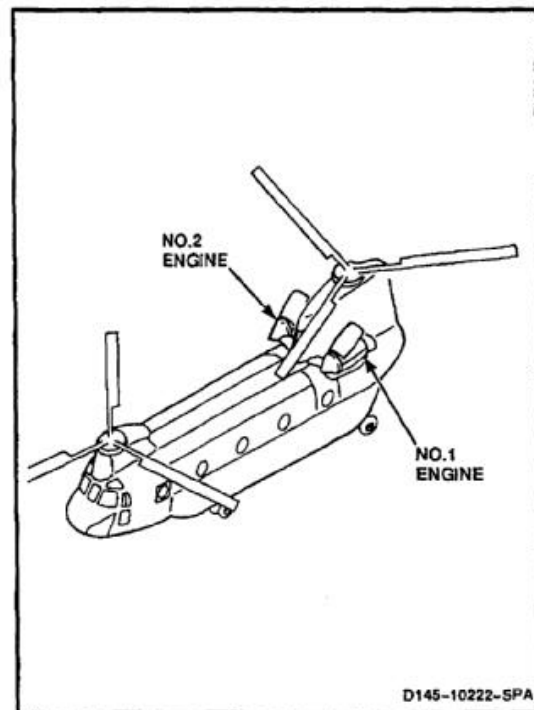
Aircraft Powerplant Repairer
Army Rotary Wing Aviator (2)

References:

TM 55-1520-240-10
TM 55-1520-240-T
TM 55-2840-254-23
Task 1-39
Task 2-2
Task 4-49
Task 4-50

Equipment Condition:

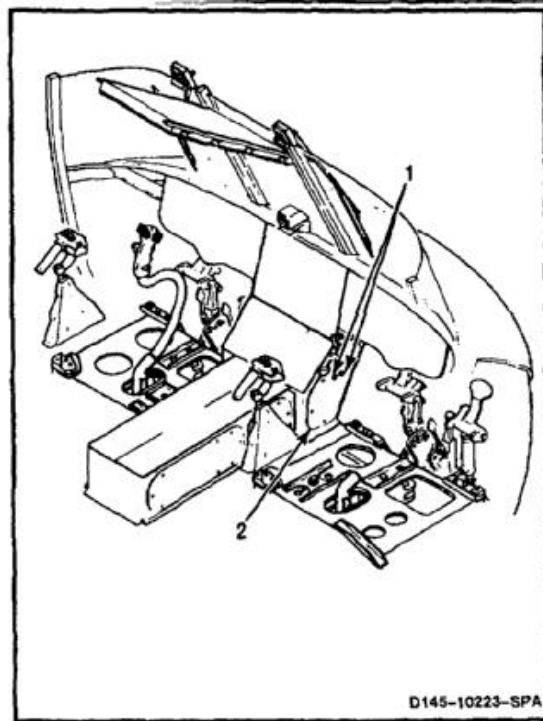
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
Test Gas Producer Tachometer Indicator (Task 8-8)
Test Gas Producer Tachometer Generator (Task 8-11)
Test Engine Oil Pressure Indicator (Task 8-14)
Test Engine Oil Temperature Indicator (Task 8-17)
Test Dual Torque Meter Indicator (Task 8-19)
Test Torque Meter Power Supply (Task 8-19)
TM 55-1520-240-T
Gas Producer Tachometer System Operational Check
(Task 8-2.3)
Engine Oil Pressure Indicating System Operational
Check (Task 8-3.3)
Engine Oil Temperature Indicating System
Operational Check (8-4.3)
Power Turbine Inlet Temperature System Operational
Check and Emergency Power Indicating System
Test (Task 8-5.3)
Torque Indicating System Operational Check (Task
8-6.3)



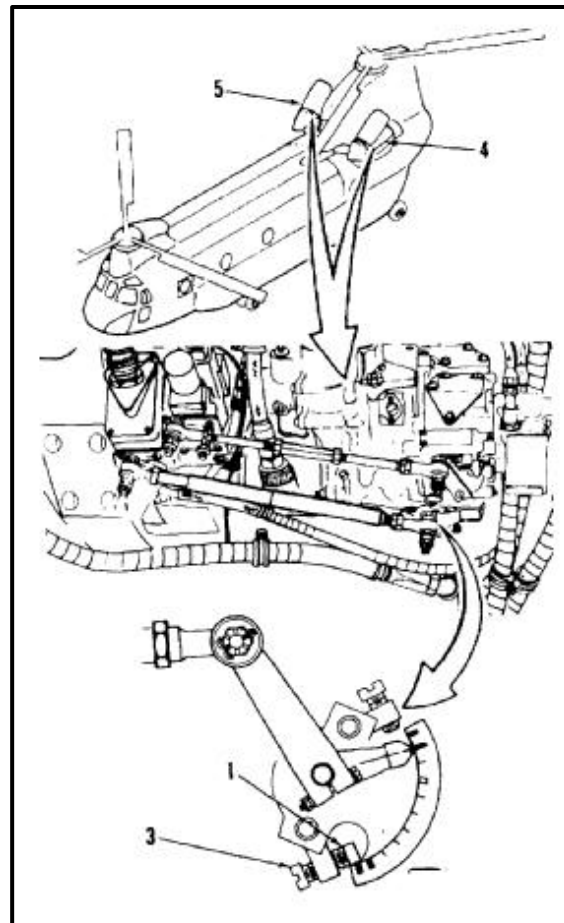
NOTE

Verify accuracy of engine indicating systems prior to performance of TEAC.

1. Remove lockwire from two stops (1). Remove stops from panel (2).



2. Install two stops (1) on two screws (3) on No. 1 engine (4) and No. 2 engine (5).
3. Connect battery (Task 1-39).



4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)

4-3

4. Have pilot set copilot's altimeter to **29.92 inches** (TM 55-1520-240-10).

5. Have pilot select altitude where TEAC can be performed at **120 KIAS** (not to exceed vne) at **98 percent** rotor rpm.

NOTE

Below **5°C** FAT it may be impossible to conduct a TEAC without exceeding **10,000 feet** pressure altitude.

During cold weather periods, precise trimming of the fuel control is less critical since considerable reserve power exists due to low ambient temperature. When the above condition occurs, enter a red dash in the aircraft forms and accomplish the TEAC as soon as conditions permit.

6. Have pilot take off and climb to height selected in step 5.
7. Deleted.
8. Deleted.
9. Have pilot set rotor speed to **100 percent** rpm using NO. 1 & 2 ENGINE BEEP TRIM switch.

10. Have pilot maintain airspeed of **120 KIAS**, in level flight.

WARNING

Do not use thrust control to reduce engine power during test. Engine overspeed can occur unless power is first reduced with NO. 1 & 2 ENGINE BEEP TRIM switch.

CAUTION

Do not allow EMERG PWR light to stay on longer than **5 seconds**. After **5 seconds**, indicator trips and timer starts.

11. If an emergency occurs or if it becomes necessary to maneuver the helicopter during TEAC, do the following:
- Reduce engine power using NO. 1 & 2 ENGINE BEEP TRIM switch.
 - When rotor rpm begins to decline, use thrust control to decrease engine power. Do not use thrust control until rotor rpm begins to decrease.

- 12. Raise thrust lever slowly.
- 13. Set ENGINE CONDITION LEVER (ECL) engine not being TEACed to GROUND. Maintain **100 percent** rotor rpm using ENGINE BEEP TRIM switch.
- 14. Continue increasing thrust and increasing NO. 1 & NO. 2 BEEP TRIM switch until gas producer (N1) speed for engine being TEACed stabilizes at maximum and rotor rpm falls to **98 percent**. Maintain N1 and **98 percent** rotor rpm using thrust control and NO. 1 & NO. 2 ENGINE BEEP TRIM switch.

WARNING

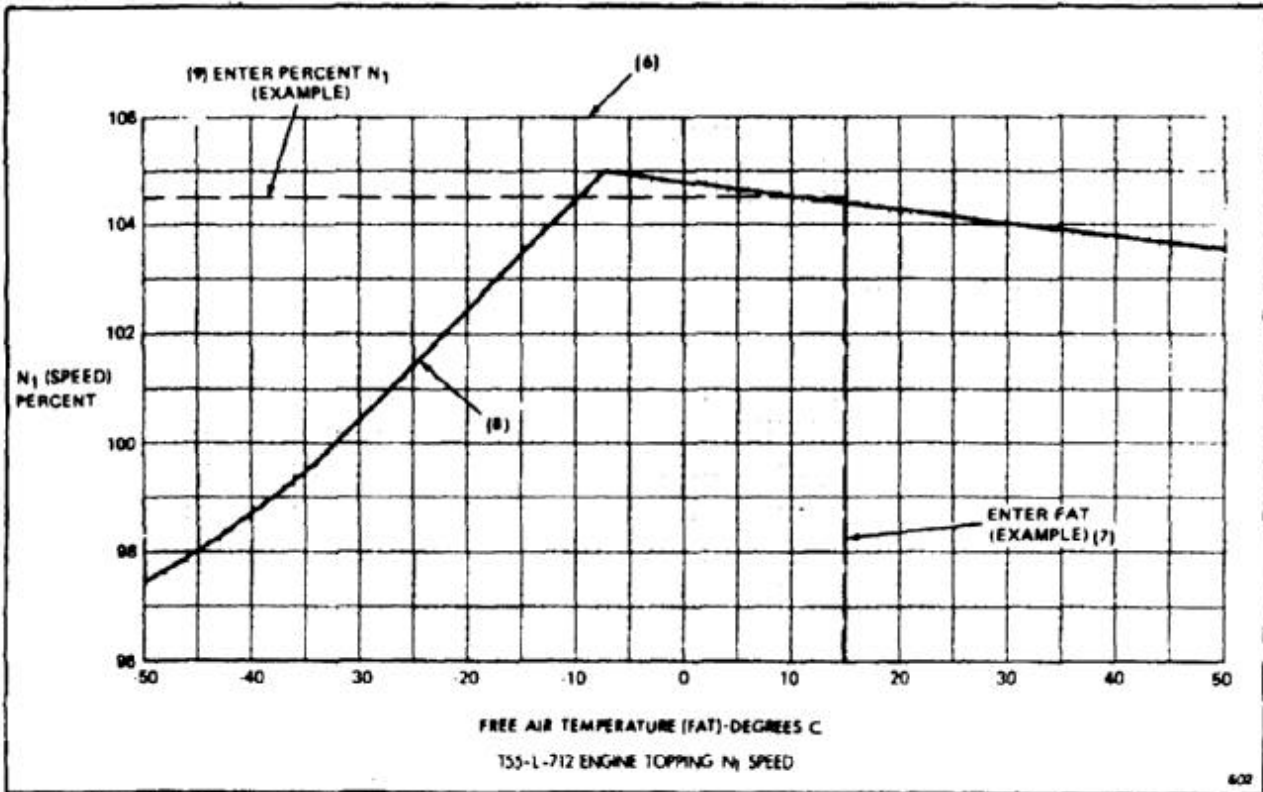
Do not adjust thrust until rotor rpm begins to decrease. An engine overspeed can occur if thrust is adjusted before rotor rpm begins to decrease.

CAUTION

Do not exceed following limits:

- a. Power turbine inlet temperature (PTIT) **890°C**.
- b. N1 — **105 percent**.

- c. Airspeed — **140 KIAS**.
- d. Engine torque — **123 percent**.
- 15. Stabilize rotor rpm at **98 percent for 2 to 3 minutes**, then record the following:
 - a. N1 speed
 - b. Rotor rpm
 - c. FAT
 - d. PTIT
 - e. Torque
 - f. Pressure altitude
- 16. Determine corrected N1 speed.
 - a. Enter c from step 15 on chart (6) at FAT (7).
 - b. Enter a from step 15 on chart (6) at N1 speed (9). Note intersection of lines.
- 17. Determine Torque Available.
 - a. Enter c from step 15 on chart (10) at FAT. Draw line vertically to f from step 15 (recorded pressure altitude).
 - b. Draw line horizontally from point determined in step 17a left to the torque available scale. Determine torque available.



18. Engine trim is acceptable as all conditions below are met:

- a. PTIT is between 860° and 890°C.

NOTE

This note applies only to engines with serial numbers of LE 71850 or greater. If PTIT is below 860°C, but between 840° and 860°C, do the following:

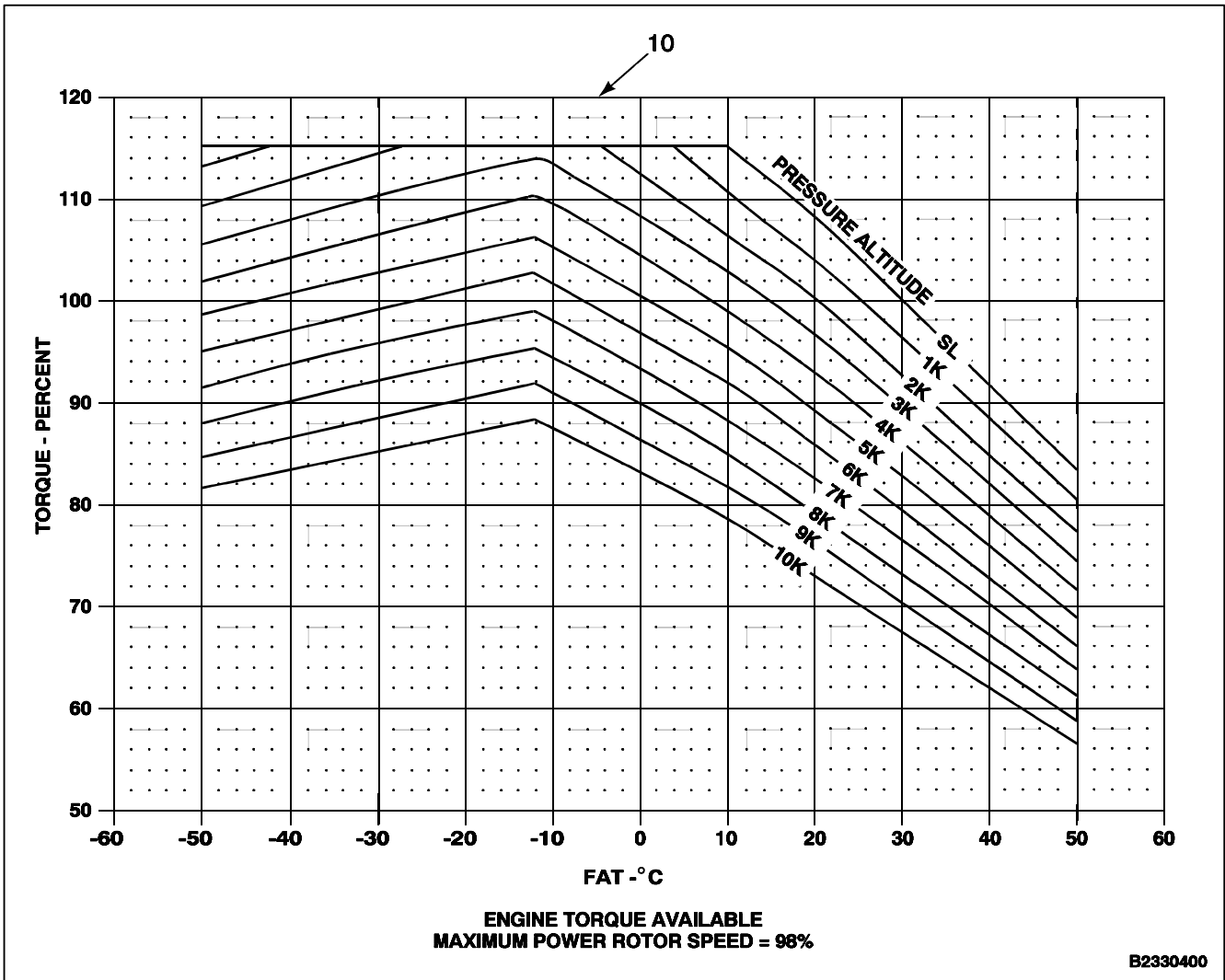
(1) Check the thermocouple harness assemblies per TM 55-2840-254-23, Task 4-24.

(2) Check the power turbine inlet temperature indicator per TM 55-1520-254-23, Task 8-2.

(3) Check the power turbine inlet temperature system per TM 55-1520-240-T, Task 8-5.

This engine is acceptable if no discrepancies are observed and PTIT indicator reading is at least 840°C.

- b. N1 and FAT lines entered on chart in step 16 must be within 5 percent but not exceed the N1 curve.
- c. Recorded torque exceeds the value determined in step 17b.
- d. If engine trim is acceptable, perform steps 19 thru 26, then go to step 29. If not accepted, perform steps 19 thru 28.



- 19. Set NO. 1 & 2 ENGINE BEEP TRIM switch to RPM DECREASE until rotor rpm begins to decrease.
- 20. Then lower thrust control to decrease N1, rotor rpm, and engine torque.



Do not move ECL of engine until speed and torque have decreased.

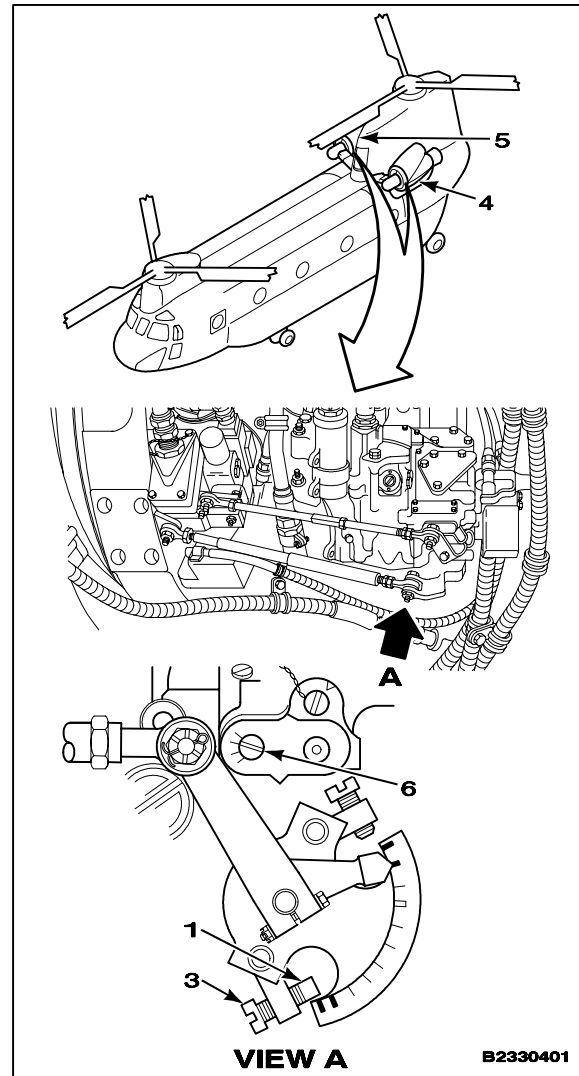
- 21. Set ECL of engine not being TEAC'ed slowly to FLIGHT.
- 22. Repeat steps 11 thru 20 on other engine.
- 23. Land aircraft and shut down engines.
- 24. Disconnect battery (Task 1-39).
- 25. Open engine work platform (Task 2-2).
- 26. On No. 1 engine, open engine access cover (Task 4-49). On No. 2 engine, remove access cover plate (Task 2-2).



Do not trim engine to exceed PTIT limits.

NOTE

N1 or PTIT deficiencies require troubleshooting before trim adjustment (TM 55-2840-254-23-1).



- 27. Trim engine as follows:
 - a. To increase N1 or PTIT, turn N1 screws (6) clockwise.
 - b. To decrease N1 or PTIT, turn N1 screw (6) counterclockwise.

NOTE

1/4 turn of screw is approx 1 percent change in N1, and 25°C change in PTIT.

- 27.1. On No. 1 engine, close engine access cover (Task 4-50). On No. 2 engine, install access cover plate (Task 2-2).

- 28. Repeat steps 4 thru 18.



Stops must be removed from both engines; otherwise, the aircraft will not be able to operate with emergency power.

- 29. Remove two stops (1) from two screws (3) on No. 1 engine (4) and No. 2 engine (5).

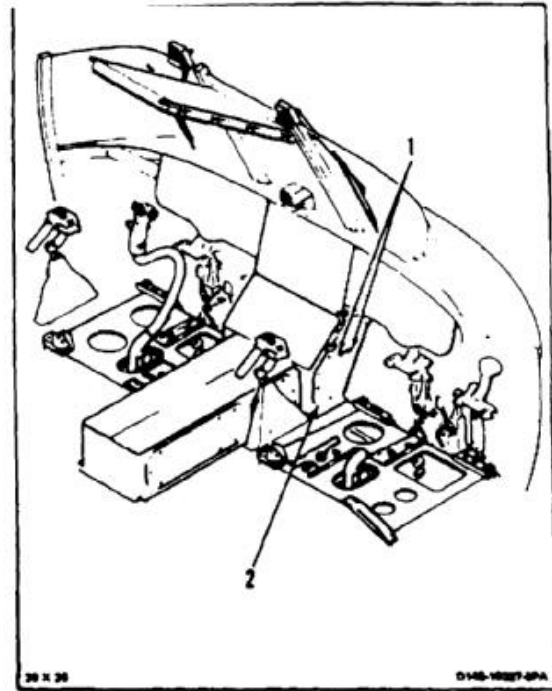
4-3 TURBINE ENGINE ANALYSIS CHECK (TEAC) (Continued)

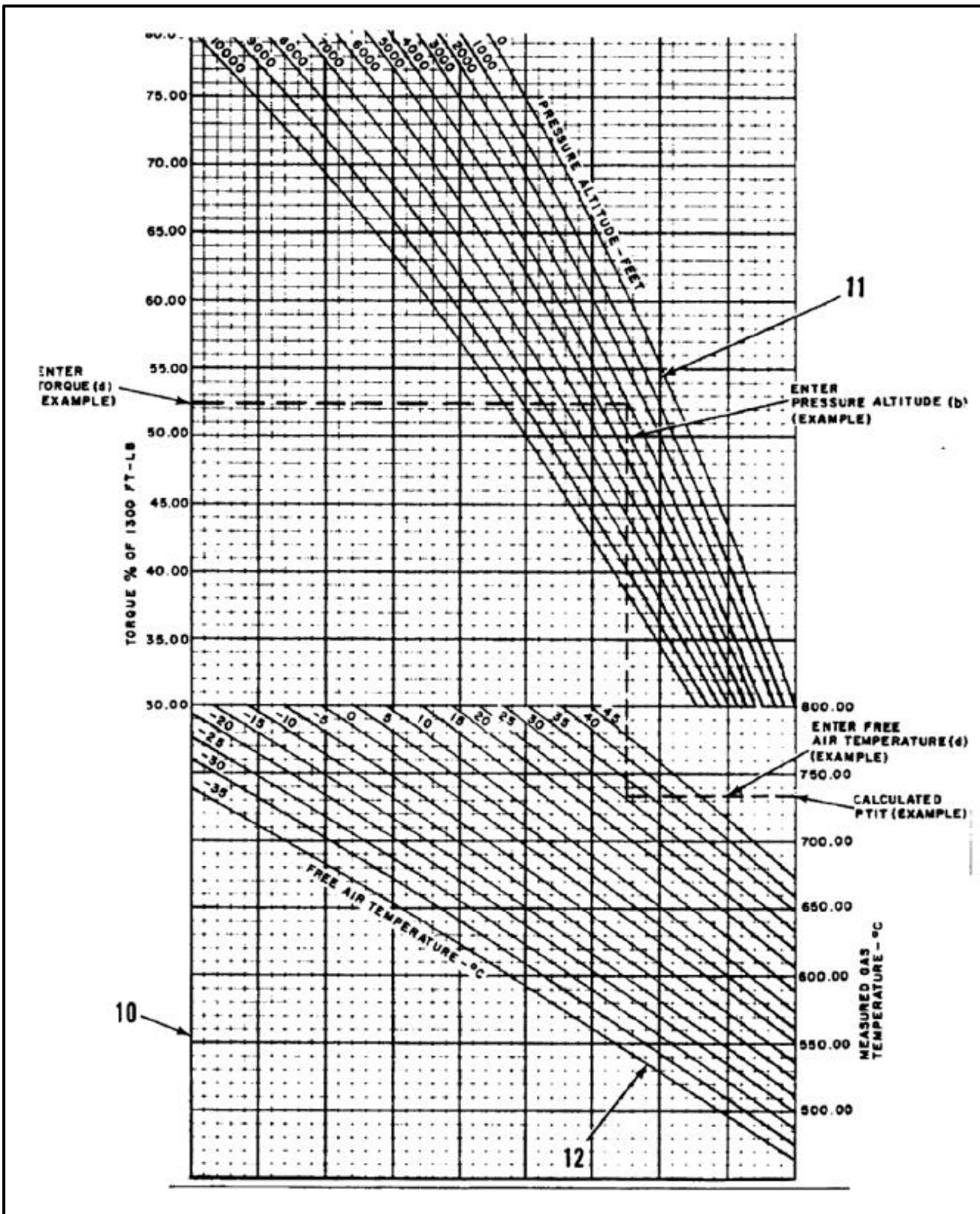
4-3

30. Close engine access cover (Task 4-50).
31. Close engine work platform (Task 2-2).
32. Install stops (1) on panel (2) in cockpit. Lockwire stops. Use lockwire (E230).

FOLLOW-ON MAINTENANCE:

Establish new HIT baseline for the applicable engine (Task 4-2.1).





END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Stopwatch

Materials:

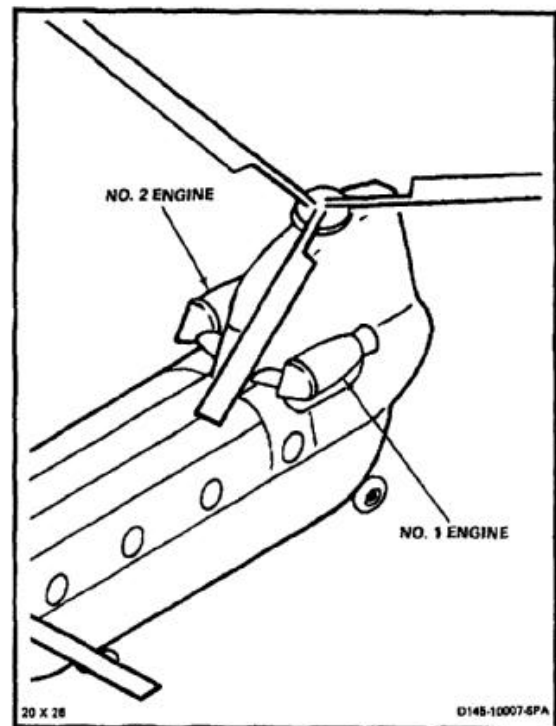
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector
Army Rotary Wing Aviator (2)

References:

TM 1-2840-265-23 With **74**
TM 55-1520-240-10
TM 55-1520-240-MTF
TM 55-2840-254-23 Without **74**
Task 2-2
Task 4-49
Task 4-50

**Equipment Condition:**

Inspect Main Oil Filter (TM 55-2840-254-23) Without **74**
Inspect Main Oil Filter (TM 1-2840-265-23) With **74**
Fuel Control Primed (TM 55-2840-254-23) Without **74**
Control Primed (TM 1-2840-265-23) With **74**
Powerplant Depreserved (Task 4-159) With **74**

NOTE

Engine must be depreserved prior to initial runup (Task 4-159).

Procedure is same for initial runup on No. 1 or No. 2 engine.

1. Operate engine at GROUND for **10 minutes**.
2. Shut engine down.
3. Open engine work platform (Task 2-2).
4. Open engine access cover (Task 4-49).

5. Inspect engine as follows:
 - a. There shall be no leaks at plumbing connections.
 - b. Hoses and accessories shall be secure.
 - c. Engine mounts shall be secure.
6. Close engine access cover (Task 4-50).
7. Close engine work platform (Task 2-2).
8. Operate both engines in FLIGHT with thrust control at ground detent. Maintain **100 percent** rotor rpm until PTIT and oil temperatures stabilize.
9. Move NO. 1 ENGINE CONDITION lever to GROUND. After PTIT stabilizes, shut down both engines.
10. Repeat steps 3 thru 5.
11. Inspect main oil filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
12. Inspect chip detectors (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
13. Inspect fuel control filters, main line fuel filter, and inline fuel filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
14. Repeat steps 6 and 7.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

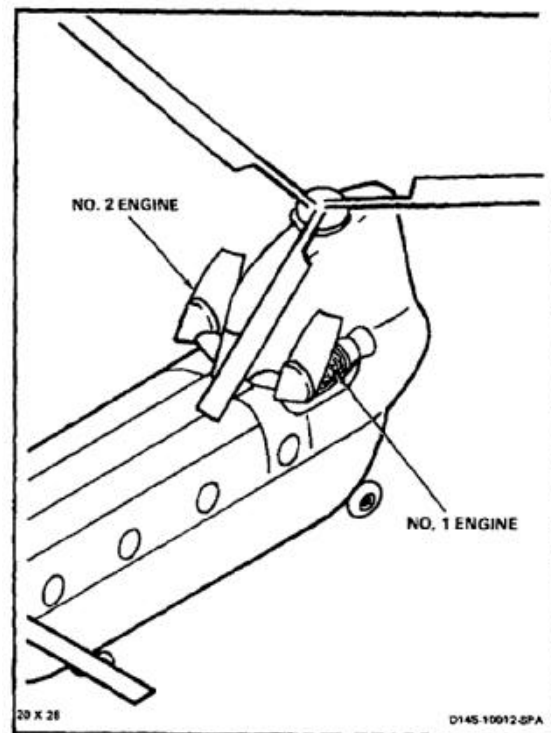
Stopwatch

Materials:

None

Personnel Required:Inspector
Army Rotary Wing Aviator**References:**

TM 55-1520-240-10

TM 55-2840-254-23 Without **74**TM 1-2840-265-23 With **74****Equipment Condition:**Battery Connected (Task 1-39)
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to check coastdown time on No. 1 or No. 2 engine.

1. Have pilot operate engine until PTIT and oil temperature has stabilized (TM 55-1520-240-10).
2. Set ENGINE CONDITION lever to GROUND.
3. After engine rpm has stabilized, set ENGINE CONDITION lever to STOP.
4. Watch N1 indicator and check time required to reach **0 rpm**. If coastdown time is more than **25 seconds**, go to Follow-On Maintenance. If coastdown time is less than **25 seconds**, go to step 5.
5. Inspect chip detectors (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

6. For engines with **74**, inspect oil system for contamination (TM 1-2840-265-23).
7. For engines without **74**, if there are no particles on chip detectors, repeat steps 1 thru 4.
8. For engines with **74**, if there are no particles on the chip detectors or in the filters, repeat steps 1 thru 4, then go to step 10.
9. For engines without **74**, engine is acceptable if second inspection of chip detectors reveals no particles.
10. For engines with **74**, if coastdown time is less than **25 seconds** after engine run, troubleshoot engine (TM 1-2840-265-23).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

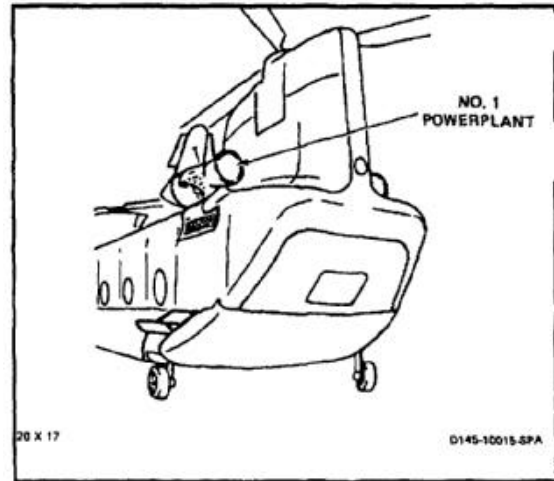
References:

TM 55-2840-254-23

TM 1-1520-253-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

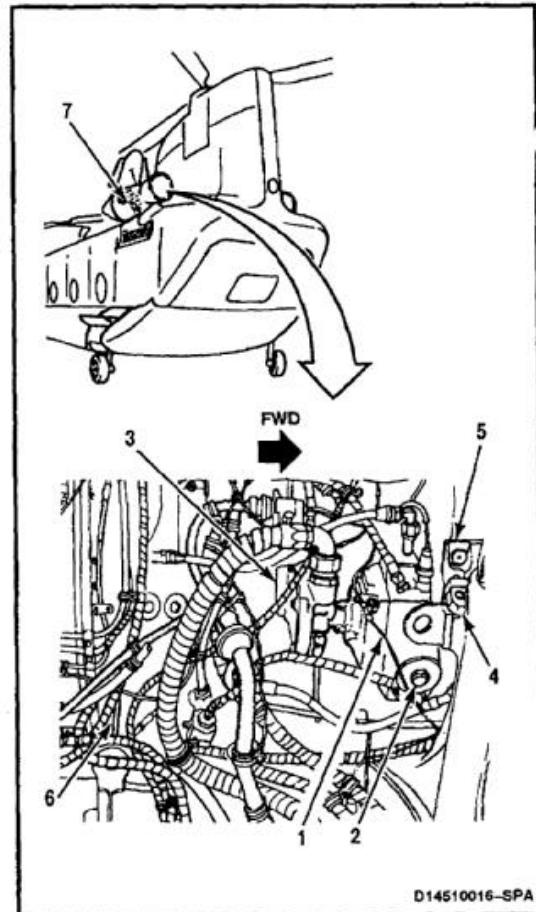
**NOTE**

Procedure is same to check No. 1 or No. 2 engine. No. 1 engine check is shown here.

NOTE

In steps 1, 3, 4, 5, and 6, if a crack is suspected, refer to TM 1-1520-253-23.

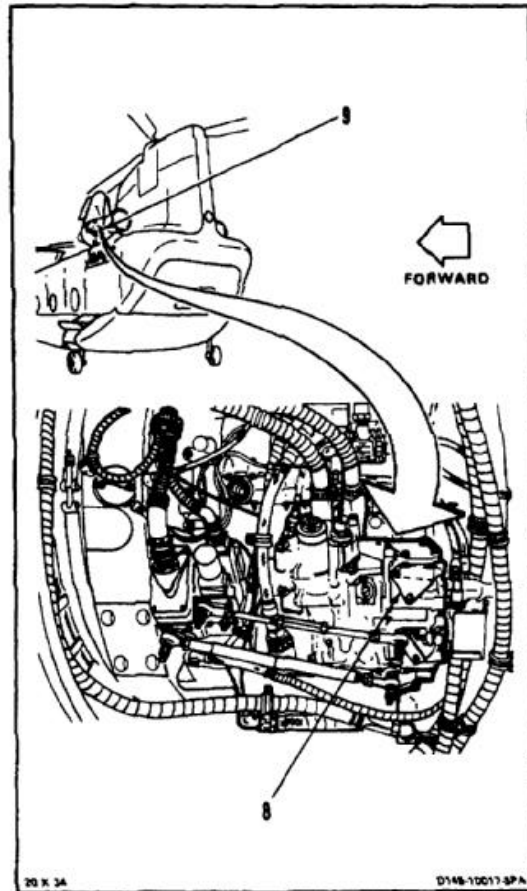
1. Check accessory gearbox (1) for cracked flanges.
2. Remove and inspect main oil filter (2) (TM 55-2840-254-23).
3. Check oil pump (3) for cracked flanges.
4. Check engine mount caps (4), adapters (5), and aft link (6) for cracks.
5. Check connecting link (7) for cracks.



6. Check fuel control (8) for cracked flanges.
7. Check security of all hose connections on powerplant (9).
8. Check security of hardware on powerplant (9).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-6.1 CHECK ENGINE AFTER EXCESSIVE G-FORCE LOAD

4-6.1

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

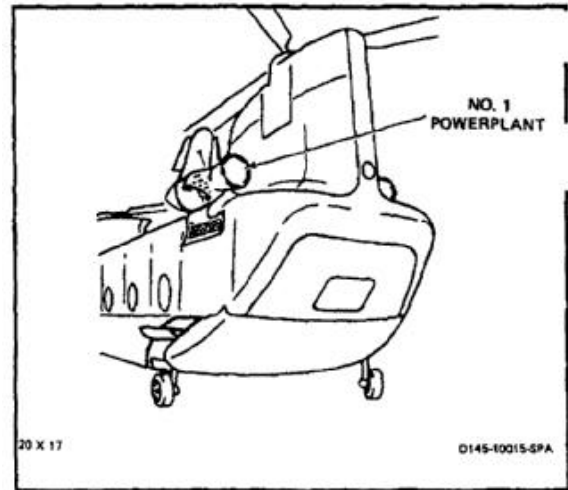
Aircraft Powerplant Repairer
Inspector

References:

TM 1-2840-265-23
TM 1-1520-253-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



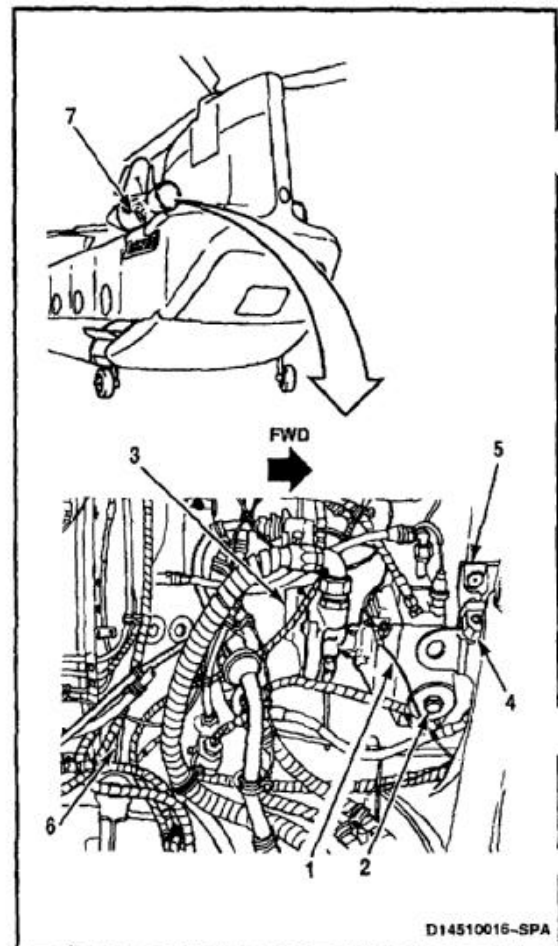
NOTE

Procedure is same to check No. 1 or No. 2 engine. No. 1 engine check is shown here.

NOTE

In steps 1, 3, 4, 5, 6, 9, 10, and 11, if a crack is suspected, refer to TM 1-1520-253-23.

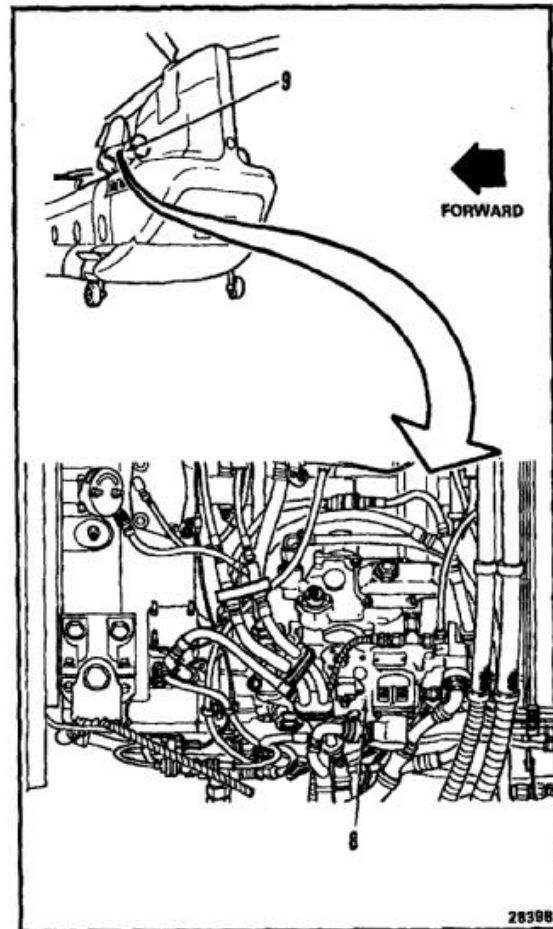
1. Check accessory gearbox (1) for cracked flanges.
2. Remove and inspect main oil filter (2) (TM 1-2840-265-23).
3. Check oil pump (3) for cracked flanges.
4. Check engine mount caps (4), adapters (5), and aft link (6) for cracks.
5. Check connecting link (7) for cracks.



6. Check hydromechanical unit (8) for cracked flanges.
7. Check security of all hose connections on powerplant (9).
8. Check security of hardware on powerplant (9).
9. Check all powerplant (9) mounted accessories for loose bolts, nuts, connections, or cracked flanges.
10. Check powerplant (9) inlet housing, compressor housing, and combustor housing for cracks and loose bolts (TM 1-2840-265-23).
11. Check powerplant (9) mounting pads for cracks or damage.
12. Perform inspect contaminated oil system (TM 1-2840-265-23).
13. Inspect output shaft seal and seal housing for damaged splines (TM 1-2840-265-23).
14. Service scavenge oil screen (TM 1-2840-265-23).
15. Check security of all connectors on powerplant (9).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-7 POWER TURBINE (N2) OVERSPEED

4-7

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

None

Materials:

None

Personnel Required:

Inspector

References:

TM 55-2840-254-23

Equipment Condition:

As Required

1. Power turbine (N2) overspeed occurs if, during POWER ON conditions:
 - a. Rotor rpm is **107 to 112 percent** for more than **12 seconds**.
 - b. Rotor rpm is greater than **112 percent**.
2. If N2 overspeed occurs, perform overspeed inspection (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

As Required

END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

None

Materials:

None

Personnel Required:

Inspector

References:

TM 1-2840-265-23

Equipment Condition:

As Required

1. Power turbine (N2) overspeed occurs if, during POWER ON conditions, N2 rpm is greater than **111.5 percent**.
2. If N2 overspeed occurs, perform overspeed inspection (TM 1-2840-265-23).

FOLLOW-ON MAINTENANCE:

As Required

END OF TASK

4-8 CHECK FOR SUSPECTED COMPRESSOR STALL

4-8

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

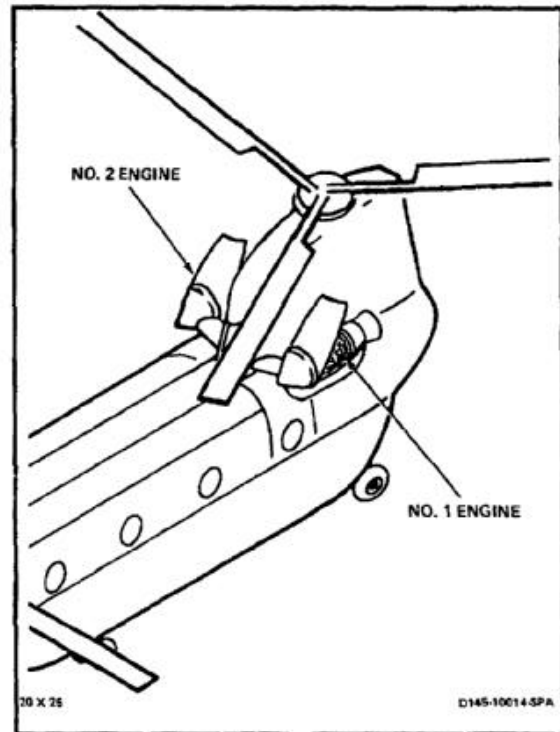
Inspector

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**
TM 55-1520-240-T

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to check No. 1 or No. 2 engine for suspected compressor stall.

1. Determine circumstances at time of suspected compressor stall.
2. Check aircraft and engine log for any history relating to reported stall.
3. Determine N1 speed at time of reported stall.
4. Check compressor rotor blades and stators (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
5. For engines without **74**, if stall occurs during starting when rotor rpm is **35 to 42 percent** or N2 is below **50 percent**, do the following:
 - a. Perform operational check of fairing hot air valve (TM 55-1520-240-T without **74**).
 - b. Adjust bleed band, bleed band actuator, and fuel control (TM 55-2840-254-23 without **74**).
6. For engines with **74**, perform a compressor stall inspection (TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

Inspector

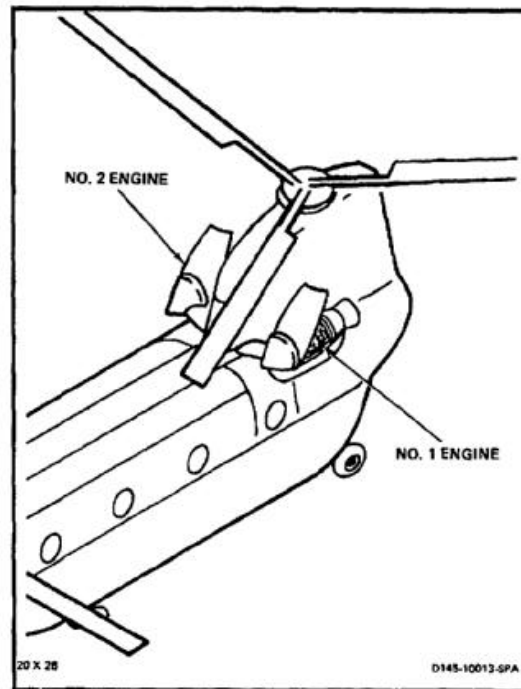
References:TM 55-2840-254-23 Without **74**TM 1-2840-265-23 With **74****Equipment Condition:**

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to inspect No. 1 or No. 2 engine after check runs.

1. Inspect engine as follows:
 - a. There shall be no leaks at plumbing connections.
 - b. Hoses and accessories shall be secure.
 - c. Engine mounts shall be secure.
2. Inspect main oil filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-49).

Close engine work platform (Task 2-2).

END OF TASK

4-10 REMOVE POWERPLANT

4-10

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Transportation Trailer
 Trailer Adapter (T16)
 Sling (T134)
 Hoist
 Rope Guide Lines
 Container, 2 Quart

Materials:

Tape (E388)
 Cloths (E135)
 Paper Tags (E264)

Personnel Required:

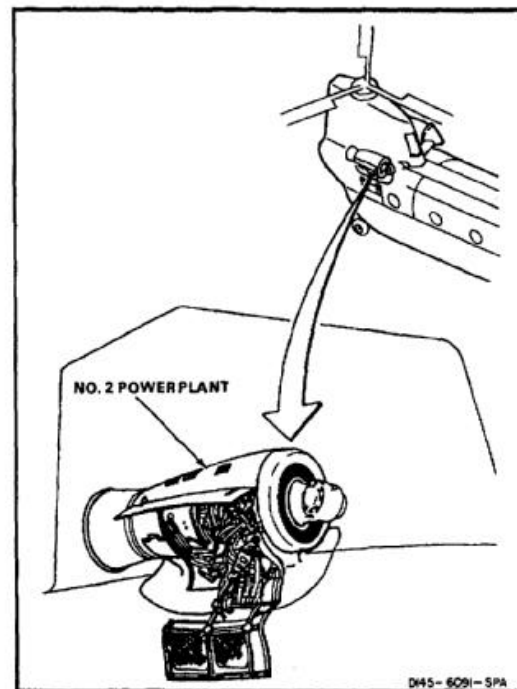
Medium Helicopter Repairer (4)

References:

Task 6-101
 TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Air Inlet Screens Removed (Task 4-65)
 Engine Side and Lower Access Covers Open (Task 4-49)
 Engine Transmission Fairing Removed (Task 4-70)
 Engine Drive Shaft Removed (Task 6-30)



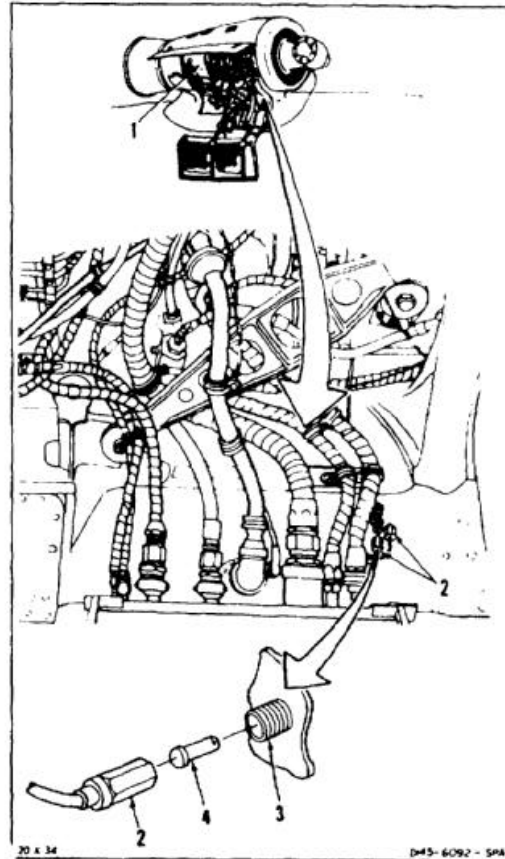
NOTE

Procedure is same for removing No. 1 or No. 2 powerplant of No. 2 powerplant is shown here.

Trailer adapter (T16) is recommended. If powerplant is to be transported over rough ground.

REMOVE POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

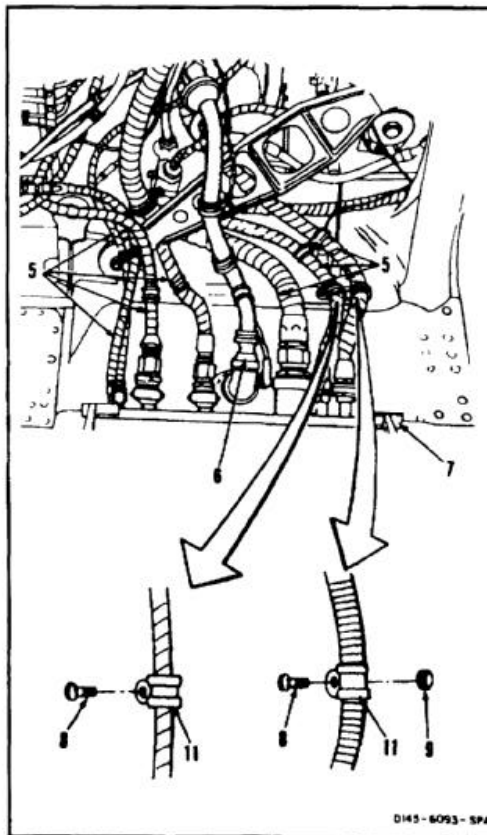
1. If powerplant (1) is to be stored, prepare for storage before removal (TM 55-2840-254-23).
2. Disconnect two fire detection elements (2) from receptacles (3) on fuselage. Make sure insert (4) stays in receptacles. Cap connectors.



4-10 REMOVE POWERPLANT (Continued)

4-10

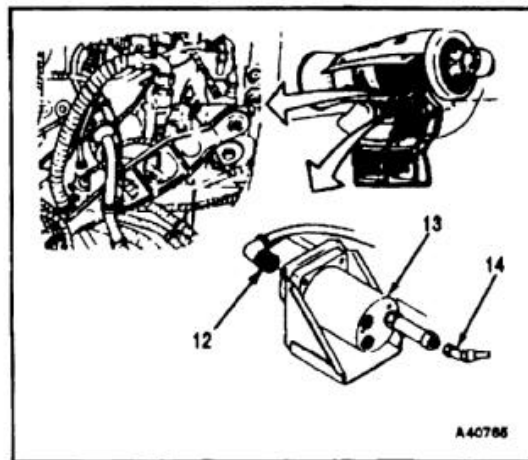
3. Tag and disconnect seven hoses (5) and two cable connectors (6) from shelf (7).
4. Remove two screws (8) and nut (9). Remove two clamps (11). Mark clamp locations. Use tape (E388).



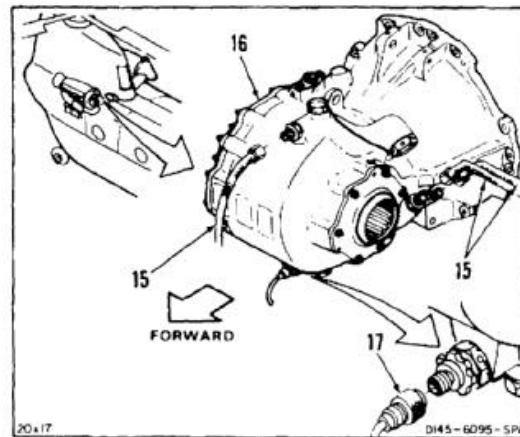
5. Remove lockwire and disconnect cable plug (12) from oil pressure transmitter (13). Disconnect oil hose (14).



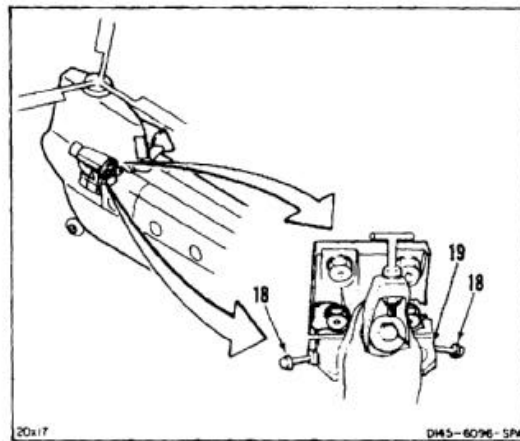
Fuel boost pump inlet fitting must be loosened before engine removal.



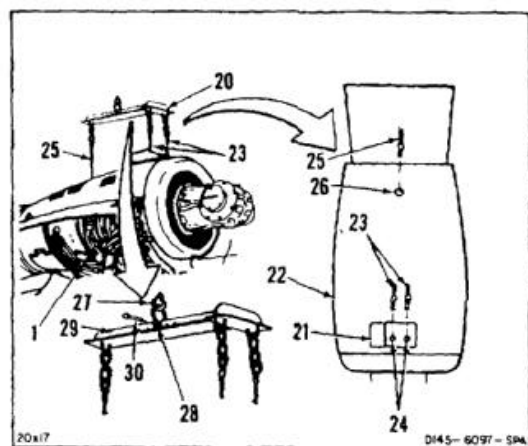
6. Tag and disconnect three hoses (15) at transmission (16). Drain oil into container. Wipe up any spilled oil. Use cloths (E135).
7. Disconnect cable plug (17).



8. Remove lockwire from two bolts (18) on two forward engine mount caps (19). Loosen bolts and push down.



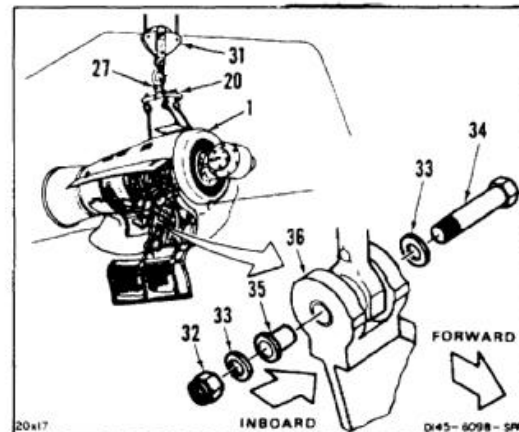
9. Install sling (20) as follows:
 - a. Open access door (21) in engine access cover (22).
 - b. Connect two cables (23) to forward fittings (24) on powerplant (1).
 - c. Connect cable (25) into aft fitting (26) through cover (22).
 - d. Adjust sling (20) until eye (27) is over center hole (28) in sling bar (29).
 - e. Install pin (30) through bar (29).



4-10 REMOVE POWERPLANT (Continued)

4-10

10. Connect hoist (31) to eye (27) of sling (20). Absorb weight of powerplant (1) with hoist.
11. Remove nut (32), two washers (33), bolt (34), and bushing (35) from aft engine mount (36).



12. Install rope guide lines (37).

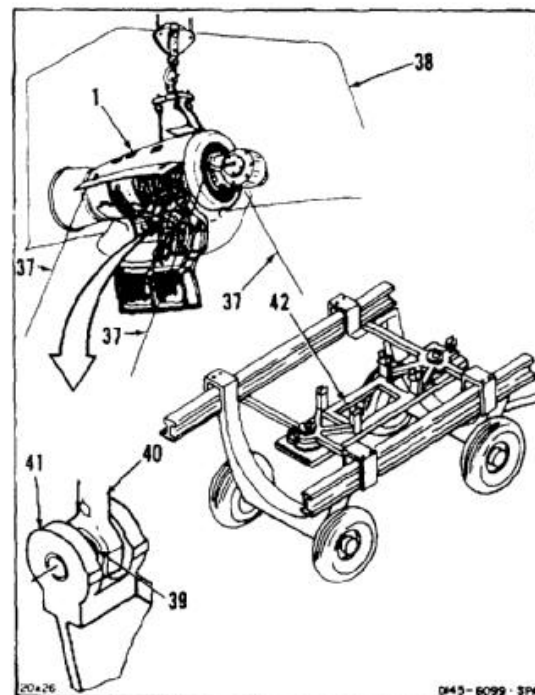
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is being moved by hoist.

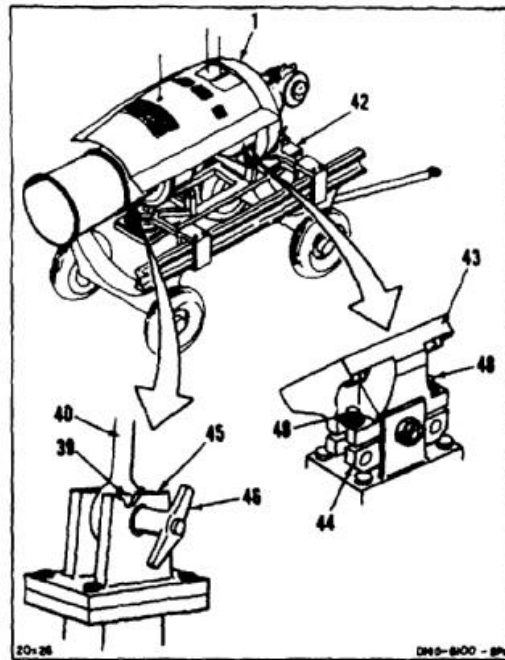
CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

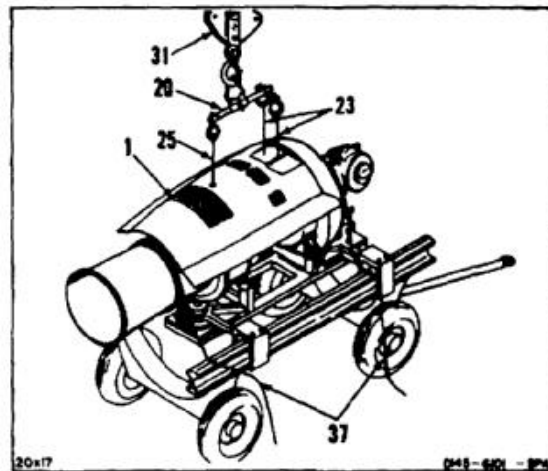
13. Raise powerplant (1) enough to clear helicopter (38). Make sure bearing (39) in aft mount link (40) does not tilt or wedge in clevis (41).
14. Lower powerplant (1) to trailer adapter (T16) (42). Have helper guide powerplant with rope guide lines (37).



15. Position powerplant (1) on trailer adapter (T16) (42). Make sure forward engine mount adapter (43) and aft link (40) align with adapter fittings (44 and 45). Make sure bearing (39) does not tilt or wedge in adapter fitting (45).
16. Install pin (46) through link (40) and fitting (45) on adapter (42).
17. Raise four bolts (48) over engine mount adapter (43). Tighten bolts.



18. Disconnect hoist (31) from sling (20).
19. Remove sling (20) from powerplant (1) by disconnecting three cables (23 and 25).
20. Remove rope guidelines (37).



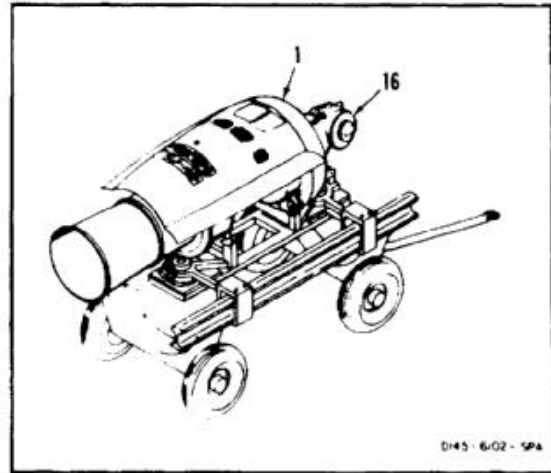
4-10 REMOVE POWERPLANT (Continued)

4-10

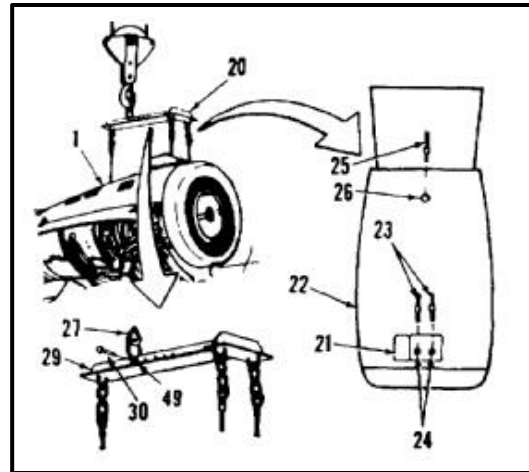
21. Remove engine transmission (16) from powerplant (1) (Task 6-100).

REMOVE POWERPLANT WITH ENGINE TRANSMISSION REMOVED**NOTE**

Art for steps 22 and 24 is referenced to remove powerplant with engine transmission installed section. Referenced art shows engine transmission installed but will not affect task performance.



22. Perform steps 1 thru 5 and 8. Go to step 23.
23. Install sling (20) as follows:
- Open access door (21) in engine access cover (22).
 - Connect two cables (23) to forward fittings (24) on powerplant (1).
 - Connect cable (25) into aft fitting (26) through cover (22).
 - Adjust sling (20) until eye (27) is over aft hole (49) in sling bar (29).
24. Perform steps 10 thru 20. Go to Follow-On Maintenance.

**FOLLOW-ON MAINTENANCE:**

Record any accumulated Emergency Power Time in DA Form 2408-15.

Perform AT TIME OF ENGINE REMOVAL FOR ANY REASON inspection (Task 1-92).

END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Transportation Trailer
 Trailer Adapter (T16)
 Sling (T134)
 Hoist
 Rope Guide Lines
 Container, 2 Quart

Materials:

Tape (E388)
 Cloths (E135)
 Paper Tags (E264)
 Gloves (E184.1)

Personnel Required:

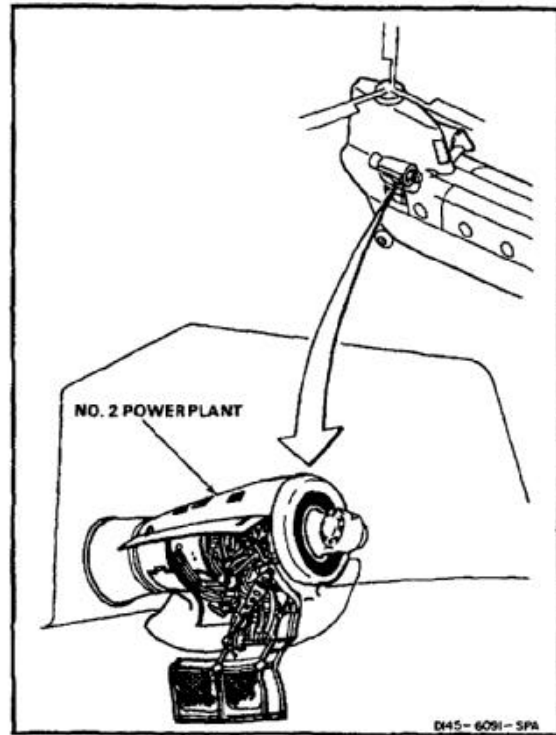
Medium Helicopter Repairer (4)

References:

Task 6-100
 TM 1-2840-265-23

Equipment Condition:

DECU Downloaded (Task 4-149)
 Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Air Inlet Screens Removed (Task 4-65)
 Engine Access Covers Open (Task 4-49)
 Engine Transmission Fairing Removed (Task 4-70)
 Engine Drive Shaft Removed (Task 6-30)



NOTE

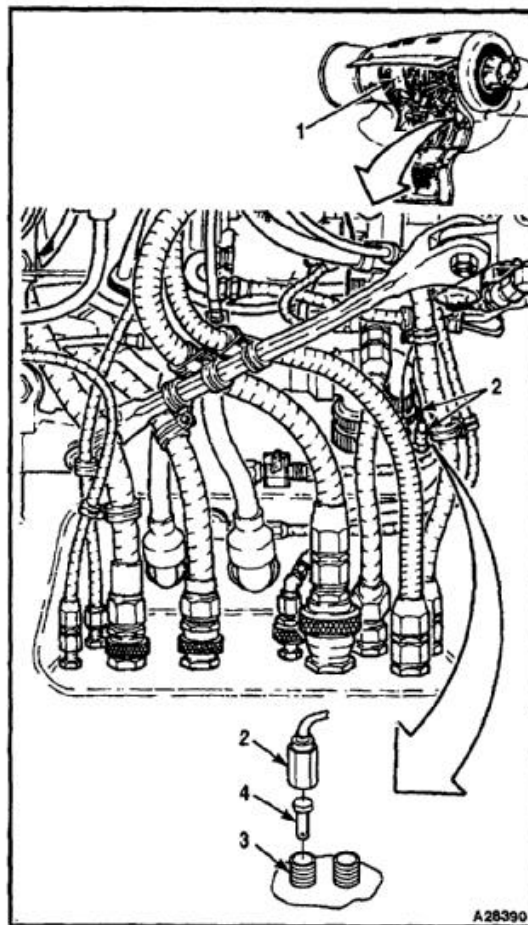
Procedure is same for removing No. 1 or No. 2 powerplant except as noted. Removal of No. 2 powerplant is shown here.

Trailer adapter (T16) is recommended if powerplant is to be transported over rough ground.

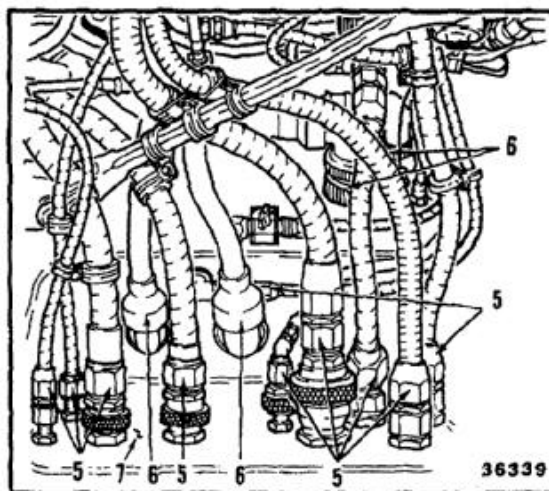
All points of engine disassembly for engine removal must be painted international orange with a band of paint not exceeding **1.00 inch** in width.

REMOVE POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

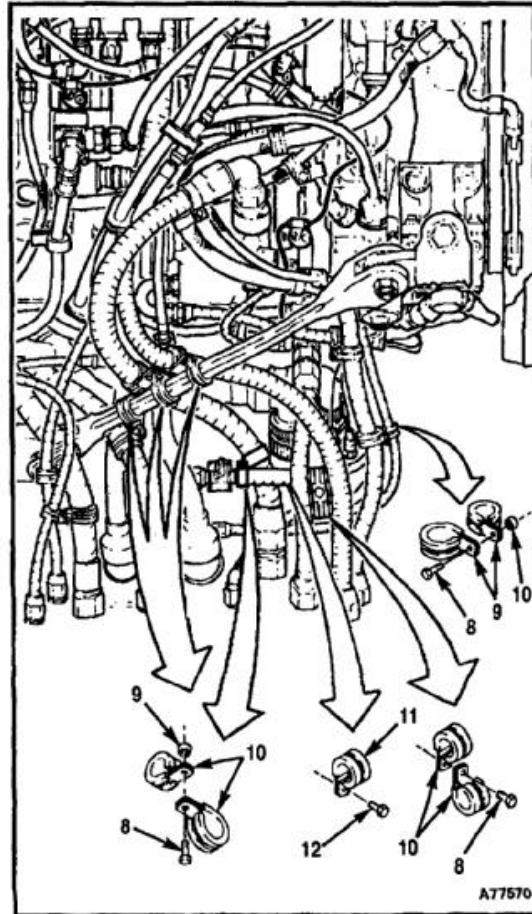
1. If powerplant (1) is to be stored, prepare for storage before removal (TM 1-2840-265-23).
2. Disconnect two fire detection elements (2) from receptacles (3) on fuselage. Make sure insert (4) stays in receptacles. Cap elements and receptacles.



3. Tag (E264) and disconnect ten hoses (5) and four cable connectors (6) from shelf (7).



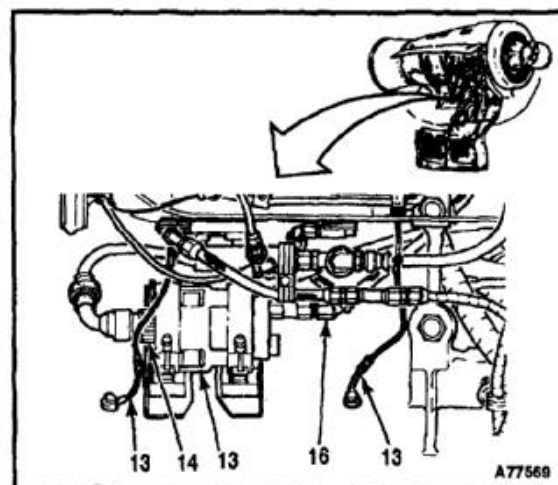
4. Remove six screws (8) and six nuts (9). Remove twelve clamps (10). Mark clamp locations. Use tape (E388).
5. On No. 2 engine only:
 - a. Remove clamp (11) and bolt (12).
 - b. Mark clamp (11) location with tape (E388).



6. Disconnect two bonding jumpers (13).
7. Disconnect cable plug (14) from oil pressure transmitter (15). Disconnect oil hose (16). Drain oil into container. Wipe up any spilled oil. Use cloths (E135).

CAUTION

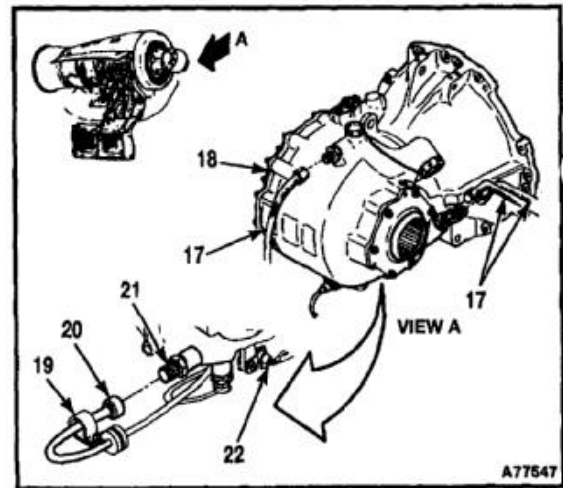
Fuel boost pump inlet fitting must be loosened before engine removal.



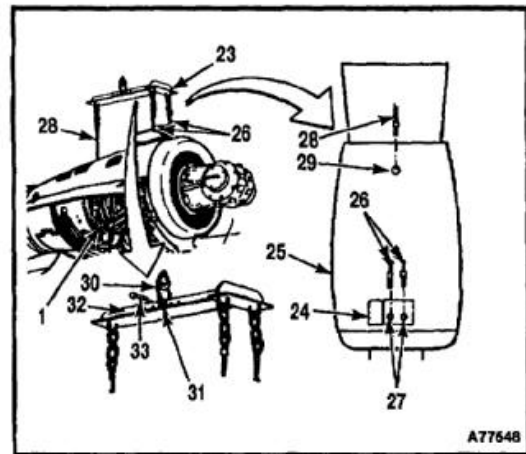
4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

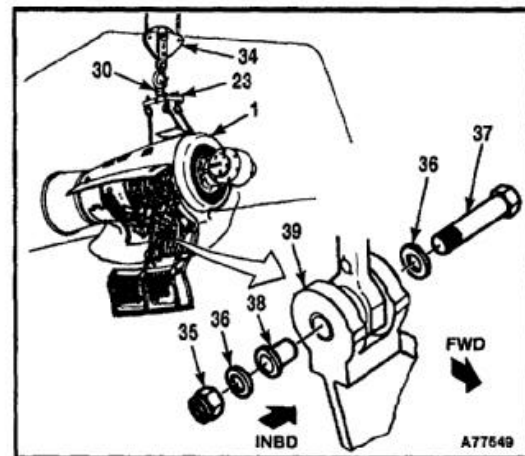
8. Tag (E264) and disconnect three hoses (17) at transmission (18). Drain oil into container. Wipe up any spilled oil. Use cloths (E135). Wear gloves (E184.1).
9. Loosen strain relief (19) and disconnect cable plug (20) from temp switch (21).
10. Disconnect plug at remote connector (22) from chip detector.



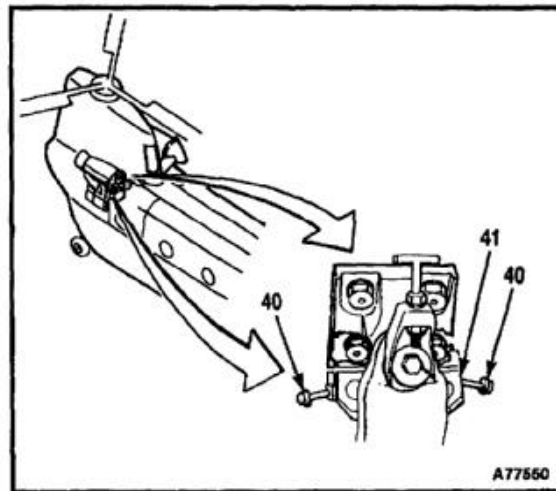
11. Install sling (23) as follows:
 - a. Open access door (24) in engine access cover (25).
 - b. Connect two cables (26) to forward fittings (27) on powerplant (1).
 - c. Connect cable (28) into aft fitting (29) through cover (25).
 - d. Adjust sling (23) until eye (30) is over center hole (31) in sling bar (32).
 - e. Install pin (33) through sling bar (32).



12. Connect hoist (34) to eye (30) of sling (23). Absorb weight of powerplant (1) with hoist.
13. Remove nut (35), two washers (36), bolt (37), and bushing (38) from aft engine mount (39).



14. Remove lockwire from two bolts (40) on two forward engine mount caps (41). Loosen bolts (40) and push down.



15. Install rope guide lines (42).

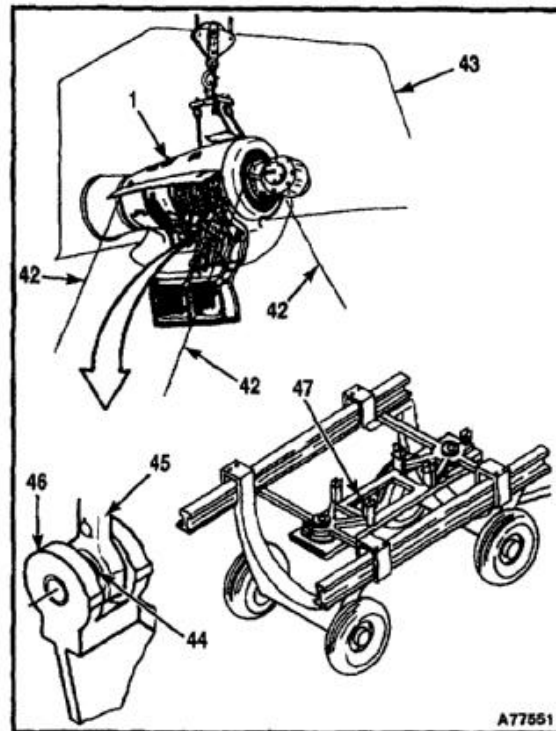
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is being moved by hoist.

CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

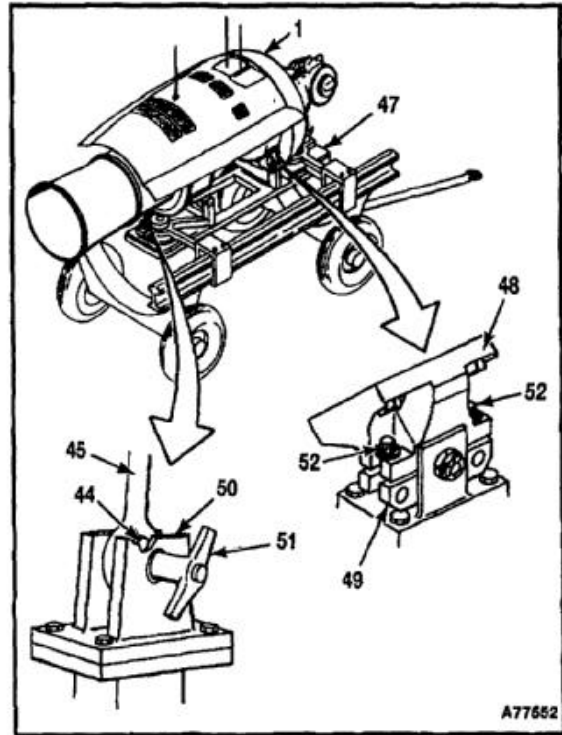
16. Raise powerplant (1) enough to clear helicopter (43). Make sure bearing (44) in aft mount link (45) does not tilt or wedge in clevis (46).
17. Lower powerplant (1) to trailer adapter (T16) (47). Have helpers guide powerplant with rope guide lines (42).



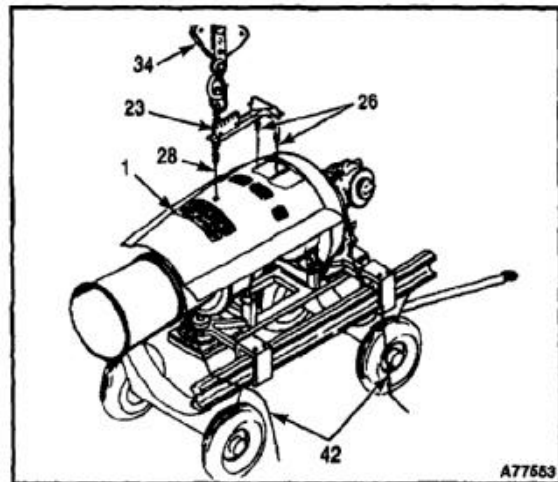
4-10.1 REMOVE POWERPLANT (Continued)

4-10.1

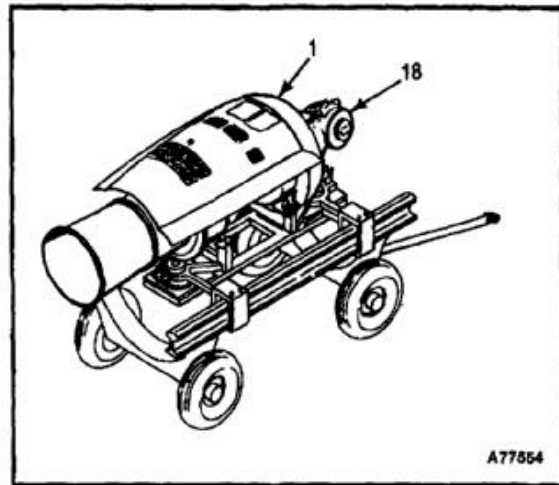
18. Position powerplant (1) on trailer adapter (T16) (47). Make sure forward engine mount adapter (48) and aft link (45) align with adapter fittings (49 and 50). Make sure bearing (44) does not tilt or wedge in adapter fitting (50).
19. Install pin (51) through link (45) and fitting (50) on adapter (47).
20. Raise four bolts (52) over engine mount adapter (48). Tighten bolts.



21. Disconnect hoist (34) from sling (23).
22. Remove sling (23) from powerplant (1) by disconnecting three cables (26 and 28).
23. Remove rope guidelines (42).

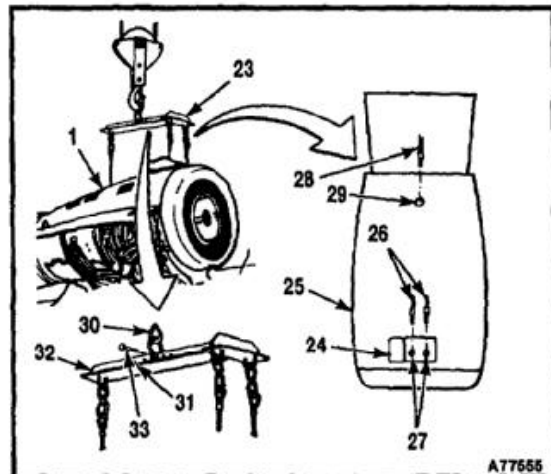


24. Remove engine transmission (18) from powerplant (1) (Task 6-100). Go to Follow-On Maintenance.



REMOVE POWERPLANT WITH ENGINE TRANSMISSION REMOVED

25. Perform steps 1 thru 6 and 9, then go to step 26.
26. Install sling (23) as follows:
- Open access door (24) in engine access cover (25).
 - Connect two cables (26) to forward fittings (27) on powerplant (1).
 - Connect cable (28) into aft fitting (29) through cover (25).
 - Adjust sling (23) until eye (30) is over aft hole (31) in sling bar (32).
 - Install pin (33) through bar (32).
27. Perform steps 12 thru 22. Go to Follow-On Maintenance.



FOLLOW-ON MAINTENANCE:

Record any accumulated Emergency Power Time in DA Form 2408-15.
 Perform AT TIME OF ENGINE REMOVAL FOR ANY REASON inspection (Task 1-92).
 Download the DECU (Task 4-149).

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Hoist
Sling (T134)
Open End Wrench, 1-1/2 Inch
Container, Engine Storage
Container, 2 Quart

Materials:

Cloth (E135)
Tape (E388)
Paper Tags (E264)

Personnel Required:

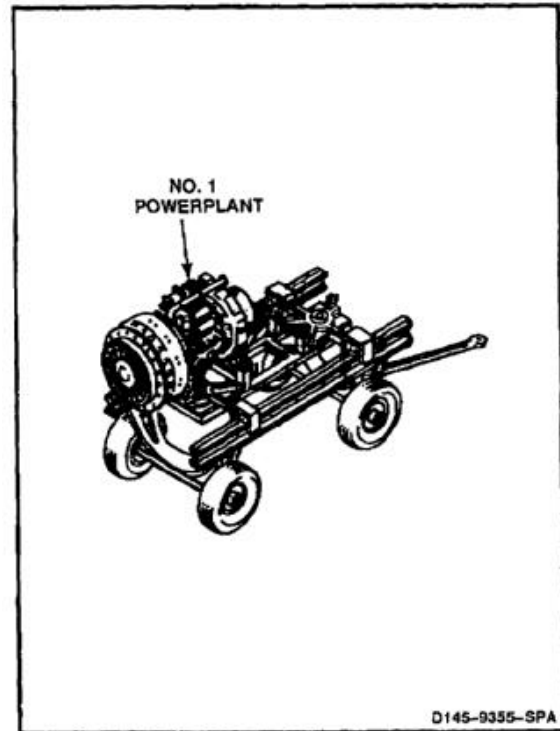
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

Equipment Condition:

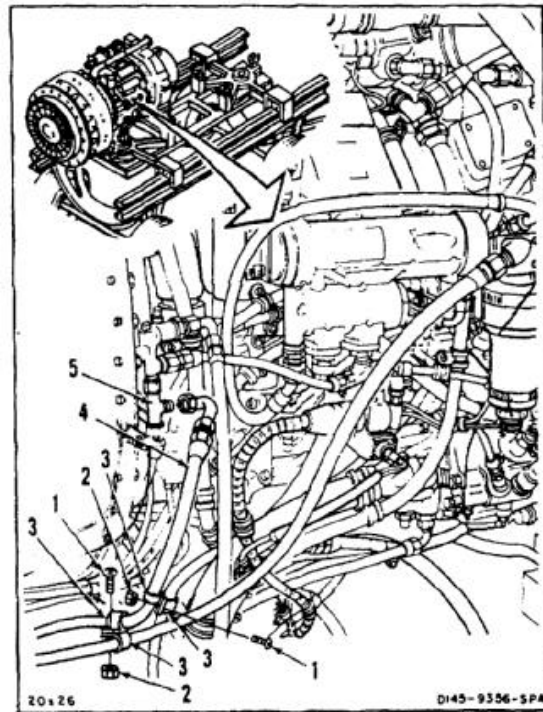
Off Helicopter Task
Engine Access Cover Removed (Task 4-52)
Engine Air Inlet Fairing Removed (Task 4-74)
Fire Detection Sensing Element Removed (Task
12-12)
Exhaust Cone Removed (Task 4-88)
Engine Cover Former Removed (Task 4-45)
Starter Removed (Task 7-141)
Gas Producer Control Linkage Removed (Task 4-112)
Power Turbine Control Linkage Removed (Task 4-132)
Gas Producer Control Actuator Removed (Task
4-108)
Power Turbine Control Actuator Removed (Task
4-138)
Gas Producer Control Actuator Support Bracket
Removed (Task 4-110)
Gas Producer Tachometer Generator Removed (Task
8-9 or 8-10)



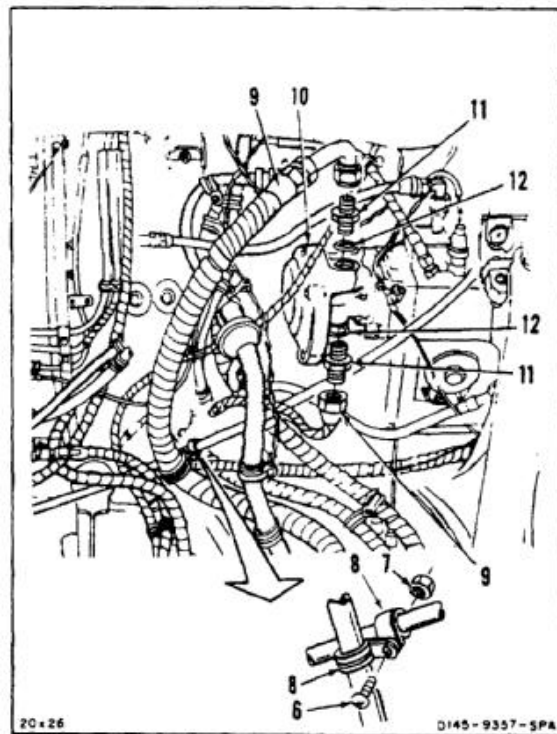
NOTE

Procedure is same to disassemble No. 1 or No. 2 powerplant, except as noted. Disassembly of No. 1 power plant is shown here.

1. Remove two screws (1) and nuts (2) and remove four clamps (3). Use tape (E388) to mark clamp locations.
2. Disconnect hose (4) at fitting (5). Tag and remove hose.



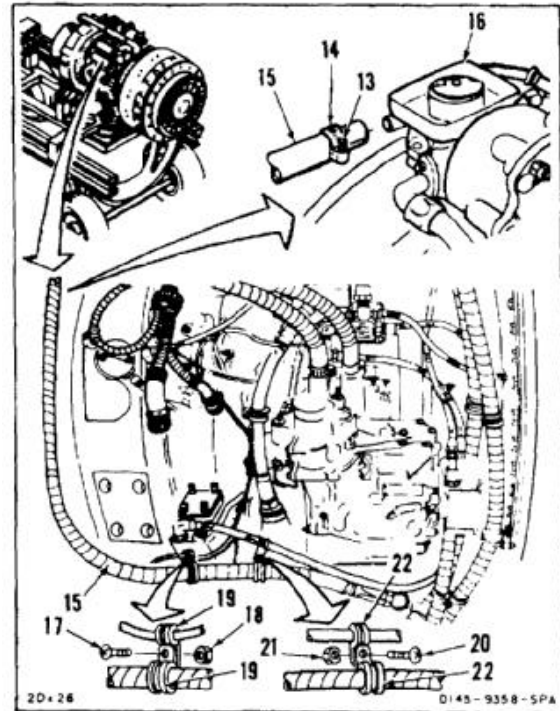
3. Remove screw (6) and nut (7) and remove two clamps (8). Use tape (E388) to mark clamp locations. Tag, disconnect, and remove two hoses (9) from fuel pump (10). Remove two reducers (11) and packings (12).



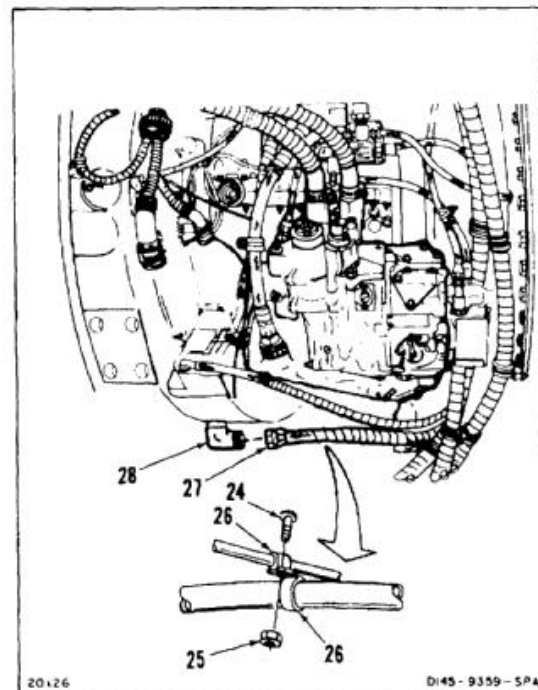
4-11 DISASSEMBLE POWERPLANT (Continued)

4-11

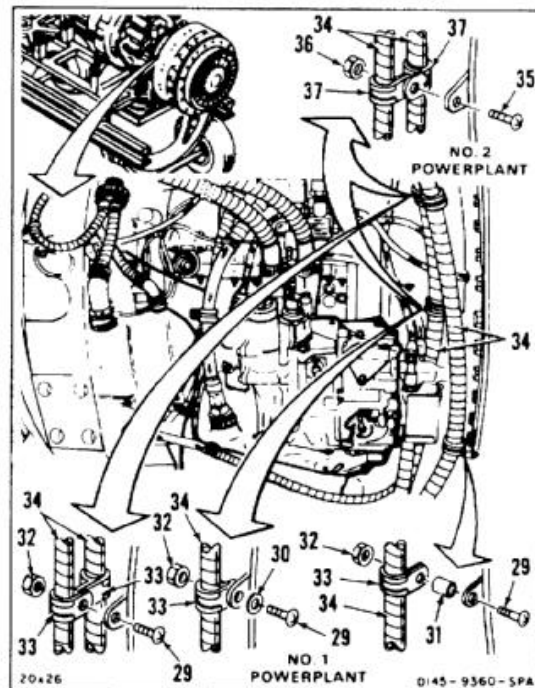
4. Loosen screw (13) on clamp (14). Tag and disconnect hose (15) from oil filler (16).
5. Remove screw (17) and nut (18) and remove two clamps (19). Use tape (E388) to mark clamp location.
6. Remove screw (20) and nut (21) and remove two clamps (22). Use tape (E388) to mark clamp location. Remove hose (15).



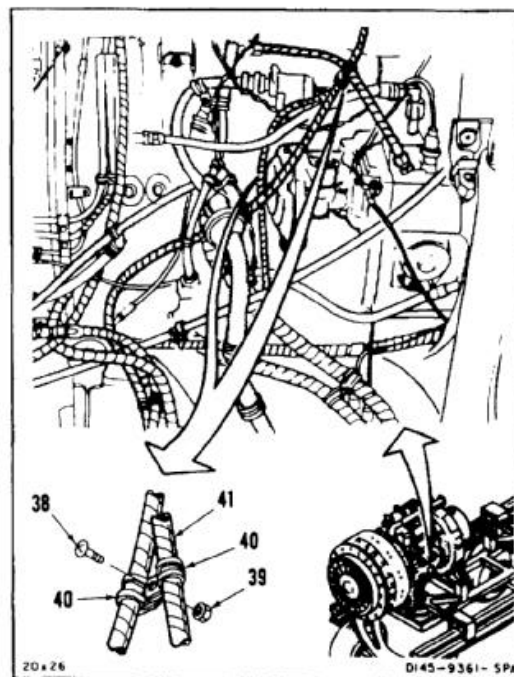
7. Remove screw (24) and nut (25). Remove two clamps (26). Use tape (E388) to mark clamp location.
8. Disconnect hose (27) at elbow (28). Tag and remove hose. Use container and cloths (E135) for spilled fluid.



9. On No. 1 powerplant, remove three screws (29), washer (30), spacer (31), and three nuts (32). Remove four clamps (33). Tag and remove two hoses (34). Use tape (E388) to mark clamp locations.
10. On No. 2 powerplant, remove two screws (35) and nuts (36). Remove four clamps (37). Tag and remove two hoses (34). Use tape (E388) to mark clamp locations.



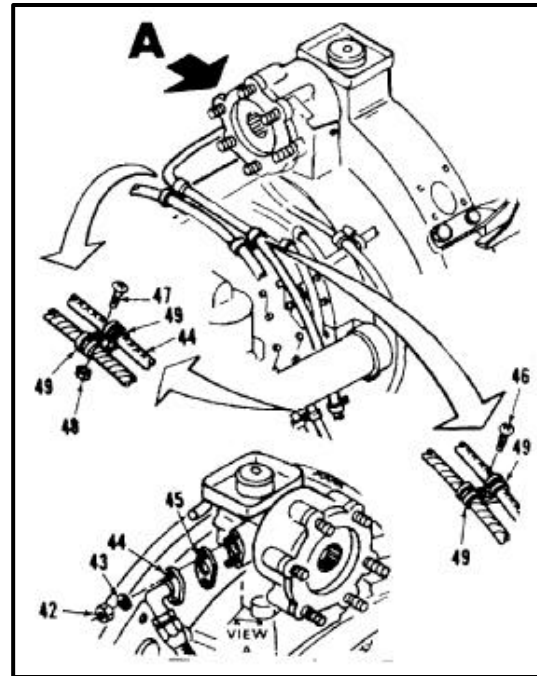
11. Remove two screws (38) and nuts (39), and remove four clamps (40). Use tape (E388) to mark clamp locations. Tag and remove hose (41).



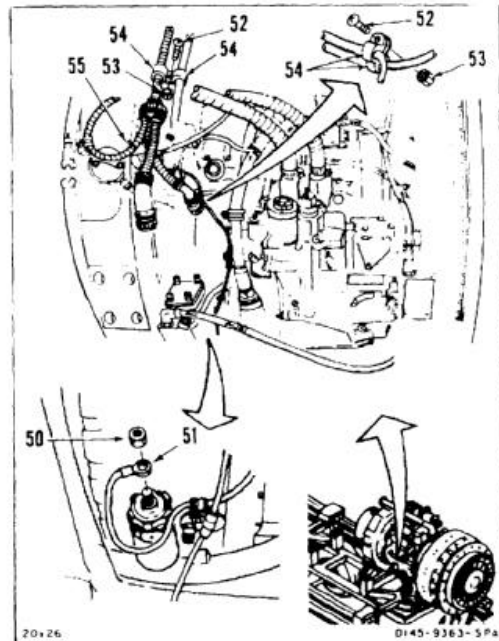
4-11 DISASSEMBLE POWERPLANT (Continued)

4-11

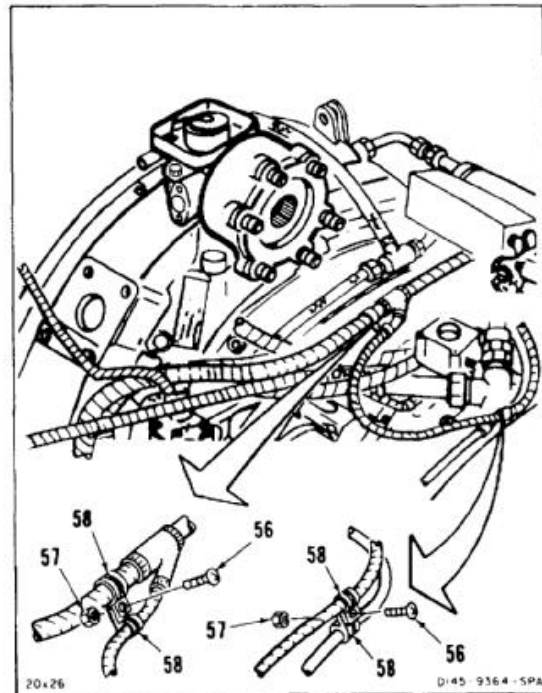
12. Remove two nuts (42) and washers (43). Tag and disconnect hose (44). Remove packing (45).
13. Remove lockwire from screw (46). Remove three screws (46 and 47), two nuts (48), and remove six clamps (49). Use tape (E388) to mark clamp locations. Remove hose (44).



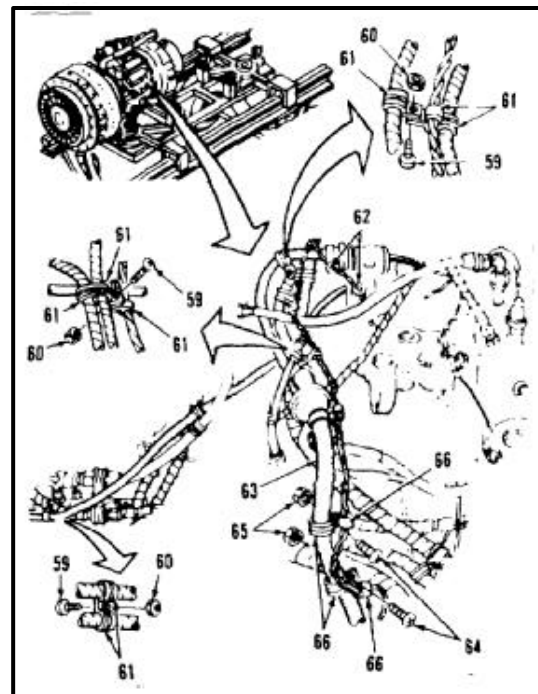
14. Remove nut (50) and disconnect wire (51).
15. Remove two screws (52) and nuts (53) and remove four clamps (54). Use tape (E388) to mark clamp locations.
16. Remove strap (55).



17. Remove two screws (56) and nuts (57) and remove four clamps (58). Use tape (E388) to mark clamp locations.



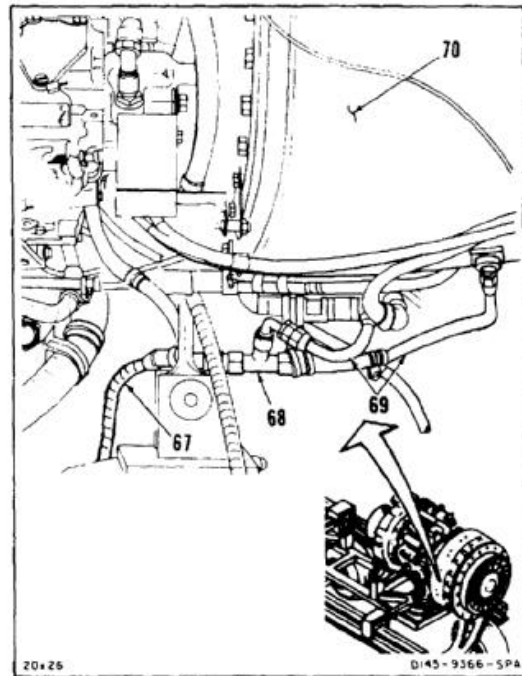
18. Remove five screws (59) and nuts (60) and remove nine clamps (61). Use tape (E388) to mark clamp locations.
19. Disconnect two plugs (62). Tag and remove electrical harnesses (63).
20. Remove two screws (64) and nuts (65) and remove four clamps (66).



4-11 DISASSEMBLE POWERPLANT (Continued)

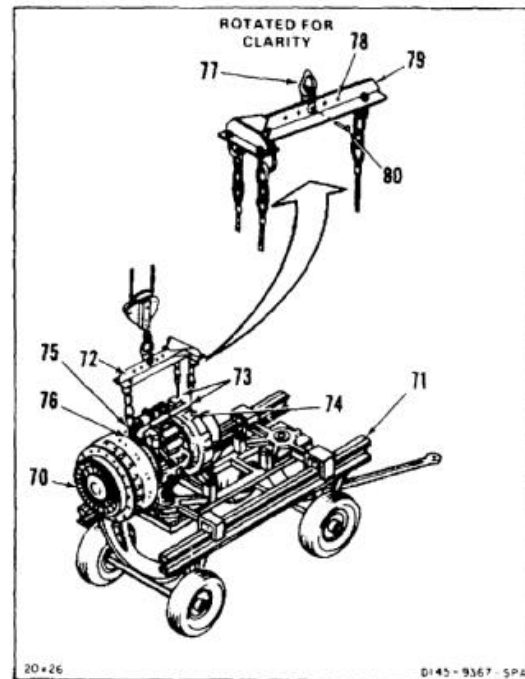
4-11

21. Disconnect hose (67) at tee (68). Tag and remove hose.
22. Disconnect and remove tee (68) from two hoses (69). Tag, disconnect, and remove two hoses from powerplant (70).

**NOTE**

Engine mount adapters and aft mount link must not be removed if powerplant is to be stored on adapter.

23. If powerplant (70) is to be stored on adapter (71) go to Follow-On Maintenance. If powerplant is to be stored in container, go to step 24.
24. Install sling (72) as follows:
 - a. Connect two cables (73) to forward fittings (74) on powerplant (70).
 - b. Connect cable (75) into aft fitting (76) on powerplant (70).
 - c. Adjust sling (72) until eye (77) is over aft hole (78) in sling bar (79).
 - d. Install pin (80) through bar (79).



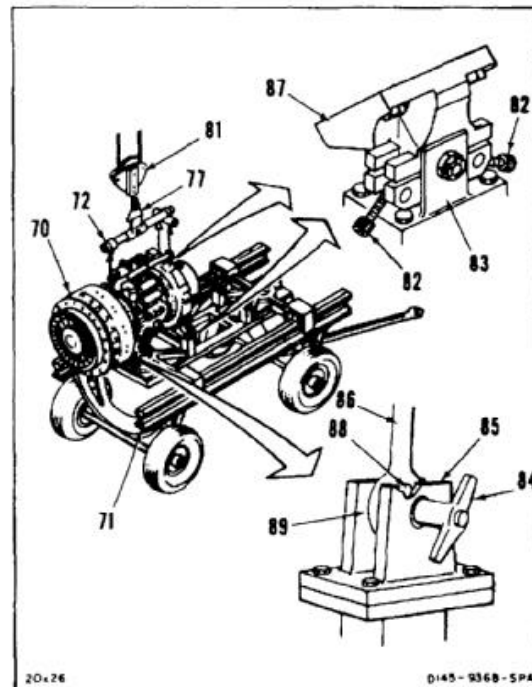
25. Connect hoist (81) to eye (77) of sling (72).
26. Loosen four bolts (82) on adapter fitting (83) and push down to side.
27. Raise hoist (81) to support weight of powerplant (70). Remove pin (84) from adapter fitting (85) and aft mount link (86).

WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

CAUTION

Make sure bearing in lower end of aft support link does not tilt in clevis, while weight of engine is supported. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.



28. Raise hoist (81) so forward engine mount adapters (87) and aft engine mount link (86) are clear of adapter (71). Make sure bearing (88) in aft engine mount link (86) does not tilt in clevis (89).

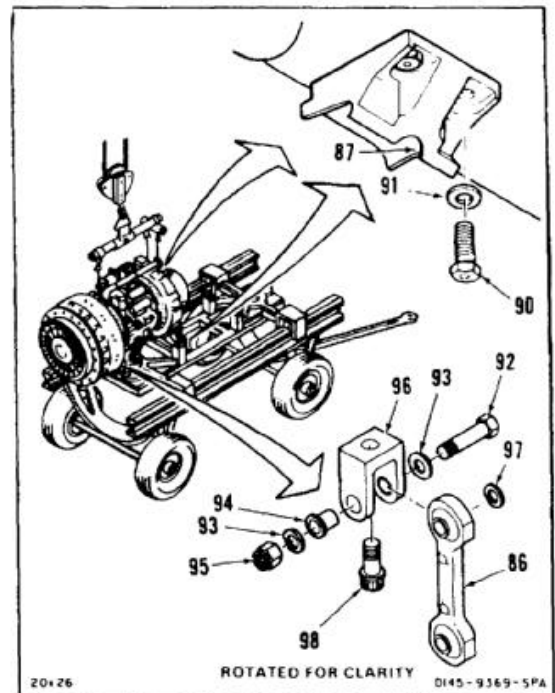
4-11 DISASSEMBLE POWERPLANT (Continued)

4-11

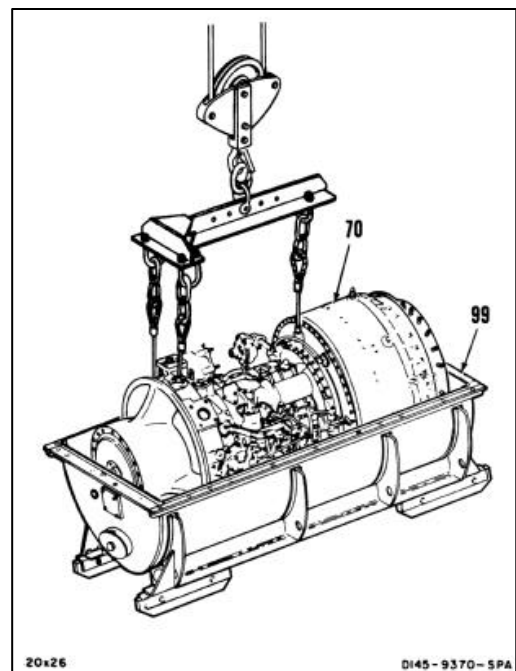
29. Remove lockwire from eight bolts (90). Remove eight bolts and washers (91) and remove two adapters (87).
30. Remove bolt (92), two washers (93), bushing (94), and nut (95) from adapter (96). Remove link (86) and spacer (97).
31. Remove lockwire and bolt (98) and remove adapter (96).

NOTE

Ensure that the N2 RPM limiting stop is removed from fuel control (TM 55-2840-254-23).



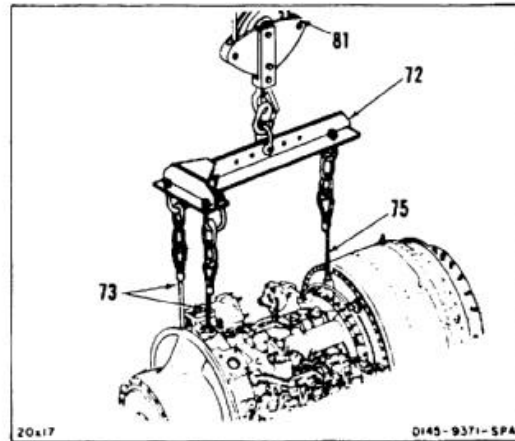
32. Prepare powerplant (70) for storage container (99) (TM 55-2840-254-23).
33. Lower powerplant (70) into storage container (99).



34. Disconnect three cables (73 and 75).
35. Disconnect hoist (81) from sling (72).

FOLLOW-ON MAINTENANCE:

Prepare powerplant for storage (TM 55-2840-254-23).



END OF TASK

4-11.1 DISASSEMBLE POWERPLANT

4-11.1

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Hoist

Sling (T134)

Open End Wrench, 1-1/2 Inch

Container, Engine Storage

Container, 2 Quart

Materials:

Cloth (E135)

Tape (E388)

Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 1-2840-265-23

Equipment Condition:

Off Helicopter Task

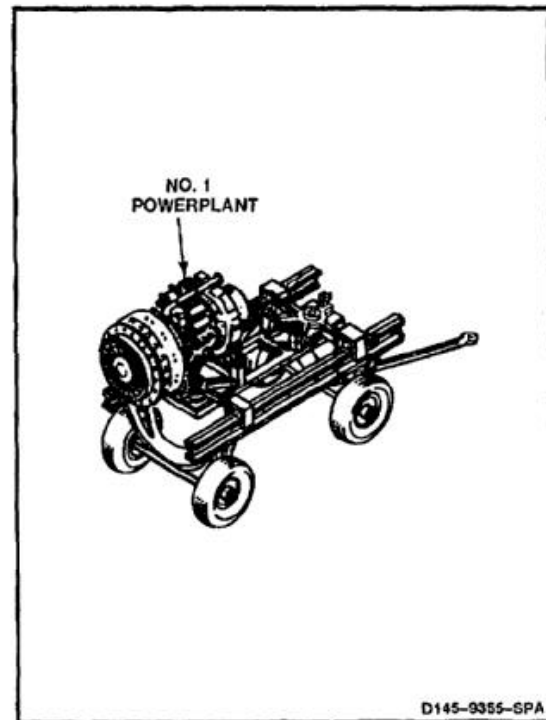
Engine Access Cover Removed (Task 4-52)

Engine Air Inlet Faking Removed (Task 4-74)

Fire Detection Sensing Element Removed (Task
12-12)

Starter Removed (Task 7-141)

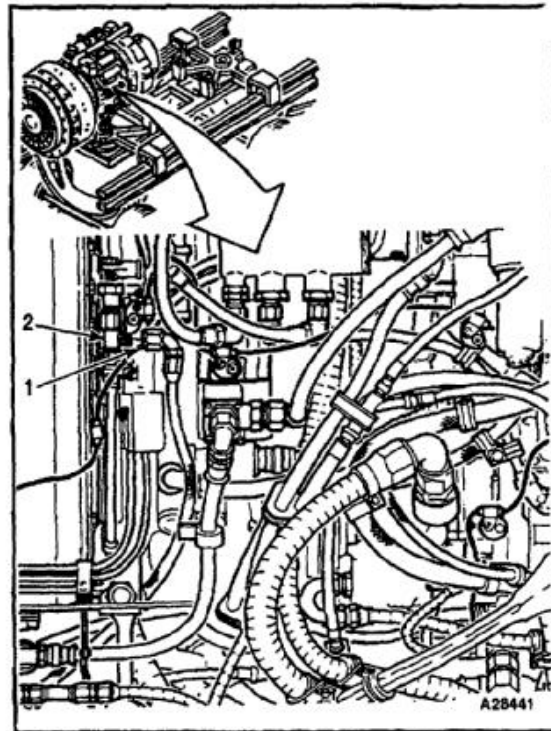
Exhaust Cone Removed (Task 4-88)



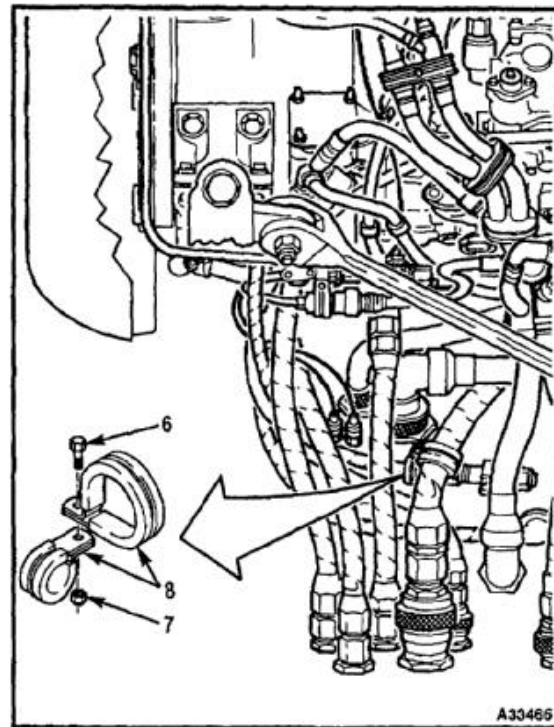
NOTE

Procedure is same to disassemble No. 1 or No. 2 powerplant, except as noted. Disassembly of No. 1 power plant is shown here.

1. Disconnect hose (1) at fitting (2). Tag and remove hose (1). Use tags (E264).



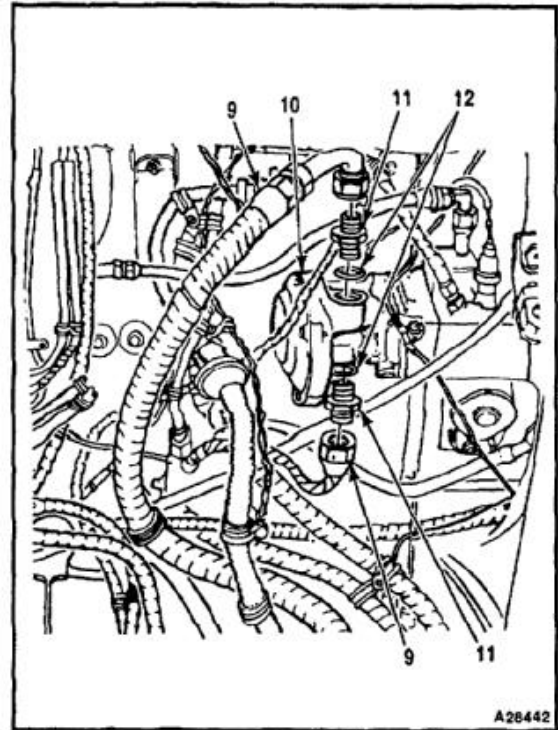
2. On No. 1 powerplant only. Remove screw (6) and nut (7) and remove clamps (8). Use tape (E388) to mark clamp locations.



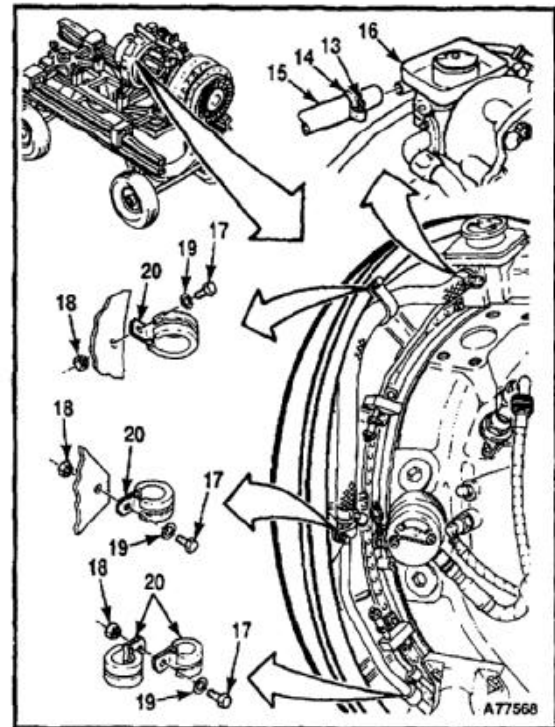
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

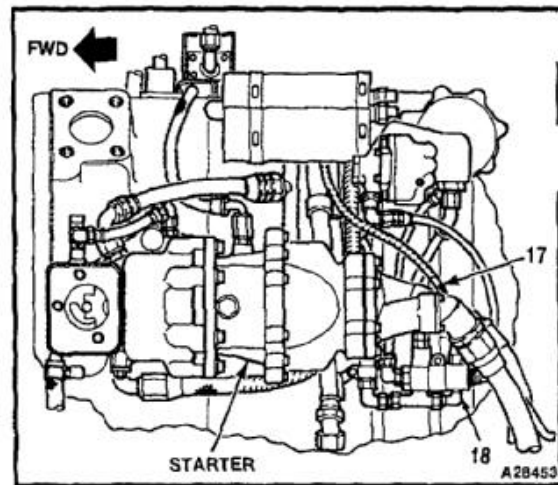
3. Tag, disconnect, and remove two hoses (9) from fuel pump (10). Use tags (E264). Remove two reducers (11) and packings (12).



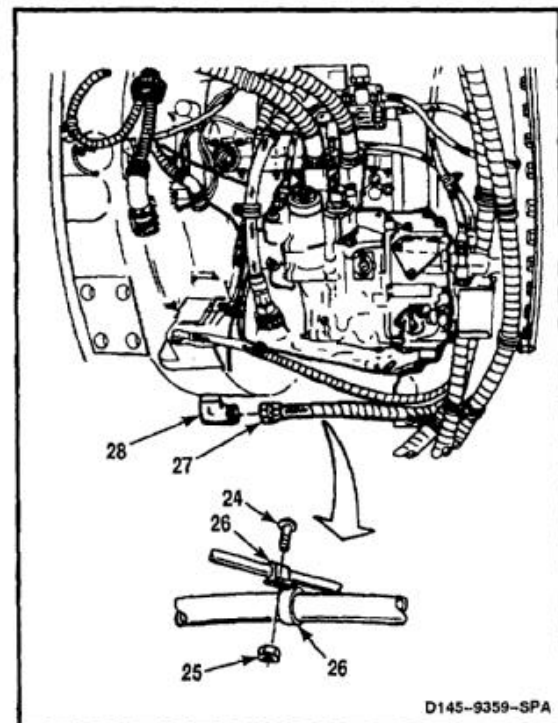
4. Loosen screw (13) on clamp (14). Tag and disconnect hose and line assembly (15) from oil filler (16). Use tags (E264).
5. Remove three screws (17), nuts (18), and washers (19). Remove four clamps (20). Use tape (E388) to mark clamp locations.
6. Remove hose and line assembly (15).



7. Tag and remove line (17) and fitting (18). Use tag (E264).



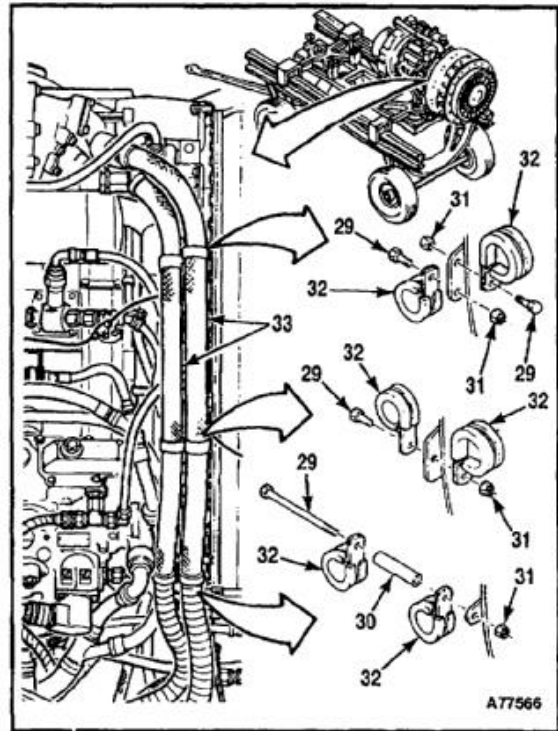
8. Remove screw (24) and nut (25). Remove two clamps (26). Use tape (E388) to mark clamp location.
9. Disconnect hose (27) at elbow (28). Tag and remove hose. Use tag (E264). Use container and cloths (E135) for spilled fluid.



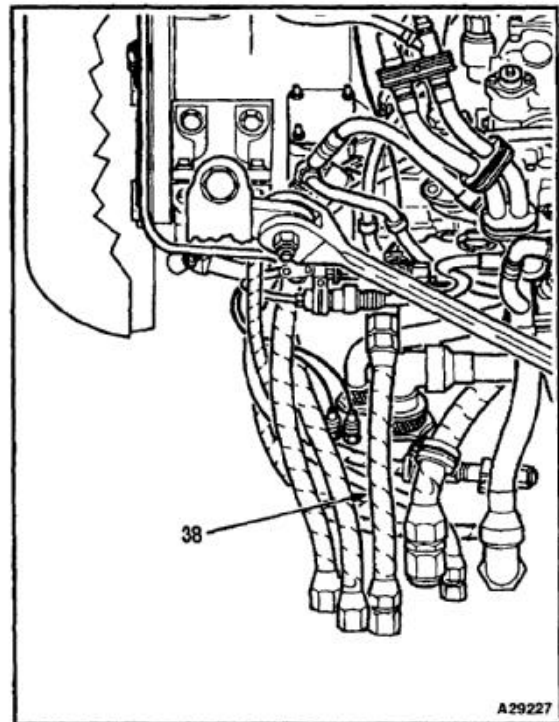
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

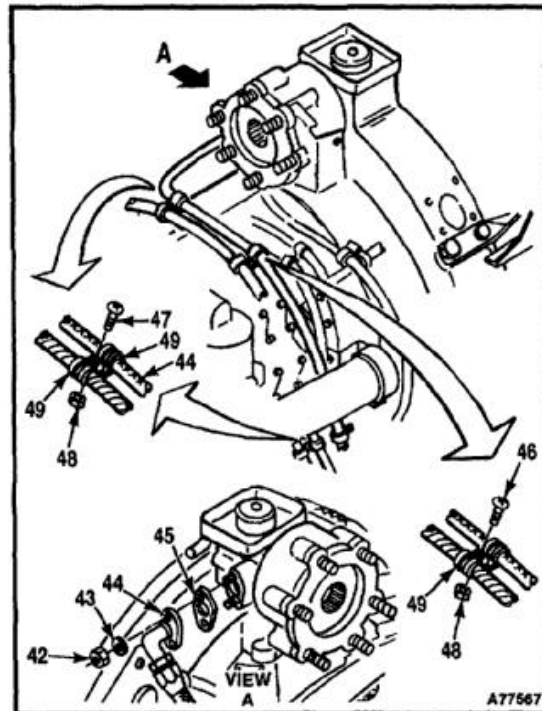
10. Remove four screws (29), spacer (30), and four nuts (31). Remove six clamps (32). Disconnect, tag, and remove two hoses (33). Use tags (E264). Use tape (E388) to mark clamp locations.



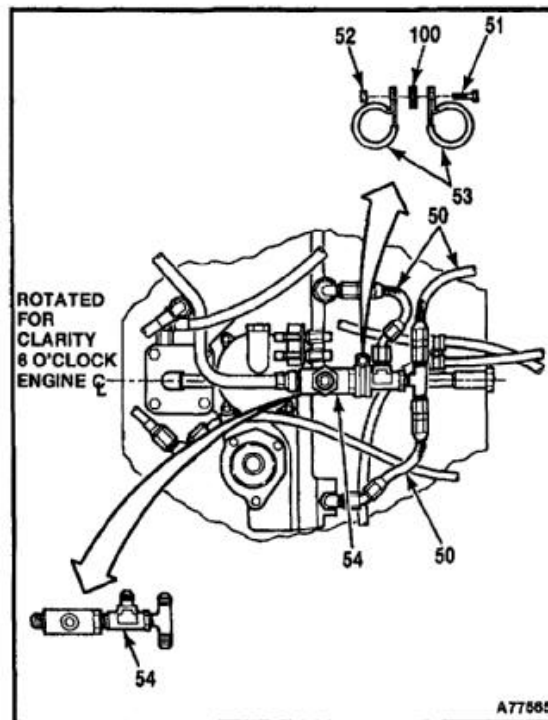
11. Tag and remove hose (38). Use tag (E264).



12. Remove two nuts (42) and washers (43). Tag and disconnect hose (44). Use tag (E264). Remove packing (45).
13. Remove lockwire from screw (46). Remove three screws (46 and 47), three nuts (48), and six clamps (49). Use tape (E388) to mark clamp locations. Remove hose (44).



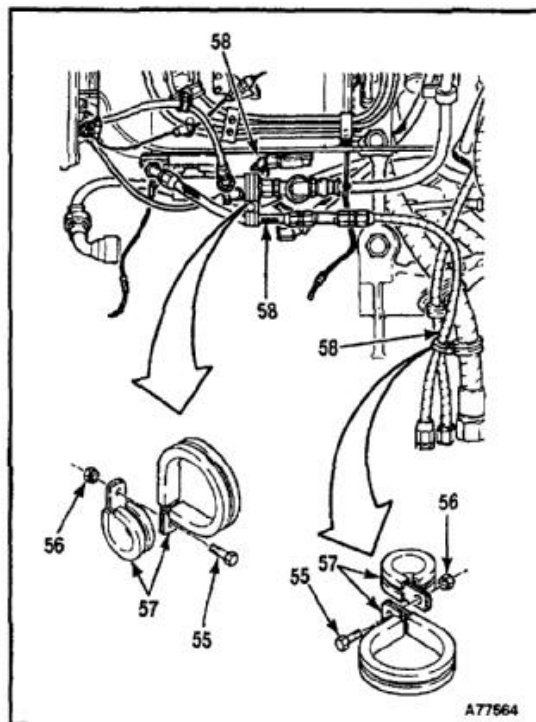
14. Tag and remove three hoses (50). Use tags (E264).
15. Remove screw (51), spacer (100), nut (52), and two clamps (53). Use tape (E388) to mark location.
16. Remove fitting (54).



4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

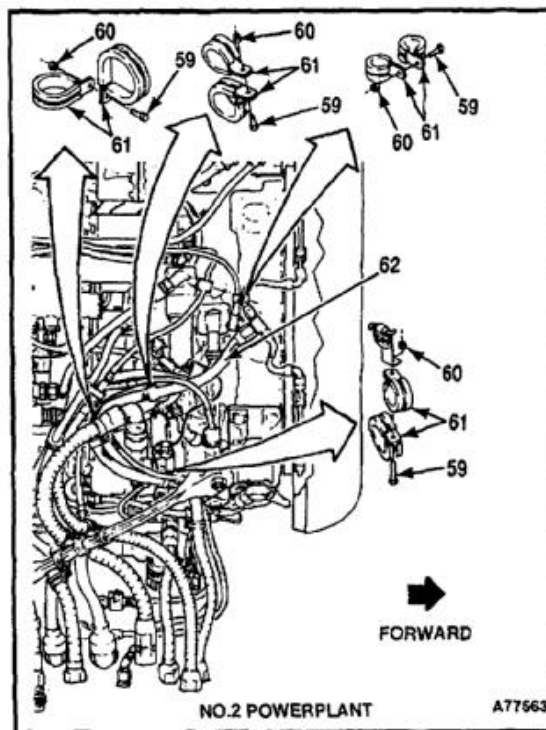
- 17. Remove two screws (55) and nuts (56) and remove four clamps (57). Use tape (E388) to mark clamp locations.
- 18. Tag and remove three hoses (58). Use tags (E264). Use a container and cloths (E135) to catch spilled liquid.



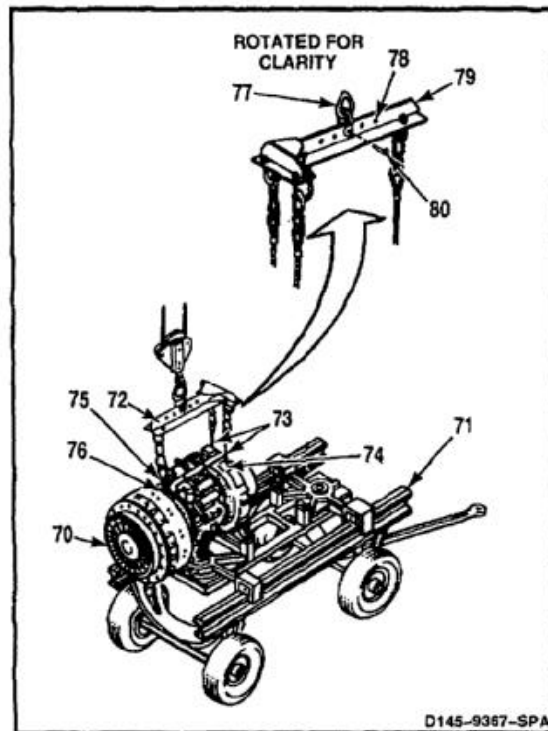
- 19. Remove four screws (59) and nuts (60) and eight clamps (61). Use tape (E388) to mark clamp locations.
- 20. Tag and remove hose (62). Use tags (E264).

NOTE

Engine mount adapters and aft mount link must not be removed if powerplant is to be stored on adapter.



21. If powerplant (70) is to be stored on adapter (71), go to Follow-On Maintenance. If powerplant is to be stored in container, go to step 22.
22. Install sling (72) as follows:
 - a. Connect two cables (73) to forward fittings (74) on powerplant (70).
 - b. Connect cable (75) into aft fitting (76) on powerplant (70).
 - c. Adjust sling (72) until eye (77) is over aft hole (78) in sling bar (79).
 - d. Install pin (80) through bar (79).
23. Connect hoist (81) to eye (77) of sling (72).
24. Loosen four bolts (82) on adapter fitting (83) and push down to side.



25. Raise hoist (81) to support weight of powerplant (70). Remove pin (84) from adapter fitting (85) and aft mount link (86).

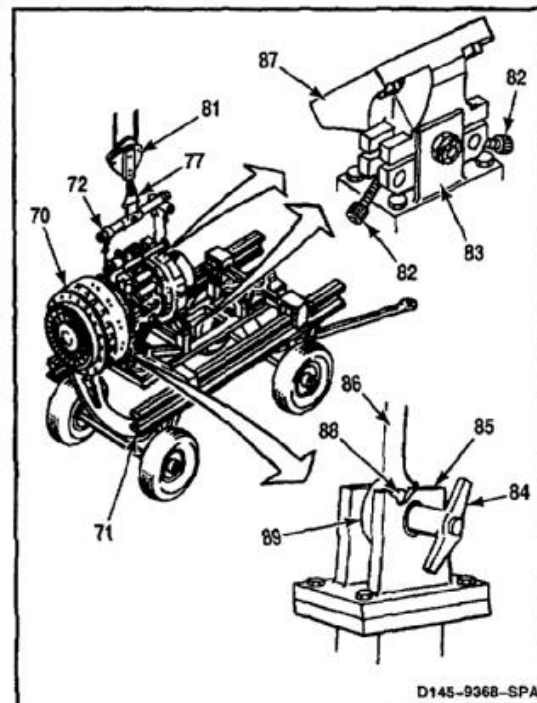
WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

CAUTION

Make sure bearing in lower end of aft support link does not tilt in clevis, while weight of engine is supported. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

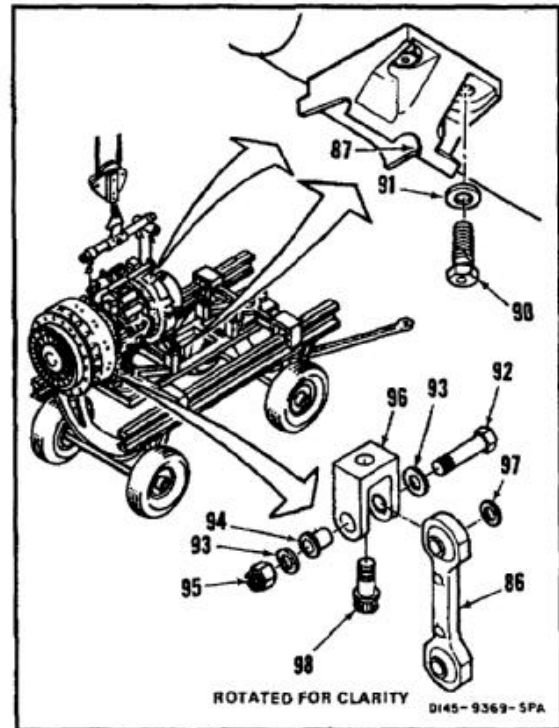
26. Raise hoist (81) so forward engine mount adapters (87) and aft engine mount link (86) are clear of adapter (71). Make sure bearing (88) in aft engine mount link (86) does not tilt in clevis (89).



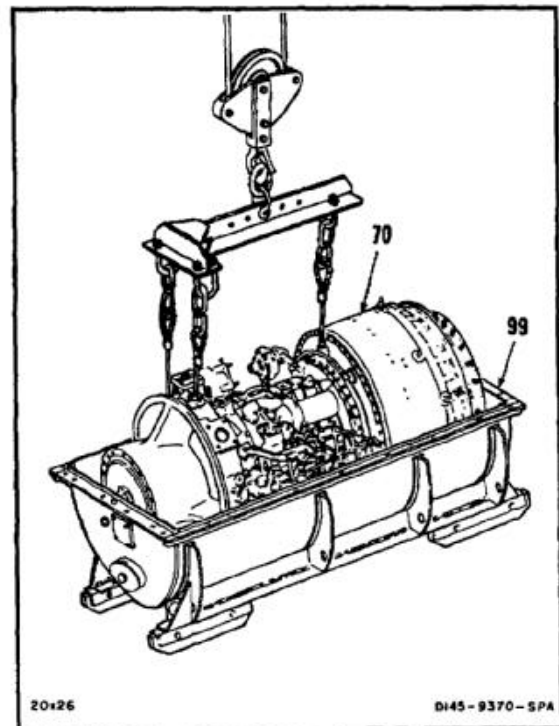
4-11.1 DISASSEMBLE POWERPLANT (Continued)

4-11.1

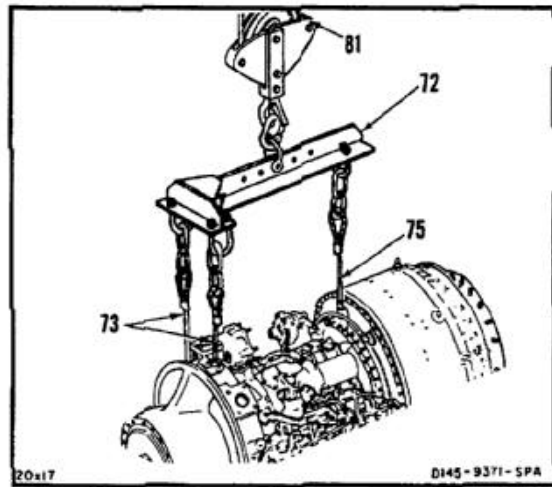
27. Remove lockwire from eight bolts (90). Remove eight bolts and washers (91) and remove two adapters (87).
28. Remove bolt (92), two washers (93), bushing (94), and nut (95) from adapter (96). Remove link (86) and spacer (97).
29. Remove lockwire and bolt (98) and remove adapter (96).



30. Prepare powerplant (70) for storage container (99) (TM 1-2840-265-23).
31. Lower powerplant (70) into storage container (99).



32. Disconnect three cables (73 and 75).
33. Disconnect hoist (81) from sling (72).

***FOLLOW-ON MAINTENANCE:***

Prepare powerplant for storage (TM 1-2840-265-23).

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
 Multimeter
 Insert/Extraction Tool
 Insulation Resistance Test Set
 Stopwatch

Materials:

Tags (E264)
 Other Materials as Required

Personnel Required:

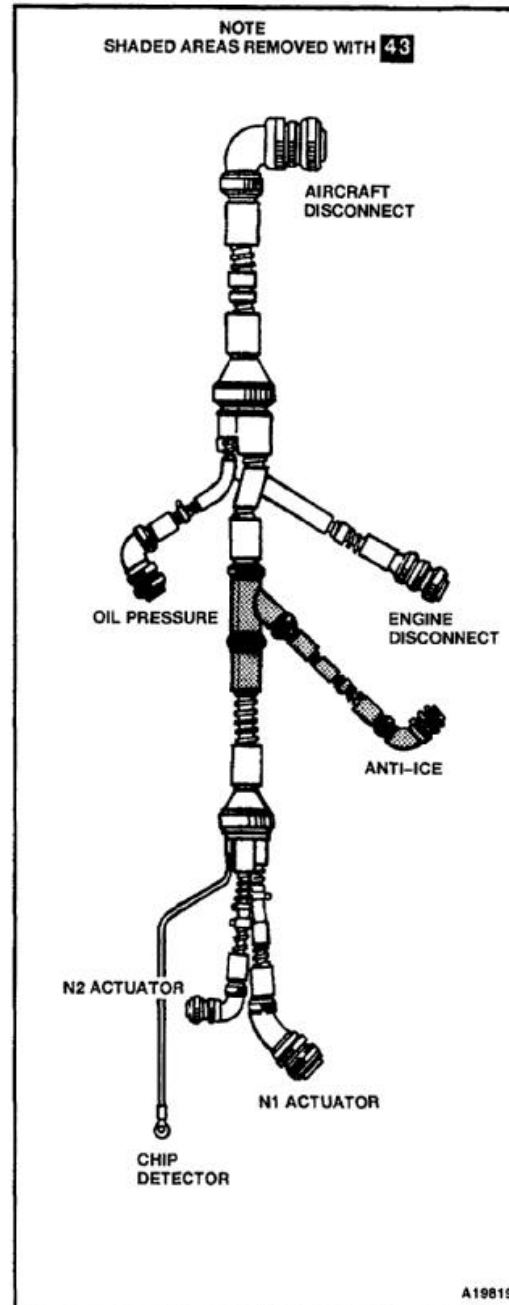
Aircraft Electrician
 Inspector

References:

TM 55-1500-323-24

Equipment Condition:

Off Helicopter Task



NOTE

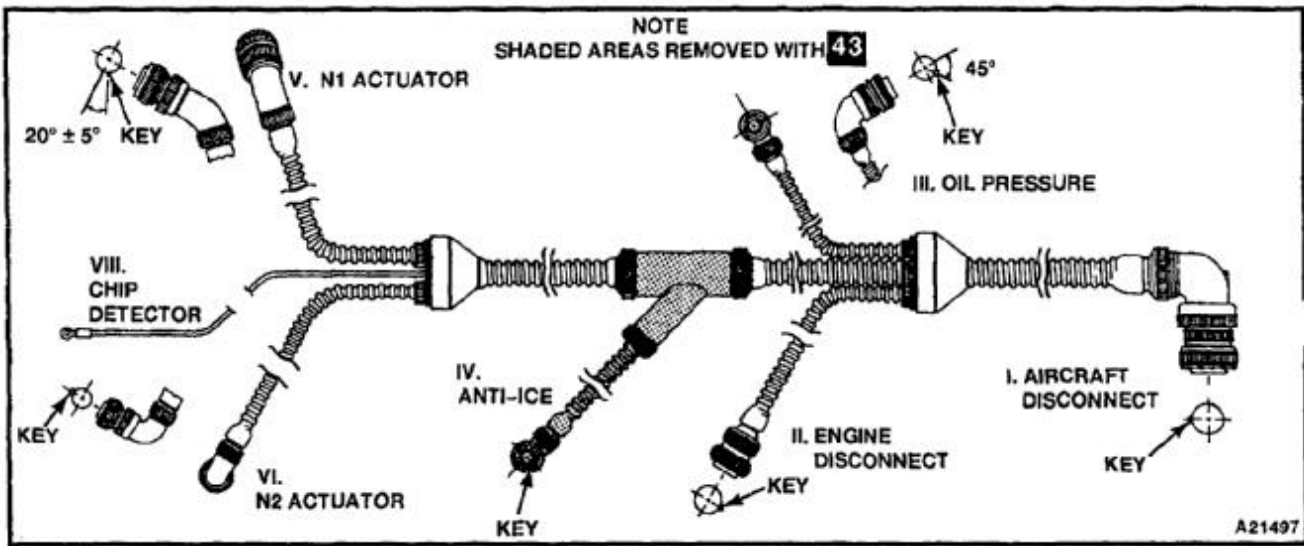
A connector must be replaced if damage will not allow it to fit with its mating connector.

1. Visually inspect harness.
 - a. Check harness connectors and housings for cracks, damaged or broken pins, and deteriorated connector inserts.

- b. Inspect harness conduit assemblies for holes, cracks, crushing, burns, or deterioration.
- c. Repair any conduit assembly that has a minor hole or crack (Task 4-11.3).
- d. Replace any conduit assembly that is severely crushed or damaged (Task 4-11.3).

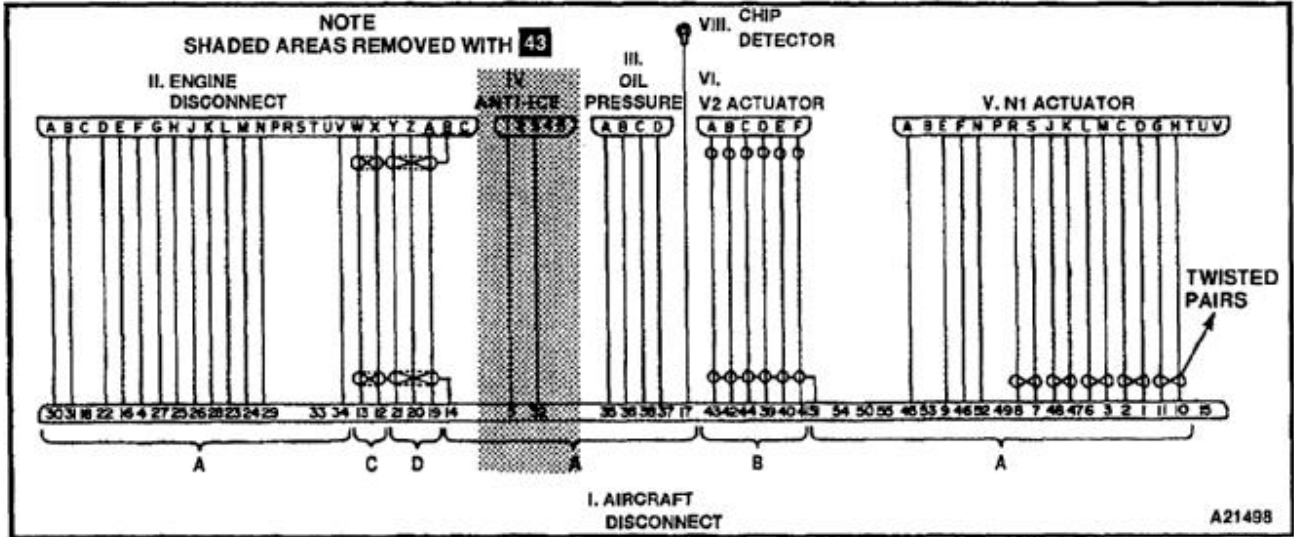


Cracks, pinholes, or other openings in the harness will admit fluids causing damage to engine components.



4-11.2 INSPECT AND TEST ENGINE ELECTRICAL HARNESS (AVIM) (Continued)

2. Check continuity of the harness per TM 55-1500-323-24.
3. Measure insulation resistance between each contact and connector shell for a maximum of **one minute** using an insulation resistance test set (TM 55-1500-323-24). Resistance shall be a minimum of **200 megohms at 500 vdc**.



WIRE AND CABLE CHART

NOTE
SHADED AREAS REMOVED WITH 43

ITEM	PART NUMBER	DESCRIPTION	LENGTH (IN)	QTY	CONNECTORS
A	MS22759/B-20	WIRE	36	13	I TO II
			51	4	I TO III
			70	2	I TO IV
			79	14	I TO V
			95	1	I TO VIII
B	MIL-C-27500-20TA1N6	CABLE	79	6	I TO VI
C	MIL-C-27500-20TA2N6		36	1	I TO II
D	MIL-C-27500-20TA3N6		36	1	I TO II

A21499

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
 Engine Harness Coned Junction Retention Tool
 (APP E-228)
 Multimeter
 Insert/Extraction Tool
 Insulation Resistance Test Set
 Strap Wrench, NSN 5120-01-231-5723
 Stiff Bristle Fiber Brush
 Other Tools As Required

Materials:

Detergent (E159.1)
 Sealant (E340.2)
 Tags (E264)
 Tape (E388)
 Tape, Silicone Self Vulcanizing (E395.1)
 Tape, Teflon (E399)
 Tubing (E431)

Parts:

Cable
 Sealing Plug (MS27488)
 Wires
 Other Parts As Required

Personnel Required:

Aircraft Electrician (2)
 Inspector

References:

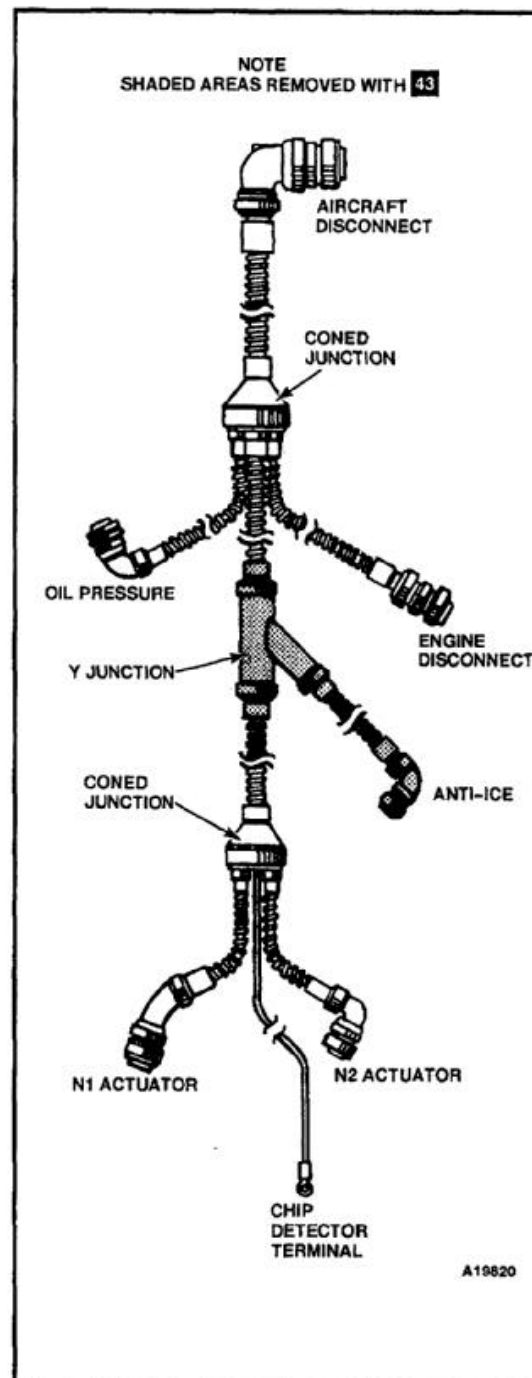
TM 55-1520-240-23P
 TM 55-1500-323-24

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

Sealant (E340.2) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



GENERAL

The following cautions and notes are common and applicable to all procedures of this task.



Use only conduit (plastic jaw) pliers and strap wrenches when working with harness connecting hardware, or damage to assemblies and adjacent hardware may result. If coned junction conduit connections are too tight to be loosened as described, standard connector pliers can be used if coned conduit coupling nuts are first wrapped with masking tape (E388). Use Engine Harness Retention Tool (APP E-228) to restrain coned sections whenever possible; otherwise damage could occur.

Do not use solvent when cleaning conduit assemblies; damage to material will result.

When removing conduit material, grasp harness around wiring as much as possible. This helps prevent unnecessary strain on wiring that could cause damage at connections elsewhere in the harness especially at corresponding engine accessory connectors.

Make sure to apply silicone sealant (E340.2) to threads before installing conduit coupling nuts and connector fittings. Sealant not only seals harness, but also secures fitting and coupling nuts because lockwire is not used.

NOTE

Maintenance described in this task is typical and may be applied to entire harness. Illustrations are typical and used as reference when repairing other parts of the harness.

Harness conduit material and junctions only provide protection and routing of internal wiring. Junction connectors attach only conduit material, not wiring. Internal wiring runs directly from aircraft disconnect to appropriate connectors with separation and distribution of wiring provided by Y and coned junctions.

With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.

When performing maintenance on connectors and adjacent fittings where access to wiring and back of connectors is necessary, conduit should be restrained away from connector hardware with a clamp or other material.

Check condition of connector insert and housing whenever maintenance is performed on a connector or adjacent hardware. Replace connector insert or housing if either is damaged so that secure, sealed connections cannot be made.

When repairing or replacing harness wiring, make sure new wiring is long enough to avoid strain on itself or rest of harness after repairs have been made.

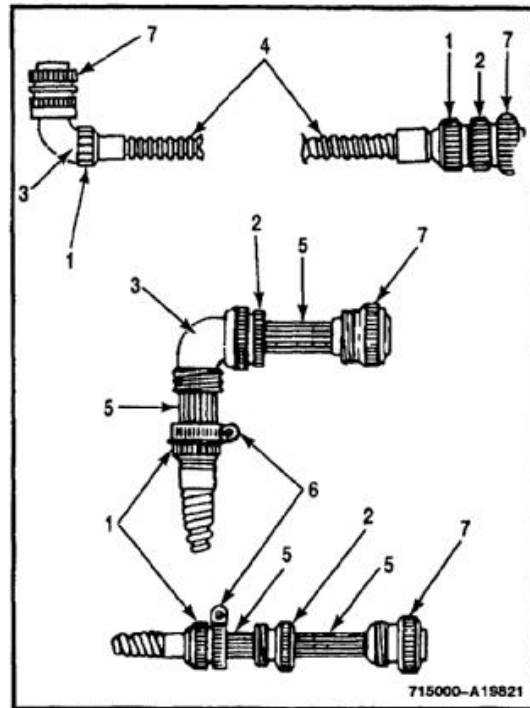
Replace entire shielded cable if its internal wire is damaged or defective.

Make sure water or other fluids that may have entered conduit, are completely drained before repairing conduit or other parts of the harness.

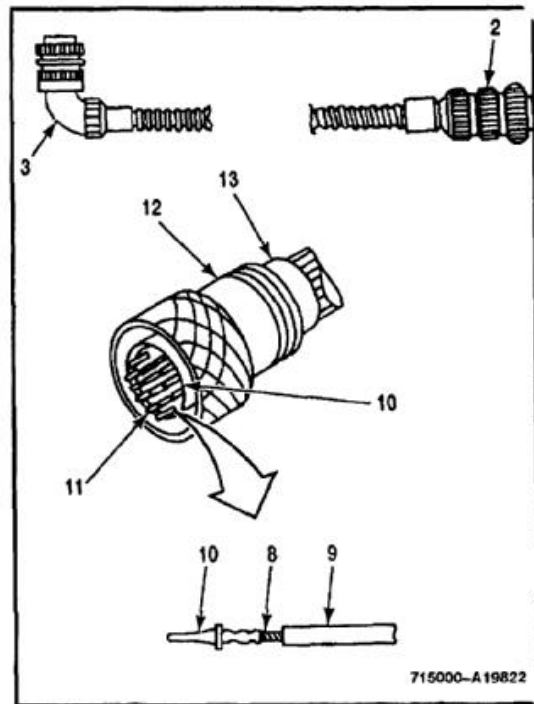
Make sure hands are free of dirt and oil when applying silicone self vulcanizing tape (E395.1).

REPLACEMENT OF CONNECTORS

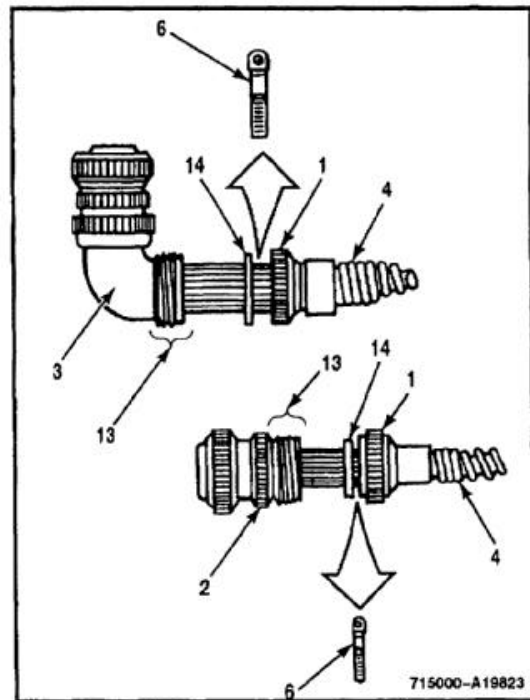
1. Loosen conduit nut (1) from adapter (2), or elbow (3) (TM 55-1500-323-24). Use a strap wrench and conduit pliers.
2. Pull conduit (4) back from adapter (2) or elbow (3) to expose wires (5).
3. Have helper hold back conduit (4) and install clamp (6) around wiring to restrain conduit.
4. Loosen and pull back adapter (2) or elbow (3) from rear of connector (7).
5. Identify and tag (E264) each wire with its contact identifier (TM 55-1500-323-24).
6. Remove wire contacts. Use extraction tool (TM 55-1500-323-24).



7. Check wire strands (8) and insulation (9) at contact (10) for damage (TM 55-1500-323-24). Replace any contact (10) if damage is found (step 20).
8. Replace insert (11) and/or housing (12) (TM 55-1500-323-24) as necessary.
9. Install contacts (10) in insert (11) as identified by their tags (TM 55-1500-323-24).
10. Install sealing plugs in unused contact positions of insert (11) (TM 55-1500-323-24).
11. Clean old sealant from threads (13) of housing (12) and adjacent fittings using hard bristle fiber brush.
12. Apply sealant (E340.2) to threads (13) of housing (12) and adjacent adapter (2) or elbow (3).
13. Assemble adapter (2) or elbow (3) to connector using a strap wrench and conduit pliers.

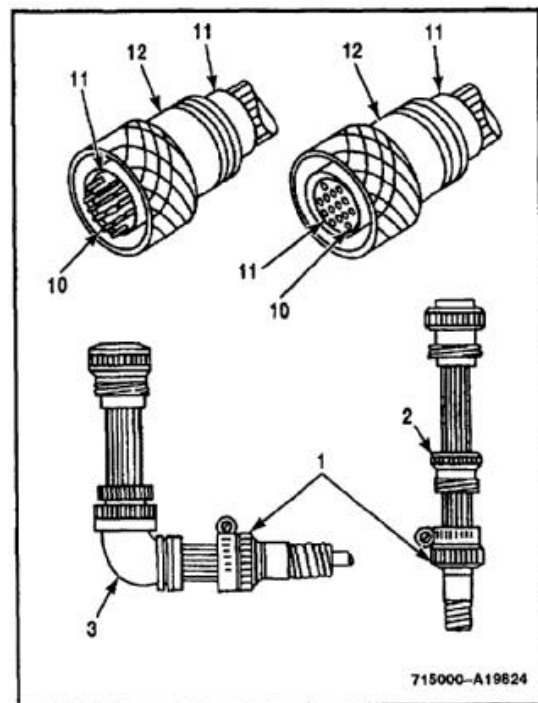


14. Remove clamp (6) restraining conduit (4) and allow conduit to expand.
15. Apply coat of sealant (E340.2) to threads (13) of adapter (2) or elbow (3).
16. Carefully position nylon washer (14) and tighten conduit nut (1) to adapter (2) or elbow (3), using a strap wrench or conduit pliers (TM 55-1500-323-24).



CONNECTOR CONTACT REPLACEMENT

17. Gain access to back of connector by removing conduit nut (1), adapters (2), or elbow (3) (steps 1 thru 6).
18. Remove damaged contact (10) from insert (11). Use extraction tool (TM 55-1500-323-24).
19. Check condition of connector insert (11) when removing contacts (10). Replace insert or entire connector, if insert or housing (12) is damaged so that a secure and sealed connection cannot be made.

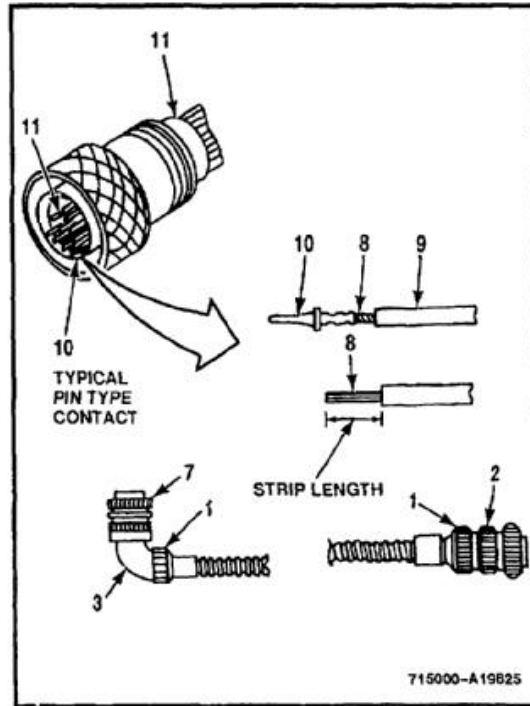


20. Replace contact as follows. When removing wire contacts (10), check wire strands (8) and insulation (9) for damage.

- a. Cut wire flush with rear of contact (10), and strip insulation from end of wire using following criteria:

Contact Size (Gage)	Strip Length Inches	Millimeters
20	0.157 to 0.186	4 to 5
16	0.250 to 0.284	6 to 7

- b. Crimp new contact (10) to wire (8) (TM 55-1500-323-24).
 - c. Insert new contact (10) into insert (11) (TM 55-1500-323-24).
21. Reassemble connector (7), adapter (2) or elbow (3), and conduit nut (1) (steps 11 thru 16).



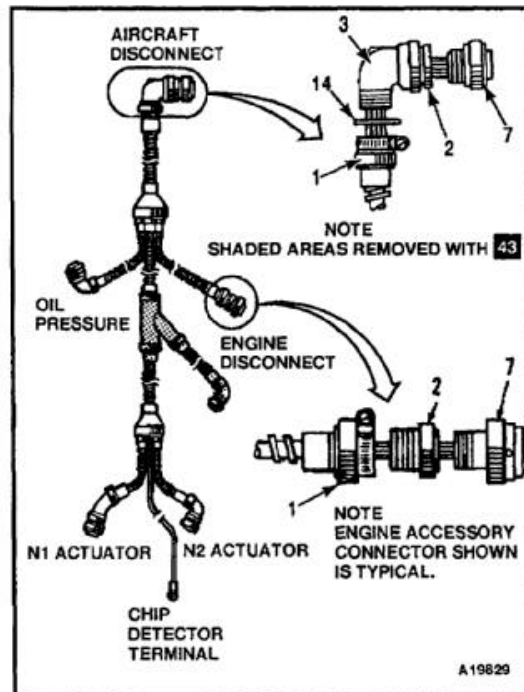
WIRE REPLACEMENT

- 22. Identify which contacts and connectors are affected.
- 23. Loosen conduit nuts (1) and adapter (2) or elbow (3) from affected connectors (7).
- 24. Pull back and restrain conduit to gain access to back of each connector.
- 25. Identify contacts at both ends of wire to be replaced (TM 55-1500-323-24).



Do not remove wire at this time.

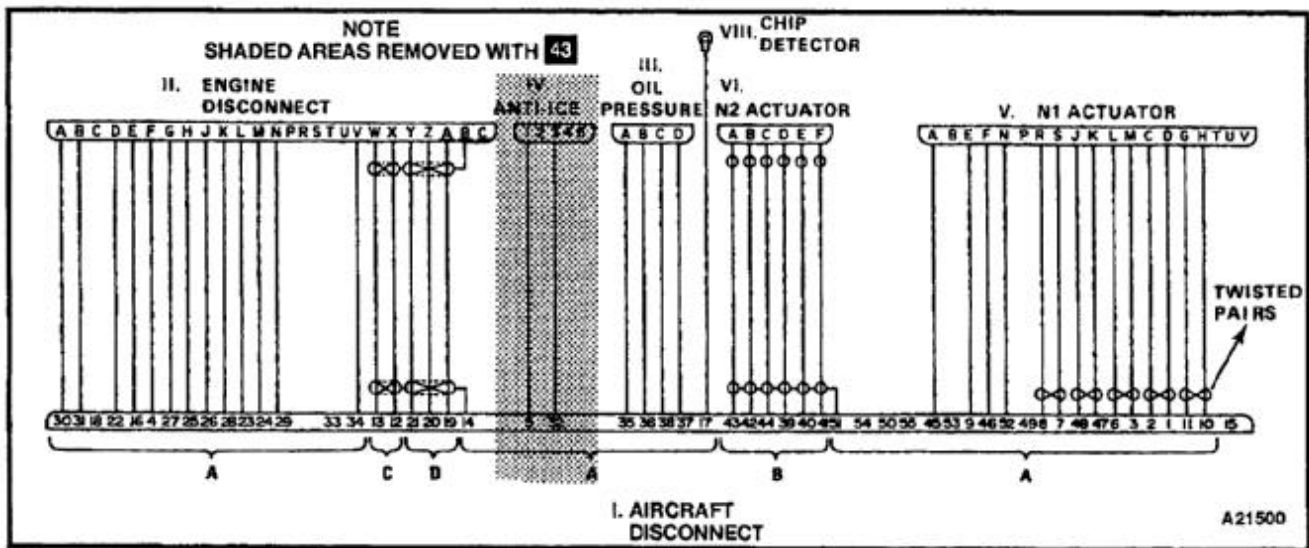
- 26. Remove contacts of defective wire or cable from connectors (7). Cut off contacts.



4-11.3 REPAIR OF ENGINE ELECTRICAL HARNESS (Continued)

4-11.3

27. Solidly attach length of new wire to either end of defective wire and wrap joint thinly with Teflon tape (E399).
28. If replacing shielded cable perform the following:
 - a. Form shield of wire into a pigtail. Due to tight fit of conduit on harness, make sure pigtails are small enough that completed cable assembly may be pulled through conduit.
 - b. Wrap shield pigtails with Teflon adhesive tape (E399).
29. Carefully pull out defective wire or cable, pulling new wire with it.
30. Cut defective wire from new wire and trim new wire to length.
31. Install contacts on new wire (TM 55-1500-323-24).
32. Install contacts into their inserts (TM 55-1500-323-24).
33. Apply sealant (E340.2) to threads of adapters, elbows, and conduit nuts.
34. Tighten fittings and conduit nuts. Use strap wrench and conduit pliers.



WIRE AND CABLE CHART

NOTE
SHADED AREAS REMOVED WITH 43

ITEM	PART NUMBER	DESCRIPTION	LENGTH (IN)	QTY	CONNECTORS
A	MS22759/8-20	WIRE	36	13	I TO II
			51	4	I TO III
			70	2	I TO IV
			79	14	I TO V
			95	1	I TO VIII
B	MIL-C-27500-20TA1N6	CABLE	79	6	I TO VI
C	MIL-C-27500-20TA2N6		36	1	I TO II
D	MIL-C-27500-20TA3N6		36	1	I TO II

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CONDUIT REPAIR**NOTE**

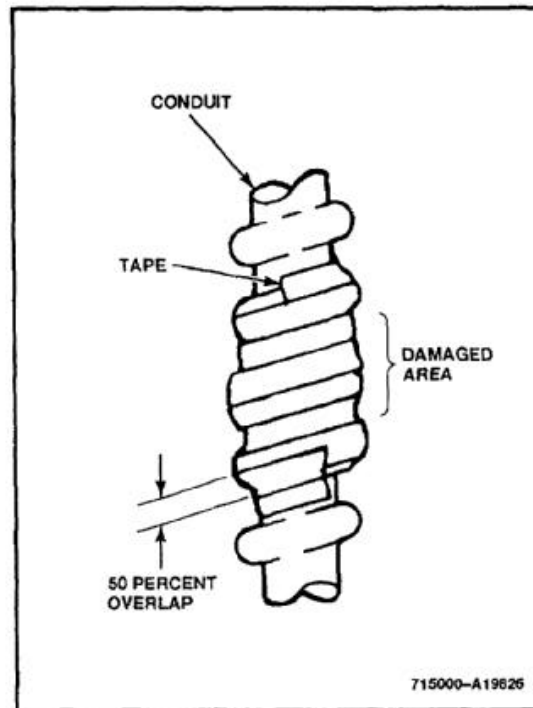
This procedure applies only to minor damage of Teflon convoluted tubing.

35. Clean damaged area of tubing with cloth and detergent (E159.1).

NOTE

When applying silicone self vulcanizing tape, do not keep tape under tension.

36. Wrap damaged area of tubing with silicone tape (E395.1). Assure **50 percent** overlap. Cover damaged area and make one full width overlap past each end of damaged area.
37. Allow repair to stand undisturbed for at least **24 hours** to allow tape to vulcanize.



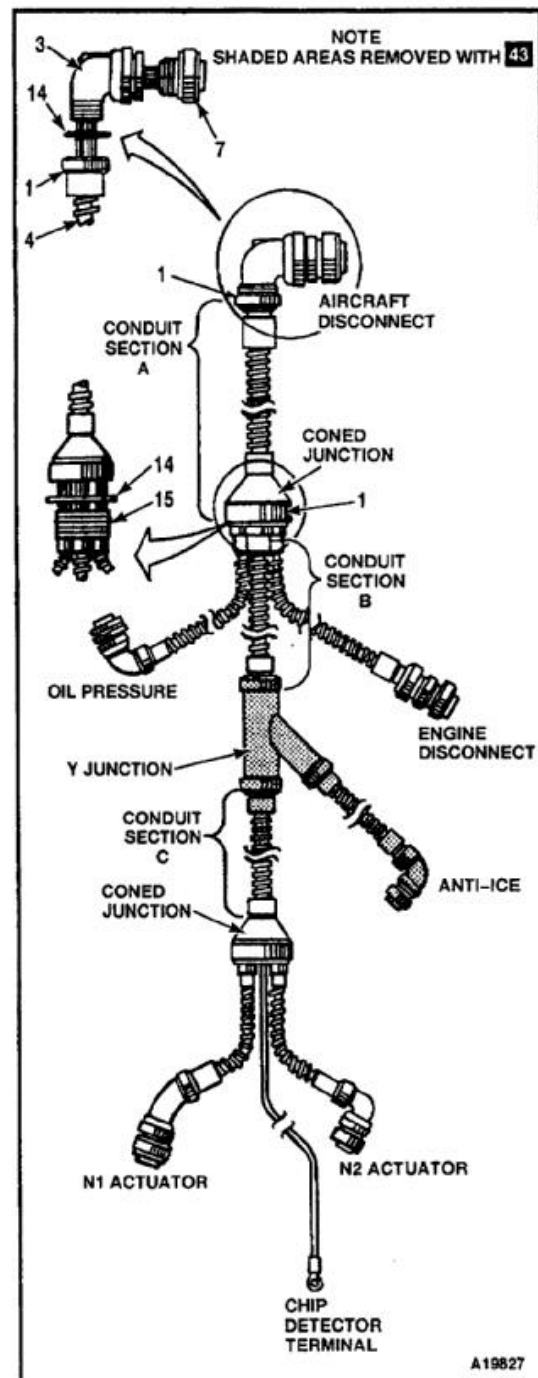
CONDUIT ASSEMBLY REPLACEMENT**NOTE**

For identification, conduit sections are referred to as section A through section H. Steps 38, 39, and 40 cover section A, section B, and section C. Step 41 covers section D through section H.

With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions. Use Engine Harness Retention Tool (APP E-228) to secure legs of harness when loosening coned junctions.

Fill each end of newly installed conduit and connector fittings with sealant (E340.2) to assure proper sealing of harness.

38. Replace conduit section A as follows:
 - a. Loosen conduit nuts (1) at coned junction and elbow (3).
 - b. Disconnect elbow (3) from aircraft disconnect (7). Leave adapter in elbow.
 - c. Push elbow (3) and conduit away from aircraft disconnect (7).
 - d. Tag (E264) and remove wiring (TM 55-1500-323-24) from aircraft disconnect (7).
 - e. Slide off elbow (3) and conduit (4).
 - f. Wrap wiring with Teflon tape (E399).
 - g. Slide new conduit section A and elbow (3) over harness wiring.
 - h. Connect wiring as tagged to aircraft disconnect (TM 55-1500-323-24). Discard tags.
 - i. Apply sealant (E340.2) around wiring in each end of conduit (4) and to threads of elbow (3) and coned junction plate (15).
 - j. Position nylon washers (14) and tighten conduit nuts (1) to coned junction and elbow (3) of aircraft disconnect.
 - k. Apply sealant (E340.2) to threads of elbow (3) and around wiring in elbow.
 - l. Connect elbow (3) to aircraft disconnect (7).

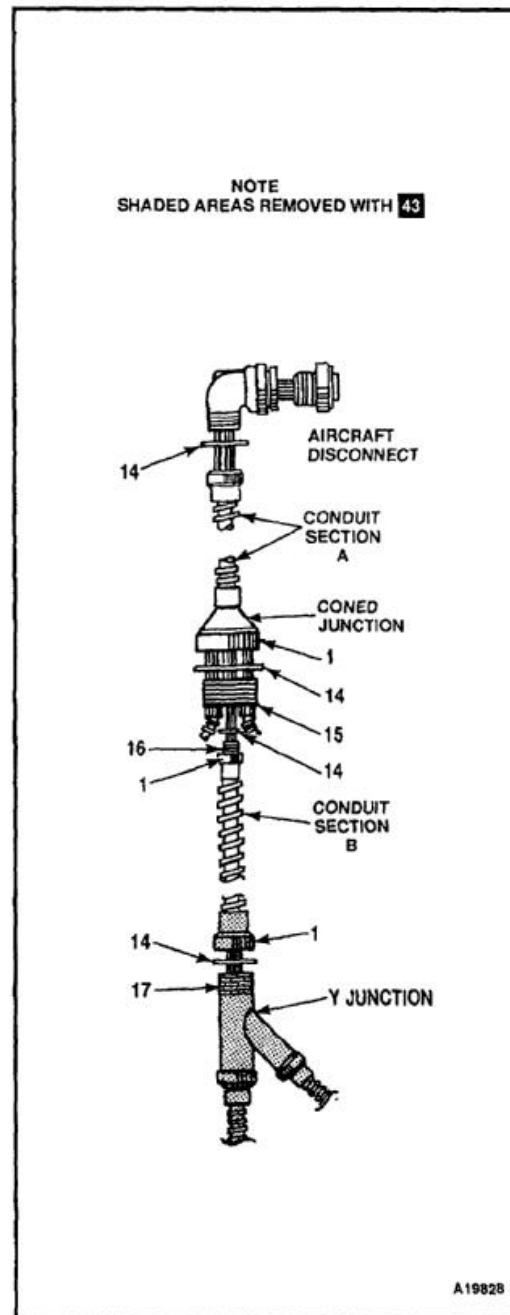


39. Replace conduit section B as follows:
- Remove conduit section A (step 38).
 - Identify wires which travel through conduit section B and separate them from taped harness covered by conduit section A.

NOTE

With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.

- Loosen section B conduit nuts (1) at plate (15) and Y junction.
- Pull back conduit at coned junction and carefully pull section B wiring through coned junction plate (15).
- Pull off conduit section B.
- Clean wiring as necessary and wrap with Teflon tape (E399) where covered by conduit section B.
- Slide wires through new conduit section B and existing coned junction plate (15).
- Apply a generous coat of sealant (E340.2) to threads (16) of coned junction plate, threads (17) of Y junction, and around wiring at each end of conduit.
- Position nylon washers (14) and tighten conduit section B coupling nuts (1).
- Install conduit section A (step 38).

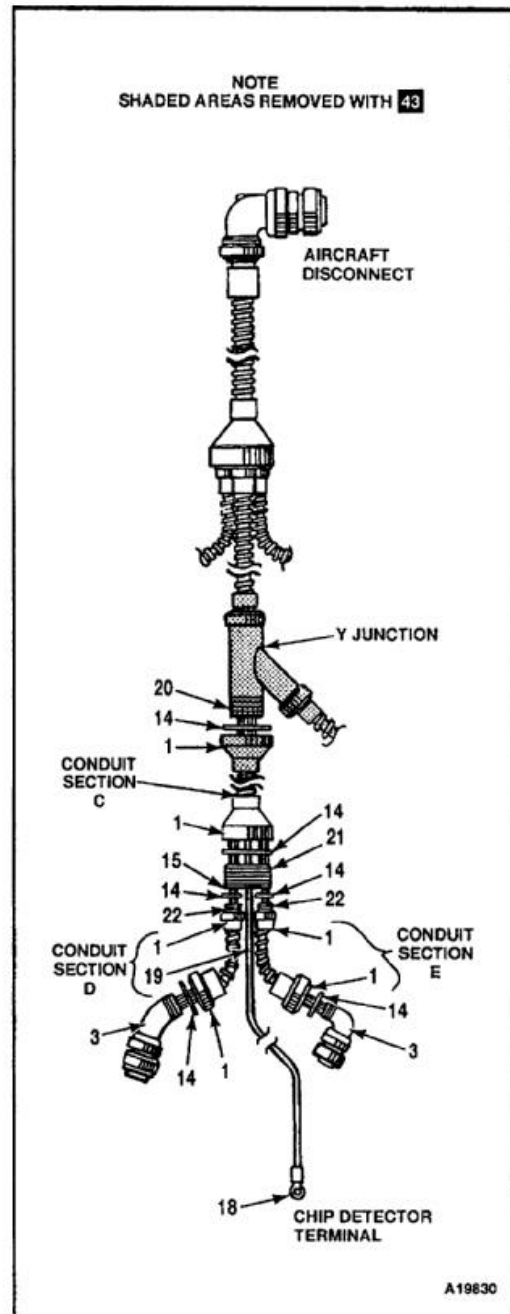


40. Replace conduit section C as follows:
- Remove connectors (7) (steps 1 thru 6).
 - Tag wires for each connector (TM 55-1500-323-24).
 - Disconnect conduit section D and section E nuts (1) from coned junction plate (15).
 - Pull connector elbows (3) and conduit sections D and E off wiring.

NOTE

With **43**, Y junction and conduit sections preceding and following Y junction are replaced by a single conduit between two coned junctions.

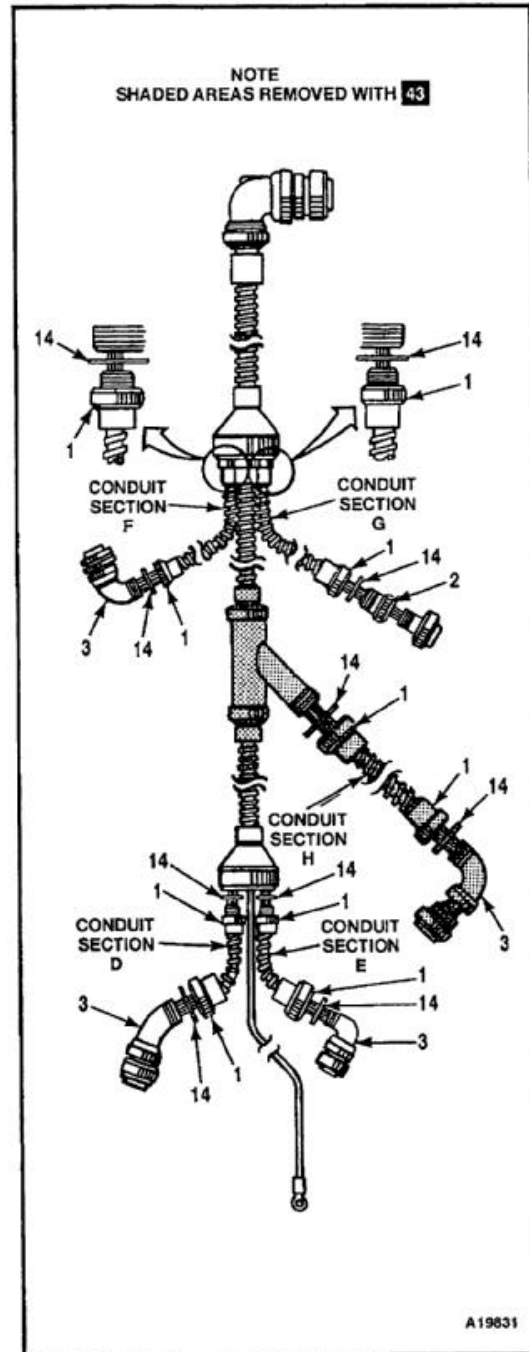
- Disconnect nuts (1) of conduit section C from coned junction plate (15) and V junction.
- Remove chip detector terminal (18).
- Slide plate (15) and conduit section C off wiring.
- Slide on new conduit section C.
- Feed wiring as tagged, through coned junction plate (15).
- Apply shrink tubing (E431) to chip detector wire (19) where it goes through junction plate (15). Apply sealant (E340.2) to wire on section C side of plate.
- Apply sealant (E340.2) to threads (20) of Y junction, and threads (21) of coned junction.
- Position nylon washers (14) and connect conduit section C conduit nuts (1) to Y junction threads (20) and coned junction threads (21).
- Install conduit sections D and E over wiring.
- Install conduit nuts (1), elbows (3), and connectors (7) (steps 7 thru 17).



41. Replace conduit section D, E, F, G, or H as follows:
- Loosen conduit nuts (1) from affected junction and connector elbow (3) or adapter (2).
 - Loosen elbow (3) or adapter (2) from connector.
 - Pull elbow (3) or adapter (2) back, and remove connector from end of affected branch of harness (steps 1 thru 6).
 - Slide off damaged conduit assembly.
 - Slide on new conduit assembly, with applicable ID tag.
 - At connector end of conduit, pull back conduit to gain access to end of wires. Make sure enough wire extends from conduit to allow installation of connector fitting and connector.
 - Slide elbow (3) or adapter (2) over wiring and install wiring in connector (TM 55-1500-323-24). Remove tags.
 - Apply sealant (E340.2) to threads of affected elbow (3) or adapter (2) and connector and around wiring at each end of conduit.
 - Position nylon washers (14) and tighten conduit nuts (1) at elbow (3) or adapter (2) and at other end of conduit.
 - Tighten elbow (3) or adapter (2) at connector.

INSPECT**FOLLOW-ON MAINTENANCE:**

Test harness (Task 4-11.2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Hoist
Sling (T134)
Open End Wrench, 1-1/2 Inch
Torque Wrench, 30 to 150 Inch-Pounds
Torque Wrench, 100 to 750 Inch-Pounds
Transportation Trailer
Powerplant Adapter (T16)

Materials:

Lockwire (E231)
Petrolatum (E274)
Strap (E376)

Parts:

Gasket

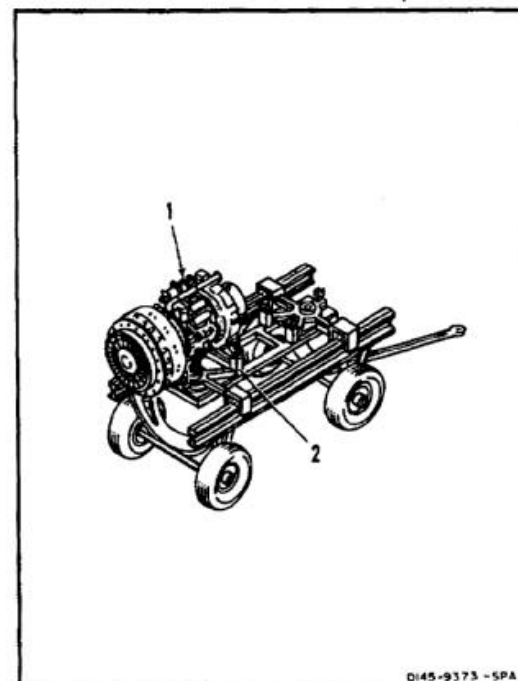
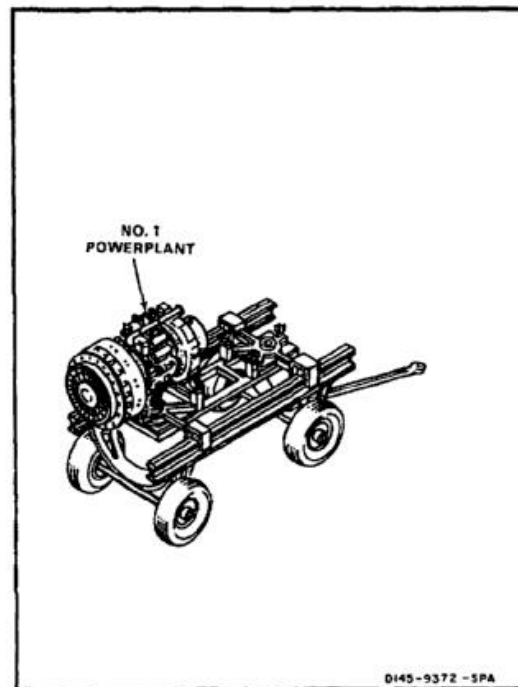
Personnel Required:

Aircraft Powerplant Repairer
Inspector

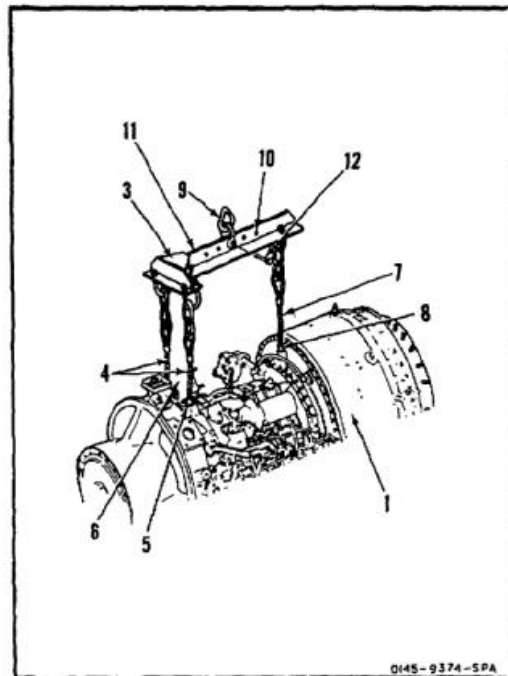
References:

TM 55-1520-240-23P
TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

1. If powerplant (1) is stored on trailer adapter (2), go to step 15. If not, go to step 2.

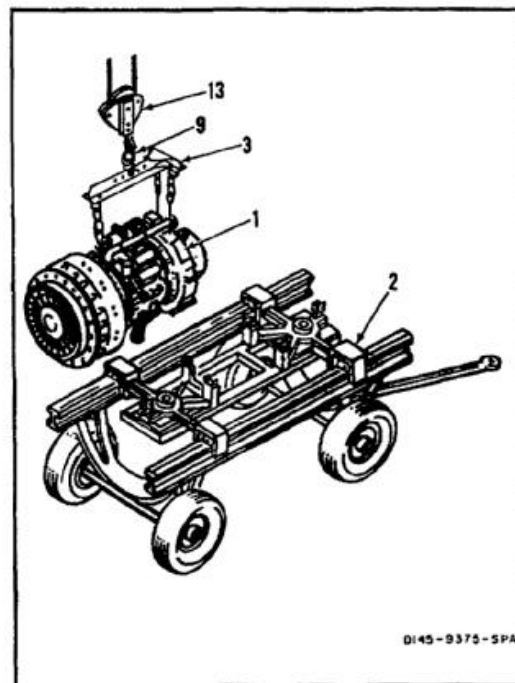


2. Install sling (3) as follows:
 - a. Connect two cables (4) to forward fittings (5) on starter drive housing (6).
 - b. Connect cable (7) to aft fitting (8) on powerplant (1).
 - c. Adjust sling (3) until eye (9) is over aft hole (10) in sling bar (11).
 - d. Install pin (12) through bar (11).
3. Connect hoist (13) to eye (9) of sling (3).

**WARNING**

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear when powerplant is raised.

4. Raise hoist (13) to lift powerplant (1) and prepare powerplant for installation on trailer adapter (2) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

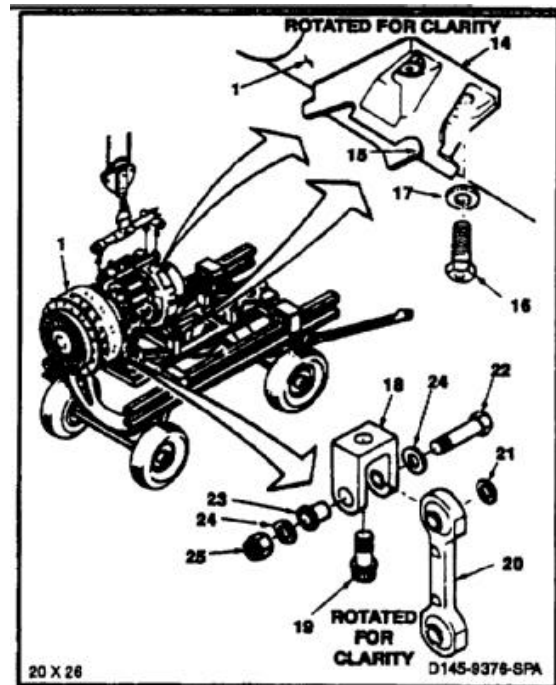


5. Position two adapters (14) so holes in adapters align with holes in powerplant (1). Make sure curved surfaces (15) of adapters are down.

WARNING

Shipping and mounting hardware are similar. Ensure correct hardware is used during powerplant assembly. Otherwise, damage to powerplant and aircraft as well as injury to personnel may occur.

6. Install eight bolts (16) and washers (17). Torque bolts to **300 to 450 inch-pounds**. Lockwire bolts. Use lockwire (E231).
7. Position adapter (18) on powerplant (1) and install bolt (19). Torque bolt to **400 inch-pounds**. Lockwire bolt. Use lockwire (E231).
8. Align hole in link (20) and spacer (21) with holes in adaptor (18). Install bolt (22), bushing (23), two washers (24), and nut (25). Torque nut (25) to **375 inch-pounds** to seat bushing. Loosen nut and retorque to **20 inch-pounds** above run on torque. Not to be less than **70 inch-pounds**.

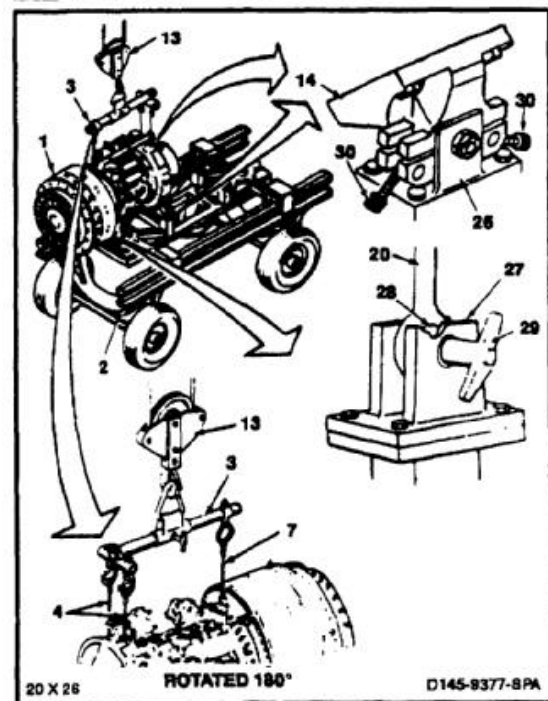


9. Position powerplant (1) over powerplant adapter (T16). Make sure forward engine mount adapters (14) and aft link (20) align with adapter fittings (26 and 27).

CAUTION

During lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis of adapter fitting. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

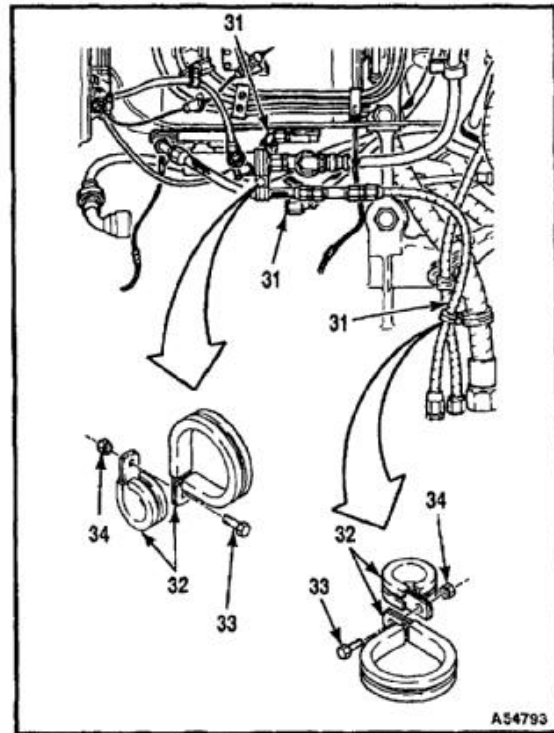
10. Lower hoist (13) slowly until powerplant (1) weight is on adapter (2). Make sure bearing (28) in aft mount link (20) does not tilt or wedge in clevis of adapter fitting (27).
11. Install pin (29) through link (20) and adapter fitting (27).
12. Raise four bolts (30) over engine mount adapters. Tighten bolts.
13. Disconnect hoist (13) from sling (3).
14. Disconnect three cables (4 and 7) and remove sling (3).



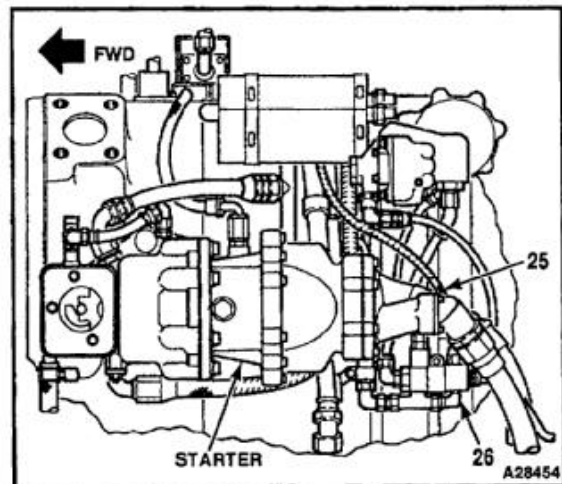
NOTE

Steps 15 thru 32 are with **74**.

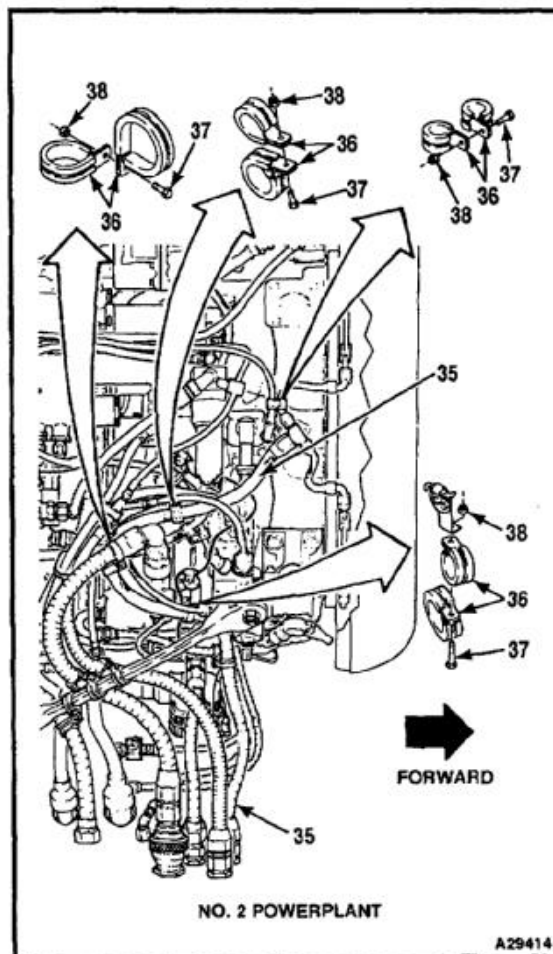
15. Position and install three hoses (31).
16. Install four clamps (32) with two screws (33) and nuts (34). Remove tags and tape from hoses (31).



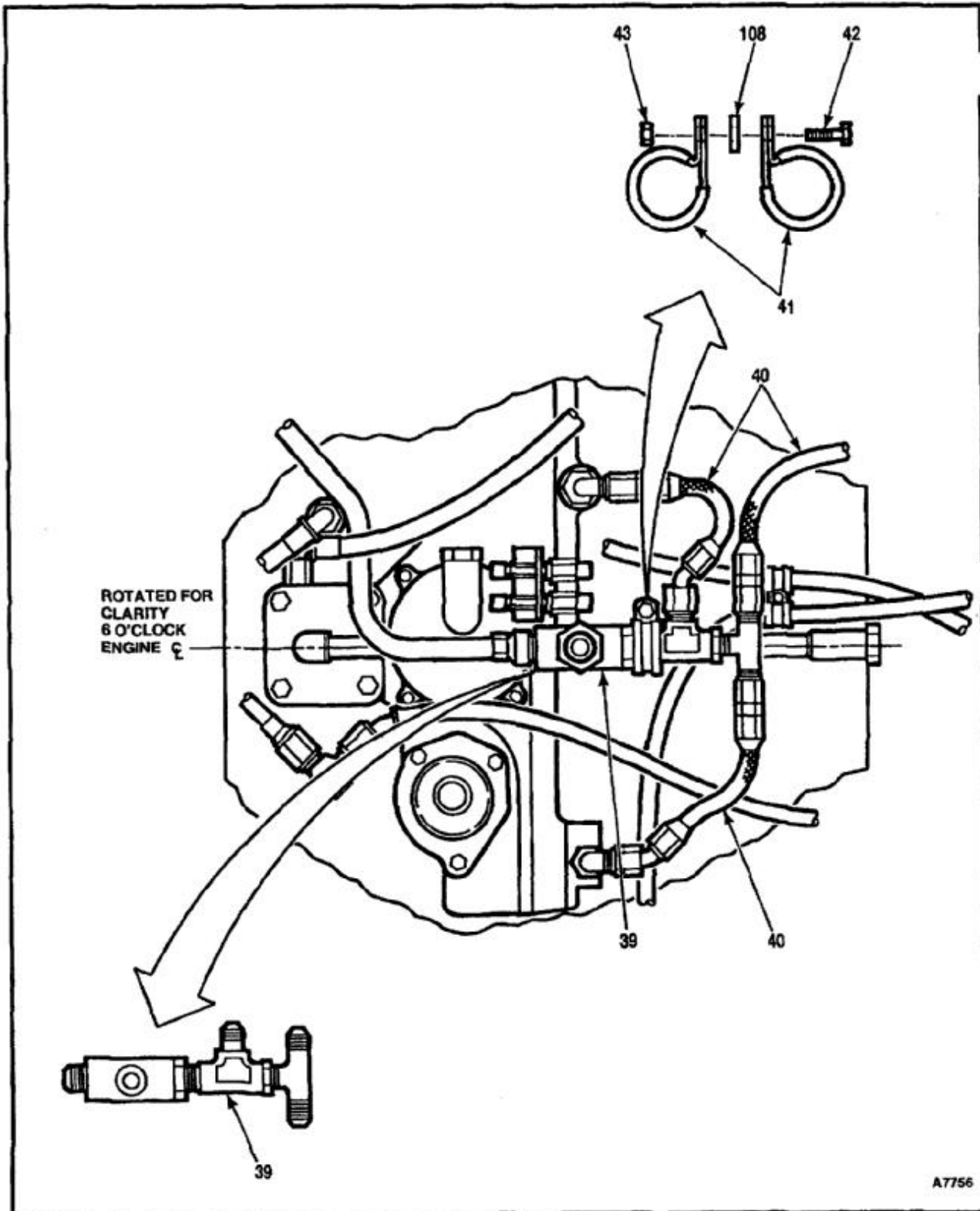
17. Install line (25) and fitting (26).



- 18. Position and install two hoses (35).
- 19. Install eight clamps (36) with four screws (37) and nuts (38). Remove tags and tape from hoses (35).



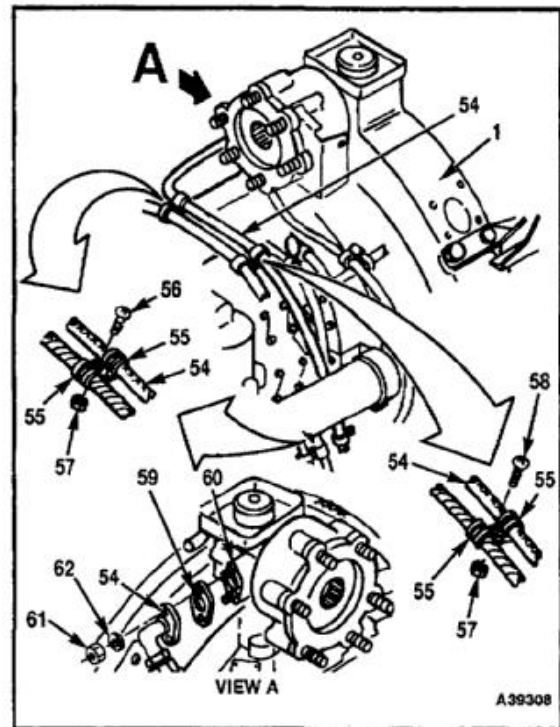
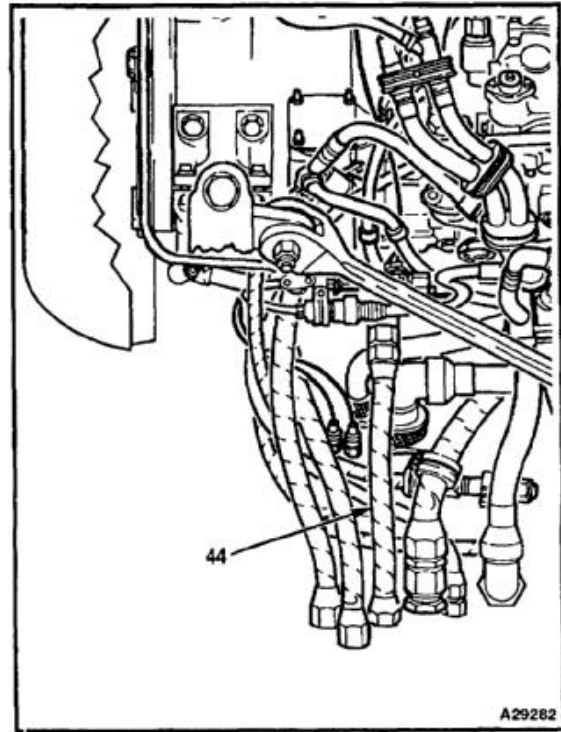
- 20. Install fitting (39).
- 21. Position and install three hoses (40).
- 22. Install two clamps (41) with screw (42), spacer (108), and nut (43).



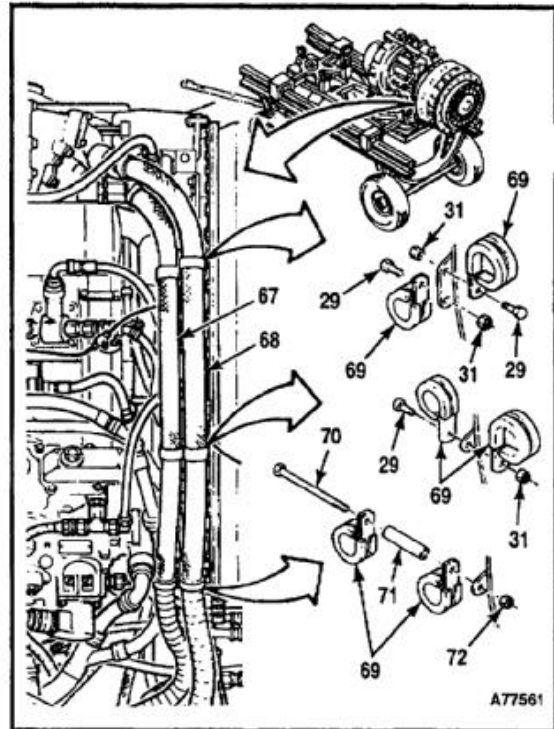
- 23. Position and install hose (44). Remove tag from hose (44).

- 24. Position hose (54) on powerplant (1) and install six clamps (55). Install two screws (56) and nuts (57). Install screw (58). Remove tag.

- 25. Install serviceable gasket (59) on starter drive housing. Position hose (54) on housing (60) and install two nuts (61) and two washers (62). Remove tag and tape.

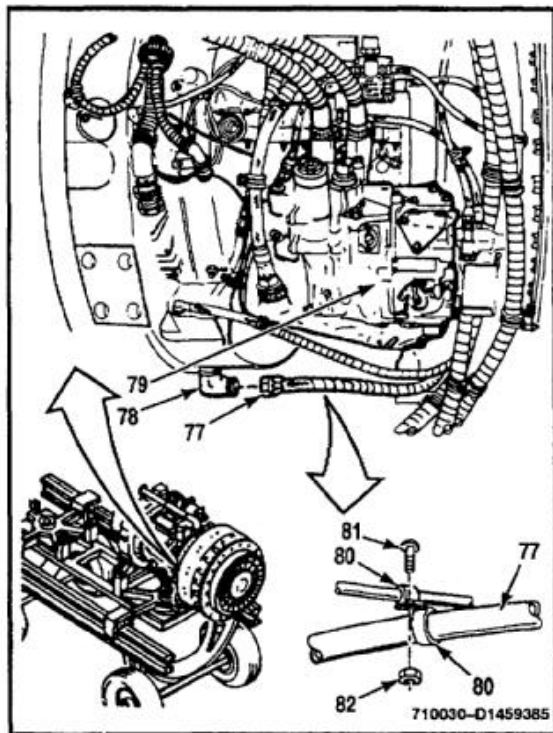


26. Position two hoses (67 and 68) on powerplant.
27. Install six clamps (69) on two hoses (67 and 68).
28. Install one screw (70), one spacer (71), and one nut (72). Remove tags and tape from hoses (67 and 68).
29. Install three screws (29) into three clamps (69) and three nuts (31). Remove tags and tape from hoses (67 and 68).

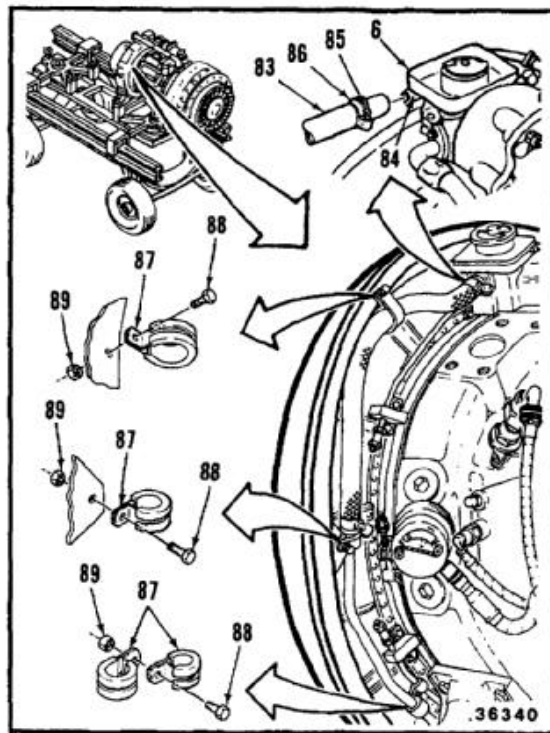


- 30. Connect hose (77) to elbow (78). Remove tag.
- 31. Install two clamps (80) and install screw (81) and nut (82). Remove tape from hose (77).

- 32. Install hose and line assembly (83) on fitting (84) on oil filler (6). Tighten screw (85) on clamp (86).



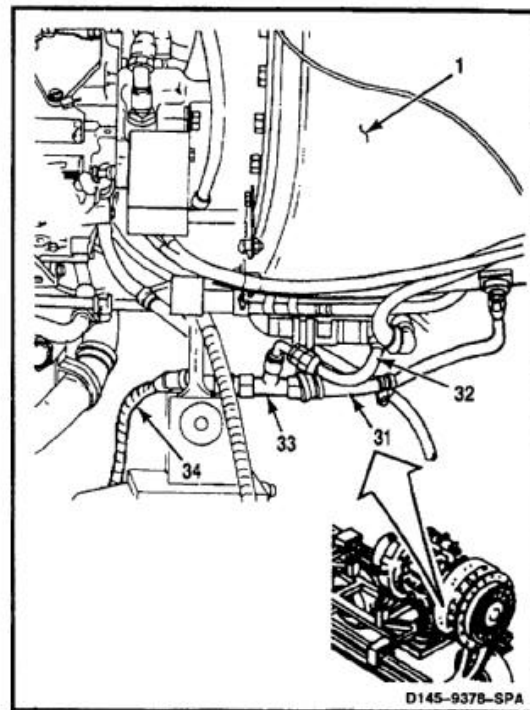
- 33. Install four clamps (87) and install three screws (88), and nuts (89). Remove tags and tape from hose (83).



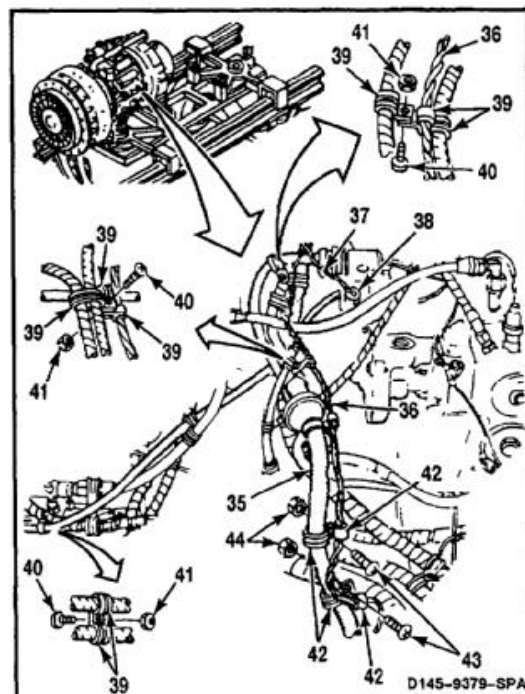
NOTE

Steps 34 thru 55 are without **74**.

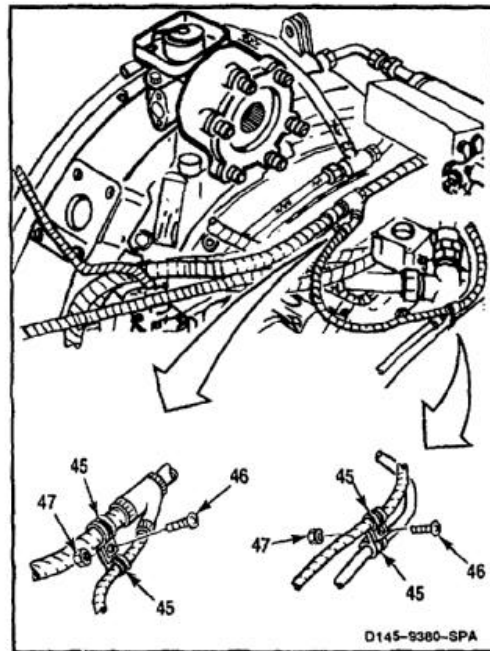
- 34. Connect hose (31) to powerplant (1). Remove tags.
- 35. Connect hose (32) to powerplant (1). Remove tag.
- 36. Connect tee (33) to two hoses (31 and 32). Remove tag.
- 37. Connect hose (34) to tee (33). Remove tag.



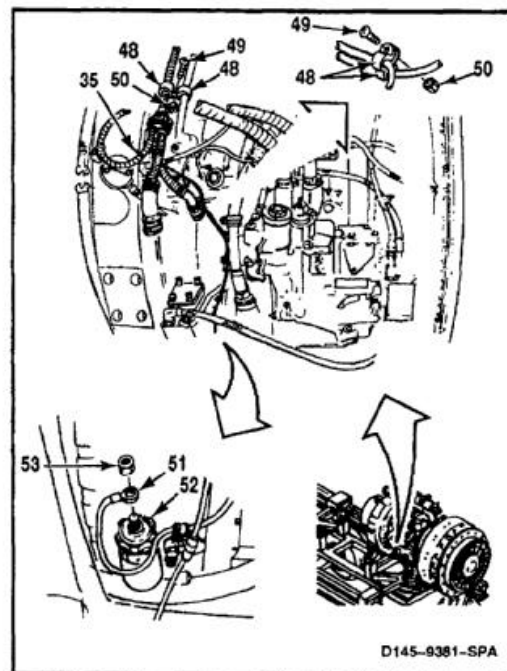
- 38. Position two electrical harnesses (35 and 36) on powerplant (1) and connect two plugs (37 and 38).
- 39. Install nine clamps (39) and install five screws (40) and nuts (41).
- 40. Install four clamps (42) and install two screws (43) and nuts (44).



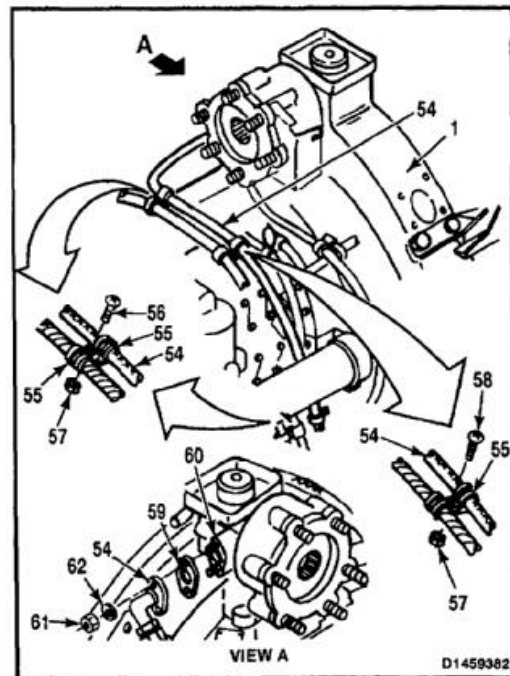
- 41. Install four clamps (45) and install two screws (46) and nuts (47).
- 42. Install four clamps (48) and install two screws (49) and two nuts (50). Remove tape from harness (35).



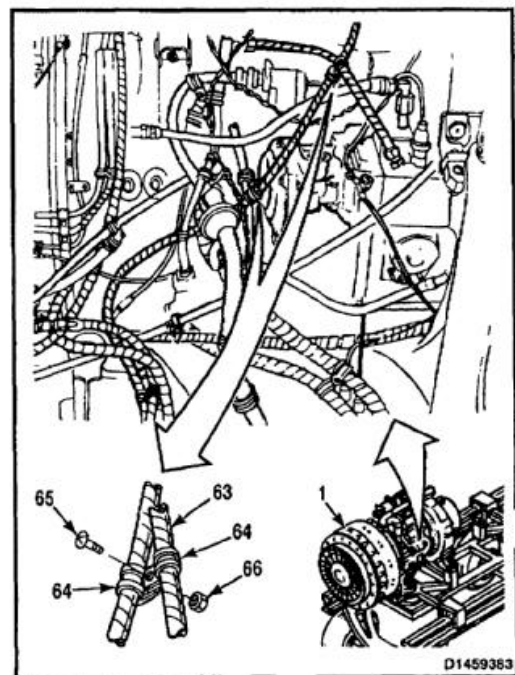
- 43. Secure chip detector wire (51) to harness (35). Use strap (E376).
- 44. Connect wire (51) to chip detector (52). Install nut (53).



- 45. Position hose (54) on powerplant (1) and install six clamps (55). Install two screws (56) and two nuts (57). Install and lockwire screw (58). Use lockwire (E231). Remove tag.
- 46. Install serviceable gasket (59) on starter drive housing (60). Position hose (54) on housing and install two nuts (61) and two washers (62). Remove tag.

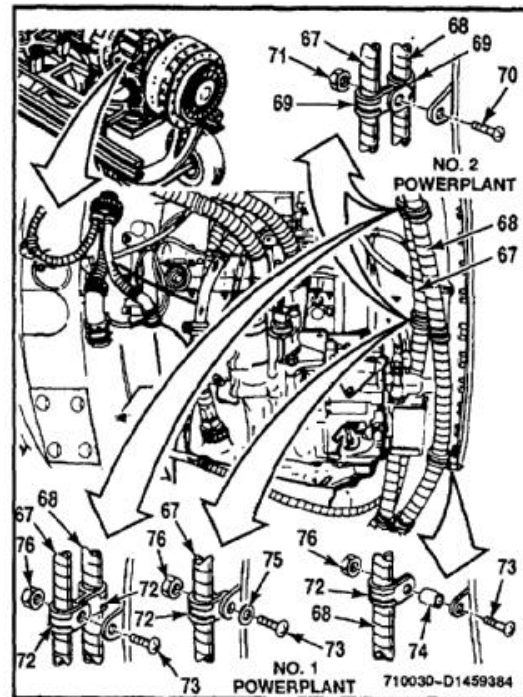


- 47. Position starter drain hose (63) on powerplant (1). Install four clamps (64) and install two screws (65) and two nuts (66). Remove tag and tape from hose.

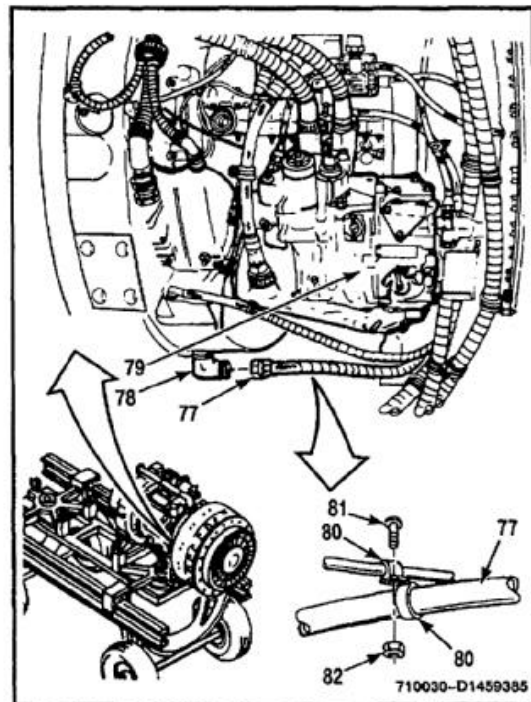


4-12 ASSEMBLE POWERPLANT (Continued)

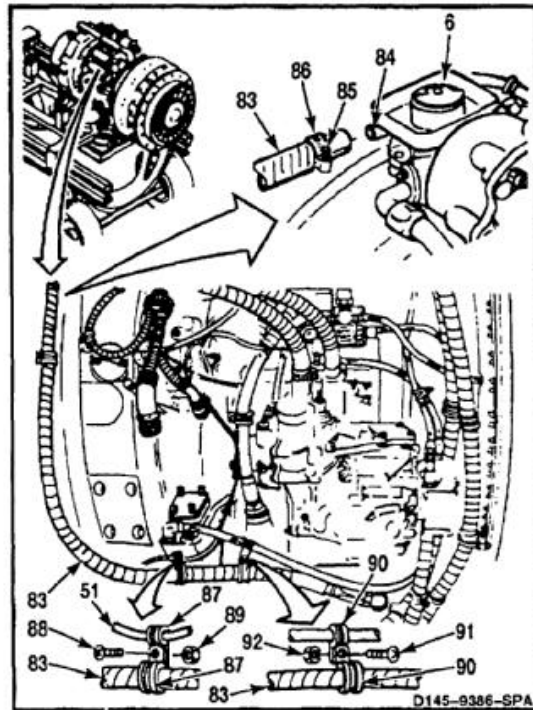
- 48. Position two hoses (67 and 68) on powerplant (1).
- 49. On No. 2 powerplant, install four clamps (69) and install two screws (70). Install two nuts (71) on screws. Remove tag and tape from hoses (67 and 68).
- 50. On No. 1 powerplant, install four clamps (72) on two hoses (67 and 68). Install three screws (73), spacer (74), washer (75), and two nuts (76). Remove tag and tape from hoses.



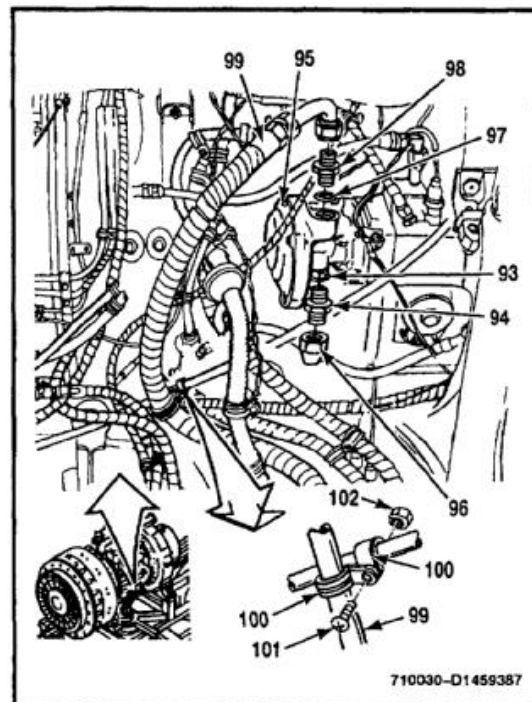
- 51. Connect hose (77) to elbow (78) on fuel control (79). Remove tag.
- 52. Install two clamps (80) and install screw (81) and nut (82). Remove tape from hose (77).



53. Install hose (83) on fitting (84) on oil filler (6). Tighten screw (85) on clamp (86).
54. Install two clamps (87) and install screws (88) and nut (89). Remove tags and tape from hose (83) and wire (51).
55. Install two clamps (90) and install screw (91) and nut (92). Remove tag and tape from hose (83).



56. Lubricate packing (93) with petrolatum (E274). Install packing on union (94). Install union on fuel pump (95). Connect hose (96) to union. Remove tag.
57. Lubricate packing (97) with petrolatum (E274). Install packing on reducer (98). Install reducer in fuel pump (95). Connect hose (99) to reducer. Remove tag.
58. Install two clamps (100) and install screw (101) and nut (102). Remove tape from hose (99).



59. Connect hose (103) at fitting (104).
60. Install four clamps (105). Install two screws (106) and nuts (107). Remove tag and tape from hose (103).

INSPECT**FOLLOW-ON MAINTENANCE:**

For engines without **74**:

Install gas producer control actuator support bracket (Task 4-111).

Install power turbine control actuator (Task 4-139).

Install gas producer control actuator (Task 4-109).

Install and rig power turbine control linkage (Task 4-140).

Install and rig gas producer control linkage (Task 4-113).

For all engines:

Install gas producer tachometer generator (Task 8-12 or 8-13) without **74**.

Install starter (Task 7-142).

Install fire detection sensing element (Task 12-13).

Install engine cover former (Task 4-46).

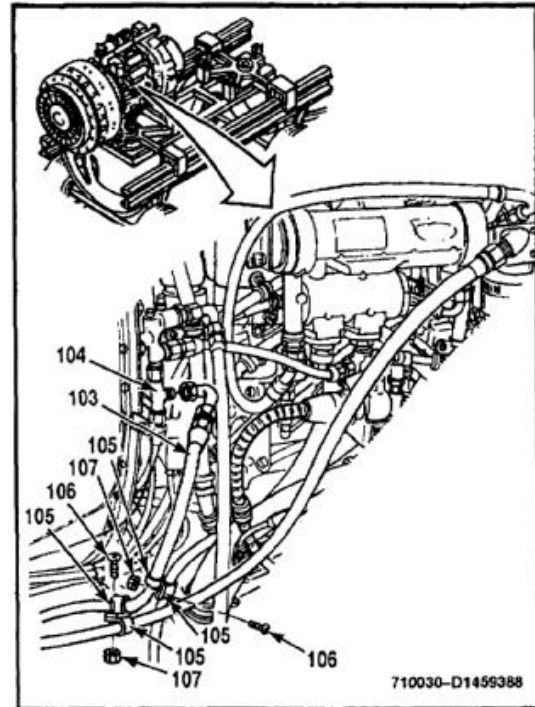
Perform resistance check of thermal couple harness assembly (TM 55-2840-254-23).

Install exhaust cone (Task 4-90) without **74**.

Install exhaust cone (TM 1-2840-265-23, Task 4-75) with **74**.

Install engine air inlet fairing (Task 4-75).

Install engine access cover (Task 4-59).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 0 to 150 Inch-Pounds
 Torque Wrench, 100 to 750 Inch-Pounds
 Rope Guide Lines
 Hoist
 Crowfoot Attachment, 3/8 Inch
 Sling (T134)

Materials:

Lockwire (E229)
 Lockwire (E231)
 Petrolatum (E274)

Personnel Required:

Medium Helicopter Repairer (3)
 Inspector

References:

TM 55-1520-240-23P
 Task 4-44
 Task 6-107

Equipment Condition:

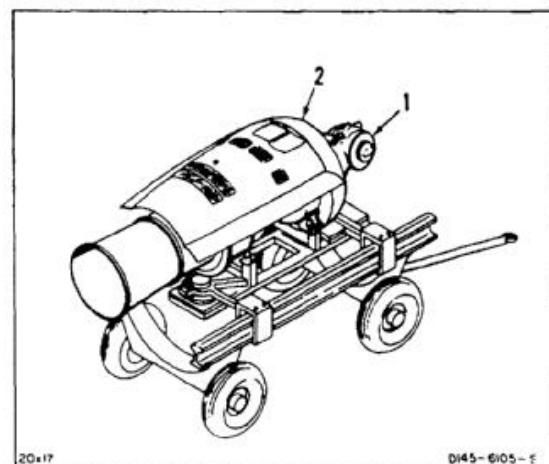
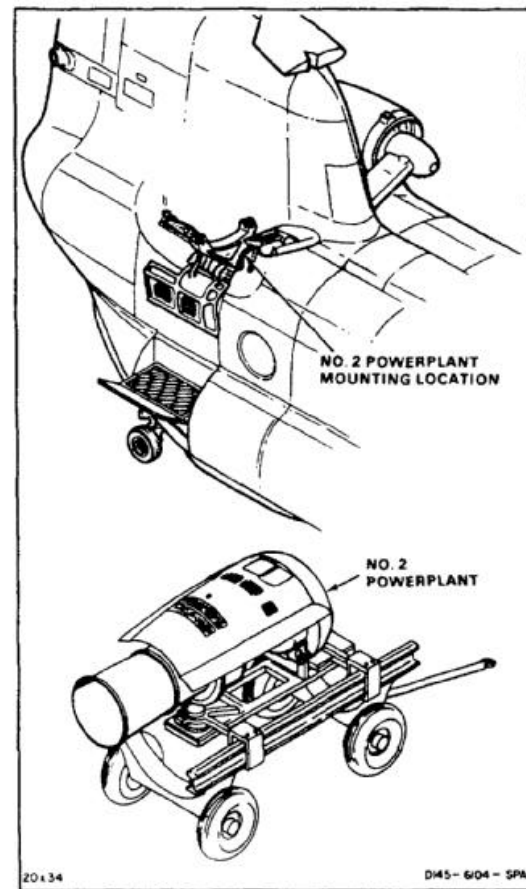
Aft Engine Mount Link and Adapter Parts Inspected
 (Task 4-37)

NOTE

Procedure is same to install No. 1 or No. 2 powerplant. Installation of No. 2 powerplant is shown here.

INSTALL POWERPLANT WITH ENGINE TRANSMISSION INSTALLED

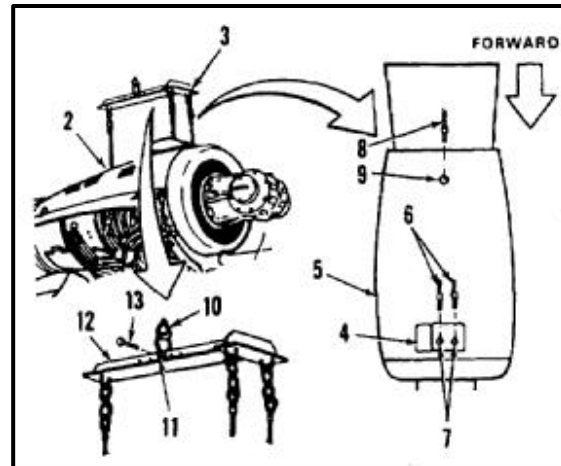
1. Install engine transmission (1) on powerplant (2) (Task 6-107).



4-13 INSTALL POWERPLANT (Continued)

4-13

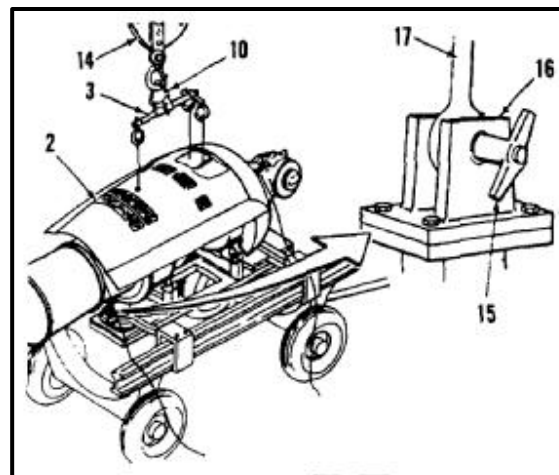
2. Install sling (3) as follows:
 - a. Open access door (4) in engine access cover (5).
 - b. Connect two cables (6) into forward fittings (7) on powerplant (2).
 - c. Connect cable (8) into aft fitting (9) through cover (5).
 - d. Adjust sling (3) until eye (10) is over center hole (11) in sling bar (12).
 - e. Install pin (13) through bar (12).



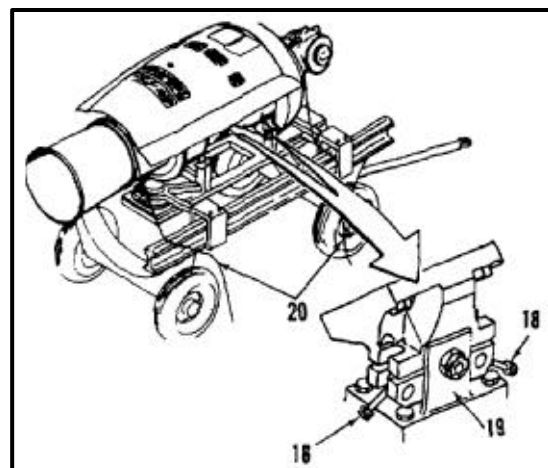
3. Connect hoist (14) to eye (10) of sling (3). Absorb weight of powerplant (2) with hoist.
4. Remove pin (15) from adapter fitting (16) and aft mount link (17).

WARNING

Powerplant is heavy and can injure personnel if it drops. Personnel must stay clear while powerplant is being moved by hoist.



5. Loosen four bolts (18) on trailer adapter (T19) (19) and push down to side.
6. Install rope guide lines (20).



CAUTION

During raising of powerplant, make sure bearing in lower end of aft engine mount link does not tilt in clevis of trailer adapter (T16). If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

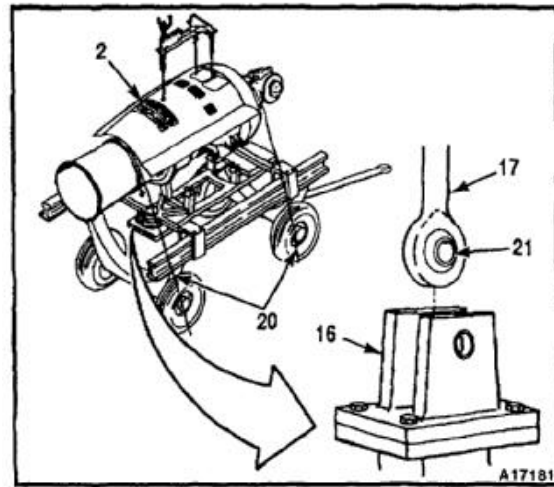
7. Raise powerplant (2). Make sure bearing (21) in aft mount link (17) does not tilt or wedge in fitting (16). Have helpers guide powerplant (2) with rope guide lines (20).

CAUTION

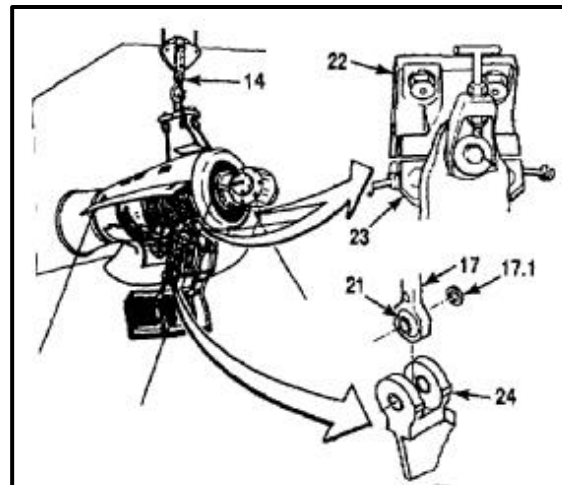
During lowering of powerplant, make sure bearing in lower end of aft support link does not tilt in engine mount clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

For T55-L-712 engines, make sure all hydraulic, fuel, and electrical cables are routed behind connecting link on No. 1 powerplant.

For T55-L-714A engines, the starter hydraulic return and starter seal drain lines must be routed outside the connecting link for both No. 1 and No. 2 engines.



8. Slowly lower hoist (14) until forward adapters (22) rest on caps (23).
- 8.1. Align holes in aft link (17) with spacer (17.1) with holes in aft engine mount (24). Lower hoist (14) until aft link (17) fits in aft engine mount (24). Make sure bearing (21) does not tilt in aft engine mount (24).





Make sure powerplant weight is on aft support link and not on firewall former. Damage to powerplant and former can occur if weight is not on support link.

9. Install slip fit bushing (25), shoulder outboard, in clevis (24).
10. Install bolt (26), two washers (27), and nut (28). Raise or lower powerplant (2) as needed for clearance.
11. Adjust firewall former (29) (Task 4-44).
12. Relax tension on hoist (17).
13. Torque nut (28) to **350-400 inch-pounds** to seat bushing. Loosen nut and retorque to **20 inch-pounds** above run-on torque. Not to be less than **70 inch-pounds**.

INSPECT

14. Check barrel nuts (30). Breakaway torque shall not be less than **7 inch-pounds**.
15. Push four bolts (31) up and over adapter (22) and tighten evenly.
16. Torque bolts (31) to **20 inch-pounds** above friction torque.

NOTE

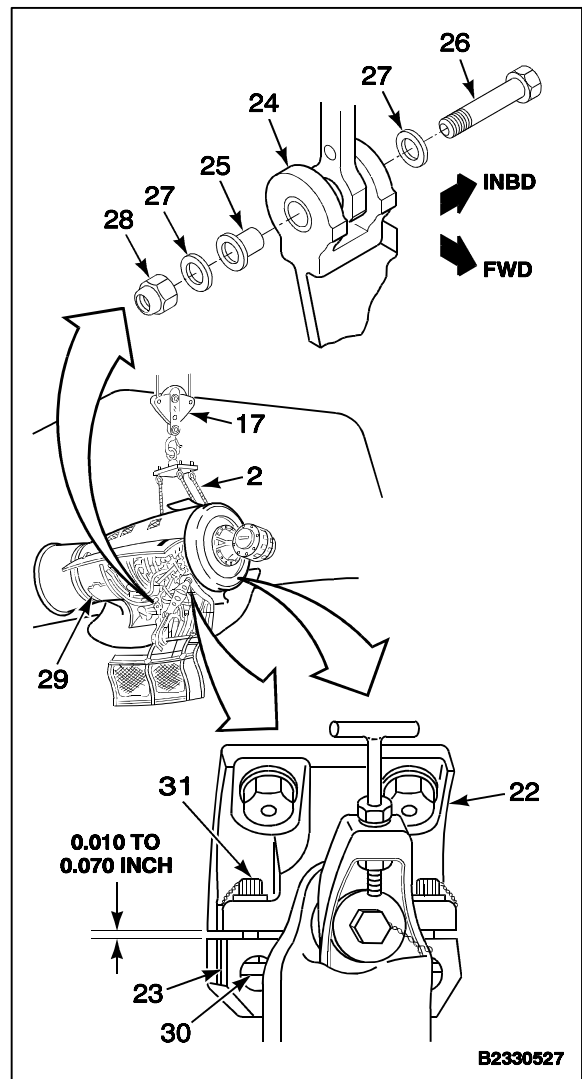
It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

17. Measure gap between adapters (22) and caps (23). Gap shall measure **0.010 to 0.070 inch**.
18. Torque bolts (31) to **105 inch-pounds**.
19. Measure gap between adapters (22) and caps (23). Gap shall measure **0.010 to 0.070 inch**.

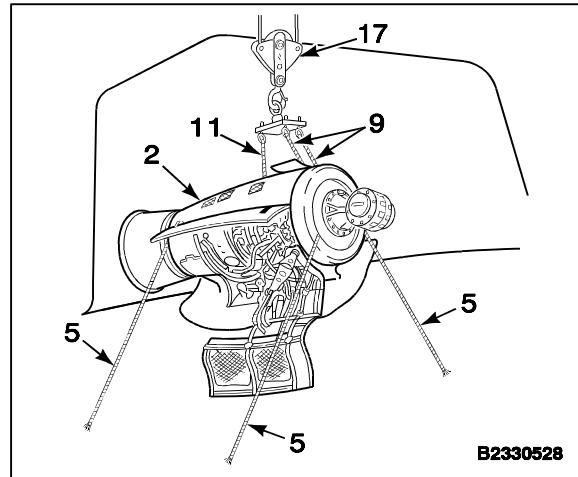
NOTE

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

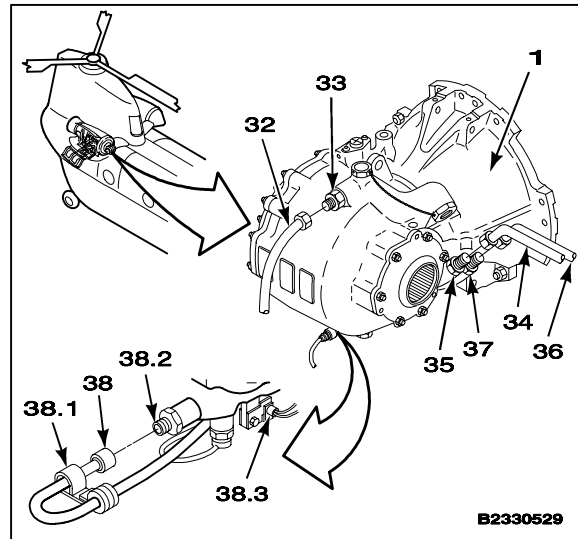
20. Check bolts (31). Bolts shall protrude a minimum of two threads through barrel nuts (30), but shall not bottom out. Add washers under bolthead if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).



21. Disconnect three cables (9 and 11) from powerplant (2).
22. Lift sling (T134), with cables (9 and 11), away from powerplant (2). Remove cables from hoist (17).
23. Remove rope guide lines (5).



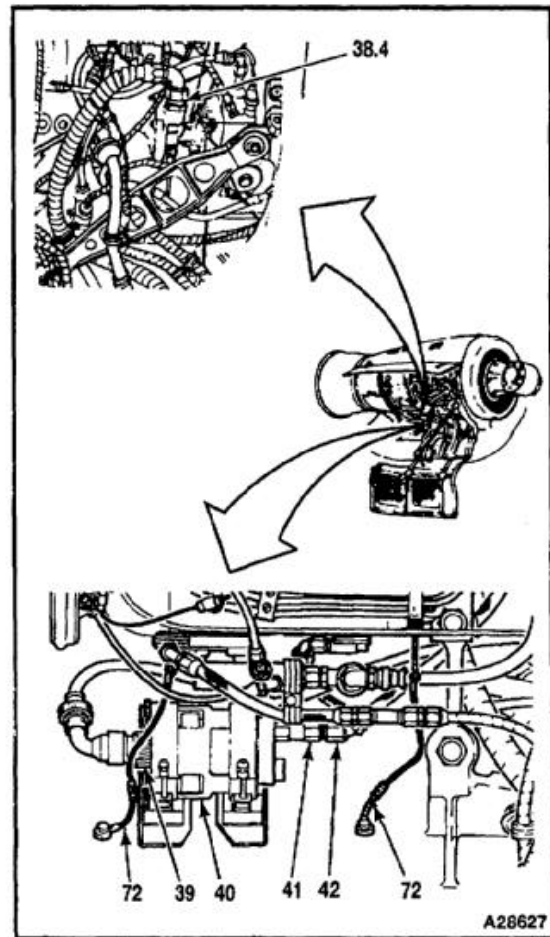
24. Connect hose (32) to port (33) in transmission (1). Remove tag from hose.
25. Connect hose (34) to port (35). Remove tag from hose.
26. Connect hose (36) to port (37). Remove tag from hose.
27. Connect cable plug (38) to temp switch (38.2). Tighten strain relief (38.1) to properly secure cable to plug.
- 27.1. Connect cable plug to remote connector (38.3) for transmission chip detector.



4-13 INSTALL POWERPLANT (Continued)

4-13

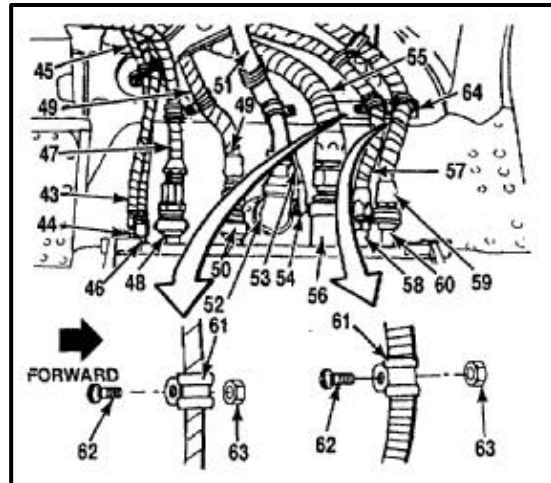
- 27.2. Tighten fuel boost pump inlet fitting (38.1).
- 27.3. Connect bonding jumpers (72) with **74**.
28. Connect cable plug (39) to oil pressure transmitter (40). Lockwire plug. Use lockwire (E229).
29. Lubricate thread of fitting (41). Use petrolatum (E274). Connect hose (42).



NOTE

In order to minimize or alleviate chafing, the following actions may be taken with no change of routing allowed:

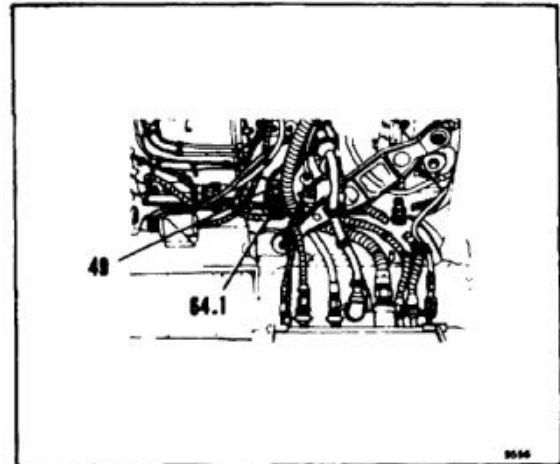
- a. Installation of spiral wrap.
 - b. Minor repositioning of existing clamps.
 - c. Minor reshaping of fire detection sensing wires.
 - d. Reclocking of hose connections.
 - e. Minor reclocking of electrical connectors.
(This should be done only when all previous methods have been tried.)
30. Connect hose (43) to port (44). Remove tag.
 31. Connect hose (45) to port (46). Remove tag.
 32. Connect hose (47) to port (48). Remove tag.
 33. Connect hose (49) to port (50). Remove tag.
 34. Connect cable connector (51) to receptacle (52). Remove tag.
 35. Connect cable connector (53) to receptacle (54). Remove tag. Lockwire connector. Use lockwire (E229).
 36. Connect hose (55) to port (56). Remove tag.
 37. Connect hose (57) to port (58). Remove tag.
 38. Connect hose (59) to port (60). Remove tag.
 39. Connect two clamps (61). Install two screws (62) and nut (63) in bracket (64). Remove tape.



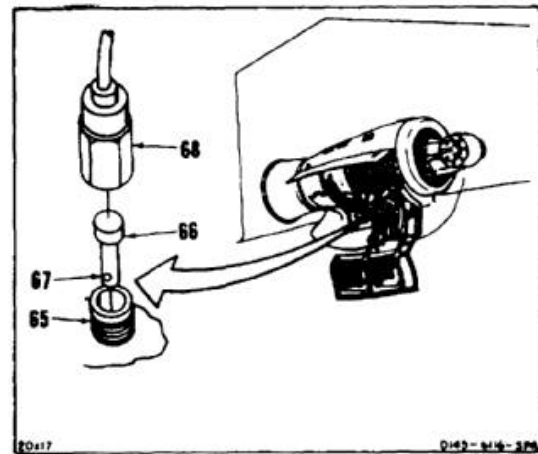
4-13 INSTALL POWERPLANT (Continued)

4-13

- 39.1. Make sure hose (49) cannot chafe on aft nozzle (64.1).



40. Remove caps from receptacles (65). Make sure inserts (66) are in receptacles (65). White dot (67) first.
41. Connect two connectors (68) to receptacles (65) at fuselage.



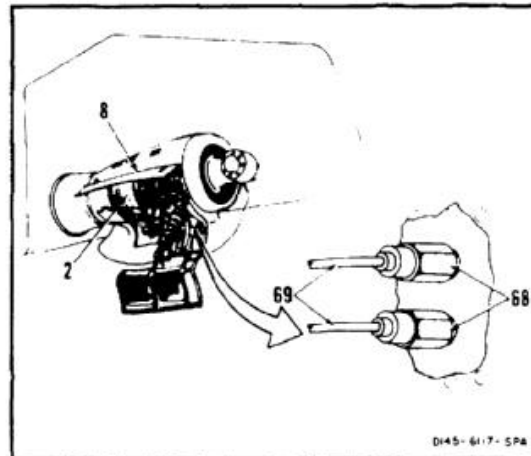
42. Torque connectors (68) to **65 inch-pounds**.



Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

43. Make sure fire detection sensing element (69) cannot chafe on powerplant (2) or cover (8).

INSPECT

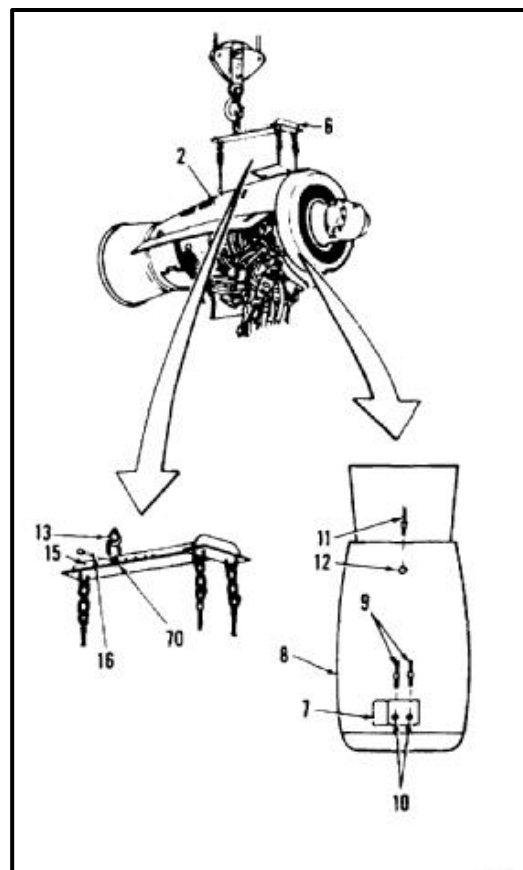


INSTALL POWERPLANT WITH ENGINE TRANSMISSION REMOVED

NOTE

Art for steps 44, 46, and 47 is referenced to install powerplant with Engine Transmission Installed section. Referenced art shows engine transmission installed but will not affect task performance.

44. Perform steps 2 and 3. Then go to step 45.
45. Install sling (6) as follows:
- Open access door (7) in engine access cover (8).
 - Connect two cables (9) into forward fittings (10) on powerplant (2).
 - Connect cable (11) into aft fitting (12) through cover (8).
 - Adjust sling (6) until eye (13) is over aft hole (70) in sling bar (15).
 - Install pin (16) through bar (15).
46. Perform step 5 thru 23. Then go to step 47.
47. Perform steps 28 thru 43. Then go to Follow-On Maintenance.



FOLLOW-ON MAINTENANCE:

- Install engine transmission (if not already installed) (Task 6-107).
- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T, without **74**).
- Perform operational check of power turbine control system (TM 55-1520-240-T, without **74**).
- Close engine side and lower access covers (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-4).
- Check powerplant plumbing for leaks.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).
- Retorque exhaust cone coupling nuts after initial ground run (Task 4-90).
- Perform operational check of engine torquemeter indicating system (TM 55-1520-240-T).
- Perform operational check of PTIT indicating system and resistance check of the harness assembly (TM 55-1520-240-T, TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**, and Task 4-24).
- Check forward engine mounts for proper clearance. Do not exceed 4 flight hours. Torque forward engine mount adapter bolts (Task 4-35).
- Adjust engine droop eliminator variable resistors (Task 4-118, without **74**).
- Install and rig power turbine control linkage (Task 4-140, without **74**).
- Rig thrust control position transducer assembly (Task 4-154, with **74**).
- Upload DECU with new engine data (Task 4-149, with **74**).
- Perform operational check of FADEC system (TM 55-1520-240-T, with **74**).
- Depreserve the powerplant (Task 4-159, with **74**).
- Perform P3 leak check (Task 4-159, with **74**).
- Perform operational check of fire sensing indication system (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944
- Vibration Mounting Kit, NSN 4920-00-879-0331
- Electrical Power Cable Assembly
- Torque Wrench, 30 to 150 Inch-Pounds
- Stopwatch
- AC Power Supply, 115 Volts, 400 Hz
- Adapter (APP E-1)

Materials:

Tape (E399)

Parts:

Keywashers, Bolts

Personnel Required:

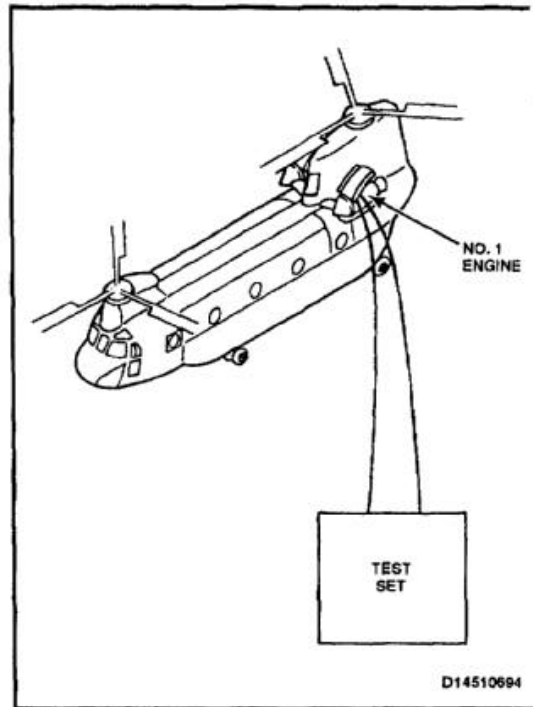
- Aircraft Powerplant Repairer
- Inspector
- Army Rotary-Wing Aviator (2)

References:

- TM 55-1520-240-10
- TM 55-4920-243-15
- Task 1-36
- Task 2-2
- Task 4-49
- Task 4-50

Equipment Condition:

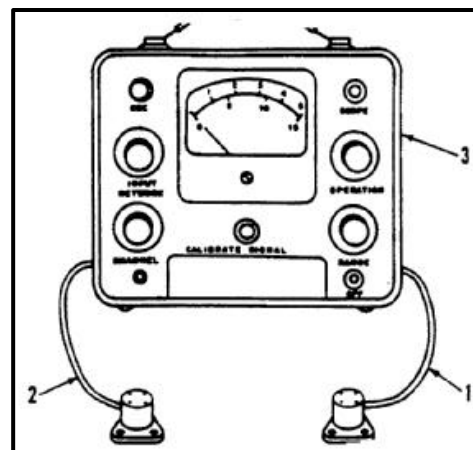
- Battery Connected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



NOTE

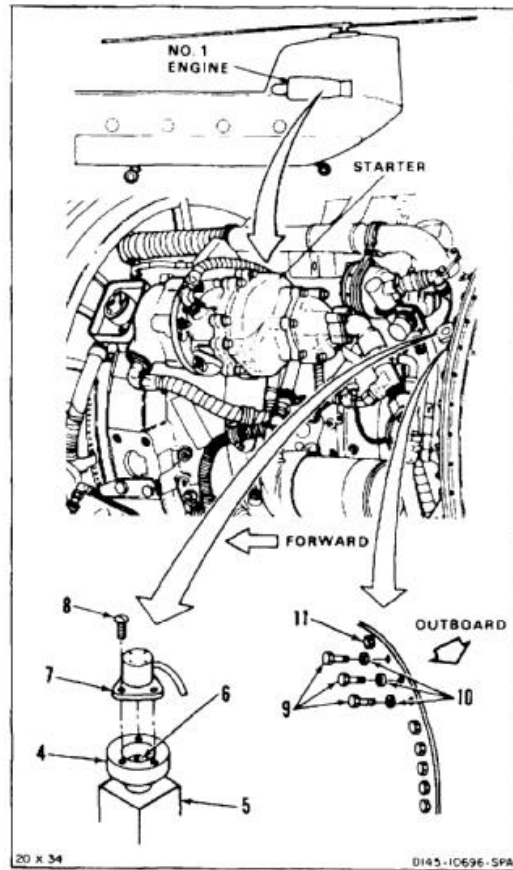
Procedure is same to perform engine vibration test on No. 1 or No. 2 engine except as noted. No. 1 engine is shown here.

1. Prepare test set for use (TM 55-4920-243-15).
2. Disconnect two cables (1 and 2) from meter (3).

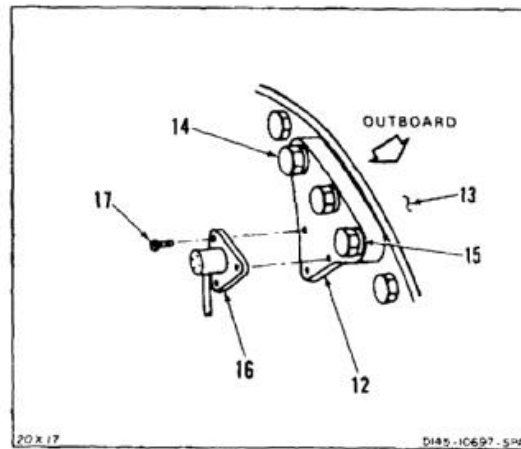


INSTALL TEST SET

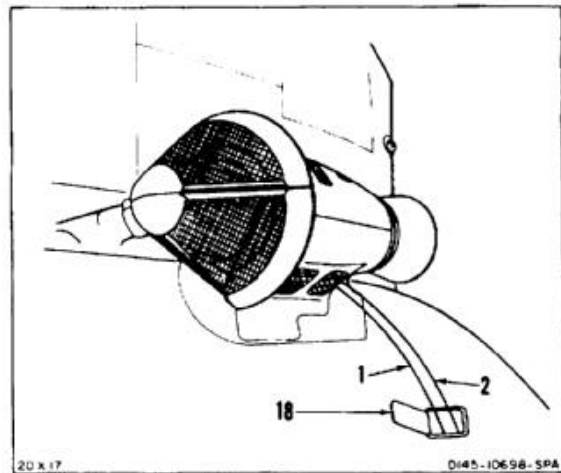
3. Position adapter (4) in fitting (5) and secure with screw (6).
4. Position transducer (7) on adapter (4) and secure with three screws (8).
5. Remove three bolts (9) and keywashers (10), outboard from top bolt (11).



6. Position adapter (12) on powerplant (13) and install three bolts (14) and keywashers (15).
7. Position transducer (16) on adapter (12) and secure with three screws (17).



8. Secure cables (1 and 2) to fuselage and route cables inside cabin through EMERG APU FUEL SHUTOFF access door (18). Use tape (E399).
9. On No. 2 engine, cables (1 and 2) will be routed through ACCESS RAMP CONTROL panel.
10. Close engine access cover (Task 4-50).
11. Close engine work platform (Task 2-2).

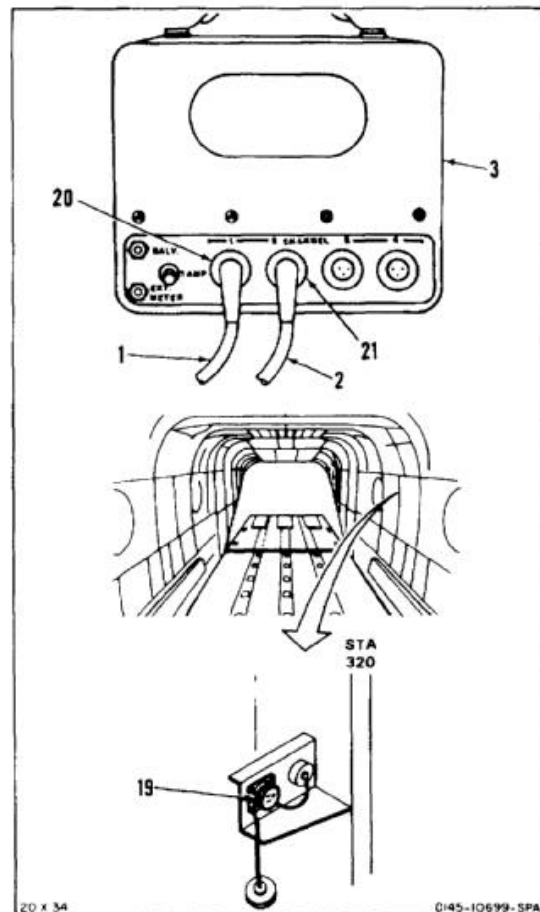


12. Apply aircraft electrical power (Task 1-36).

NOTE

Do not allow meter to be without power for more than **two minutes** when moving to aircraft electrical system.

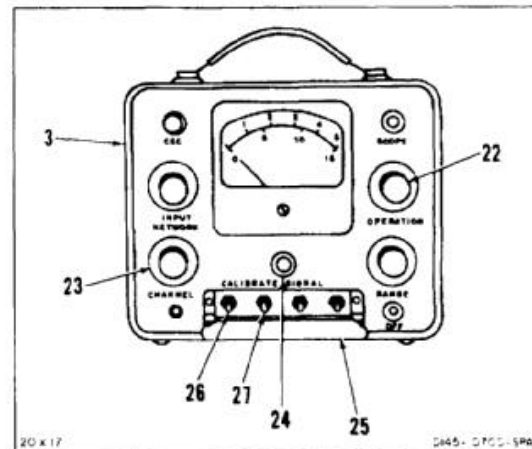
13. Disconnect meter (3) from power source and connect to aircraft **115V, 1Ph, 15 AMP** receptacle (19) at sta. 320.
14. Connect No. 1 transducer cable (1) to meter (3) at CHANNEL 1 socket (20).
15. Connect No. 2 transducer cable (2) to meter (3) at CHANNEL 2 socket (21).



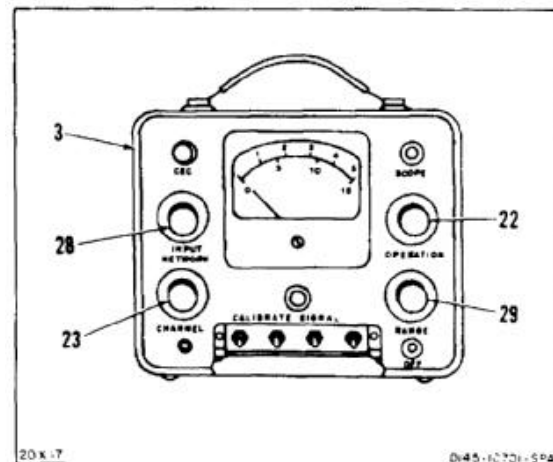
ADJUST METER**NOTE**

Vibration pickup transducer part number CFC4-118-0107 is calibrated at **10.5**. If vibration pickup transducer part number CEC4-128-0101 is used, calibrate it at **6.0**.

16. Set OPERATION selector (22) to C. Pointer shall move toward right side of scale.
17. Set CHANNEL selector (23) to 1.
18. Push in CALIBRATE SIGNAL control (24). Adjust control until meter (3) indicates **10.5**.
19. Slowly release control.
20. Open panel (25). Adjust SENSITIVITY 1 control (26) until meter indicates **15.0**.
21. Push in CALIBRATE SIGNAL control (24). Meter shall indicate **10.5**.
22. Slowly release control (24). Meter shall indicate **15.0**.
23. Set CHANNEL selector (23) to 2.
24. Repeat steps 19 and 20.
25. Adjust SENSITIVITY 2 control (27) until meter (3) indicates **15.0**.
26. Push CALIBRATE SIGNAL control (24). Meter (3) shall indicate **10.5**.
27. Release control (24). Meter (3) shall indicate **15.0**.

**PERFORM TEST**

28. Set INPUT NETWORK selector (28) to 70.
29. Set OPERATION selector (22) to VX1.0.
30. Set RANGE selector (29) to 5.
31. Set CHANNEL selector (23) to 1.
32. Observe meter (3) during test. Average velocity shall not exceed **1.2 inches per-second**.



- 33. Have pilot operate engines in GROUND (TM 55-1520-240-10). Allow engines to stabilize for **30 seconds**.
- 34. Record data on chart.
- 35. Set CHANNEL selector (23) to 2.
- 36. Record data on chart.
- 37. Set CHANNEL selector (20) to 1.
- 38. Have pilot trim engines to minimum rpm.
- 39. Have pilot increase engines to FLIGHT. Allow engines to stabilize for **30 seconds**.
- 40. Record data on chart.
- 41. Set CHANNEL selector (23) to 2.
- 42. Record data on chart.
- 43. Set CHANNEL selector (23) to 1.
- 44. Have pilot trim engines to **100 percent** rotor rpm.
- 45. Have pilot set N1 to **92 percent**. Allow engines to stabilize for **30 seconds**.
- 46. Record data on chart.
- 47. Set CHANNEL selector (23) to 2.
- 48. Record data on chart.

ENGINE VIBRATION TEST DATA SHEET

ENGINE SERIAL NO. _____ (TSN) _____

LAST OVERHAUL LOCATION _____ (TSLO) _____

AIRCRAFT SERIAL NO. _____ A/C TIME _____

TEST LOCATION _____ DATE _____

TESTED BY _____ OBSERVER _____

Engine Passed Test – Accepted Engine Failed Test

CONDITION	N1 (%)	NR (%)	NO. 1 PICKUP 70 Hz	N1 (%)	NR (%)	NO. 2 PICKUP 70 Hz
Ground Idle						
Minimum Beep						
Maximum	92	100		92	100	

1 Engine does does not exceed 1.2 ips average velocity during acceleration

2 Engine does does not exceed 1.2 ips average velocity during deceleration

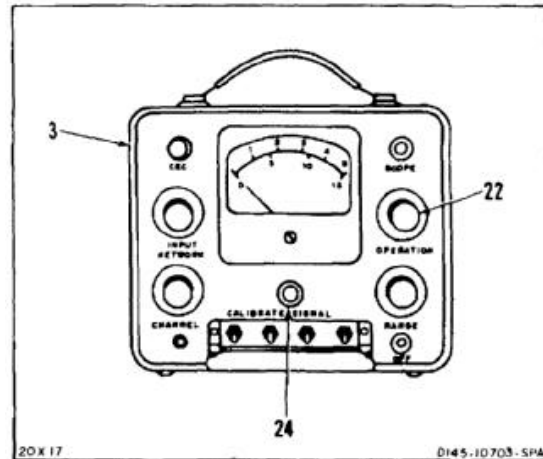
3 Record average velocities at steady state speeds indicated

4 The maximum acceptable average velocity for all pickups under all conditions is 1.2 inches per second using 70 Hz filter.

42 x DI45-10702-SPA

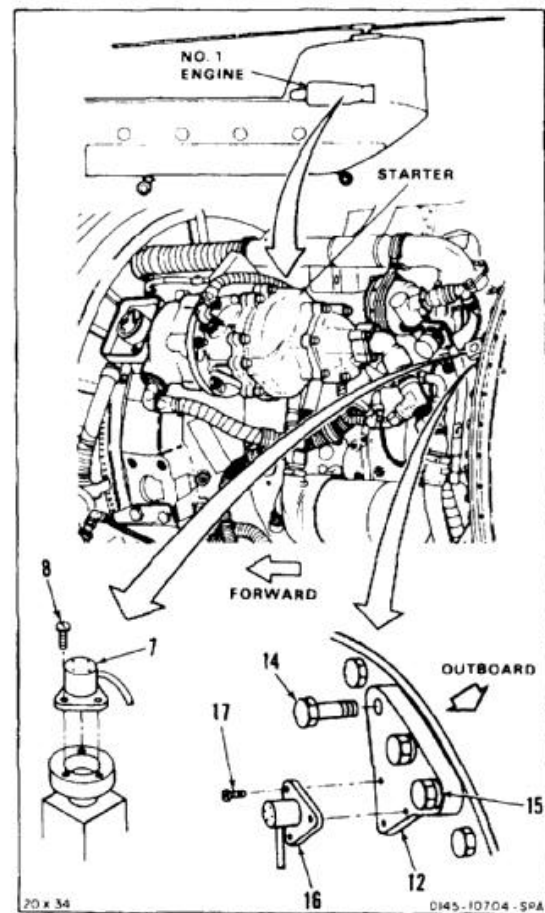
4-14 PERFORM ENGINE VIBRATION TEST (Continued)

- 49. Set OPERATION selector (22) to C. Meter (3) shall indicate between **14.0 and 1/16 inch** beyond full scale.
- 50. Push CALIBRATE SIGNAL control (24). Meter (3) shall indicate **10.5**. Release control.
- 51. Test must be performed again if meter (3) does not indicate readings in steps 50 and 51.
- 52. Have pilot land helicopter and shut down engines.

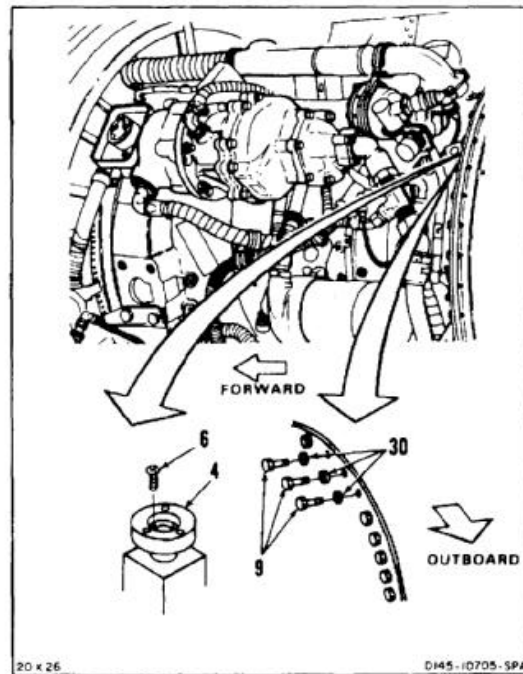


REMOVE TEST SET

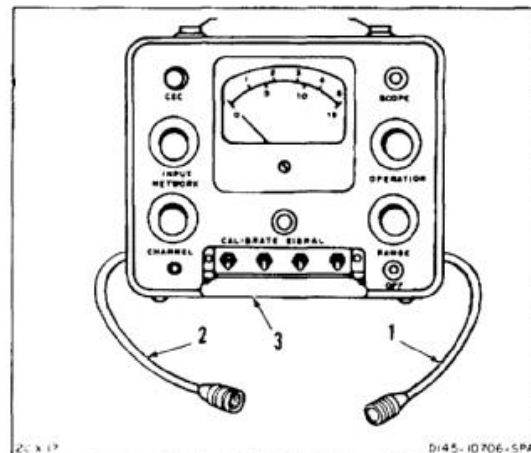
- 53. Disconnect meter (3) from power source.
- 54. Disconnect battery (Task 1-39).
- 55. Open engine work platform (Task 2-2).
- 56. Open engine access cover (Task 4-49).
- 57. Remove six screws (8 and 17).
- 58. Remove two transducers (7 and 16).
- 59. Remove three bolts (14), washers (15), and adapter (12).



- 60. Install three bolts (9) and new washers (30). Torque bolts (9) to **85 inch-pounds**.
- 61. Remove screw (6) and adapter (4).



- 62. Disconnect and remove two cables (1 and 2).
- 63. Remove tape from cables and fuselage. Remove meter (3).



FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-14.1 REMOVE POWER TURBINE INLET TEMPERATURE (PTIT) WIRE HARNESS

4-14.1

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Powerplant Mechanic's Tool Kit, NSN
5180-00-323-4944

Materials:

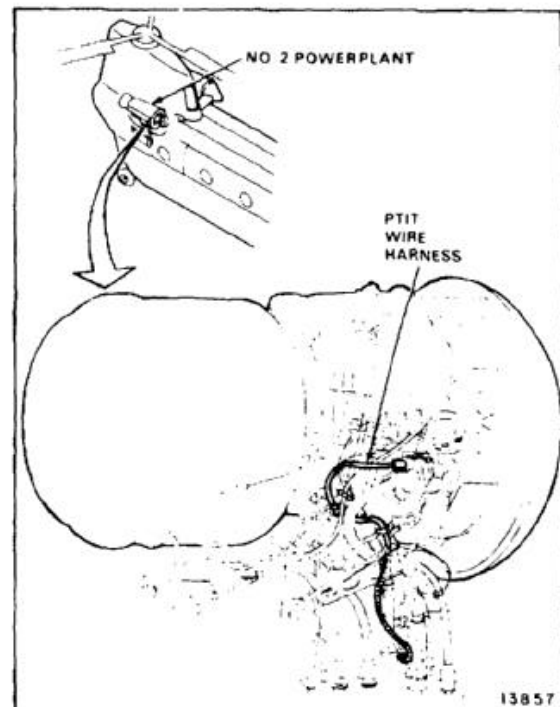
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

Battery Disconnect (Task 1-39)
Electrical Power Off
Engine Access Cover Open (Task 4-49)

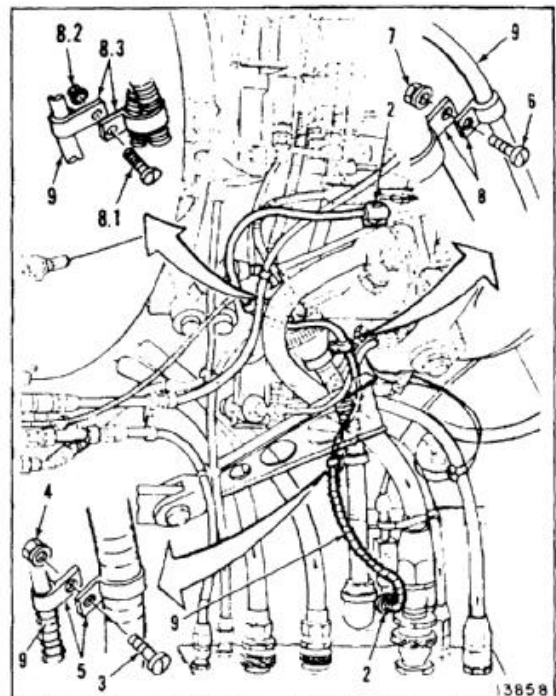
**NOTE**

Procedure is same to remove PTIT wire harness from No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Disconnect connectors (1 and 2).
2. Remove screw (3), nut (4), and clamps (5).
3. Remove screw (6), nut (7), and clamps (8).
- 3.1. Remove screw (8.1), nut (8.2), and clamps (8.3).
4. Remove PTIT wire harness (9).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Mechanic's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

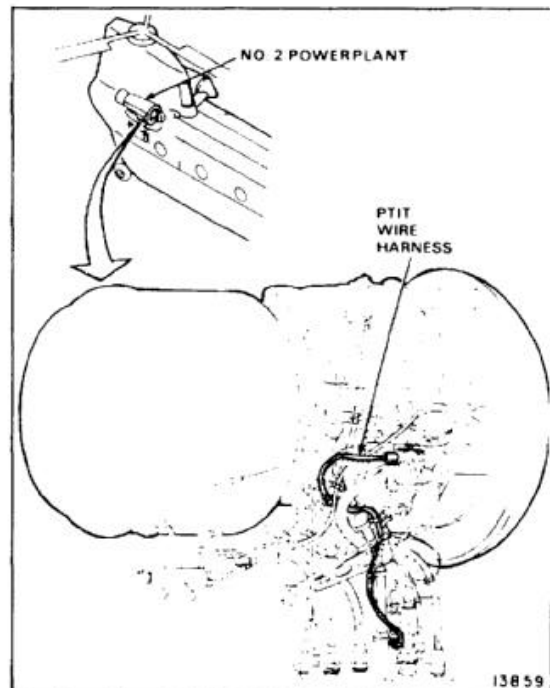
Aircraft Powerplant Repairer

References:

TM 55-1520-240-23

Equipment Condition:

Battery Disconnect
Electrical Power Off

**NOTE**

Procedure is same to install PTIT wire harness in No. 1 or No. 2 engine. No. 2 engine is shown here.

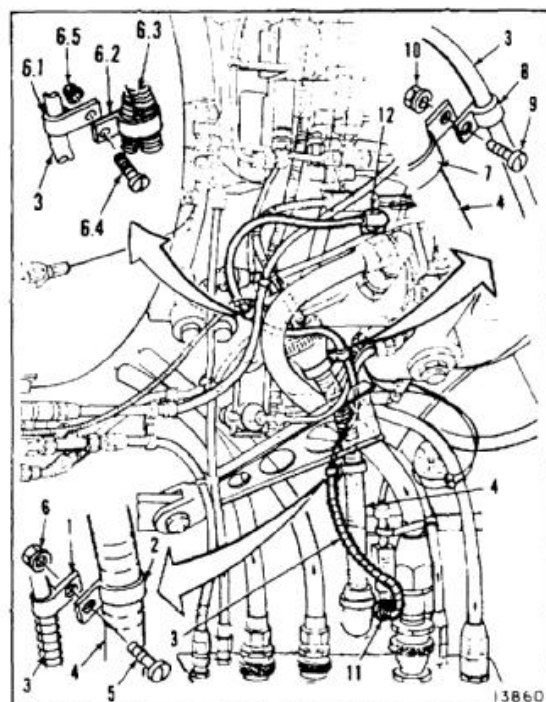
NOTE

Ensure that harness does not chafe against clamps or other engine components.

1. Install clamps (1 and 2) on PTIT wire harness (3) and flexible hose (4). Secure clamps (1 and 2) with screw (5) and nut (6).
2. Install clamps (7 and 8) on PTIT wire harness (3) and flexible hose (4). Secure clamps (7 and 8) with screw (9) and nut (10).
- 2.1. Install clamps (6.1 and 6.2) on PTIT wire harness (3) and flexible hoses (6.3). Secure clamps (6.1 and 6.2) with screw (6.4) and nut (6.5).
3. Install connectors (11 and 12).

FOLLOW-ON MAINTENANCE:

Battery connected (Task 1-39).
Close engine access cover (Task 4-50).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

Paper Tags (E264)
Tape (E388)

Personnel Required:

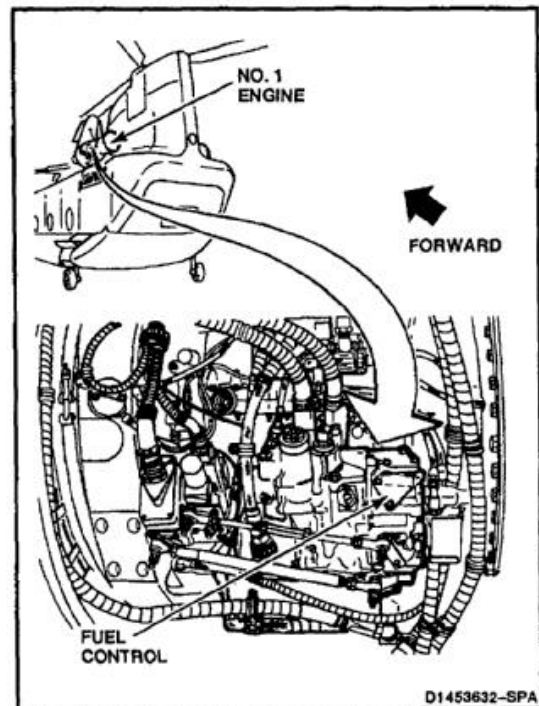
Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23

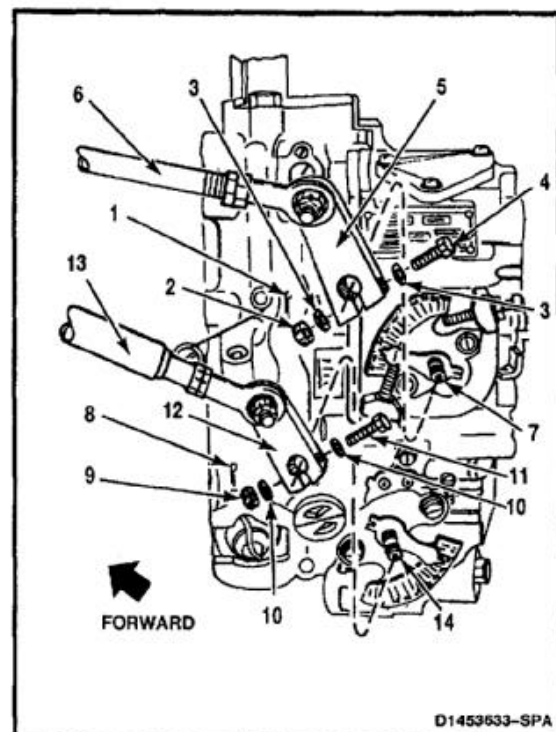
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

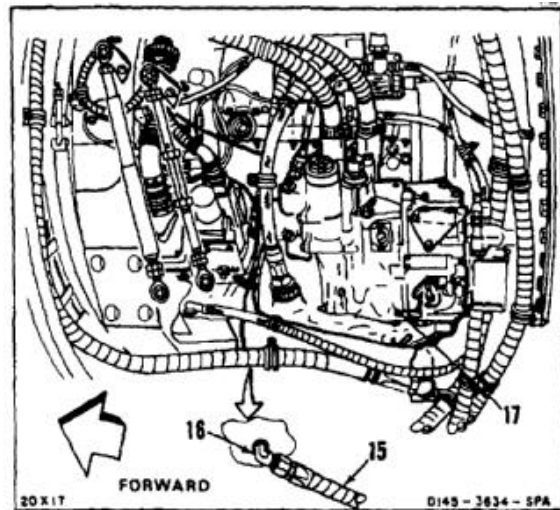
**NOTE**

Procedure is same to remove fuel control on No. 1 or No. 2 engine. Fuel control on No. 1 engine is shown here.

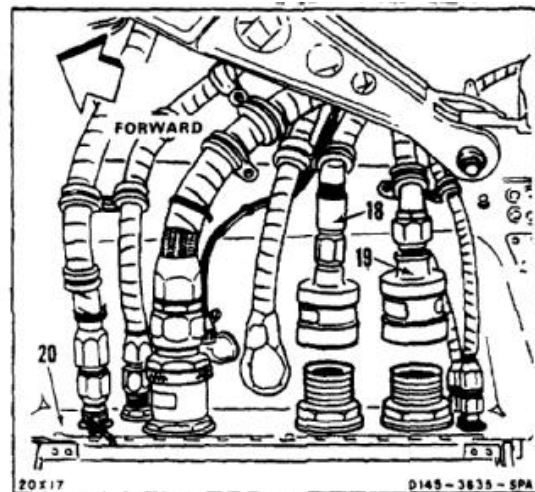
1. Remove cotter pin (1), nut (2), two washers (3), and bolt (4) from lever (5). Move rod (6) off shaft (7), up and forward.
2. Remove cotter pin (8), nut (9), two washers (10), and bolt (11) from lever (12). Move rod (13) off shaft (14), up and forward.



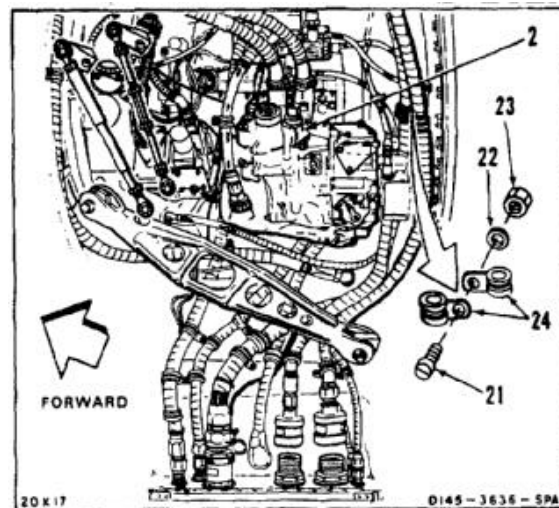
3. Tag and disconnect drain hose (15) from elbow (16) on bottom of fuel control (17).



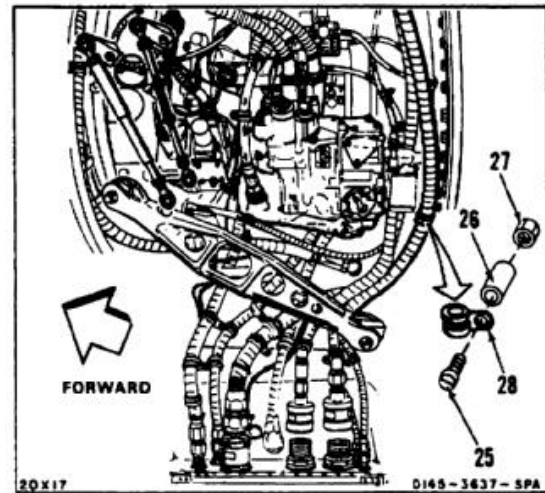
4. Tag and disconnect two hoses (18 and 19) at shelf (20).



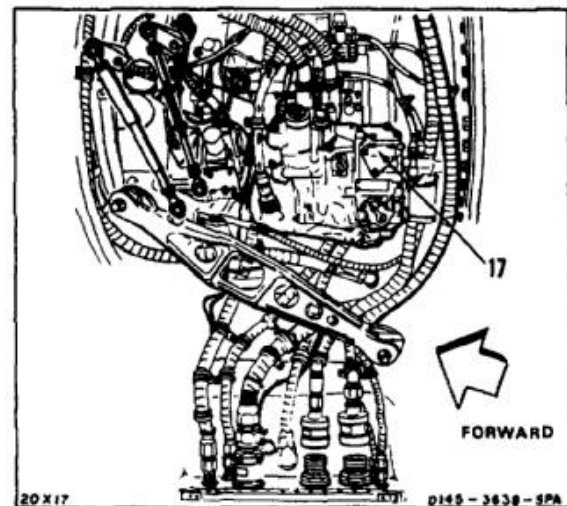
5. Remove screw (21), washer (22), and nut (23). Disconnect two clamps (24). Mark clamp location. Use tape (E388).



6. Remove screw (25), spacer (26), and nut (27). Disconnect clamp (28). Mark clamp location. Use tape (E388).



7. Remove fuel control (17) (TM 55-2840-254-23).
 8. Remove the N2 RPM limiting stop from fuel control (TM 55-2840-254-23).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Parts:

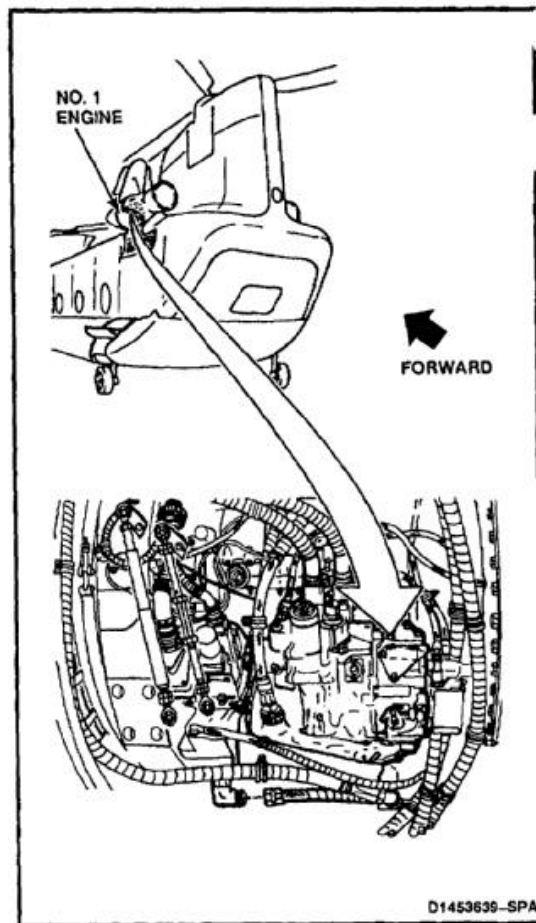
Cotter Pins

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

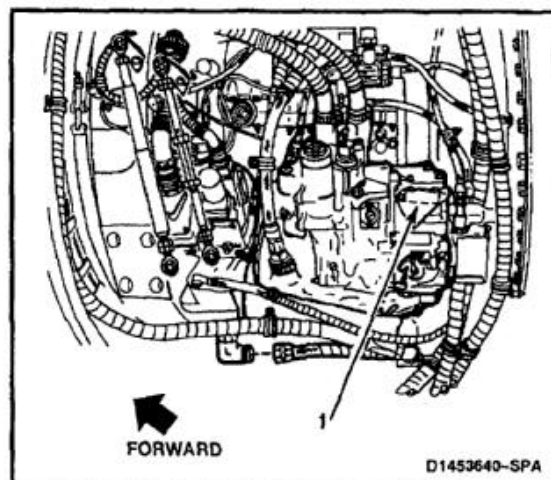
TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23P



NOTE

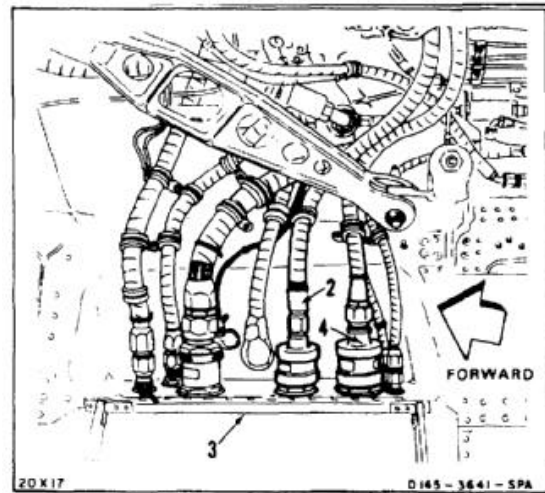
Procedure is same to install fuel control on No. 1 or No. 2 engine. Fuel control on No. 1 engine is shown here.

1. Install fuel control (1) (TM 55-2840-254-23).

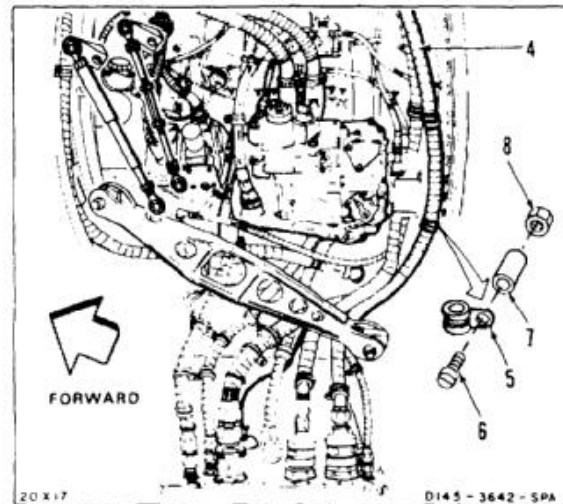


4-16 INSTALL ENGINE FUEL CONTROL (Continued)

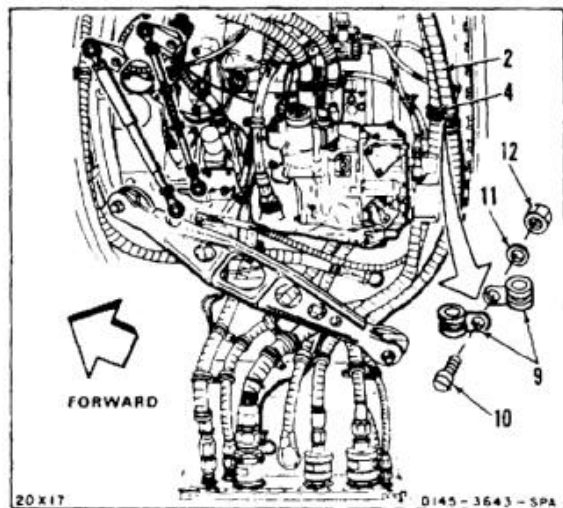
2. Connect hose (2) at shelf (3). Remove tag.
3. Connect hose (4) at shelf (3). Remove tag.



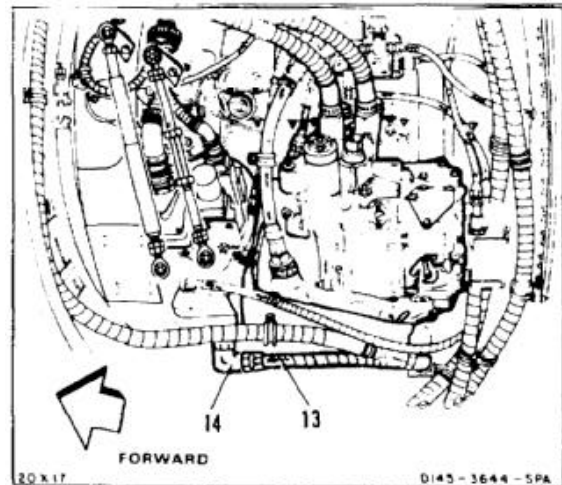
4. Position clamp (5) around hose (4). Install screw (6), spacer (7), and nut (8).



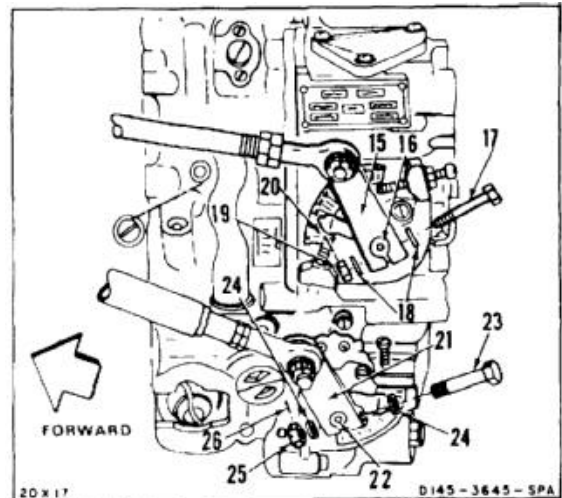
5. Position clamps (9) on two hoses (2 and 4). Install screw (10), washer (11), and nut (12).



6. Connect hose (13) to elbow (14).



7. Position lever (15) on shaft (16). Install bolt (17), two washers (18), nut (19), and cotter pin (20).
8. Position lever (21) on shaft (22). Install bolt (23), two washers (24), nut (25), and cotter pin (26).

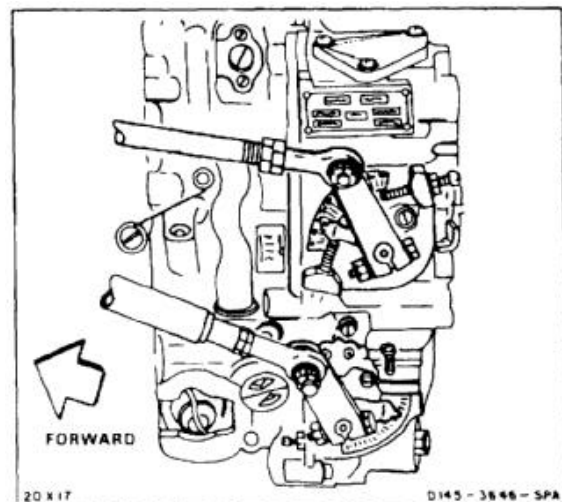


9. Install the N2 RPM limiting stop on fuel control (TM 55-2840-254-23).

INSPECT

FOLLOW-ON MAINTENANCE:

- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Prime fuel control (TM 55-2840-254-23).
- Adjust fuel control (TM 55-2840-254-23).
- Perform engine teac check (Task 4-3).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-17 REMOVE ENGINE FUEL BOOST PUMP

4-17

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2 Quart

Materials:

Cloths (E135)

Personnel Required:

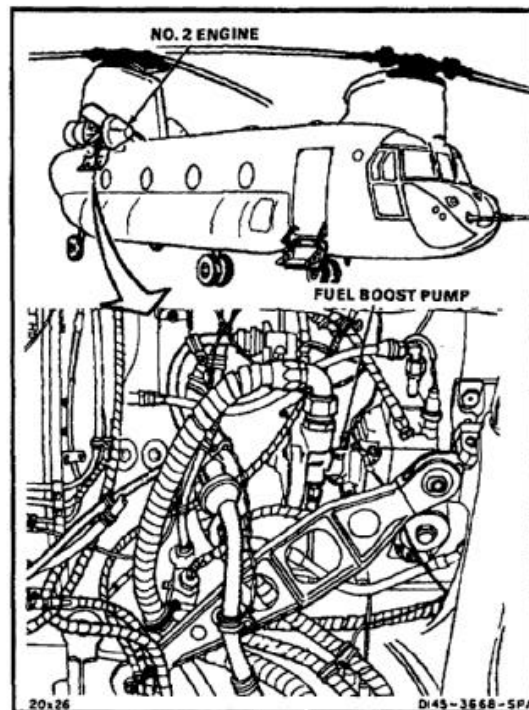
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

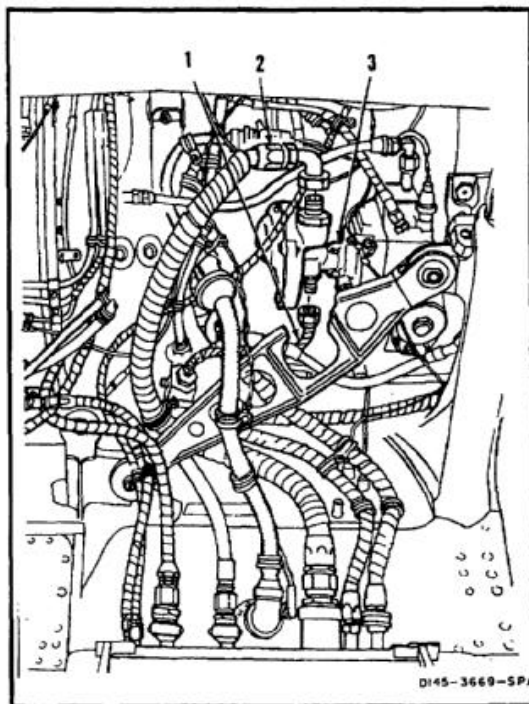
**NOTE**

Procedure is same to remove fuel boost pump from No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. Disconnect two hoses (1 and 2) from pump (3). Use container to catch spilled fuel. Plug hoses. Clean up any spilled fuel. Use cloths (E135).
2. Remove pump (3) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2 Quart

Materials:

Cloths (E121)
Gloves (E184.1)

Personnel Required:

Aircraft Powerplant Repairer

References:

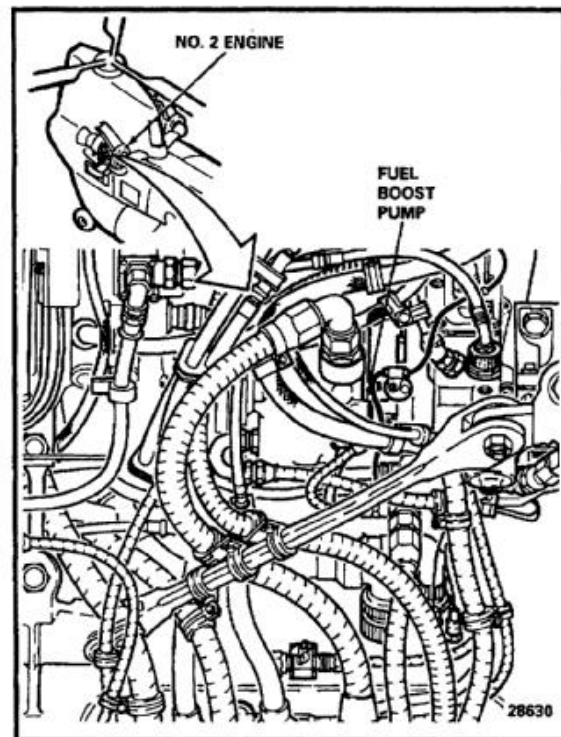
TM 1-2840-265-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

General Safety Instructions:**WARNING**

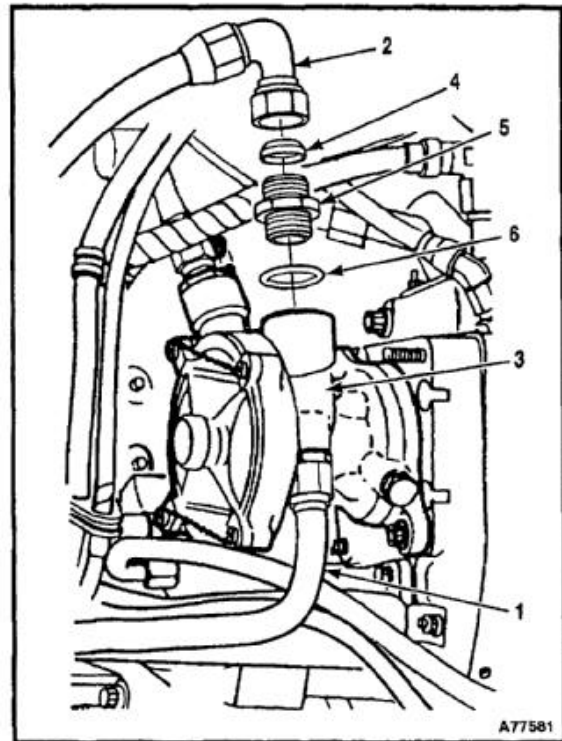
Fuels (JP4/JP5/JP8) (E182/E182.1) are combustible and toxic. They can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



NOTE

Procedure is same to remove fuel boost pump from No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. Disconnect hoses (1 and 2) from pump (3). Remove and discard conical seal (4). Use container to catch spilled fuel. Plug and tag hoses. Clean up any spilled fuel. Use rags (E121). Wear gloves (E184.1).
2. Remove union (5) and packing (6). Discard packing.
3. Remove pump (3) (TM 1-2840-265-23).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch

Materials:

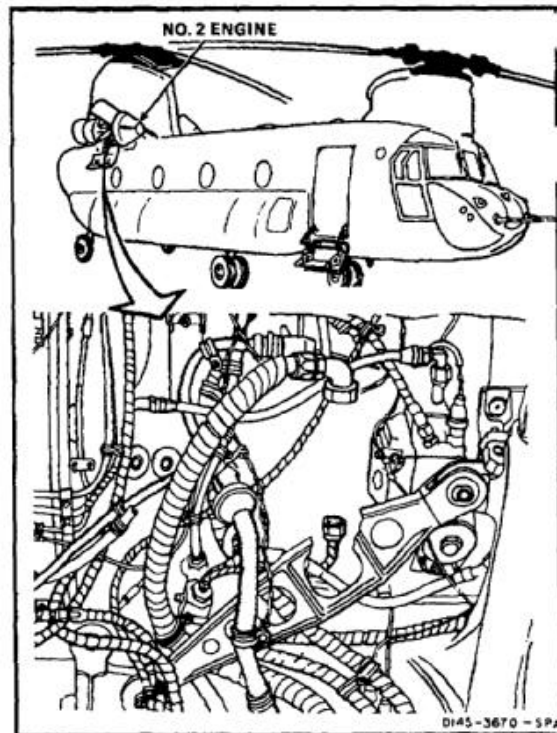
None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

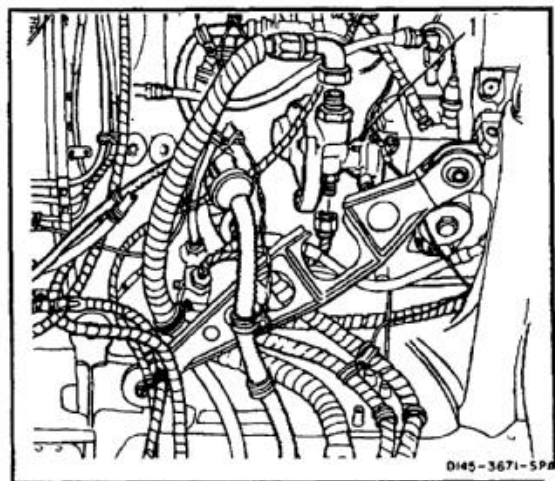
References:

TM 55-2840-254-23
TM 55-2840-254-23P
TM 55-1520-240-23P

**NOTE**

Procedure is same to install fuel boost pump on No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

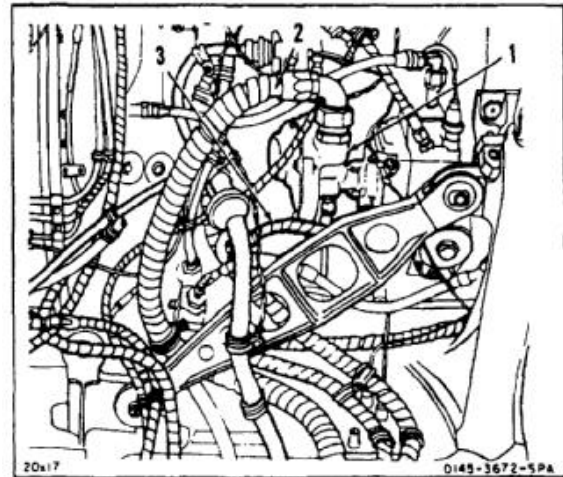
1. Install pump (1) (TM 55-2840-254-23).



2. Connect two hoses (2 and 3) to pump (1).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch

Materials:

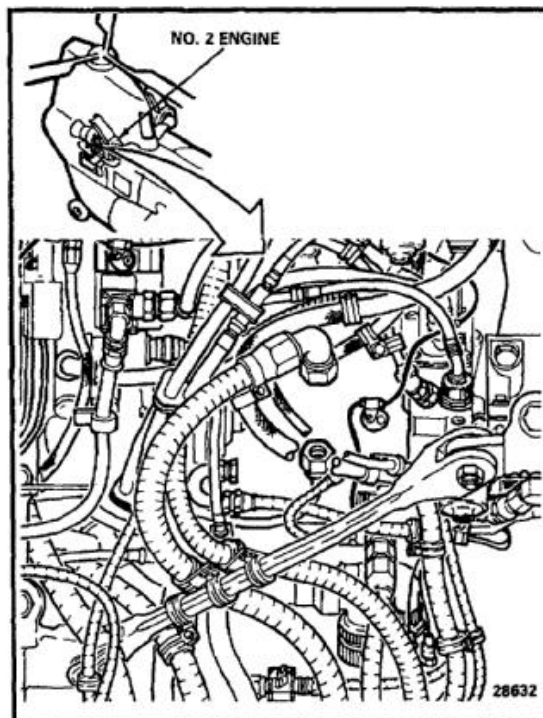
Conical Seal
Packing
Petrolatum (E274)

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

TM 1-2840-265-23
TM 1-2840-265-23P

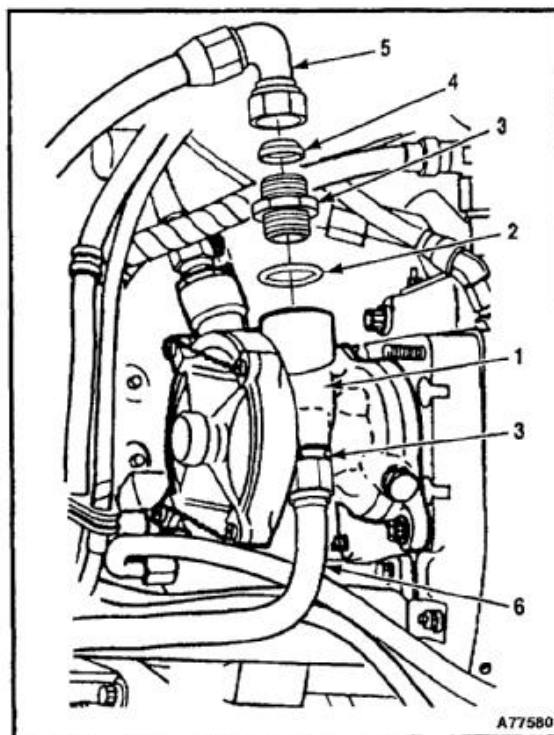
**NOTE**

Procedure is same to install fuel boost pump on No. 1 or No. 2 engine. No. 2 fuel boost pump is shown here.

1. Install pump (1) (TM 1-2840-265-23).
2. Use petrolatum (E274) to lubricate and install new packing (2) and unions (3) into fuel pump (1).
3. Install new conical seal (4) and connect hoses (5 and 6) to unions (3).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

4-19 REPLACE INLINE FUEL FILTER ELEMENT

4-19

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4962
Strap Wrench

Materials:

Cloths (E135)

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-2840-254-23 Without **74**
TM 55-2840-254-23P Without **74**
TM 1-2840-265-23 With **74**
TM 1-2840-265-23P With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

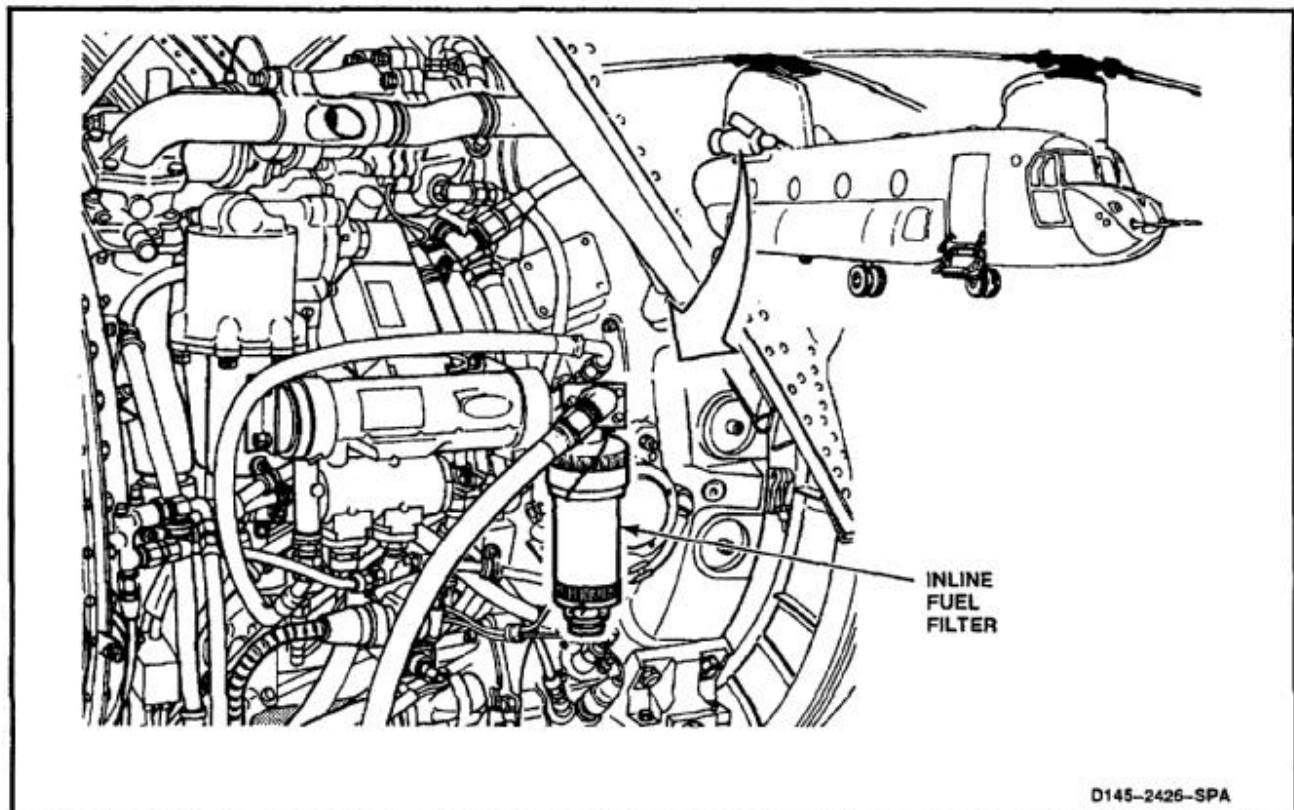
NOTE

Procedure is same for No. 1 and No. 2 engine. No. 2 engine is shown.

1. Replace inline fuel filter (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

INSPECT**FOLLOW-ON MAINTENANCE:**

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



D145-2426-SPA

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

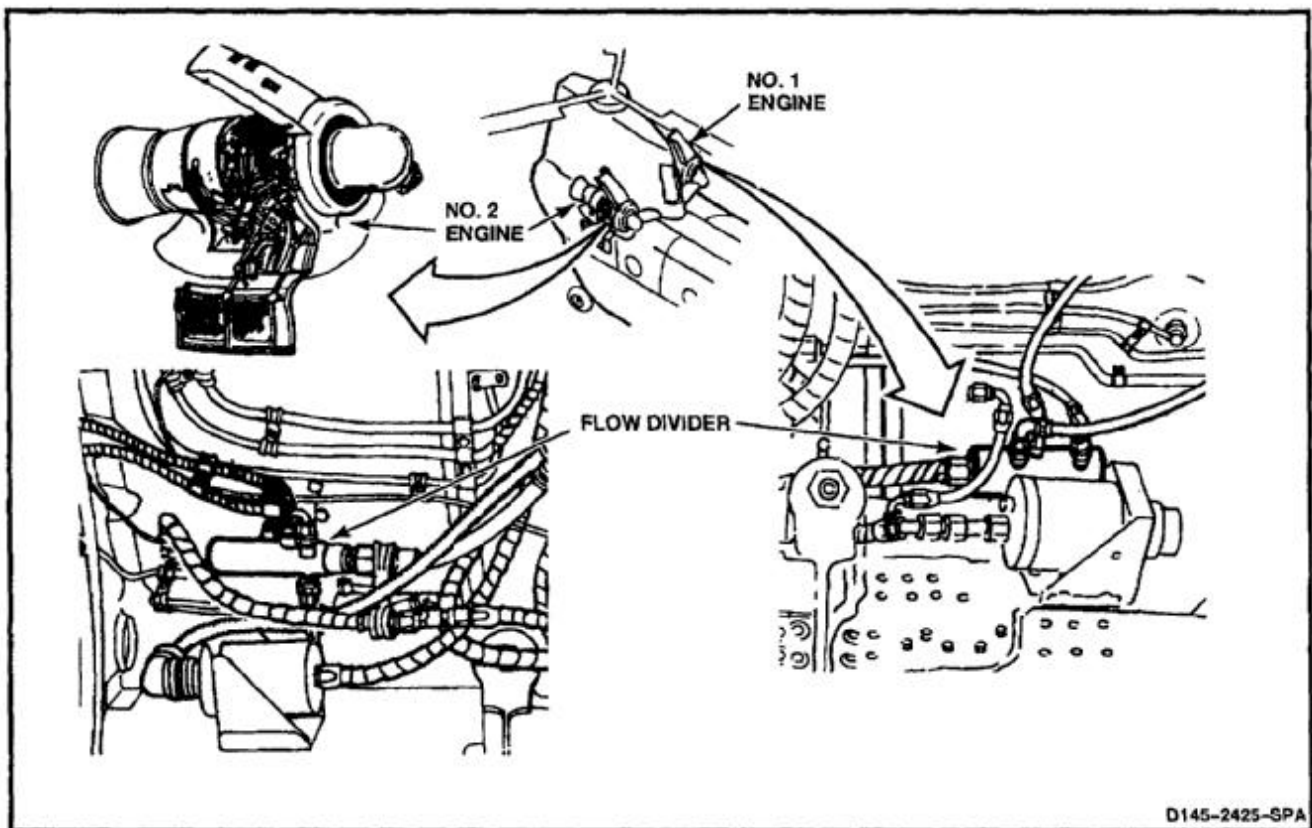
Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)

1. Replace flow divider (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4962

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-2840-254-23

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)

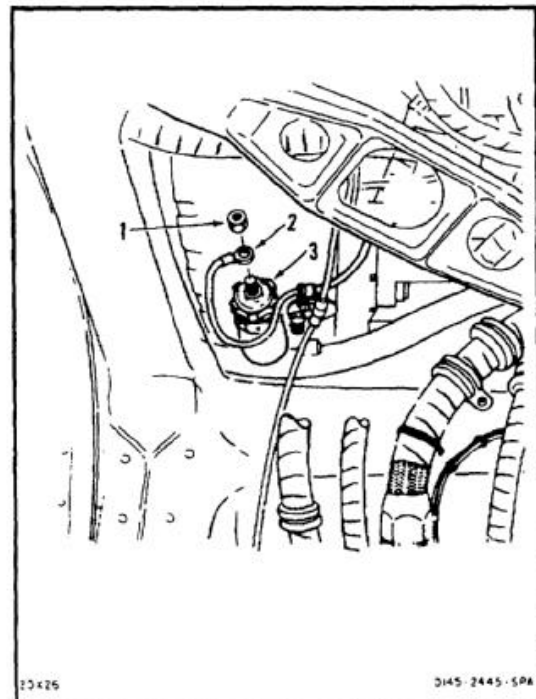
**NOTE**

Procedure is same to remove No. 1 or No. 2 gearbox chip detector. No. 1 gearbox chip detector is shown here.

1. Remove nut (1). Disconnect wire (2).
2. Remove chip detector (3) (TM 55-2840-254-23).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4962

Materials:

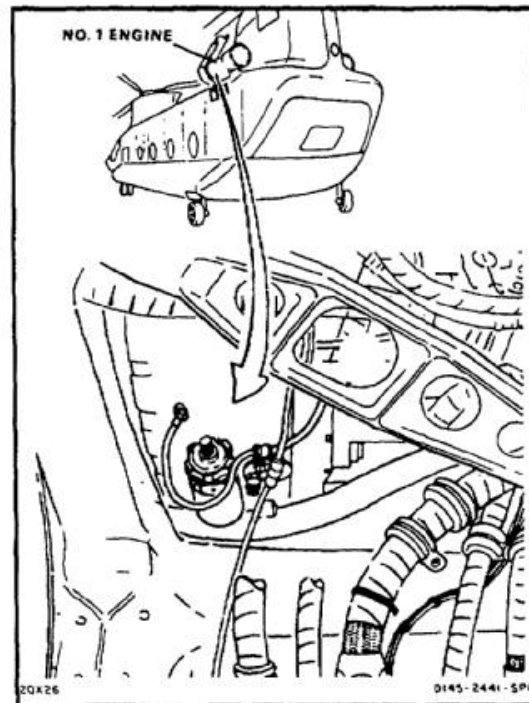
None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-2840-254-23
 TM 55-2840-254-23P

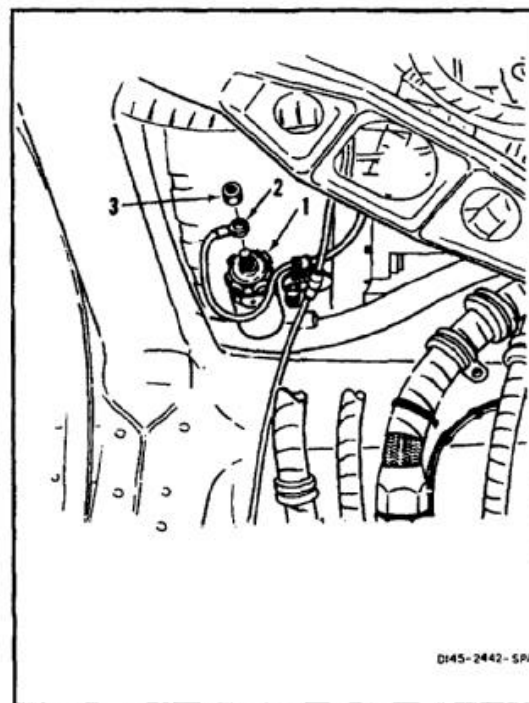
**NOTE**

Procedure is same to install No.1 or No. 2 gearbox chip detector. No. 1 gearbox chip detector is shown here.

1. Install chip detector (1) (TM 55-2840-254-23).
2. Connect wire (2) to detector (1). Install nut (3).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



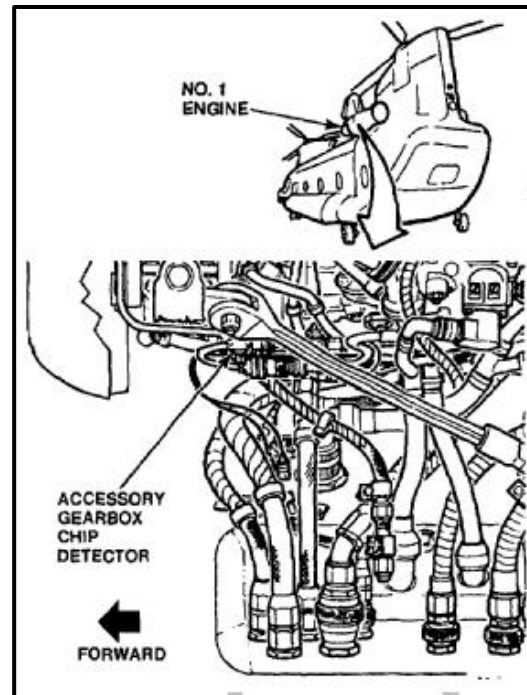
END OF TASK

4-22.1 REPLACE ENGINE ACCESSORY GEARBOX CHIP DETECTOR

4-22.1

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

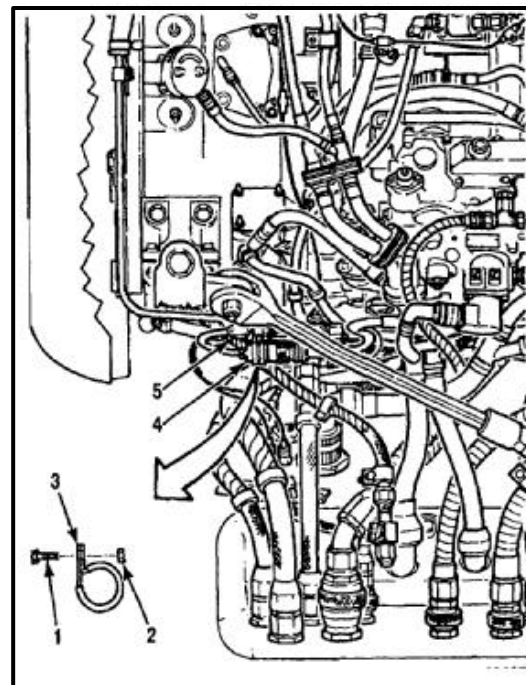
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4962

Materials:Tape (E388)
Lockwire (E231)**Personnel Required:**Medium Helicopter Repairer
Inspector**References:**TM 1-2840-265-23
TM 1-2840-265-23P**Equipment Condition:**Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to remove No. 1 or No. 2 engine gearbox chip detector. No. 1 engine gearbox chip detector is shown here.

REMOVE

1. Remove bolt (1) and nut (2) from clamp (3). Remove clamp (3). Use tape (E388) to mark clamp location.
2. Remove lockwire and disconnect connector (4).
3. Remove chip detector (5) (TM 1-2840-265-23).

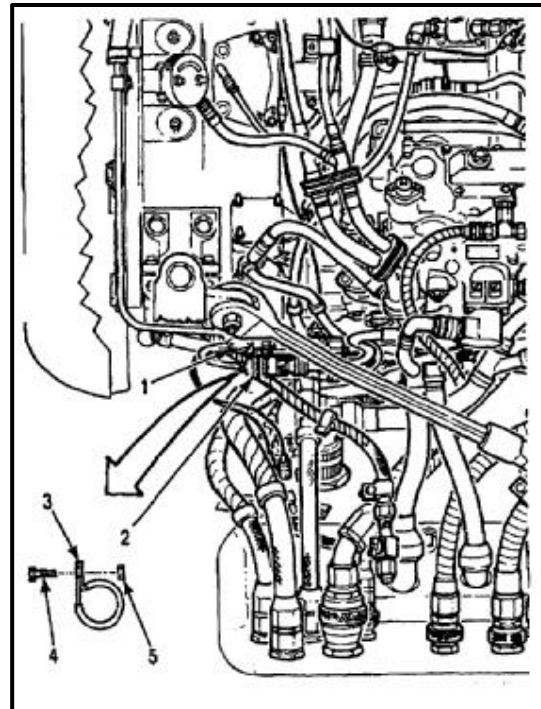


INSTALL

4. Install chip detector (1) (TM 1-2840-265-23).
5. Install connector (2). Lockwire (E231).
6. Remove tape. Install clamp (3), with bolt (4) and nut (5).

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

4-23 REPLACE OUTPUT SHAFT SEAL

4-23

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Transmission Removed (Task 6-100)
 Engine Work Platform Open (Task 2-2)

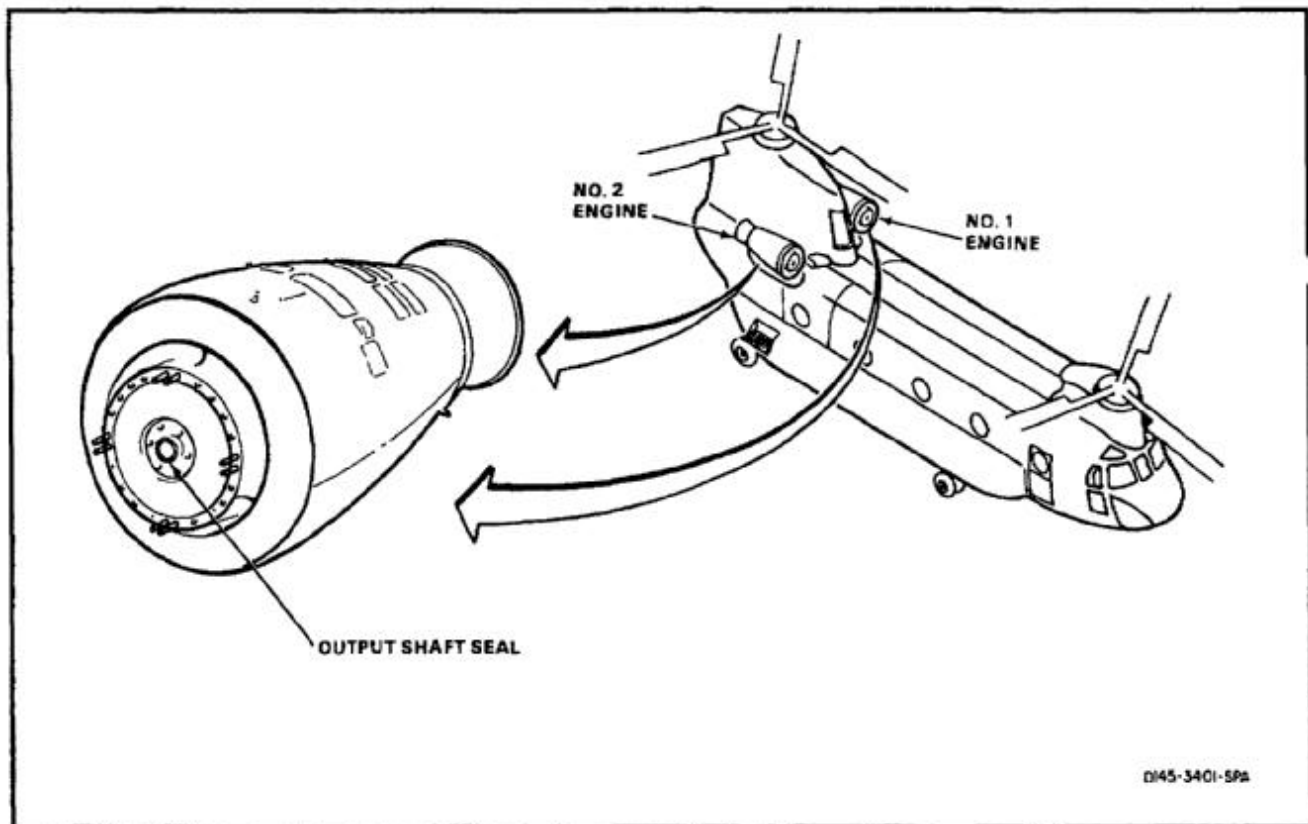
NOTE

Procedure is same to replace output shaft seal on No.1 or No.2 engine.

1. Replace output shaft seal (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Install engine transmission (Task 6-107).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)
 Starter Removed (Task 7-141)

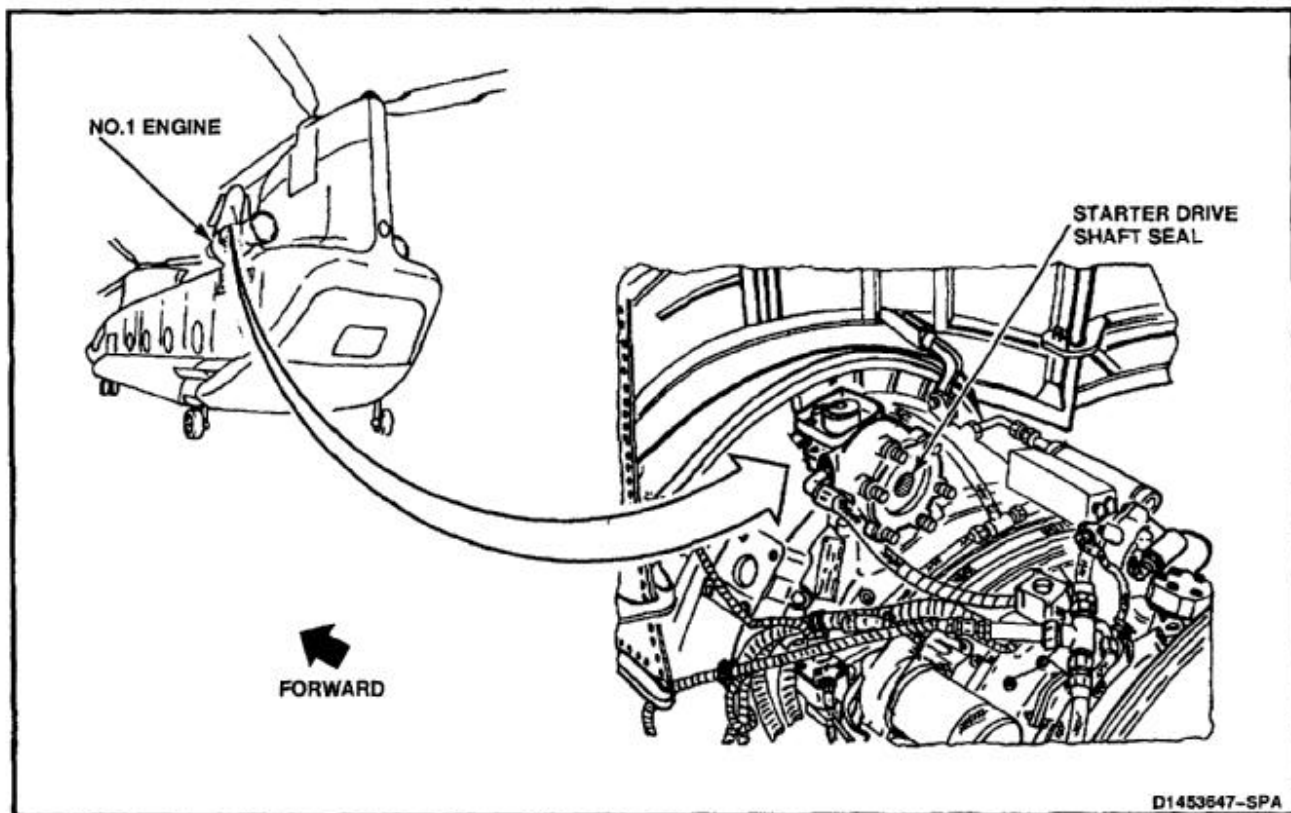
NOTE

Procedure is same to replace starter drive shaft seal on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Replace starter drive shaft seal (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Install starter (Task 7-142).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

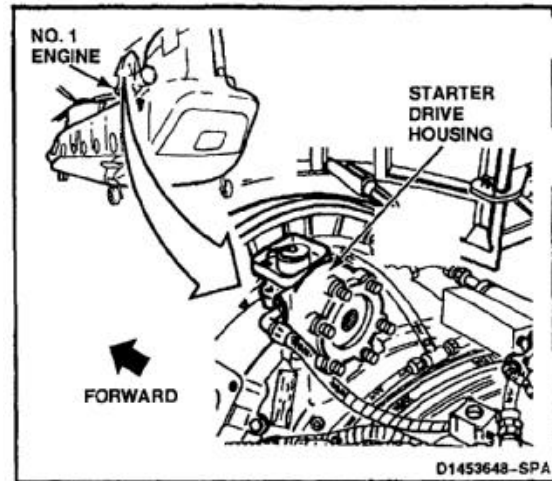
None

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**



Equipment Condition:

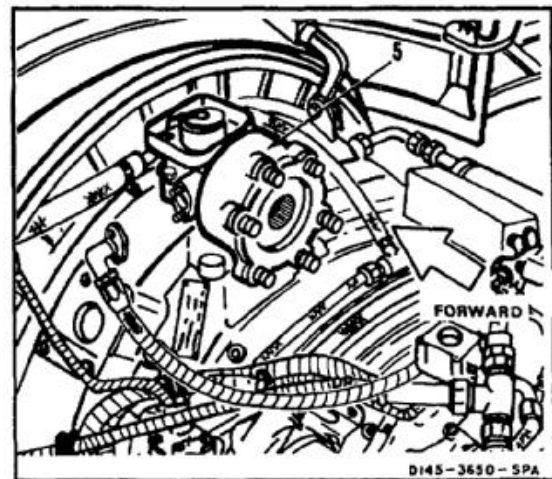
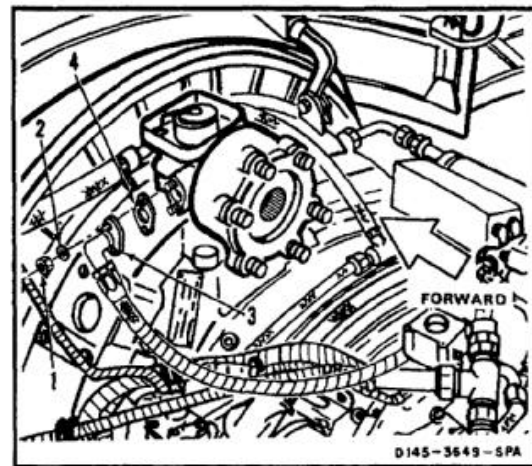
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)
- Starter Removed (Task 7-141)

NOTE

Procedure is same to remove starter drive housing on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Remove two nuts (1) and washers (2). Remove hose (3) and gasket (4).

2. Remove starter drive housing (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

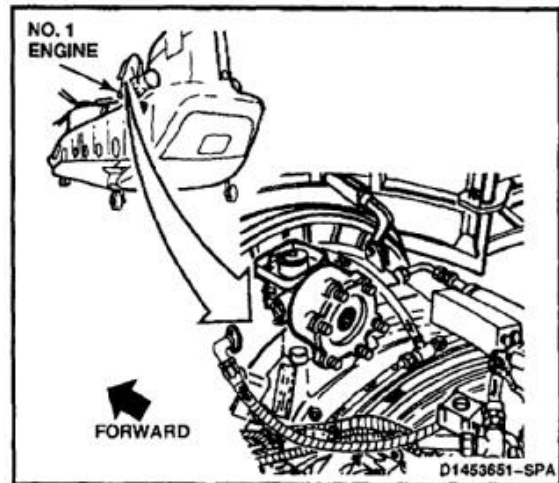
Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

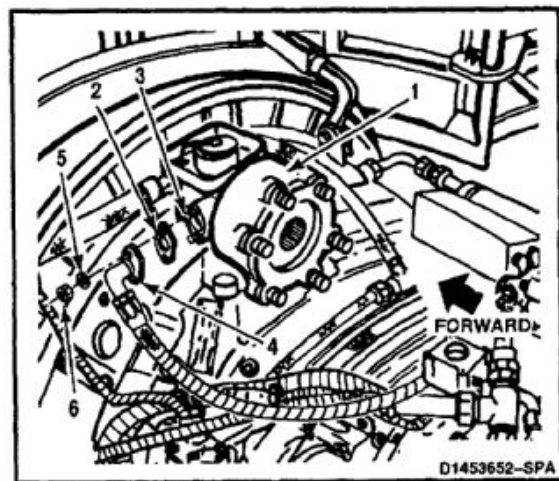
**References:**

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

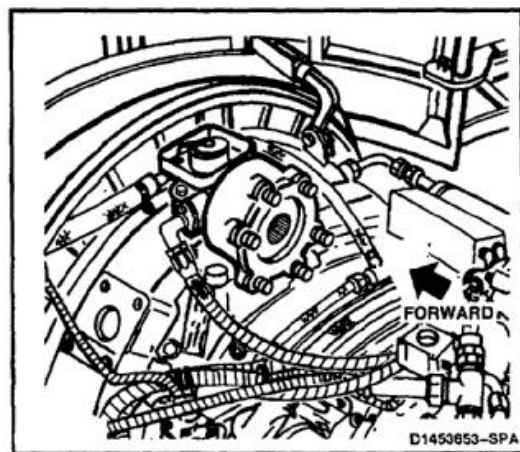
NOTE

Procedure is same to install starter drive housing on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Install starter drive housing (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
2. Install gasket (2) on port (3).
3. Position hose (4) over gasket (2) and install two washers (5) and nuts (6).

**INSPECT****FOLLOW-ON MAINTENANCE:**

Install starter (Task 7-142).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

4-27 REMOVE FORWARD ENGINE MOUNT CAP ASSEMBLY

4-27

INITIAL SETUP**Applicable Configurations:**

All

Tools:Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Puller**Materials:**

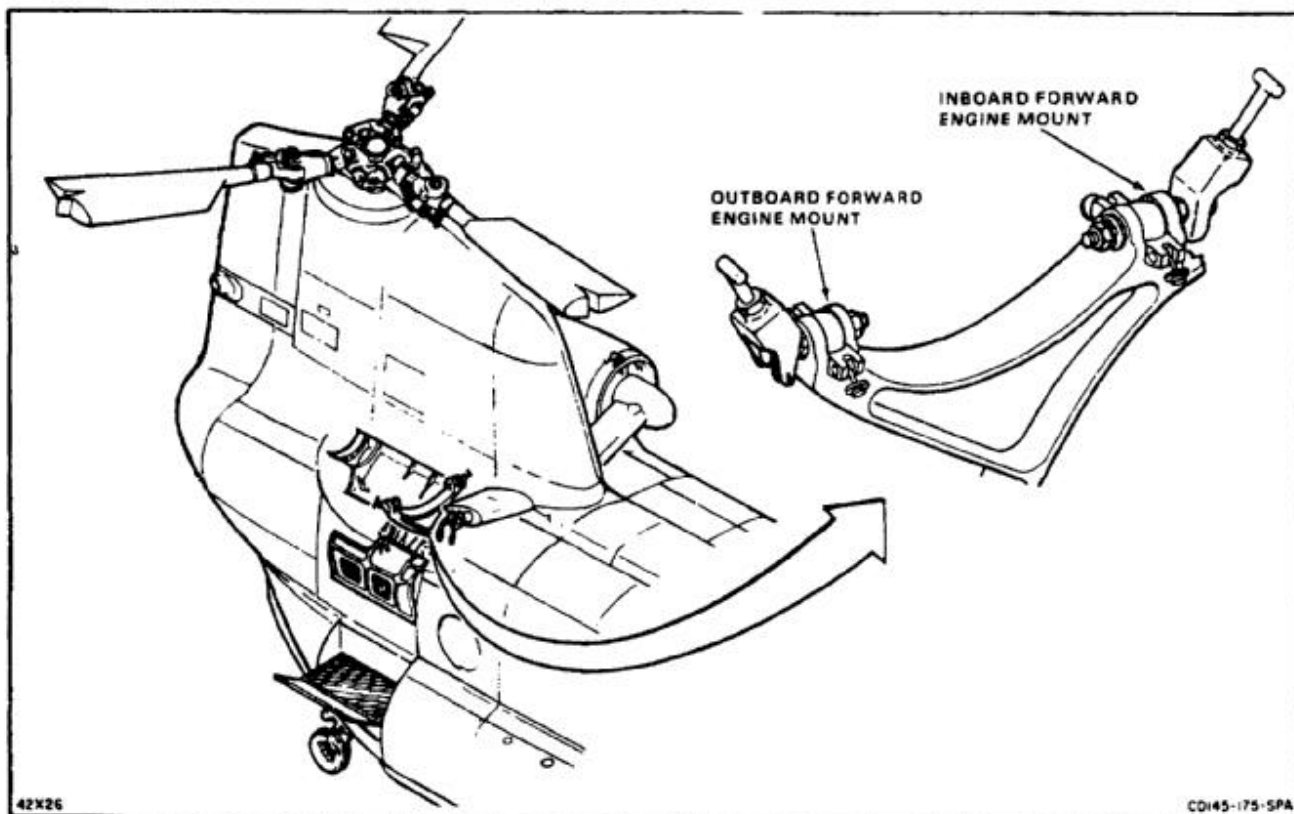
None

Parts:

Nuts (2)

Personnel Required:

Medium Helicopter Repairer (2)

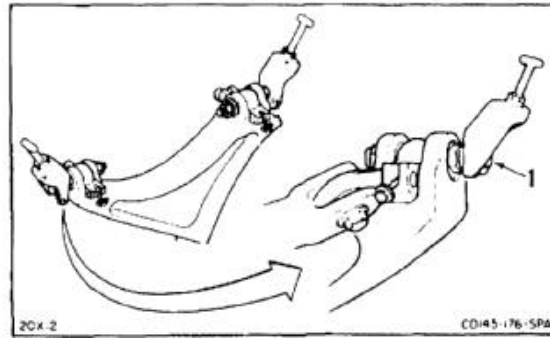
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Powerplant Removed (Task 4-10)

NOTE

This procedure can be used to remove forward engine mounts on No. 1 or No. 2 engine. Forward engine mounts for No. 2 engine are shown here.

REMOVE OUTBOARD MOUNT CAP ASSEMBLY

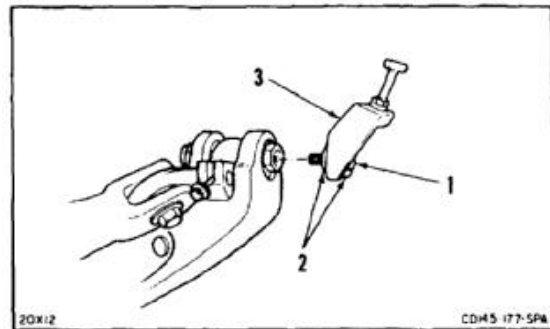
1. Remove lockwire from bolt (1).
2. Loosen bolt (1).



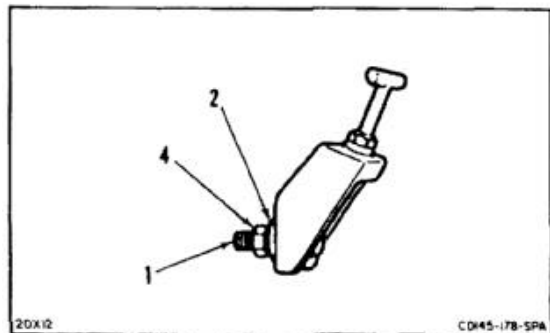
NOTE

When removing bolt, keep washers together on bolt in exact order. Placement of washers affects adjustment of engine covering.

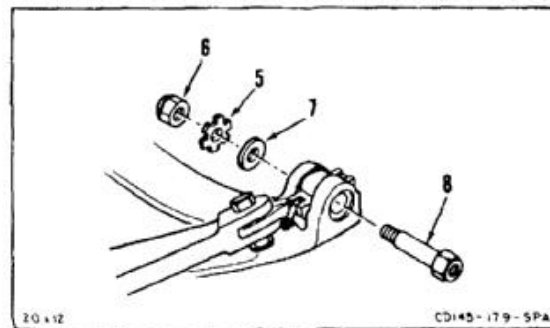
3. Remove bolt (1), six washers (2), and latch bracket (3) together as one piece.



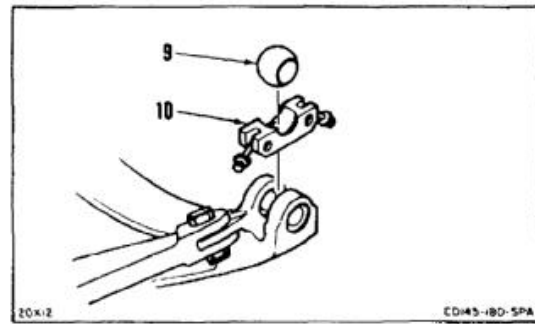
4. Install spare nut (4) on bolt (1) to keep washers (2) in place.



5. Bend tabs on lockwasher (5), away from nut. Remove nut (6), lockwasher (5), and washer (7).
6. Remove bolt (8).

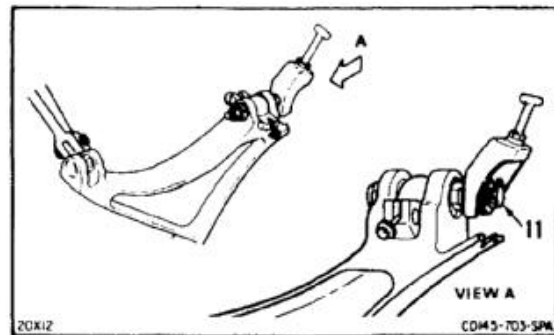


7. Remove bearing (9) and cap (10).



REMOVE INBOARD MOUNT CAP ASSEMBLY

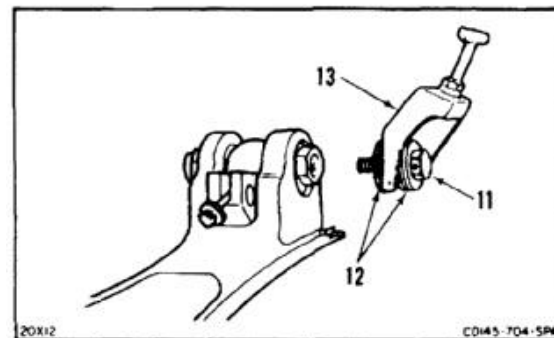
8. Remove lockwire from bolt (11).
9. Loosen bolt (11).



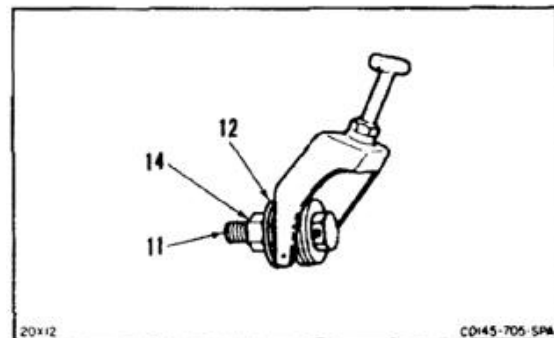
NOTE

When removing bolt, keep washers together on bolt in exact order. Placement of washers affects adjustment of engine covering.

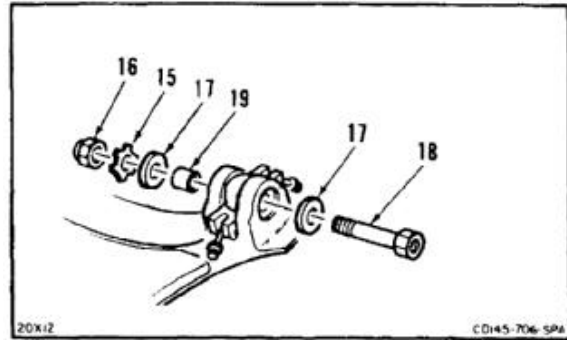
10. Remove bolt (11), six washers (12), and latch bracket (13) together as one piece.



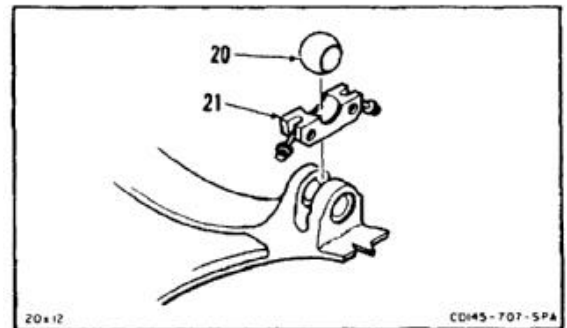
11. Install spare nut (14) on bolt (11) to keep washers (12) in place.



12. Bend tabs on lockwasher (15). Remove nut (16), lockwasher, and washer (17).
13. Remove bolt (18), washer (17), and slip-fit bushing (19). Use puller.



14. Remove bearing (20) and cap (21).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Micrometer Caliper, Outside, 0 To 1 Inch
 Vernier Caliper, 0 To 24 Inches

Materials:

Cloths (E135)
 Dry Cleaning Solvent (E162)
 Gloves (E186)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

TM 55-1520-240-23P
 TM 1-1520-253-23

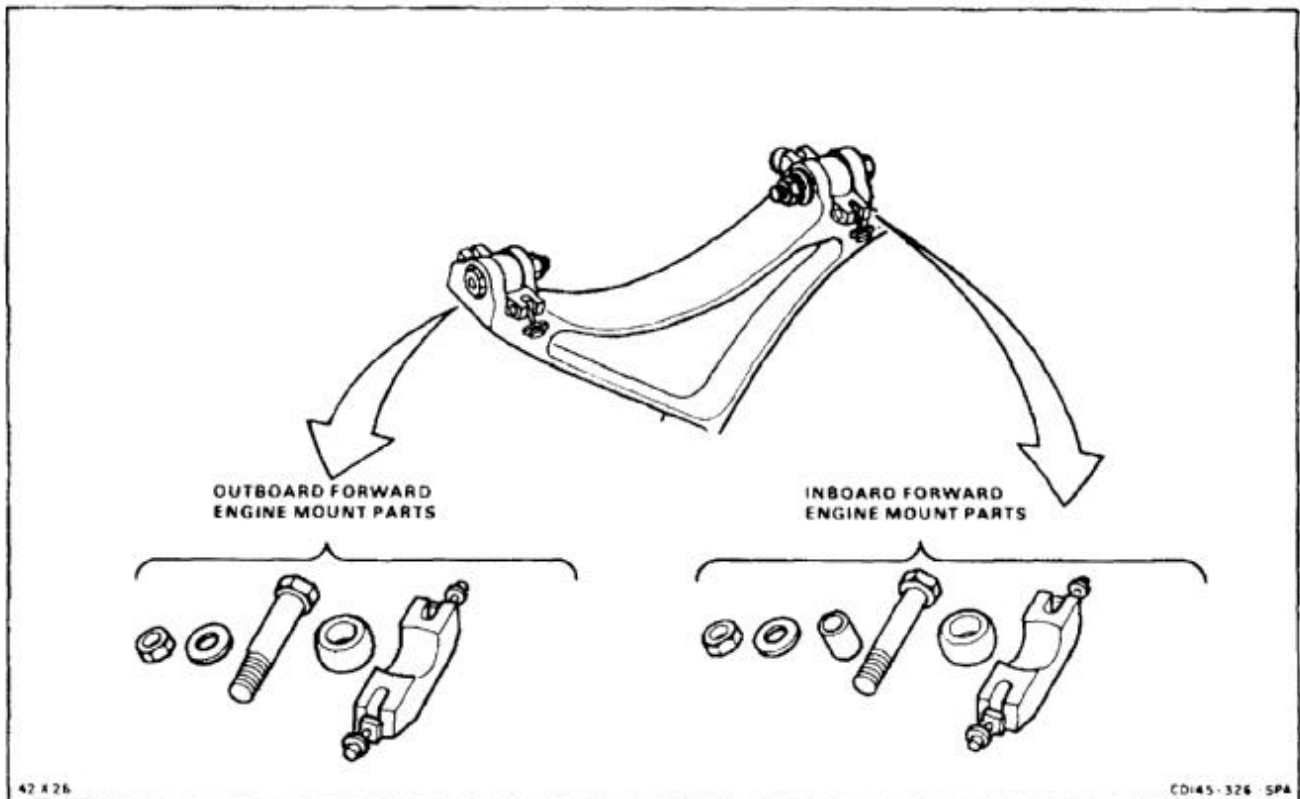
Equipment Condition:

Forward Engine Mount Cap Assembly Removed
 (Task 4-27)
 Off Helicopter Task

General Safety Instructions:

WARNING

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



NOTE

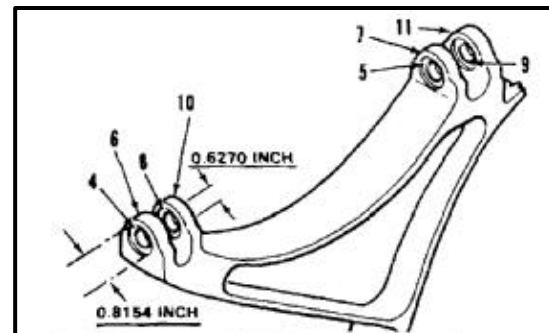
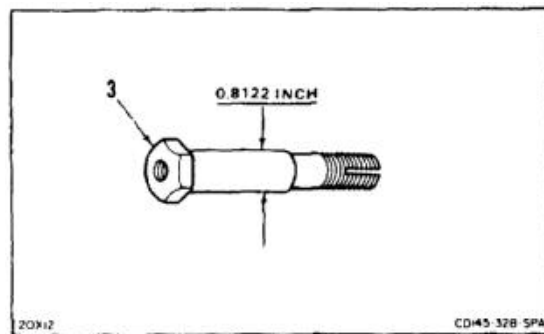
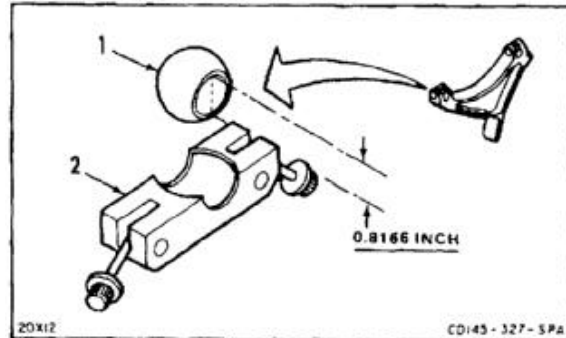
Procedure can be used to inspect parts from No. 1 or No. 2 engine mounts.

NOTE

If a crack is suspected in the forward engine mount caps, forward engine mount adapter or forward engine mount structure, refer to TM 1-1520-253-23.

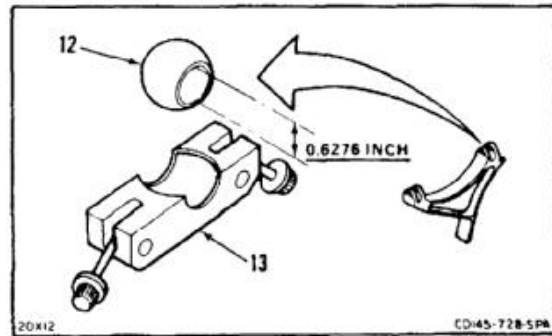
INSPECT OUTBOARD MOUNT PARTS

1. Clean bearing (1) and cap (2) with solvent (E162) and cloths (E135). Wear gloves (E186).
2. Measure inside diameter of bearing (1). Diameter of bearing shall not be more than **0.8166 inch**.
3. Measure outside diameter of bolt (3). Diameter shall not be less than **0.8122 inch**.
4. Measure inside diameters of bushings (4 and 5) in two lugs (6 and 7). Diameter shall not be more than **0.8154 inch**.
5. Measure inside diameter of bushings (8 and 9) in two lugs (10 and 11). Diameter shall not be more than **0.6270 inch**.

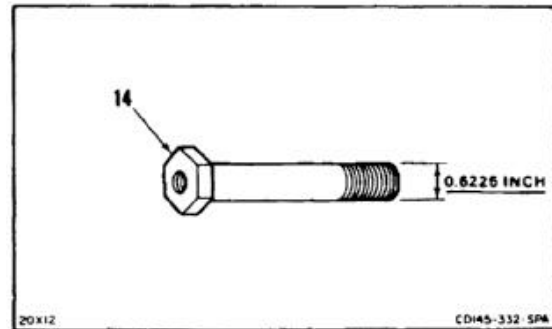


INSPECT INBOARD MOUNT PARTS

6. Clean bearing (12) and cap (13) with dry cleaning solvent (E162) and cloths (E135). Wear gloves (E186).
7. Measure inside diameter of bearing (12). Diameter shall not be more than **0.6276 inch**.



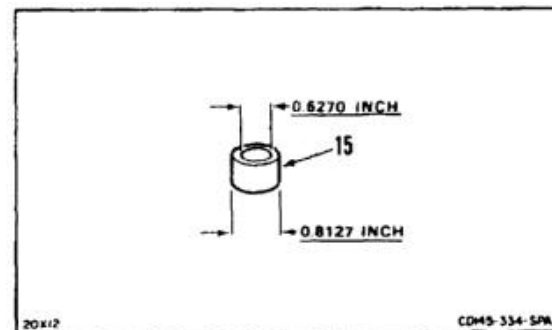
8. Measure diameter of bolt (14). Diameter shall not be less than **0.6225 inch**.



9. Measure outside diameter of bushing (15). Diameter shall not be less than **0.8127 inch**.
10. Measure inside diameter of bushing (15). Diameter shall not exceed **0.6270 inch**.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Sling (T134)
 Hoist

Materials:

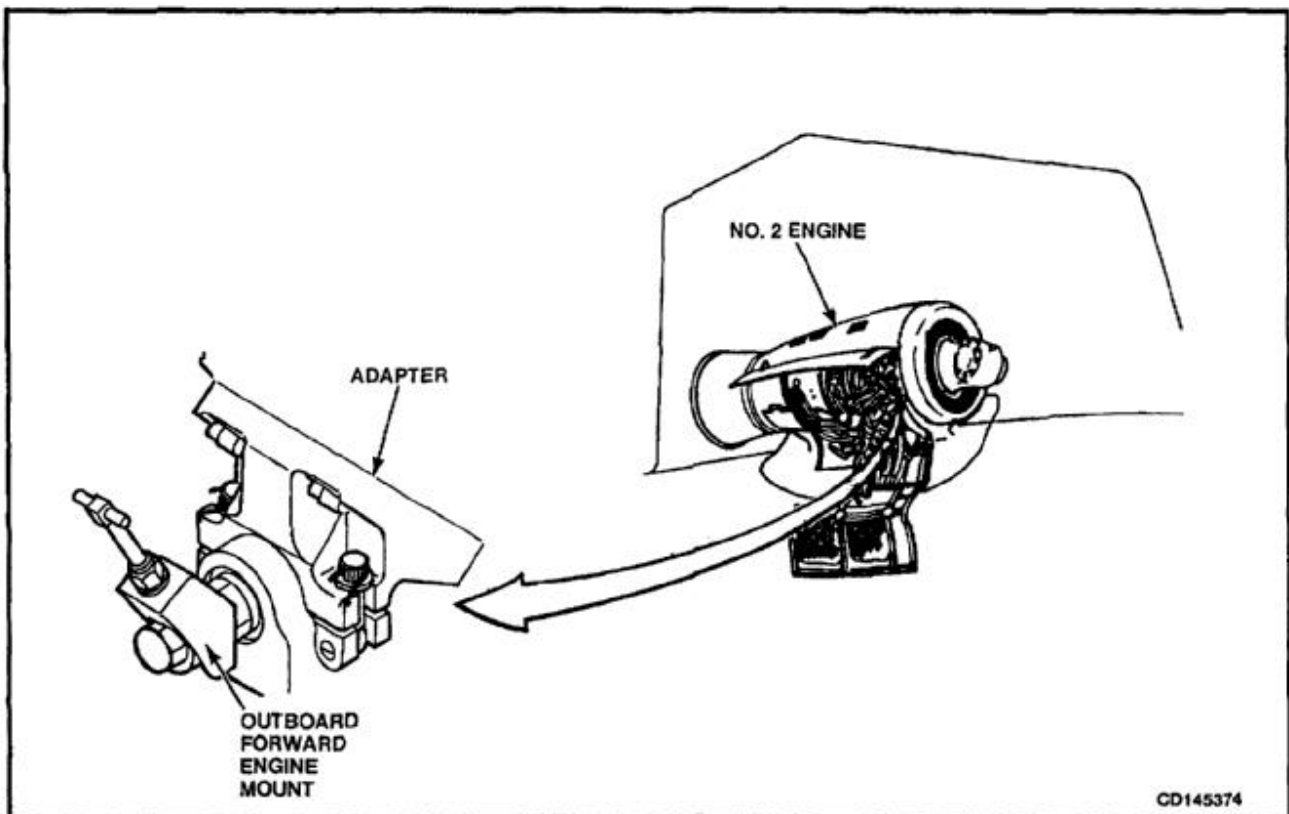
Tape (E388)
 Paper Tags (E264)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Air Inlet Screens Removed (Task 4-65)
 Engine Side and Lower Access Covers Open (Task 4-49)
 Engine Transmission Fairing Removed (Task 4-70)
 Engine Drive Shaft Removed (Task 6-30)

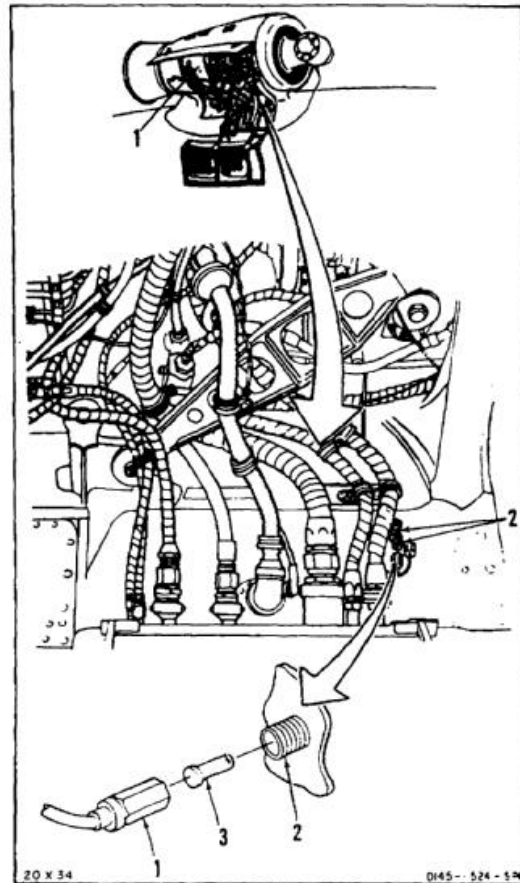


NOTE

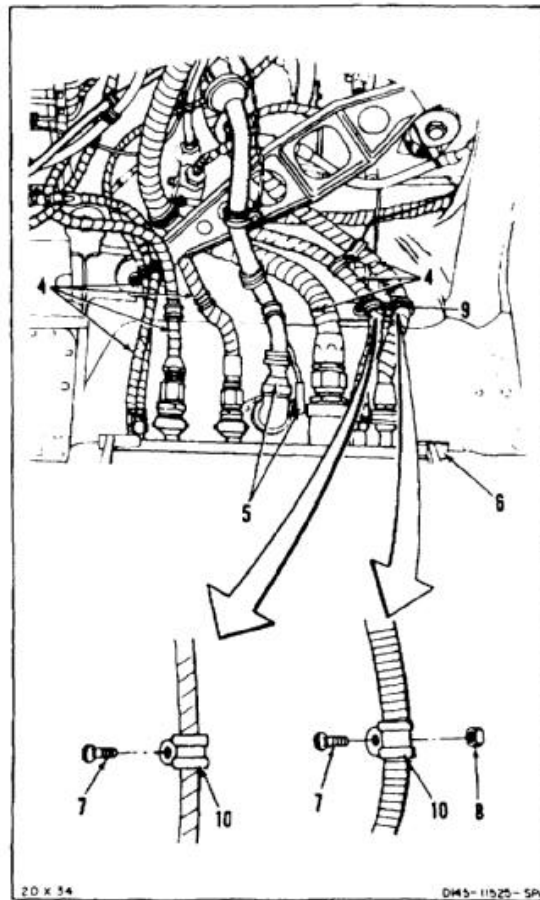
Procedure can be used to remove inboard or outboard forward engine mount adapters on either engine. Outboard adapter on No. 2 engine is shown here.

HOIST ENGINE

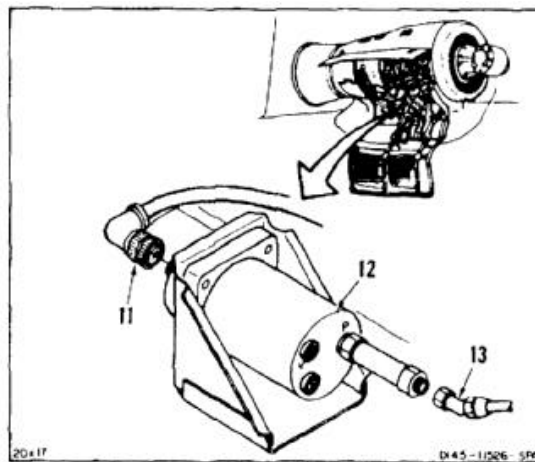
1. Disconnect two fire detection cables (1) from receptacles (2) on fuselage. Make sure insert (3) stays in receptacles. Cap connectors.



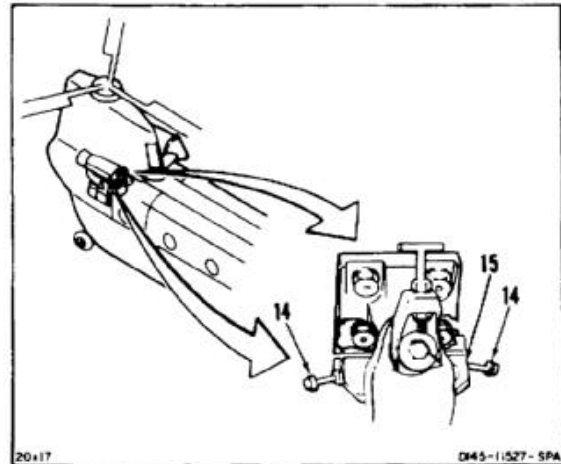
2. Tag and disconnect seven hoses (4) and two cable connectors (5) from shelf (6).
3. Remove two screws (7) and nut (8) from bracket (9). Remove two clamps (10). Mark clamp locations. Use tape (E388).



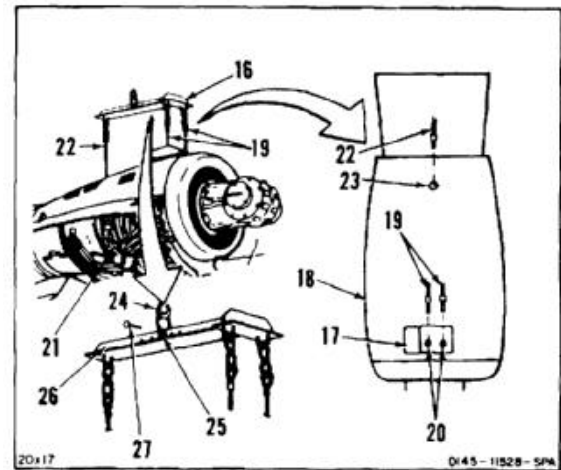
4. Remove lockwire and disconnect cable plug (11) from oil pressure transmitter (12). Disconnect oil hose (13).



5. Remove lockwire from two bolts (14) on two forward engine mount caps (15). Loosen bolts and push down to side.



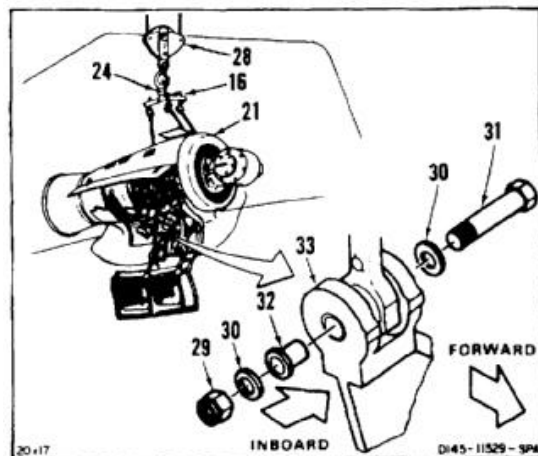
6. Install sling (16) as follows:
 - a. Open access door (17) in engine access cover (18).
 - b. Connect two cables (19) to forward fittings (20) on engine (21).
 - c. Connect cable (22) into aft fitting (23) through cover (18).
 - d. Adjust sling (16) until eye (24) is over center hole (25) in sling bar (26).
 - e. Install pin (27) through bar (26).



7. Connect hoist (28) to eye (24) of sling (16). Absorb weight of engine (21) with hoist.
8. Remove nut (29), two washers (30), bolt (31), and bushing (32) from aft engine mount (33).

CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.



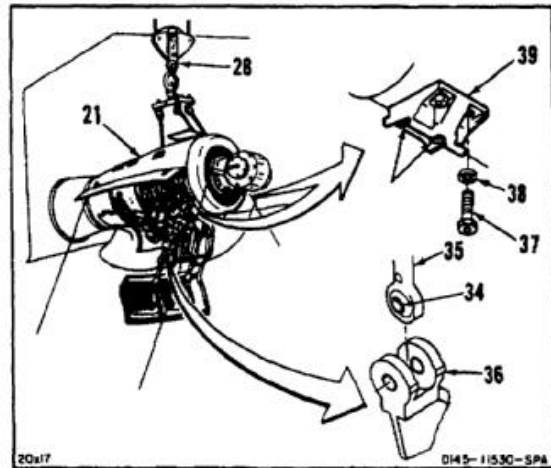
9. Raise hoist (28) slowly to lift engine (21) **2 to 3 inches** above installed position. Make sure bearing (34) in aft link (35) does not tilt in aft engine mount clevis (36).

REMOVE ADAPTER

10. Remove lockwire from 4 bolts (37). Remove four bolts and washers (38).
11. Remove adapter (39).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER

4-29.1

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Engine Sling (T134)
 Hoist
 Container, 2 Quart

Materials:

Tape (E388)
 Paper Tags (E264)
 Wiping Rags (E121)
 Gloves (E184.1)
 Lubricating Oil (E254)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Air Inlet Screens Removed (Task 4-65)

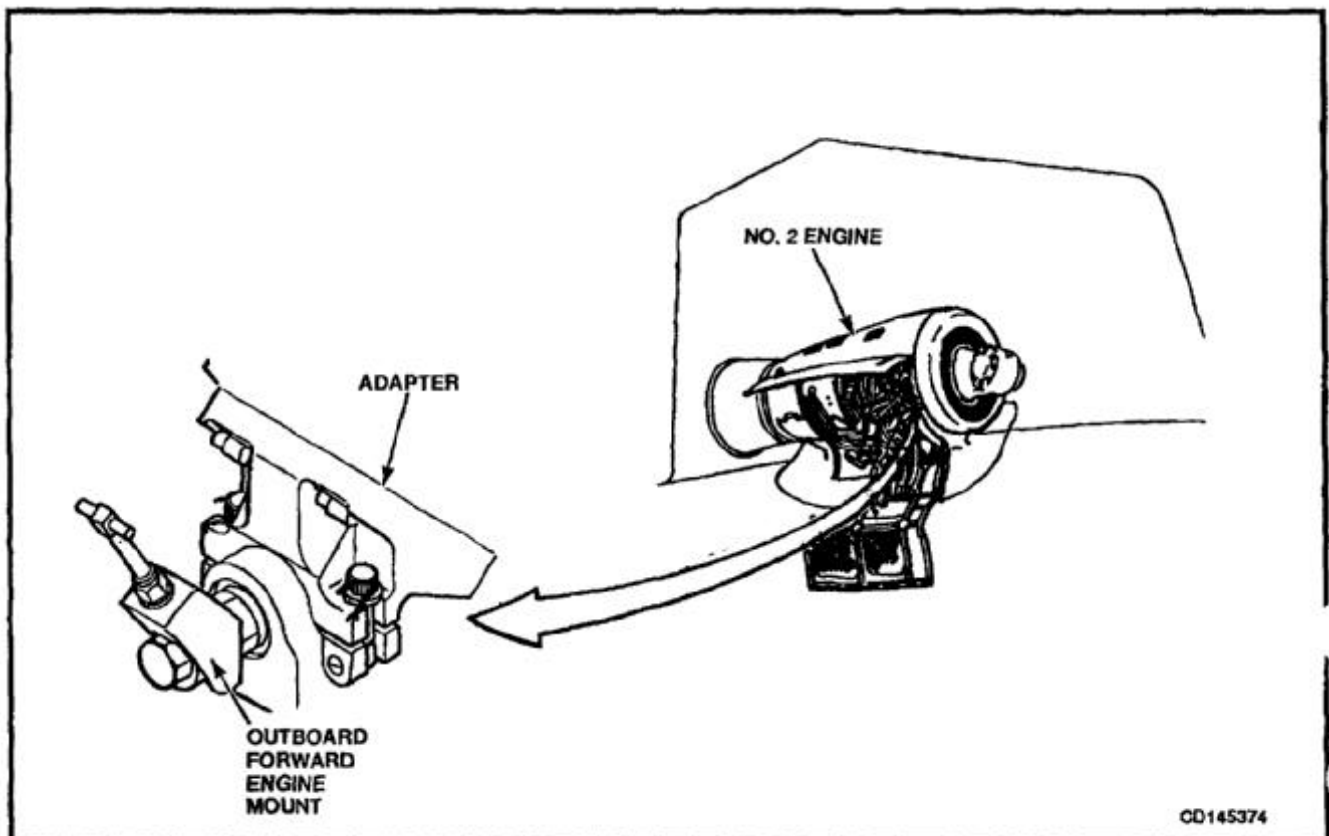
Engine Side and Lower Access Doors Open (Task 4-49)
 Engine Transmission Fairing Removed (Task 4-70)
 Engine Drive Shaft Removed (Task 6-30)

General Safety Instructions:**WARNING**

Fuels (JP4/JP5/JP8) (E182/E182.1) are combustible and toxic. They can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

WARNING

Oil (E254) is toxic and can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



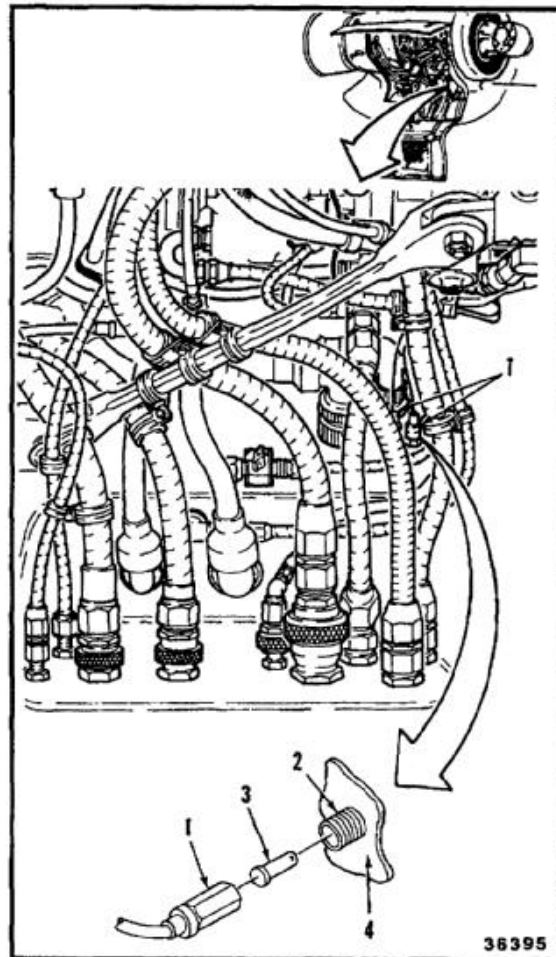
CD145374

NOTE

Procedure can be used to remove inboard or outboard forward engine mount adapters on either engine (powerplant) except as noted. Outboard adapter on No. 2 engine is shown here.

HOIST ENGINE

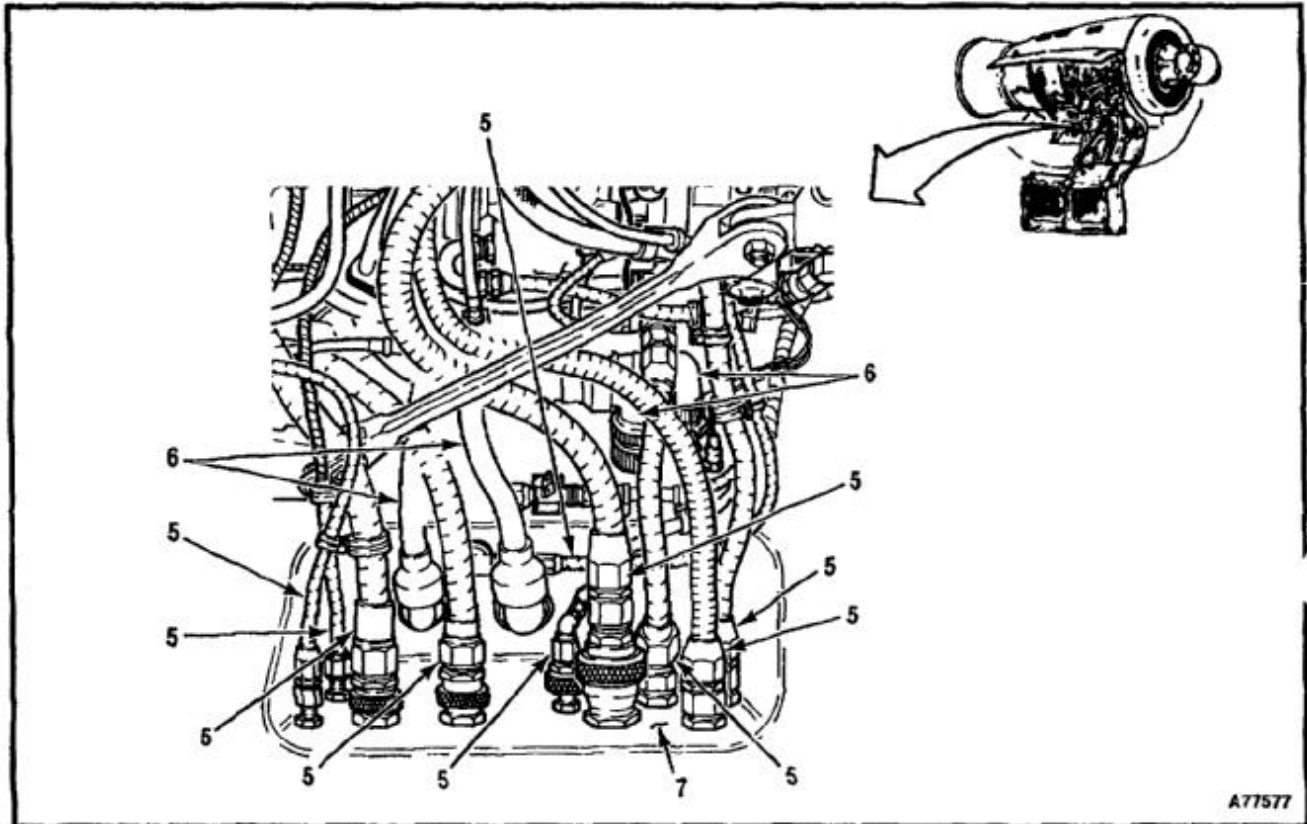
1. Disconnect two fire detection cables (1) from receptacles (2) on fuselage (4). Make sure insert (3) stays in receptacles (2). Cap cables (1) and receptacles (2).



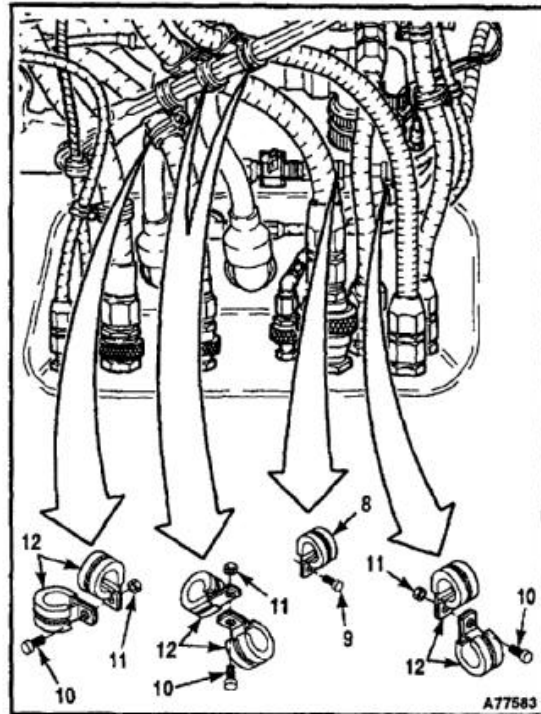
4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29.1

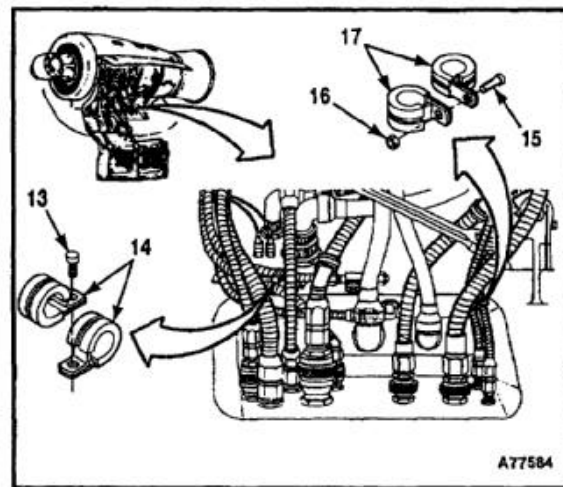
2. Tag and disconnect ten hoses (5) and four cable connectors (6) from shelf (7). Wear gloves (E184.1). Use container to catch fluids. Use rags (E121) to wipe up any spilled fluids.



3. On No. 2 engine only:
 - a. Remove clamp (8) and screw (9).
 - b. Remove four screws (10) and nuts (11). Remove eight clamps (12). Use tape (E388) to mark clamp locations.



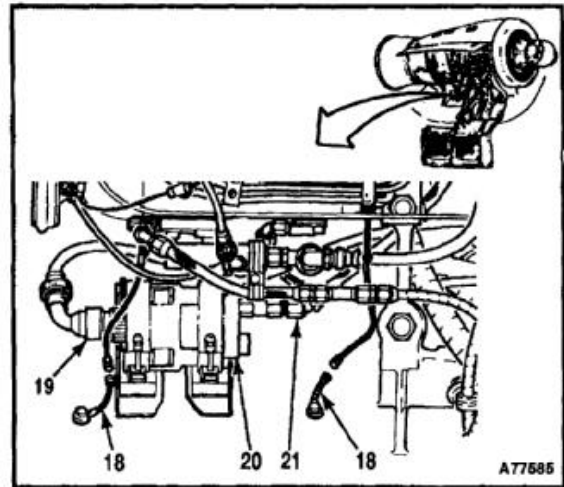
4. On No. 1 engine only:
 - a. Remove screw (13) and two clamps (14). Remove screw (16), nut (18), and two clamps (17). Use tape (E388) to mark clamp locations.



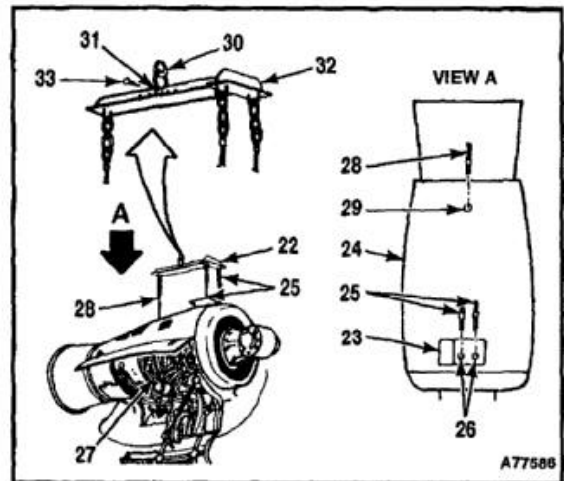
4-29.1 REMOVE FORWARD ENGINE MOUNT ADAPTER (Continued)

4-29.1

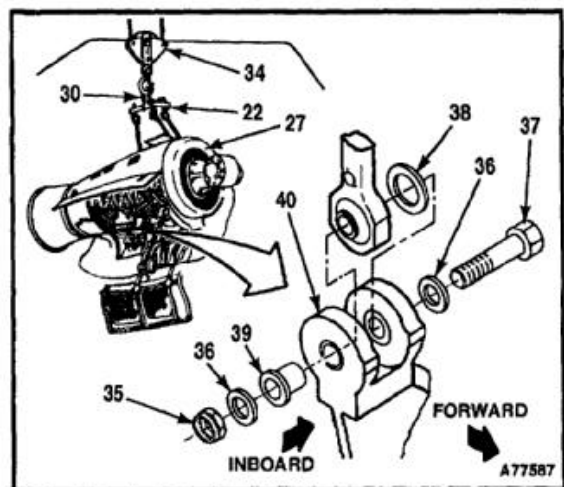
5. Disconnect two bonding jumpers (18).
6. Disconnect cable plug (19) from oil pressure transmitter (20). Disconnect oil hose (21). Drain oil into container. Wipe up any spilled oil using rags (E121). Wear gloves (E184.1).



7. Install sling (22) as follows:
 - a. Open access door (23) in engine access cover (24).
 - b. Connect two cables (25) to forward fittings (26) on powerplant (27).
 - c. Connect cable (28) into aft fitting (29) through cover (24).
 - d. Move eye (30) over center hole (31) in sling bar (32).
 - e. Install pin (33) through center hole in bar.



8. Connect hoist (34) to eye (30) of sling (22). Absorb weight of powerplant (27) with hoist.
9. Remove nut (35), two washers (36), bolt (37), spacer (38), and bushing (39) from aft engine mount (40).



10. Remove lockwire from two bolts (41) on two forward engine mount caps (42). Loosen bolts (41) and push down.

CAUTION

All engine hoses and cable clamps attached to the airframe must be disconnected and hose and cable routing must be clear before lifting engine. Damage to equipment will occur if hoses or cable clamps are left attached or engine hoses and cables become entangled.

INSPECT

CAUTION

During raising and lowering of powerplant to adapter, make sure bearing in aft engine mount link does not tilt in clevis. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

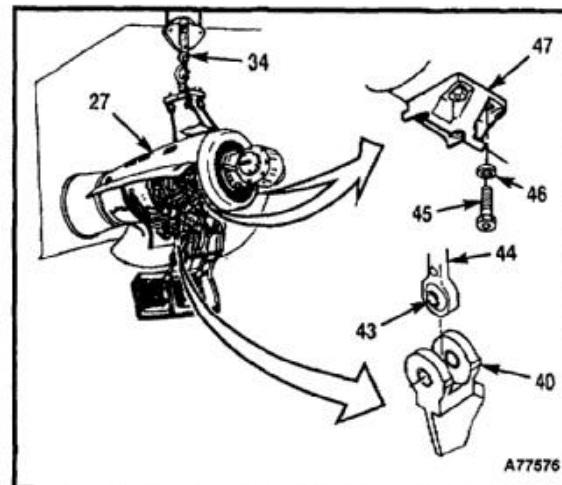
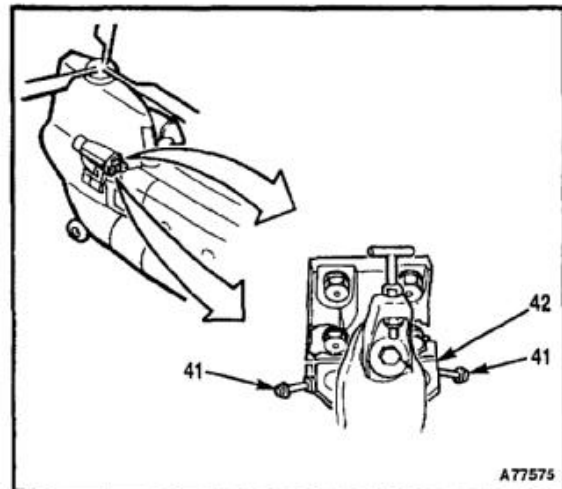
11. Raise hoist (34) slowly to lift powerplant (27) 2 to 3 inches above installed position. Make sure bearing (43) in aft engine mount link does not tilt in aft engine mount clevis (40).

REMOVE ADAPTER

12. Remove lockwire from 4 bolts (45). Remove four bolts and washers (46).
13. Remove adapter (47).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

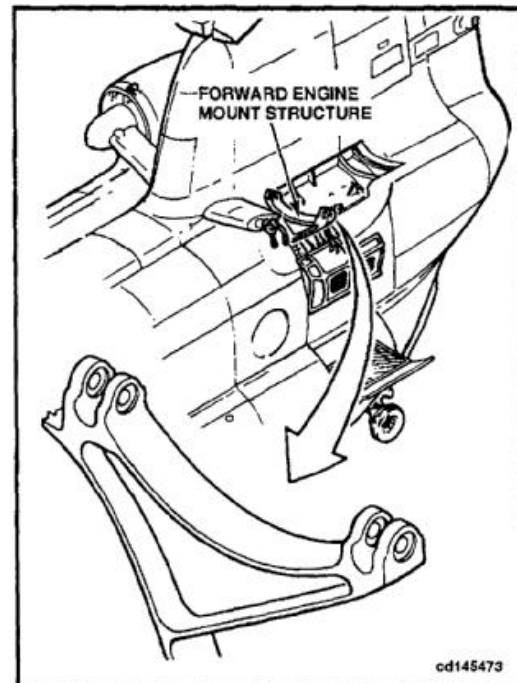
Micrometer Caliper, 0 to 1 Inch

Materials:

Abrasive Cloth (E1)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:Forward Engine Mount Cap Assembly Removed
(Task 4-27)

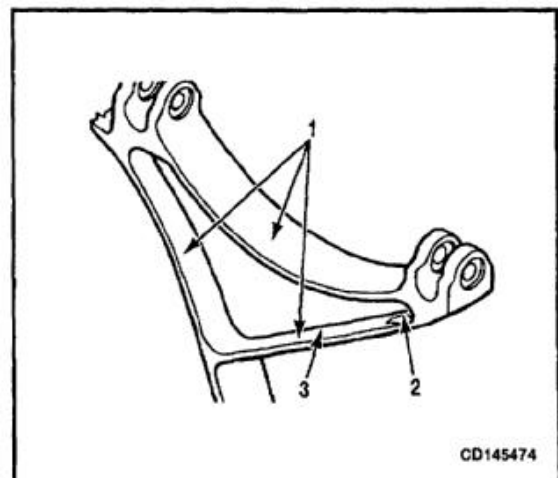
Do not burnish deeper than **10 percent** into structure thickness.

NOTE

Any burnished area must be large enough to blend smoothly into area around it.

Procedure can be used to repair mount structure for No. 1 and No. 2 engine. Mount structure for No. 1 engine is shown.

1. Burnish cracks, nicks, or gouges on engine mount structure (1).
2. Measure thickness of burnished area (2) on structure. Record measurement.
3. Measure thickness of unburnished area (3) on structure. Record measurement.
4. Subtract measurement in step 2 from measurement in step 3. Difference shall not be more than **10 percent** of structure thickness.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

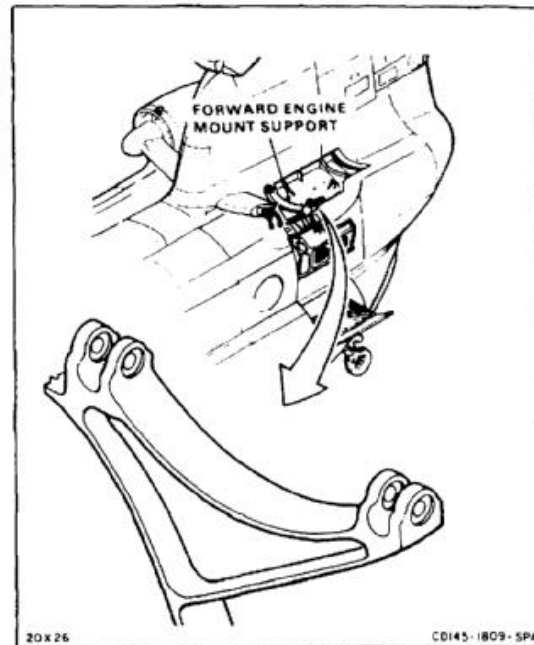
All

Tools:

Micrometer Caliper, 0 to 1 Inch

Materials:

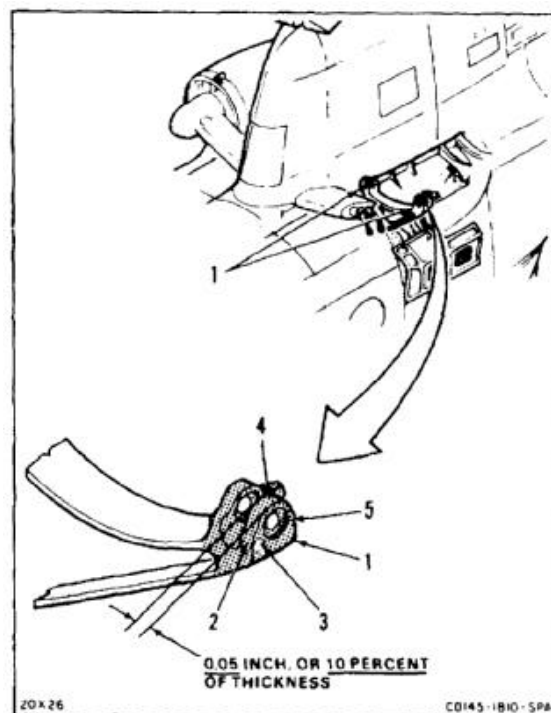
Abrasive Cloth (E1)

Personnel Required:Medium Helicopter Repairer
Inspector**Equipment Condition:**Engine Work Platform Open (Task 2-2)
Powerplant Removed (Task 4-10)
Forward Engine Mount Cap Assembly Removed
(Task 4-27)**NOTE**

Any burnished area must be large enough to blend smoothly into area around it.

This task can be used to repair mount lugs for No. 1 and No. 2 engine. Mount lugs for No. 1 engine are shown.

1. Burnish scratches, nicks, or gouges on engine mount lugs (1). Do not burnish deeper than **10 percent** into lug thickness, or **0.050 inch**, whichever is less.
2. Measure thickness (2) of burnished area (3) on lug (1). Record measurement.
3. Measure thickness (4) of unfurnished area (5) on lug (1). Record measurement.
4. Subtract measurement in step 2 from measurement in step 3. Difference shall not be more than **0.050 inch**, or **10 percent** of material thickness.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-168

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

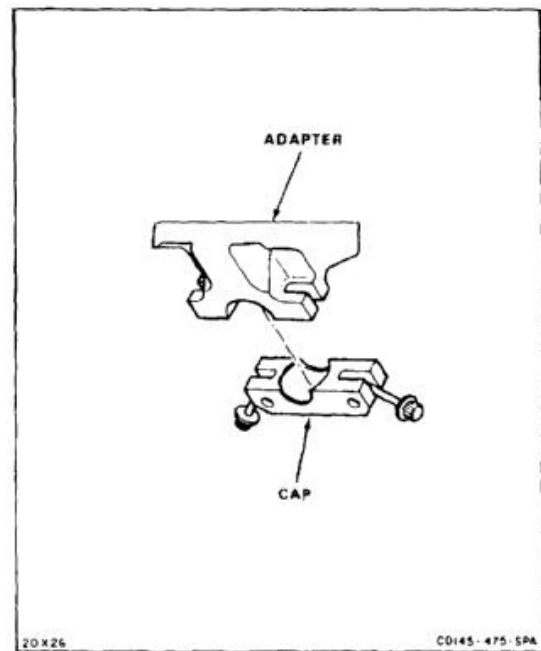
Abrasive Cloth (E1)

Personnel Required:

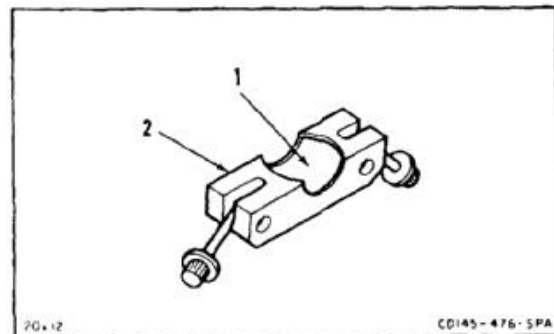
Medium Helicopter Repairer

Equipment Condition:

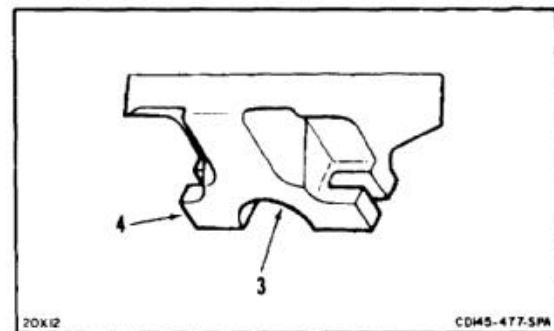
Off Helicopter Task



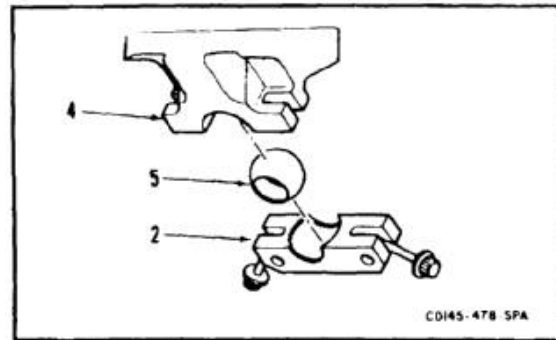
1. Burnish inside curve (1) of cap (2) to remove scratches, scoring, or gouges. Use abrasive cloth (E1).



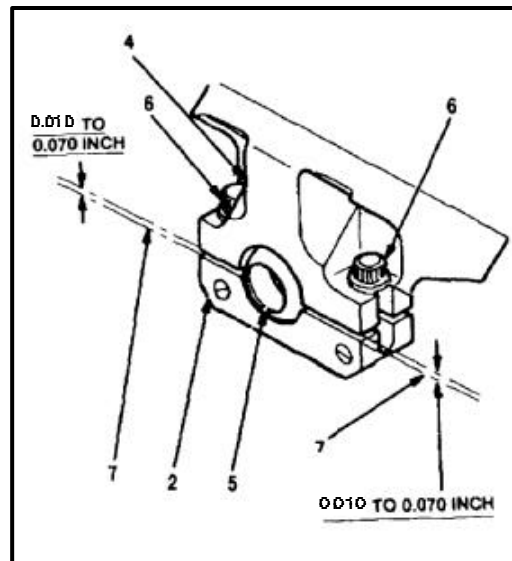
2. Burnish inside curve (3) of adapter (4) to remove scratches, scoring, or gouges. Use abrasive cloth (E1).



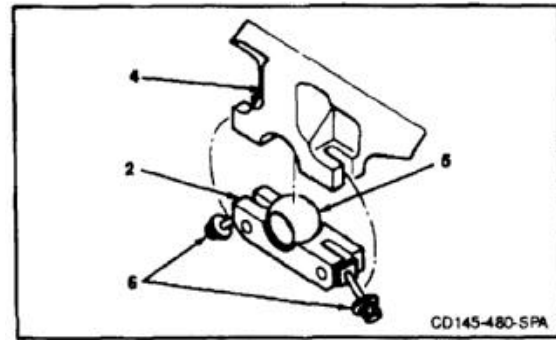
3. Place bearing (5) in cap (2).
4. Hold cap (2) and bearing (5) against adapter (4).



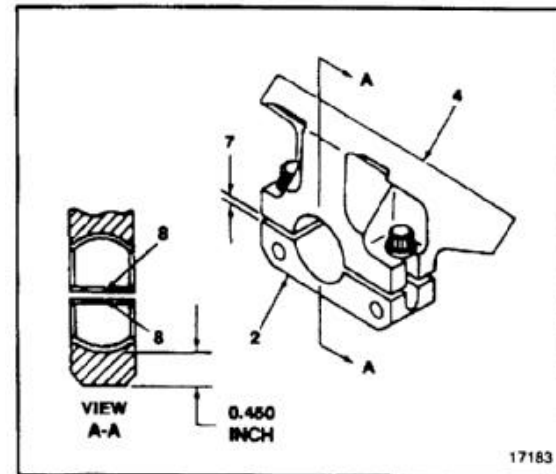
5. Secure cap (2) and bearing (5) to adapter (4) with bolts (6).
6. Torque bolts (6) to **105 inch-pounds**.
7. Measure gap (7).
 - a. If gap measures **0.010 to 0.070 inch** at each end of cap (2), no repair required.
 - b. If gap is less than **0.010 inch**, continue with step 8.
 - c. If gap is more than **0.070 inch** replace cap and adapter (4).
8. Loosen bolts (6).



9. Push bolts (6) out and down.
10. Remove cap (2) and bearing (5) from adapter (4).



11. If gap (7) measured in step 7, is less than **0.010 inch**, dress facing surfaces (8) in equal amounts, with fine aluminum oxide abrasive cloth (E1), supported on a flat surface. Continue until a gap of **0.010 to 0.070 inch** exists. Do not paint surfaces.
12. If gap (7) is greater than **0.070 inch**. Replace cap (2) and adapter (4).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

General Safety Instructions:**Applicable Configurations:**

All

Tools:

Aviation Intermediate Machine Shop Set, NSN
4920-00-405-9279
Mechanical Puller
Telescoping Gage, 3/4 To 1-1/4 Inch
Outside Micrometer Caliper, 0 To 1 Inch
Inside Caliper

Materials:

Carbon Dioxide (Dry Ice) (E92)
Cloths (E135)
Gloves (E184.1)
Epoxy Primer (E292)
Steel, Bar, CRES, 0.040 Inch Thick (E367)

Personnel Required:

Machinist

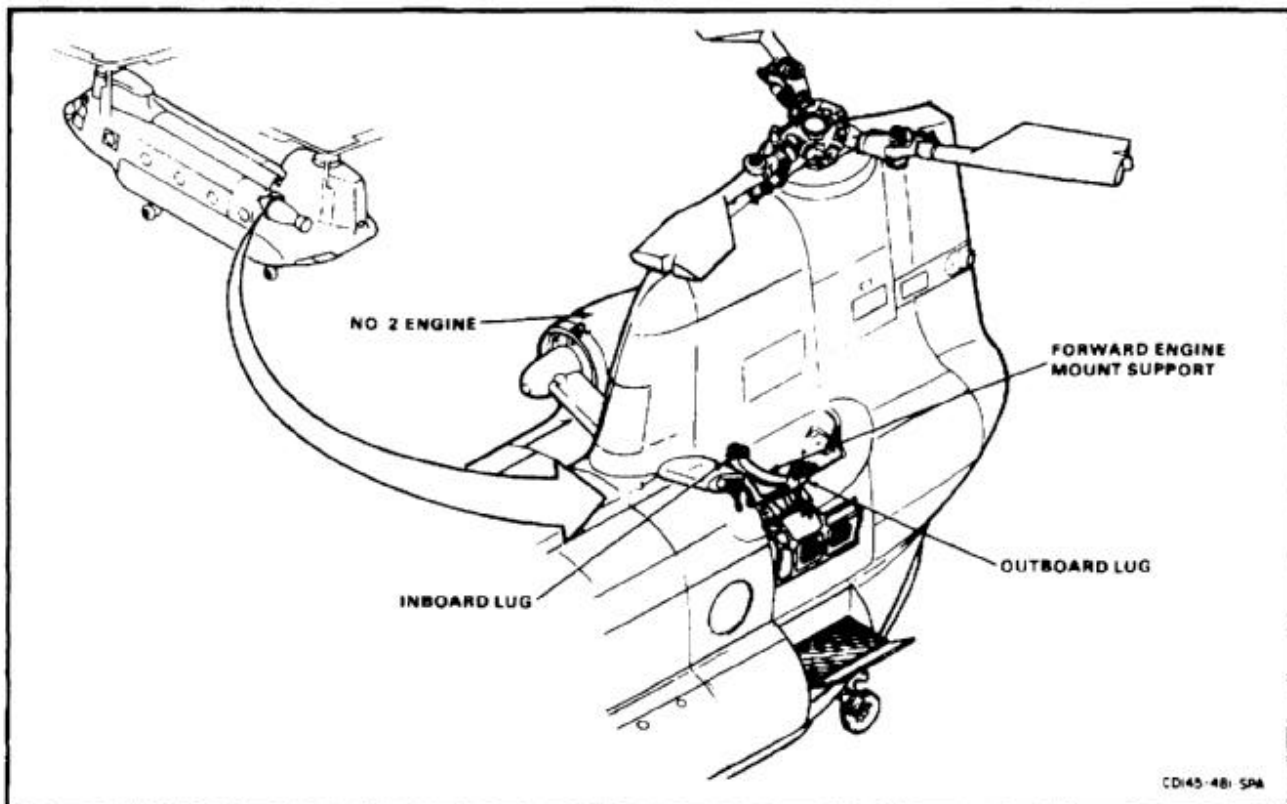
Equipment Condition:

Forward Engine Mount Cap Assembly Removed
(Task 4-27)

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns and may be toxic. Use only in well-ventilated area. Do not get in eyes, on skin, or clothing. In case of contact, immediately flush skin with water for at least **15 minutes**. Get medical attention for eyes.

Epoxy primer (E292) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



NOTE

This task can be used to replace bushings in lugs on No. 1 or No. 2 engine mount support. Only bushings in lugs on No. 1 engine mount support are shown here.

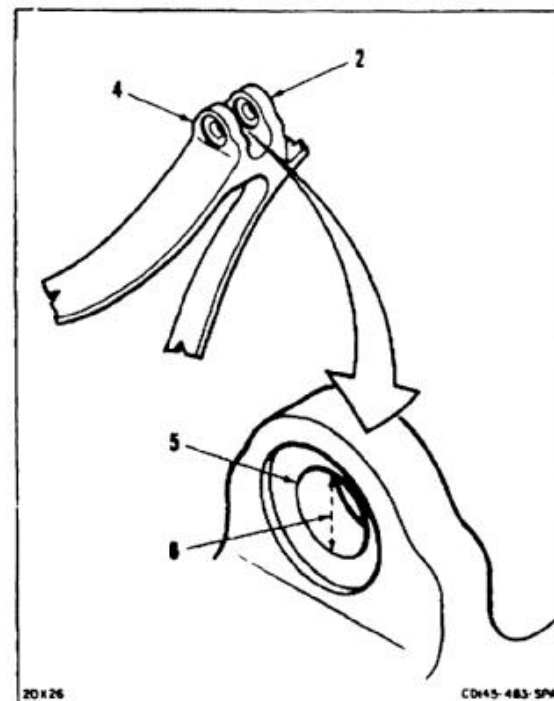
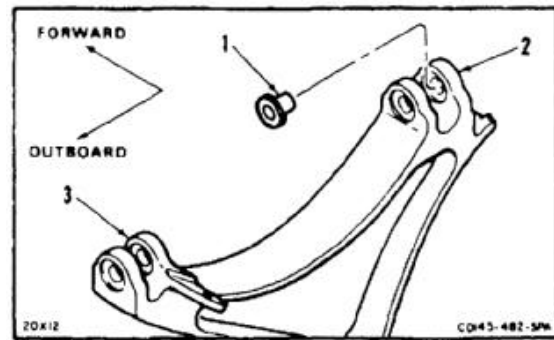
REPLACE SHOULDER BUSHING**NOTE**

It may be necessary to apply carbon dioxide (E92) to bushing area for easier removal of bushing.

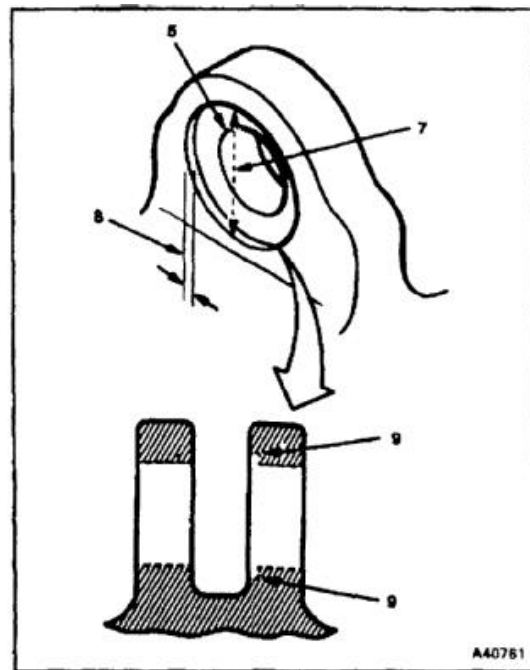
1. Remove shoulder bushing (1) from engine mount lugs (2) and (3).
2. Ream lug (2) in line with other lug (4). Make a round hole (5) with an inside diameter (6) no larger than **0.9844 inch**.

NOTE

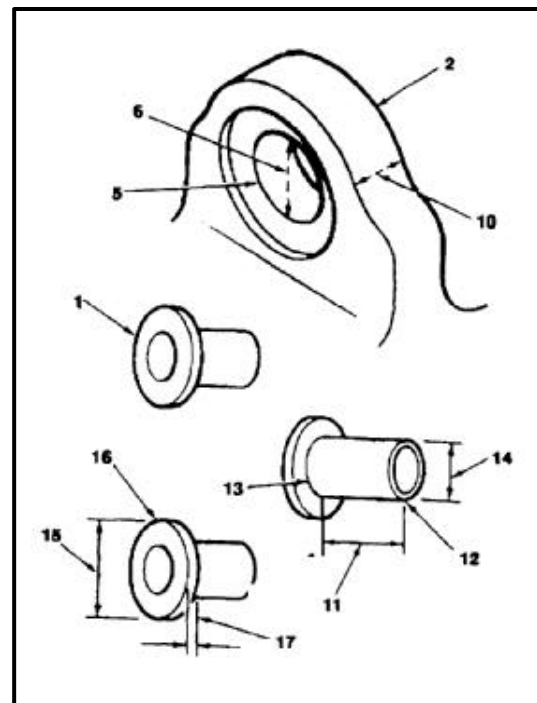
On some helicopters, the original spotface diameter (7) is **1.38 inches**. Do not increase this diameter.



3. Respotface hole (5) to increase spotface diameter (7) to **1.38 inches**. Do not increase spotface depth (8).
4. Spotface radius (9) to **0.030 inch**.



5. Measure inside diameter (6) of hole (5). Record measurement.
6. Measure width (10) of lug (2). Record measurement.
7. Make new shoulder bushing (1) from steel (E367) as follows:
 - a. Make bushing length (11) from flat end (12) to counterbore (13) equal to lug width (10). (See measurement recorded in step 6.)
 - b. Make outside diameter (14) of bushing (1) **0.0008 to 0.0023 inch** more than inside diameter (6) of hole (5). (See measurement recorded in step 5.)
 - c. Make outside diameter (15) of shoulder (16) **1.125 inches**.
 - d. Make width (17) of shoulder (16) **0.060 inch**.



4-33 REPLACE BUSHINGS IN FORWARD ENGINE MOUNT LUGS (AVIM) (Continued)

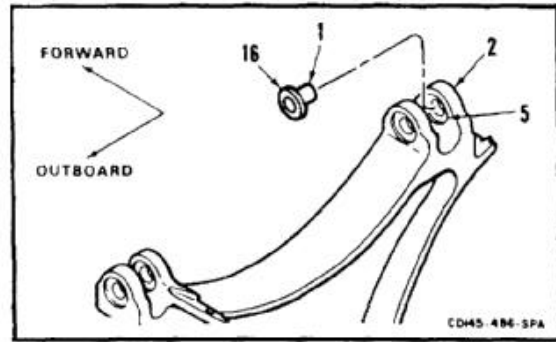
4-33

8. Coat inside of hole (5) in lug (2) with epoxy primer (E292). Wear gloves (E184.1).

NOTE

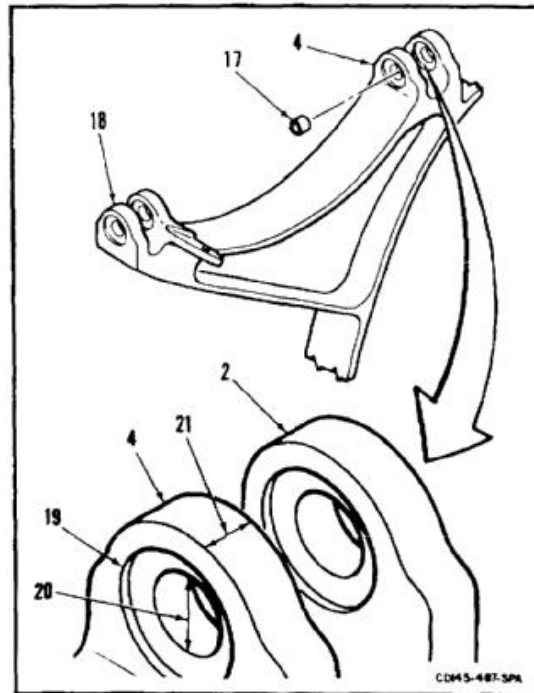
Bushing must be installed while epoxy primer (E292) is still wet.

9. Install new bushing (1) in lug (2) so shoulder (16) of bushing is facing outboard.
10. Wipe off excess primer from lug (2). Use cloths (E135).

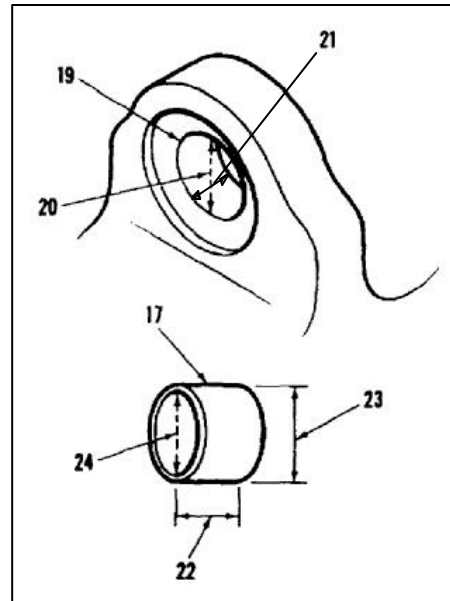
**REPLACE SHOULDERLESS BUSHING****NOTE**

It may be necessary to apply carbon dioxide (E92) to bushing area for easier removal of bushing.

11. Remove bushing (17) from engine mount lugs (4) and (18).
12. Ream lug (4) in line with other lug (2). Make a round hole (19) with an inside diameter (20) no larger than **0.9844 inch**.



13. Measure inside diameter (20) of hole (19). Record measurement.
14. Measure thru-bore thickness (21). Record measurement.
15. Make new shoulderless bushing (17) from steel (E367) as follows:
 - a. Make bushing length (22) equal to lug width (21). (See measurement recorded in step 14.)
 - b. Make outside diameter (23) of bushing (17) **0.0008 to 0.0023 inch** more than inside diameter (20) of hole (19). (See measurement recorded in step 13.)
 - c. Make inside diameter (24) of bushing (17) equal to **0.8144 inch**.

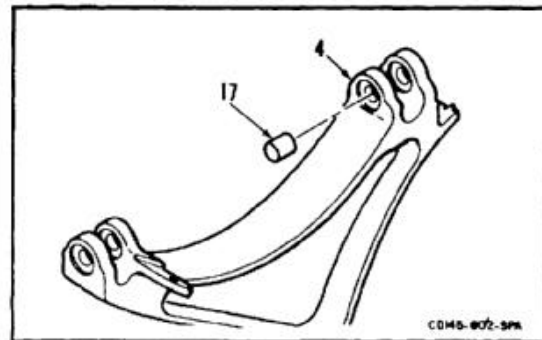


16. Coat inside of lug (4) with epoxy primer (E292). Wear gloves (E184.1).

NOTE

Bushing must be installed in lug while epoxy primer (E292) is still wet.

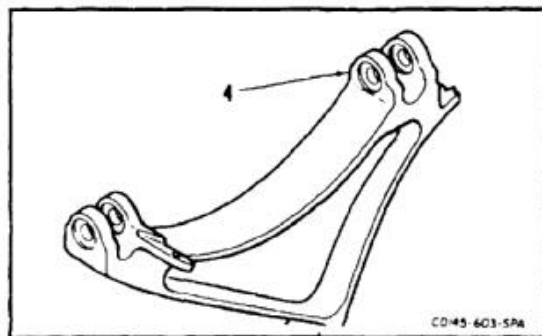
17. Install new shoulderless bushing (17) in lug (4).



18. Wipe off any excess epoxy primer (E292) from lug (4). Use cloths (E135).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-34 INSTALL FORWARD ENGINE MOUNT CAP ASSEMBLY

4-34

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 100 To 750 Inch-Pounds

Materials:

Lockwire (E231)

Parts:

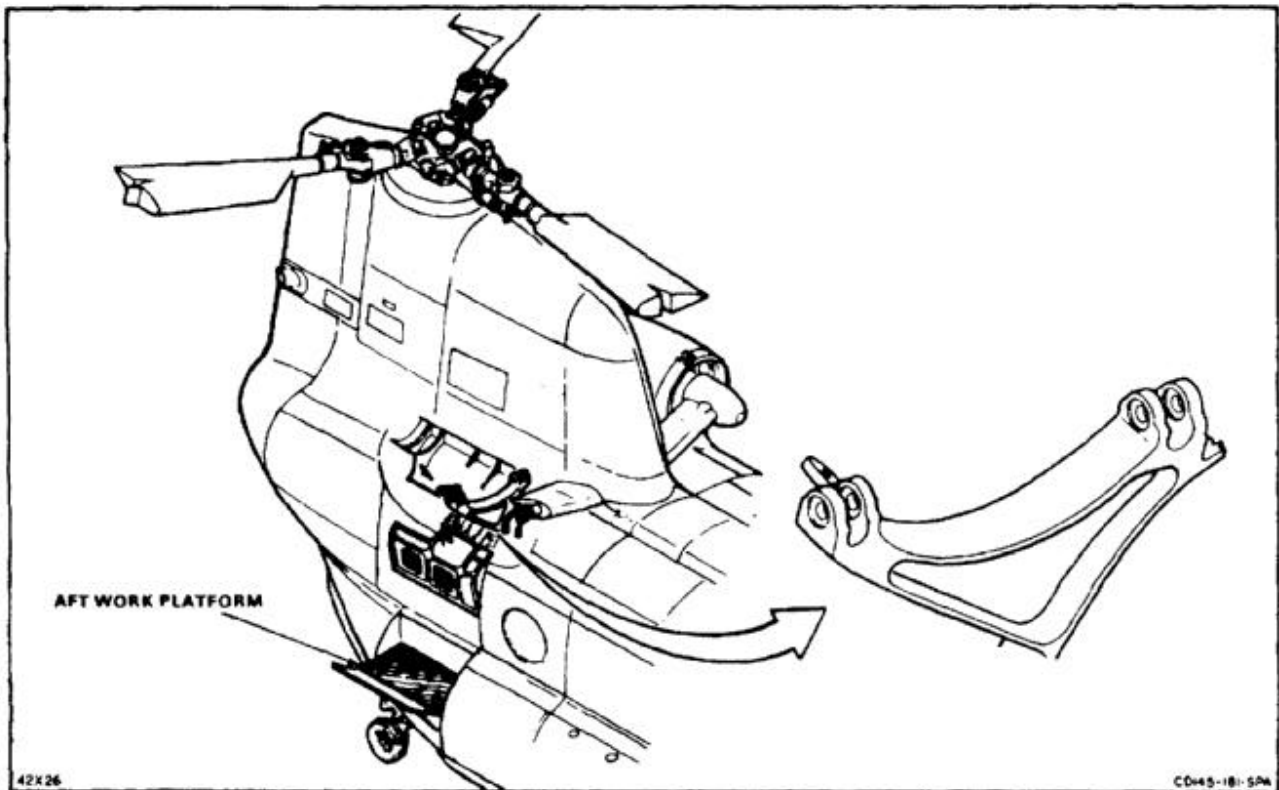
Lockwashers

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

TM 55-1520-240-23P

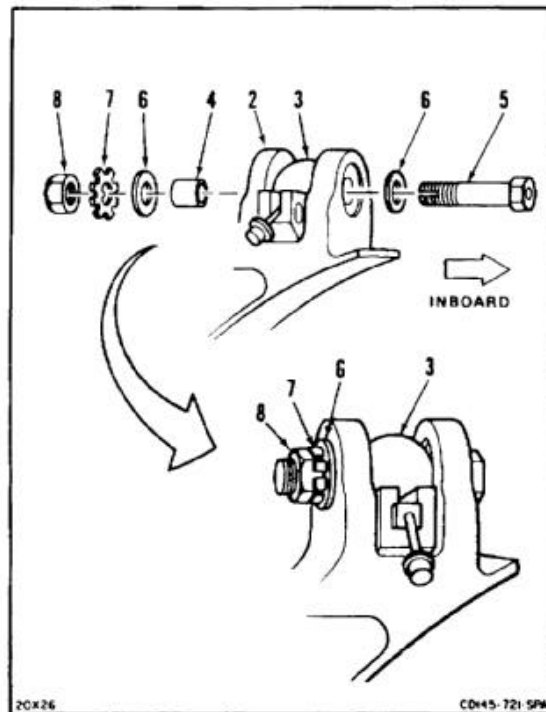
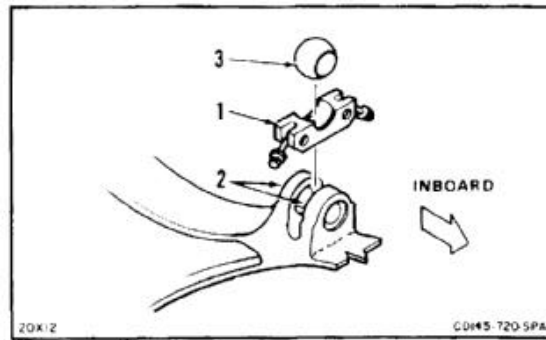


NOTE

This procedure can be used to install forward engine mounts on No. 1 or No. 2 engine. Forward engine mounts on the No. 2 engine are shown here.

INSTALL INBOARD MOUNT

1. Position cap (1) between lugs (2).
2. Install bearing (3) in cap (1) so shoulder of bearing is facing inboard.
3. Install slip-fit bushing (4) in hole in lug (2).
4. Install bolt (5) and washer (6), bolt head inboard.
5. Install washer (6), lockwasher (7), and nut (8) on bolt (5).
6. Torque nut (8) on inboard mount to **350 inch-pounds**. Make sure bearing (3) is tight.
7. Bend tab on lockwasher (7) flat over nut (8).

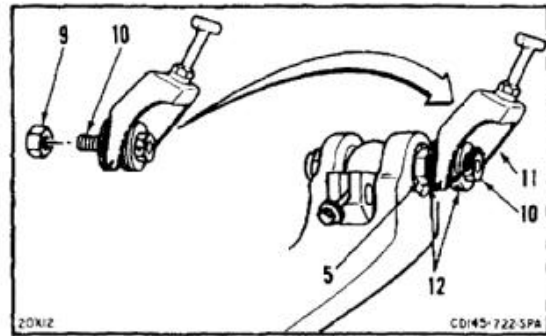


8. Remove spare nut (9) from bolt (10).

NOTE

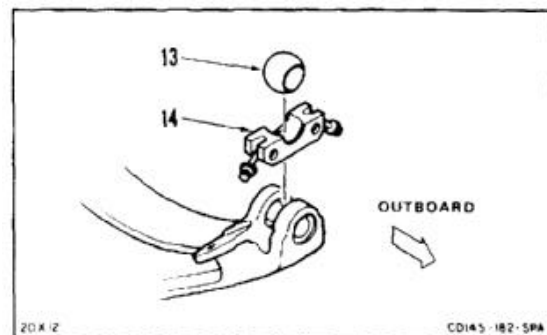
When installing latch bracket, make sure washers are kept in order. Placement of washers affects adjustment of engine covering.

9. Position latch bracket (11), bolt (10), and six washers (12) together as one piece against bolt (5). Install bolt (10), washers (12), and latch bracket (11) into head of bolt (5).
10. Lockwire bolt (10). Use lockwire (E231).

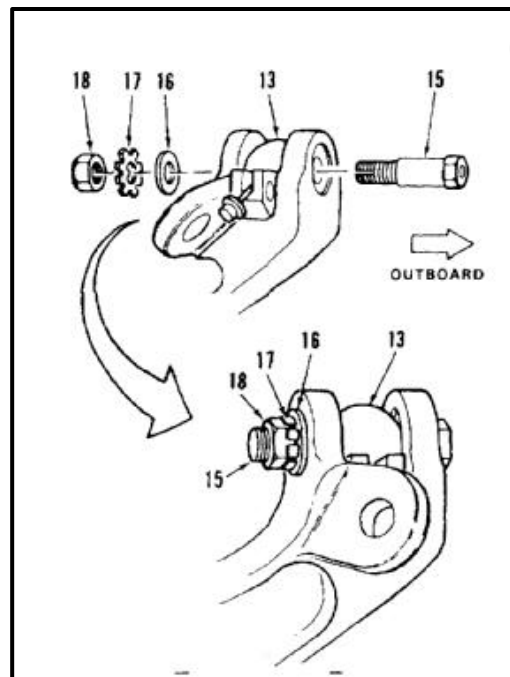


INSTALL OUTBOARD MOUNT

11. Install bearing (13) and cap (14).



12. Install bolt (15), bolt head outboard.
13. Install washer (16), lockwasher (17), and nut (18) on bolt (15).
14. Torque nut (18) on outboard mount to **350 inch-pounds**. Make sure bearing (13) turns freely.
15. Bend tab on lockwasher (17) flat over nut (18).

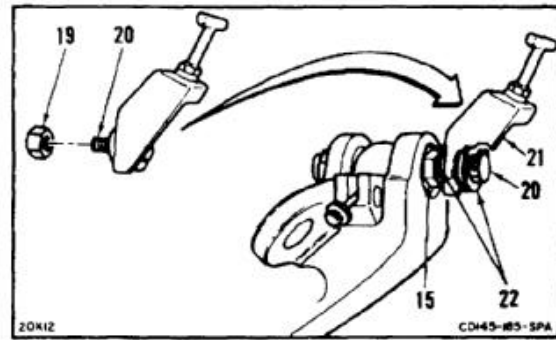


16. Remove spare nut (19) from bolt (20).

NOTE

When installing latch bracket, make sure washers are kept in order. Placement of washers affects adjustment of engine covering.

17. Hold latch bracket (21), bolt (20), and six washers (22) together as one piece against bolt (15).
18. Install bolt (20), washers (22), and latch bracket (21) into head of bolt (15).
19. Lockwire bolt (20). Use lockwire (E231).



INSPECT

FOLLOW-ON MAINTENANCE:

Close aft work platform (Task 2-2).

END OF TASK

4-35 INSTALL FORWARD ENGINE MOUNT ADAPTER

4-35

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 710 Inch-Pounds
Torque Wrench, 100 to 750 Inch-Pounds
Crowfoot Attachment, 3/8 Inch

Materials:

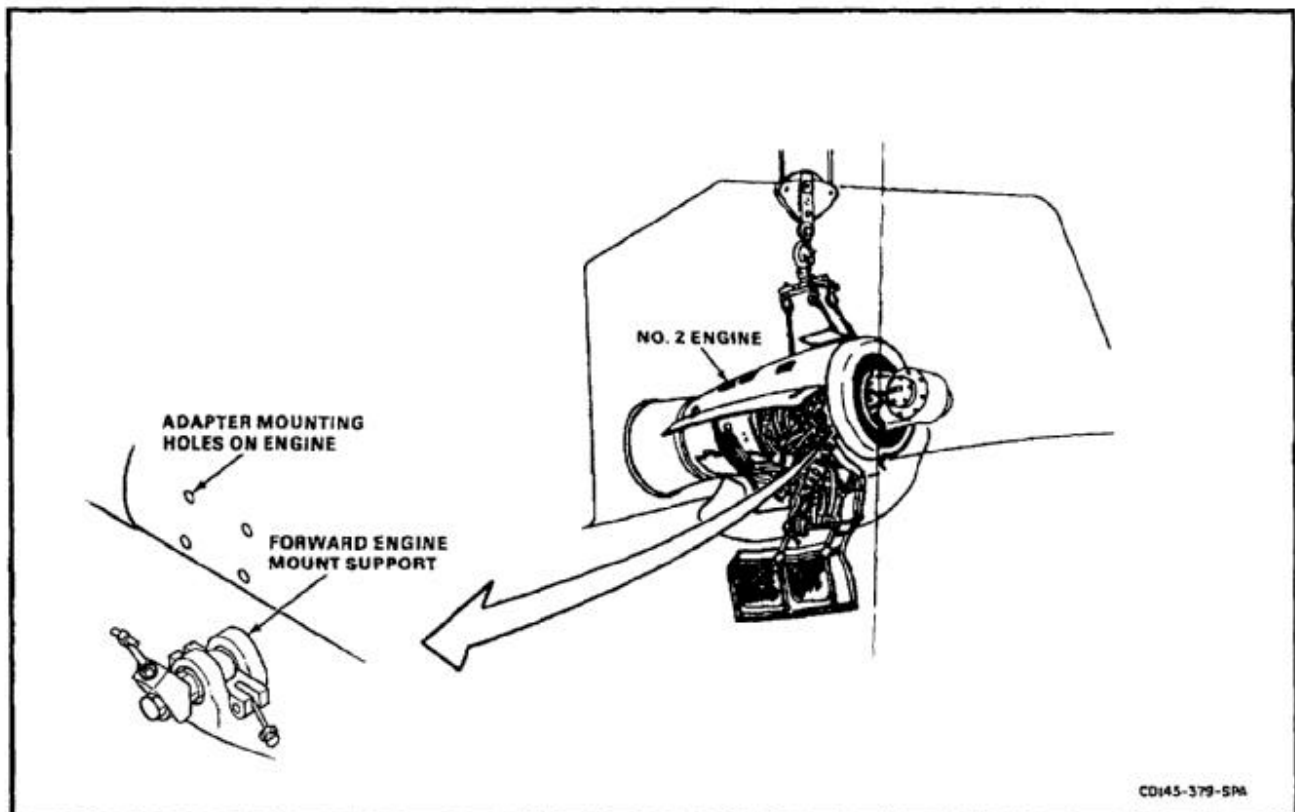
Lockwire (E229)
Lockwire (E231)
Petrolatum (E274)

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 4-44



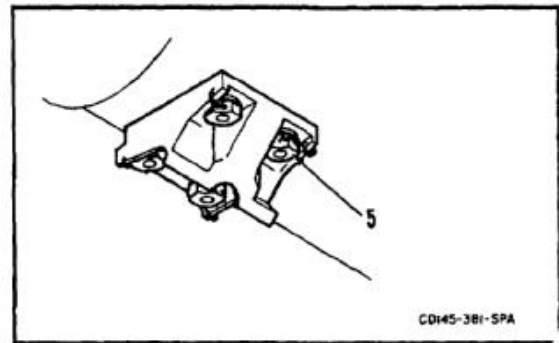
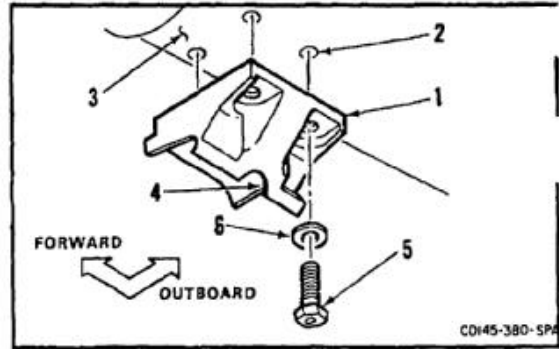
NOTE

Procedure can be used to install inboard or outboard forward engine mount adapters on either engine. Outboard adapter on No. 2 engine is shown here.

INSTALL ADAPTER

1. Position adapter (1) so holes in adapter align with holes (2) on engine (3) as shown. Make sure curved surface (4) of adapter is down.
2. Install four bolts (5) and washers (6).
3. Torque four bolts (5) to **300 to 450 inch-pounds**.
4. Lockwire bolts (5). Use lockwire (E231).

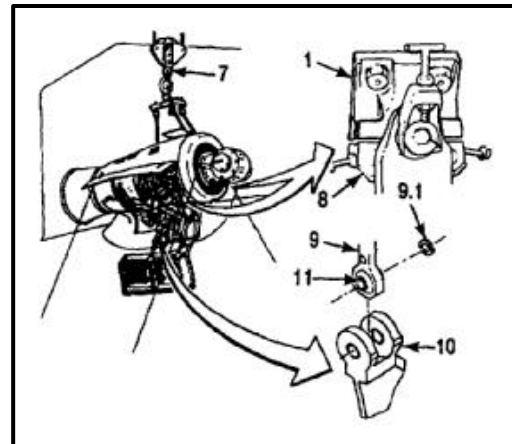
INSTALL ENGINE



CAUTION

Make sure bearing in lower end of aft support link does not tilt in engine mount clevis, before and while lowering engine. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

5. Slowly lower hoist (7) until forward adapters (1) rest on caps (8).
- 5.1. Align holes in aft link (9) with spacer (9.1) with holes in aft engine mount (10). Lower hoist (7) until aft link (9) fits in aft engine mount (10). Make sure bearing (11) does not tilt in aft engine mount (10).



CAUTION

Make sure engine weight is on aft support link and not on firewall former. Damage to engine and former can occur if weight is not on support link.

6. Install slip-fit bushing (12), shoulder outboard, in clevis (10).
7. Install bolt (13), two washers (14), and nut (15). Raise or lower engine (3) as needed for clearance.
8. Adjust firewall former (16) (Task 4-44).
9. Relax tension on hoist (7).
10. Torque nut (15) to **375 inch-pounds** to seat bushing. Loosen nut and retorque to **20 inch-pounds** above run-on torque. Not to be less than **70 inch-pounds**.

INSPECT

11. Check barrel nuts (17). Breakaway torque shall not be less than **7 inch-pounds**.
12. Push four bolts (18) up and over adapter (1).
13. Torque bolts (18) to **20 inch-pounds** above friction torque.

NOTE

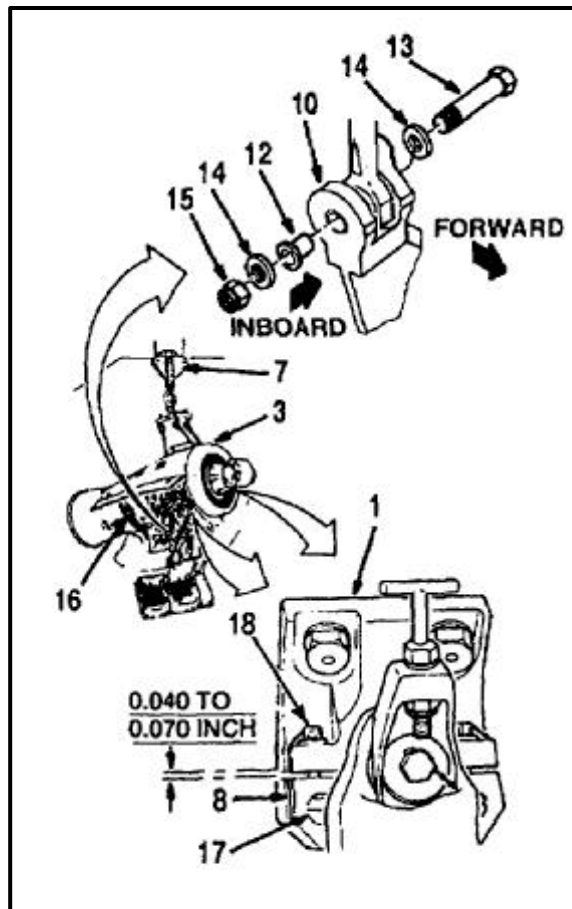
It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

14. Measure gap between adapters (1) and caps (8). Gap shall measure **0.010 to 0.070 inch**.
15. Torque bolts (18) to **105 inch-pounds**.
16. Measure gap between adapters (1) and caps (8). Gap shall measure **0.010 to 0.070 inch**.

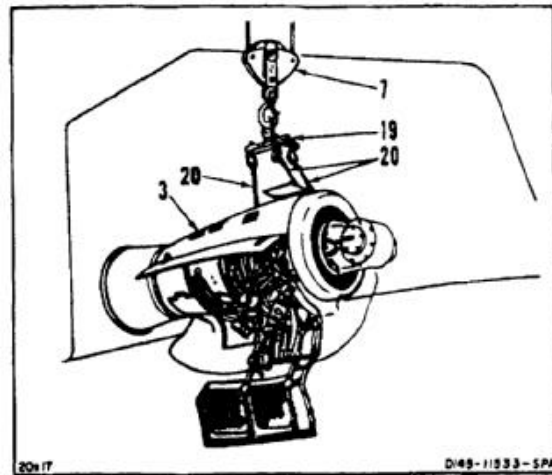
NOTE

It is acceptable for clearances to vary inboard to outboard and/or forward to aft providing the clearance at any point is within the defined limits.

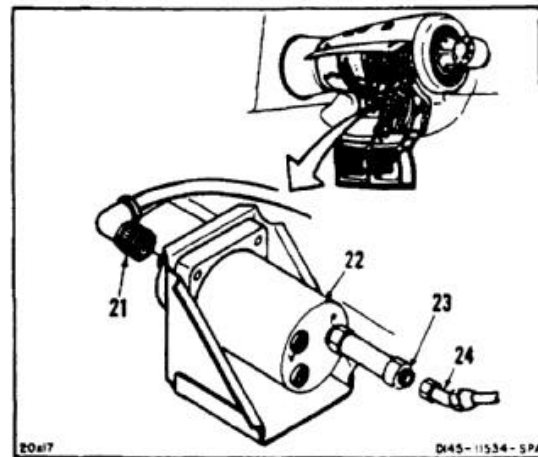
17. Check bolts (18). Bolt threads shall protrude a minimum of two threads through barrel nuts (17), but shall not bottom out. Add washers under bolt head if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).



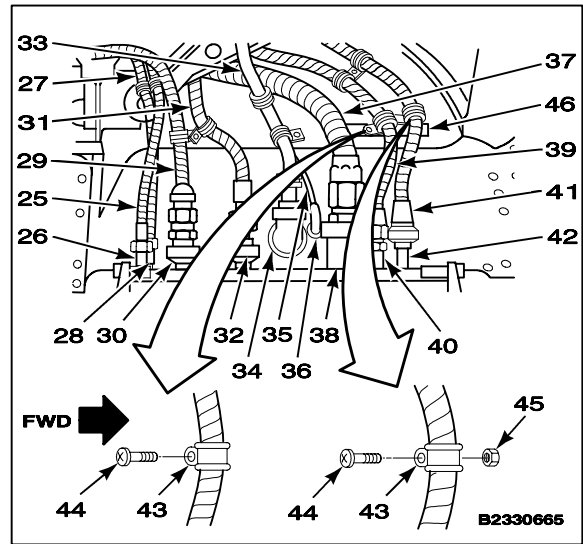
18. Disconnect hoist (7) from sling (19).
19. Disconnect three cables (20) from engine (3). Remove sling (19).



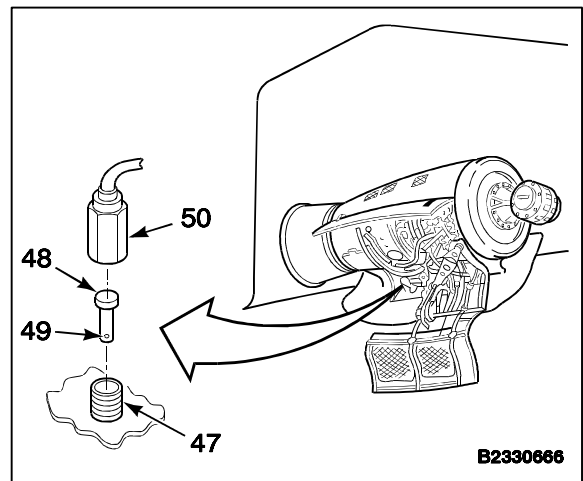
20. Connect cable plug (21) to oil pressure transmitter (22). Lockwire plug. Use lockwire (E229).
21. Lubricate thread of fitting (23). Use petrolatum (E274). Connect hose. (24).



22. Connect hose (25) to port (26). Remove tag.
23. Connect hose (27) to port (28). Remove tag.
24. Connect hose (29) to port (30). Remove tag.
25. Connect hose (31) to port (32). Remove tag.
26. Connect cable connector (33) to receptacle (34). Remove tag. Lockwire connector. Use lockwire (E231).
27. Connect cable connector (35) to receptacle (36). Remove tag.
28. Connect hose (37) to port (38). Remove tag.
29. Connect hose (39) to port (40). Remove tag.
30. Connect hose (41) to port (42). Remove tag.
31. Connect two clamps (43). Install two screws (44) and nut (45) in bracket (46). Remove tape.



32. Remove caps from receptacles (47). Make sure inserts (48) are in receptacles white dot (49) first.
33. Connect two cables (50) to receptacles (47) at fuselage.

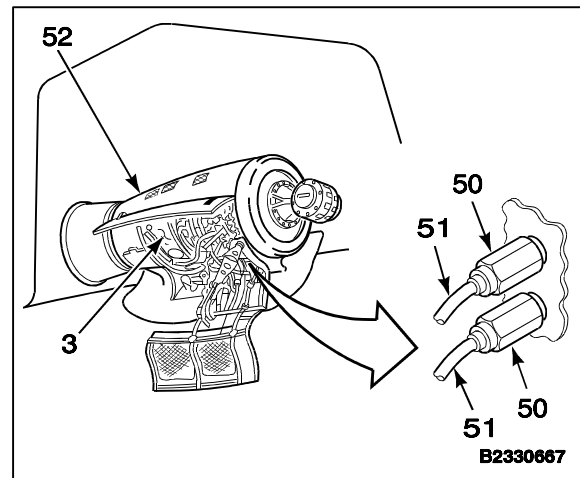


34. Torque connectors (50) to **65 inch-pounds**.



Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

35. Make sure fire detection sensing element (51) cannot chafe on engine (3) or cover (52).



FOLLOW-ON MAINTENANCE:

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).
- Close engine side and cover access covers (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-4).
- Check powerplant plumbing for leaks.

END OF TASK

4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER

4-35.1

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Torque Wrench, 100 to 750 Inch-Pounds
Crowfoot Attachment, 3/8 Inch

Materials:

Lockwire (E229)
Lockwire (E231)
Petrolatum (E274)

Parts:

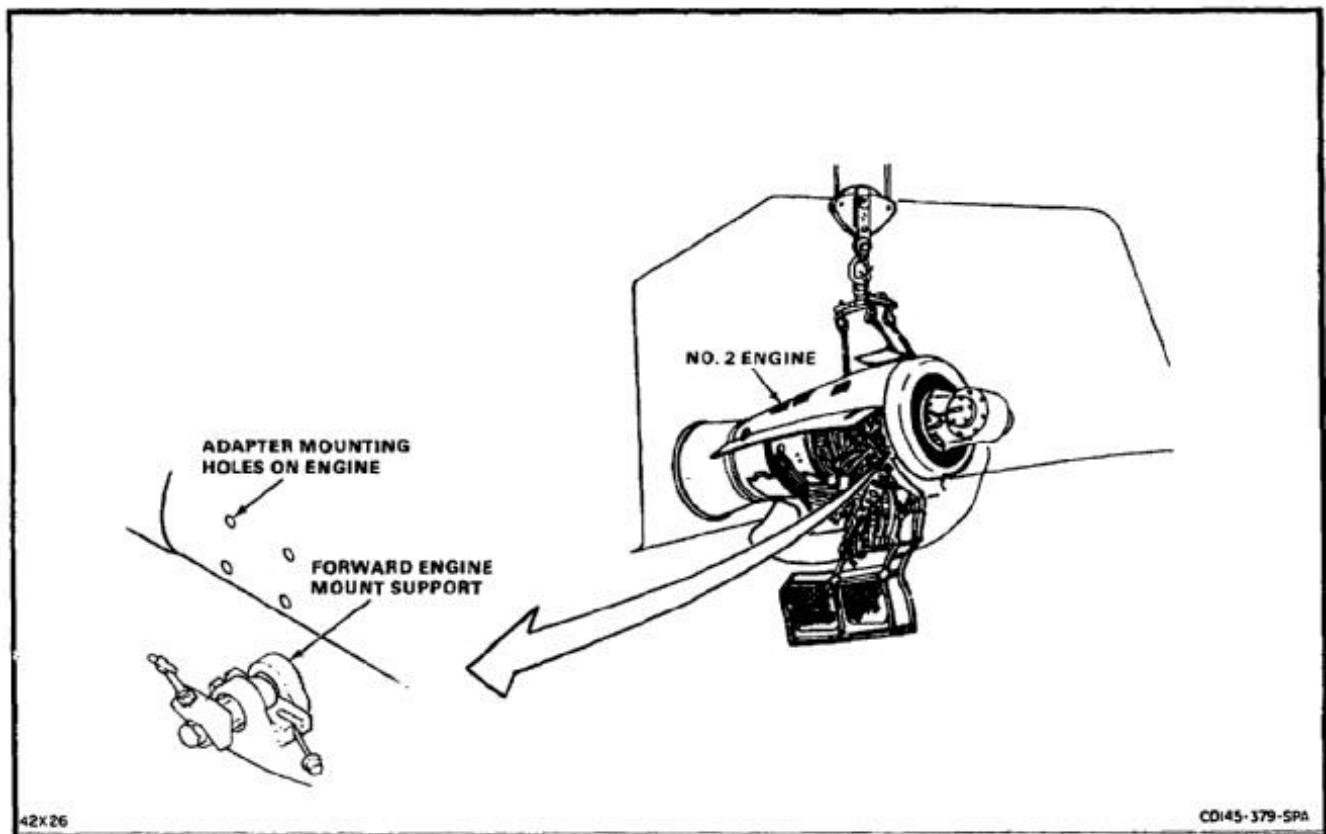
Conical Seal

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

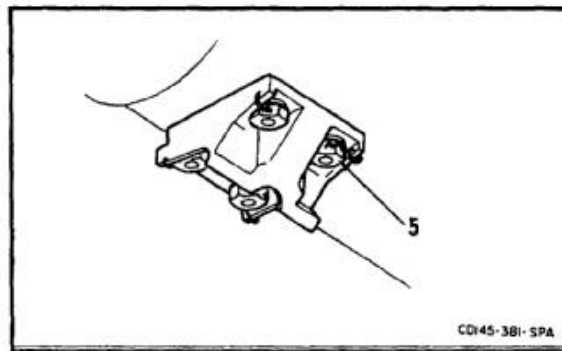
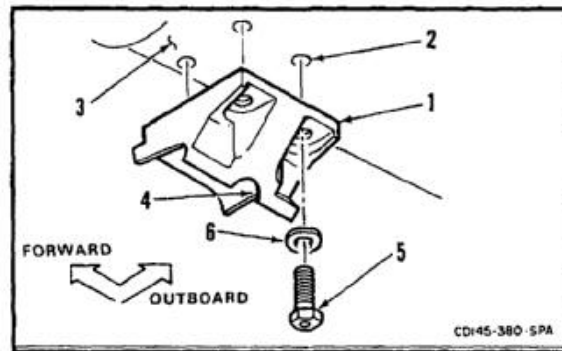
Task 2-313
TM 55-1520-240-T



INSTALL ADAPTER**NOTE**

Procedure can be used to install inboard or outboard forward engine mount adapters on either engine. Outboard adapter installation on No. 2 engine is shown here, except as noted.

1. Position adapter (1) so holes in adapter align with holes (2) on engine (3) as shown. Make sure curved surface (4) of adapter is down.
2. Install four bolts (5) and washers (6).
3. Torque four bolts (5) to **300 to 450 inch-pounds**.
4. Lockwire bolts (5). Use lockwire (E231).

**INSTALL ENGINE**

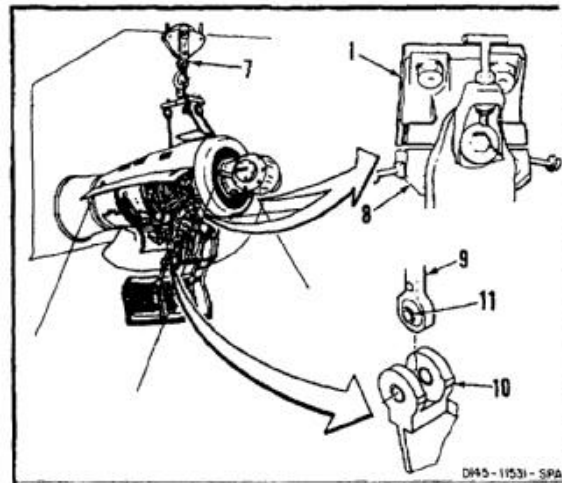
Make sure bearing in lower end of aft support link does not tilt in engine mount clevis, before and while lowering engine. If bearing tilts, it will wedge in clevis, causing damage to bearing and clevis.

5. Slowly lower hoist (7) until forward adapters (1) rest on caps (8) and aft link (9) fits in clevis (10). Make sure bearing (11) does not tilt in clevis.



Make sure engine weight is on aft support link and not on firewall former. Damage to engine and former can occur if weight is not on support link.

Spacer must be located on the same side of the link assembly as the fixed bushing.



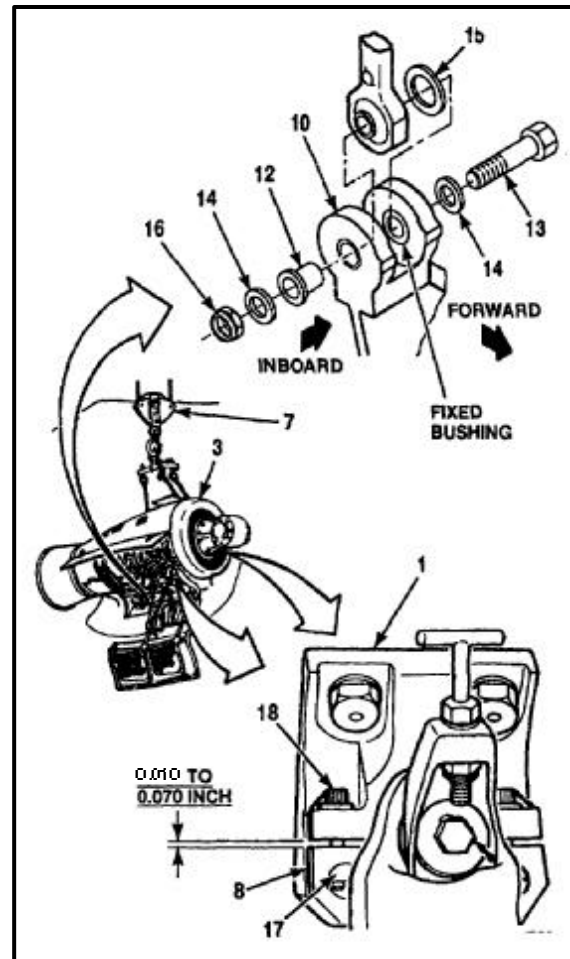
4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

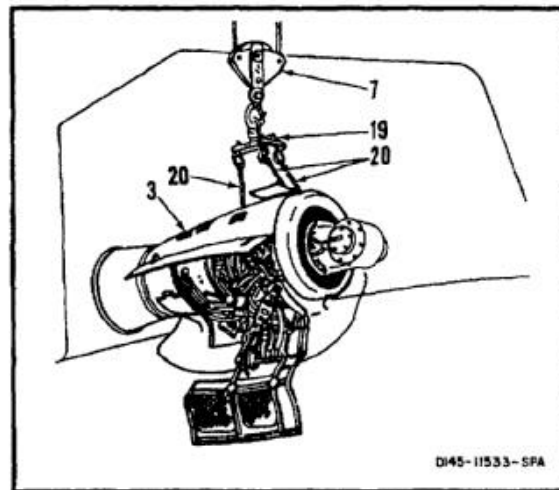
6. Install slip-fit bushing (12), shoulder outboard, in clevis (10).
7. Install bolt (13), two washers (14), spacer (15), and nut (16). Raise or lower engine (3) as needed for clearance.
8. Torque nut (16) to **350 to 400 inch-pounds** to seat bushing. Loosen nut and retorque to **20 inch-pounds** above run on torque and not less than **70 inch-pounds**.

INSPECT

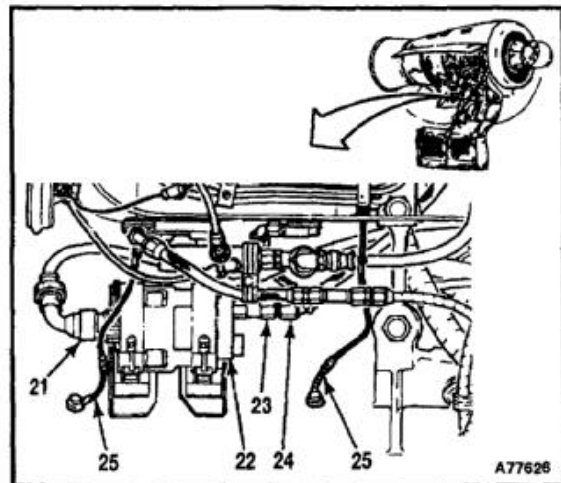
9. Check barrel nuts (17). Rotational torque shall not be less than **7 inch-pounds**.
10. Push four bolts (18) up and over adapter (1) and tighten evenly.
11. Torque bolts (18) to **20 inch-pounds** above friction torque.
12. Relax tension on hoist (7).
13. Re-torque bolts (18) to **95 to 110 inch-pounds**.
14. Measure gap between adapters (1) and caps (8). Gap shall measure **0.010 to 0.070 inch**.
15. Check bolts (18). Bolts shall extend a minimum of two threads through barrel nuts (17) but shall not bottom out. If bolts bottom out, add washers under bolt head and repeat steps 13 and 14. Lockwire bolts (18). Use lockwire (E231).



16. Disconnect hoist (7) from sling (19).
17. Disconnect three cables (20) from engine (3). Remove sling (19).
18. Connect cable plug (21) to oil pressure transmitter (22). Lockwire plug. Use lockwire (E229).
19. Lubricate thread of fitting (23). Use petrolatum (E274). Connect hose (24).



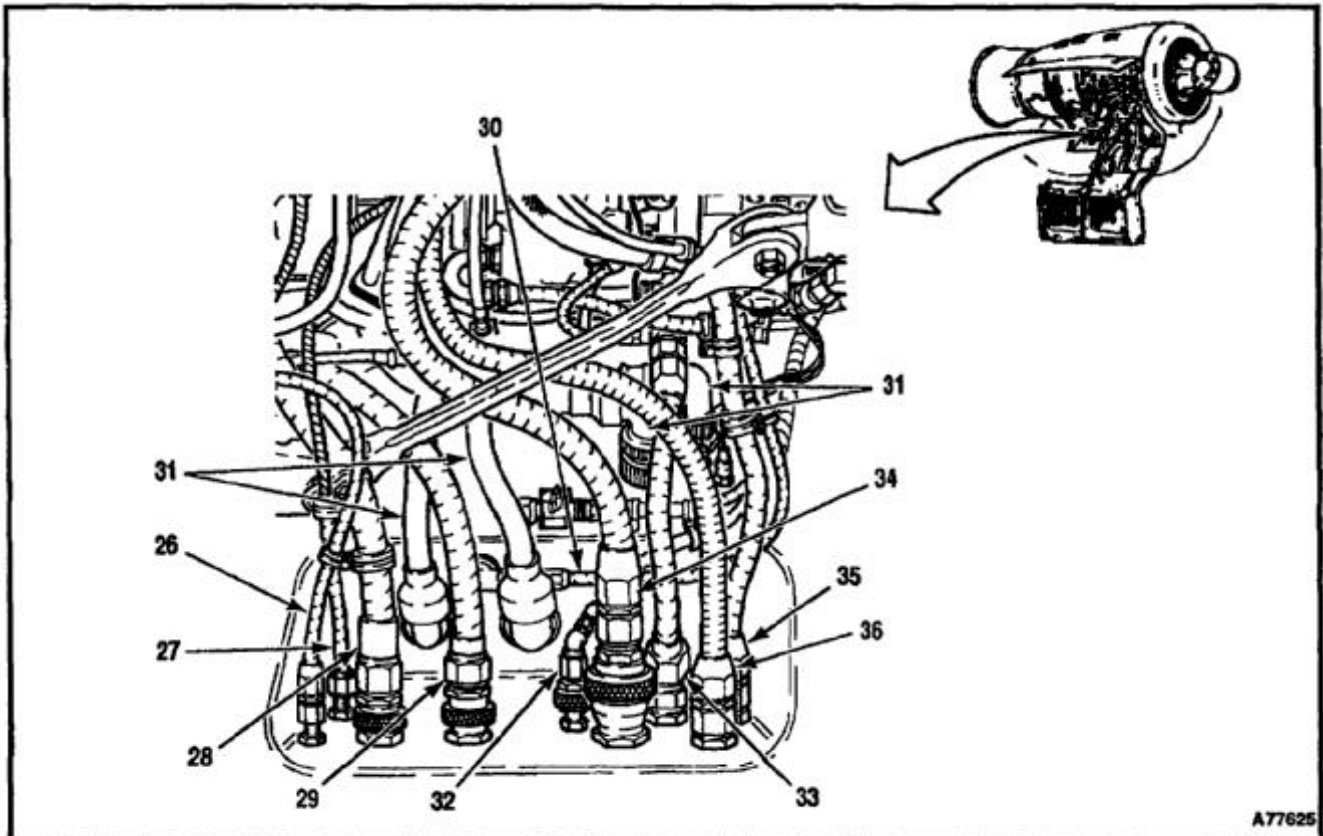
20. Connect bonding jumpers (25).



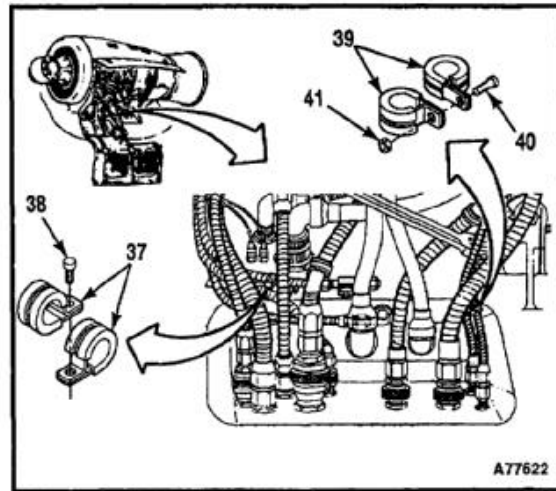
4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

4-35.1

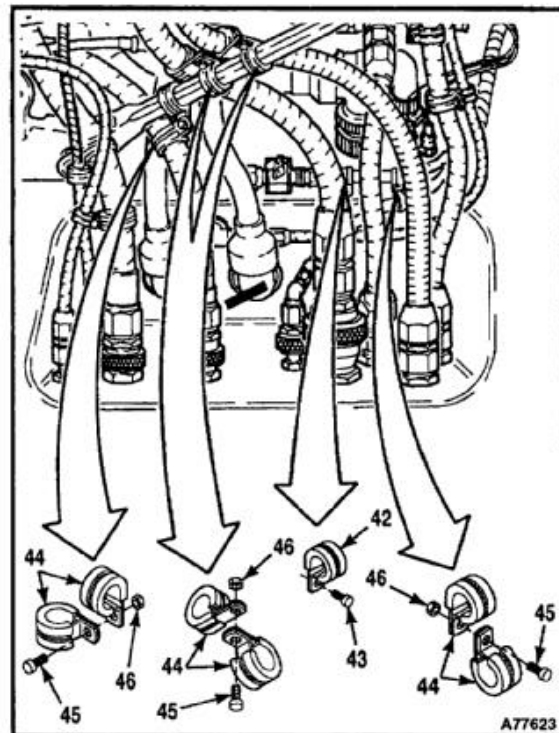
21. Connect hoses (26 and 27). Remove tags.
22. Connect hoses (28, 29 and 30). Remove tags.
23. Connect four cable connectors (31). Remove tags.
24. Connect hoses (32 and 33). Remove tags.
25. Connect hose (34). Remove tag.
26. Connect hoses (35 and 36). Remove tags.
27. Perform bonding preparation (Task 2-313).



28. On No. 1 powerplant only:
- a. Install two clamps (37) with screw (38). Remove tape from hoses.
 - b. Install two clamps (39) with screw (40) and nut (41). Remove tape from hoses.



29. On No. 2 powerplant only:
- a. Install clamp (42) with screw (43).
 - b. Install eight clamps (44) with screws (45) and nuts (46).



4-35.1 INSTALL FORWARD ENGINE MOUNT ADAPTER (Continued)

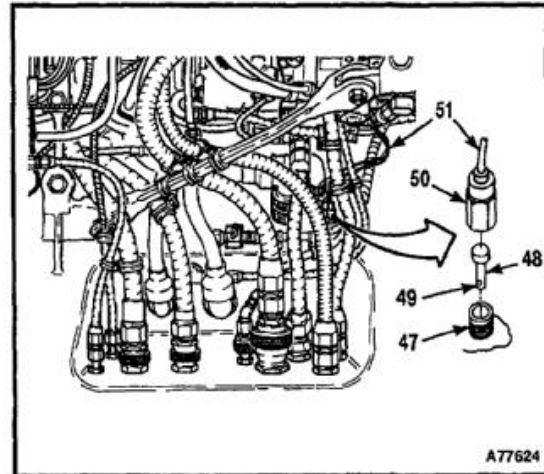
4-35.1

30. Remove caps from two receptacles (47). Make sure inserts (48) are in receptacles, white dot (49) first.
31. Connect two connectors (50) to receptacles (47) at fuselage.
32. Torque connectors (50) to **50 to 75 inch-pounds**.

CAUTION

Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

33. Make sure fire detection sensing element (51) does not chafe.

**FOLLOW-ON MAINTENANCE:**

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-4).
- Check powerplant plumbing for leaks.
- Re-torque bolts (18) and check forward engine mounts for proper clearance after four hours of flight.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Hoist
 Sling

Materials:

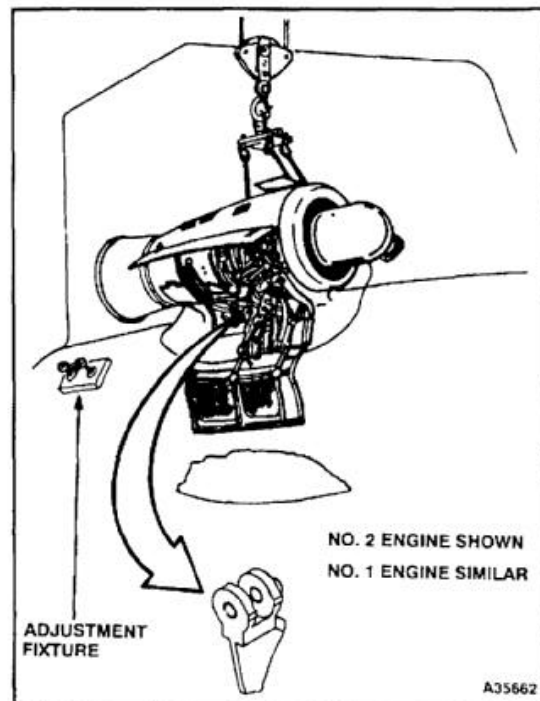
Paper Tags (E264)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Side Access Doors Open (Task 4-49)
 Engine Lower Access Door Opened (Task 4-49)



CAUTION

For helicopters without **57** make sure bearing in lower end of link does not tilt within clevis while weight of engine is supported. If bearing tilts it will wedge in clevis and damage bearing and clevis.

Do not stretch or stress hoses and electrical harnesses attached to helicopter, when supporting engine weight. Stress or stretching can damage hoses and harnesses.

NOTE

For helicopters with **57** adjustable link 145PS700-1 is adjusted to set engine cross shaft alignment at the time of aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixtures are unique and are not interchangeable.

This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.

Aft engine mount links that have been modified by **57** with adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.

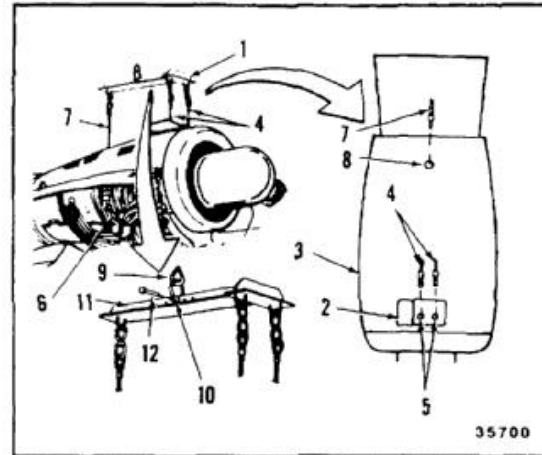
This procedure can be used to remove aft engine mount link and adapter on either engine. Link and adapter on No. 2 engine are shown here.

As a result of applying **57** MWO 1-1520-240-50-60, new adjustable link 145PS700-1 becomes part of the airframe and should not be removed to support engine on trailer adapter (T16) MWO 1-1520-240-50-60 provides instructions to permanently mount old one piece link 114PS223-1 to trailer adapter (T16) to provide support for the engine.

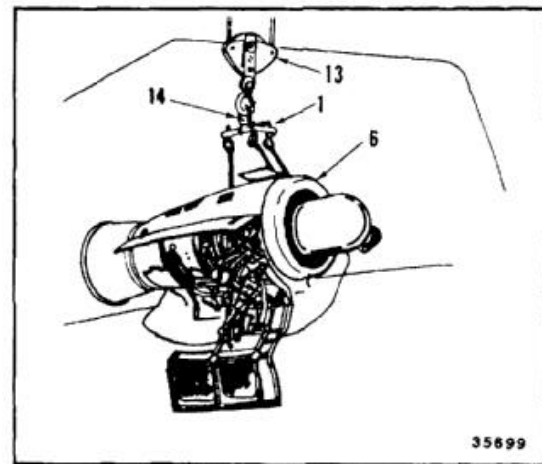
4-36 REMOVE AFT ENGINE MOUNT LINK AND ADAPTER (Continued)

4-36

1. Install sling (1) as follows:
 - a. Open access door (2) in engine access cover (3).
 - b. Connect two cables (4) to forward fittings (5) on powerplant (6).
 - c. Connect cable (7) into aft fitting (8) through cover (3).
 - d. Adjust sling (1) until eye (9) is over center hole (10) in sling bar (11).
 - e. Install pin (12) through bar (11).



2. Connect hoist (13) to eye (14) of sling (1). Raise hoist slowly to support weight of powerplant (6). Do not lift engine from installed position.

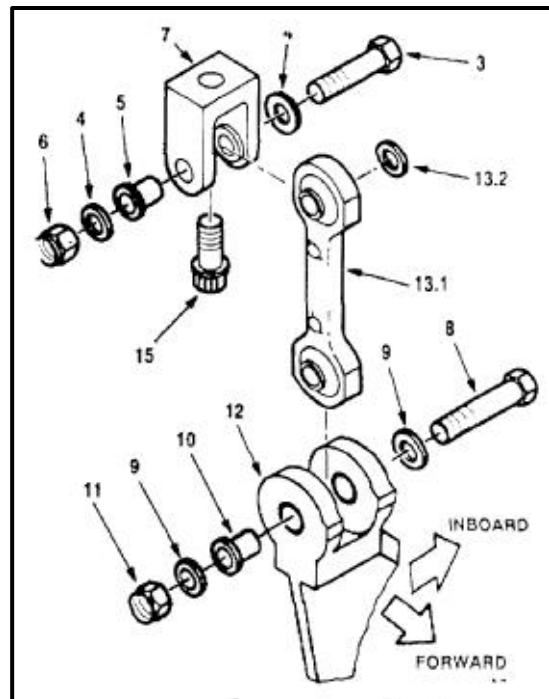


NOTE

Link assembly (13.1), bolts (3 and 8), and spacer (13.2) must be tagged with aircraft serial number and side of aircraft from which they were removed. For spacers and bolts, note whether they were upper or lower.

REMOVE AFT ENGINE MOUNT LINK AND ADAPTER WITHOUT 57

3. Remove bolt (3), two washers (4), bushing (5), and nut (6) from adapter (7).
4. Remove bolt (8), two washers (9), bushing (10), and nut (11) from mount (12).
5. Tag and remove link (13.1) and spacer (13.2).
6. Remove lockwire and bolt (15).
7. Remove adapter (7).

**NOTE**

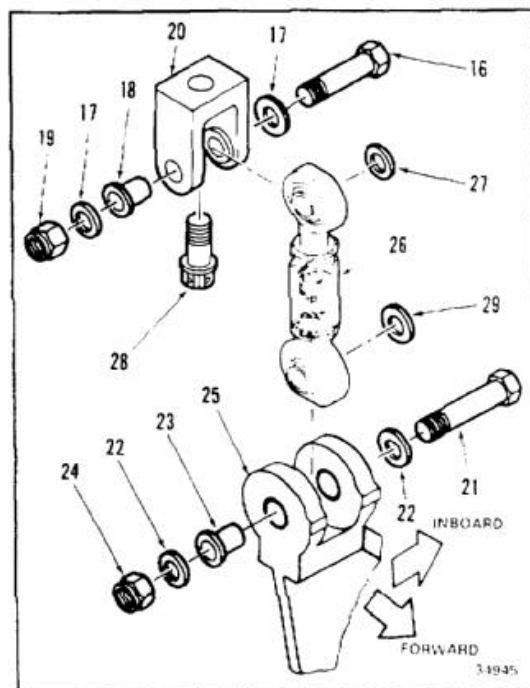
Adjustable link assembly (26), bolts (16 and 21), and spacers (27 and 29) must be tagged with aircraft serial number and side of aircraft from which they were removed. For spacers and bolts, note whether they were upper or lower.

REMOVE AFT ENGINE MOUNT LINK AND ADAPTER WITH 57

8. Remove bolt (16), two washers (17), bushing (18), and nut (19) from adapter (20).
9. Remove bolt (21), two washers (22), bushing (23), and nut (24) from mount (25).
10. Tag and remove link (26) and spacers (27 and 29).
11. Remove lockwire and bolt (28).
12. Remove adapter (20).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Technical Inspection Tool Kit, NSN 5180-00-323-5114
 Dial Indicating Scale, 0 to 50 Pounds
 Outside Micrometer, 0 to 1 Inch
 Vernier Caliper, 0 to 1 Inch
 Vise

Materials:

Cloth (E135)
 Dry Cleaning Solvent (E162)
 Gloves (E186.1)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

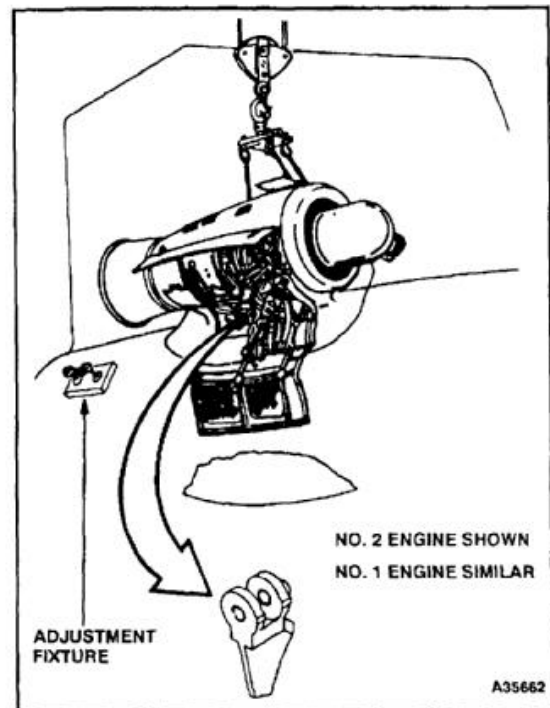
TM 55-1500-322-24
 TM 55-1520-240-23P
 TM 1-1520-253-23

Equipment Condition:

Aft Engine Mount Link and Adapter Removed (Task
 4-36)

General Safety Instructions:**WARNING**

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

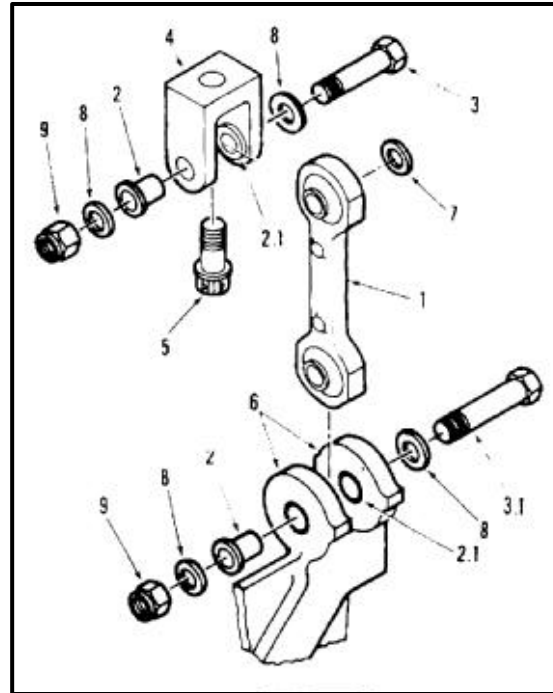


INSPECT AFT ENGINE MOUNT LINK AND ADAPTER WITHOUT 57

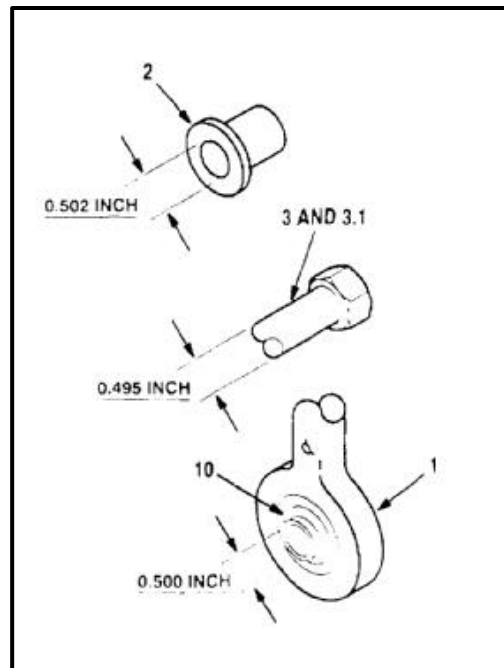
1. Clean link (1), four bushings (2 and 2.1), two bolts (3 and 3.1), adapter (4), adapter bolt (5), and aft engine mount lugs (6) on structure. Use solvent (E162) and cloth (E135). Wear gloves (E186.1).
2. Inspect link (1), four bushings (2 and 2.1), two bolts (3 and 3.1), bolt (5), and adapter (4). There shall be no cracks, gouges, scratches, or dents, which exceed **10 percent** of material thickness or **0.040 inch**, whichever is less. If a crack is suspected in the aft engine mount link or the aft engine mount adapter, refer to TM 1-1520-253-23.
3. Inspect spacer (7), four washers (8), and two nuts (9) for obvious damage.

NOTE

During the inspection of the aft engine mount lugs, inspect for cracks originating from the inboard lug recess at the bolt hole.



4. Inspect lugs (6) on structure. There shall be no cracks, gouges, scratches, or dents deeper than **0.040 inch**.
5. Measure inside diameter of four bushings (2). Diameter shall not be more than **0.502 inch**.
6. Measure inside diameter of two bearings (10). Bearing diameter shall not be more than **0.500 inch**.
7. Measure shank diameter of two bolts (3 and 3.1). Diameter shall not be less than **0.495 inch**.
8. Use a dial indicating scale to apply a **25 to 50 pound** load to bearing (10) in axial direction. Apply a **25 to 50 pound** load to bearing (10) in opposite direction. Measure axial play. Play shall not be more than **0.030 inch**.
9. Apply a **25 to 50 pound** load to bearing (10) in radial direction. Apply a **25 to 50 pound** load to bearing (10) in opposite direction. Measure radial play. Play shall not be more than **0.006 inch**.
10. Repeat steps 8 and 9 four times for each bearing (10). Rotate bearing **90°** each time.

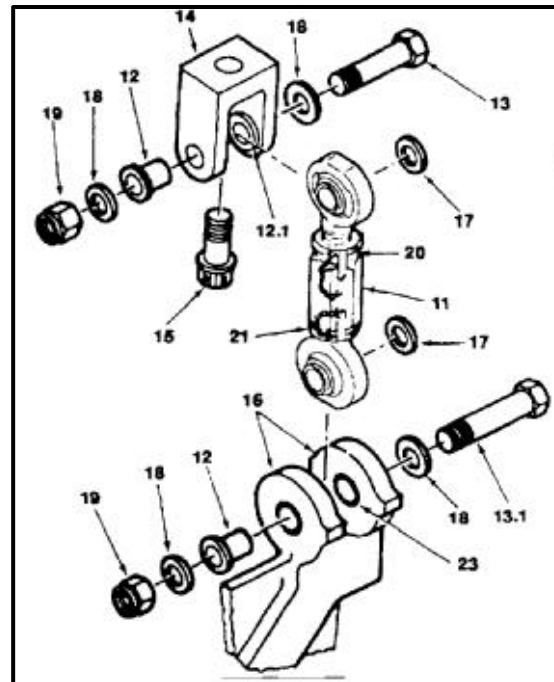


INSPECT AFT ENGINE MOUNT LINK AND ADAPTER WITH 57

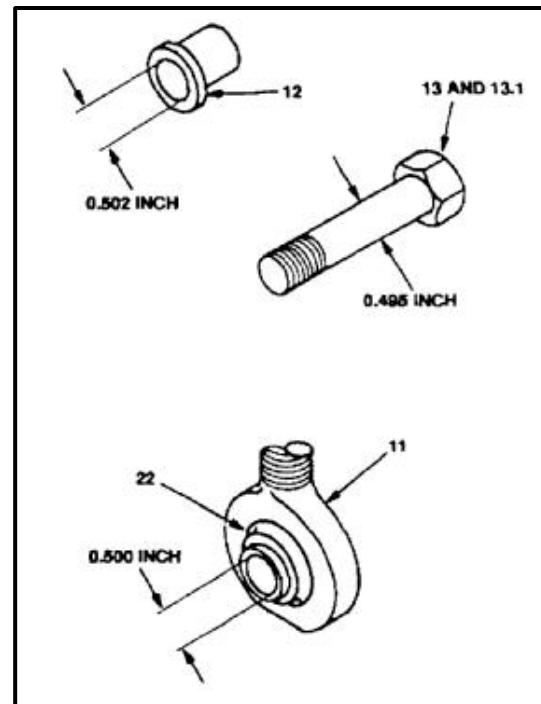
11. Clean link (11), four bushings (12, 12.1, and 23), two bolts (13 and 13.1), adapter (14), adapter bolt (15), and aft engine mount lugs (16) on structure. Use solvent (E162) and cloth (E135). Wear gloves (E186.1).
12. Inspect link (11), four bushings (12, 12.1, and 23), two bolts (13 and 13.1), bolt (15), and adapter (14). There shall be no cracks, gouges, scratches, or dents, which exceed **10 percent** of material thickness or **0.040 inch**. Whichever is less. If a crack is suspected in the aft engine mount link or the aft engine mount, refer to TM 1-1520-253-23.
13. Inspect lockwire on engine mount link for breaks.
14. Inspect torque stripe of link body and jam-nuts (21) for breaks.

NOTE

During the inspection of the aft engine mount lugs, inspect for cracks originating from the inboard lug recess at the bolt hole.



15. Inspect lugs (16) on structure. There shall be no cracks, gouges, scratches, or dents deeper than **0.040 inch**.
16. Measure inside diameter of four bushings (12). Diameter shall not be more than **0.502 inch**.
17. Measure inside diameter of two bearings (22). Bearing diameter shall not be more than **0.500 inch**.
18. Measure shank diameter of two bolts (13 and 13.1). Diameter shall not be less than **0.495 inch**.
19. Use a dial indicating scale to apply a **25 to 50 pound** load to bearing (22) in axial direction. Apply a **25 to 50 pound** load to bearing (22) in opposite direction. Measure axial play. Play shall not be more than **0.006 inch**.
20. Apply a **25 to 50 pound** load to bearing (22) in radial direction. Apply a **25 to 50 pound** load to bearing (22) in opposite direction. Measure radial play. Play shall not be more than **0.006 inch**.
21. Repeat steps 19 and 20 four times for each bearing (22). Rotate bearing **90°** each time.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Technical Inspection Tool Kit, NSN 5180-00-323-5114

Materials:

Abrasive Cloth (E1)
 Lacquer, Glossy White (E223), Torque Stripe
 Antiseize Compound (E76)
 Lockwire (E231)

Personnel Required:

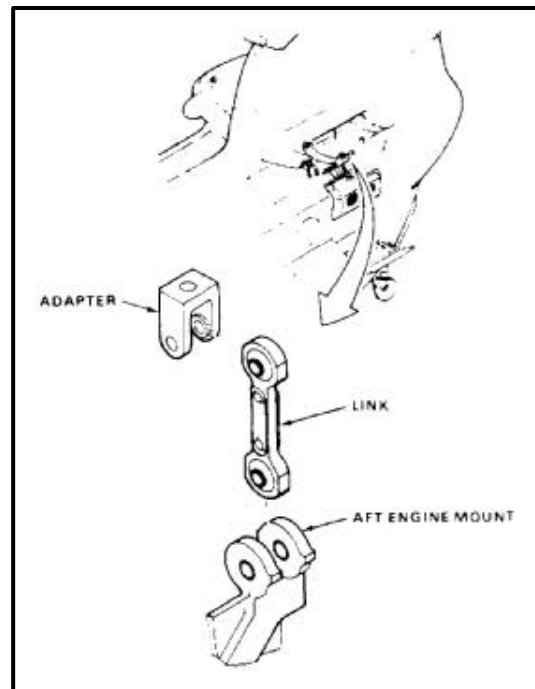
Medium Helicopter Repairer
 Inspector

References:

Task 4-37
 Task 4-38.1

Equipment Condition:

Aft Engine Mount Link and Adapter Removed (Task
 4-36)



Do not burnish deeper than **0.04 inch** on aft engine mount lugs. Do not burnish other areas deeper than **0.040** or **10 percent** of material thickness, whichever is less.

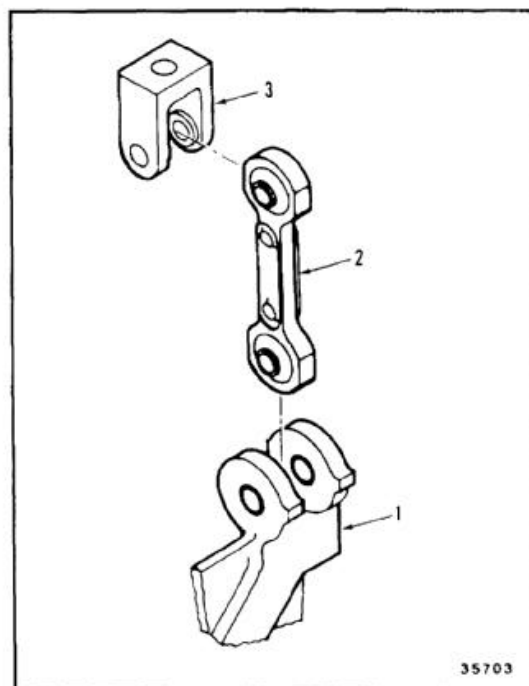
NOTE

Procedure is same to repair No. 1 or No. 2 aft engine mount, link and adapter. No. 1 aft engine mount, link and adapter are shown here.

Any burnished area must blend smoothly into area around it.

Repair procedure is similar for aft engine mount link and adapter parts with **57** and without **57**. Differences are noted.

1. Burnish scratches, dents, or gouges on engine mount (1), link (2), and adapter (3).

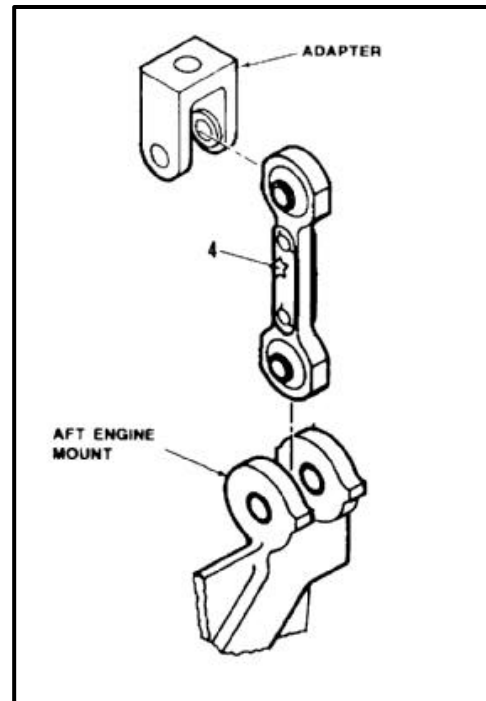


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4-38 REPAIR AFT ENGINE MOUNT, LINK, AND ADAPTER (Continued)

4-38

2. Measure Depth of Damage (4) following Blending/Burnishing.
3. Depth of Blend/Burnish shall not be deeper than **0.040 inch** or **10 percent** of material thickness, whichever is less.

INSPECT

NOTE

The following procedures are only for aft engine mount link with **57**.

NOTE

If evidence indicates that adjustment of the aft engine mount link assembly has been tampered with, re-adjust link assembly (Task 4-38.1).

4. Replace broken lockwire (6). Use lockwire (E231).

NOTE

Before replacing broken torque stripe, check torque on two jamnuts in accordance with Task 4-38.1.

5. Replace broken torque stripe (7) on two jamnuts (8). Use lacquer (E223).

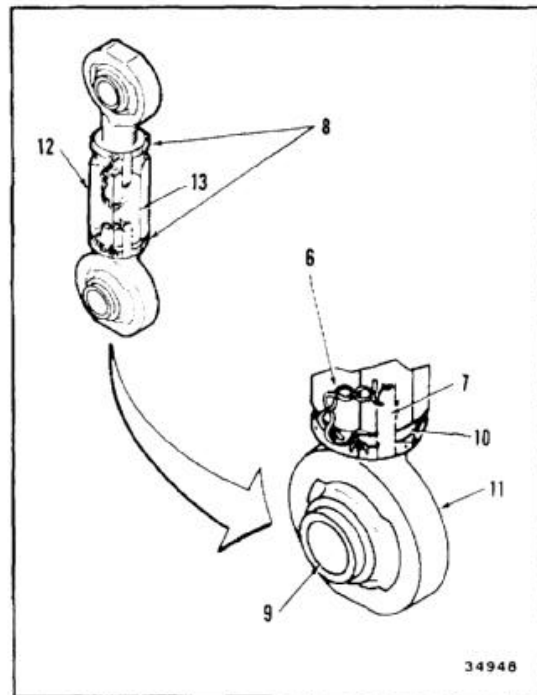
INSPECT

6. If either bearing assembly of the link assembly is worn beyond the axial and radial play limits of Task 4-37, replace the bearings (9) as follows:
 - a. Rotate bearing (9) and align with removal slots in rod end (11). Remove bearing from rod end and discard.
 - b. Clean and inspect bearing surface in rod end. Fretting marks in the bearing race areas may be polished out if the **0.010 inch** maximum axial wear tolerance is not exceeded after polishing.
 - c. Install new bearing (9).
 - d. Check bearing play in accordance with Task 4-37.

NOTE

If bearings are replaced and adjustment has not been tampered with, readjustment of link is not necessary.

- e. If other parts of the link assembly are damaged and require replacement, completely disassemble, clean, inspect, and replace parts as necessary.



- f. Reassemble link as follows:

WARNING

Antiseize compound (E76) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Coat threads of rod ends with antiseize compound (E76).

- (1) Screw rod end (11) with jamnut (7) and locking device (10) into center body (12) until end of rod end is in the center of the sight hole (13).
 - (2) Repeat above procedure for other end.
- g. Re-adjust link assembly in accordance with Task 4-38.1.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-38.1 ADJUSTABLE AFT ENGINE MOUNT LINK ADJUSTMENT

4-38.1

INITIAL SETUP**Applicable Configurations:**With **57****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Vernier Caliper, 6 to 7 Inch, NSN 5210-00-234-8017
 Torque Wrench, 150 to 750 Inch-Pounds
 Drill Bit, 0.063 Inch

Materials:

Lockwire (E231)
 Lacquer, Glossy White (E223), Torque Stripe

Personnel Required:

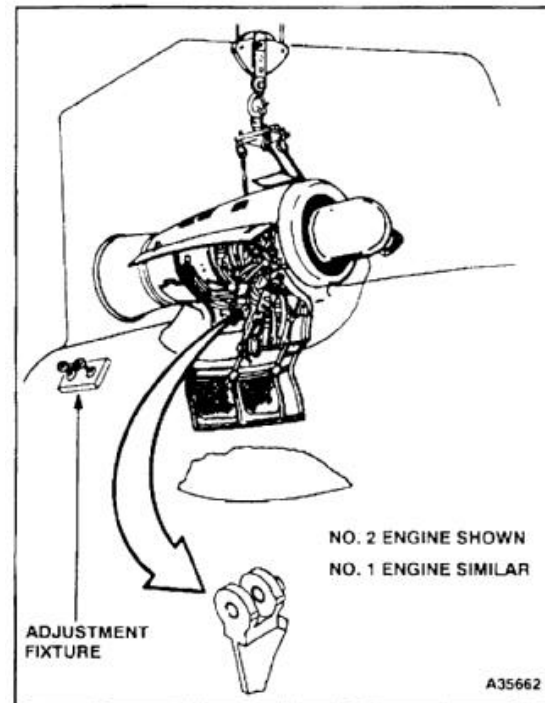
Medium Helicopter Repairer
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Aft Engine Mount Link and Adapter Removed (Task 4-36)

**NOTE**

Adjustable link 145PS700-1 is adjusted to set engine cross shaft alignment at the time of aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixtures are unique and are not interchangeable. This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.

Aft engine mount links that have been modified by **57** with adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.

NOTE

Adjustment procedure is the same for the left and the right adjustable engine mount link. The right mount link is shown here.

1. Use the two **0.50 inch** bolts (1) from the applicable engine mount adjustable link (2) to locate engine mount link (2) between fixture adapters (3). Back off jamnuts (6) to allow rotation of link center body (5). Ensure that as correct length adjustment is reached, bearings on each end of link are in contact with their respective fixture adapters (3). Ensure that bearings do not ride up the shanks of the bolts (1).

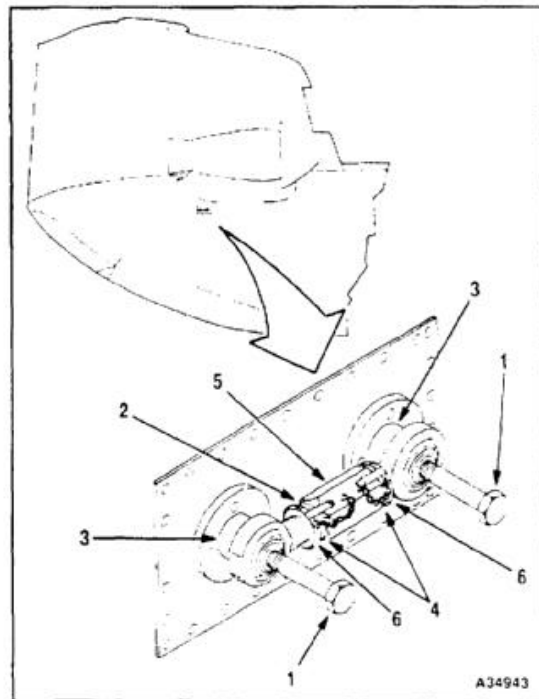
CAUTION

If a **0.063 inch** drill bit enters the turn buckle cavity when inserted in the inspection holes, the maximum allowable link length will have been exceeded. Do not adjust link past this point. Damage to helicopter can occur.

NOTE

Ensure that engine mount link center-body does not turn during tightening.

2. Align keys in two lockwashers (4) with slots in engine mount link center body (5). Tighten two jamnuts (6).
3. Remove engine mount adjustable link from helicopter.



4-38.1 ADJUSTABLE AFT ENGINE MOUNT LINK ADJUSTMENT (Continued)

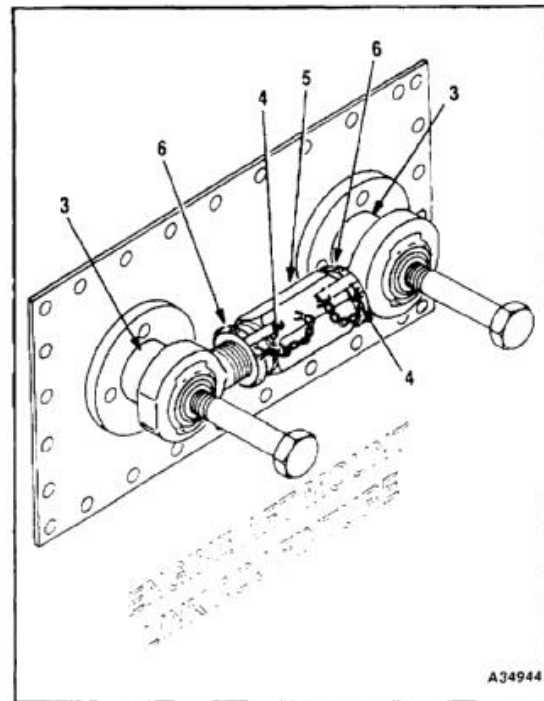
4-38.1

4. Torque two jamnuts (6) to **200 to 300 inch-pounds**.
5. Reinstall engine mount adjustable link (5) on adapters (3) of adjustment fixture to ensure proper adjustment.

NOTE

Bottom end of link assembly has left hand thread and must be lockwired accordingly.

6. Lockwire two jamnuts (6) to two lockwasher tabs (4). Use lockwire (E231).
7. Paint torque stripe on two jamnuts (6) and engine mount link (5) center body. Use lacquer (E223).
8. Remove engine mount adjustable link (5) from adjustment fixture.
9. Measure engine mount adjustable link (5) from end to end to three decimal places with a vernier caliper and record dimension in log book.
10. Vibroetch on link (5) center body helicopter tail number, link's length in inches and which engine (No. 1 or No. 2) link will be installed on.

**FOLLOW-ON MAINTENANCE:**

Install aft engine mount link (Task 4-39).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Hoist
 Sling

Materials:

Lockwire (E231)

Personnel Required:

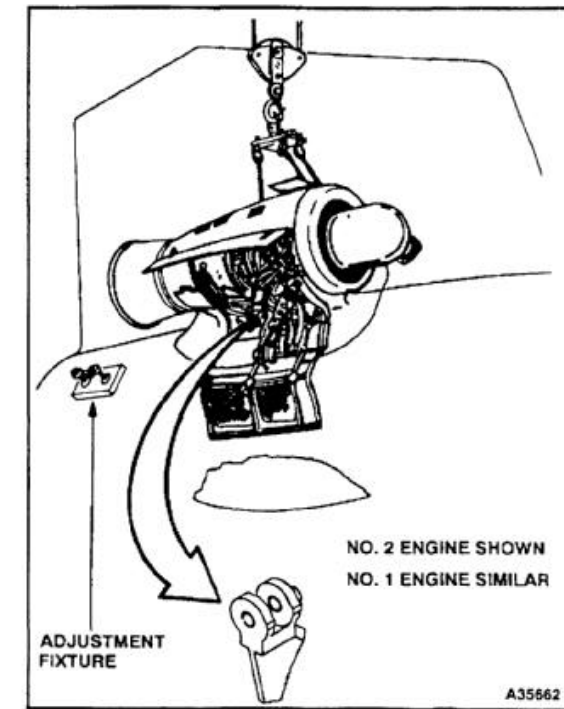
Medium Helicopter Repairer (2)
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

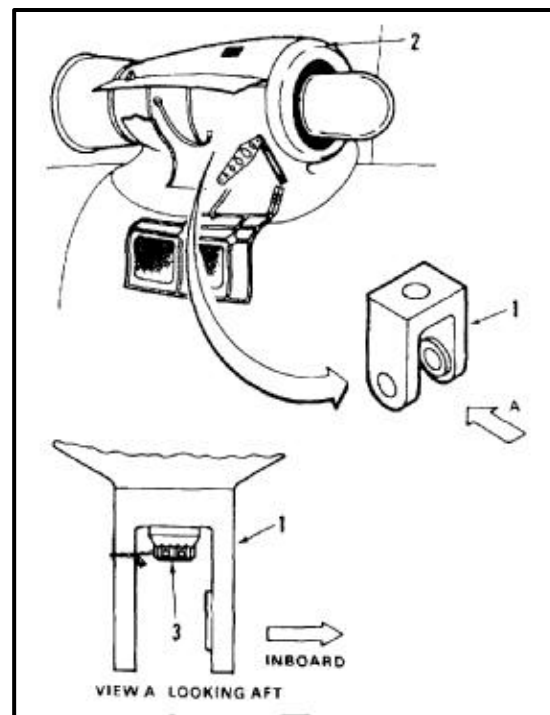
Aft Engine Mount Link and Adapter Removed (Task
 4-36)

**NOTE**

As a result of applying **57** MWO 1-1520-240-50-60 provides instructions to permanently mount old one piece link 114PS223-1 to trailer adapter (T16) to provide support for engine. Do not remove one piece link from trailer adapter (T16).

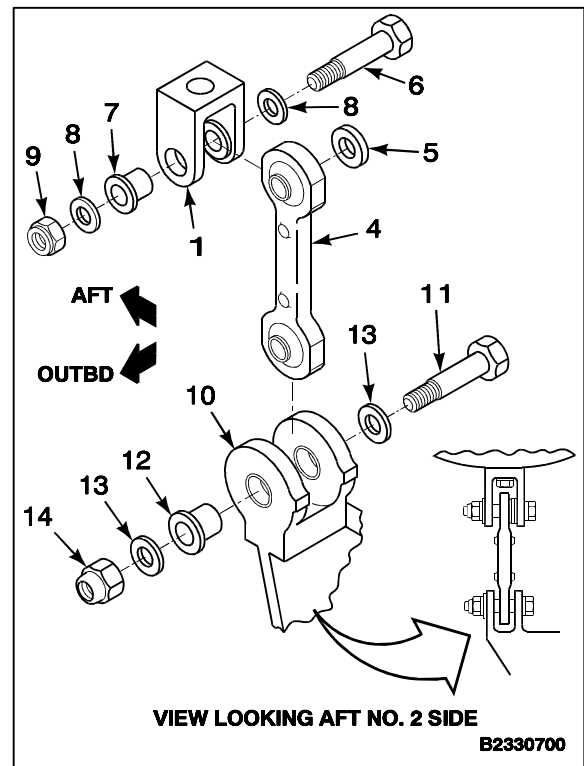
This procedure can be used to install aft engine mount link and adapter on either engine. Link and adapter on No. 2 engine are shown here.

1. Position adapter (1) on engine (2).
2. Install bolt (3).
3. Torque bolt (3) to **300 to 450 inch-pounds**.
4. Lockwire bolt (3). Use lockwire (E231).



**INSTALL AFT ENGINE MOUNT LINK AND ADAPTER
(WITHOUT 57)**

5. Install link (4) as follows:
 - a. Remove tags from link (4), bolts (6 and 11) and spacer (5).
 - b. Align holes in link (4) and spacer (5) with holes in adapter (1). Ensure spacer is on same side as fixed bushing.
 - c. Install bolt (6), bushing (7), two washers (13), and nut (14).
 - d. Align holes in link (4) with holes in aft engine mount (10).
 - e. Install bolt (11), bushing (12), two washers (13), and nut (14).
6. Torque nut (9) to **350-400 inch-pounds** to seat bushing (7). Loosen nut and retorque nut to **20 inch-pounds** above run-on torque value, but in no case should the torque be less than **70 inch-pounds**.
7. Torque nut (14) to **350-400 inch-pounds** to seat bushing (12). Loosen nut and retorque nut to **20 inch-pounds** above run-on torque value, but in no case should the torque be less than **70 inch-pounds**.
8. Go to step 12.

INSPECT

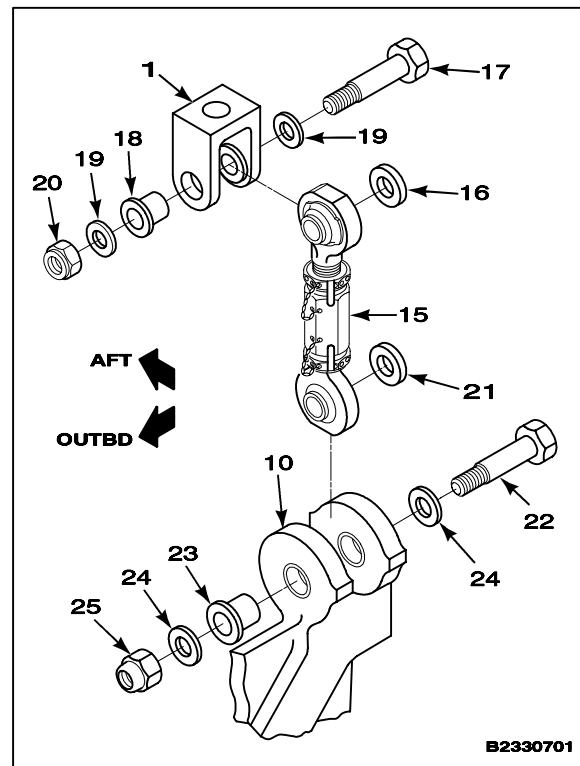
**INSTALL AFT ENGINE MOUNT LINK AND ADAPTER
(WITH 57)**

Adjustable link assembly is adjusted to set engine cross shaft alignment at the time of aircraft manufacture or incorporation of MWO 1-1520-240-50-60. The adjustment fixture are unique and are not interchangeable. This preserves the proper link length measurement for each engine should the link need to be replaced or adjusted.

Aft engine mount links that have been modified by 57 adjustable link 145PS700-1 must not be replaced with fixed link 114PS223-1.

NOTE

When installing adjustable link ensure that 'up arrow', located on the link center body, is pointing towards the underside of the engine.

**NOTE**

The engine mount should be installed so that the lower bearing loader slot faces outboard. Failure to do so would allow the mount to twist causing damage to the airframe lug.

9. Install link (15) as follows:
 - a. Remove tags from link (15), bolts (17 and 22), and spacers (16 and 21).
 - b. Align holes in link (15) and spacer (16) with holes in adapter (1).
 - c. Install bolt (17), bushing (18), two washers (19), and nut (20).
 - d. Align holes in link (15) and spacer (21) with holes in aft engine mount (10).
 - e. Install bolt (22), bushing (23), two washers (24), and nut (25).
10. Torque nut (20) to **350-400 inch-pounds** to seat bushing (18). Loosen nut and retorque nut to **20 inch-pounds** above run-on torque value, but in no case should the torque be less than **70 inch-pounds**.

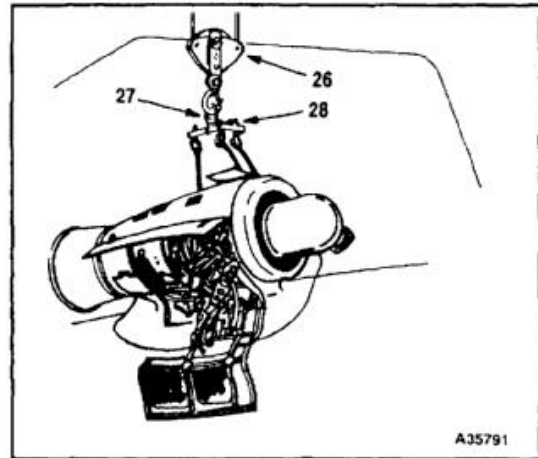
11. Torque nut (25) to **350-400 inch-pounds** to seat bushing (23). Loosen nut and retorque nut to **20 inch-pounds** above run-on torque value, but in no case should the torque be less than **70 inch-pounds**.

INSPECT

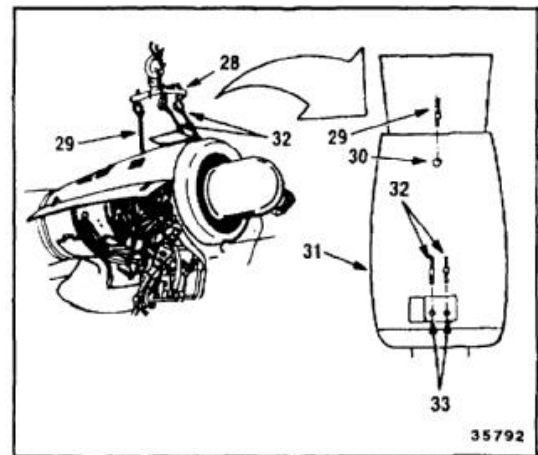
4-39 INSTALL AFT ENGINE MOUNT LINK AND ADAPTER (Continued)

4-39

12. Lower hoist (26). Disconnect hoist (26) from eye (27) of sling (28).



13. Remove sling (28) as follows:
- Disconnect cable (29) from aft fitting (30) through cover (31).
 - Disconnect two cables (32) from forward fittings (33) on powerplant.

**FOLLOW-ON MAINTENANCE:**

- Close engine side access doors and lower access door (Task 4-49).
- Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Drift Pin (Brass)

Materials:

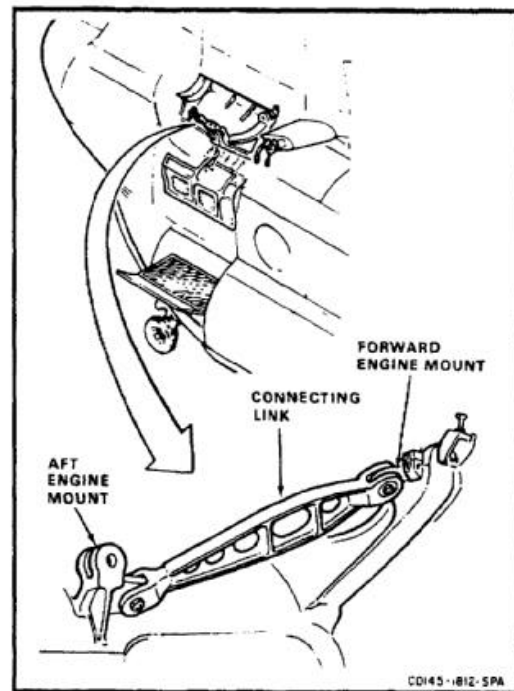
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

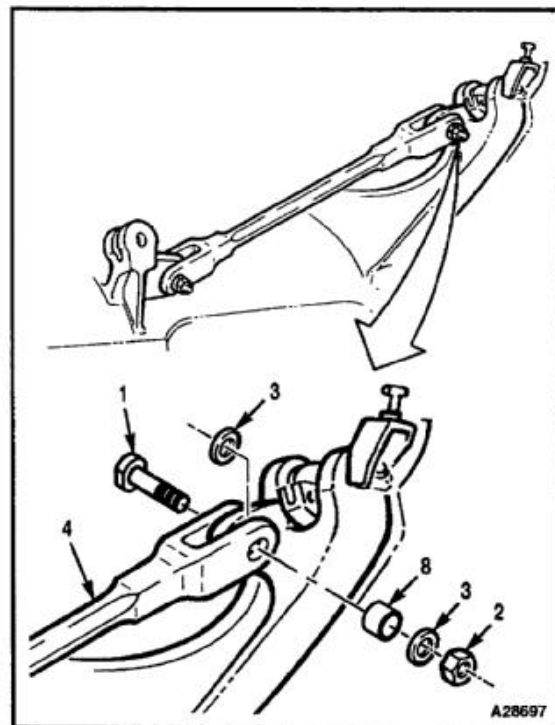
Battery Disconnected (Task 1-39)
Electrical Power Off
Powerplant Removed (Task 4-10)

**NOTE**

Procedure can be used to remove connecting link (drag strut) on No. 1 or No. 2 engine. Link on No. 2 engine is shown here.

A drift pin and hammer may be used to remove bolt, if necessary.

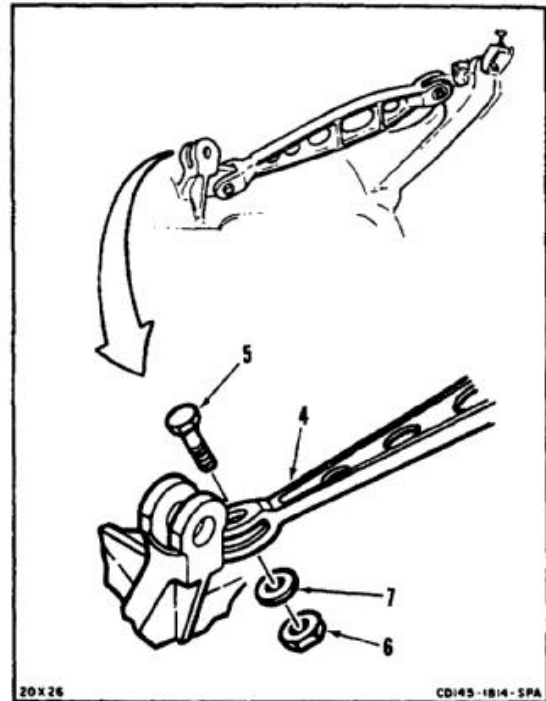
1. Remove bolt (1), nut (2), bushing (8), and washers (3) from link (4).



4-40 REMOVE CONNECTING LINK (DRAG STRUT) (Continued)

4-40

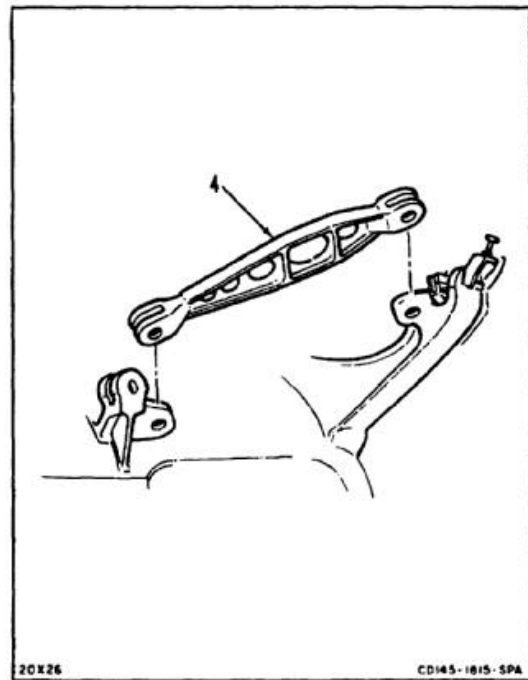
2. Remove bolt (5), nut (6), and washer (7) from link (4).



3. Remove link (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Drift Pin (Brass)

Materials:

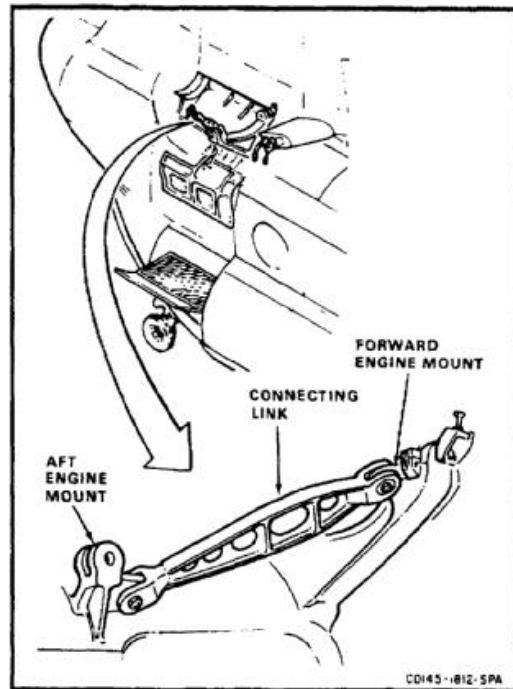
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Powerplant Removed (Task 4-10)

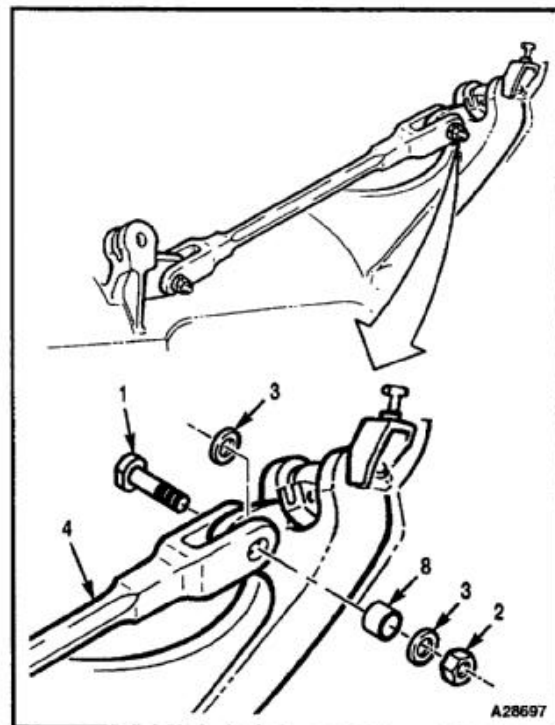


NOTE

Procedure can be used to remove connecting link (drag strut) on No. 1 or No. 2 engine. Link on No. 2 engine is shown here.

A drift pin and hammer may be used to remove bolt, if necessary.

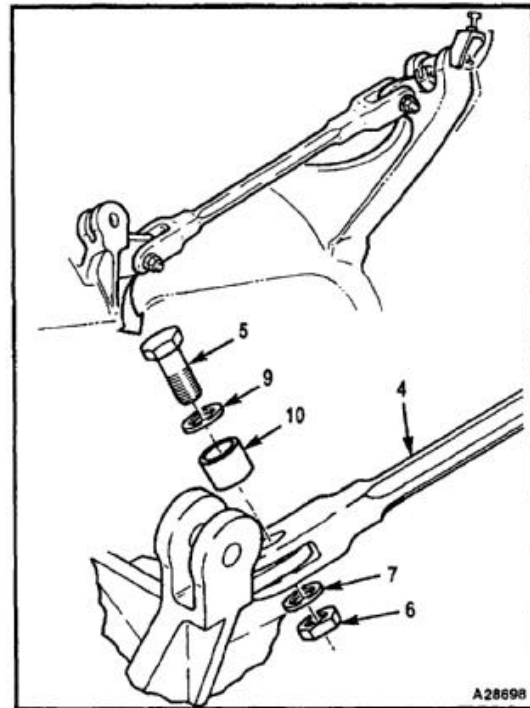
1. Remove bolt (1), nut (2), washers (3), and bushing (8) from link (4).



4-40.1 REMOVE CONNECTING LINK (DRAG STRUT) (Continued)

4-40.1

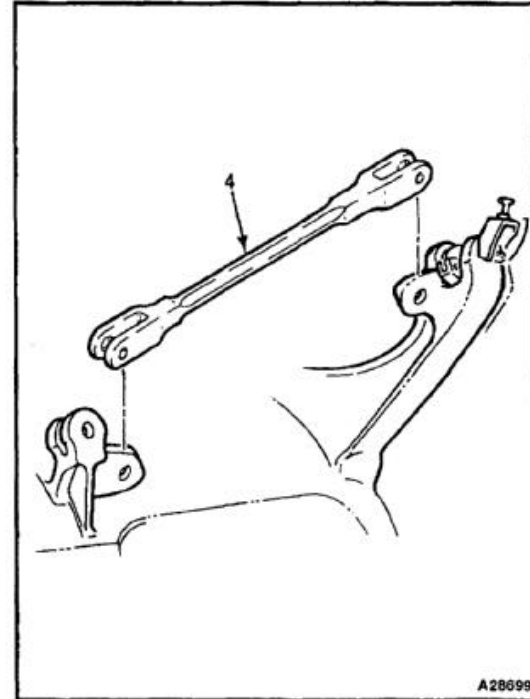
2. Remove bolt (5), washer (9), nut (6), washer (7), and bushing (10) from link (4).



3. Remove link (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Technical Inspection Tool Kit, NSN 5180-00-323-5114
 Dial Indicating Scale, 0 to 50 Pounds
 Vernier Caliper
 Micrometer

Materials:

Dry Cleaning Solvent (E162)
 Cloths (E135)
 Gloves (E136)

Personnel Required:

Medium Helicopter Repairer
 Inspector

References:

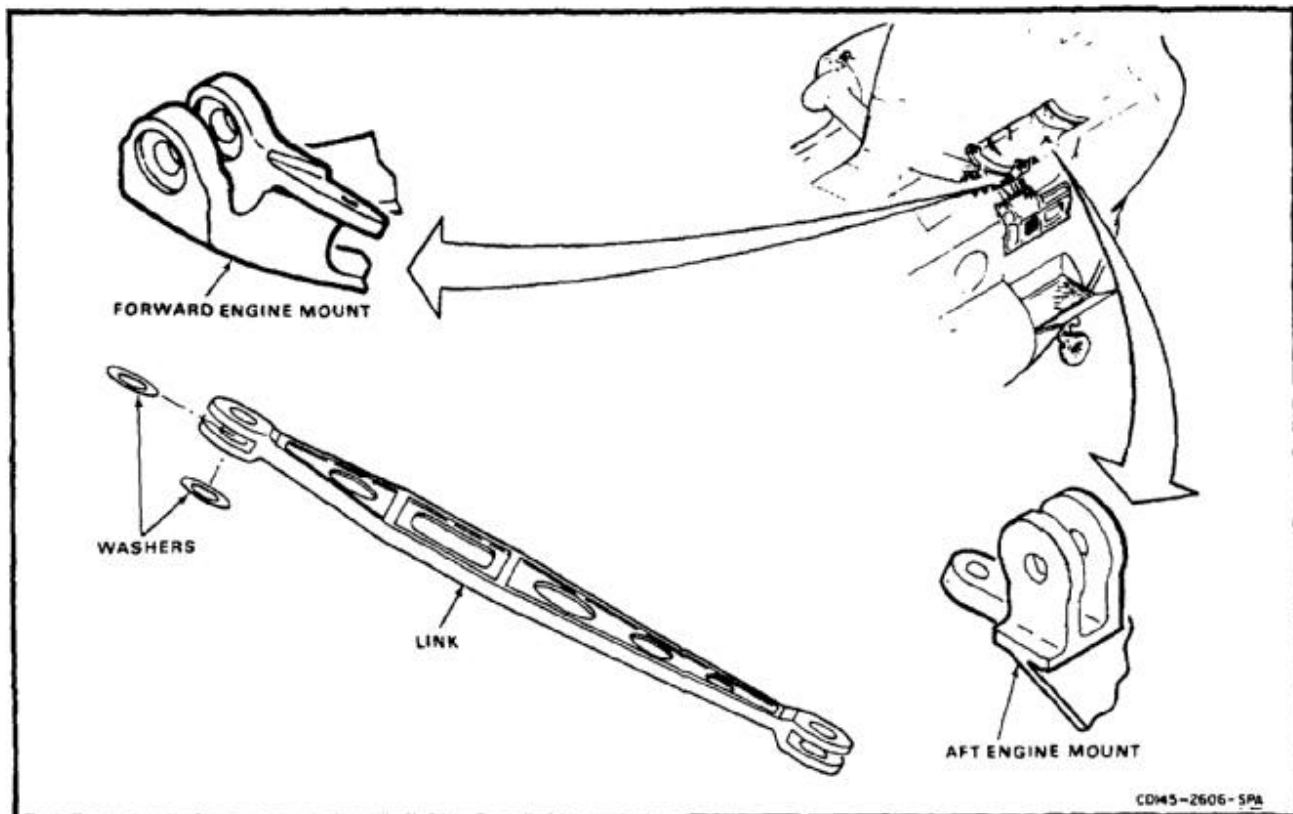
TM 1-1520-253-23

Equipment Condition:

Connecting Link Removed (Task 4-40)

General Safety Instructions:**WARNING**

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



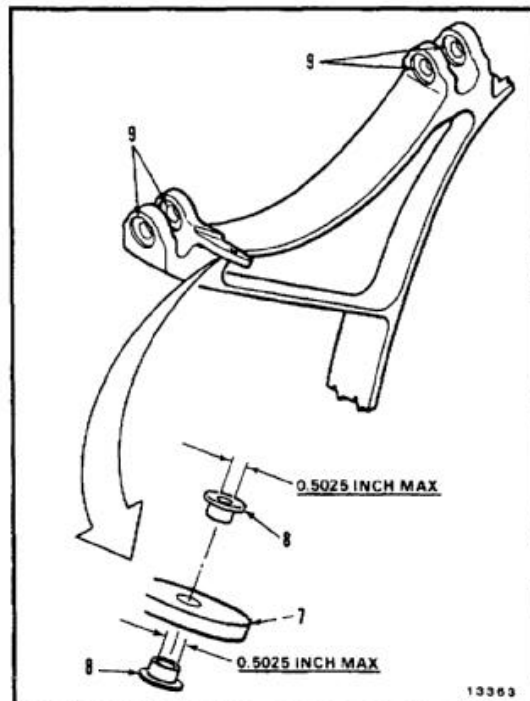
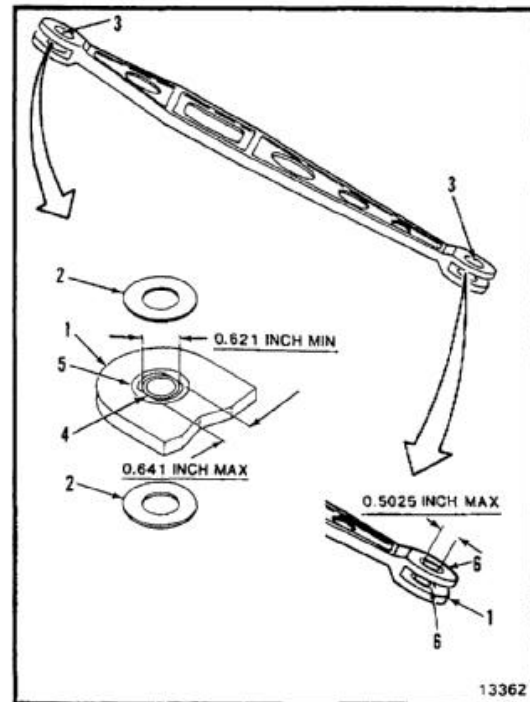
4-41 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41

NOTE

Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.

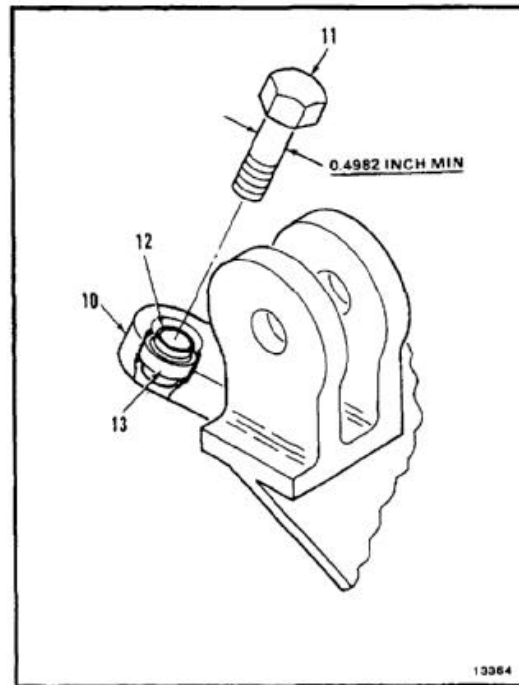
1. Clean link (1) and two washers (2). Use solvent (E162) and cloth (E135). Wear gloves (E186).
2. Check surface of link (1) for nicks, scratches, and gouges. Damage in areas other than bores (3) is acceptable if it does not exceed **0.040 inch** or **10 percent** of material thickness, whichever is less. If a crack is suspected in the connecting link, refer to TM 1-1520-253-23.
3. Inspect bushing (4) for wear. Outside diameter shall not be less than **0.621 inch**.
4. Measure inside diameter of insert (5) across flats. Inside diameter shall not exceed **0.641 inch**.
5. Measure two washers (2). Washers shall be **0.015 inch to 0.035 inch** thick. Maximum allowable reduction of thickness at wear spots is **0.002 inch**.
6. Inspect bushings (6) on lower end of link (1). Inside diameter shall not exceed **0.5025 inch**.
7. Clean fitting (7) and two bushings (8). Use solvent (E162) and cloth (E135). Wear gloves (E186).
8. Check surface of fitting (7) for nicks, scratches, and gouges. Damage in areas other than bores (9) is acceptable if it does not exceed **0.040 inch** or **10 percent** of material thickness, whichever is less.
9. Inspect two bushings (8) in fitting (7). Inside diameter shall not exceed **0.5025 inch**.



4-41 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41

10. Clean fitting (10) and bolt (11). Use solvent (E162) and cloth (E135). Wear gloves (E186).
11. Check surface of fitting (10) for nicks, scratches, and gouges. Damage in areas other than bore (13) is acceptable if it does not exceed **0.040 inch or 10 percent** of material thickness, whichever is less.
12. Measure shank of bolt (11). Diameter shall not be less than **0.4982 inch**. Record measurement.
13. Measure inside diameter of bearing (12) in aft mount fitting (10). Record measurement.
14. Subtract measurement made in step 12 from measurement made in step 13. Difference shall not be more than **0.002 inch**.
15. Apply **25 to 50 pound** load to bearing (12) in an axial direction. Apply **25 to 50 pound** load in opposite direction. Measure axial play between bearing and race (13). Play shall not exceed **0.025 inch**.
16. Apply **25 to 50 pound** load to bearing (12) in a radial direction. Apply **25 to 50 pound** load in opposite direction. Measure radial play between bearing and race (13). Play shall not exceed **0.006 inch**.
17. Measure radial play between race (13) and fitting (10). Play shall not exceed **0.002 inch**.


FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-216

4-41.1 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS

4-41.1

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

- Technical Inspection Tool Kit, NSN 5180-00-323-5114
- Dial Indicating Scale, 0 to 50 Pounds
- Vernier Caliper
- Micrometer

Materials:

- Dry Cleaning Solvent (E162)
- Cloths (E135)
- Gloves (E184.1)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

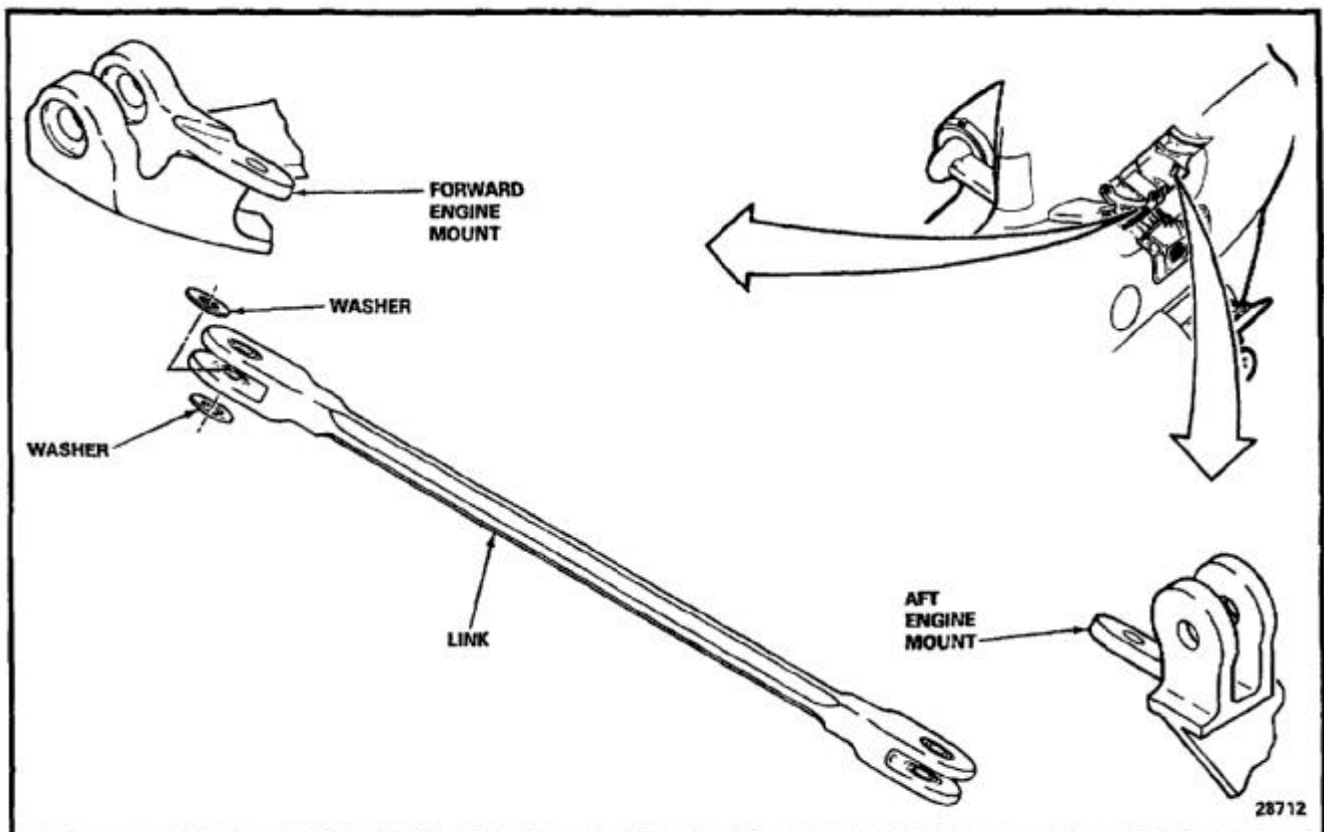
Equipment Condition:

Connecting Link Removed (Task 4-40.1)

General Safety Instructions:

WARNING

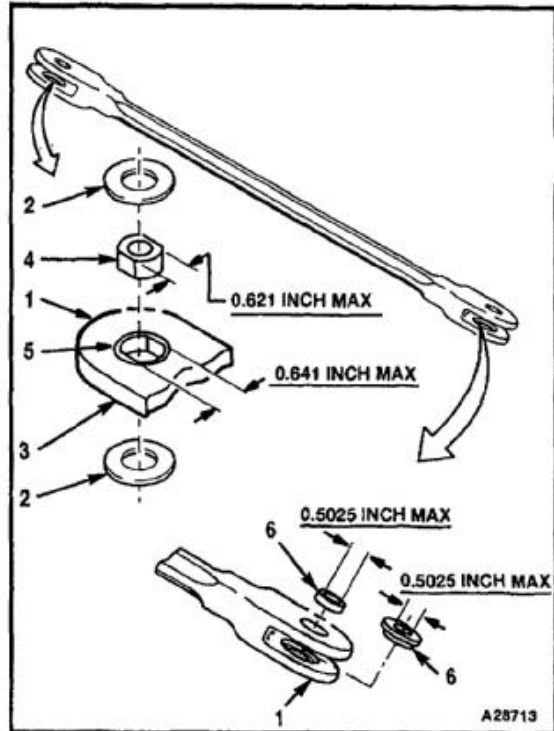
Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



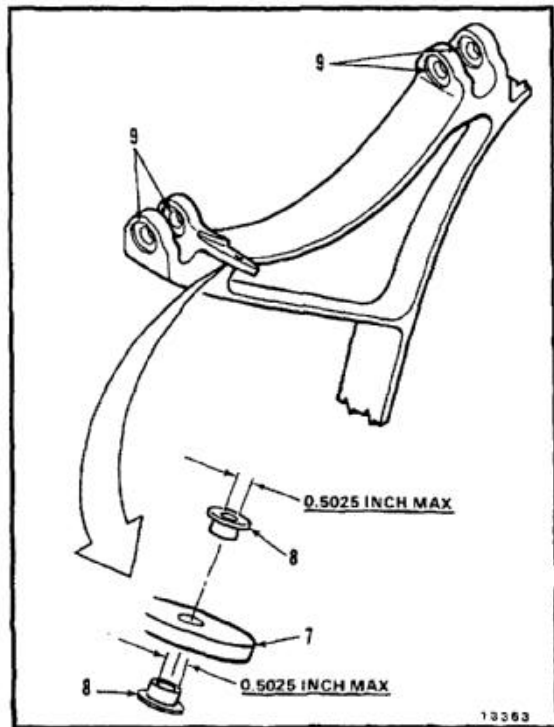
NOTE

Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.

1. Clean link (1) and two washers (2). Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
2. Check surface of link (1) for nicks, scratches, and gouges. Damage in areas other than bores (3) is acceptable if it does not exceed **0.040 inch or 10 percent** of material thickness, whichever is less.
3. Inspect bushing (4) for wear. Outside diameter shall not be less than **0.621 inch** across flats.
4. Measure inside diameter of insert (5) across flats. Inside diameter shall not exceed **0.641 inch**.
5. Measure two washers (2). Washers shall be **0.022 inch to 0.028 inch** thick. Maximum allowable reduction of thickness at wear spots is **0.002 inch**.
6. Inspect bushings (6) on lower end of link (1). Inside diameter shall not exceed **0.5025 inch**.



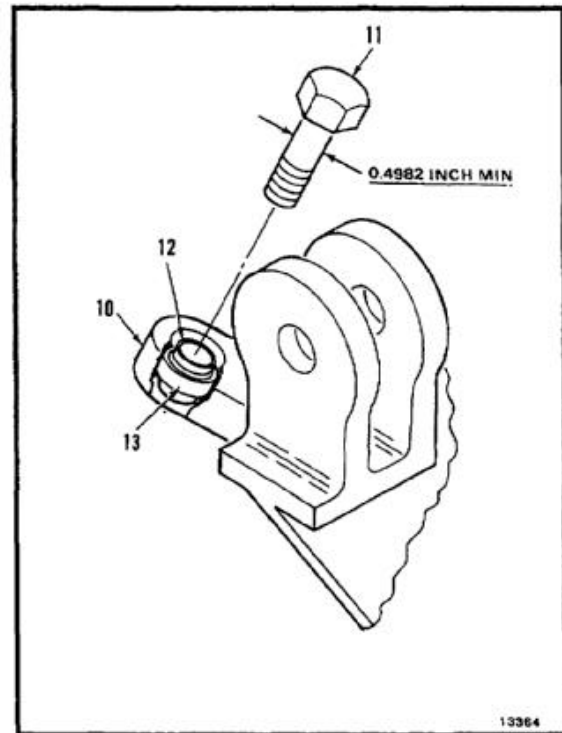
7. Clean fitting (7) and two bushings (8). Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
8. Check surface of fitting (7) for nicks, scratches, and gouges. Damage in areas other than bores (9) is acceptable if it does not exceed **0.040 inch or 10 percent** of material thickness, whichever is less.
9. Inspect two bushings (8) in fitting (7). Inside diameter shall not exceed **0.5025 inch**.



4-41.1 INSPECT CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (Continued)

4-41.1

10. Clean fitting (10) and bolt (11). Use solvent (E162) and cloth (E135). Wear gloves (E184.1).
11. Check surface of fitting (10) for nicks, scratches, and gouges. Damage in areas other than bore (13) is acceptable if it does not exceed **0.040 inch or 10 percent** of material thickness, whichever is less.
12. Measure shank of bolt (11). Diameter shall not be less than **0.4982 inch**. Record measurement.
13. Measure inside diameter of bearing (12) in aft mount fitting (10). Record measurement.
14. Subtract measurement made in step 12 from measurement made in step 13. Difference shall not be more than **0.002 inch**.
15. Apply **25 to 50 pound** load to bearing (12) in an axial direction. Apply **25 to 50 pound** load in opposite direction. Measure axial play between bearing and race (13). Play shall not exceed **0.025 inch**.
16. Apply **25 to 50 pound** load to bearing (12) in a radial direction. Apply **25 to 50 pound** load in opposite direction. Measure radial play between bearing and race (13). Play shall not exceed **0.006 inch**.
17. Measure radial play between race (13) and fitting (10). Play shall not exceed **0.002 inch**.


FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Mechanical Puller
 Micrometer Depth Gage
 Outside Micrometer Caliper, 0 to 1 Inch
 Staking Tool (T109)
 Vernier Caliper
 Arbor Press
 Installation Bar (APP E-123)

Materials:

Brush (E85)
 Cloths (E135)
 Chalk (E110)
 Kevlar Gloves (E187)
 Epoxy Primer (E292)
 Carbon Dioxide (Dry Ice) (E92)
 Gloves (E184.1)
 Sealant (E328)
 Steel, Bar (E367)

Parts:

Bushings
 Bearing

Personnel Required:

Machinist
 Inspector

References:

TM 55-1520-240-23P
 TM 1-1500-204-23
 TM 55-1500-322-24

Equipment Condition:

Connecting Link Removed (Task 4-40 Without **74**,
 Task 4-40.1 With **74**)

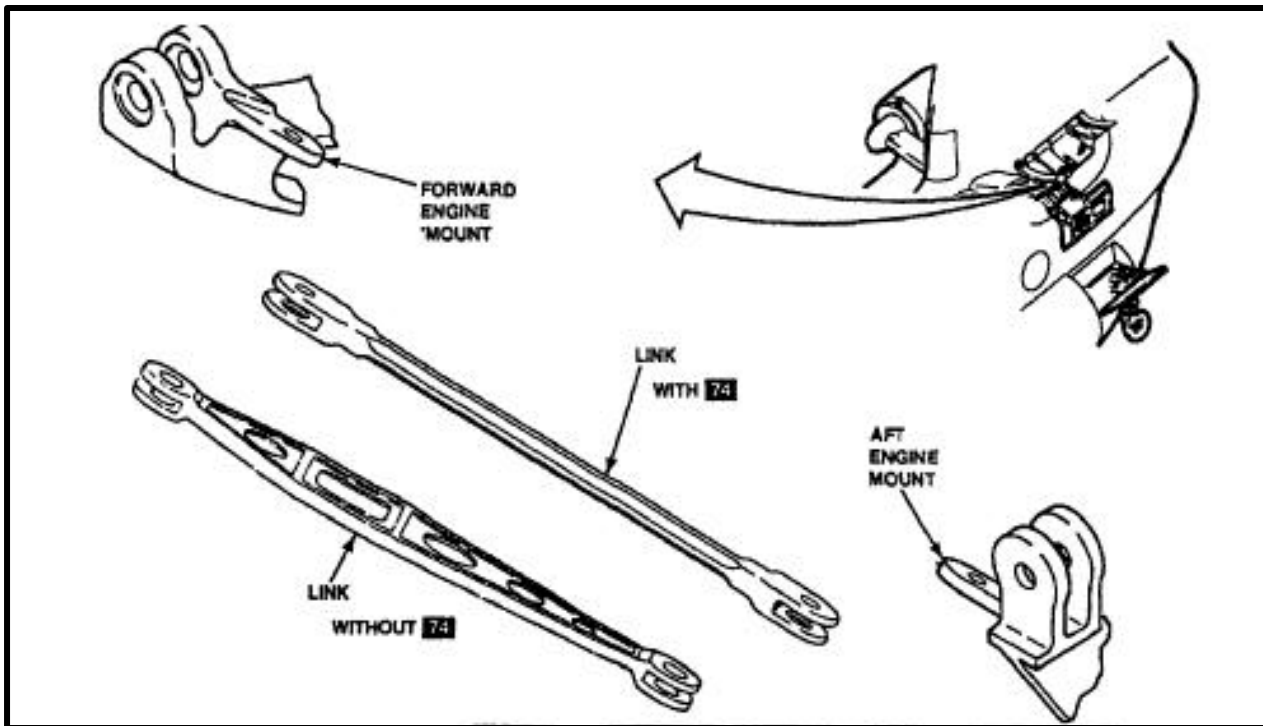
General Safety Instructions:**WARNING**

Epoxy primer (E292) is flammable and very toxic. It can irritate skin and cause burns. Protective clothing or body suit with respirator and eye protection is required if material is to be applied by spraying. Use only in well-ventilated area away from open flame and excessive heat. In case of contact, immediately flush skin or eyes with plenty of water for at least **15 minutes**. Get medical attention for eyes.

WARNING

Carbon dioxide (dry ice) (E92) causes severe burns and may be toxic. Use only in well-ventilated area. Do not get in eyes, on skin or clothing. In case of contact, immediately flush skin with plenty of water for at least **15 minutes**. Get medical attention for eyes.

4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS
(AVIM) (Continued)



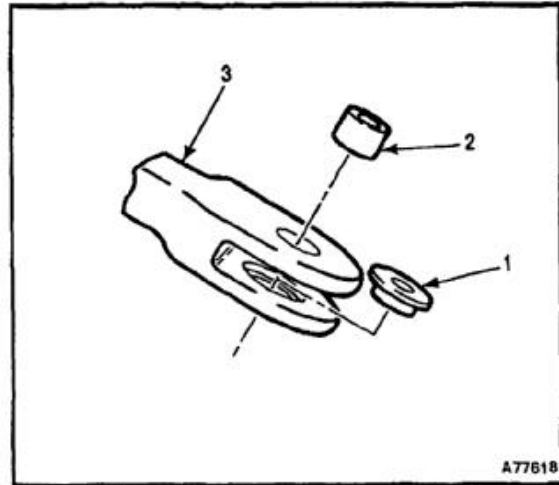
WARNING

Wear Kevlar gloves (E187) when handling heated or chilled parts. Injury to personnel can result.

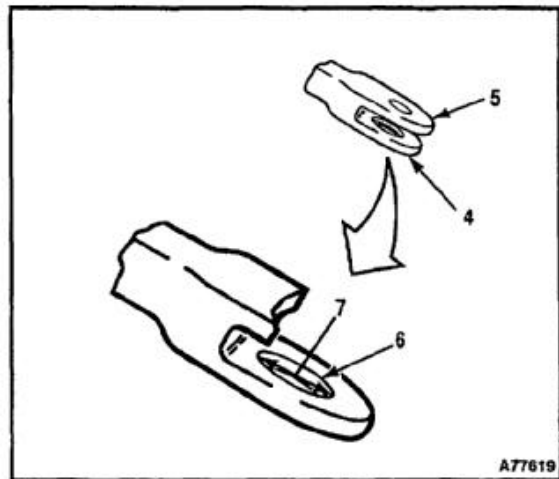
NOTE

Procedure can be used for No. 1 or No. 2 engine connecting link and fittings. Link and fittings for No. 1 engine are shown.

It may be necessary to freeze bushing areas with carbon dioxide (E92) for easier removal of bushings.

**REPLACE BUSHINGS IN LINK AND FORWARD ENGINE MOUNT FITTING**

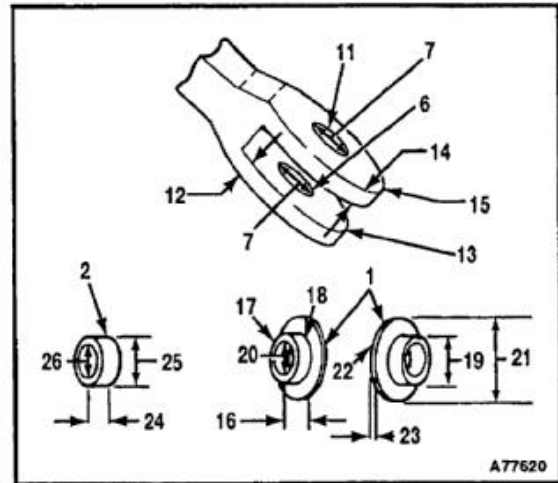
1. Replace shoulder bushing (1) and shoulderless bushing (2) as follows:
 - a. Remove shoulder bushing (1) and shoulderless bushing (2) from link (3).



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

4-42

- b. Ream lug (4) in line with other lug (5). Make a round hole (6) with an inside diameter (7) no larger than **0.6562 inch**.
- c. Measure inside diameter (7) of hole (6 and 11). Record measurement.
- d. Measure width (12) of lug (13). Record measurement.
- e. Measure width (14) of lug (15). Record measurement.
- f. Make new shoulder bushing (1) from steel (E367) as follows:
 - (1) Make bushing length (16) from flat end (17) to counterbore (18) equal to lug width (12). (See measurement recorded in step d.)
 - (2) Make outside diameter (19) of bushing (1) **0.0008 to 0.0020 inch** more than inside diameter (7) of hole (6). (See measurement recorded in step c.)
 - (3) Make inside diameter (20) of bushing (1) **0.500 inch**.
 - (4) Make outside diameter (21) of shoulder (22) **0.07500 inch**.
 - (5) Make width (23) of shoulder (22) **0.062 inch**.
- g. Make new shoulderless bushing (2) from steel (E367) as follows:
 - (1) Make bushing length (24) **0.4012 to 0.4062 inch**.
 - (2) Make outside diameter (25) **0.0008 to 0.0023 inch** more than inside diameter of hole (7). (See measurement recorded in step c.)
 - (3) Make inside diameter (26) of bushing (2) **0.500 inch**.

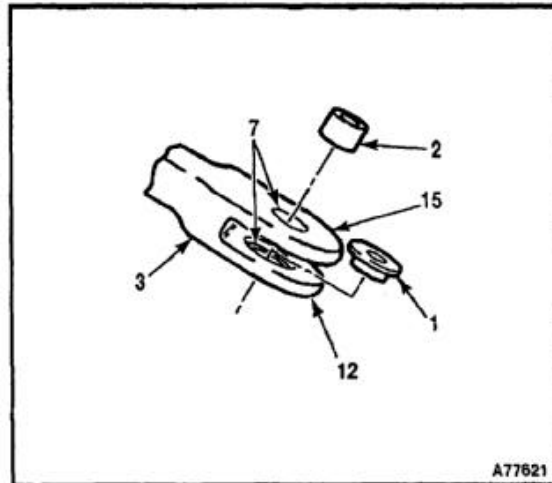


- h. Coat inside of holes (7) in lugs (12 and 15) with epoxy primer (E292). Wear gloves (E184.1).

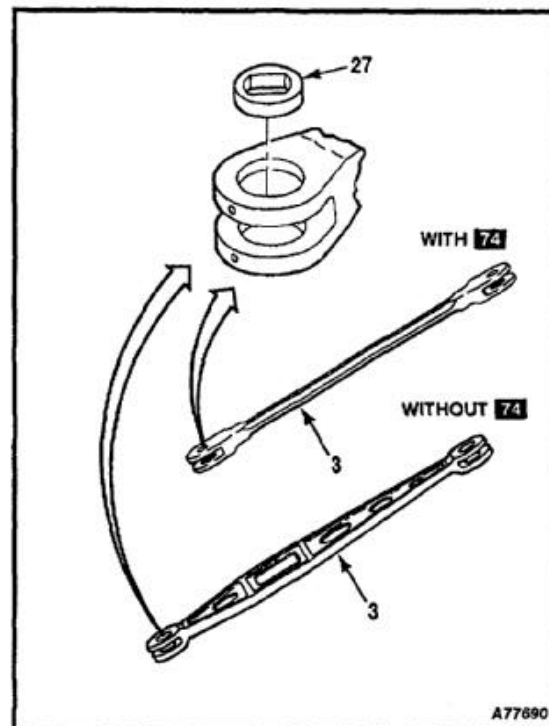
NOTE

Bushings must be installed while epoxy primer (E292) is still wet.

- i. Install new shoulder and shoulderless bushings (1 and 2) in lugs (12 and 15) of link (3).
- j. Wipe off any excess primer (E292) from lugs (12 and 15). Use cloths (E135).

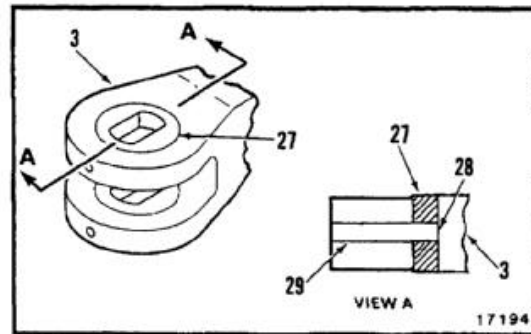


- 2. Replace slotted bushing (27) in link (3) as follows:



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

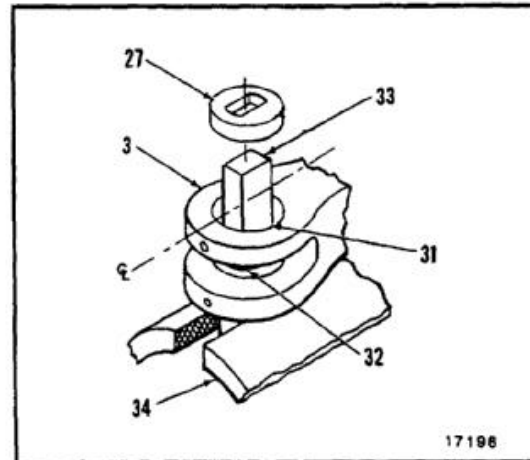
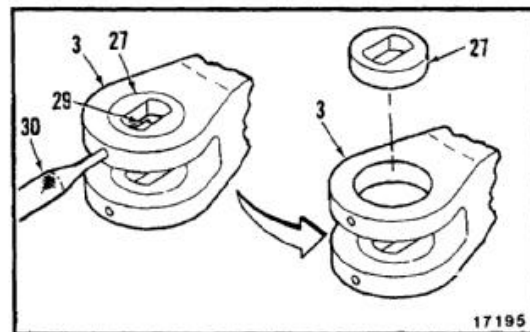
- a. If necessary, grind inside surface (28) of bushing (27) in link (3) to expose end of lockpin (29).
- b. Remove lockpin (29) by driving lockpin through link (3) into slot of bushing (27). Use drift (30). Cut off lockpin about halfway into slot and continue driving until lockpin is removed.
- c. Remove bushing (27) from link (3).



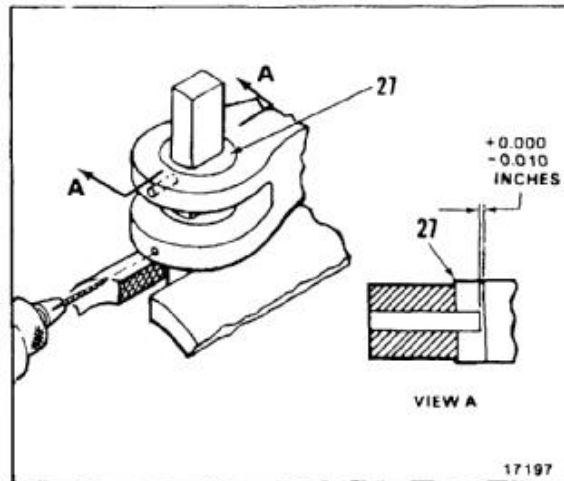
NOTE

Slot in bushing (27) must be parallel to centerline of hole (31) and slot of other bushing (32) within $1/4^\circ$.

- d. Install new bushing (27) in link (3). Use bar (APP E-123) (33) and vise (34).



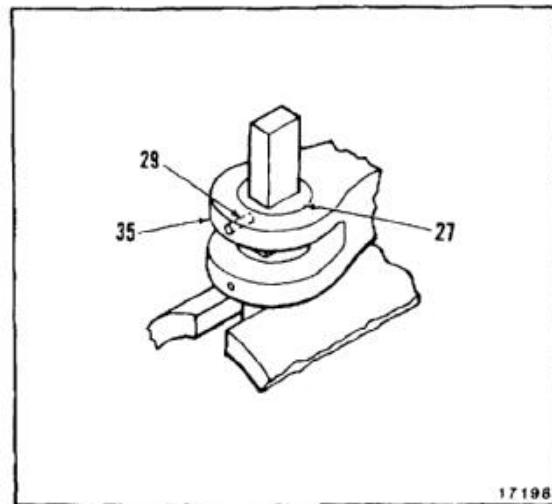
- e. Drill **0.0927 to 0.0937 inch** round hole into new bushing (27) to within approximately **0.010 inch** of inside edge of bushing.



NOTE

Do not allow lockpin (29) to protrude into slot of bushing (27) after peening.

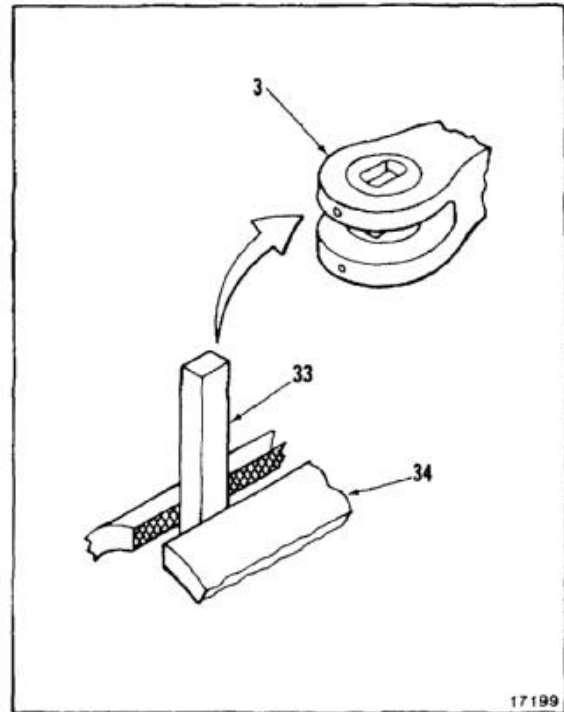
- f. Insert new lockpin (29) and peen lug (35) over lockpin at **90°** to original peen.



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

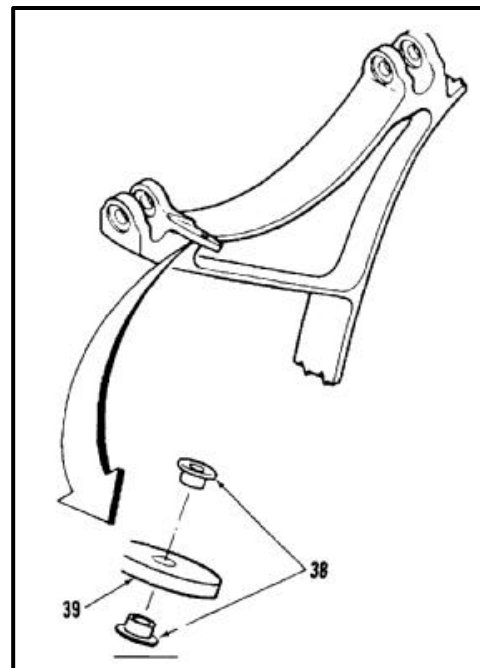
4-42

- g. Remove link (3) from bar (33) and vise (34).



3. Replace shoulder bushings (38) in forward engine mount fitting (39) as follows:

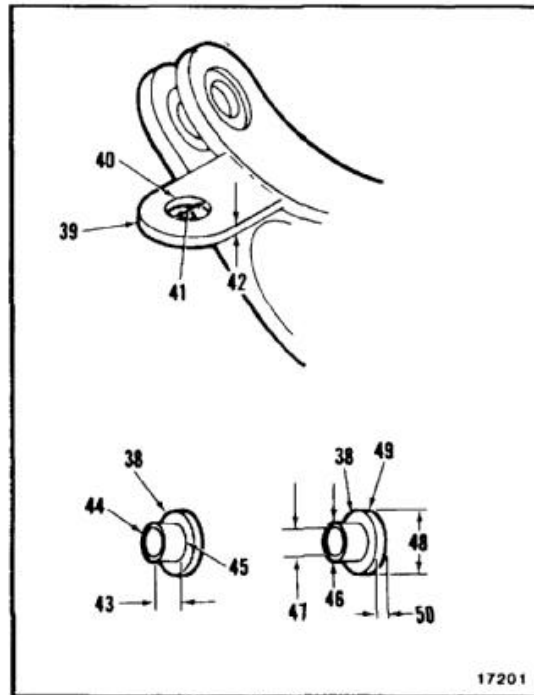
- a. Remove shoulder bushings (38) from engine mount fitting lug (39).



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

4-42

- b. Ream lug (39). Make a round hole (40) with an inside diameter (41) no larger than **0.6562 inch**.
- c. Measure inside diameter (41) of hole (40). Record measurement.
- d. Measure width (42) of lug (39). Record measurement.
- e. Make new shoulder bushings (38) from steel (E367) as follows:
 - (1) Make length (43) from flat end (44) to counterbore (45) equal to one half of lug width (42). (See measurement recorded in step d.)
 - (2) Make outside diameter (46) of bushing (38) **0.0008 to 0.0020 inch** more than inside diameter (40) of hole (41). (See measurement recorded in step c.)
 - (3) Make inside diameter (47) of bushing (38) **0.500 inch**.
 - (4) Make outside diameter (48) of shoulder (49) **0.7500 inch**.
 - (5) Make width (50) of shoulder (49) **0.062 inch**.
- f. Coat inside of hole (40) in lug (39) with epoxy primer (E292). Wear gloves (E184.1).



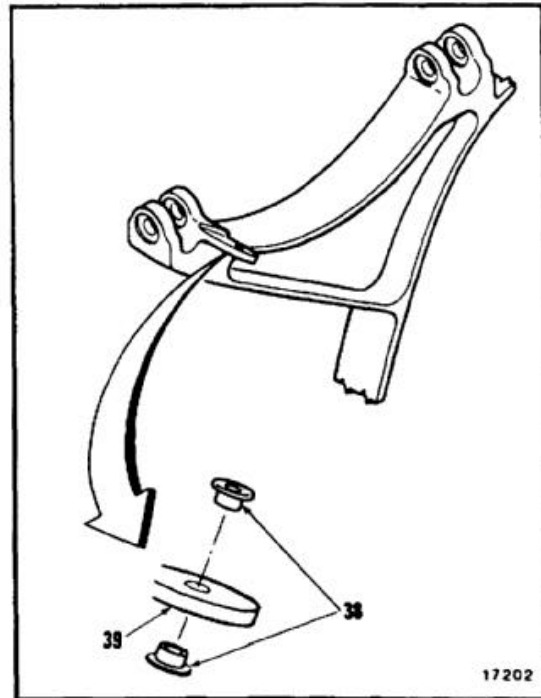
4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

4-42

NOTE

Bushings must be installed while epoxy primer (E292) is still wet.

- g. Install new shoulder bushings (38) in engine mount fitting lug (39).
- h. Wipe off any excess epoxy primer (E292) from lug (39). Use cloths (E135).



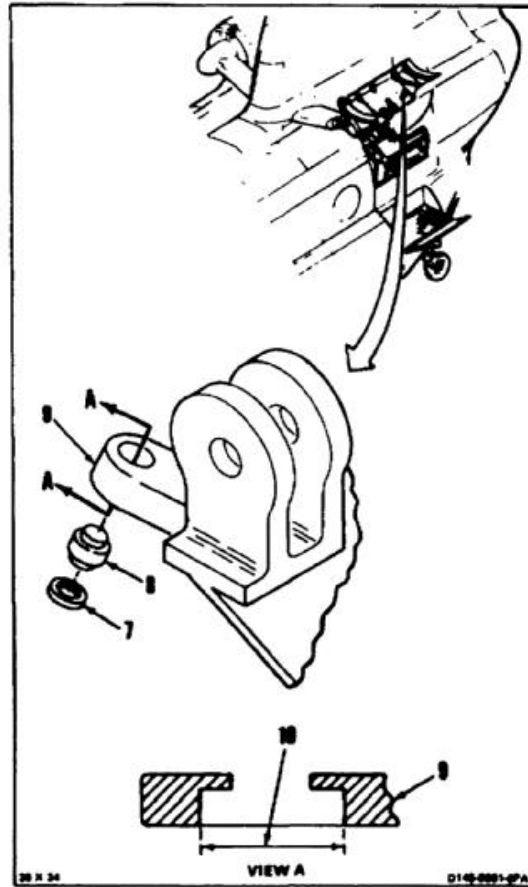
INSTALL BEARING AND OVERSIZE BUSHING IN AFT MOUNT FITTING

4. Remove retainer and bearing (8) from aft engine mount fitting.
5. Measure diameter of hole (10) in fitting (9). If dimension is **1.125 inches or less**, go to step 16. If dimension is greater than **1.125 inches**, go to step 6.

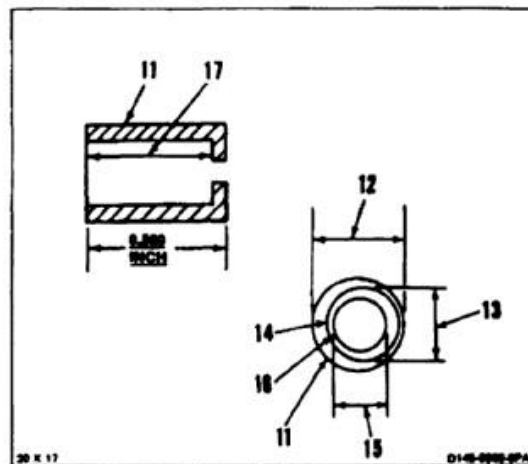


Do not increase hole depth when reaming lug.

6. Ream hole (10) in fitting (9) to **1.3120 inches**. Do not increase hole depth.

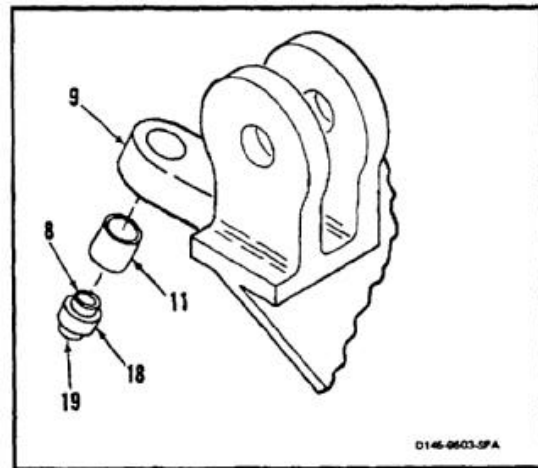


7. Make eccentric bushing (11) from steel (E387) as follows:
 - a. Make bushing (11) **0.560 inch** in length.
 - b. Make outside diameter (12) of bushing (11) **1.3125 inches**.
 - c. Make inside diameter (13) of hole (14) in bushing (11) **1.000 inch and 0.010 inch** off center.
 - d. Make inside diameter (15) of hole (16) in bushing (11) **1.245 inches and 0.010 inch** off center.
 - e. Make depth (17) of hole in bushing (11) **0.381 inch**.

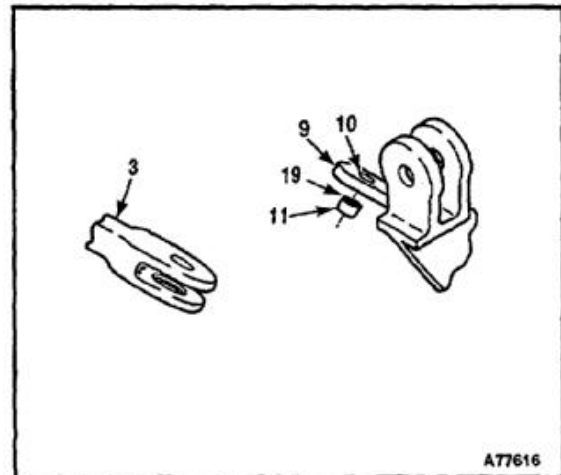


4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

8. Apply epoxy primer (E292) to outside of race (18), inside of bushing (11), and hole in fitting (9). Allow primer to dry. Wear gloves (E184.1).
9. Brush outside of race (18) and inside of bushing (11) with sealant (E328). Wear gloves (E184.1).
10. Install bearing (8) in bushing (11).



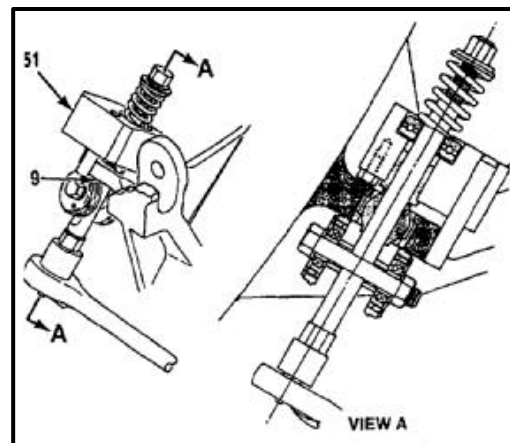
11. Position link (3) on aft engine mount fitting (9). Align holes in lower end of link (3), bearing (19), and fitting. Mark position of bushing (11) with chalk (E110).
12. Brush outside of bushing (11) and hole (10) in fitting (9) with sealant (E328).
13. Align bushing (11) with mark on fitting (9) found in step 11. Install bushing in fitting.



14. Stake fitting (9). Use staking tool (51) (T109).

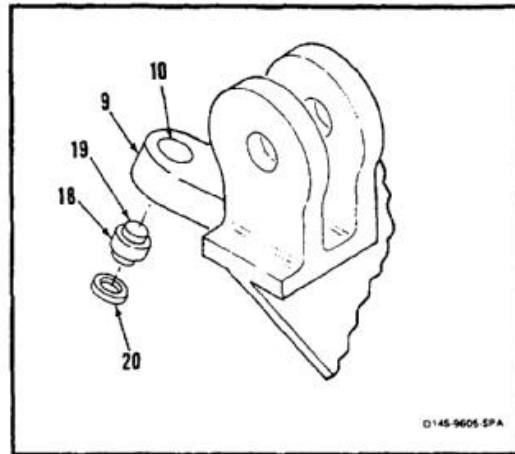
INSPECT

15. Go to step 20.



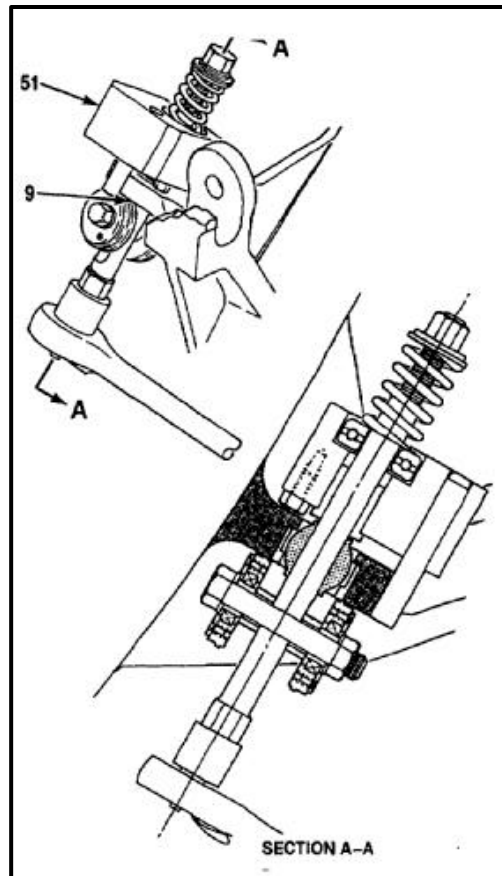
REPLACE BEARING IN AFT ENGINE MOUNT FITTING

16. Apply epoxy primer (E292) to outside of race (18), retainer (20), and hole (10) in fitting (9). Allow primer to dry. Wear gloves (E184.1).
17. Brush outside diameter of race (18), retainer (20), in hole (10), in fitting (9), with sealant (E328).
18. Install bearing (19), and retainer (20), in hole (10) in fitting (9) (TM 55-1500-322-24).



19. Stake fitting (9). Use staking tool (51) (T109).

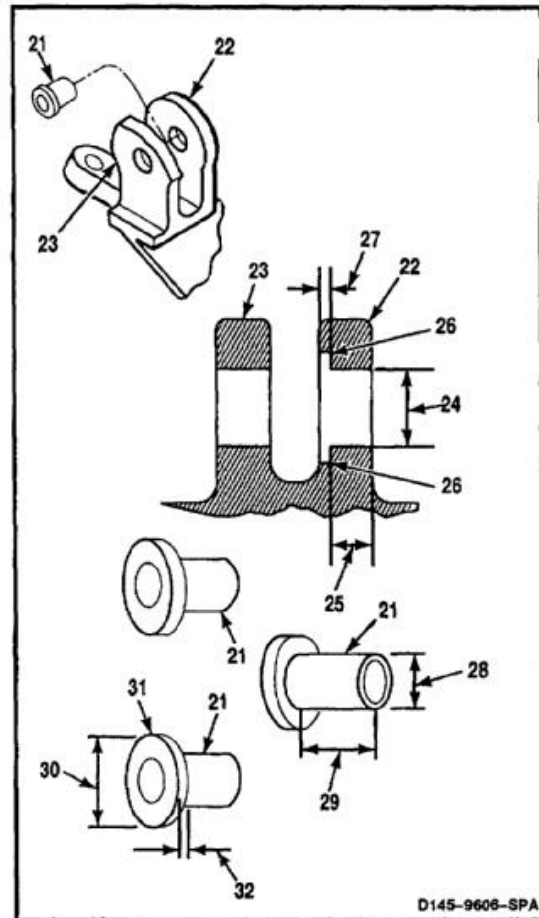
INSPECT



4-42 REPAIR CONNECTING LINK (DRAG STRUT) AND ENGINE MOUNT FITTINGS (AVIM) (Continued)

REPLACE BUSHING IN INBOARD LUG

20. Remove bushing (21) from lug (22).
21. Ream lug (22) in line with other lug (23). Make a round hole with an inside diameter (24), no larger than **0.8120 inch**.
22. Respotface hole in lug (22) to make flat spotface surface. Do not decrease lug thickness to less than **0.354 inch**.
23. Measure inside diameter (24) of hole in lug (22). Record measurement.
24. Measure width (25) of lug (22) to spotface (26). Record measurement.
25. Measure depth (27) of spotface (26). Record measurement.
26. Make new bushing (21) from steel (E367) as follows:
 - a. Make outside diameter (28) of bushing (21) **0.0010 to 0.0020 inch** more than dimension found in step 22.
 - b. Make bushing length (29) equal to dimension found in step 24.
 - c. Make outside diameter (30) of shoulder (31) **0.75 inch**.
 - d. Make shoulder thickness (32) equal to measurement found in step 25.



D145-9606-SPA

27. Apply epoxy primer (E292) to inside of hole in lug (22). Wear gloves (E184.1).

NOTE

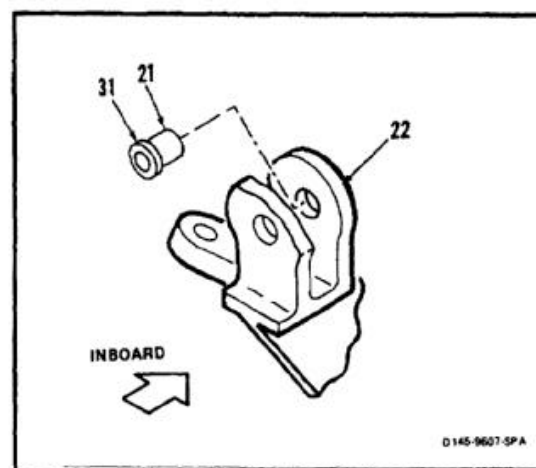
Bushing must be installed while epoxy primer (E292) is wet.

28. Install bushing (21) in lug (22) with shoulder (31) of bushing outboard.
29. Wipe off excess primer (E292) from lug (22) with cloths (E135).

INSPECT

FOLLOW-ON MAINTENANCE:

None



D145-9607-SPA

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 30 to 150 Inch-Pounds
 Torque Wrench, 100 to 750 Inch-Pounds

Materials:

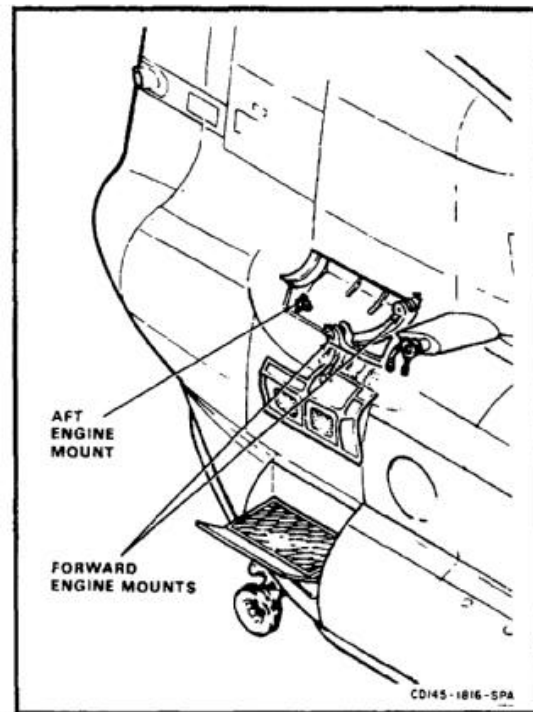
None

Personnel Required:

Medium Helicopter Repairer
 Inspector

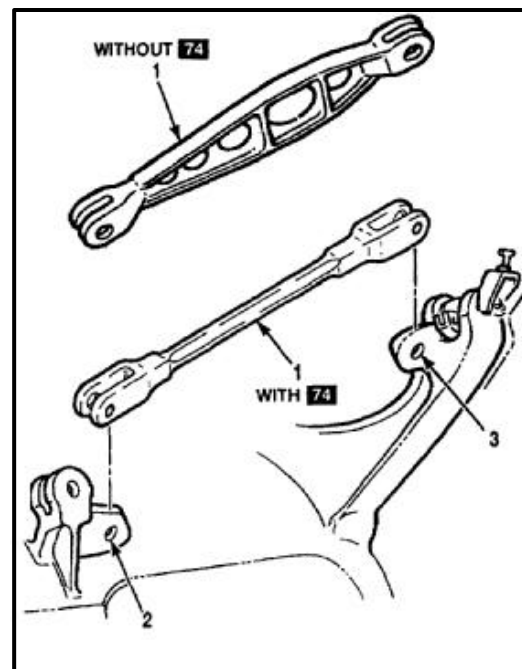
References:

TM 55-1520-240-23P

**NOTE**

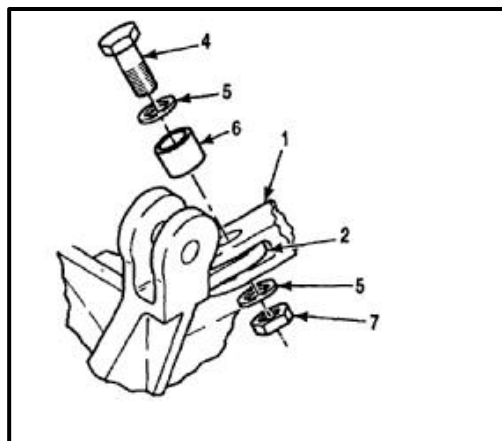
Procedure can be used to install link (drag strut) on No. 1 engine or No. 2 engine. Link on No. 2 engine is shown here.

1. Position with **74** link (1) with the slotted bushing forward between aft engine mount fitting (2) and forward engine mount fitting (3) as shown. Position without **74** link with reinforced side facing inboard.
2. Align holes in fitting (2 and 3) with link (1).

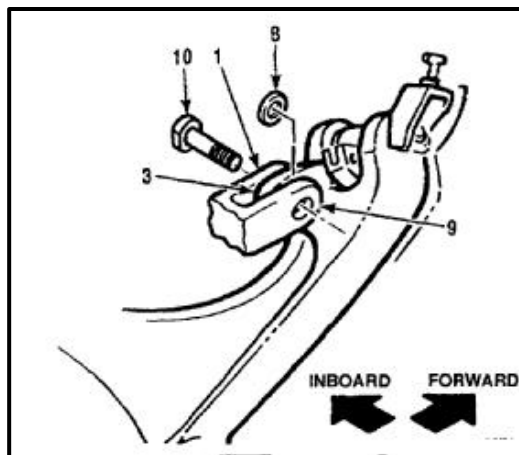


4-43 INSTALL CONNECTING LINK (DRAG STRUT) (Continued)

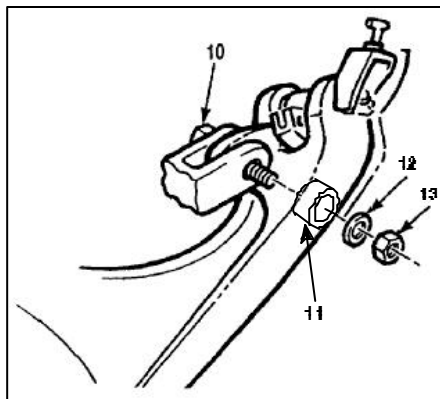
- 3. Install bolt (4) through washer (5) and bushing (6), through link (1) and fitting (2).
- 4. Install washer (5) and nut (6) on bolt (4).



- 5. Position washer (8) between forward engine mount fitting (3) and outboard lug (9) of link (1) as shown.
- 6. Align holes in fitting (3), washer (8), and link (1).
- 7. Install bolt (10) through link (1), fitting (3), and washer (8). Align flats on bolt (10) head with flats on link (1).



- 8. Install bushing (11), washer (12), and nut (13) on bolt (10).



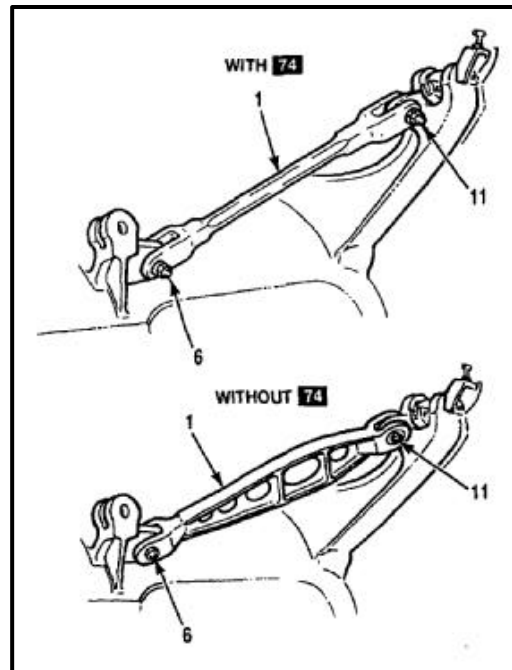
9. Torque nut (6) on aft end of link (1) to **350 inch-pounds**.

NOTE

Ensure flats on bolt (10) head remain aligned with flats on link (1) while torquing nut (11).

10. Torque nut (11) on forward end of link (1) to **105 inch-pounds**.

INSPECT



FOLLOW-ON MAINTENANCE:

Install powerplant (Task 4-13).

END OF TASK

4-44 ADJUST ENGINE FIREWALL AND ENGINE COVER FORMER

4-44

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692
Thickness Gage

Materials:

None

Personnel Required:

Medium Helicopter Repairer
Inspector

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
Exhaust Cone Removed (Task 4-88)

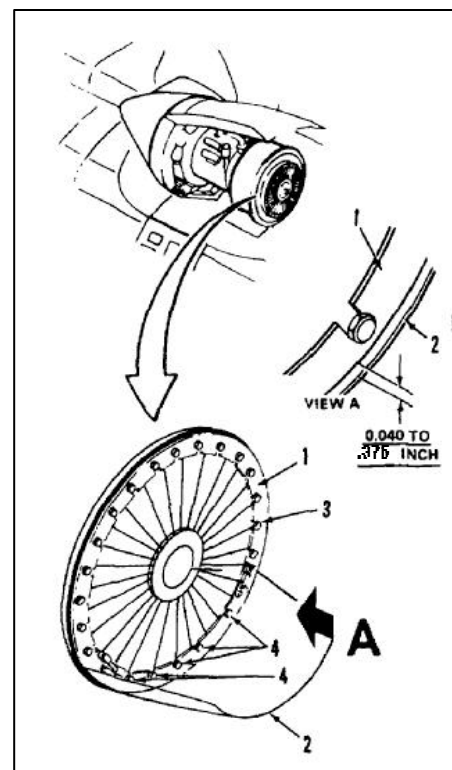
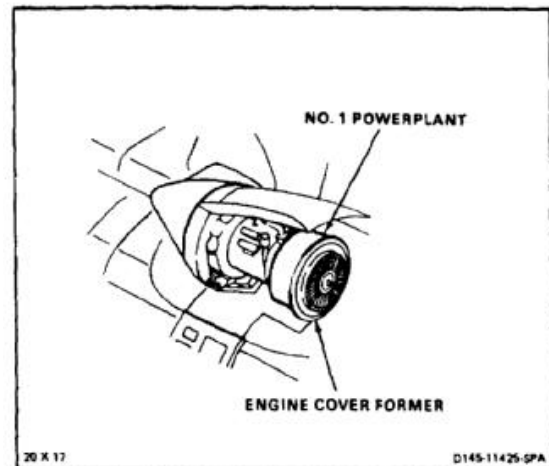
NOTE

Procedure is same to adjust engine firewall and engine cover former on No. 1 or No. 2 engine. Adjustment of No. 1 engine firewall and cover former is shown here.

1. Measure seal compression between airframe former (1) and engine former seal (2). If seal appears to be compressed **0.040 to 0.100 inch**, go to Follow-On Maintenance. If not, go to step 2.
2. Loosen 20 bolts (3) and five screws (4).
3. Adjust airframe former (1) and seal (2) with a clearance of up to **0.375 inch**.
4. Tighten 20 bolts (3) and five screws (4).

INSPECT**FOLLOW-ON MAINTENANCE:**

Install exhaust cone (Task 4-90).
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

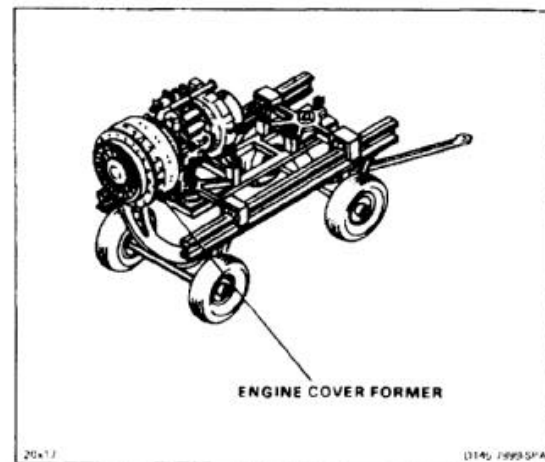
None

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

Off Helicopter Task
Engine Access Cover Open (Task 4-49)
Engine Exhaust Cone Removed (Task 4-88)



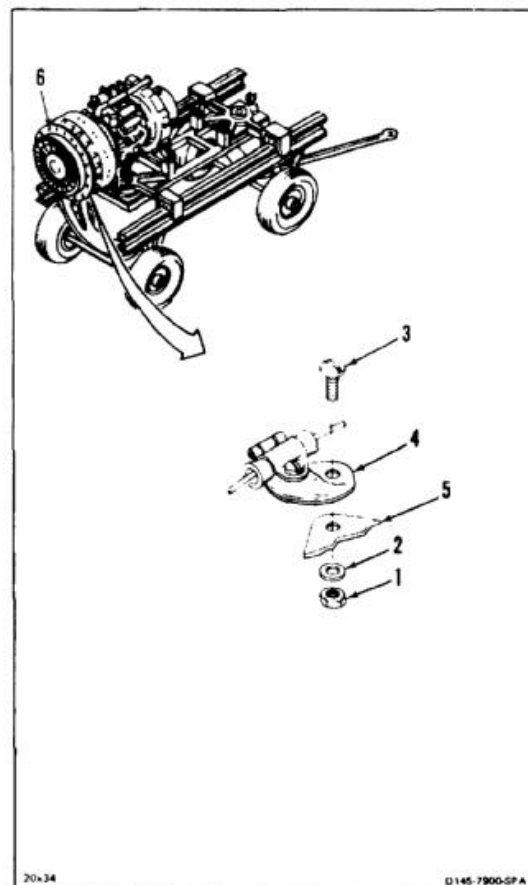
Do not pinch, crush, kink, or make sharp bends in element. Element can be damaged.

NOTE

Procedure is same to remove engine cover former on No. 1 or No. 2 powerplant. Removal of No. 1 former is shown here.

Engine access cover omitted for clarity.

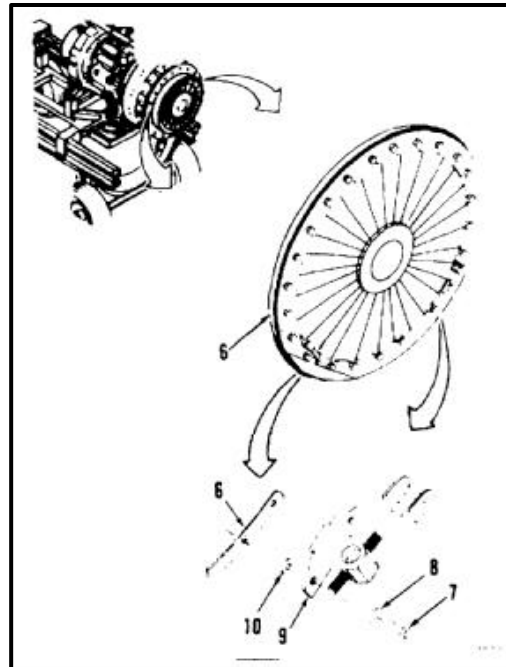
1. Remove nut (1), washer (2), and screw (3) at 10 locations. Release 10 fire detection element clamps (4) from 10 clips (5). Move element away from former (6).



4-45 REMOVE ENGINE COVER FORMER (Continued)

4-45

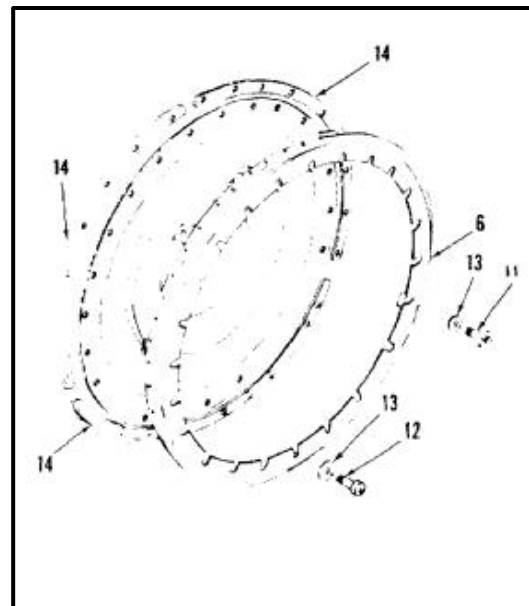
2. Remove four bolts (7) and washers (8) from bracket (9) and former (6). Remove bracket and two washers (10).



3. Remove 16 bolts (11), 5 screws (12), and 21 washers (13) from former (6).
4. Remove former (6) and retaining rings (14).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

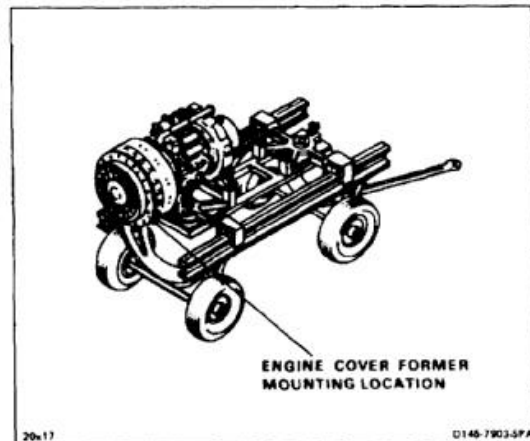
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P



Do not pinch, crush, kink, or make sharp bends in element. Element can be damaged.

NOTE

Procedure is same to install engine cover former on No. 1 or No. 2 powerplant. Installation of No. 1 former is shown here.

1. Position former (1) and retaining rings (2 and 3) on powerplant (4) so that bolt holes in former rings and powerplant align. Install 16 bolts (5), 2 washers (6), and 14 washers (7) in top of former (1).

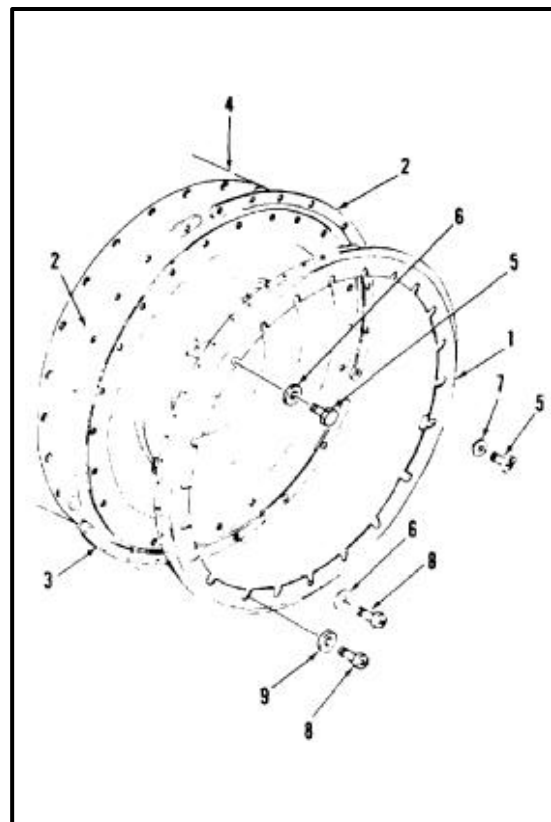
NOTE

Do not tighten bolts at this time.

2. Install 5 screws (8), washer (6), and 4 washers (9) in bottom of former (1).

NOTE

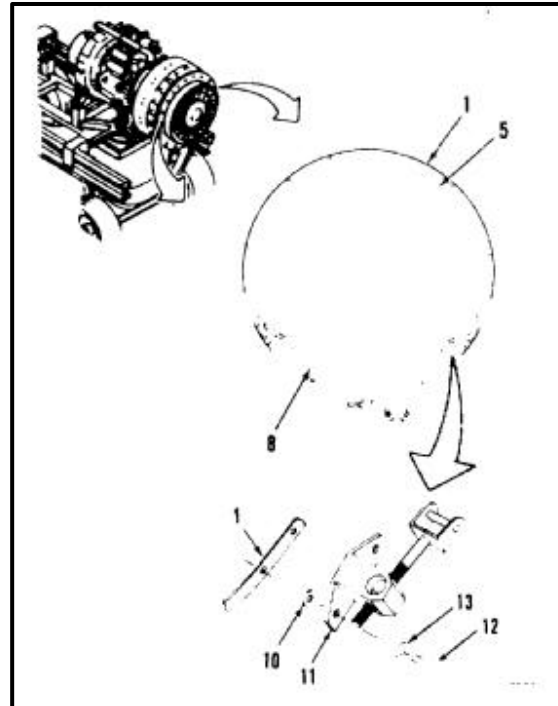
Do not tighten bolts at this time.



NOTE

R/H bracket shown, L/H bracket opposite.

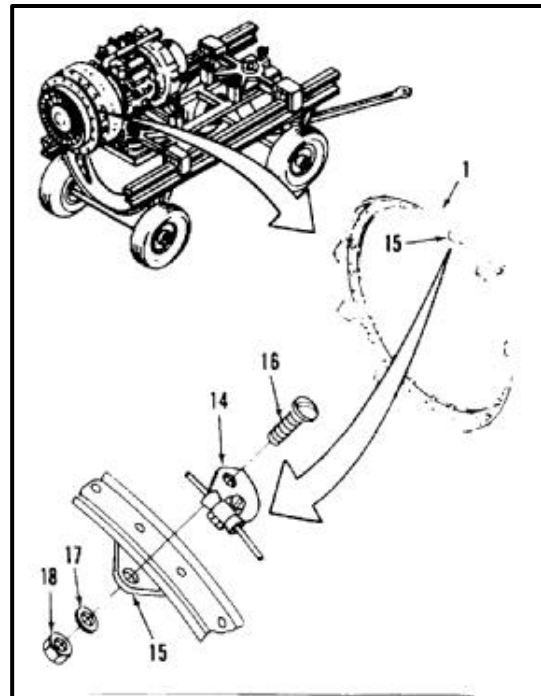
3. Position four washers (10) and two brackets (11) on former (1). Install four bolts (12) and washers (13).
4. Tighten 16 bolts (5) and five screws (8).



5. Position 10 fire detection element clamps (14) on 10 clips (15) on former (1). Install 10 screws (16), washers (17), and nuts (18).

FOLLOW-ON MAINTENANCE:

Install exhaust cone (Task 4-90).
 Install powerplant (Task 4-13).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

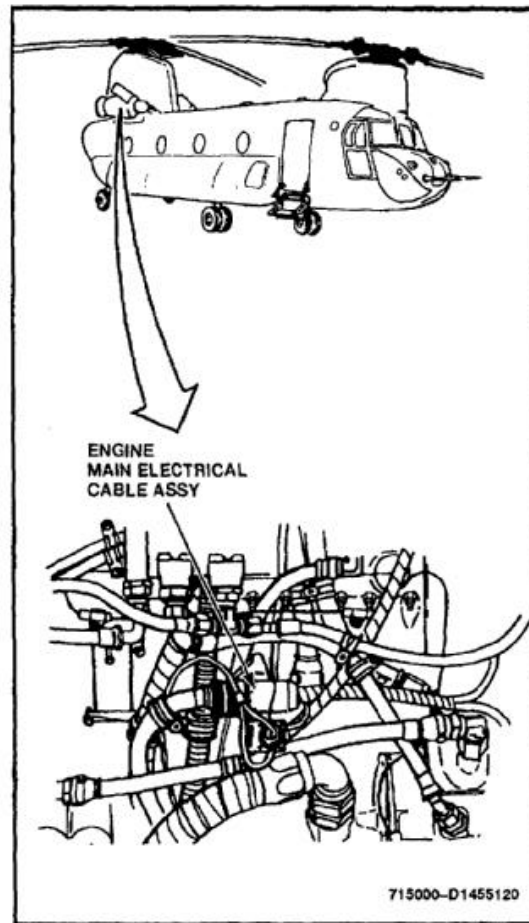
Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

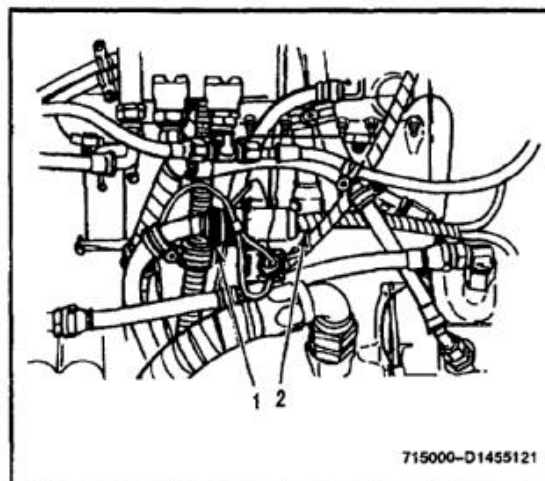
**NOTE**

Procedure is same to remove main electrical cable assembly on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Disconnect connector (1) from cable assembly (2).
2. Remove cable assembly (2) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-242

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

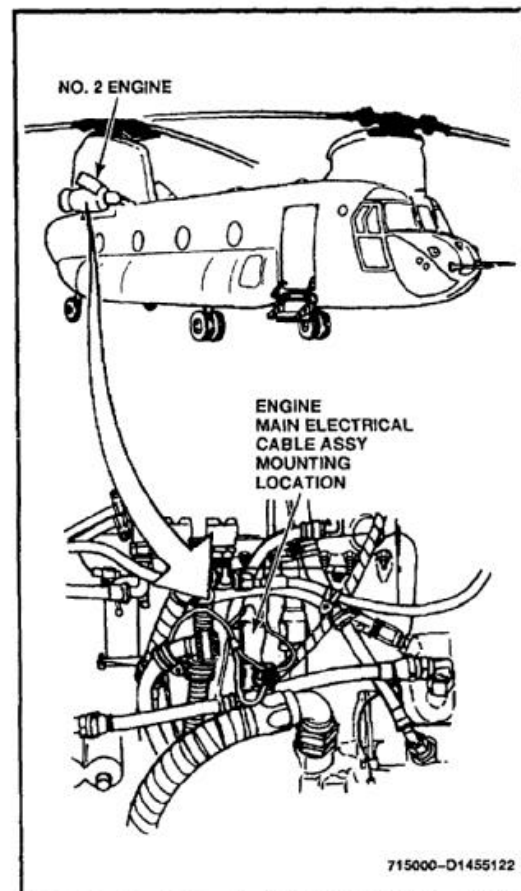
None

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

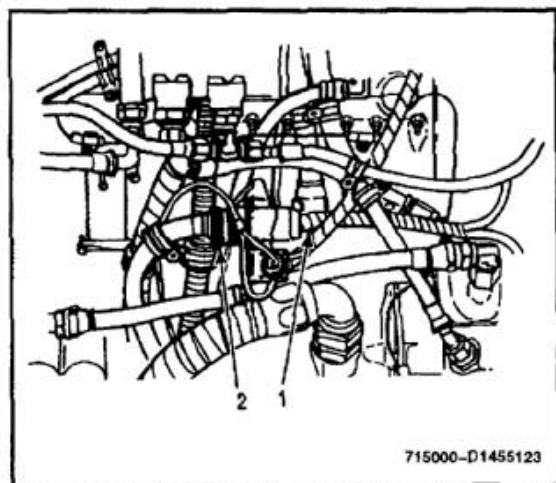
**NOTE**

Procedure is same to install main electrical cable assembly on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Install cable assembly (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
2. Connect connector (2) to cable assembly (1).

INSPECT**FOLLOW-ON MAINTENANCE:**

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

**SECTION III
COOLING SYSTEM**

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

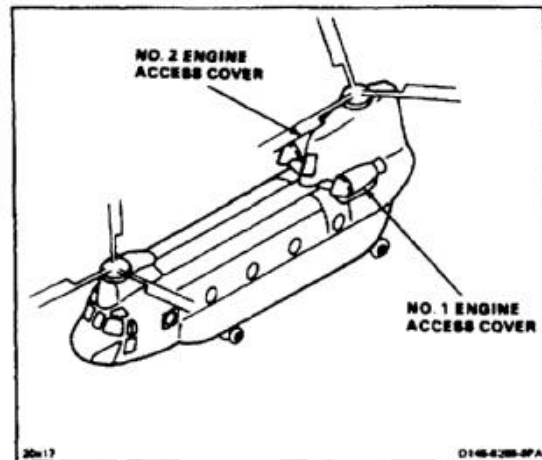
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)

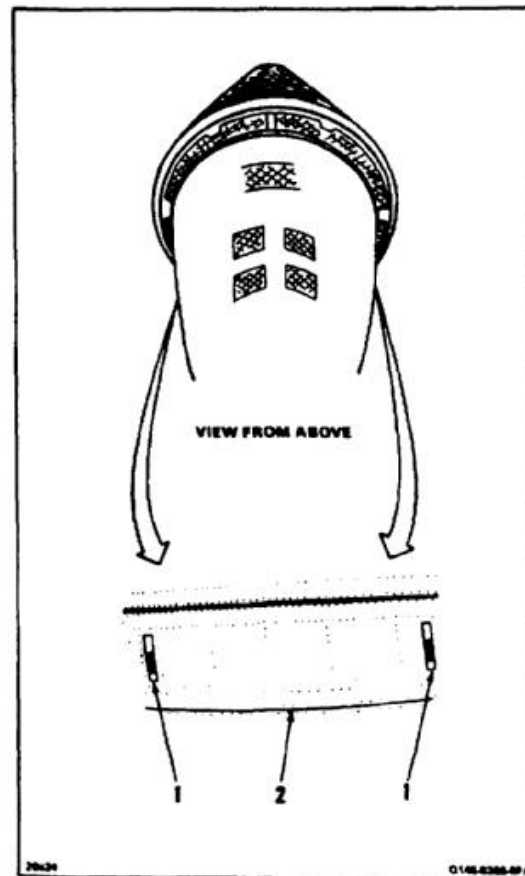


NOTE

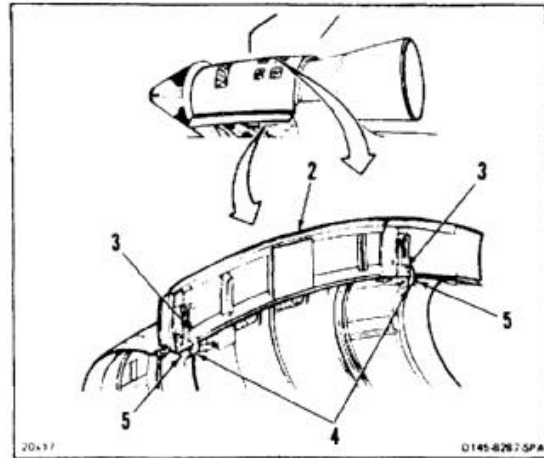
Procedure is same to open engine access cover on No. 1 and No. 2 engine. Opening of No. 1 engine cover is shown.

OPEN SIDE ACCESS DOORS

1. Disengage four latches (1) on two side access doors (2).



2. Raise side access doors (2). Align holes in hinges (3) and fittings (4) and install pins (5).

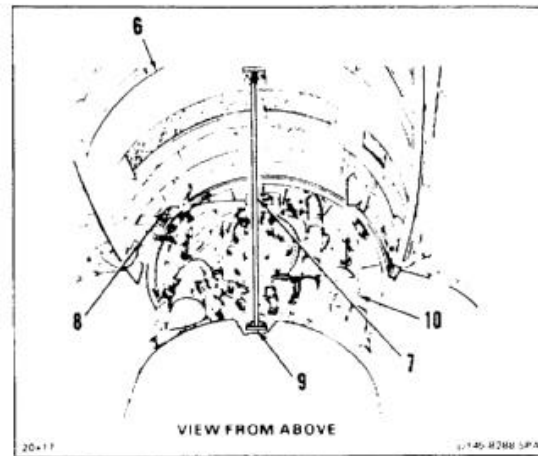


CAUTION

Make sure side access doors are pinned open before raising upper access cover. Raising upper cover with side doors down can damage engine components.

OPEN UPPER ACCESS COVER

3. Raise upper cover (6). Disengage support strut (7) from fitting (8).
4. Position strut (7) over fitting (9) in powerplant (10). Lower cover (6) enough to install strut in fitting.

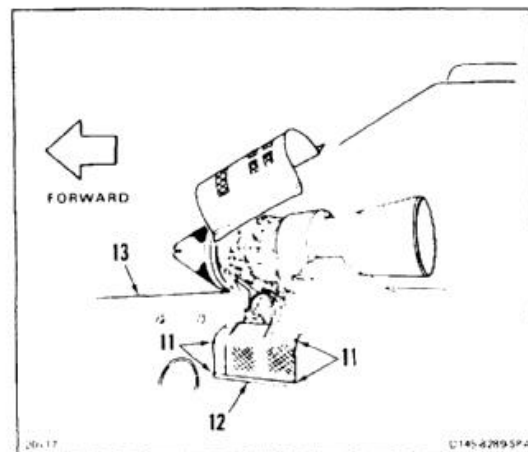


OPEN LOWER ACCESS DOOR

5. Release four fasteners (11) on lower access door (12). Lower door to fuselage (13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

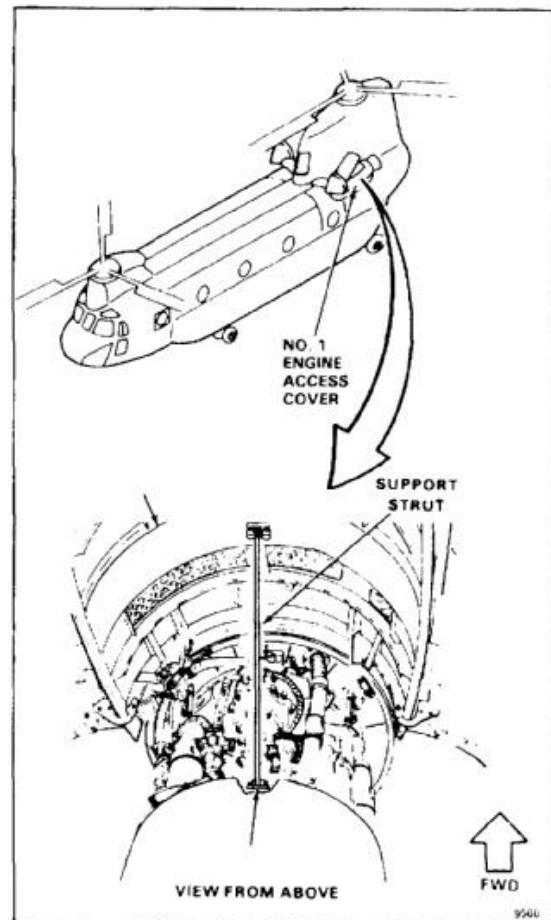
Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Work Platform Open (Task 2-2)

Engine Access Cover Open (Task 4-49)

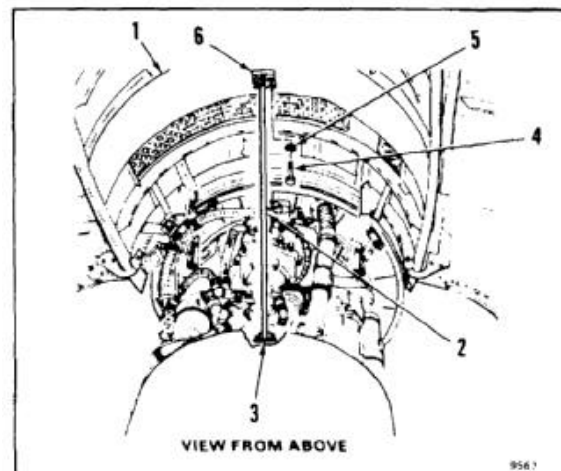
**NOTE**

Procedure is same to remove support strut on No. 1 and No. 2 engine. Removal of No. 1 support strut is shown here.

1. Have helper support upper cover (1).
2. Disengage support strut (2) from powerplant fitting (3).
3. Remove four screws (4) and washers (5) from bracket (6). Remove strut (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-248

4-49.2 INSTALL ENGINE COVER SUPPORT STRUT

4-49.2

INITIAL SETUP**Applicable Configurations:**

All:

Tools:

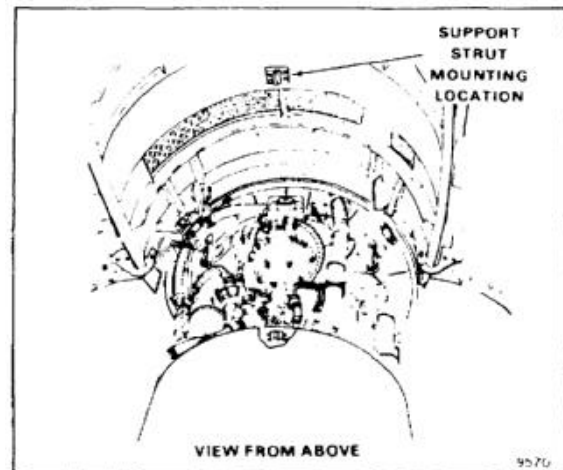
Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

None

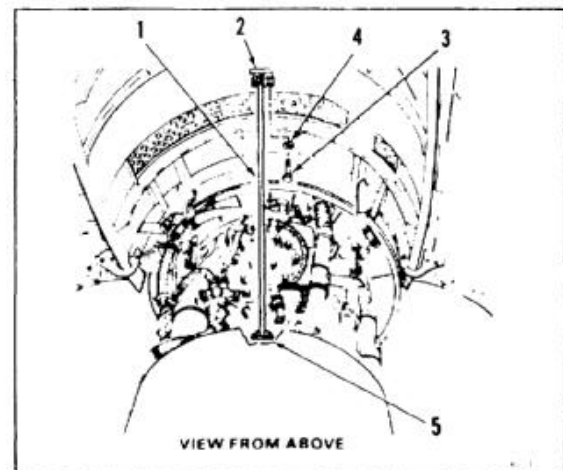
Personnel Required:Medium Helicopter Repairer (2)
Inspector**References:**

TM 55-1520-240-23P

**NOTE**

Procedure is same to install support strut on No. 1 and No. 2 engine. Installation of No. 1 support strut is shown here.

1. Position strut (1) on bracket (2). Install four screws (3) and washers (4) in bracket.
2. Engage strut (1) in powerplant fitting (5).

**FOLLOW-ON MAINTENANCE:**

Close engine cover (Task 4-50).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

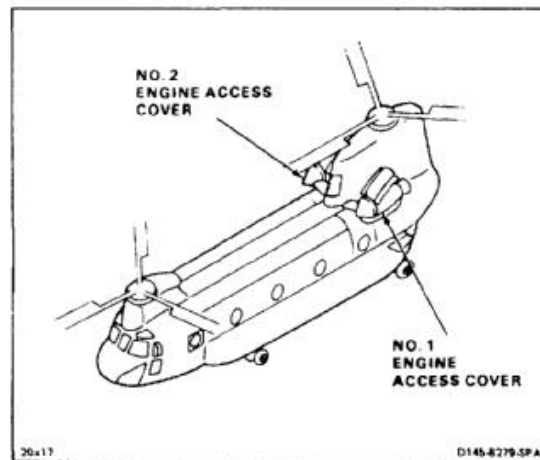
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

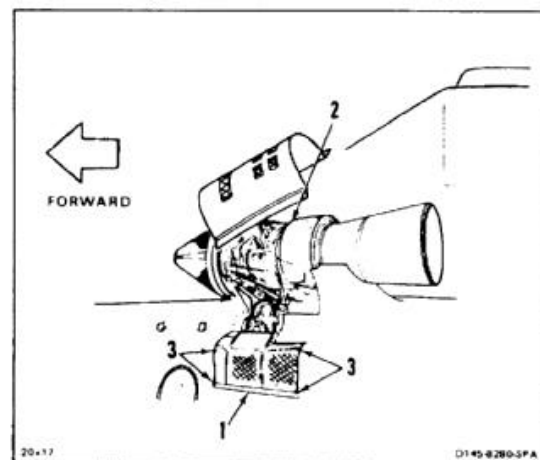


NOTE

Procedure is same to close engine access cover on No. 1 and No. 2 engine. Closing of No. 1 engine cover is shown.

CLOSE LOWER ACCESS DOOR

1. Raise lower access door (1) to powerplant (2) and secure in position with four fasteners (3).

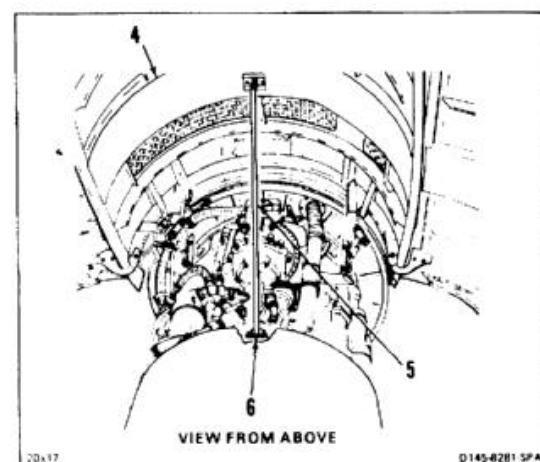


CLOSE UPPER ACCESS COVER

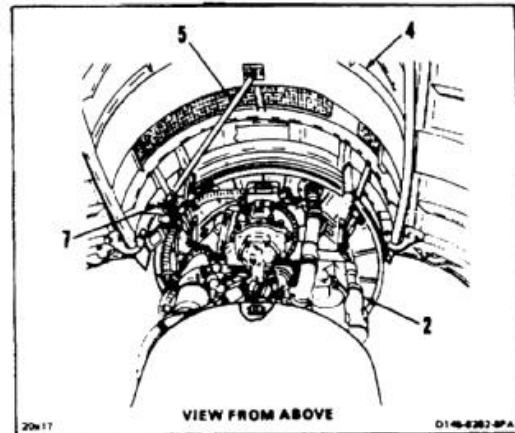


Make sure side access doors are pinned open before lowering upper access cover. Lowering upper cover with side doors down can damage engine components.

2. Support upper access cover (4) and disengage support strut (5) from powerplant fitting (6).

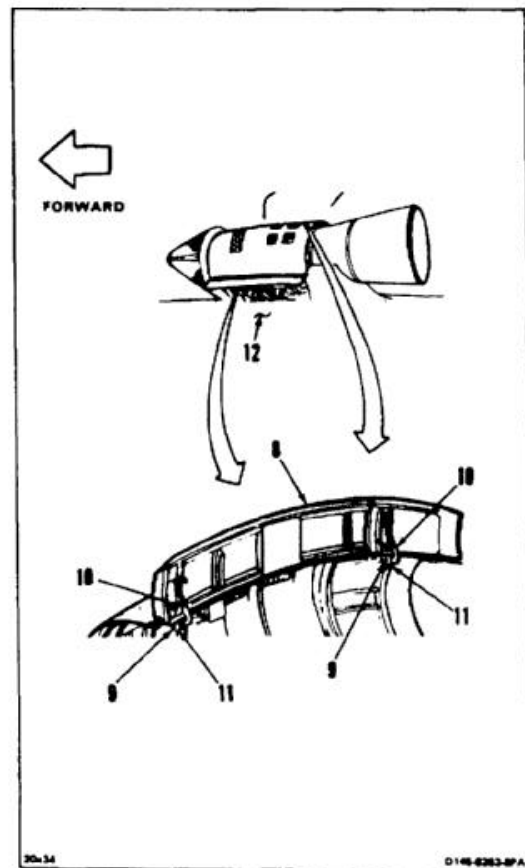


3. Install strut (5) in fitting (7) on cover (4). Lower cover to powerplant (2).



CLOSE SIDE ACCESS DOORS

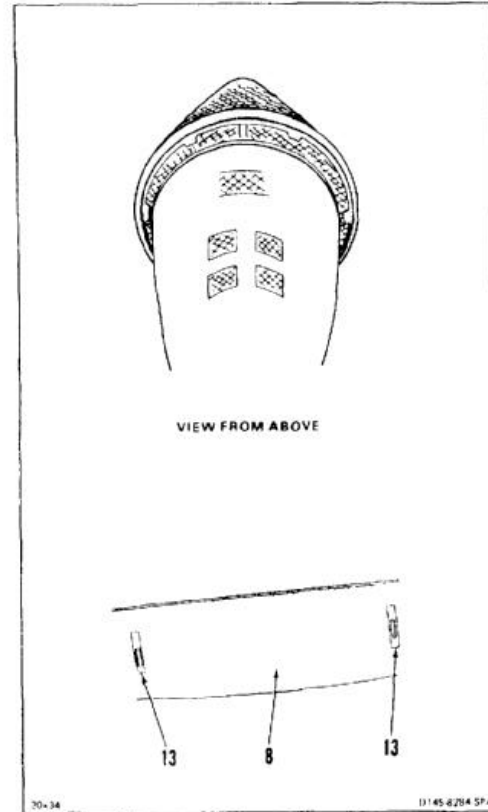
4. Support two side access doors (8) and remove pins (9) from hinges (10) and fittings (11). Lower door to fuselage (12).



- Secure four latches (13) on two side access doors (8).

FOLLOW-ON MAINTENANCE:

Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

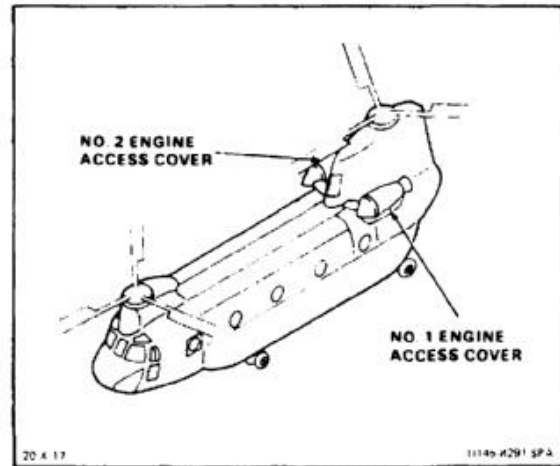
Task 4-49

Equipment Condition:

Battery Disconnected (Task 1-39)

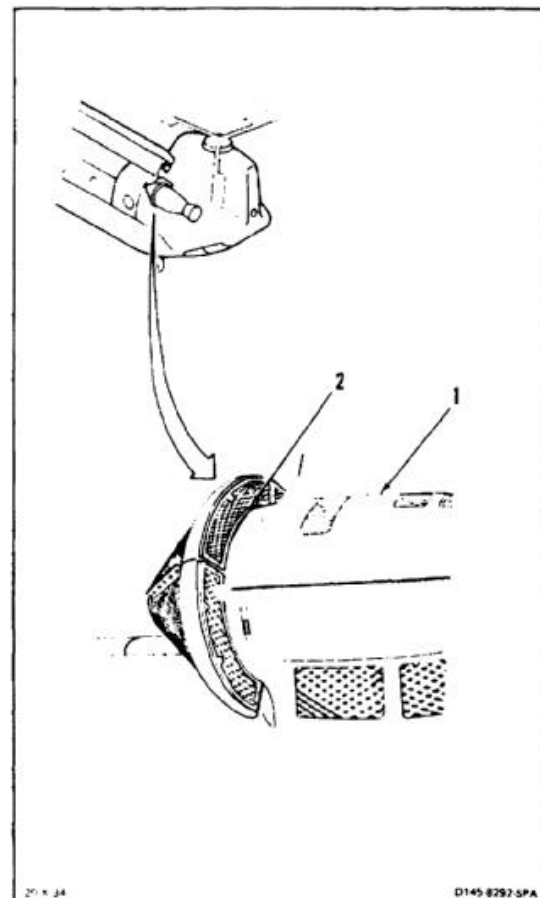
Electrical Power Off

Engine Work Platform Open (Task 2-2)

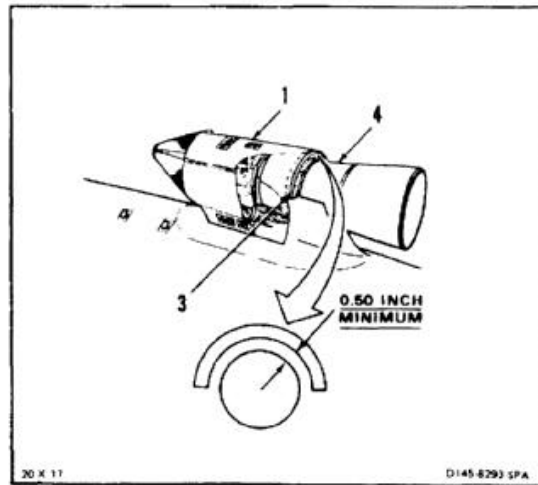
**NOTE**

Procedure is same to adjust No. 1 or No. 2 engine access cover. Adjustment on No. 1 engine cover is shown.

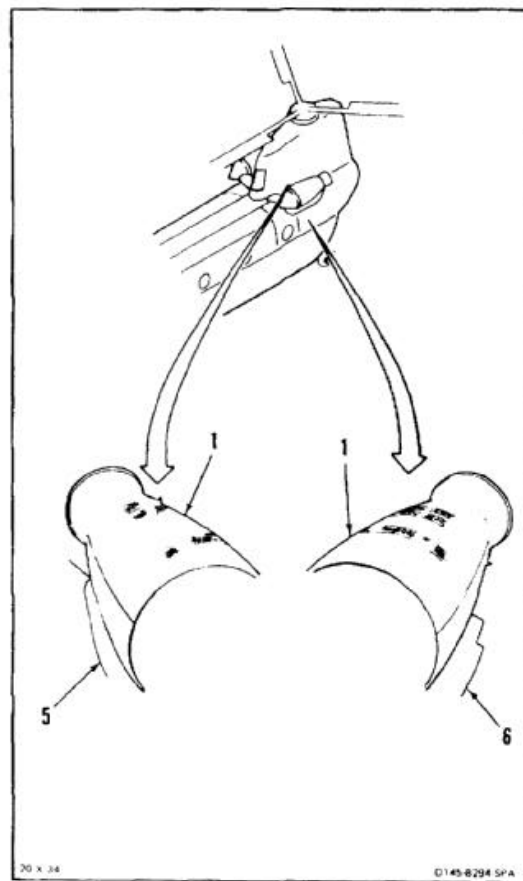
1. Check fit of engine access cover (1) and engine air inlet fairing (2). Make sure cover fits flush on fairing.



2. Make sure cover (1) sits firmly on engine cover former (3).
3. Check gap between aft end of cover (1) and exhaust cone (4). An uneven gap is allowed. Minimum gap shall be **0.50 inch**.



4. Make sure gap between cover (1) and fairing (5) is equal to gap between cover and lower access door (6). If gaps are not equal, perform step 5. If gaps are equal, go to Follow-On Maintenance.



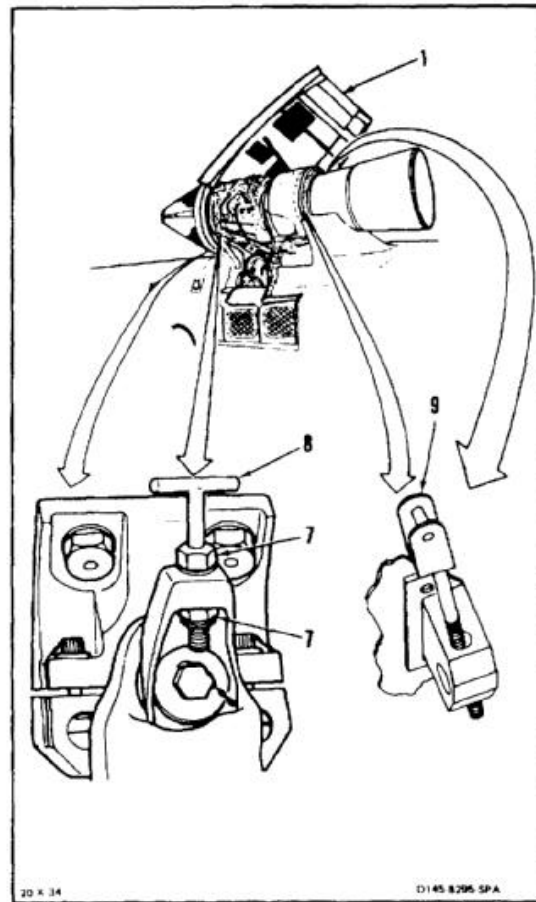
CAUTION

When adjusting cover, do not overtighten latches. Damage to cover can result.

5. Adjust engine cover (1) as follows:
 - a. Open engine cover (1) (Task 4-49).
 - b. Loosen two nuts (7) on forward latch brackets (8).
 - c. Turn brackets (8 and 9) counterclockwise to loosen cover (1). Turn brackets clockwise to tighten cover.
 - d. Tighten two nuts (7) on forward latch brackets (8).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

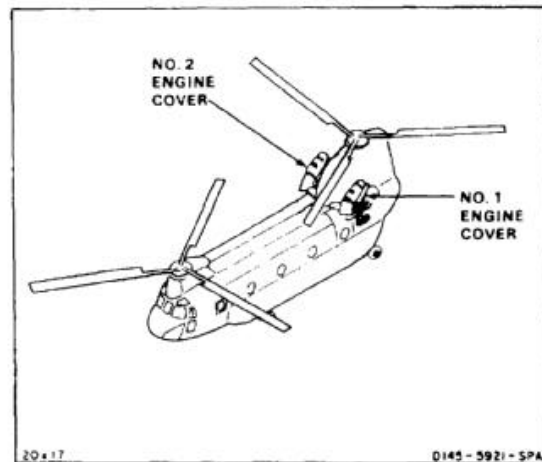
None

Personnel Required:

Medium Helicopter Repairer(2)

Equipment Condition:

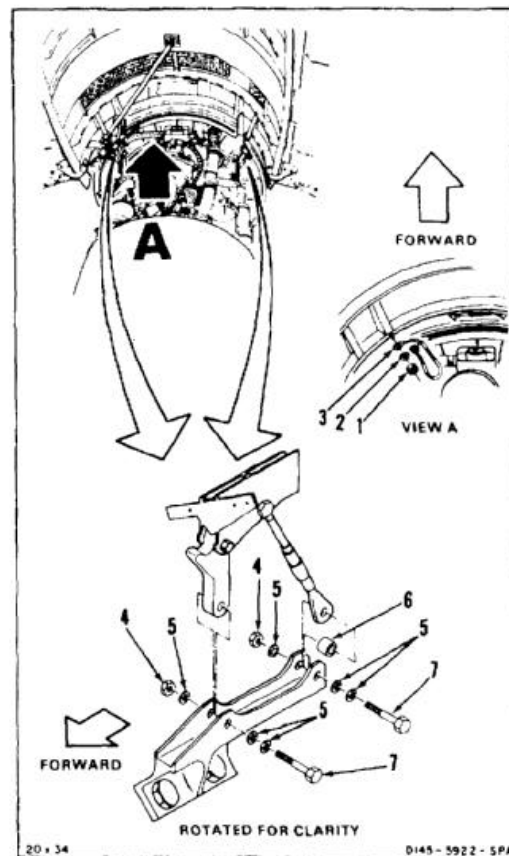
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)



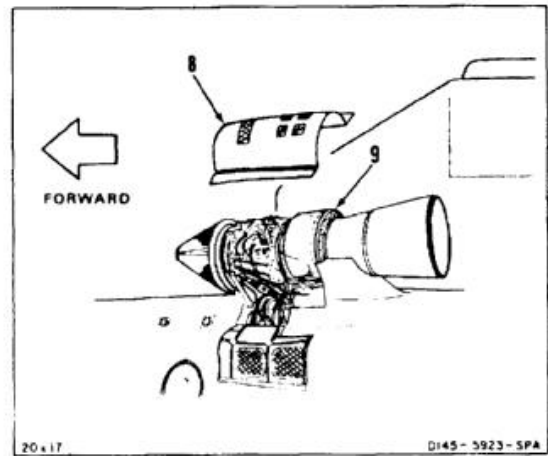
NOTE

Procedure is same to remove engine access cover from No. 1 or No. 2 engine.

1. Remove nut (1) and washer (2). Disconnect bonding jumper (3).
2. Remove four nuts (4), twelve washers (5), two spacers (6), and four bolts (7).



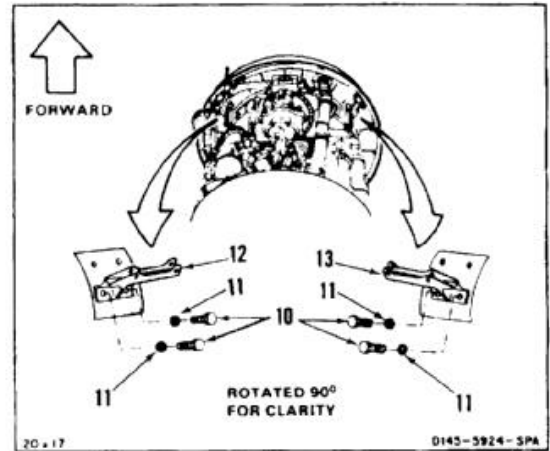
3. Lift and remove cover (8) from engine (9).



4. Remove lockwire from four bolts (10). Remove four bolts and washers (11). Remove two hinge fittings (12 and 13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

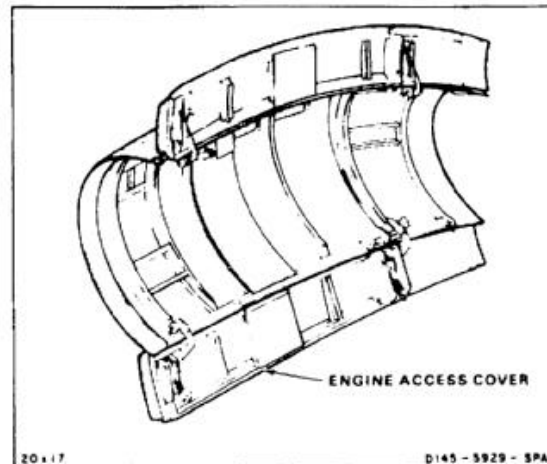
None

Personnel Required:

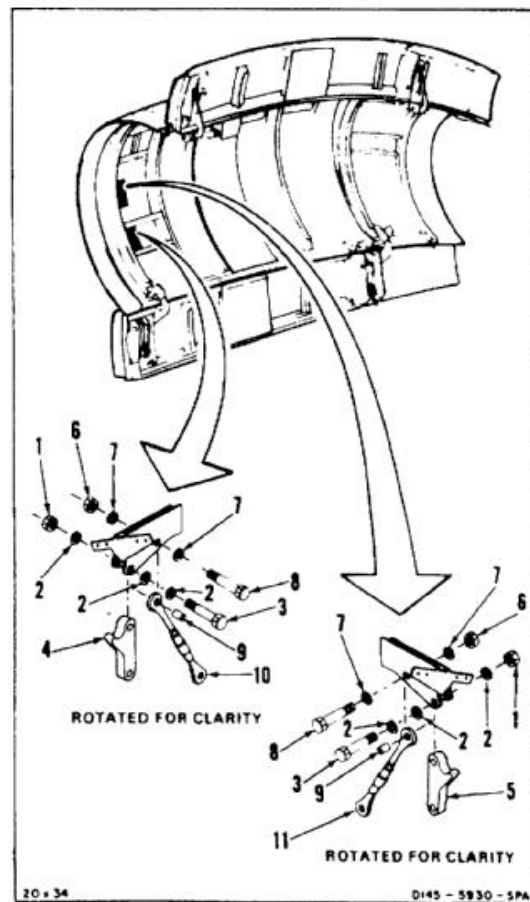
Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task



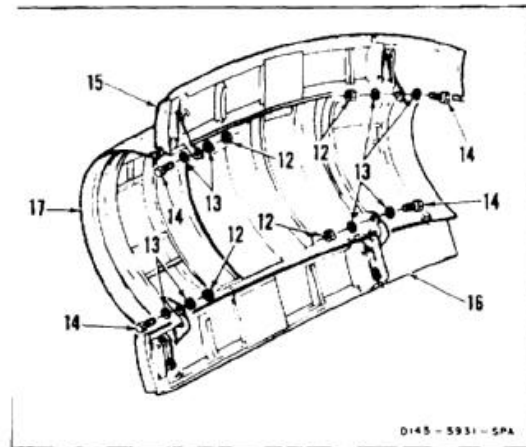
1. Remove two nuts (1), six washers (2), and two bolts (3). Remove two hinge links (4 and 5).
2. Remove two nuts (6), four washers (7), two bolts (8), and two spacers (9). Remove two turnbuckles (10 and 11).



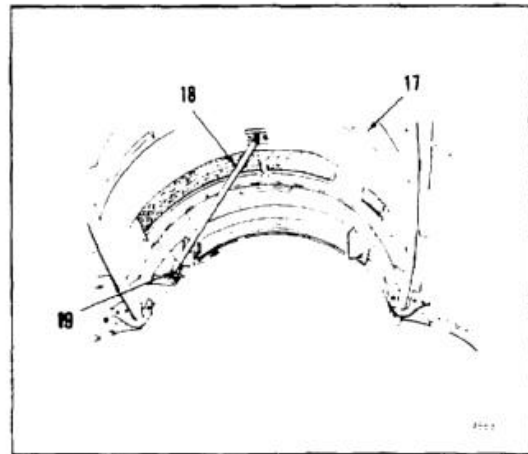
NOTE

Make sure bushing remains in each access door hinge.

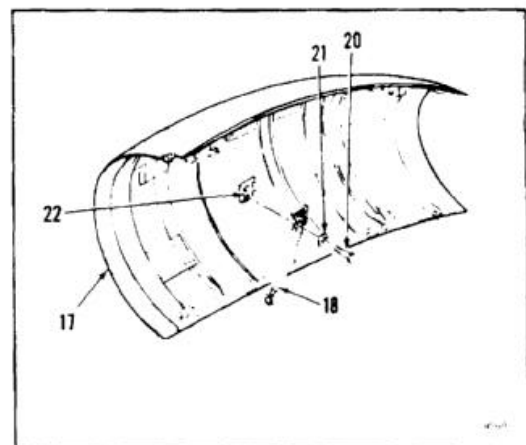
3. Remove four nuts (12), eight washers (13), and four bolts (14). Remove side access doors (15 and 16) from cover (17).



4. Disengage strut (18) from fitting (19) on cover (17).



5. Remove four screws (20) and washers (21) from bracket (22) in upper cover (17). Remove strut (18).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**

Task 4-55

Task 4-56

Task 4-57

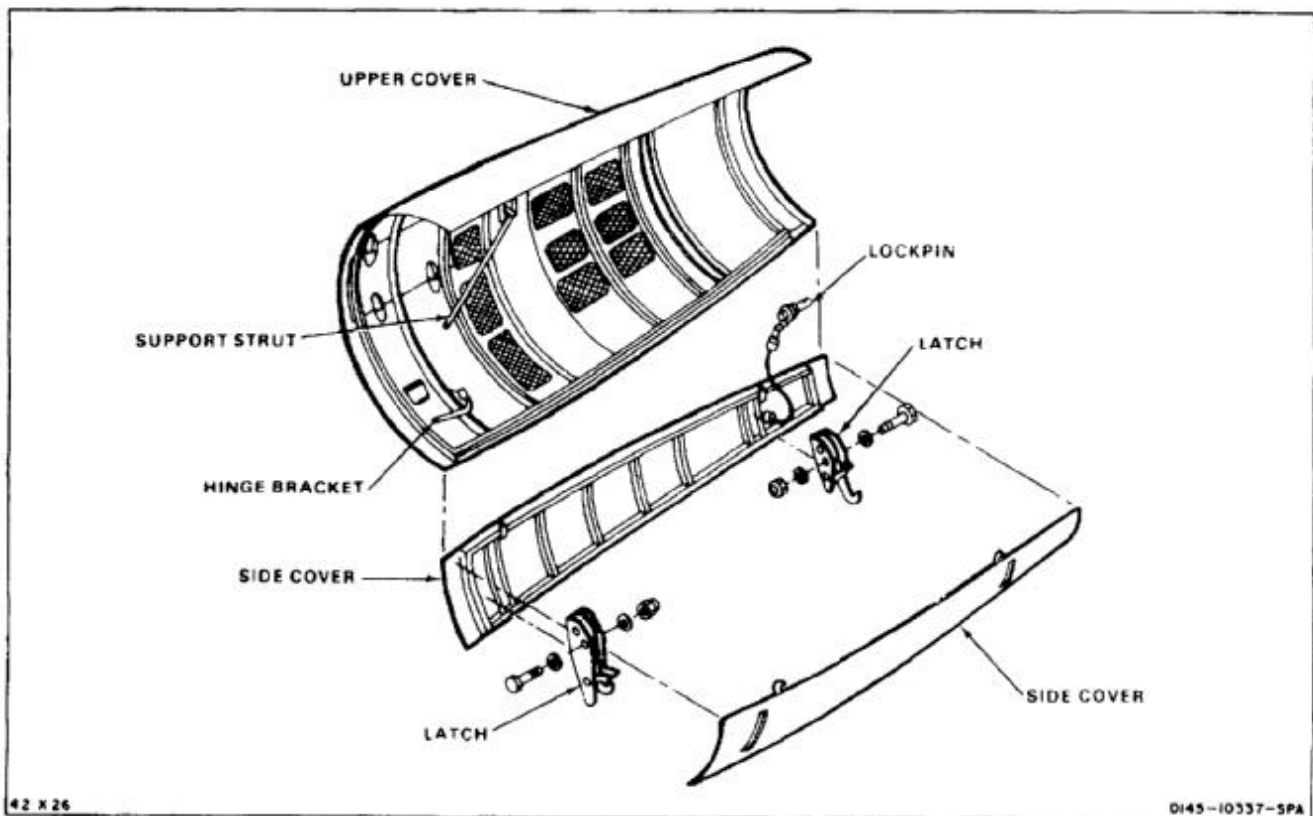
Equipment Condition:

As Required

General Safety Instructions:

As Required

1. Each engine covering consists of an upper cover assembly and two side cover assemblies.
2. Repairs to engine covering are classified as minor repairs (Task 4-55), major repairs (Task 4-56), and repairs requiring replacement (Task 4-57).

INSPECT**FOLLOW-ON MAINTENANCE:**

As Required

END OF TASK

4-260

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**

Task 2-6

Equipment Condition:

As Required

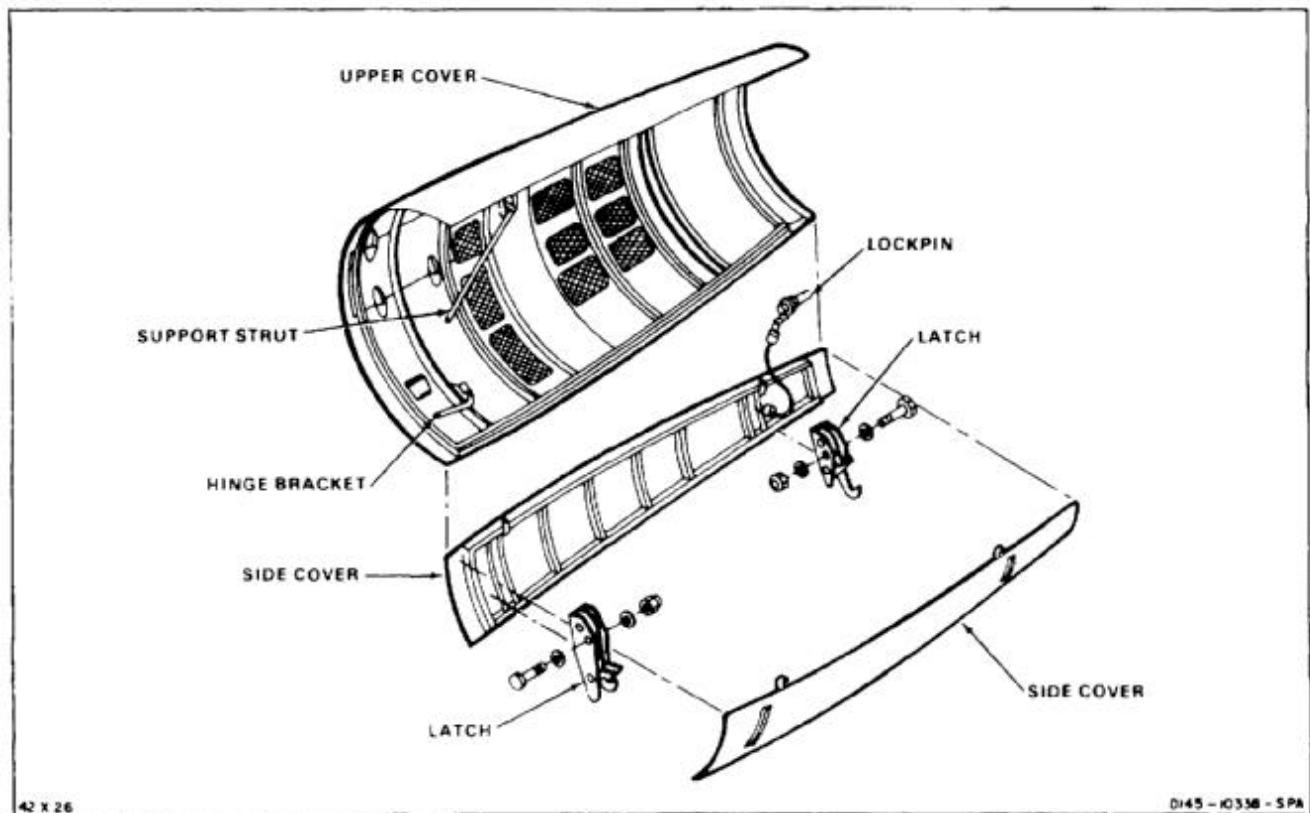
General Safety Instructions:

As Required

1. Repair small nicks, dents, or scratches by burnishing.
2. Stop drill cracks less than **1 inch** long. Cracks shall not exceed **1 inch**.
3. Check holes. Trimmed diameter of round or oval holes shall not exceed **1 inch**.

INSPECT**FOLLOW-ON MAINTENANCE:**

Refinish as required (Task 2-6).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

TM 1-1500-204-23
Task 4-55

Equipment Condition:

As Required

General Safety Instructions:

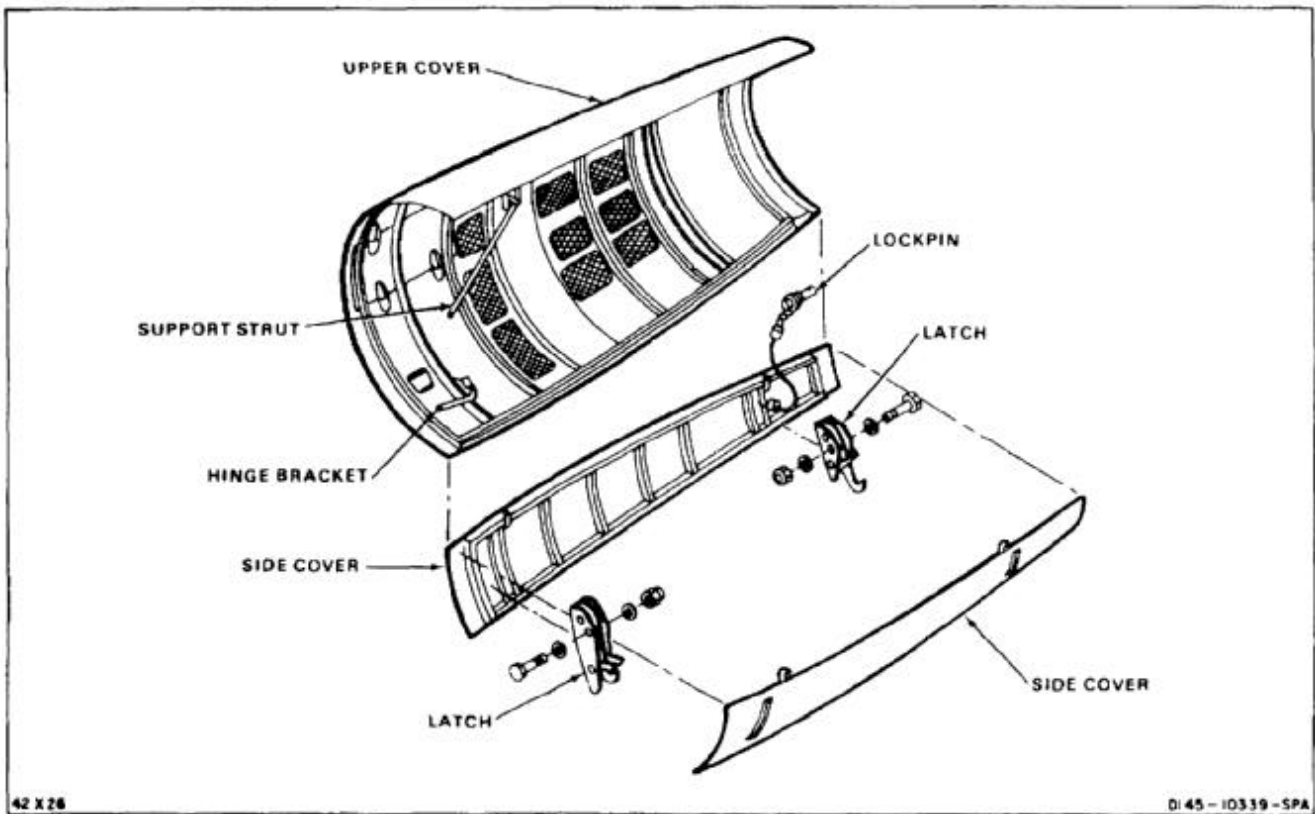
As Required

1. Repair damage to skin greater than minor damage (Task 4-55) as follows:
 - a. Patch skin damage that affects less than **25 percent** of skin panel.
 - b. Repair skin damage that affects more than **25 percent** of skin panel, or boundary member, by insertion.
2. Patch damage to formed parts that does not affect a bend radius.

INSPECT

FOLLOW-ON MAINTENANCE:

As Required



42 X 26

DI 45-10339-SPA

END OF TASK

4-262

4-57 REPAIR ENGINE COVER — REPAIRS REQUIRING REPLACEMENT (AVIM)

4-57

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**Task 4-53
Task 4-58**Equipment Condition:**

As Required

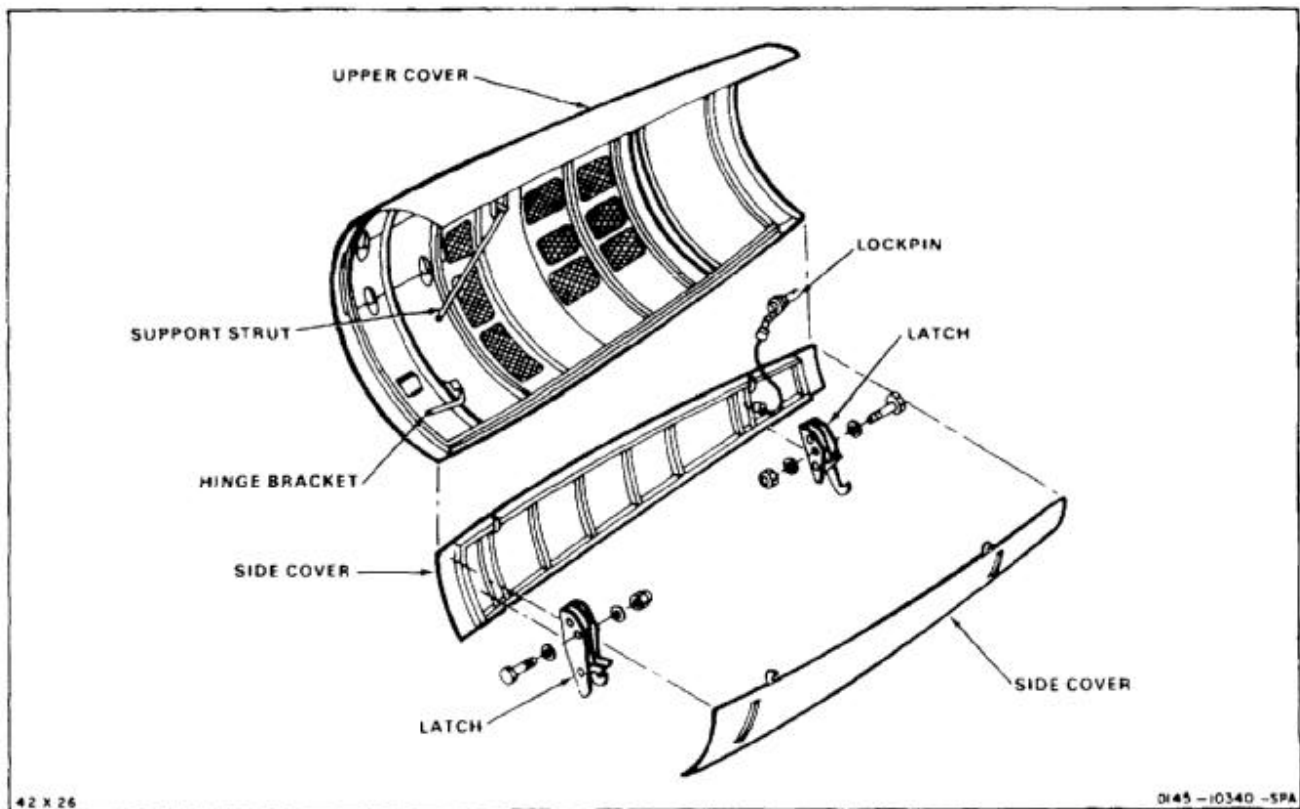
General Safety Instructions:

As Required

1. Replace upper cover or side cover if damage affects bend radius of formed parts (Tasks 4-53 and 4-58).

INSPECT**FOLLOW-ON MAINTENANCE:**

As Required



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

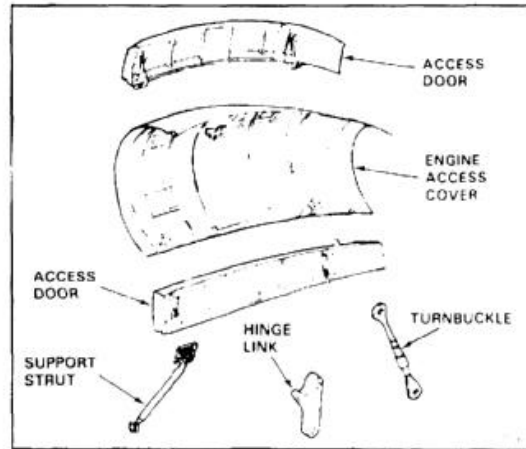
None

Personnel Required:

Medium Helicopter Repairer
Inspector

References:

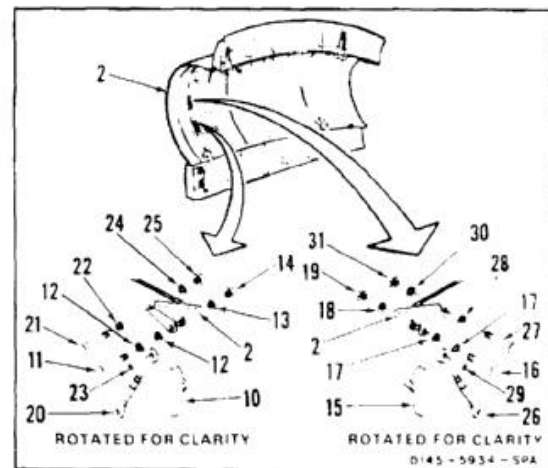
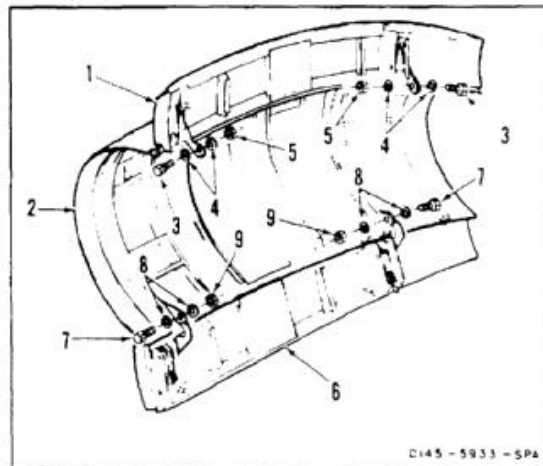
TM 55-1520-240-23P



NOTE

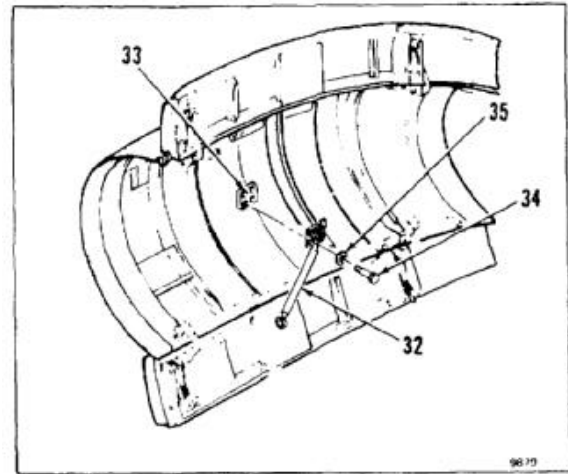
Make sure each access door hinge has bushing installed.

1. Position side access door (1) on engine access cover (2). Install two bolts (3), four washers (4), and two nuts (5).
2. Position side access door (6) on engine access cover (2). Install two bolts (7), four washers (8), and two nuts (9).
3. Position hinge link (10) on cover (2). Install bolt (11), two washers (12), washer (13), and nut (14).
4. Position hinge link (15) on cover (2). Install bolt (16), two washers (17), washer (18), and nut (19).
5. Position turnbuckle (20) on cover (2). Install bolt (21), washer (22), spacer (23), washer (24), and nut (25).
6. Position turnbuckle (26) on cover (2). Install bolt (27), washer (28), spacer (29), washer (30), and nut (31).

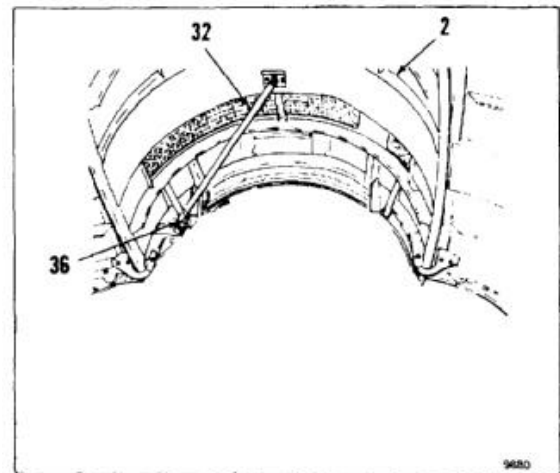


INSPECT

7. Position strut (32) on bracket (33). Install four screws (34) and washers (35).



8. Install strut (32) in fitting (36) on upper cover (2).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

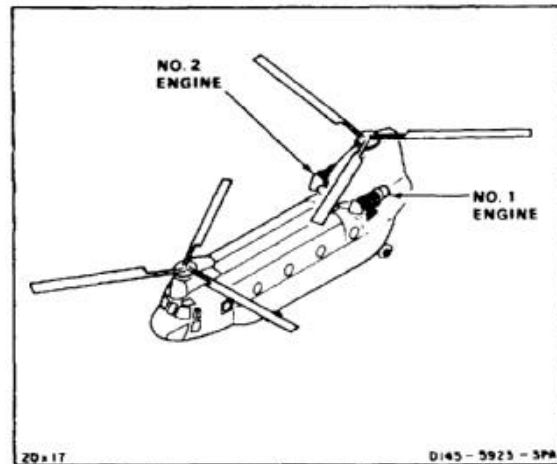
Lockwire (E231)

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

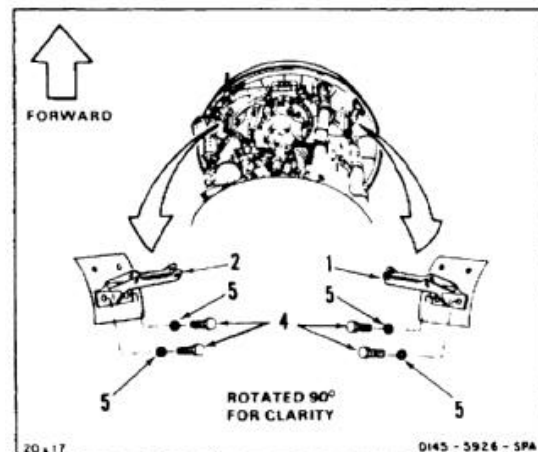
TM 55-1520-240-23P



NOTE

Procedure is same to install engine access cover on No. 1 or No. 2 engine.

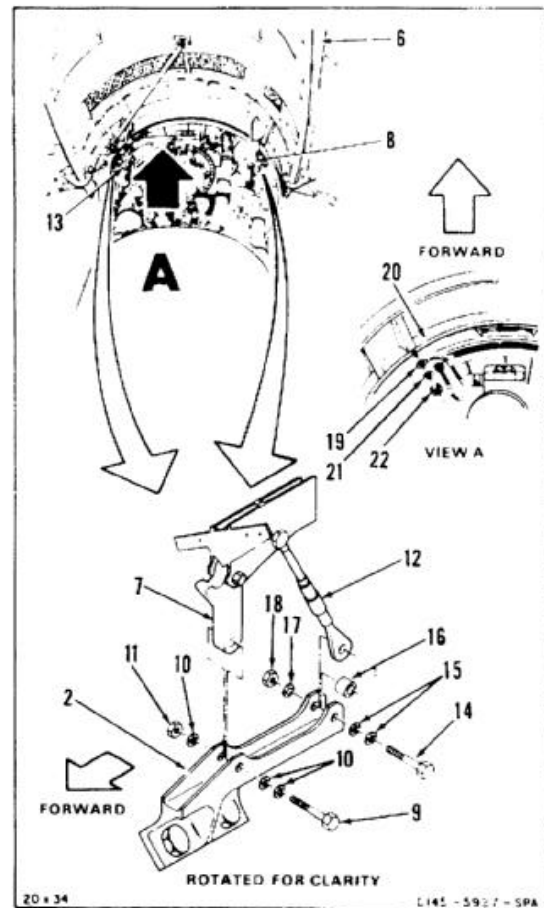
1. Position two hinge link fittings (1 and 2) on engine (3). Install two bolts (4) and washers (5). Lockwire bolts. Use lockwire (E231).



4-59 INSTALL ENGINE ACCESS COVER (Continued)

4-59

2. Position cover (6) on engine (3). Position hinge links (7 and 8) in fittings (1 and 2). Install two bolts (9), six washers (10), and two nuts (11).
3. Position turnbuckles (12 and 13) in fittings (1 and 2). Install two bolts (14), four washers (15), two spacers (16), two washers (17), and two nuts (18).
4. Connect bonding jumper (19) to fairing (20). Install washer (21) and nut (22).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Adjust engine access cover (Task 4-51).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector

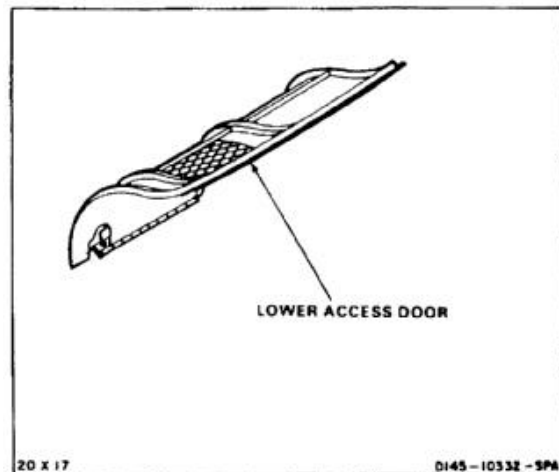
1. Lower access door is a hinged single piece of skin whose contour is supported by pressed frames. The skin is cut out in one place, and a screen is installed.
2. Repairs to lower access door are classified as minor repairs (Task 4-61), major repairs and repairs requiring replacement (Task 4-62).

References:Task 4-61
Task 4-62**Equipment Condition:**

As Required

General Safety Instructions:

As Required

**INSPECT****FOLLOW-ON MAINTENANCE:**

As Required

END OF TASK

4-268

4-60.1 REPLACE ENGINE LOWER ACCESS COVER

4-60.1

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

Dry Cleaning Solvent (E162)

Sealant (E339)

Cloths (E120)

Gloves (E186)

Personnel Required:

Medium Helicopter Repairer (2)

Equipment Condition:

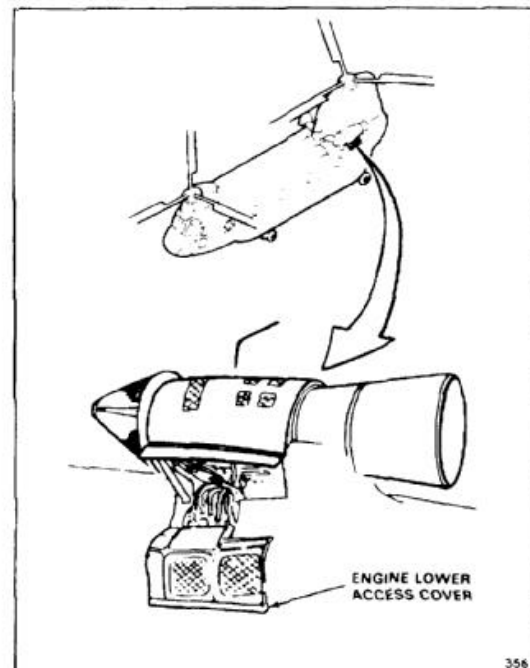
Battery Disconnected (Task 1-39)

Electrical Power Off

Engine Lower Access Cover Open (Task 4-49)

References:

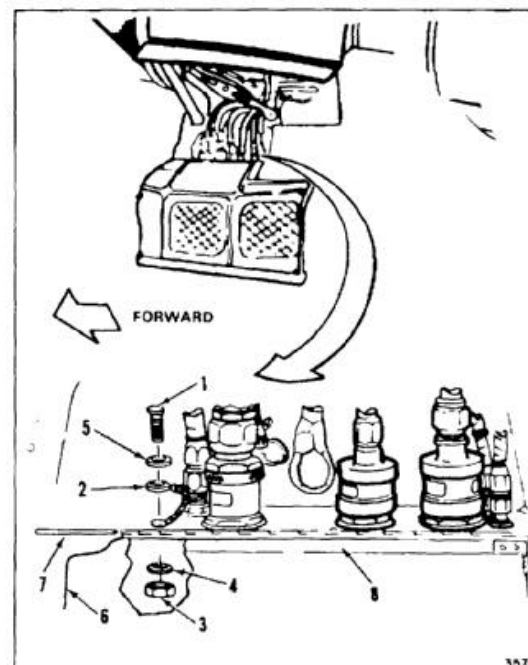
TM 55-1520-240-23P

**NOTE**

Procedure is same to replace right or left engine lower access cover. Replacement of left cover is shown here.

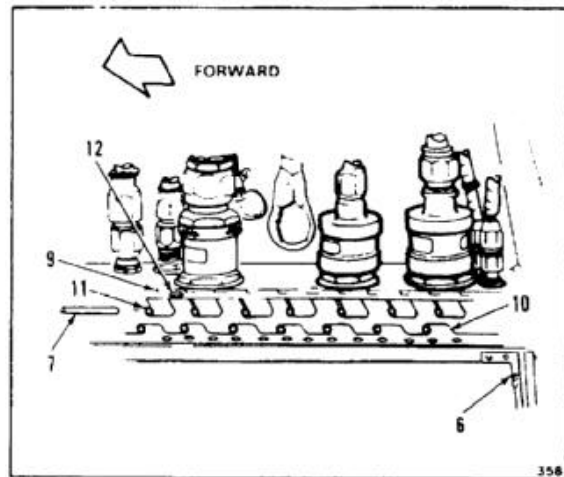
REMOVE

1. Remove sealant from bolt (1) head holding bonding jumper (2).
2. Have helper hold bolt (1). Working inside aircraft, remove nut (3) and washer (4) from bolt.
3. Remove bolt (1) and washer (5). Disconnect jumper (2) from bolt.
4. Have helper support cover (6). Push hinge pin (7) forward out of hinge (8) until pin can be gripped and pulled forward out of hinge. Remove cover.



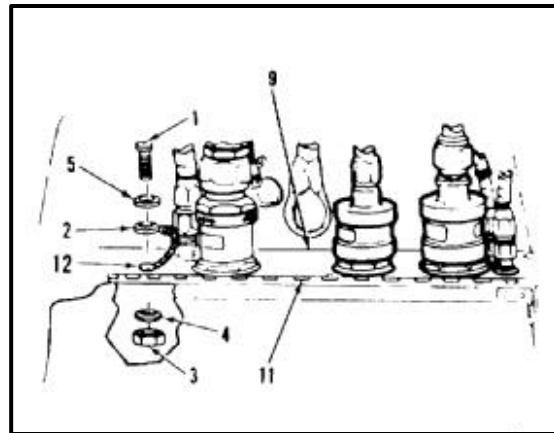
INSTALL

5. Position cover (6) on pylon structure (9). Align hinge fitting (10) on cover (6) and hinge fitting (11) on structure. Have helper support cover.
6. Install hinge pin (7) from forward end of cover (6) in hinge fittings (10 and 11). Pin must be about **.2 inch** inside hinge (10) when fully installed.
7. Squash end of hinge leave (10) to stop pin (7) sliding out.

**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

8. Clean bolt (1) head and surface around bolt hole (12). Use cloths (E120) and solvent (E162). Wear gloves (E186).
9. Position washer (5) and jumper (2) on bolt (1). Install bolt in hinge (11) and structure (9).
10. Have helper hold bolt (1). Install washer (4) and nut (3) on bolt.

**WARNING**

Sealant (E339) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

11. Apply sealant (E339) to bolt (1) head and surface around bolt. Wear gloves (E186).

FOLLOW-ON MAINTENANCE:

Close engine lower access cover (Task 4-49).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Rubber (E319)
Cement (E101)
Tape (E381)
Gloves (E186)

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

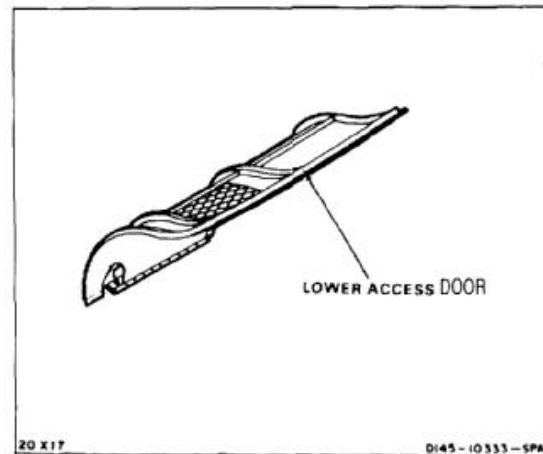
As Required

Equipment Condition:

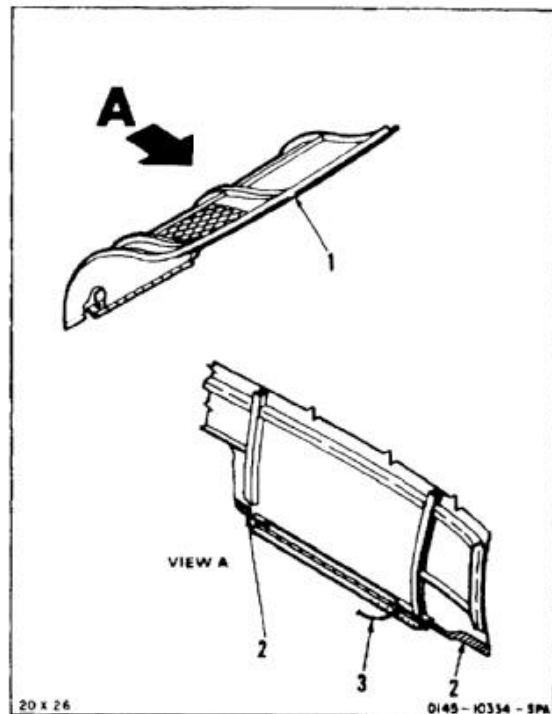
As Required

General Safety Instructions:**WARNING**

Cement (E101) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



1. Check door seal (1) for wear or damage. Replace seal if needed. Use rubber (E319) and cement (E101). Wear gloves (E186).
2. Check anti-chafe tape (2) for wear or damage. Replace tape if needed. Use tape (E381) and cement (E101).
3. Replace bonding jumper (3) if damaged.
4. Repair small nicks, dents, or scratches by burnishing.
5. Stop drill cracks less than **1 inch** long. Cracks shall not exceed **1 inch**.
6. Check holes. Trimmed diameter of round or oval holes shall not exceed **1 inch**.

INSPECT**FOLLOW-ON MAINTENANCE:**

Refinish as required (Task 2-6).

END OF TASK

4-272

4-62 REPAIR LOWER ACCESS DOOR — MAJOR DAMAGE (AVIM)**4-62****INITIAL SETUP****Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**TM 1-1500-204-23
Task 4-61**Equipment Condition:**

As Required

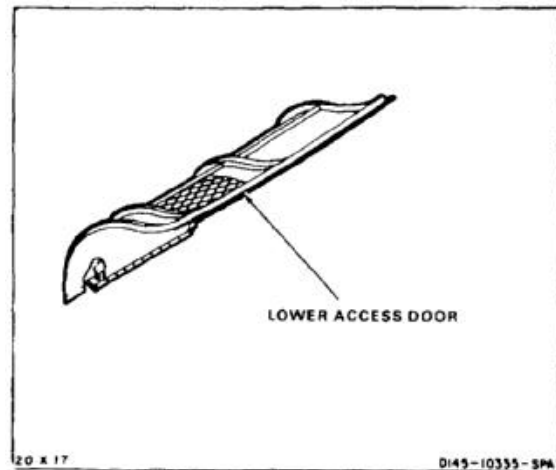
General Safety Instructions:

As Required

1. Repair damage to skin greater than minor damage (Task 4-61) as follows:
 - a. Patch skin damage that affects less than **25 percent** of skin panel.
 - b. Repair skin damage that affects more than **25 percent** of skin panel, or boundary members, by insertion.
2. Patch damage to formed parts that does not affect a bend radius.
3. Replace lower access door when damage affects bend radius of formed parts.

INSPECT**FOLLOW-ON MAINTENANCE:**

As Required



END OF TASK

4-273/(4-274 blank)

SECTION IV
AIR INDUCTION SYSTEM

INITIAL SETUP

Applicable Configurations:

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
Thickness Gage

Materials:

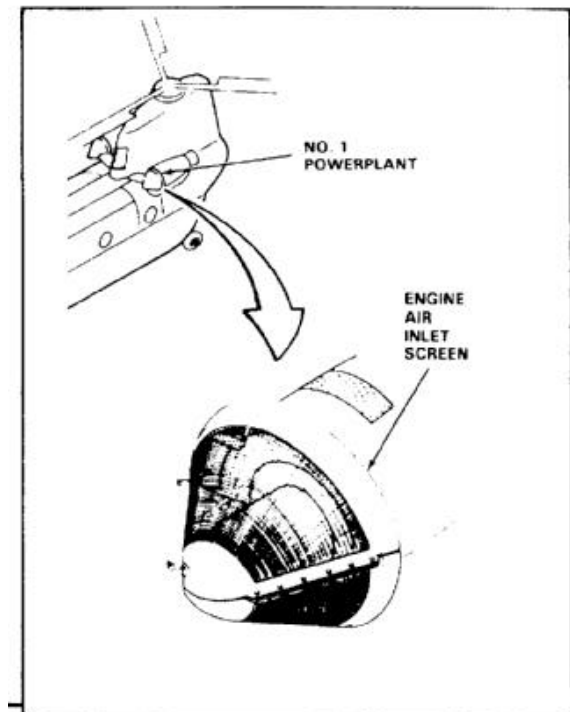
None

Personnel Required:

Aircraft Structural Repairer (2)
Inspector

Equipment Condition:

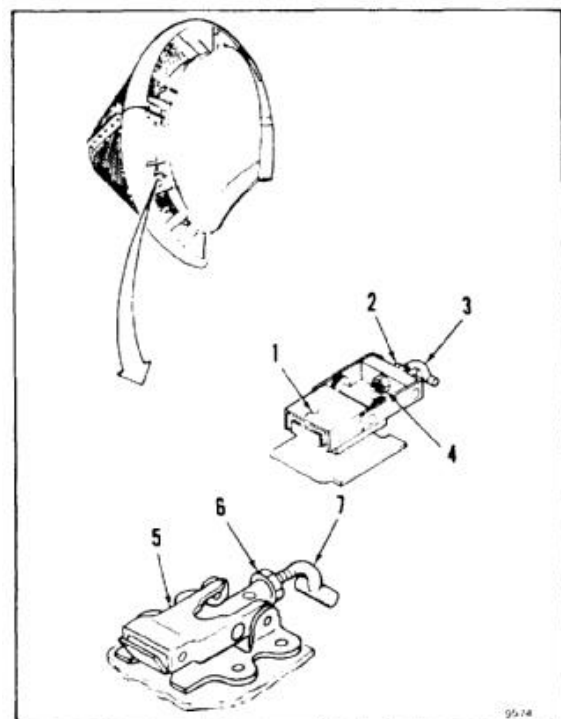
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)

**NOTE**

Procedure is same to adjust new engine air inlet screens for No. 1 or No. 2 engine. Adjustment of screens for No. 1 engine is shown here.

Two types of latches are used on engine screens. Screen adjustment is shown using both latches.

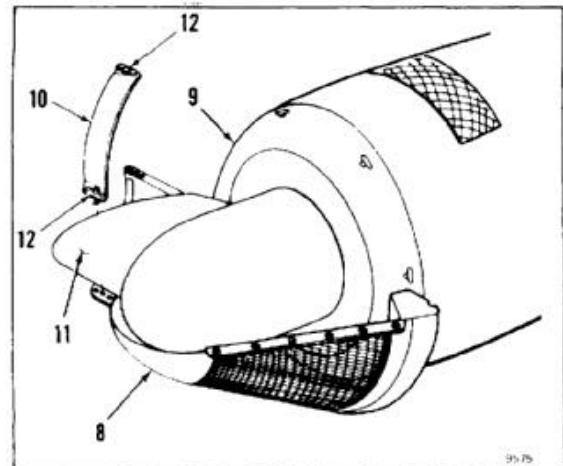
1. On five Hartwell latches (1):
 - a. Tighten nuts (2) against upper ends of tee bolts (3).
 - b. Tighten nuts (4) against lower ends of tee bolts (3).
2. On five Avibank latches (5):
 - a. Tighten nuts (6) against upper ends of tee bolts (7).
 - b. Turn tee bolts (7) **five turns** counterclockwise.



ADJUST LOWER SCREEN**CAUTION**

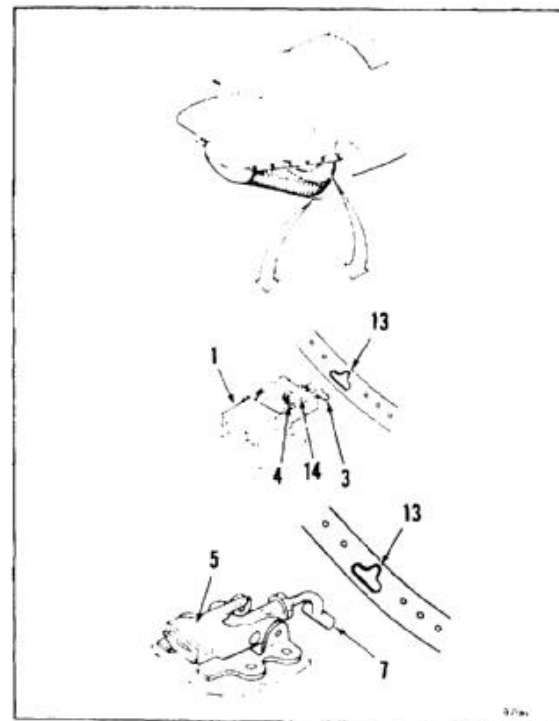
When installing lower screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.

3. Have helper position lower screen (8) on engine air inlet fairing (9). Make sure air holes on fairing are not covered.
4. Position strap (10) over engine drive shaft fairing (11). Secure two fasteners (12).
5. Trim cushions and flange on screen (8) as required to fit around air inlet firing (9) and drive shaft fairing (11). A maximum gap of **0.25 inch** is allowed.

**INSPECT****CAUTION**

Do not overtighten nuts on latches. Overtightening can cause damage to screens, latches, and fairings.

6. On two Hartwell latches (1):
 - a. Insert tee bolts (3) in fairing holes (13) and close latches (1).
 - b. Tighten nuts (4) until they contact trunnions (14).
7. On two Avibank latches (5):
 - a. Insert tee bolts (7) in fairing holes (13) and close latches (5). If latch closes with moderate force, go to step 8. If not, go to step 7b.
 - b. Release latches (5) and remove tee bolts (7) from holes (13).
 - c. Tighten tee bolts (7) **one turn**.
 - d. Insert tee bolts (7) in holes (13) and close latches (5).
 - e. Repeat steps b, c, and d until only a moderate force is required to close latches (5).

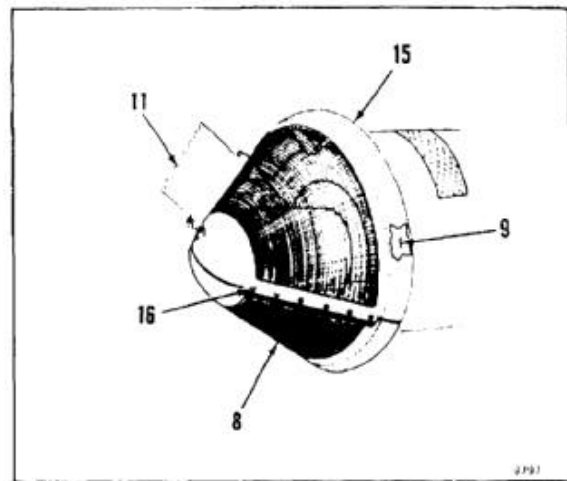


ADJUST UPPER SCREEN**CAUTION**

Make sure there is no foreign matter in air inlet. If foreign matter is left in inlet, damage to powerplant will occur.

CAUTION

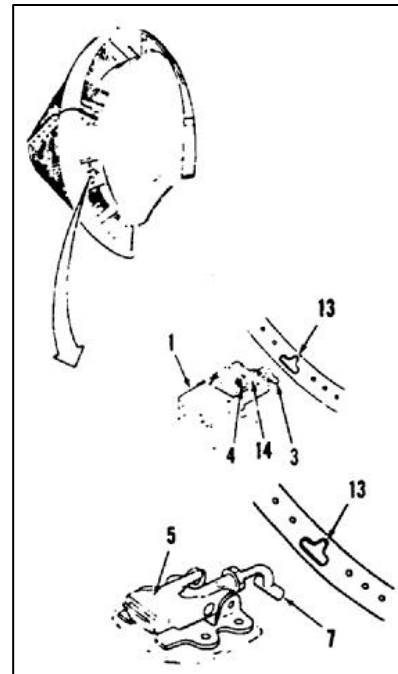
When installing upper screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.



8. Position upper screen (15) on lower screen (8) and fairing (11). Make sure holes on fairing are not covered.
9. Trim cushions and flange on screen (15) as required to obtain proper fit around air inlet fairing (9) and drive shaft fairing (11). A maximum gap of **0.25 inch** is allowed.

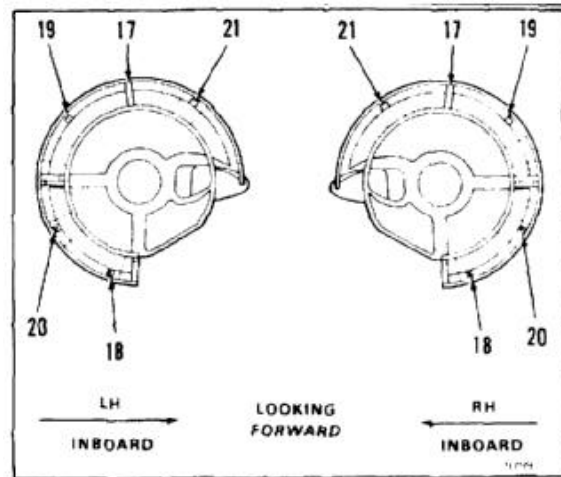
INSPECT

10. Secure six fasteners (16).
11. On three Hartwell latches (1):
 - a. Insert tee bolts (3) in holes (13).
 - b. Tighten nuts (4) against trunnions (14) until light force is required to close latches (1).
12. On three Avibank latches (5):
 - a. Insert tee bolts (7) in fairing holes (13) and close latches (5). If latch closes with moderate force, go to step 13. If not, go to step 12b.
 - b. Release latches (5) and remove tee bolts (7) from holes (13).
 - c. Tighten tee bolts (7) **one turn**.
 - d. Insert tee bolts (7) in holes (13) and close latches (5).
 - e. Repeat steps b, c, and d until moderate force is required to close latches (5) in step d.

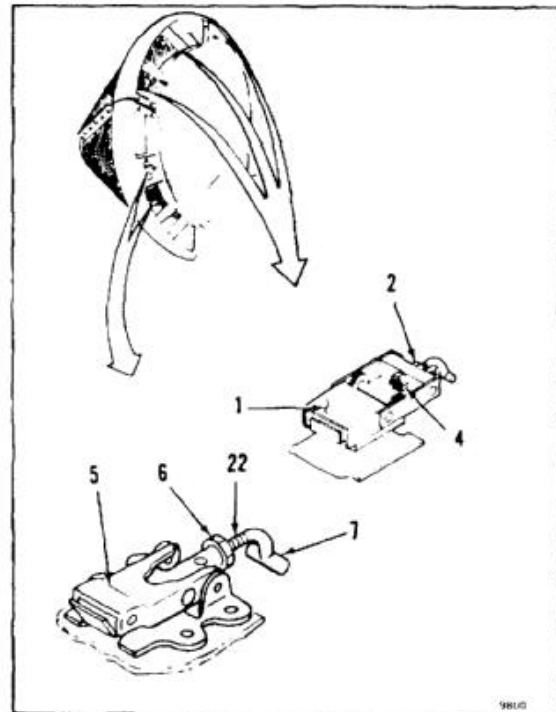


ADJUST LATCHES

13. Adjust all latches as in steps 6, 7, 11, and 12 in the following sequence:
 - a. Upper screen center latch (17).
 - b. Lower inboard latch (18).
 - c. Upper outboard latch (19).
 - d. Lower outboard latch (20).
 - e. Upper inboard latch (21).



14. Perform step 13 until a moderate force is required to close latches (1 or 5).
15. Repeat step 13 until a firm force is required to close latches (1 or 5).
16. Tighten nuts (2 and 4 or 6) on tee bolts (3 or 7).
17. If too few tee bolt threads (22) are available to accomplish a firm force on latches, add another nose cushion (Task 4-159). If firm closing force is obtained, go to step 19. If not, perform step 18.
18. Repeat steps 14, 15, and 16.

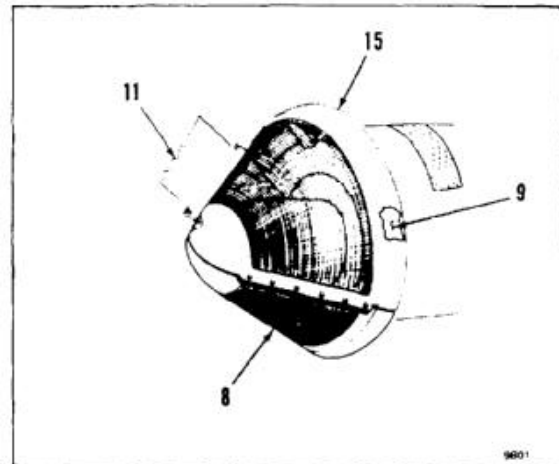


19. Check gap between screens (8 and 5), air inlet fairing (9), and drive shaft fairing (11). A maximum gap of **0.25 inch** is allowed.

INSPECT

FOLLOW-ON MAINTENANCE:

- Remove engine air inlet screens (Task 4-65).
- Paint last 3 numbers of aircraft serial number on upper and lower screens (TB 746-93-2).
- Install engine air inlet screens (Task 4-76).
- Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

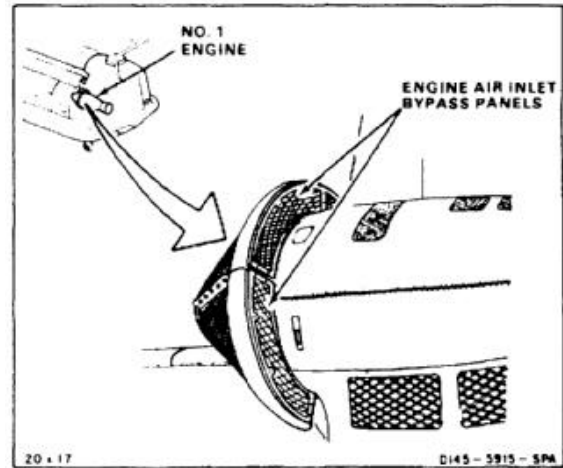
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)

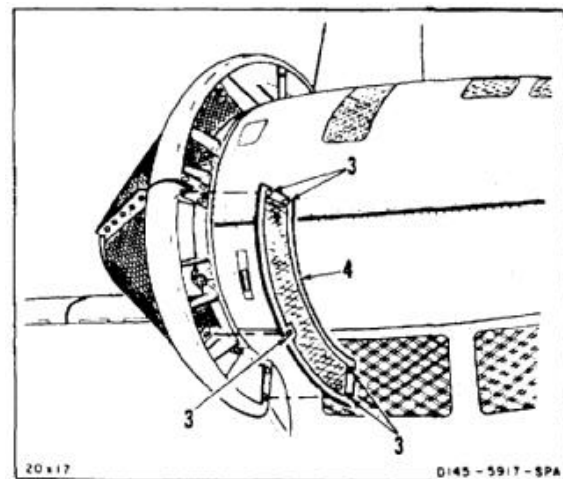
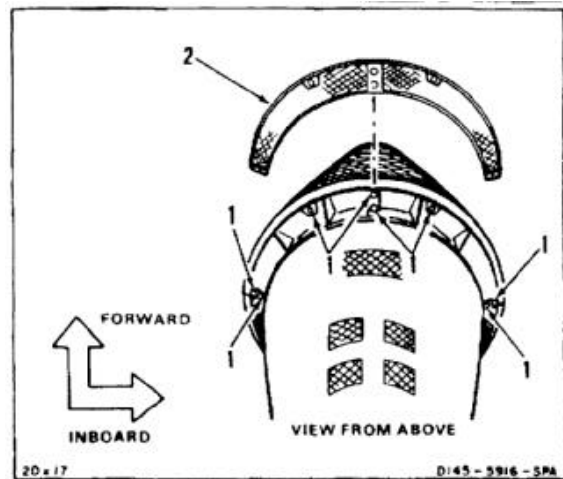


NOTE

Procedure is same to remove bypass panels on No. 1 or No. 2 engine. Removal of No. 1 bypass panels is shown here.

1. Release eight fasteners (1).
2. Remove upper panel (2).

3. Release five fasteners (3).
4. Remove lower panel (4).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

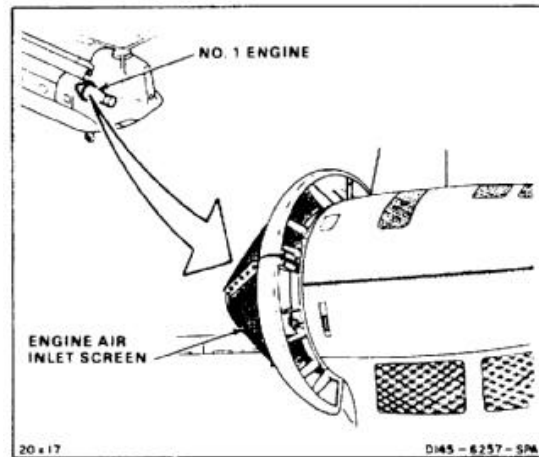
None

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Air Inlet Screen Bypass Panels Removed (Task 4-64)

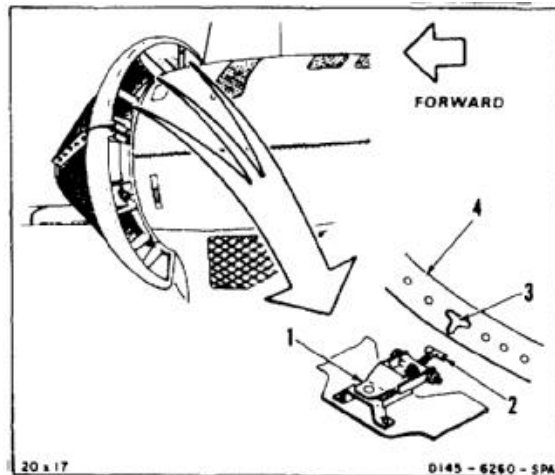


NOTE

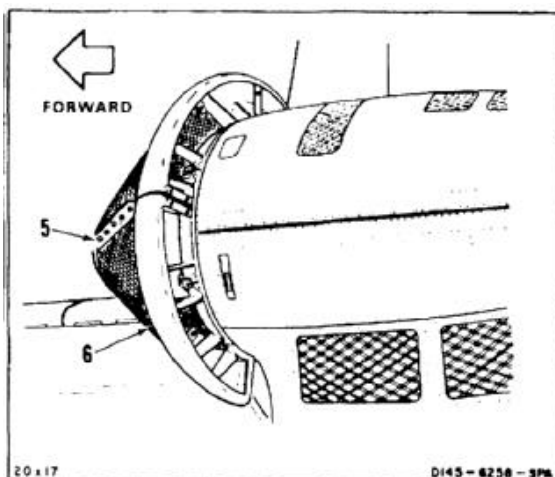
Procedure is same to remove engine air inlet screens on No. 1 or No. 2 engine. Removal of No. 1 air inlet screens is shown here.

REMOVE UPPER SCREEN

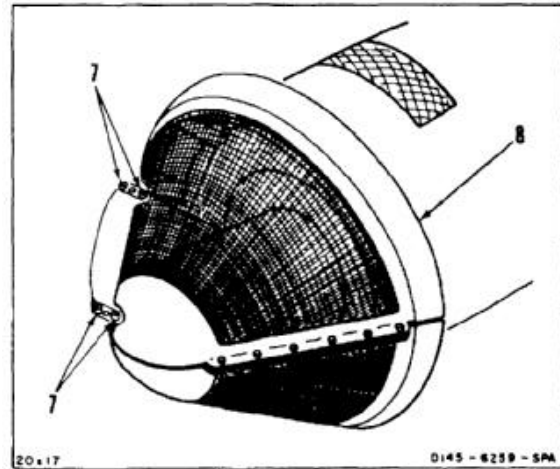
1. Release three latches (1). Disengage three tee bolts (2) from holes (3) in inlet fairing (4).



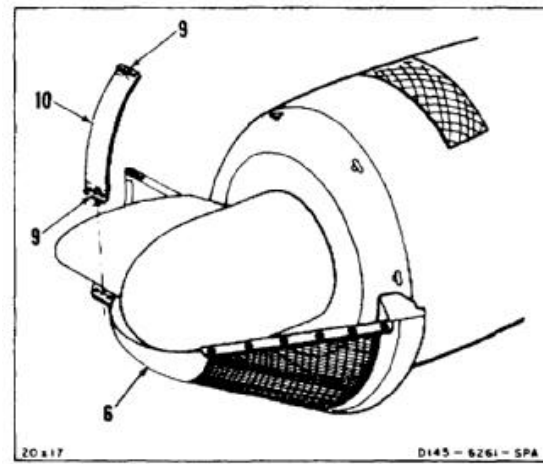
2. Release six fasteners (5) on lower screen (6).



3. Release four fasteners (7).
4. Remove upper screen (8).



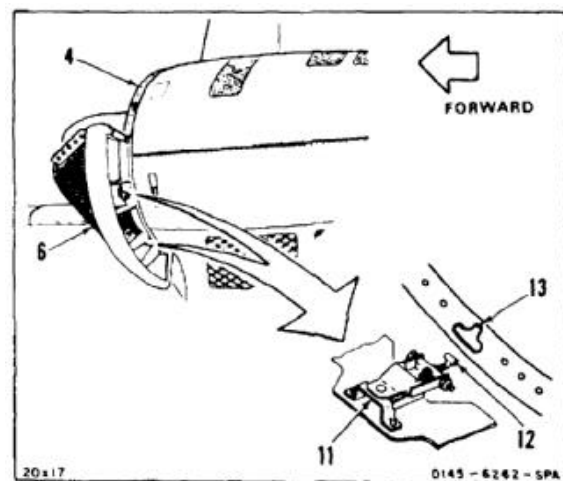
5. Release two fasteners (9). Remove strap (10). Support lower screen (6).



6. Release two latches (11). Disengage two tee bolts (12) from holes (13) in inlet fairing (4).
7. Remove lower screen (6).

FOLLOW-ON MAINTENANCE:

Inspect engine inlet for FOD.
 Install engine inlet protective covers (Task 1-32).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Source of Compressed Air
Goggles

Materials:

Brush (E85)

Personnel Required:

Medium Helicopter Repairer

Equipment Condition:

Off Helicopter Task

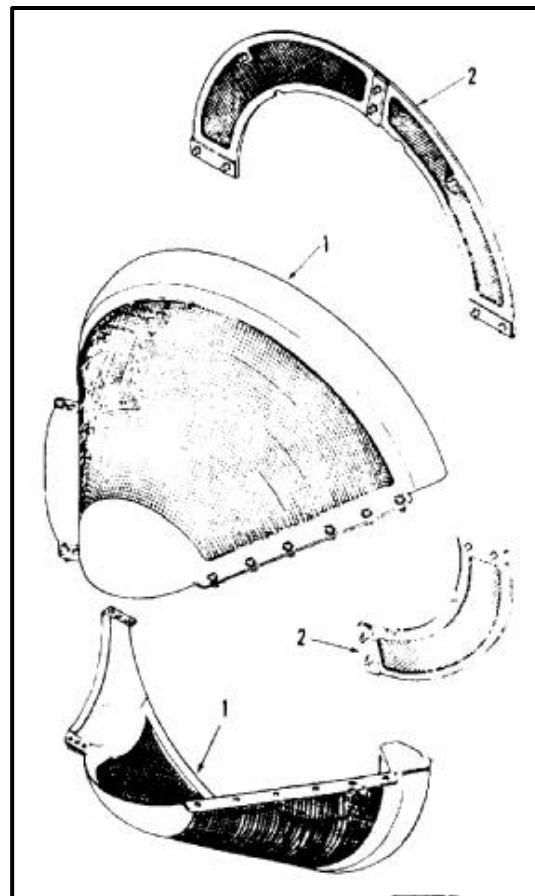
WARNING

Do not use more than **30 psi** compressed air for cleaning purposes. Debris propelled under pressure can cause injury to eyes. Use source of compressed air under **30 psi** and eye protection to prevent injury to personnel.

1. Clean engine air inlet screens (1) and bypass panels (2). Use compressed air and brush (E85). Wear goggles.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-284

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

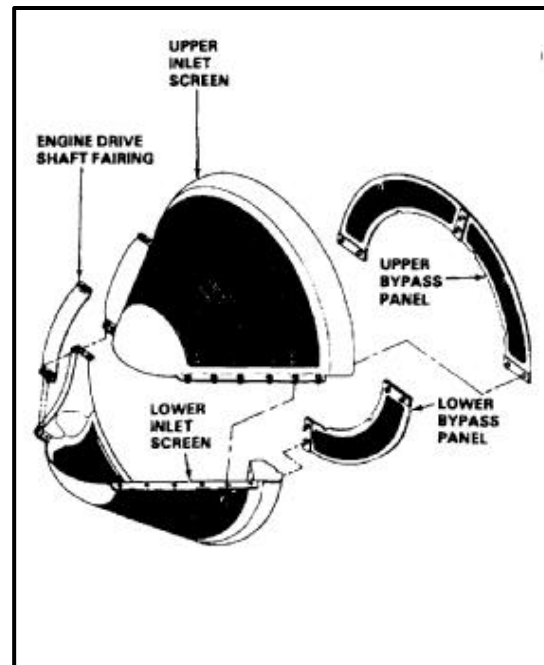
As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**Task 4-68
Task 4-69**Equipment Condition:**

As Required

General Safety Instructions:

As Required



1. On aircraft equipped with **40**, **0.020 fine** mesh screen is installed over **0.063 coarse** mesh screen of the upper and lower engine inlet screens only.
2. Engine air inlet screens consist of upper and lower screen assemblies attached with quick-release fasteners at each mating flange. Upper and lower bypass panels are attached with quick-release fasteners to upper and lower screen assemblies.
3. Repairs to engine air inlet screen and bypass panels are classified as minor repairs (Task 4-68), major repairs, and repairs requiring replacement (Task 4-69).

FOLLOW ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP**Applicable Configurations:**

All

Tools:

As Required

Materials:

As Required

Personnel Required:

Aircraft Structural Repairer

Inspector

References:

Task 2-6

Task 4-69

TM 1-1500-204-23

Equipment Condition:

As Required

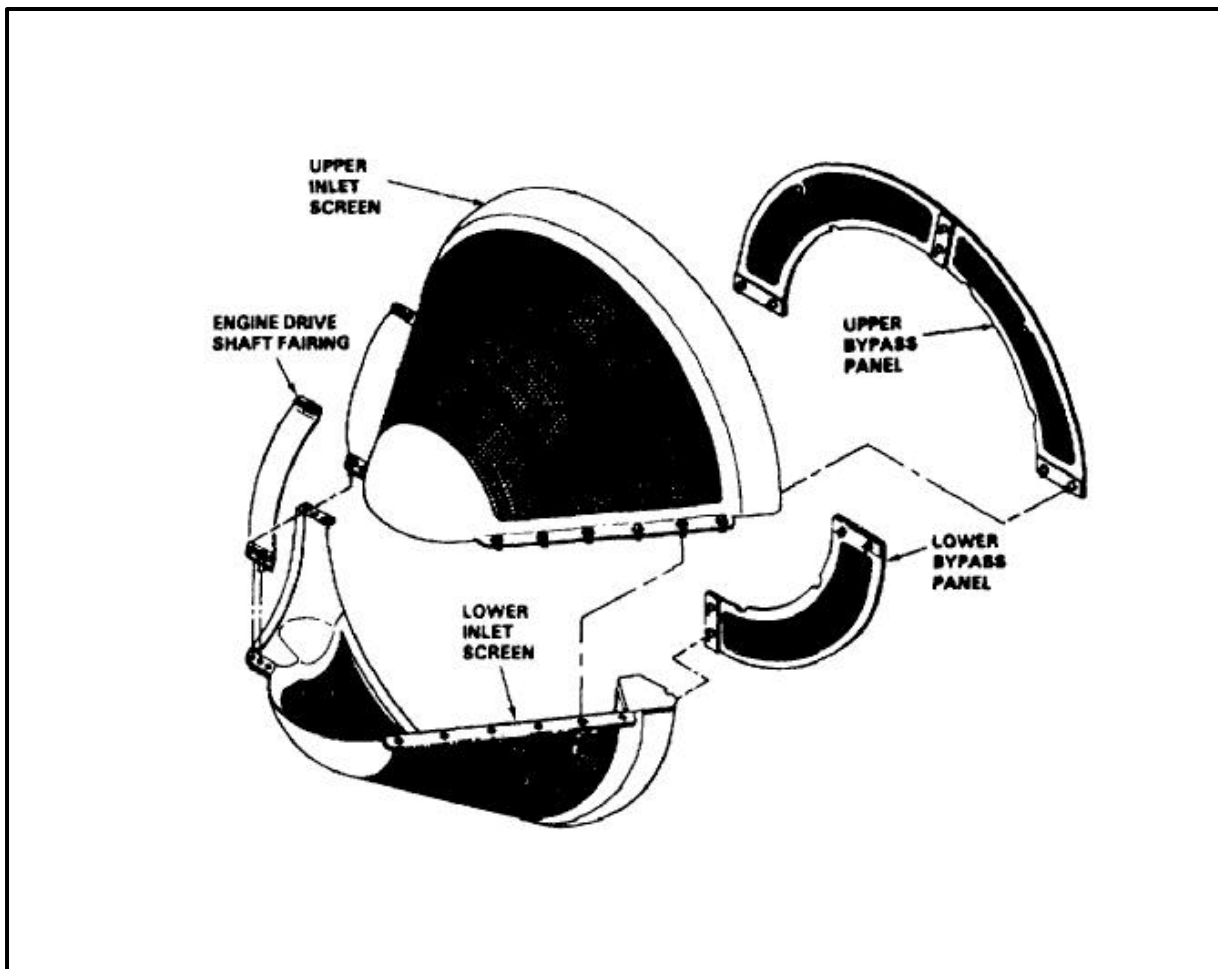
General Safety Instructions:

As Required

1. Burnish minor nicks, dents, or scratches on engine air inlet screen and bypass panels (Task 4-69).
2. Refinish repaired area (Task 2-6).
3. Replace Camloc fastener (TM 1-1500-204-23).

FOLLOW-ON MAINTENANCE:

As Required



4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES

4-68.1

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876

Materials:

Pencil (E271)
 Adhesive (E27)
 Gloves (E186)

Parts:

Washers
 Rivets

Personnel Required:

Aircraft Structural Repairer
 Inspector

References:

TM 55-1520-240-23P
 Task 2-317

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

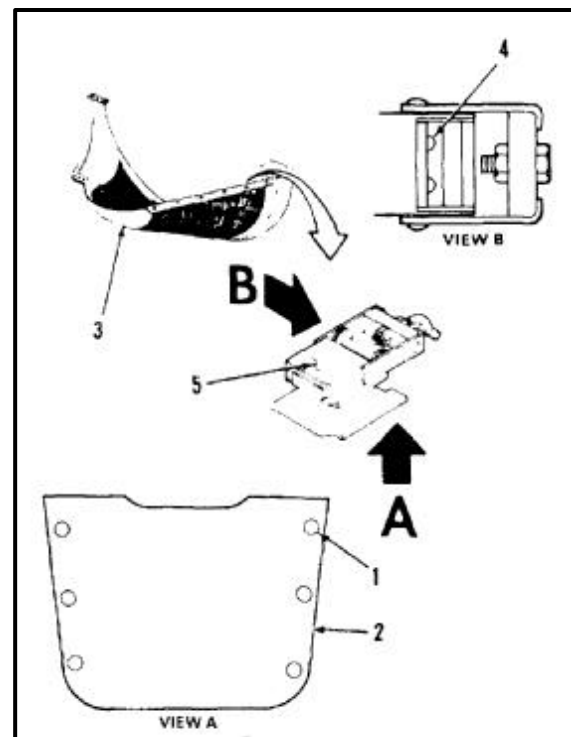
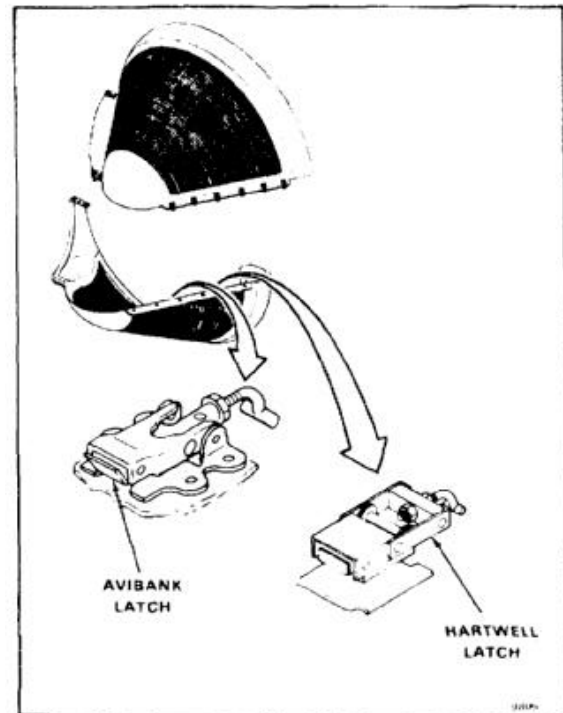
Adhesive (E27) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

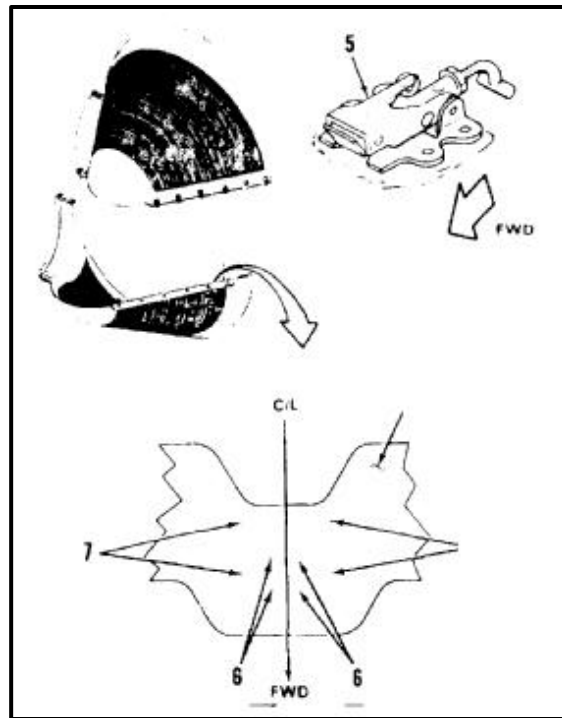
Two types of latches (Avibank 9170 and Hartwell H976-7) are used on engine screens. When replacing latch assemblies, use only Avibank 9170 latches.

The engine screen assembly has five latches. Replacement is same for all.

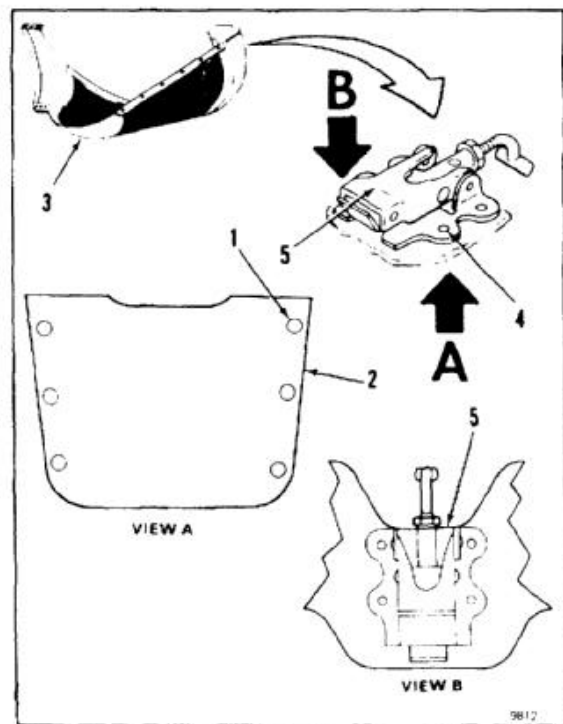
1. If Hartwell latch (5) is installed, drill out six rivets (1) which attach pad (2). Remove pad from screen (3). If Avibank latch is installed, go to step 7.
2. Drill out four rivets (4) securing latch (5). Remove latch.



3. To prepare holes for Avibank installation, mark centerline between Hartwell holes (6) to rear edge of screen (3). Use pencil (E271).
4. Position new Avibank latch (5) centered on mark drawn in step 3 and flush with rear edge of screen (3).
5. Mark new latch (5) hole positions. Use pencil (E271). Remove latch.
6. Drill four holes (7) through marks drawn in step 5. Countersink holes on underside of screen (3).



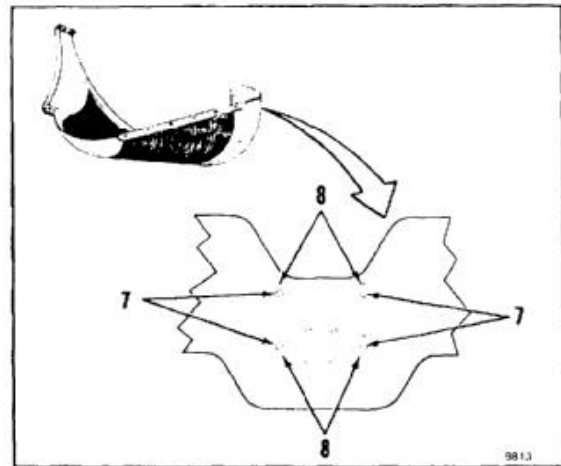
7. If replacing an Avibank latch, drill out six rivets (1) from pad (2) on screen (3). Remove pad.
8. Drill out four rivets (4) which attach latch (5). Remove latch.



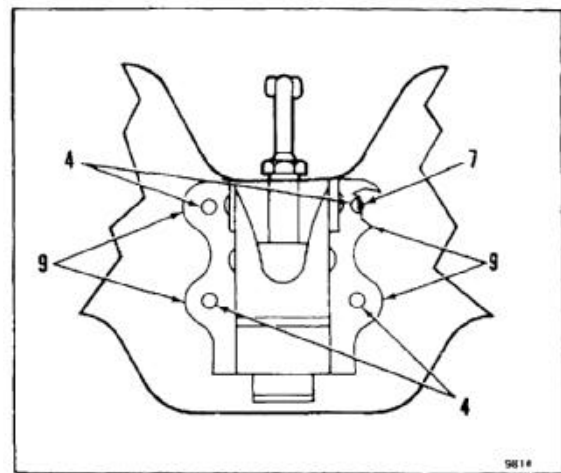
4-68.1 REPLACE ENGINE SCREEN LATCH ASSEMBLIES (Continued)

4-68.1

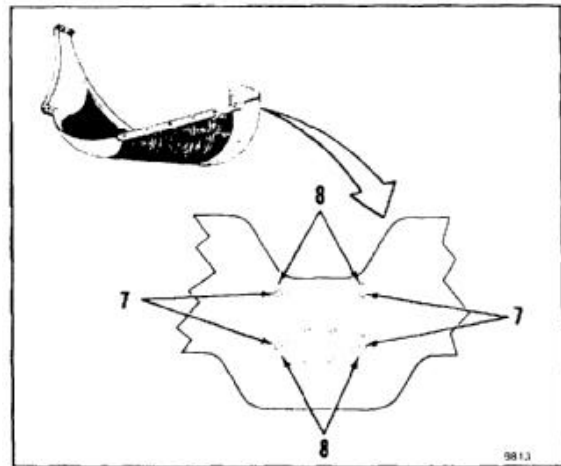
9. Prepare adhesive (E27) (Task 2-317).
10. If any washers (8) are loose or missing, perform step 11. If not, go to step 12.
11. Apply adhesive (E27) to one side of four washers (8). Install washers over holes (7).



12. Apply adhesive (E27) to bottom of latch mounting flanges (9).
13. Position latch flanges (9) over holes (7) and install four rivets (4). Apply adhesive to heads of rivets.
14. Remove excess adhesive (E27). Leave a fillet around flanges (9).



15. Position serviceable pad (2) on screen (3) and install with six rivets (1). Apply adhesive to heads of rivets (Task 2-317). Allow adhesive to cure.



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-290

4-68.2 REPLACE ENGINE SCREEN ACCESS DOOR LATCHES

4-68.2

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876

Materials:

Adhesive (E27)

Parts:

Rivets
 Cable
 Ferrule (2)
 Eyelet (APP E-46)
 Latch (APP E-47)
 Clip (APP E-48)

Personnel Required:

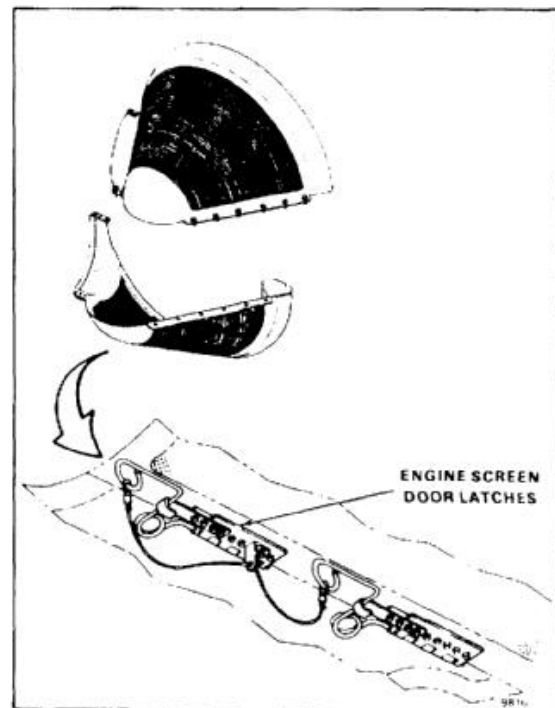
Aircraft Structural Repairer
 Inspector

References:

Appendix E
 TM 55-1520-240-23P
 Task 2-317

Equipment Condition:

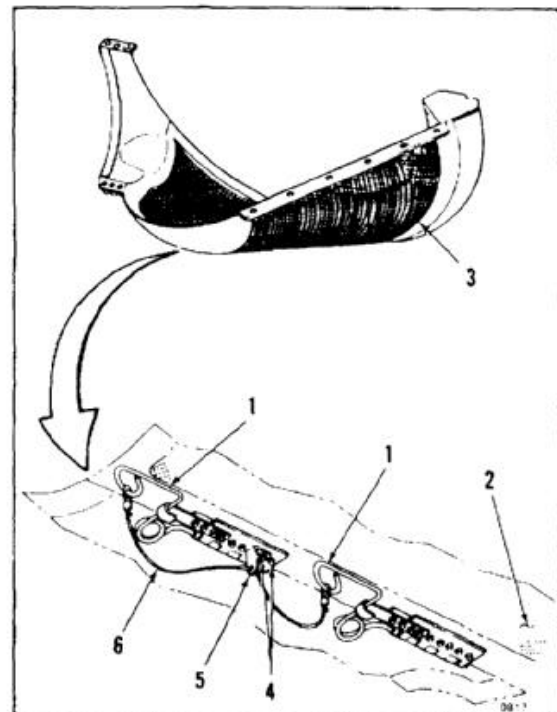
Off Helicopter Task

**NOTE**

Procedure is same to repair latches in RH or LH screens. Repair of LH screen is shown.

REPLACE EYELET

1. Disengage latch pins (1) and open access panel (2) on screen (3).
2. Drill out two rivets (4) from eyelet (5). Remove eyelet.
3. Cut and remove latch cable (6).
4. Position new eyelet (5) on screen (3). Install two rivets (4).
5. Go to step 17.

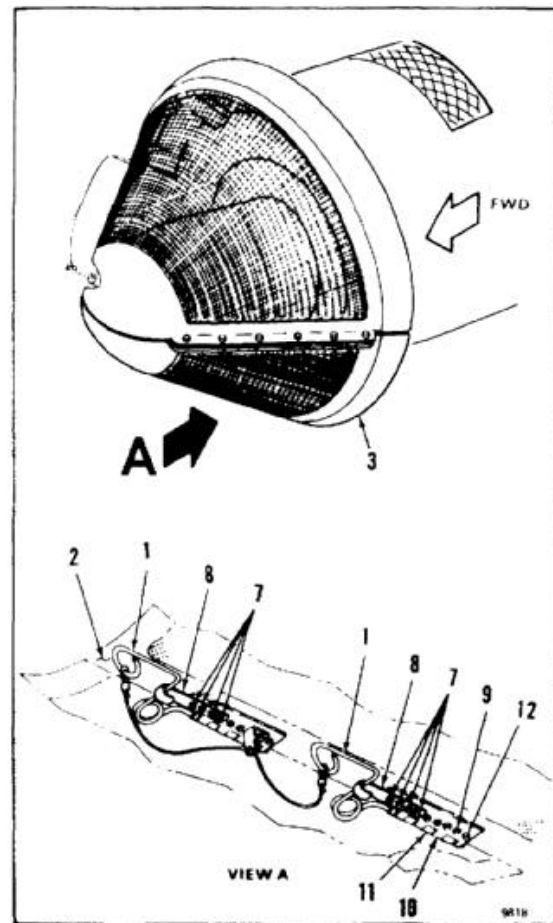


REPLACE CLIP

6. Disengage latch pins (1) and open access door (2) on screen (3).
7. Drill out four rivets (7) and remove clip (8).
8. Position new clip (8) on screen (3) and install four rivets (7).
9. Go to Follow-On Maintenance.

REPLACE LATCH

10. Perform steps 1 thru 3 and 7.
11. Drill out remaining rivets (9) and remove latch (10).
12. Position new latch (10) on screen (3) so it aligns and engages mating latch (11).
13. Install new latch (10) with rivets (9). Place washer (12) under rivet heads.
14. Repeat steps 4 and 8.
15. Go to step 7.



REPLACE LATCH CABLES AND PINS

16. Cut cable (6) and remove from latch pins (1) and eyelet (5).
17. Replace pins (1), as required.
18. Cut new cable (6) to **13.31 inches**.
19. Thread new cable (6) thru eyelet (5) and pass each end (13) through new ferrule (14).
20. Thread cable ends (13) thru pin loops (15) and back thru ferrules (14).
21. Crimp ferrules (14).

WARNING

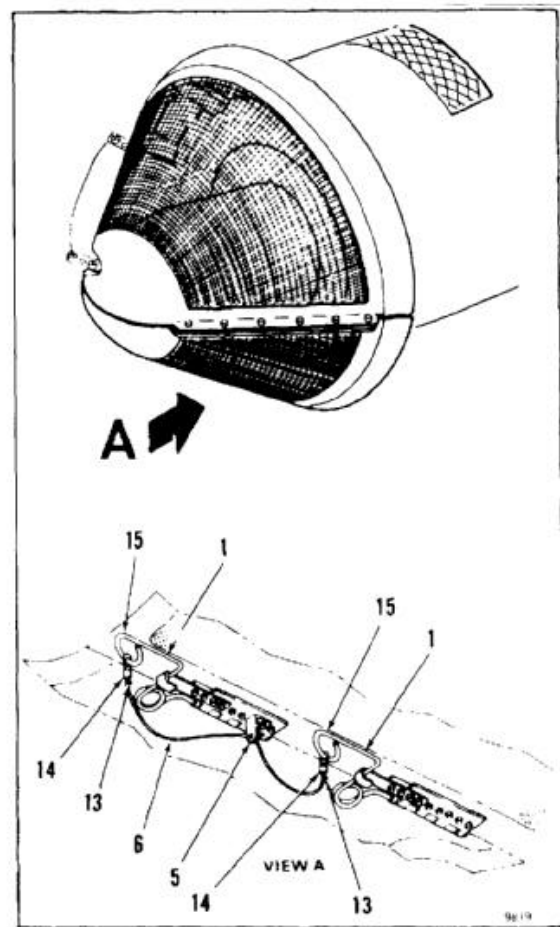
Adhesive (E27) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

INSPECT

22. Prepare adhesive (E27) (Task 2-317). Coat all rivet heads with adhesive. Allow adhesive to cure.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

Adhesive (E58)
Solvent (E244)
Cloths (E120)
Gloves (E186)
Rubber, Sheet (E319)

Personnel Required:

Aircraft Structural Repairer
Inspector

References:

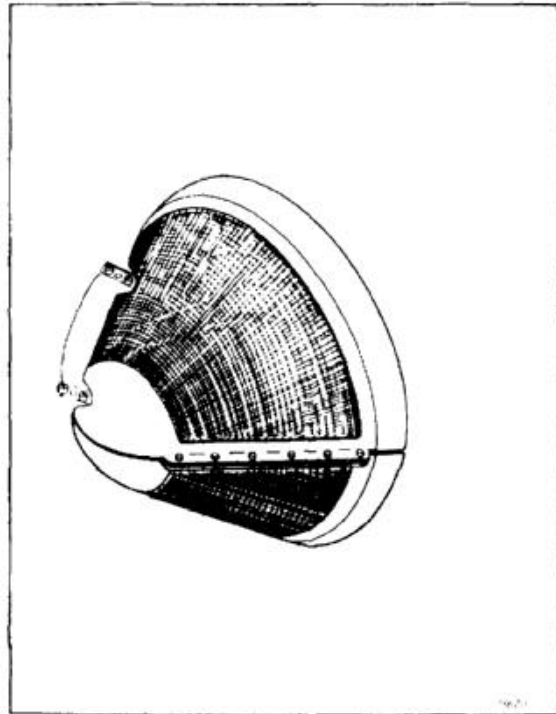
TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

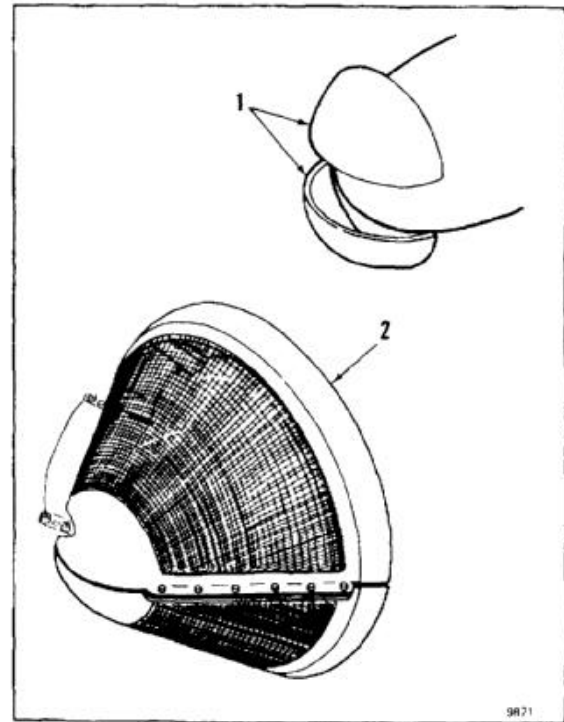
Methyl-ethyl-ketone (E244) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



NOTE

Procedure is same for replacement of all engine screen rubber cushions. Replacement of nose cushion is shown here.

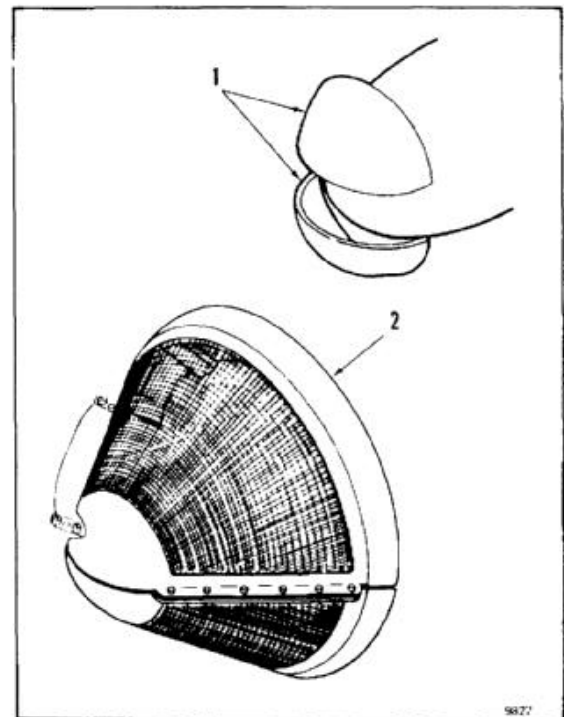
1. Pull cushion (1) from screen (2).
2. Clean surface of screen (2). Use solvent (E244) and cloths (E120). Wear gloves (E186).



3. Make new cushion (1) from rubber (E319).
4. Fit new cushion (1) to screen (2) and trim, as required.
5. Apply adhesive to cushion (1) and screen (2).
6. Immediately install cushion (1) on screen (2), with firm hand pressure.
7. Remove excess adhesive from cushion (1) and screen (2). Use solvent (E244) and cloths (E120). Wear gloves (E186).

INSPECT**FOLLOW-ON MAINTENANCE:**

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
 AVIM Tool Set #2
 Heat Lamp

Materials:

Adhesive (E43)
 Dry Cleaning Solvent (E161)
 Cloths (E120)
 Epoxy Topcoat (E166)
 Epoxy Primer (E292)
 Abrasive Pad (E2)
 Acetone (E20)
 Temperature Indicating Strips (E413)

Personnel Required:

Aircraft Structural Repairer
 Inspector

References:

TM 55-1520-240-23P
 Task 2-317

Equipment Condition:

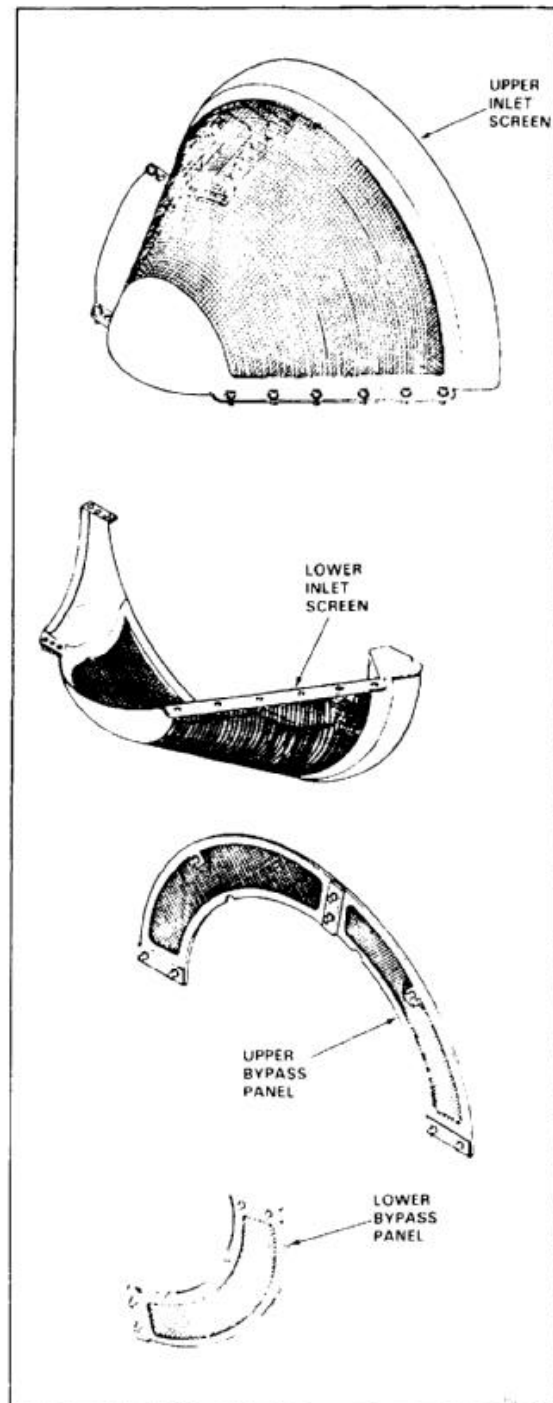
Off Helicopter Task

General Safety Instructions:**WARNING**

Methyl-ethyl-ketone (E244) is flammable. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

WARNING

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



WARNING

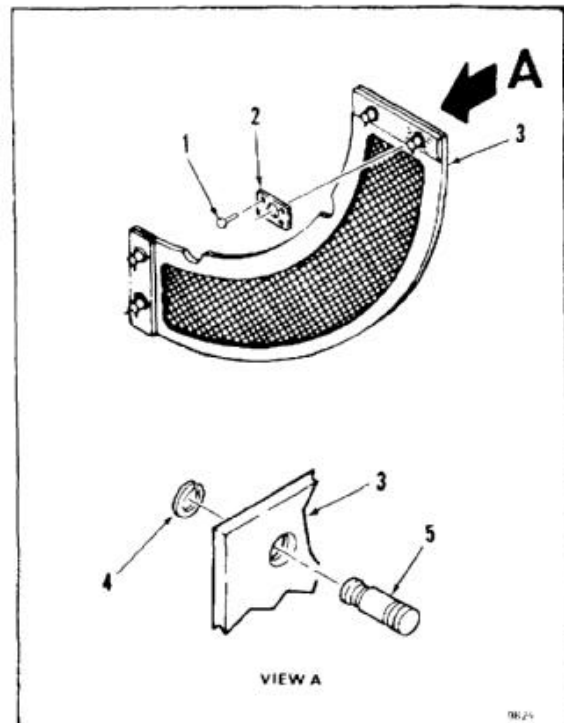
Epoxy primer (E292) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

NOTE

Procedure is similar to remove Deutsch fastener from any screen. Removal from lower bypass panel and screen is shown.

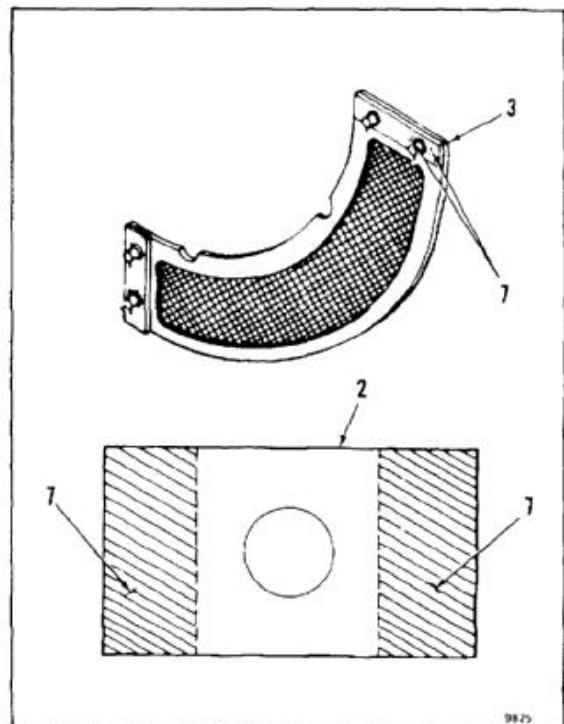
REPLACE STUD

1. If installed, drill rivets (1) from retainer (2) and panel (3).
2. Heat retainer (2) to **140°F to 160°F (60°C to 71°C)** and remove from panel (3). Use heat lamp. Monitor temperature with temperature indicating strips (E413).
3. Remove retaining ring (4) and stud (5) from panel (3).

**WARNING**

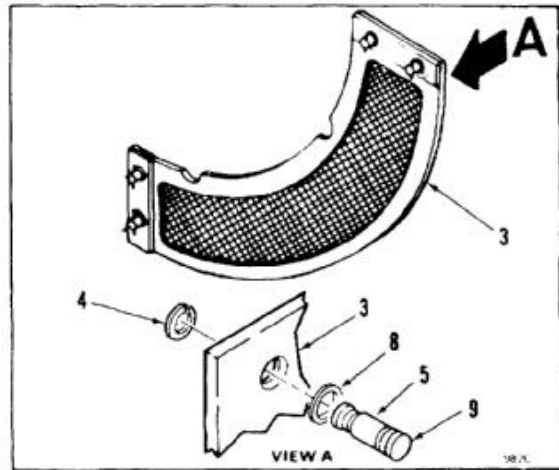
Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

4. Remove epoxy finish from bonding surface (7) of retainer (2) and panel (3). Use acetone (E20) and abrasive pads (E2).
5. Clean bonding surfaces (7) on new retainer (2) and panel (3). Use cloths (E120) and solvent (E161).



6. Insert new stud (5) in panel (3) with washer (8) under stud head (9).
7. Install retainer ring (4) on stud (5) on back side of panel (3).

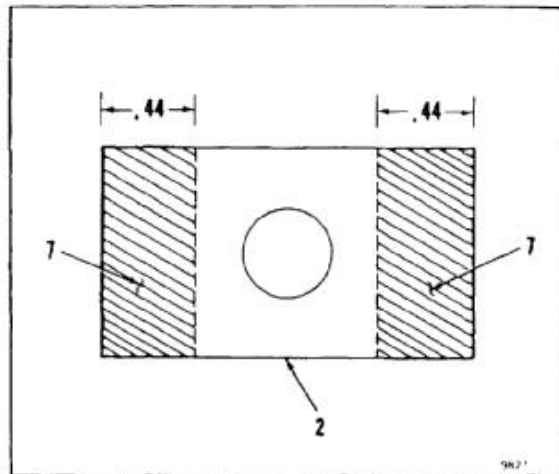
INSPECT



NOTE

Do not apply adhesive to panel.

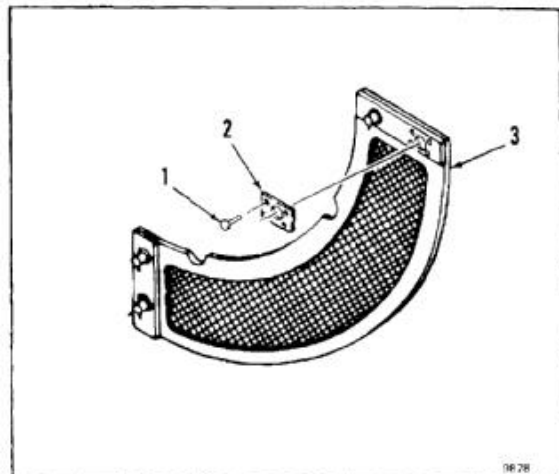
8. Prepare adhesive (Task 2-317). Apply light coat of adhesive to bonding surface (7) of retainer (2).



9. Position retainer (2) on panel (3). Align holes in retainer with holes in panel. Install four rivets (1). Allow adhesive to cure.

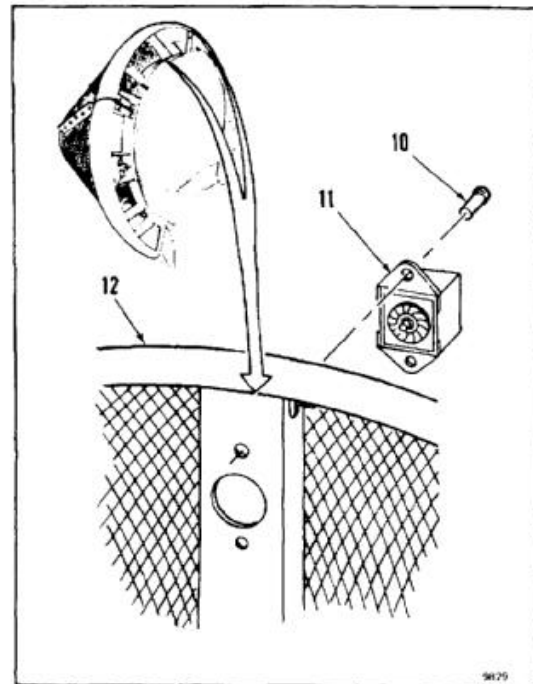
INSPECT

10. Apply primer (E292) and **two coats** of epoxy topcoat (E166).



REPLACE RECEPTACLE

11. Drill out two rivets (10) securing receptacle (11) to screen (12). Remove receptacle.
12. Remove adhesive residue and debris from screen (12). Use solvent (E161) and cloths (E120).
13. Position new receptacle (11) on screen (12). Install receptacle on screen with two rivets (10).
14. Mix adhesive (E43) (Task 2-317) and apply adhesive to rivet heads (10).
15. Allow adhesive to cure. Apply **one coat** of epoxy primer (E292) and **two coats** of epoxy topcoat (E166).

INSPECT**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

As Required

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**AMS 5680
SAE-AMS-STD-2219
Task 2-349
Task 2-352
Task 2-367
Task 4-64
Task 4-65
Task 4-66
Task 4-67
Task 4-68
Task 4-68.1
Task 4-68.2
Task 4-68.3
Task 4-68.4
Task 4-69
Task 4-76
TB 746-93-2
TM 1-1500-204-23**Equipment Condition:**

Off Helicopter Task

General Safety Instructions:

As Required



Anytime a screen is damaged in different areas, and same strand of wire is impacted by those areas, care must be taken to make sure repairs secure the wire along its entire length across the screen.

NOTE

Aircraft with **40**, have 0.020 fine mesh screen installed over 0.063 coarse mesh screen on the upper and lower engine inlet only.

1. Repair screen material as follows:
 - a. Remove screen assembly from engine. Refer to Tasks 4-64 and 4-65.
 - b. Before repairing screen material, make sure screen is cleaned (Task 4-66) and existing finish removed from affected area.
 - c. If fine mesh material on inlet screen is not badly abraded or opened, repair as follows:
 - (1) If abrasion of screen does not exceed half the thickness of the wire, sand the surfaces smooth and refinish the screen (Tasks 2-349 and 2-352).

- (2) If only a few strands of screen are badly abraded or separated, tac weld (SAE-AMS-STD-2219) across the defect with 0.020, AMS 5680 wire.
- d. Proceed as follows if fine mesh screen is badly abraded, opened, or separated:

NOTE

If screen was previously patched in area recently damaged, or repair requires overlapping an older repair with a new one, the new repair should encompass new and old areas with removal of the old patch.

If numerous repairs have already been made to the screen, the screen assembly should be replaced.

- (1) Cut out damaged area to form a square or rectangular hole, cutting each side of the hole along and on the damaged side of good strands of wire.
- (2) Bend back strands from cut wires to first good cross strand along each side of the hole.
- (3) Weld (SAE-AMS-STD-2219) the cut and bend back strands to the cross strands with 0.020, AMS 5680 wire.

4-69 REPAIR ENGINE AIR INLET SCREEN AND BYPASS PANELS — MAJOR REPAIRS

(AVIM) (Continued)

4-69

(4) Prepare a patch of the same screen material slightly larger and same shape as hole.

(5) Remove strand(s) running along each side of the patch so as to free strands along those sides.

4-69 REPAIR ENGINE AIR INLET SCREEN AND BYPASS PANELS — MAJOR REPAIRS

(AVIM) (Continued)

4-69

- (6) Bend free strands down and place patch over hole with strands going through screen being repaired.
 - (7) From other side of screen assembly, bend wires extending from patch around good wires of screen assembly.
 - (8) Weld (SAE-AMS-STD-2219) bent strands from patch, to strands of screen assembly with 0.020, AMS 5680 wire.
 - (9) After welding is completed, sand or grind away any rough surfaces.
 - (10) Refinish screen (Tasks 2-349 and 2-352).
2. Replace air inlet screen or bypass panel when enough of the heavy mesh screen is broken away to allow objects to pass. (Refer to Tasks 4-67, 4-65 and 4-76.)
 3. Repair impregnated glass cloth parts. (Refer to TM 1-1500-204-23, TB 746-93-2 and Task 4-67.)
 4. Repair rubber seals. (Refer to Task 2-367.)
 5. Replace mounting latch assembly, including rubber pad. (Refer to Task 4-68.1.)
 6. Replace access door latches. (Refer to Task 4-68.2.)
 7. Replace engine screen cushions. (Refer to Task 4-68.3.)
 8. Replace engine screen bypass panel fasteners. (Refer to Task 4-68.4.)

FOLLOW-ON MAINTENANCE:

As Required

END OF TASK

4-302

INITIAL SETUP

Applicable Configurations:

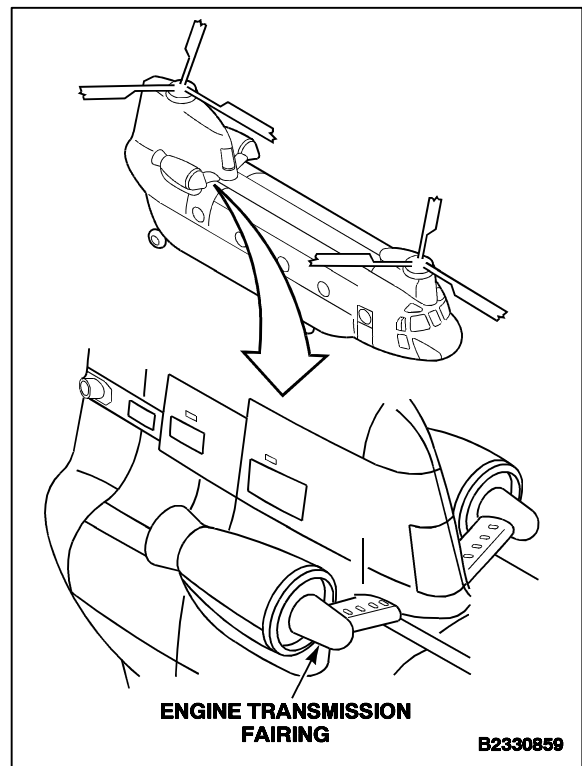
All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

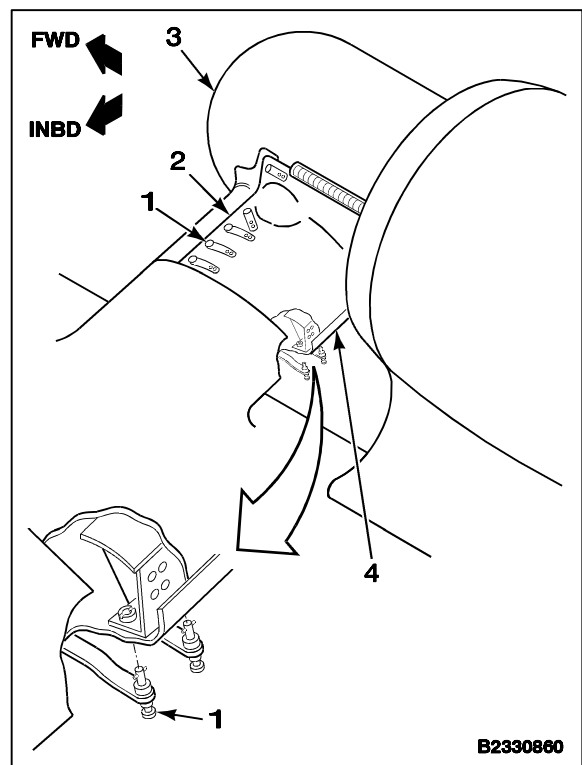
Materials:

None

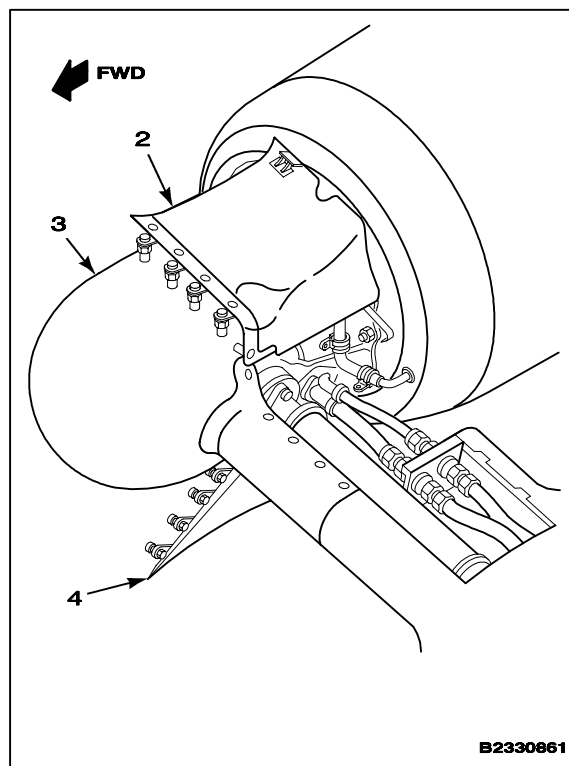
Personnel Required:CH-47 Helicopter Repairer
Inspector**Equipment Condition:**Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Air Bypass Panels Removed (Task 4-64)
Engine Air Inlet Screens Removed (Task 4-65)**NOTE**

Procedure can be used to remove transmission fairing on No. 1 or No. 2 engine. Fairing on No. 2 engine is shown here.

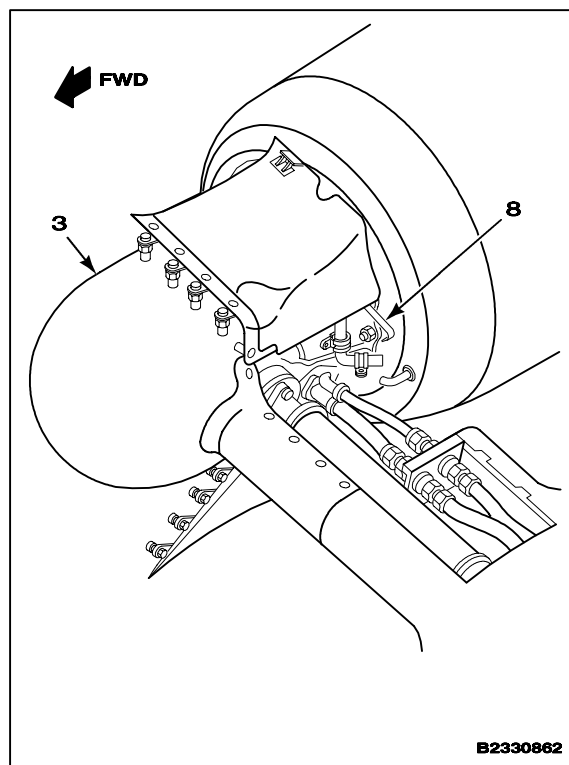
1. Release five turn lock fasteners (1) on upper panel (2) of transmission fairing (3).
2. Release seven fasteners (1) on lower panel (4) of fairing (3).



3. Open upper panel (2) and lower panel (4) of fairing (3).

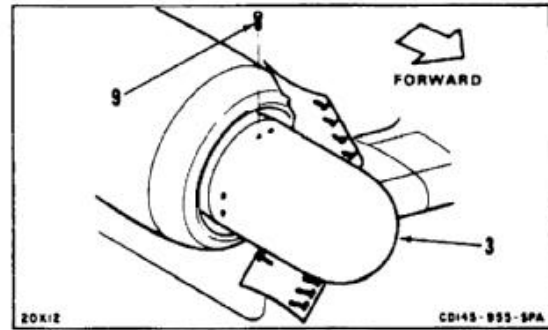


4. Remove retainer band (8) from fairing (3).
5. Deleted.
6. Deleted.

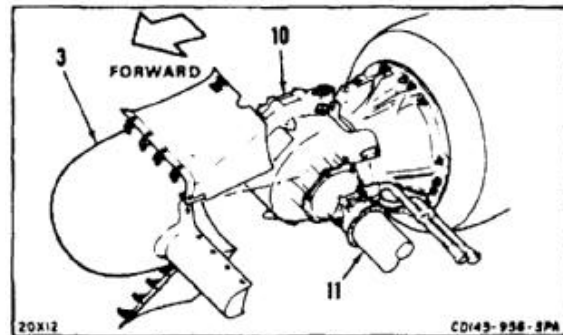


4-70 REMOVE ENGINE TRANSMISSION FAIRING (Continued)

7. Remove six bolts (9) from top, side, and bottom of fairing (3).



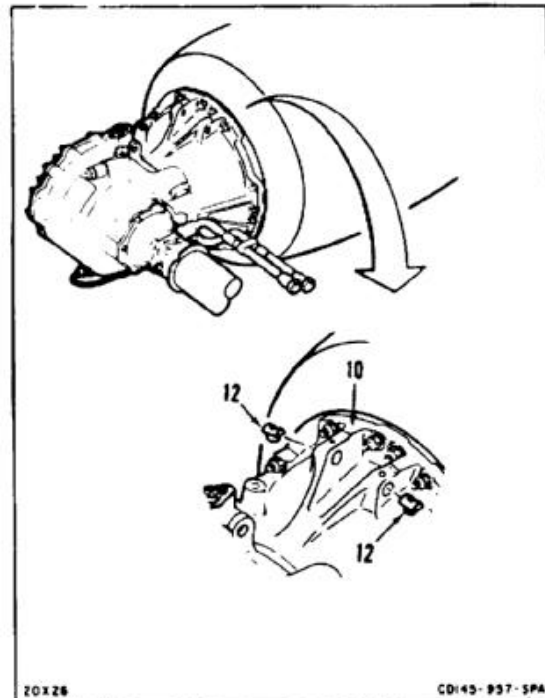
8. Move fairing (3) forward off transmission (10). Turn fairing as needed to clear engine shaft (11).



CAUTION

Do not operate engine with transmission fairing removed unless barrel nuts are removed from transmission. If engine is operated with barrel nuts installed, barrel nuts can loosen and lodge in engine.

9. If engine is to be operated, remove six barrel nuts (12) from top, side, and bottom of transmission (10).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**Reference:**TM 1-1500-204-23
TB 43-0105**Equipment Condition:**

As Required

General Safety Instructions:

As Required

1. Engine transmission fairing consists of bullet shaped shell and airfoil-shaped structures. Shell covers engine transmission. Airfoil shaped structure covers part of engine shaft between engine and combining transmissions. Both fairing sections contain anti-icing air ducts.
2. Check that damage such as cracks, dents, and scratches is no closer than **3/4 inch** from any fastener.
3. Stop drill small cracks (TM 1-1500-204-23).
4. Remove dents and scratches by burnishing (TM 1-1500-204-23).

NOTE

Once an engine transmission fairing has been drilled, the fairing will be limited to installation on the side of the aircraft where the holes will be on the bottom of the fairing.

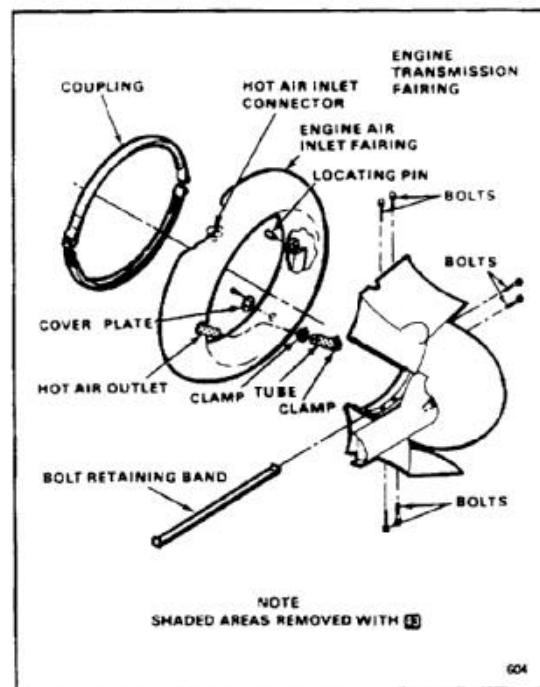
5. If evidence of corrosion or fluids pooling in the lower part of the engine transmission fairing, drill one **1/8 inch** hole directly forward of the engine transmission fairing stiffening ring and one **1/8 inch** hole directly aft of the engine transmission fairing stiffening ring.
6. Refinish as required (TB 43-0105).

INSPECT**FOLLOW-ON MAINTENANCE:**

As Required

END OF TASK

4-306



4-72 REPAIR ENGINE TRANSMISSION FAIRING — MAJOR DAMAGE (AVIM)

4-72

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876

Materials:

As Required

Personnel Required:Aircraft Structural Repairer
Inspector**References:**TM 1-1500-204-23
TB 43-0105
Task 2-6
Task 4-71**Equipment Condition:**

Off Helicopter Task

General Safety Instructions:

As Required

1. Repair damage to engine transmission fairing that exceeds minor damage limits (Task 4-71). Damage may not exceed **50 percent** of cross-section of part (Task 4-71 and TM 1-1500-204-23).
2. Refinish as required (Task 2-6 and TB 43-0105).
3. Replace engine transmission fairing parts if damage is more than **50 percent** of cross section.

INSPECT**FOLLOW-ON MAINTENANCE:**

See Task 4-71 for modification of fairing for corrosion.

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

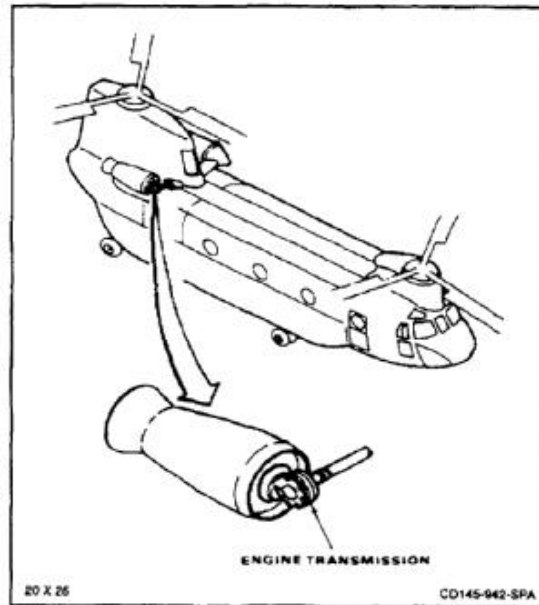
Personnel Required:Medium Helicopter Repairer
Inspector**References:**

TM 55-1520-240-23P

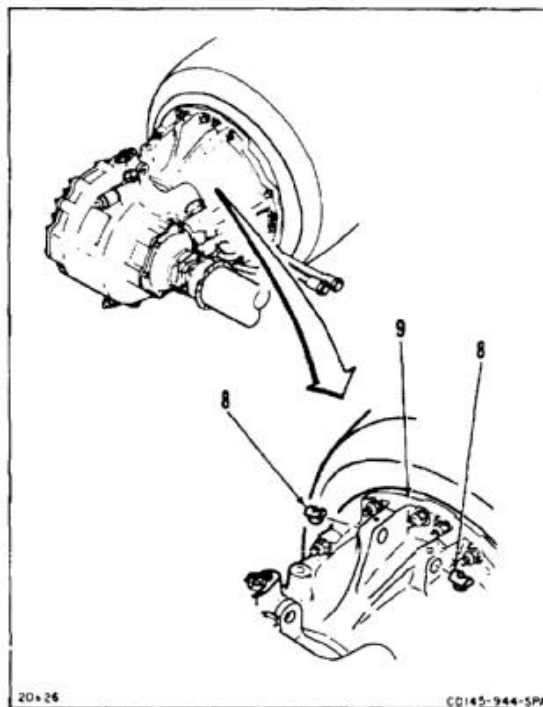
NOTE

Procedure can be used to install transmission fairing on No. 1 or No. 2 engine. Fairing on No. 2 engine is shown here.

If fairing has been modified to add drain holes per Task 4-71, the fairing is limited to installation on the side of the aircraft where the holes will be on the bottom of the fairing.



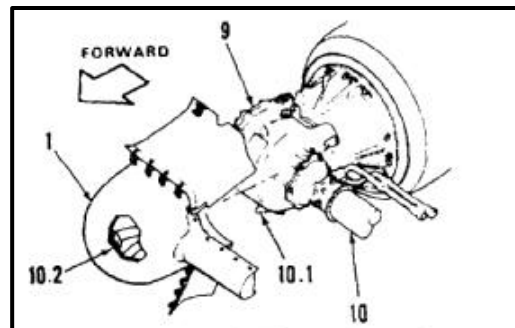
1. If barrel nuts (8) were removed, install six barrel nuts in top, side, and bottom of transmission (9).



CAUTION

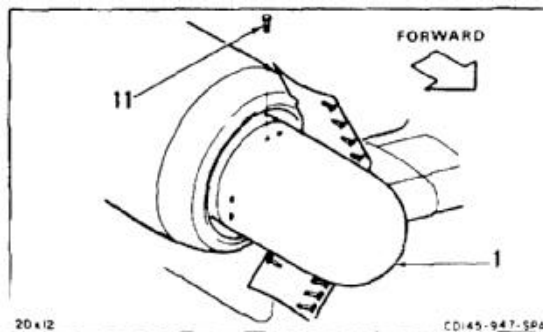
Handle fairing carefully to avoid damage to anti-icing duct.

2. Carefully position fairing (1) on transmission (9). Turn fairing as needed to clear engine shaft (10).

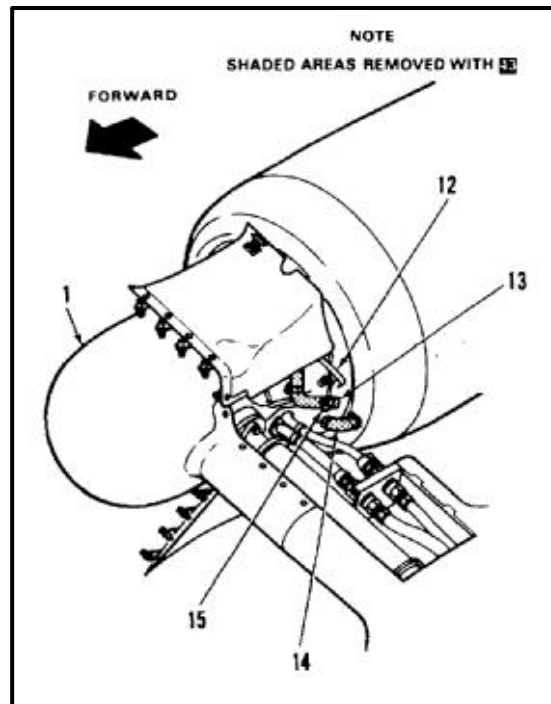


3. Install six bolts (11) in top, side, and bottom of fairing (1).

INSPECT

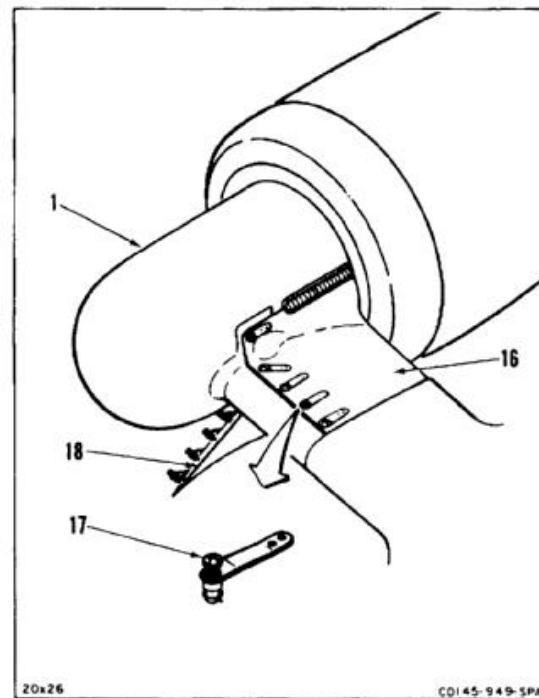


4. Install retainer band (12) in fairing (1).
5. Connect anti-icing hose (13) to hot air outlet (14) with clamp (15).



INSPECT

6. Secure upper panel (16) to fairing (1) with five turnlock fasteners (17). There shall be no broken or loose fasteners.
7. Close lower panel (18).

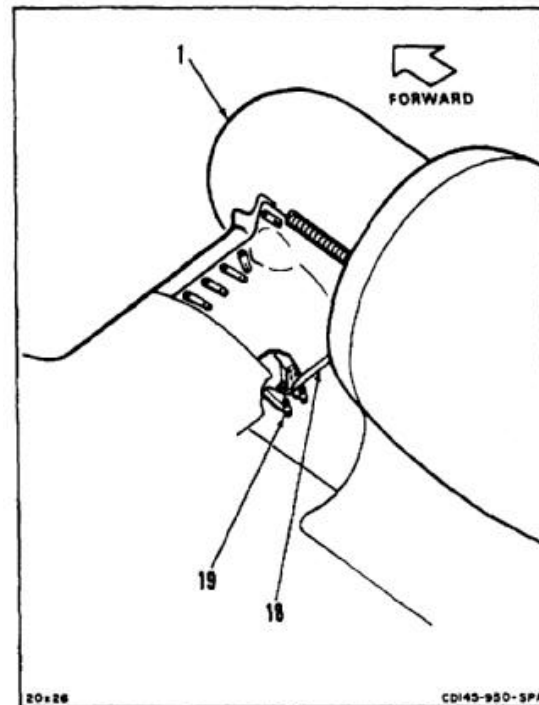


8. Secure lower panel (18) to fairing (1) with seven fasteners (19). There shall be no broken or loose fasteners.

INSPECT

FOLLOW-ON MAINTENANCE:

- Install air inlet screen assembly (Task 4-76).
Install air bypass panels (Task 4-77).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Sling (T134)
 Hoist

Materials:

Paper Tags (E264)
 Masking Tape (E388)

Personnel Required:

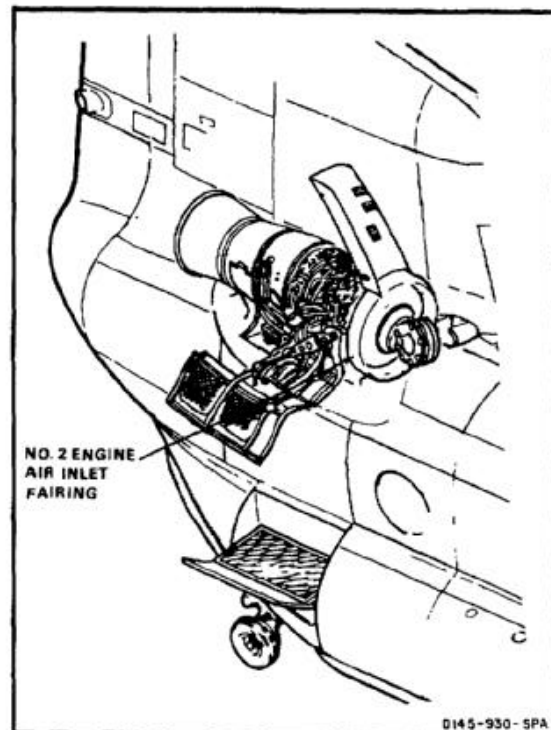
Medium Helicopter Repairer (2)

References:

Task 4-50

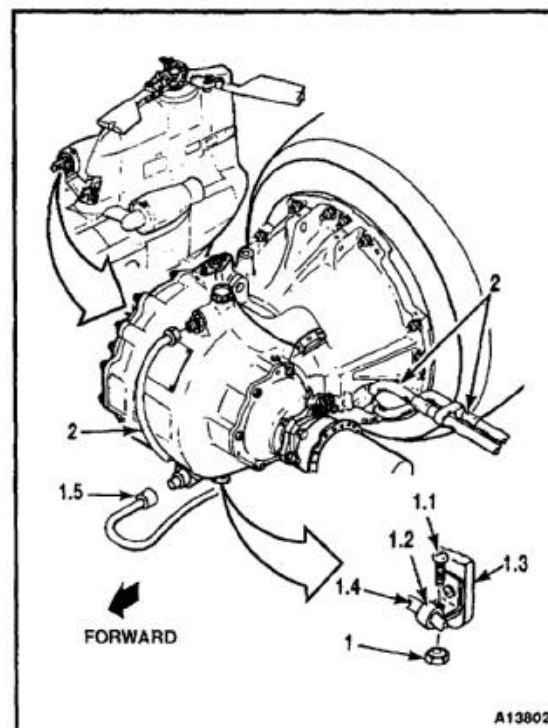
Equipment Condition:

Engine Work Platform Open (Task 2-2)
 Engine Mount Adapter Removed (Task 4-29)
 Engine Access Cover Open (Task 4-49)
 Engine Air Inlet Screens Removed (Task 4-65)
 Engine Transmission Fairing Removed (Task 4-70)
 Engine Drive Shaft Removed (Task 6-30)

**NOTE**

Procedure is same to remove No. 1 or No. 2 engine air inlet fairing. No. 2 fairing is shown here.

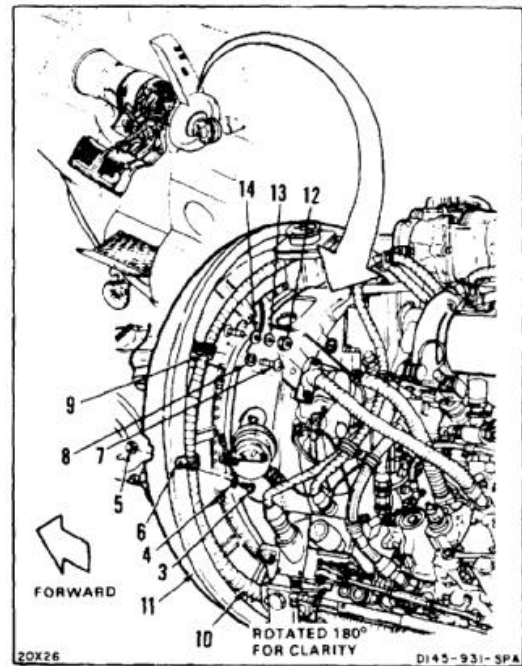
1. Remove nut (1) and screw (1.1) from clamp (1.2) at lower lifting lug (1.3). Release temperature and chip detector wire (1.4).
- 1.1. Disconnect cable plug (1.5).
2. Tag and disconnect three hoses (2). Use paper tags (E264).



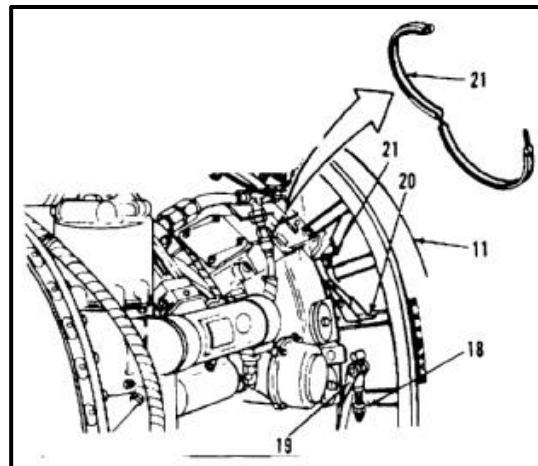
4-74 REMOVE ENGINE AIR INLET FAIRING (Continued)

4-74

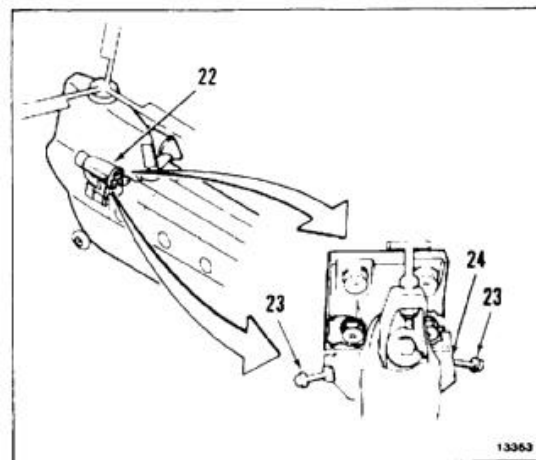
3. Remove screw (3), washer (4), and nut (5) from clamp (6). Remove screw (7) and washer (8) from clamp (9). Move hose (10) away from fairing (11).
4. Remove nut (12) and washer (13). Disconnect electrical lead (14) from fairing (11).



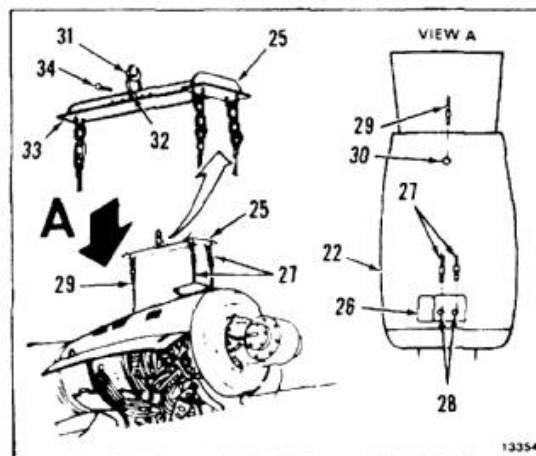
5. Loosen nut (18) on clamp (19) until lever (20) can be lifted to release coupling (21).
6. Remove coupling (21) from fairing (11).



7. Close engine upper access cover (22) (Task 4-50).
8. Remove lockwire from two bolts (23) on two forward engine mount caps (24). Loosen bolts and push down to side.



9. Install sling (25) as follows:
 - a. Open access door (26) in engine access cover (22).
 - b. Connect two cables (27) to forward fittings (28).
 - c. Connect cable (29) into aft fitting (30) through cover (22).
 - d. Adjust sling (25) until eye (31) is over center hole (32) in sling bar (33).
 - e. Install pin (34) through bar (33).



4-74 REMOVE ENGINE AIR INLET FAIRING (Continued)

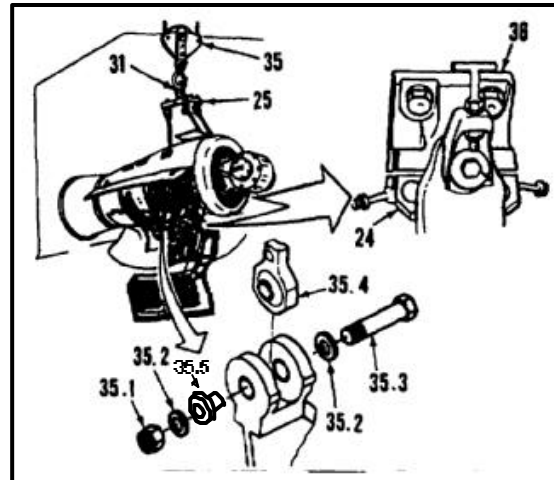
4-74

10. Connect hoist (35) to eye (31) of sling (25).
11. Raise hoist (35) slowly to remove slack from sling (25).
12. Remove nut (35.1), bushings (35.5), washers (35.2), and bolt (35.3) from lower end of aft engine mount link (35.4).

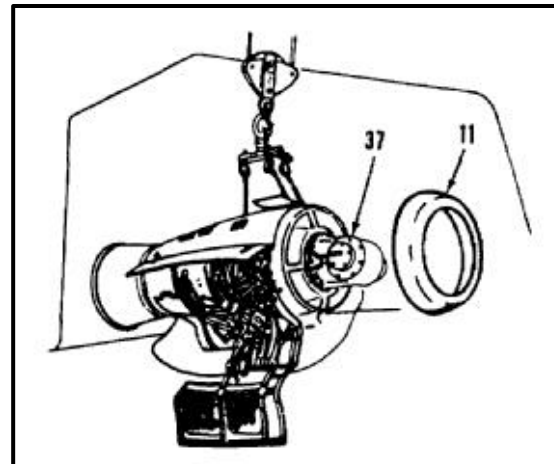
CAUTION

Do not lift powerplant more than **1 inch**. Connecting hoses and wires might be damaged.

13. Continue to raise hoist (35) slowly until forward adapters (36) are lifted about **1 inch** above caps (24).



14. Move fairing (11) forward and off engine transmission (37).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Sling (T134)
Hoist

Materials:

Paper Tags (E264)
Masking Tape (E388)

Personnel Required:

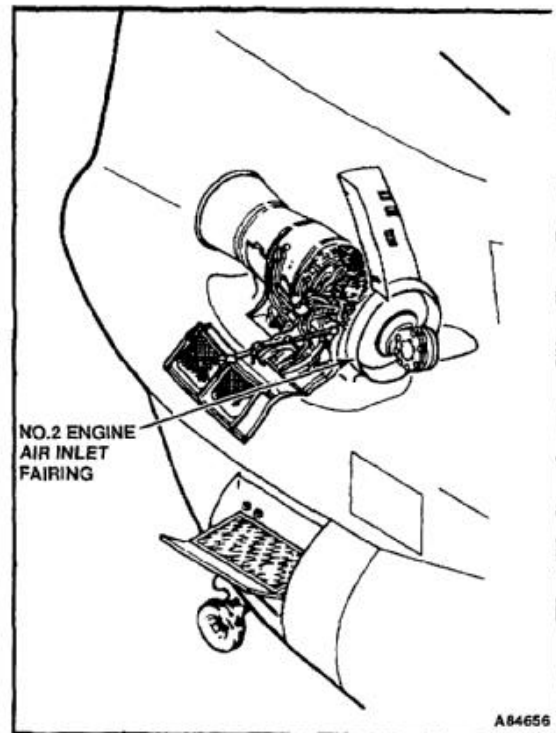
Medium Helicopter Repairer (3)

References:

Task 4-50

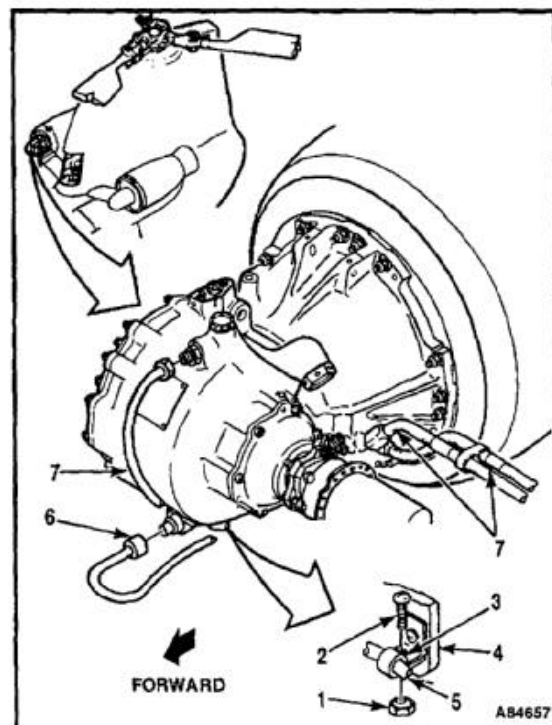
Equipment Condition:

Engine Work Platform Open (Task 2-2)
Engine Drive Shaft Removed (Task 6-30)
Remove Engine Mount Adapter (Task 4-29.1)
Engine Access Cover Open (Task 4-49)
Engine Air Inlet Screens Removed (Task 4-65)
Engine Transmission Fairing Removed (Task 4-70)

**NOTE**

Procedure is same to remove No. 1 or No. 2 engine air inlet fairing. No. 2 fairing is shown here.

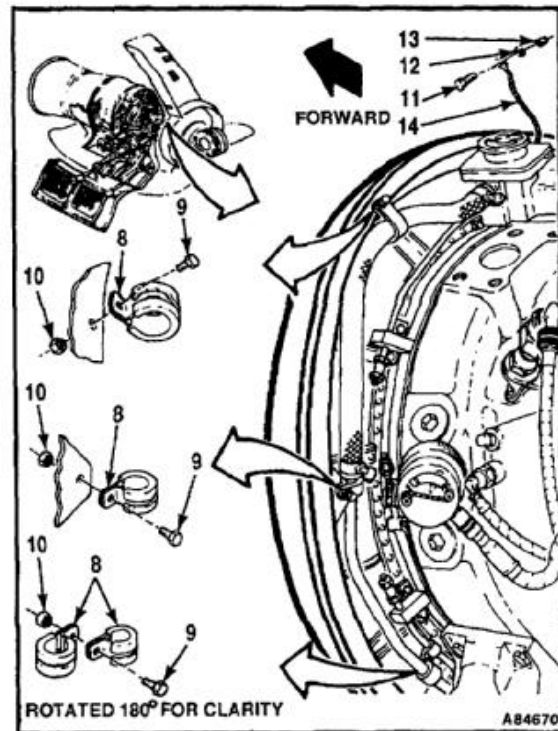
1. Remove nut (1) and screw (2) from clamp (3) at lower lifting lug (4). Release temperature and chip detector wire (5).
2. Disconnect cable plug (6).
3. Tag and disconnect three hoses (7). Use paper tags (E264).



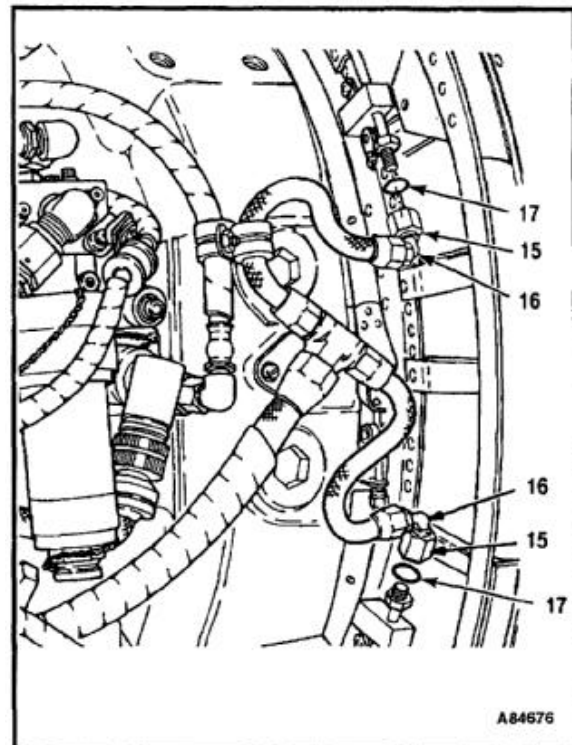
4-74.1 REMOVE ENGINE AIR INLET FAIRING (Continued)

4-74.1

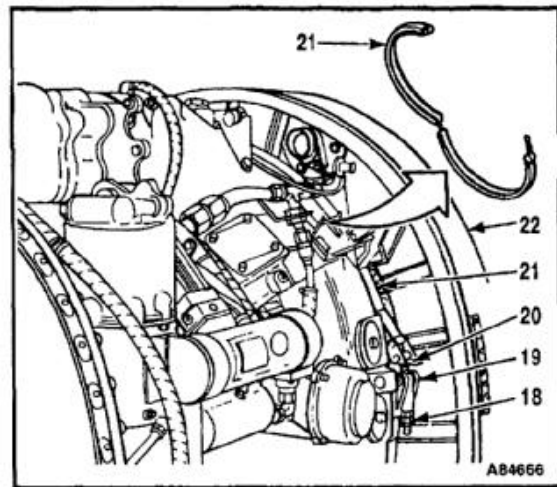
4. Remove four clamps (8), secured by three screws (9) and nuts (10). Use masking tape (E388) to make clamp locations.
5. Remove screw (11), washer (12), and nut (13) from bonding wire (14).



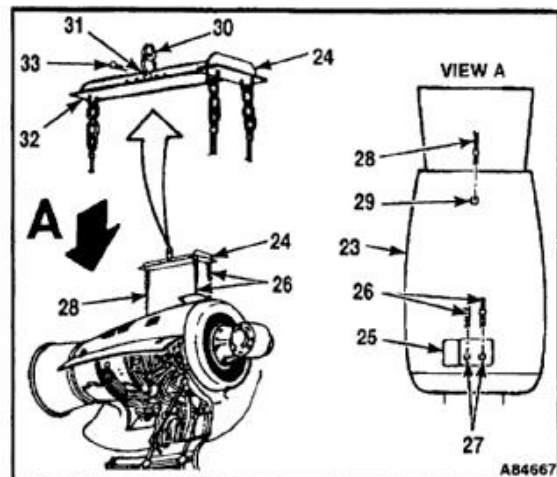
6. Disconnect two fittings (15) from water wash tubing (16).
7. Remove two packings (17) from two fittings (15). Discard packings (17).



8. Loosen nut (18) on clamp (19) until lever (20) can be lifted to release coupling (21).



9. Remove coupling (21) from fairing (22).
10. Close engine upper access cover (23) (Task 4-62).
11. Install sling (24) as follows:
 - a. Open access door (25) in engine access cover (23).
 - b. Connect two cables (26) to forward fittings (27).
 - c. Connect cable (28) into aft fitting (29) through cover (23).
 - d. Adjust sling (24) until eye (30) is over center hole (31) in sling bar (32).
 - e. Install pin (33) through bar (32).



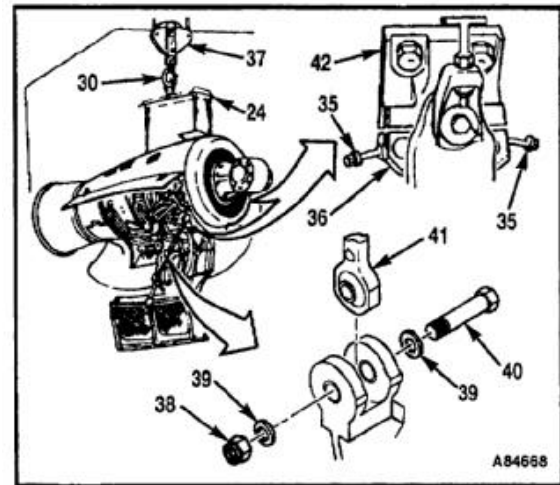
4-74.1 REMOVE ENGINE AIR INLET FAIRING (Continued)

4-74.1

12. Connect hoist (34) to eye (30) of sling (24).
13. Remove lockwire from two bolts (35) on two forward engine mount caps (36). Loosen bolts and push down to side.
14. Have helpers hold engine to prevent unnecessary movement.
15. Raise hoist (37) slowly to remove slack from sling (24).
16. Remove nut (38), washers (39), and bolt (40) from lower end of aft engine mount link (41).



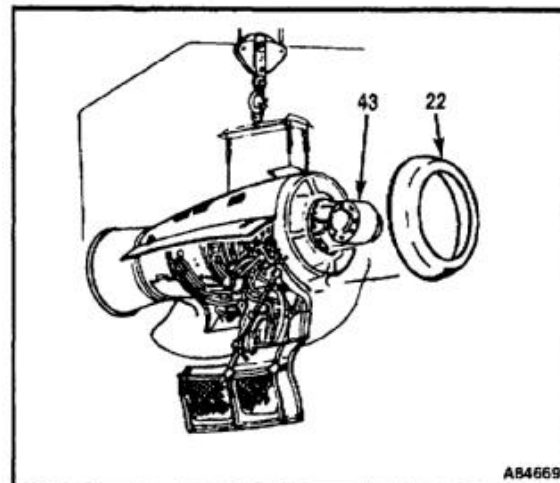
Do not lift powerplant more than **1 inch**. Connecting hoses and wires might be damaged.



17. Continue to raise hoist (37) slowly until forward adapters (42) are lifted about **1 inch** above caps (36).
18. Move fairing (22) forward and over engine transmission (43).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 0 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

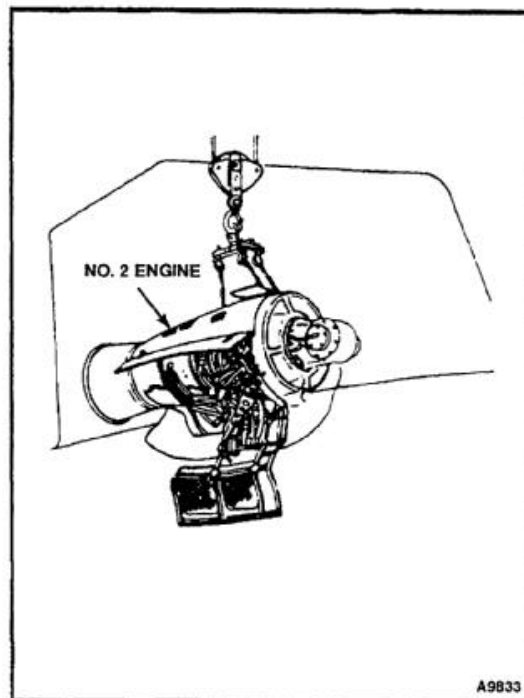
Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P
Task 4-32
Task 4-49

Equipment Condition:

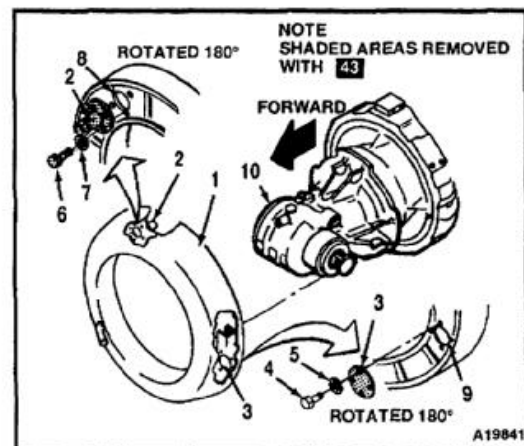
Engine Raised With Hoist (Task 4-74)

**NOTE**

Procedure is same to install engine air inlet fairing on No. 1 or No. 2 engine.
No. 2 engine is shown here.

Fairing can be used on either engine.

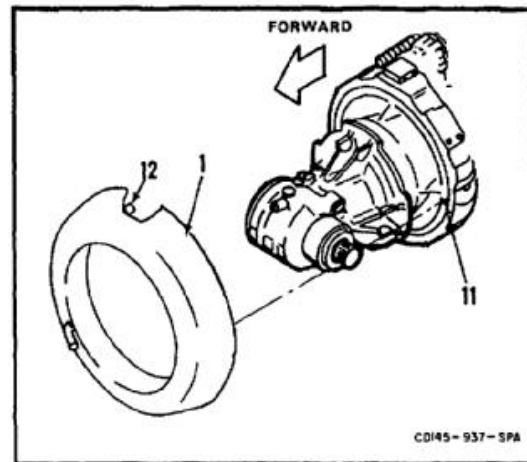
1. On helicopters with **43**, if fairing (1) is replacement for No. 1 engine, go to step 2. If fairing (1) is replacement for No. 2 engine, reverse tube (2) and cover (3) as follows:
 - a. Remove four screws (4) and washers (5). Remove cover (3).
 - b. Remove four screws (6) and washers (7). Remove tube (2).
 - c. Position cover (3) on opposite hole (8). Install four screws (4) and washers (5).
 - d. Position tube (2) on hole (9). Install four screws (6) and washers (7).
2. Slide fairing (1) over transmission (10).



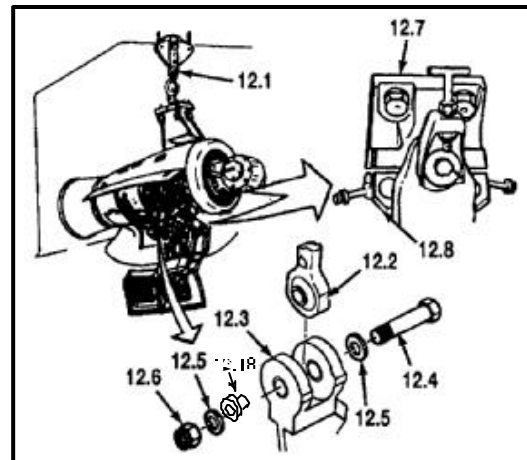
NOTE

Engine access cover is not shown for clarity.

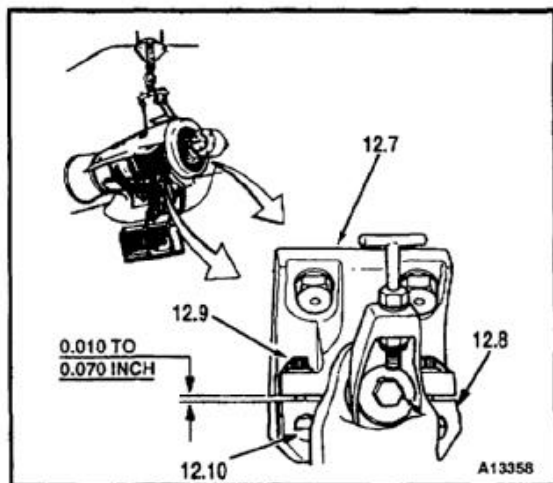
3. Position fairing (1) on engine (11) so locating pin (12) aligns with engine.



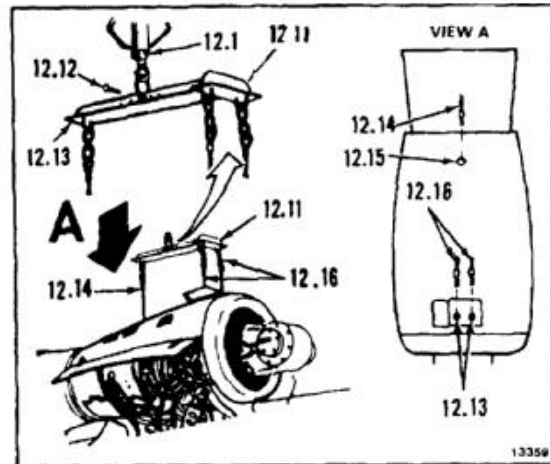
- 3.1. Slowly lower hoist (12.1) until lower end of aft engine mount link (12.2) aligns with mount (12.3). Install bolt (12.4), washers (12.5), and nut (12.6). Torque nut (12.6) to **350 to 400 inch-pounds** to seat bushing (12.18). Loosen nut and retorque nut to **20 inch-pounds** above run-on torque value, but in no case should the torque be less than **70 inch-pounds**.
4. Continue to lower hoist (12.1) slowly until forward adapters (12.7) rest on caps (12.8).



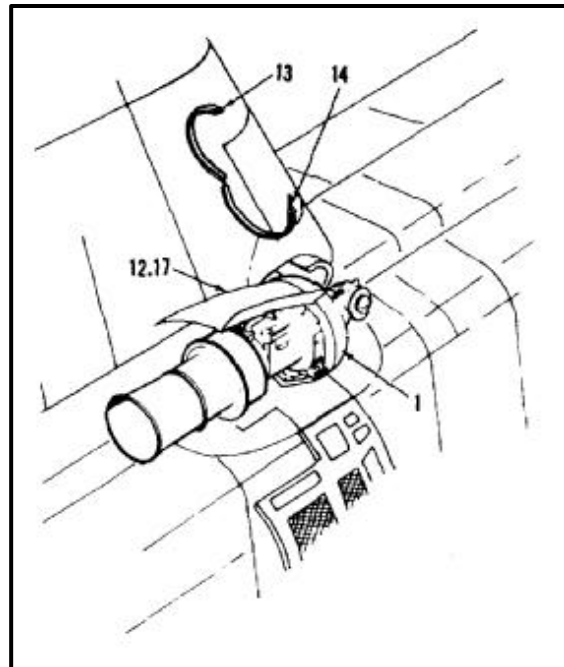
5. Check that friction torque of bolts (12.9) in barrel nuts (12.10) is not less than **7 inch-pounds**.
- 5.1. Push four bolts (12.9) up and over adapter (12.7).
- 5.2. Torque bolts (12.9) to **105 inch-pounds**. Check that gap between adapters (12.7) and caps (12.8) is **0.010 to 0.070 inch**.
- 5.3. If gap measurement exceeds **0.010 to 0.070 inch**, repair mount (Task 4-32), and repeat step 5.2.
- 5.4. Check bolts (12.9). Bolt threads shall protrude a minimum of two threads through barrel nuts (12.10), but shall not bottom out. Add washers under bolthead if bolt is bottoming out. Lockwire bolts. Use lockwire (E231).

**INSPECT**

- 5.5. Remove sling (12.11) as follows:
- Remove pin (12.12) from bar (12.13).
 - Remove cable (12.14) from aft fitting (12.15).
 - Remove two cables (12.16) from forward fittings (12.13).
 - Remove sling (12.11) from hoist (12.1).



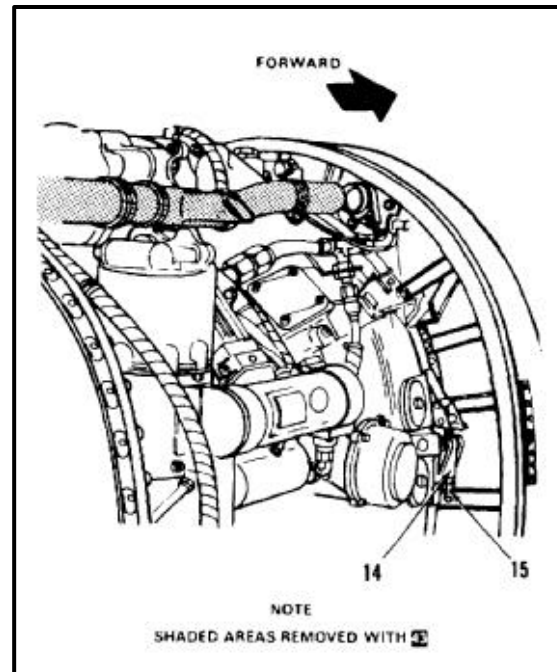
- Open access cover (12.17) (Task 4-49).
- Position coupling (13) around fairing (1) with clamp (14) outboard, mid-position.
- Push clamp (14) down to secure coupling (13). Lockwire clamp. Use lockwire (E231).



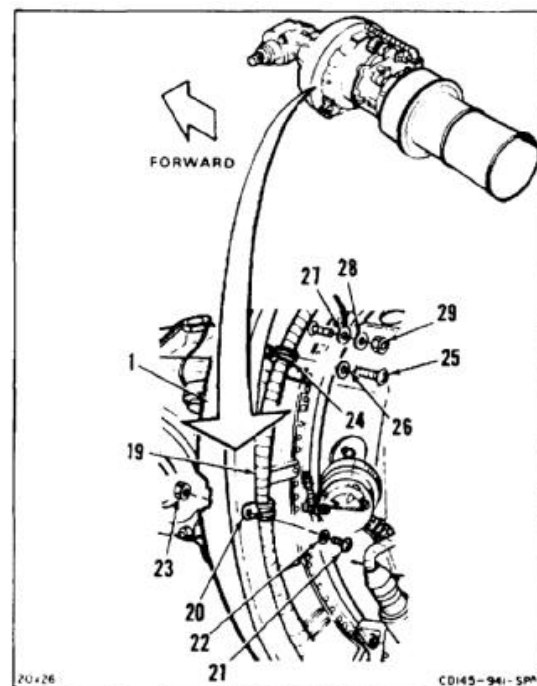
NOTE

Engine must be cool to touch before torquing nut.

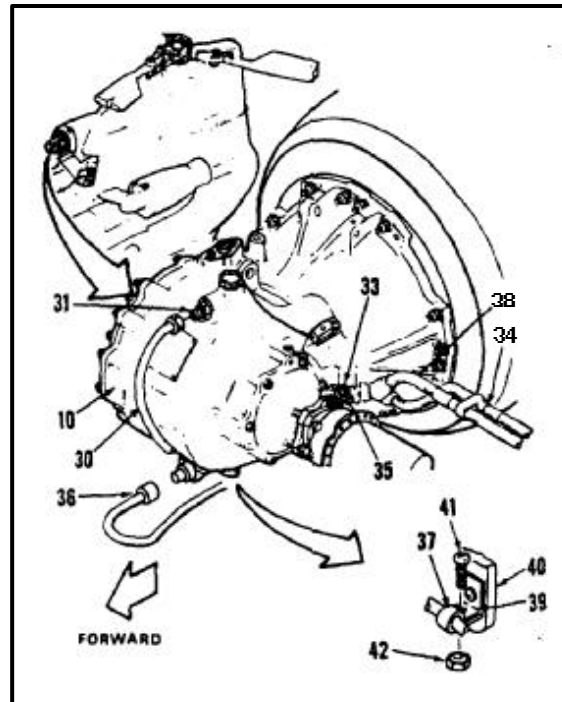
6. Torque nut (15) on clamp (14) to **50 inch-pounds**.



7. Secure hose (19) to fairing (1) with clamp (20), screw (21), washer (22), and nut (23). Install clamp (24) with screw (25) and washer (26).
8. Connect electrical lead (27) to fairing (1) and install washer (28) and nut (29).



9. Connect hose (30) to port (31) on transmission (10). Remove tag.
10. Connect hose (32) to port (33). Remove tag.
11. Connect hose (34) to port (35). Remove tag.
12. Connect cable plug (36).
13. Position clamp (37) with temperature and chip detector wiring (38) against clip (39) on lower lifting lug (40). Install screw (41) and nut (42).



FOLLOW-ON MAINTENANCE:

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Perform operational check of gas producer control system (TM 55-1520-240-T).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close engine side and cover access covers (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-4).
- Check powerplant plumbing for leaks.
- Check forward engine mounts for proper clearance after four hours of flight.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).
- Retorque exhaust cone coupling nuts after initial ground run.

END OF TASK

4-75.1 INSTALL ENGINE AIR INLET FAIRING

4-75.1

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 100 to 750 Inch-Pounds
 Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:

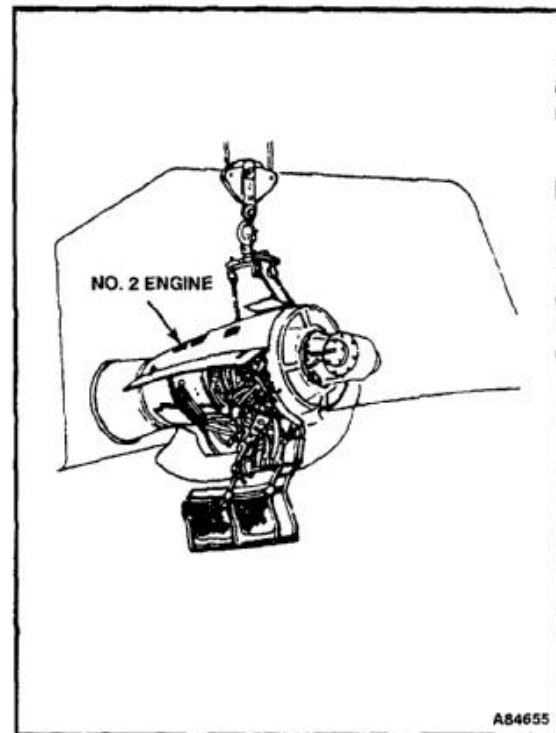
Medium Helicopter Repairer (3)
 Inspector

References:

Task 4-35.1
 Task 4-49
 TM 55-1520-240-23P

Equipment Condition:

Engine Raised with Hoist (Task 4-74)

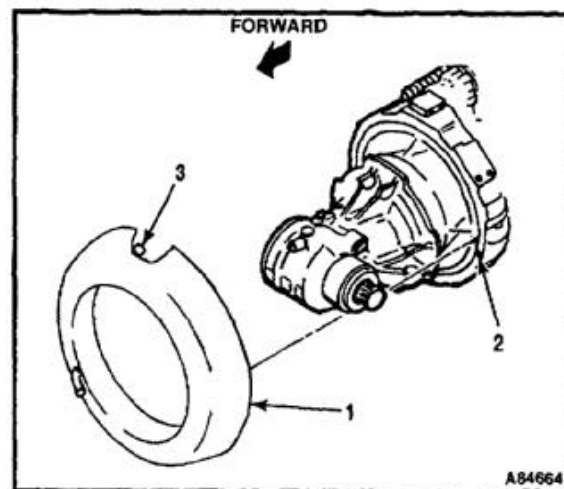
**NOTE**

Procedure is same to install engine air inlet fairing on No. 1 or No. 2 engine. No. 2 engine is shown here.

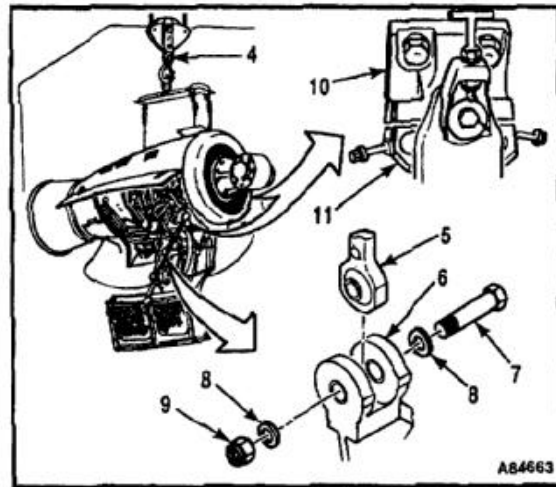
Fairing can be used on either engine.

Engine access cover not shown for clarity.

- Using two helpers, steady engine and position fairing (1) on engine (2) so locating pin (3) aligns with engine.



2. Slowly lower hoist (4) until lower end of aft engine mount link (5) aligns with mount (6).
3. Install bolt (7) with head facing inboard, washers (8), and nut (9). Torque nut to **375 inch-pounds** to seat bushing. Loosen nut and retorque to **20 inch-pounds** above run-on torque. Not to be less than **70 inch-pounds**.
4. Continue to lower hoist (4) slowly until forward adapters (10) rest on caps (11).

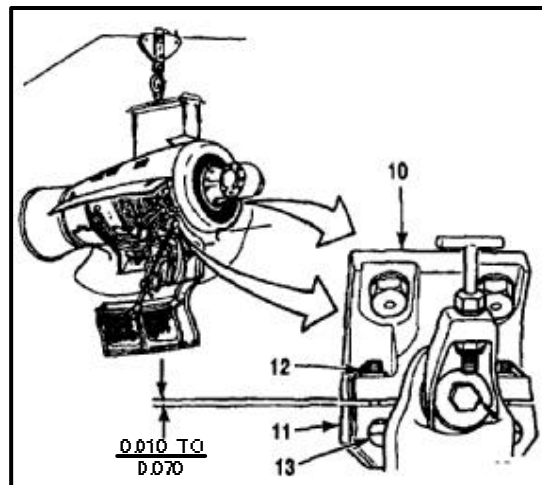


5. Check that friction torque of bolts (12) in barrel nuts (13) is not less than **7 inch-pounds**.
6. Push four bolts (12) up and over adapter (10).
7. Torque bolts (12) to **105 inch-pounds**. Check that gap between adapters (10) and caps (11) is **0.01 to 0.070 inch**.
8. If the gap measurement exceeds **0.01 to 0.070 inch**, go to Task 4-35.1, step 15.

NOTE

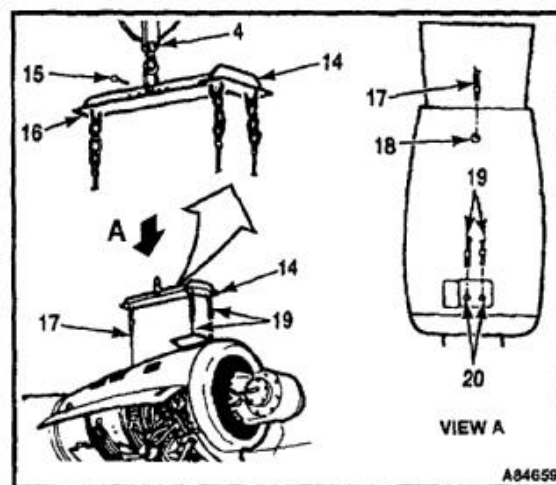
If bolts bottom out, washer may be added under bolt head.

9. Check that bolts (12) protrude through barrel nuts (13) a minimum of two threads, but shall not bottom out. Lockwire bolts. Use lockwire (E278).



INSPECT

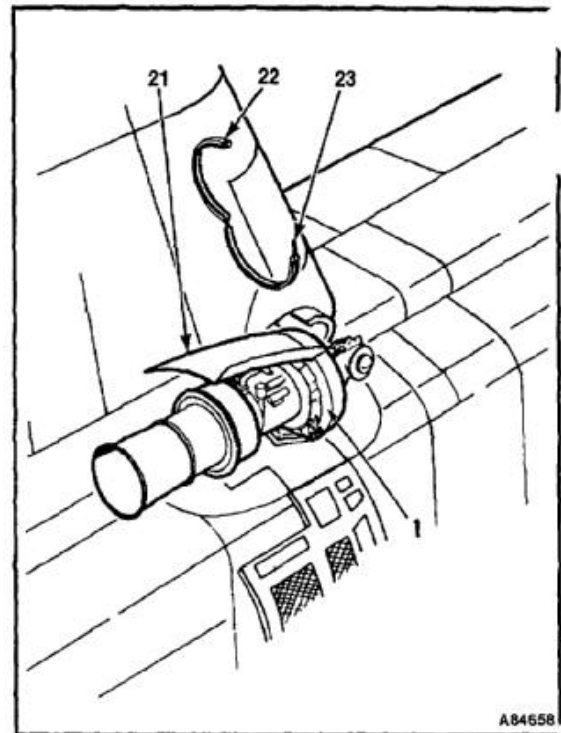
10. Remove sling (14) as follows:
 - a. Remove pin (15) from bar (16).
 - b. Remove cable (17) from aft fitting (18).
 - c. Remove two cables (19) from forward fittings (20).
 - d. Remove sling (14) from hoist (4).



4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

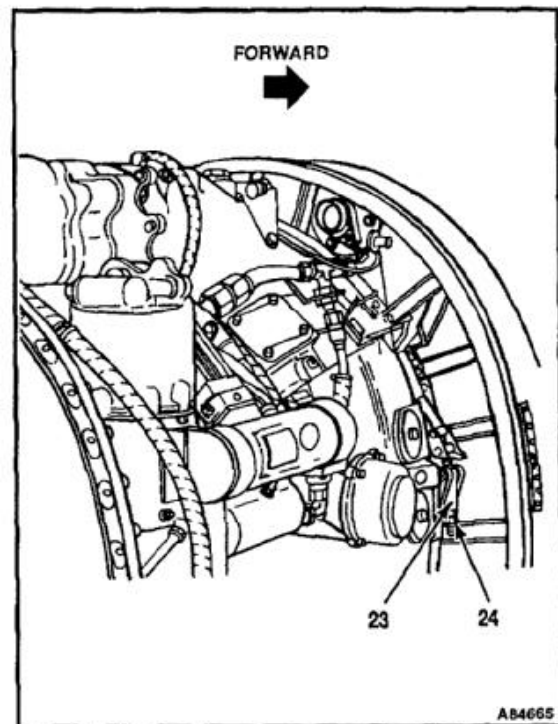
4-75.1

11. Open access cover (21) (Task 4-49).
12. Position coupling (22) around fairing (1) with clamp (23) outboard, mid-position.
13. Push clamp (23) down to secure coupling (22).

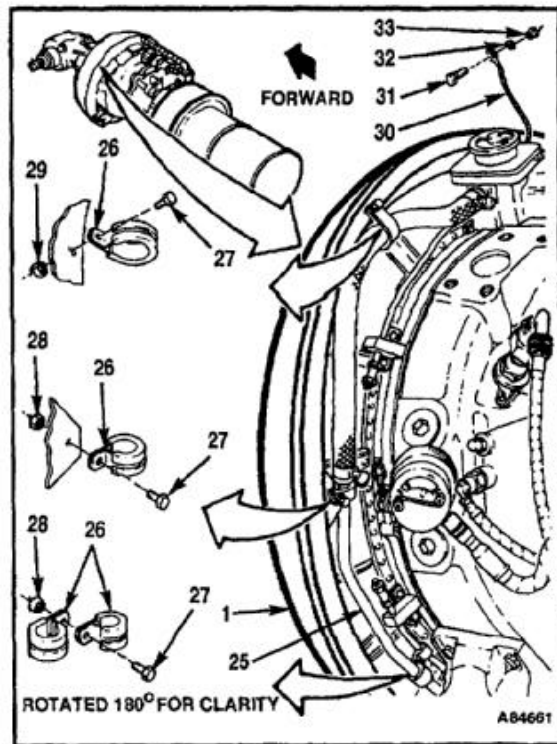
**NOTE**

Engine must be cool to touch before torquing nut.

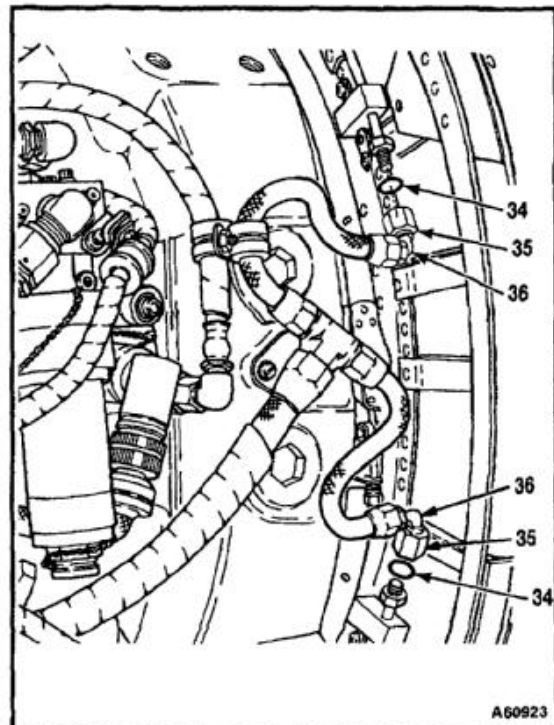
14. Torque nuts (24) on both sides of clamp (23) to **50 inch-pounds**.
15. Lockwire clamp (23). Use lockwire (E231).



16. Secure tube (25) to fairing (1) with four clamps (26), three screws (27), and nuts (28 and 29).
17. Install bonding wire (30), with screw (31), washer (32), and nut (33).



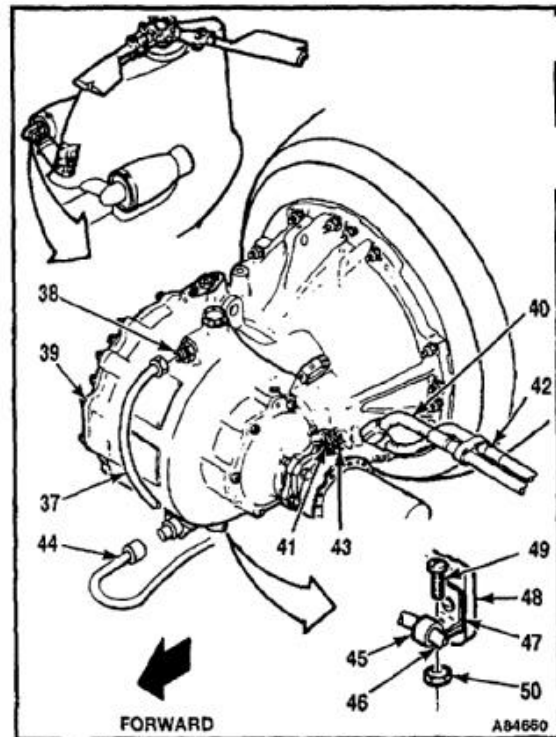
18. Install two new packings (34) on fittings (35).
19. Connect two fittings (35) to water wash tubing (36).



4-75.1 INSTALL ENGINE AIR INLET FAIRING (Continued)

4-75.1

20. Connect hose (37) to port (38) on transmission (39). Remove tag.
21. Connect hose (40) to port (41). Remove tag.
22. Connect hose (42) to port (43). Remove tag.
23. Connect cable plug (44).
24. Position clamp (45) with temperature and chip detector wiring (46) against clip (47) on lower lifting lug (48). Install screw (49) and nut (50).

***FOLLOW-ON MAINTENANCE:***

- Install engine drive shaft (Task 6-32).
- Install engine transmission fairing (Task 4-73).
- Install engine air inlet screens (Task 4-76).
- Close engine access covers (Task 4-50).
- Close engine work platform (Task 2-2).
- Perform initial run-up (Task 4-2).
- Check powerplant plumbing for leaks.
- Check forward engine mounts for proper clearance after four hours of flight.
- Perform operational check of engine oil low level warning system (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Air Inlet Screen Adjusted (Task 4-63)
Engine Inlet Protective Covers Removed (Task 1-32)

NOTE

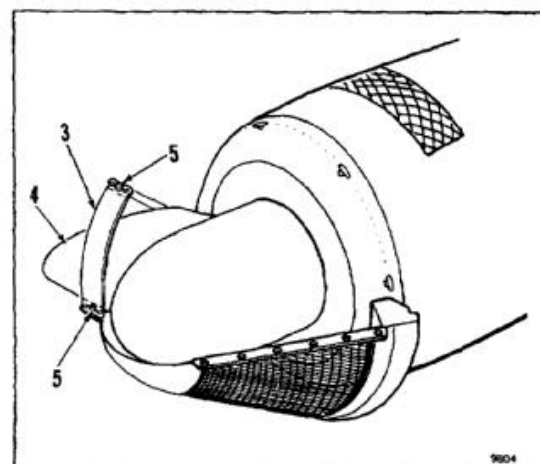
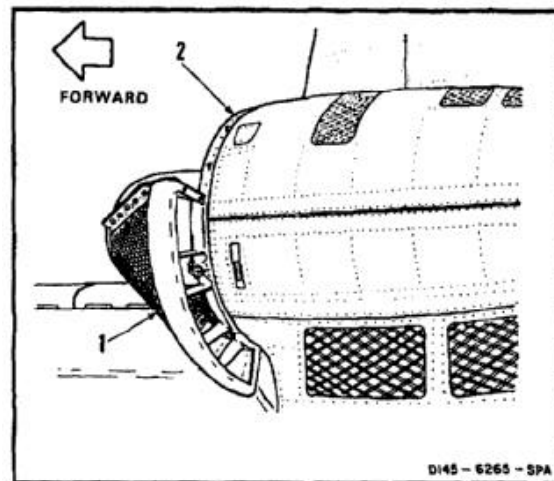
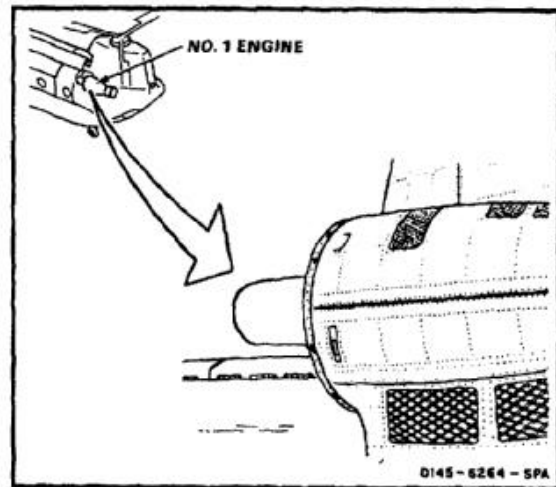
Procedure is same to install No. 1 or No. 2 engine air inlet screens. Installation of No. 1 air inlet screens is shown here.

INSTALL LOWER SCREEN



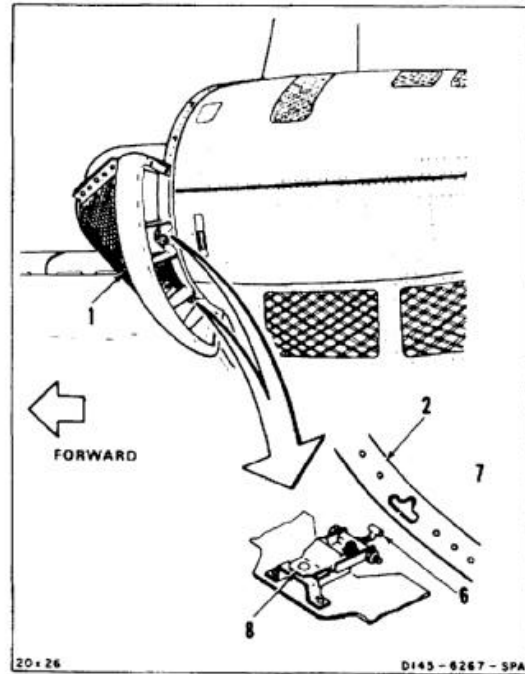
When installing lower screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.

1. Have helper position lower screen (1) on air inlet fairing (2). Make sure air holes on fairing are not covered.
2. Position strap (3) over engine transmission fairing (4). Secure two fasteners (5).



3. Engage two tee bolts (6) in holes (7). Hold lower screen (1) firmly against inlet fairing (2). Secure two latches (8) on screen.

INSPECT



INSTALL UPPER SCREEN

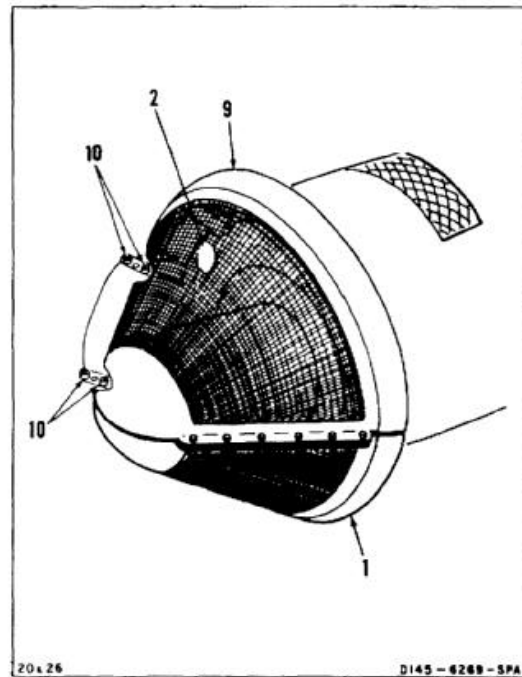
CAUTION

Make sure there is no foreign matter in air inlet. If foreign matter is left in inlet, damage to powerplant will occur.

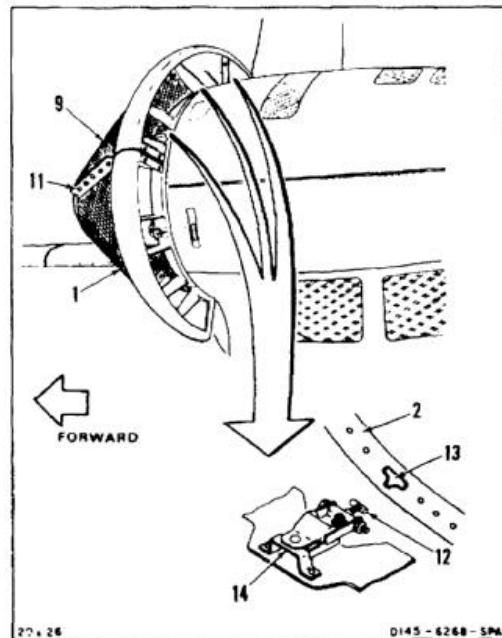
CAUTION

When installing upper screen, do not cover air holes on air inlet fairing. Air pressure build up will damage fairing.

4. Position upper screen (9) on lower screen (1) and fairing (2). Make sure air holes on fairing are not covered.
5. Secure four fasteners (10).



6. Secure six fasteners (11) on lower screen (1).
7. Engage three tee bolts (12) in holes (13) in fairing (2). Hold upper screen (9) firmly against fairing (2). Secure three latches (14) on screen.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Install engine air inlet bypass screens (Task 4-77).
- Close engine work platform (Task 2-2).
- Adjust engine screen latches (Task 4-63).

END OF TASK

4-332

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

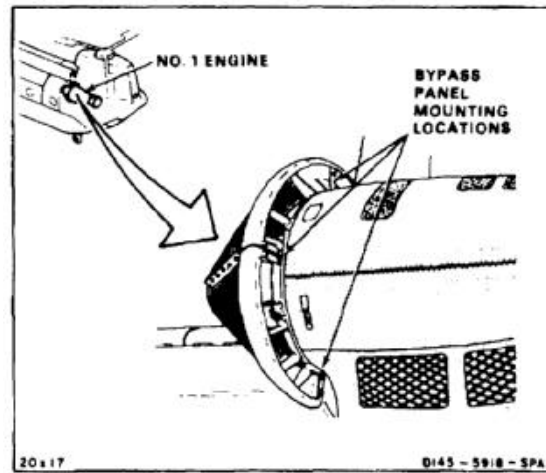
None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-23P

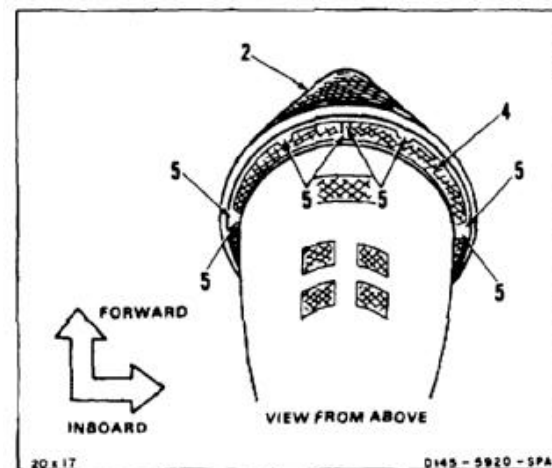
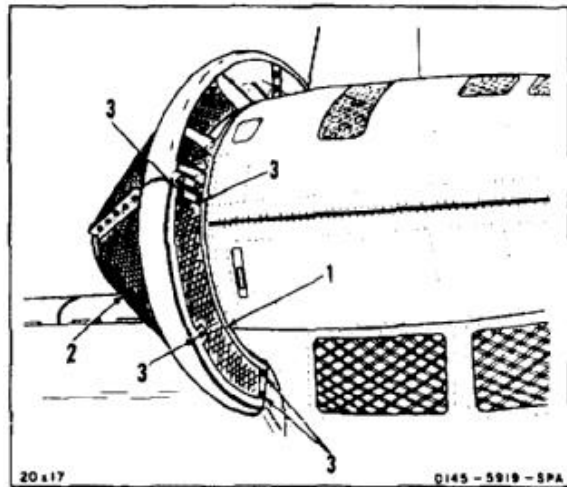


NOTE

Procedure is same to install bypass panels on No. 1 or No. 2 engine. Installation of No. 1 bypass panels is shown here.

Do not install bypass panels when inflight temperatures of **40°F (4.4°C)** or below and visible moisture are expected.

1. Position lower bypass panel (1) on air inlet screen (2).
2. Secure five fasteners (3) on lower panel (1).
3. Position upper bypass panel (4) on air inlet screen (2).
4. Secure eight fasteners (5) on upper panel (4).



FOLLOW-ON MAINTENANCE:

Close engine work platform (Task 2-2).

Tasks 4-78 thru 4-83 deleted.

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (2-2)
Engine Access Cover Open (Task 4-49)



Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

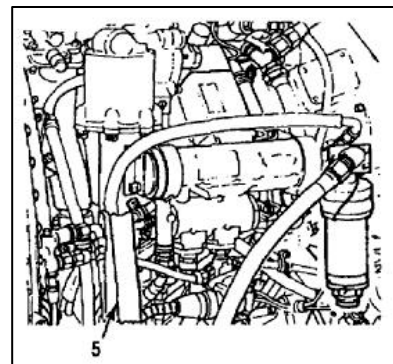
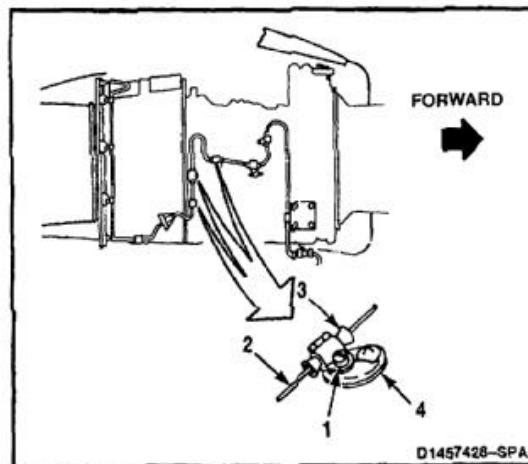
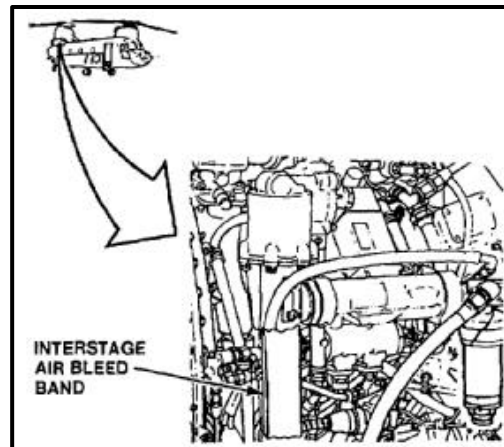
NOTE

Procedure is same to remove interstage air bleed band from No. 1 or No. 2 powerplant. Removal of No. 2 bleed band is shown here.

1. Turn three fasteners (1) counterclockwise and release elements (2) and bushing (3) from three clamps (4). Move element to side.
2. Remove interstage air bleed band (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-334

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P

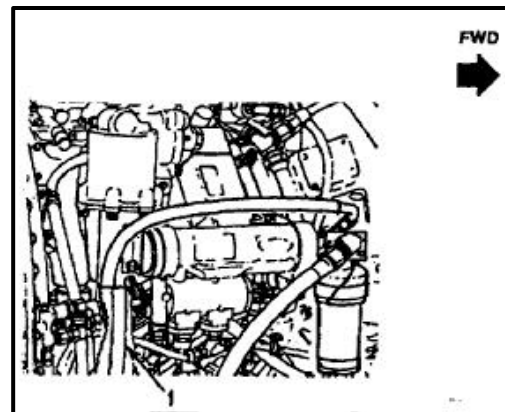
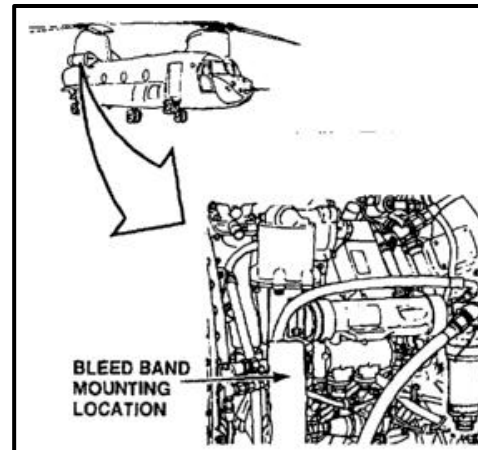
TM 55-2840-254-23 Without **74**TM 1-2840-265-23 With **74****NOTE**

Procedure is same to install interstage bleed band on No. 1 or No. 2 powerplant. Installation of No. 2 bleed band is shown here.

1. Install interstage air bleed band (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

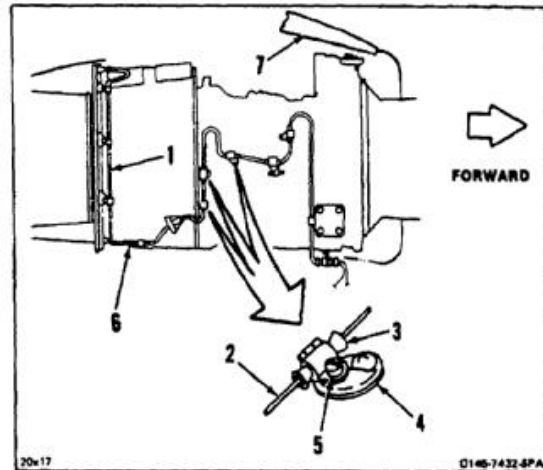


2. Position element (2) and bushing (3) in three clamps (4). Turn three fasteners (5) clockwise to secure element.



Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

3. Make sure element (2) cannot chafe on powerplant (6) or cover (7).



INSPECT

FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-86 REMOVE BLEED BAND ACTUATOR

4-86

INITIAL SETUP**Applicable Configurations:**

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:TM 55-2840-254-23 Without **74**TM 1-2840-265-23 With **74****Equipment Condition:**

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

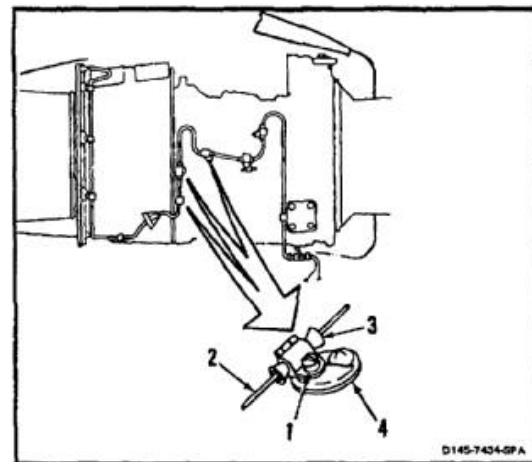
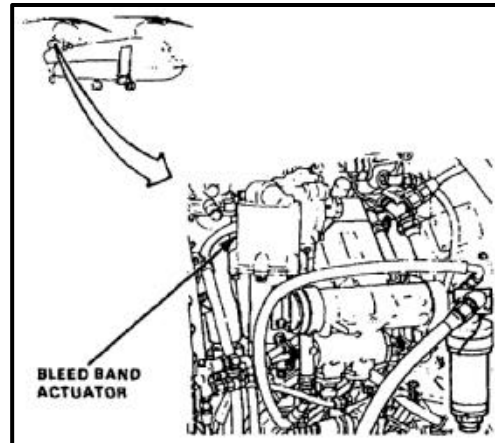


Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

NOTE

Procedure is same to remove bleed band actuator from No. 1 or No. 2 powerplant. Removal of No. 2 bleed band is shown here.

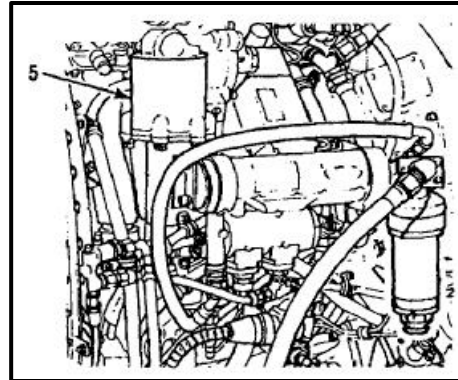
1. Turn three fasteners (1) counterclockwise and release element (2) and bushing (3) from three clamps (4). Move element to side.



2. Remove bleed band actuator (5) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-338

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

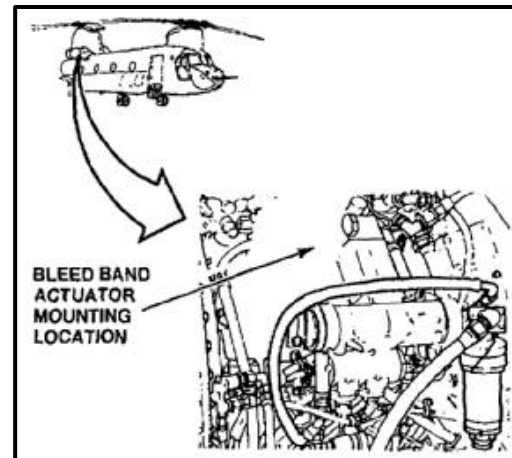
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

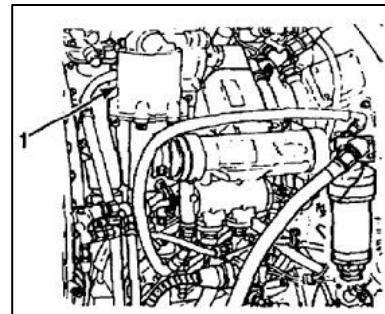
References:

TM 55-1520-240-23P

TM 55-2840-254-23 Without **74**TM 1-2840-265-23 With **74****NOTE**

Procedure is same to install bleed band actuator on No. 1 or No. 2 powerplant. Installation of No. 2 bleed band actuator is shown here.

1. Install bleed band actuator (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



CAUTION

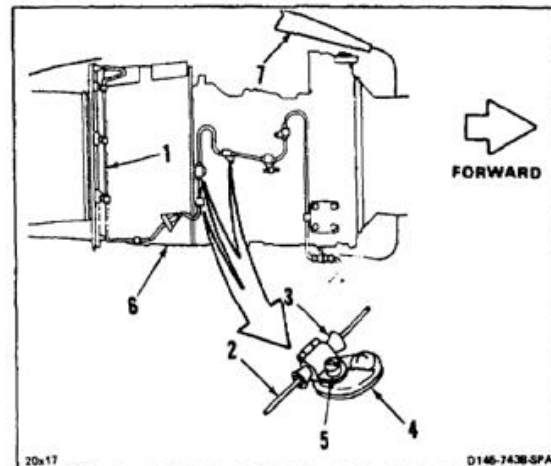
Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

2. Position element (2) and bushing (3) in three clamps (4). Turn three fasteners (5) clockwise to secure element.

CAUTION

Make sure fire detection sensing element cannot chafe on powerplant or cover. Chafing can result in a false fire indication or an inoperative fire detection system.

3. Make sure element (2) cannot chafe on powerplant (6) or cover (7).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-340

SECTION V
EXHAUST SYSTEM

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Fluorescent Penetrant Method

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

References:

TM 1-1520-253-23

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

NOTE

Procedure is same to remove exhaust cone from No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Have helper support cone (1). Loosen nut (2) on coupling (3). Disengage latch (4).

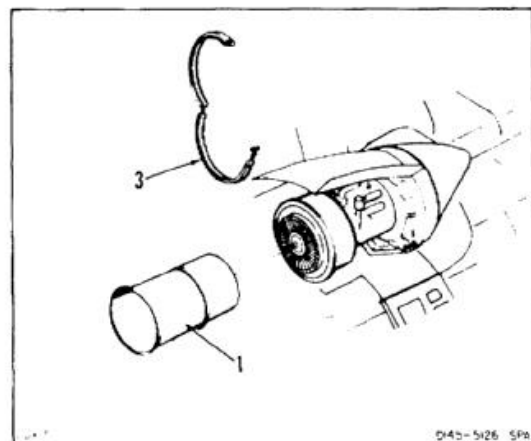
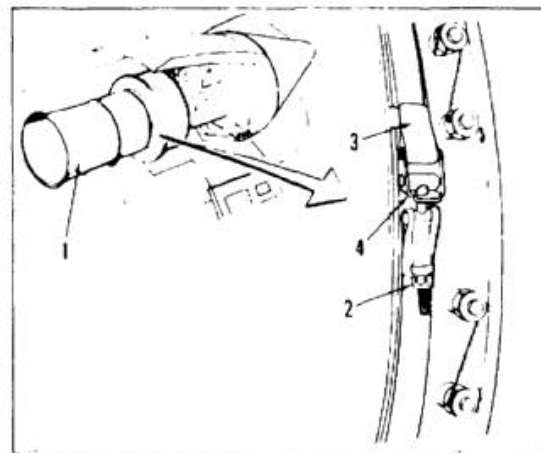
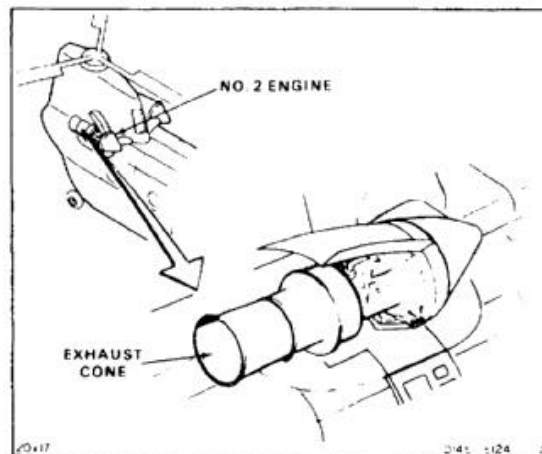


Do not let cone contact engine blades.
Damage to blades can result.

2. Remove cone (1) and coupling (3). If a crack is suspected in the exhaust cone or stiffener, refer to TM 1-1520-253-23.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-342

INITIAL SETUP

Applicable Configurations:

All

Tools:

Inert Gas Welding Set, NSN 3431-00-079-0498
 Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
 Fluorescent Penetrant Method

Materials:

Alloy Sheet (Inconel), 0.025 Inch Thick (E202)
 Welding Rods AMS5679 (E444)

Personnel Required:

Welder
 Inspector

References:

MIL-W-8611
 TM 1-1500-204-23
 TM 1-1520-253-23

Equipment Condition:

Off Helicopter Task

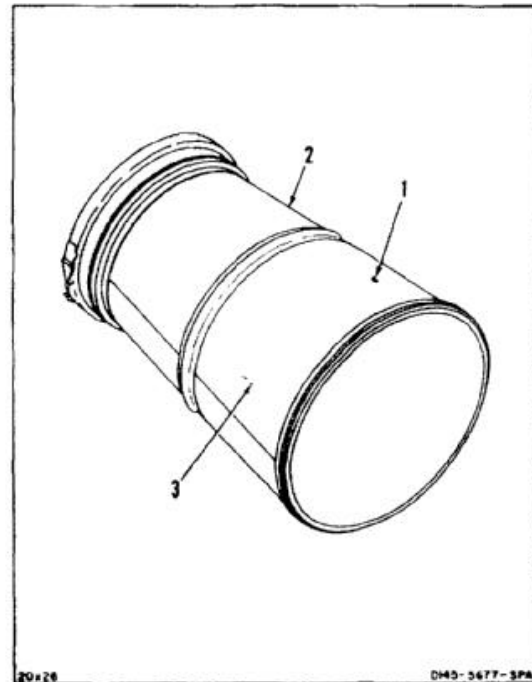
NOTE

If a crack is suspected in the exhaust cone or stiffener, refer to TM 1-1520-253-23.

1. Repair holes (1) in cone (2) by welding patches of alloy sheet (E202) (MIL-W-8611). Use welding rods (E444). Repair limits are as follows:
 - a. Limit of **2 inch** hole diameter.
 - b. Limit of three holes per cone.
 - c. Limit of **9 square-inches** of patching per cone.
 - d. Minimum of **6 inches** between holes.

INSPECT

2. Repair cracks (3) in cone (2) by welding. Use welding rod (E444). Repair limits are as follows:
 - a. Limit of **8 inches** crack length.
 - b. Limit of **1/8 inch** crack width.
 - c. Limit of **16 inches** of crack repair.



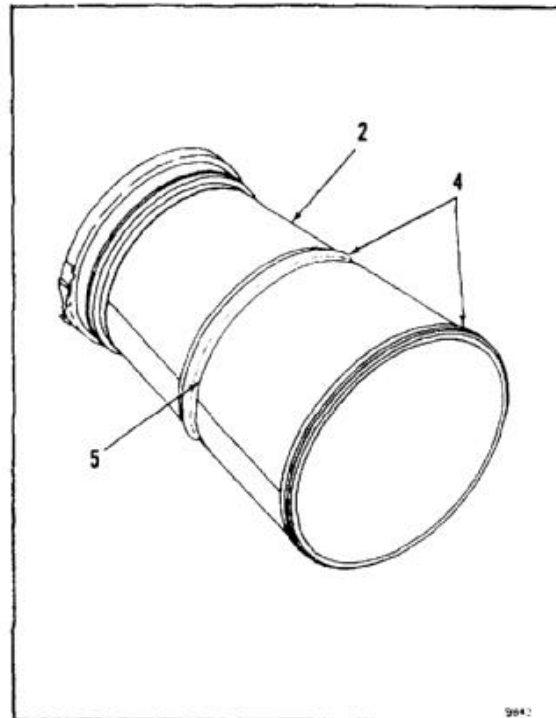
REPLACE STIFFENER BY WELDING

NOTE

Replace either of two stiffeners in the same way.

3. Cut stiffener (4) away from cone (2). Grind flange edge (5) smooth.
4. Install new stiffener (4) on flange edges (5) by seam welding (TM 1-1500-204-23).
5. Butt weld ends of new stiffener (4) (TM 1-1500-204-23). Drill two equally spaced **0.125 inch** holes in new stiffener (4).

INSPECT



REPLACE STIFFENER WITH RIVETS

6. Cut stiffener (4) away from cone (2). Grind flange edges (5) smooth.
7. Install new stiffener (4) on flange edges (5) with rivets (6) (TM 1-1500-204-23). Rivets are to be spaced **0.50 inch** apart and **0.18 inch** from flange edge.

INSPECT

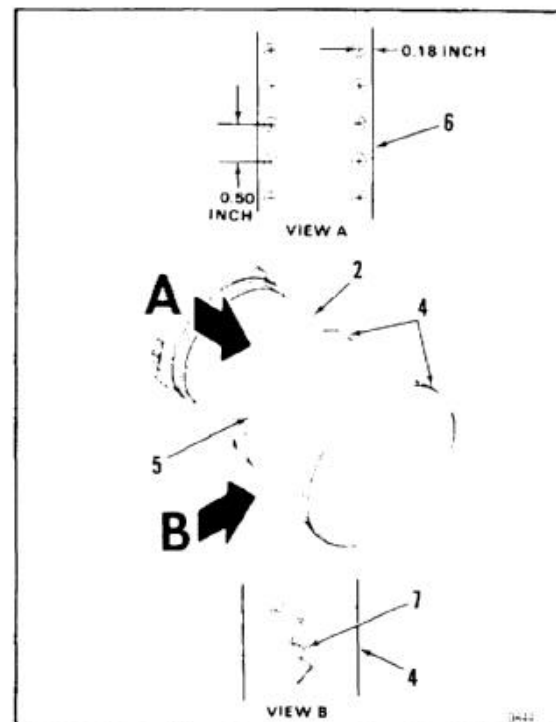
REPAIR STIFFENER CRACKS

8. Drill **0.062 inch** hole at each end of crack (7) in stiffener (4). Deburr holes.
9. Repair crack (7) by butt welding (TM 1-1500-204-23). Use welding rod (E444).

INSPECT

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Torque Wrench, 5 to 50 Inch-Pounds
 Rawhide Mallet

Materials:

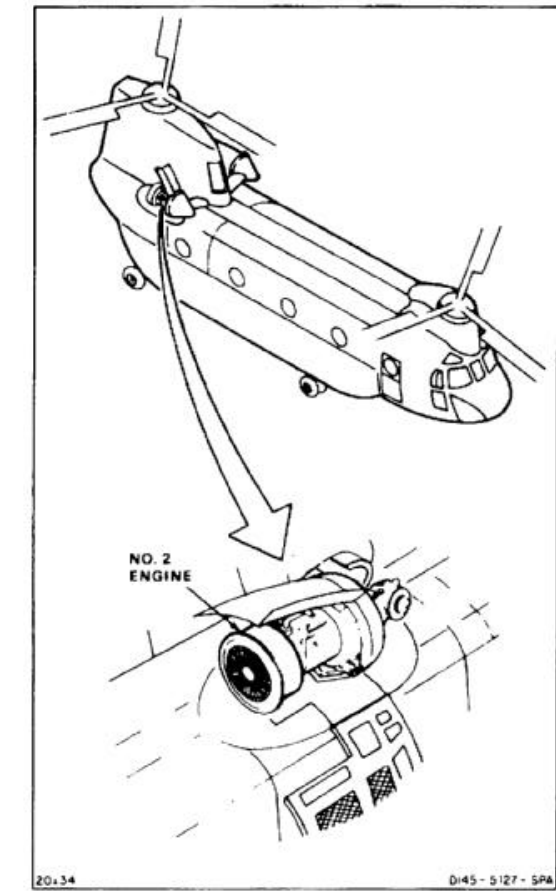
None

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

References:

TM 55-1520-240-23P

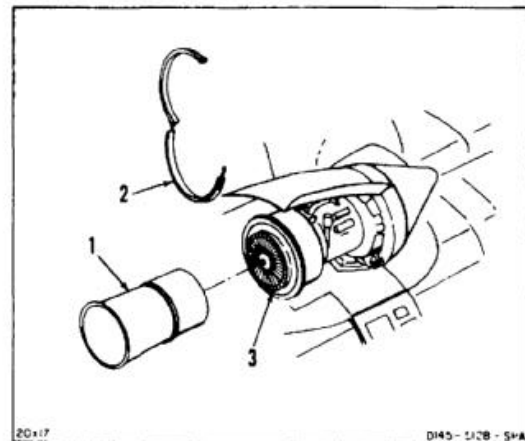


Do not let cone contact engine blades.
 Damage to blades can result.

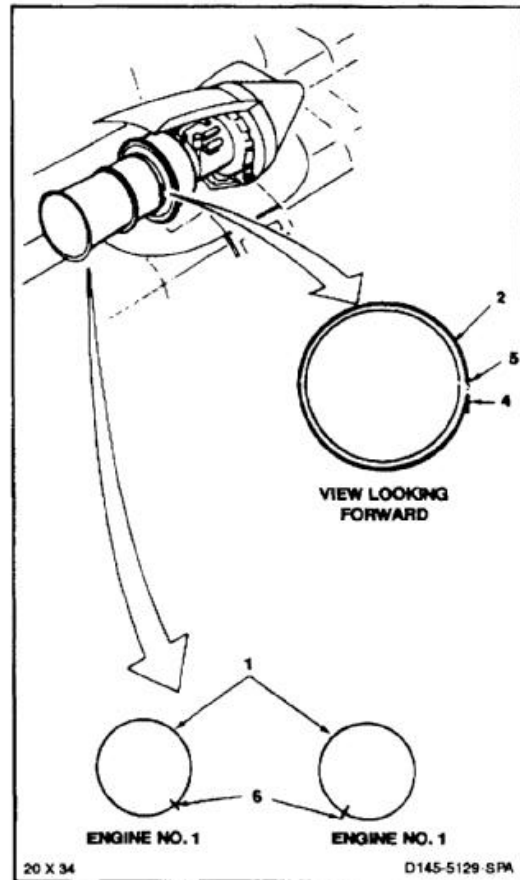
NOTE

Procedure is same to install exhaust cone on No. 1 or No. 2 engine. No. 2 engine is shown here.

1. Position cone (1) and coupling (2) on engine (3). Have helper support cone.



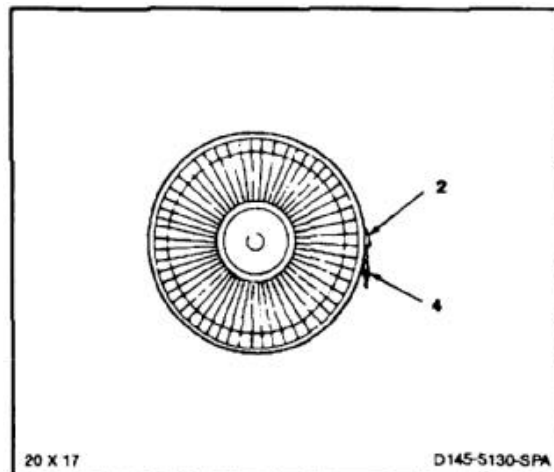
2. Align nut (4) on coupling (2). Engage latch (5). Tighten nut until cone (1) is secure. Have helper tap around coupling with rawhide mallet while nut is tightened to make sure coupling seats properly. For the No. 1 and No. 2 engine, align coupling nut at the **3 and 9 o'clock** positions.
3. Align seam (6) on cone (1) as follows:
 - a. On No. 1 engine, rotate cone until seam is at **4 o'clock** position.
 - b. On No. 2 engine, rotate cone until seam is at **8 o'clock** position.



4. Torque nut (4) to **30 inch-pounds** above friction-torque. Tap completely around coupling (2) with rawhide mallet. Make sure coupling is properly seated.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).
- Torque nut to **30 inch-pounds** above friction torque after initial ground run.



END OF TASK

4-346

SECTION VI
OIL SYSTEM

INITIAL SETUP

Applicable Configurations:

All

Tools:

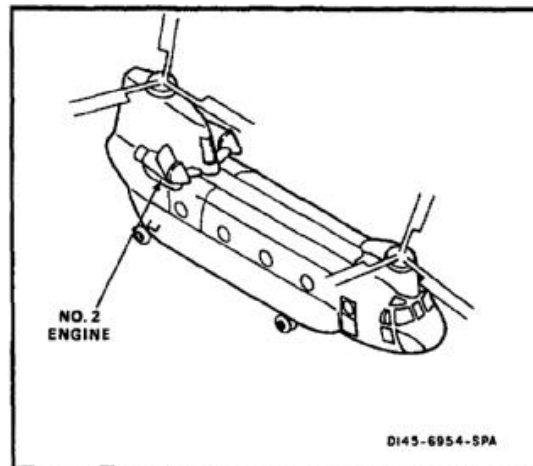
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

Lubricating Oil (E253/254/254.1)

Personnel Required:

Medium Helicopter Repairer
 Inspector
 Army Rotary-Wing Aviator (2)

**References:**

TM 55-2840-254-23 Without **74**
 TM 1-2840-265-23 With **74**
 TM 55-1520-240-10
 Task 1-52

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)

WARNING

Oil (E253/E254/E254.1) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

NOTE

Procedure is same to change engine oil on No. 1 or No. 2 powerplant.

1. Drain engine oil (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).
2. Change engine oil (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2 Quart

Materials:

Cloths (E135)
Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 1-55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

Equipment Condition:

Off Helicopter Task

General Safety Instructions:**WARNING**

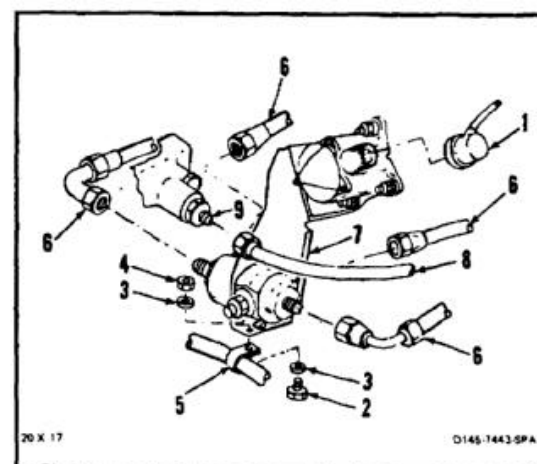
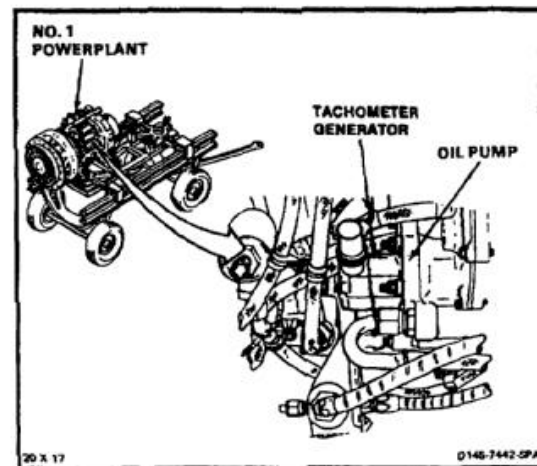
All regulations for handling fuels shall be strictly observed.

1. Remove oil pump (TM 1-2840-265-23 with **74**).

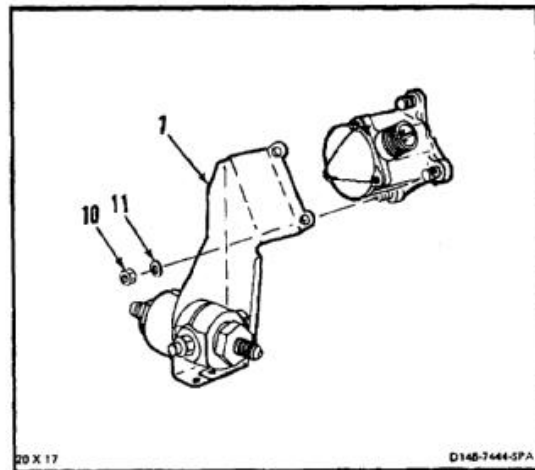
NOTE

Steps 2 thru 11 are for engines without **74**.

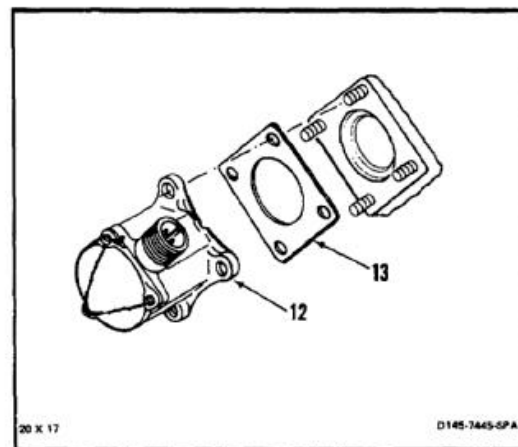
2. Remove lockwire and disconnect cable connector (1).
3. Remove screw (2), two washers (3), and nut (4). Disconnect clamp (5) from bracket (7).
4. Tag and disconnect four drain hoses (6) from bracket (7). Use cloths (E135) for spilled fluid.
5. Disconnect fuel hose (8) and cap hose and fuel control fitting (9). Clean up spilled fluid. Use cloths (E135).



6. Remove four nuts (10) and washers (11).
7. Remove bracket (7).



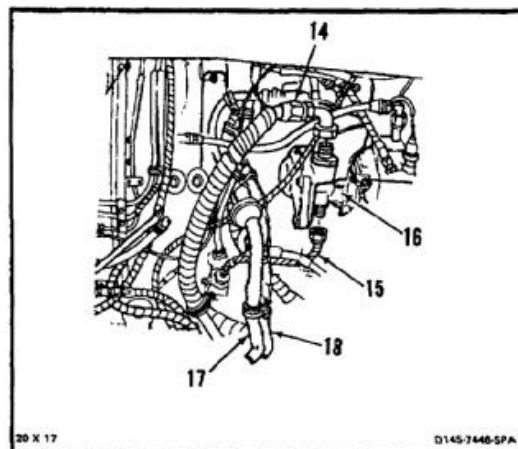
8. Remove tachometer generator (12) and gasket (13).



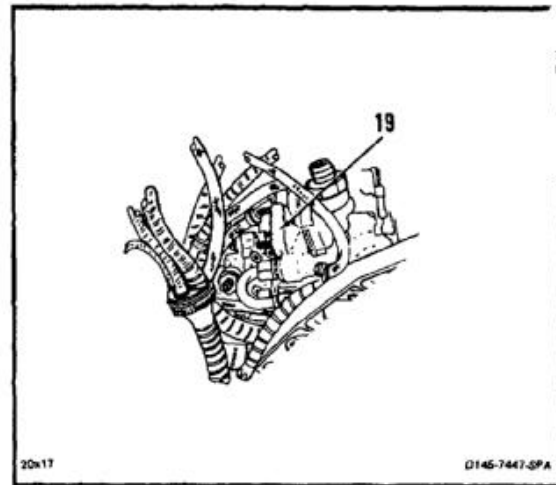
9. Disconnect two hoses (14 and 15) from fuel pump (16). Use container to catch spilled fuel. Clean up any spilled fuel. Use cloths (E135). Remove two hoses.
10. Move electrical harnesses (17 and 18) to side.

NOTE

If a crack is suspected in the oil pump, refer to TM 1-1520-253-23.



11. Remove oil pump (19) (TM 55-2840-254-23).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944
- Open End Wrench, 1-1/2 Inch
- Container, 2 Quart

Materials:

- Plastilube (E280)
- Lockwire (E231)

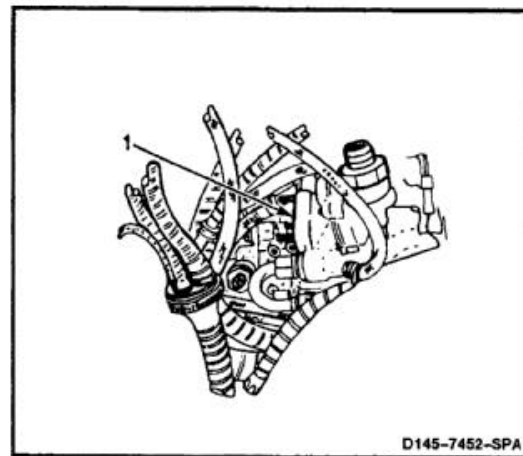
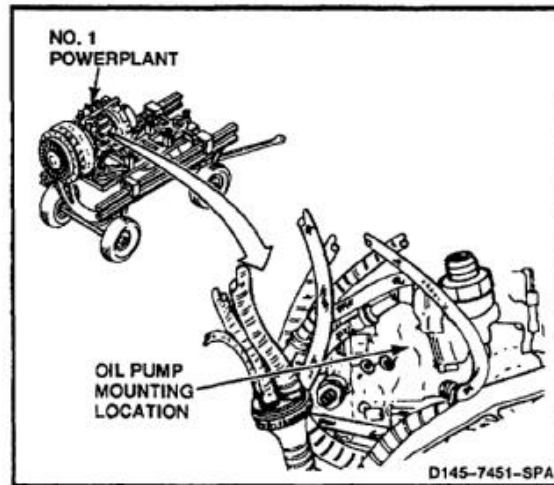
Personnel Required:

- Aircraft Powerplant Repairer (2)
- Inspector

References:

- TM 55-2840-254-23 Without **74**
- TM 1-2840-265-23 With **74**
- TM 55-1520-240-23

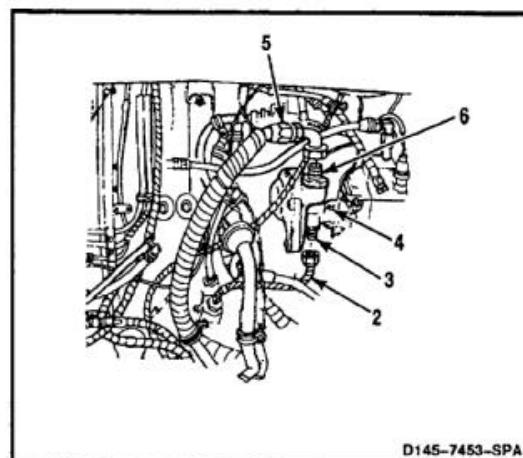
1. Install oil pump (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



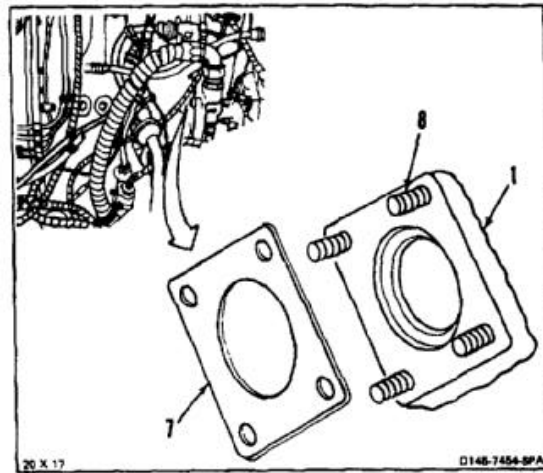
NOTE

Remainder of steps are for engines without **74**.

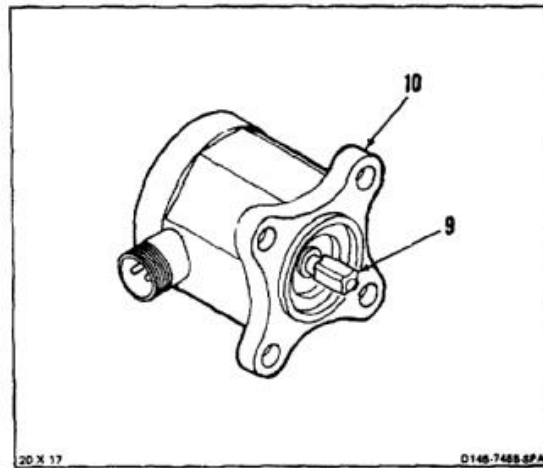
2. Connect hose (2) to port (3) on fuel pump (4).
3. Connect hose (5) to port (6) on fuel pump (4).



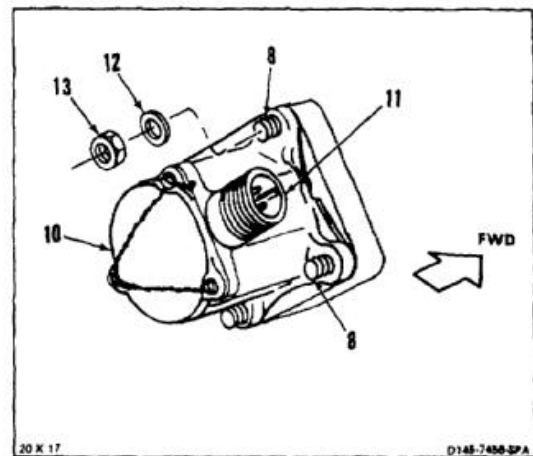
4. Install gasket (7) over mounting studs (8) on oil pump (1).



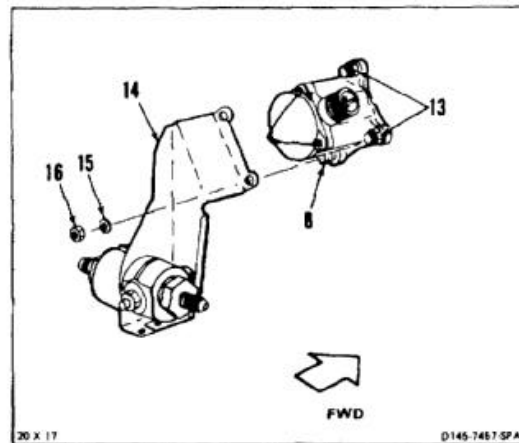
5. Lubricate shaft (9) on tachometer generator (10). Use plastilube (E280).



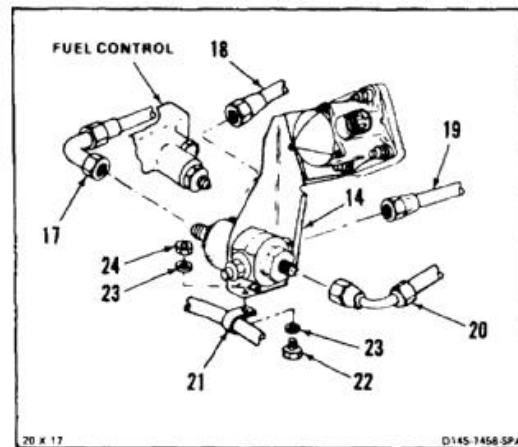
6. Position tachometer generator (10) on mount pad studs (8) with receptacle (11) positioned at **2 o'clock**.
7. Install two washers (12) and nuts (13) on two outboard studs (8). Do not tighten nuts at this time.



8. Position bracket (14) over two inboard studs (8).
9. Install two washers (15) and nuts (16) on two inboard studs (8). Tighten all four nuts (13 and 16).



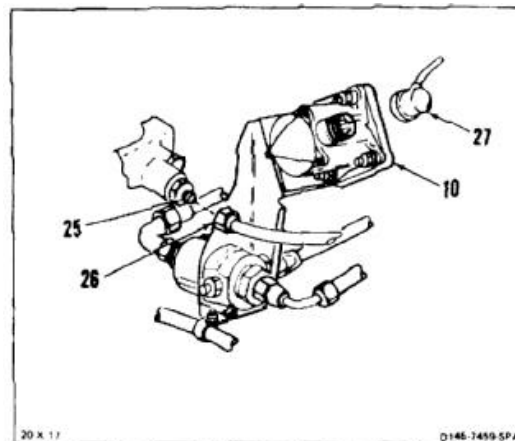
10. Connect drain hose (17). Remove tag.
11. Connect drain hose (18). Remove tag.
12. Connect drain hose (19). Remove tag.
13. Connect drain hose (20). Remove tag.
14. Connect clamp (21) to bracket 14. Install screw (22), two washers (23), and nut (24).



15. Remove cap from fitting (25) and connect fuel hose (26).
16. Connect cable connector (27) to tachometer generator (10). Lockwire connector with lockwire (E231).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch
Container, 2 Quart

Materials:

Cloths (E135)

Personnel Required:

Aircraft Powerplant Repairer (2)

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (2-2)
Engine Access Cover Open (Task 4-49)
No. 2 Gas Producer Tachometer Generator Removed
(Task 8-10)

General Safety Instructions:**WARNING**

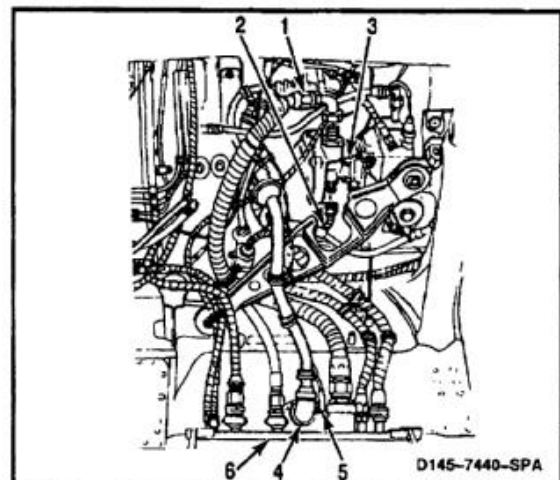
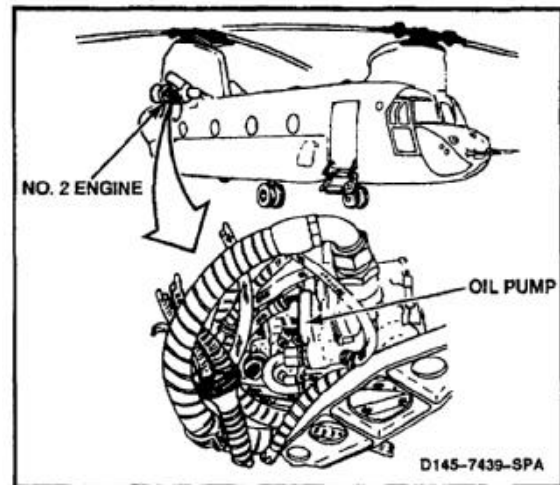
All regulations for handling fuels shall be strictly observed.

1. Remove oil pump from No. 2 powerplant (TM 1-2840-265-23 with **74**).

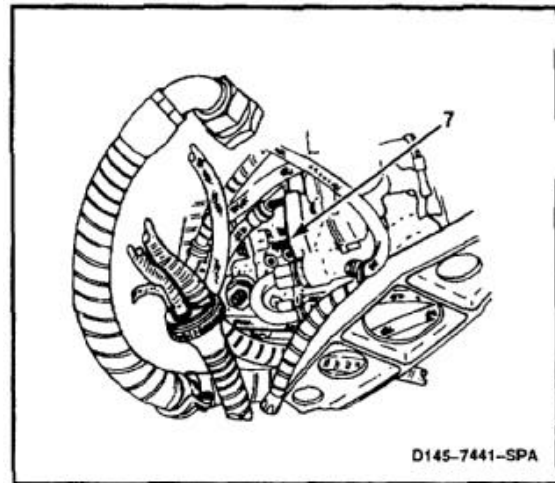
NOTE

Steps 2 and 5 are for engines without **74**.

2. Disconnect two hoses (1 and 2) from fuel pump (3). Use container to catch spilled fuel. Plug hoses. Clean up any spilled fuel. Use cloths (E135). Move hoses to side.
3. Remove lockwire from electrical harness (4).
4. Disconnect electrical harnesses (4 and 5). Move harnesses to side.



5. Remove oil pump (7) (TM 55-2840-254-23 without **74**).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Open End Wrench, 1-1/2 Inch

Materials:

Lockwire (E231)

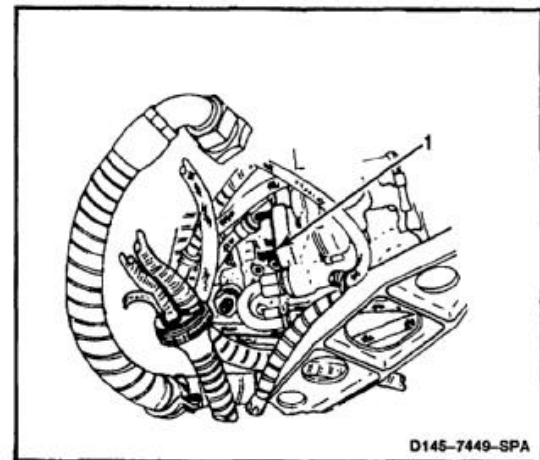
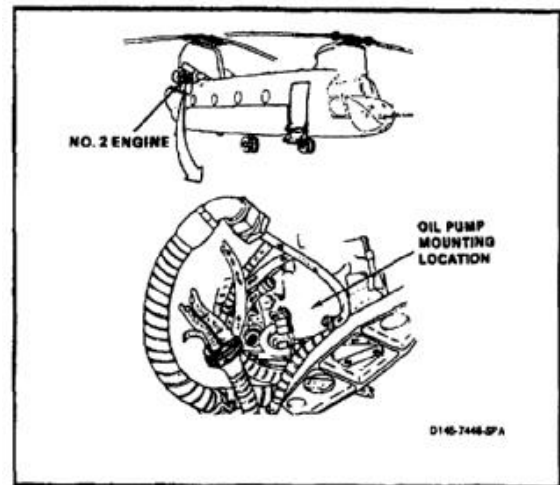
Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**
TM 55-1520-240-23P

1. Install oil pump (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



2. Connect electrical harnesses (2 and 3) to connector (4 and 5) on shelf (6). Lockwire connector (12). Use lockwire (E231).
3. Remove plugs from hoses (7 and 8). Connect hoses to ports (9 and 10) on fuel pump (11).

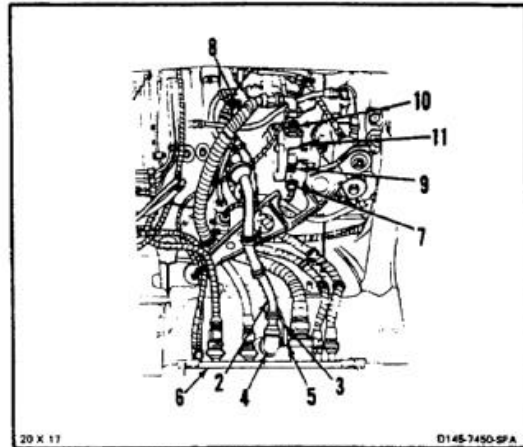


Make sure hoses and harnesses cannot chafe against each other. Chafing can cause damage to hoses and harnesses.

INSPECT

FOLLOW-ON MAINTENANCE:

- Install No. 2 gas producer tachometer generator (Task 8-13).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5100-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-234-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)

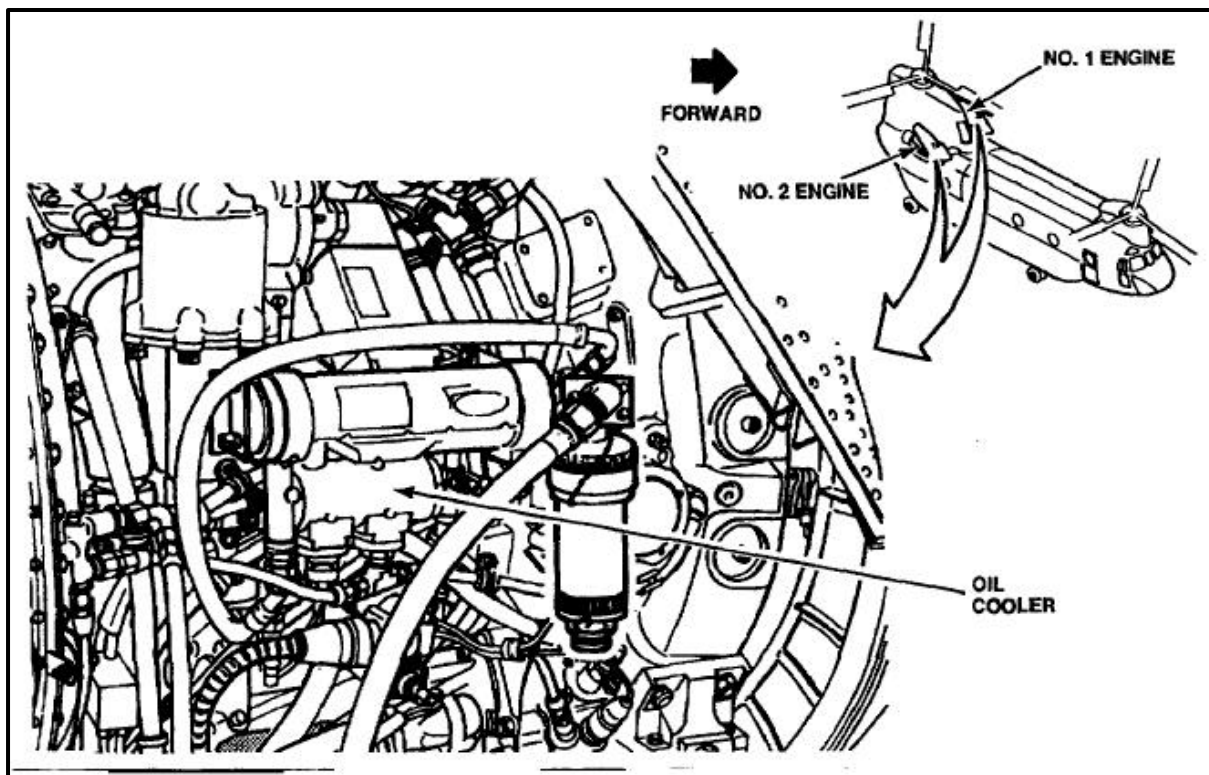
NOTE

Procedure is same to replace oil cooler on No. 1 or No. 2 engine.

1. Replace oil cooler (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)
 Oil Filler Removed (Task 4-98)

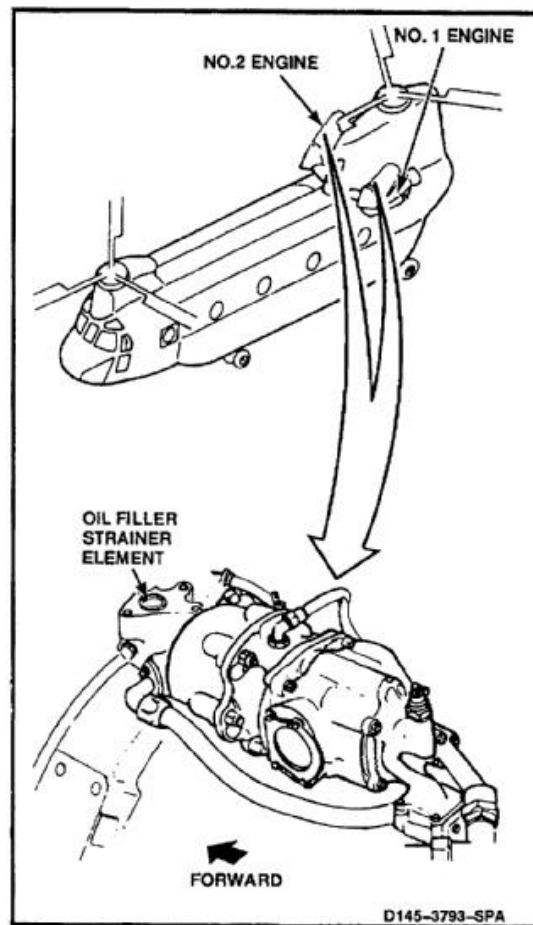
NOTE

Procedure is same to replace oil filler strainer element on No. 1 or No. 2 engine.

1. Replace oil filler strainer element (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

FOLLOW-ON MAINTENANCE:

Install oil filler (Task 4-99).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

4-360

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

Cloths (E135)

Personnel Required:

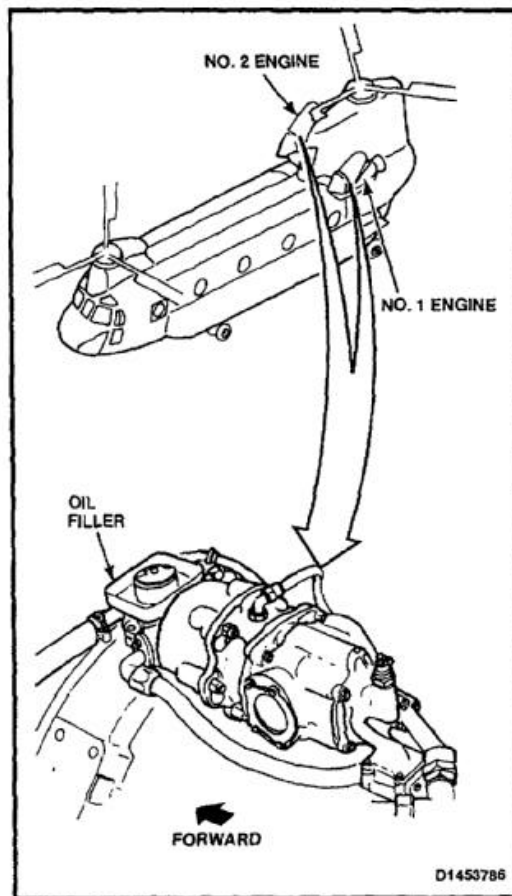
Aircraft Powerplant Repairer

References:

TM 55-2840-254-23 Without **74**
TM 1-2840-265-23 With **74**

Equipment Condition:

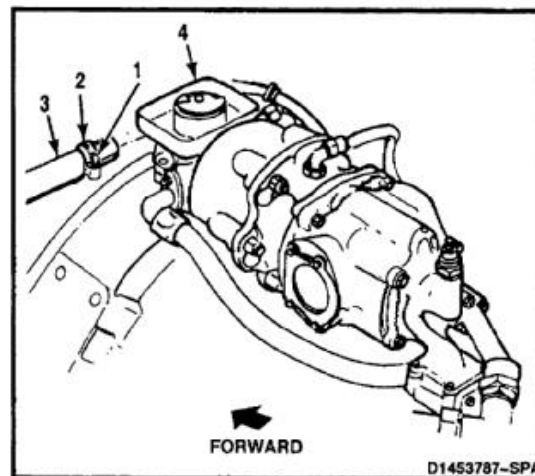
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



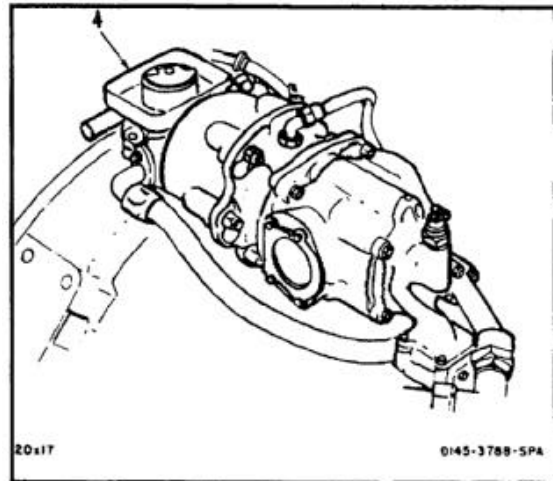
NOTE

Procedure is same to remove oil filler on No. 1 or No. 2 engine.

1. Loosen screw (1) on clamp (2). Disconnect hose (3) from oil filler (4). Use cloths (E135) to clean spilled oil.



2. Remove oil filler (4) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-362

INITIAL SETUP

Applicable Configurations:

All

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

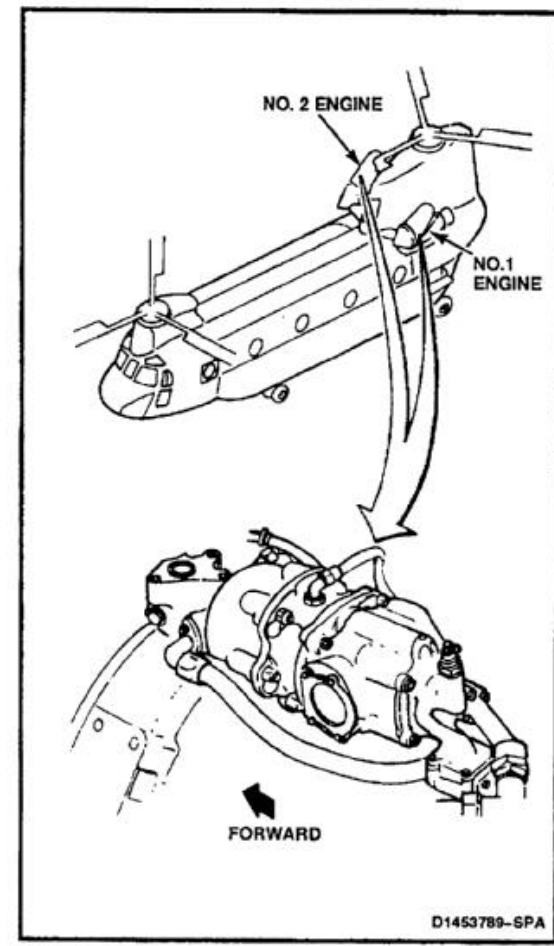
None

Personnel Required:

Aircraft Powerplant Repairer

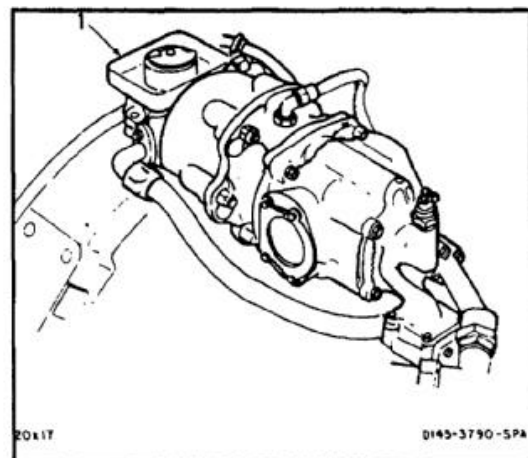
References:

TM 55-2840-254-23 Without **74**
 TM 55-2840-254-23P Without **74**
 TM 1-2840-265-23 With **74**
 TM 1-2840-265-23P With **74**

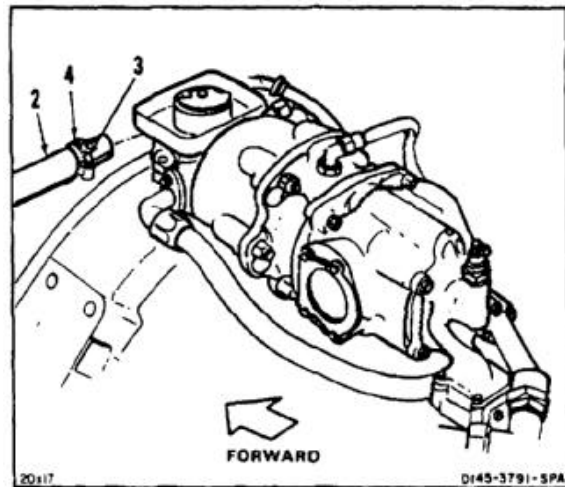
**NOTE**

Procedure is same to install oil filler
on No. 1 or No. 2 engine.

1. Install oil filler (1) (TM 55-2840-254-23 without **74**, TM 1-2840-265-23 with **74**).



2. Connect hose (2). Tighten screw (3) on clamp (4).



FOLLOW-ON MAINTENANCE:

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

4-364

SECTION VII IGNITION SYSTEM

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

Materials:

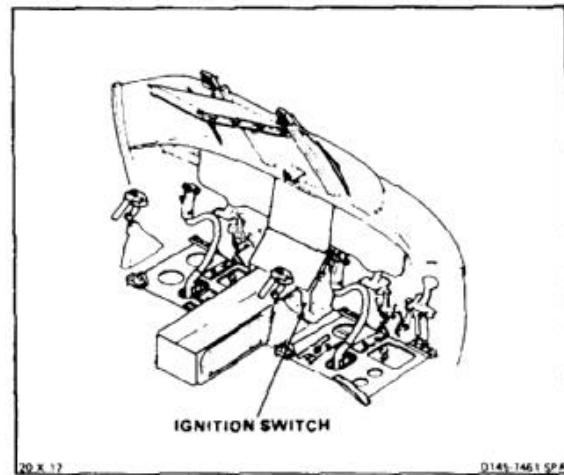
Paper Tags (E264)
Tape (E385)

Personnel Required:

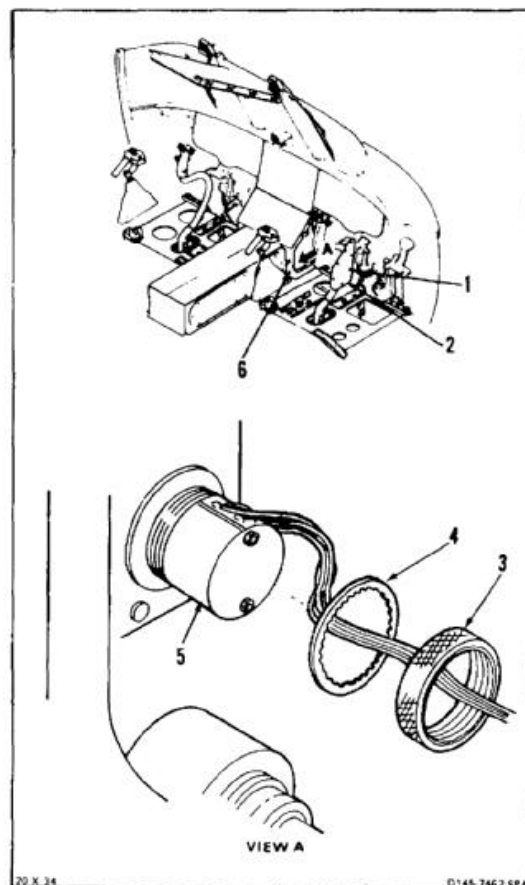
Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



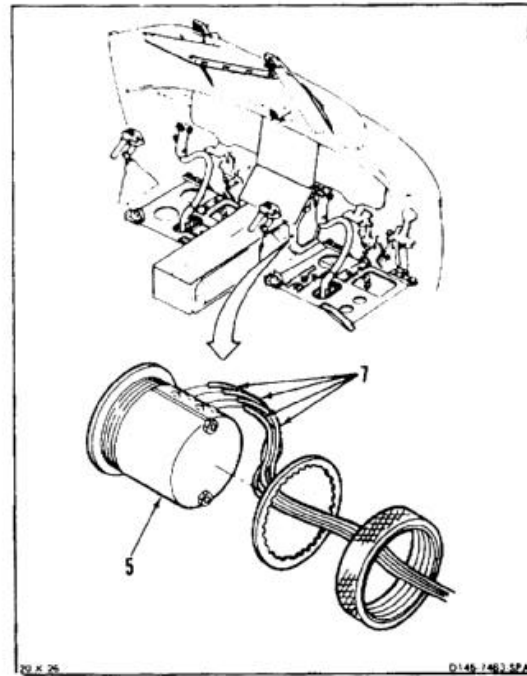
1. Release seven fasteners (1). Remove panel (2).
2. Remove nut (3) and washer (4) from switch (5).
3. Remove switch (5) from console (6).



4-100 REMOVE IGNITION SWITCH (Continued)

4-100

4. Unsolder four wires (7) from switch (5). Tag wires. Use paper tags (E264). Tape exposed ends of wires. Use tape (E385).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

4-367

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

Materials:

Solder (E360)

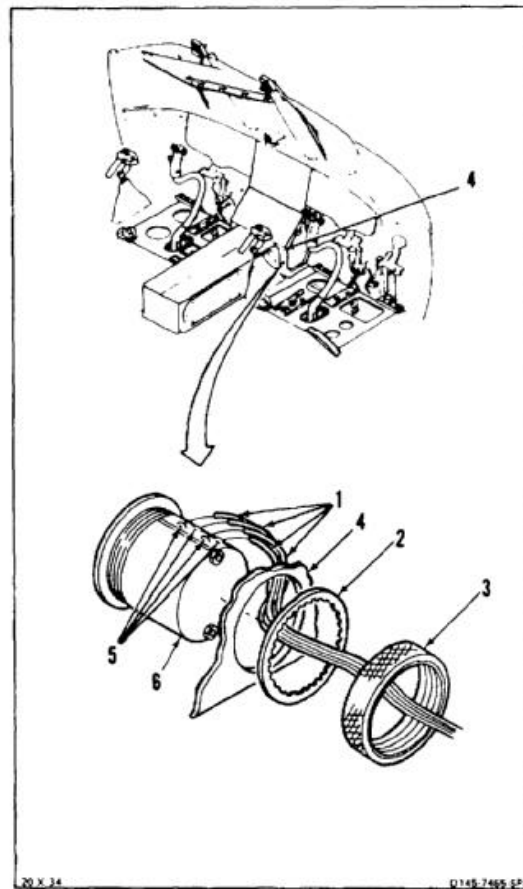
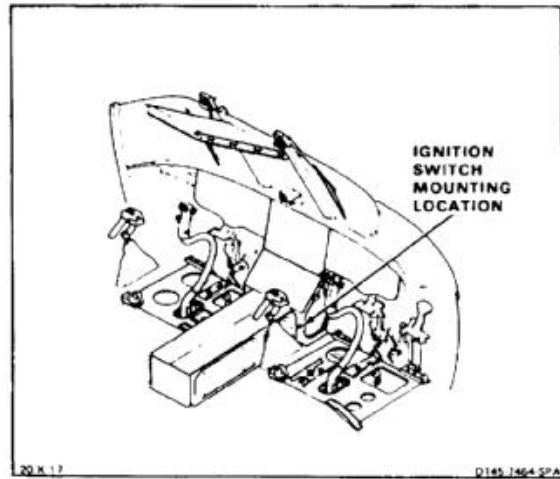
Personnel Required:

Aircraft Electrician
Inspector

References:

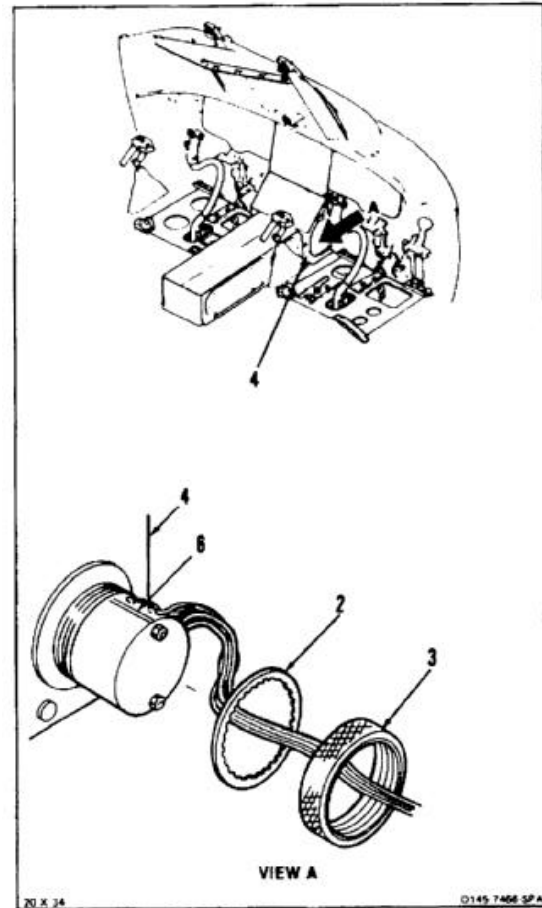
TM 55-1520-240-23P

1. Insert four wires (1) through washer (2), nut (3), and console (4).
2. Remove tape from ends of four wires (1). Solder four wires to four terminals (5) on switch (6). Use solder (E360). Remove tape from wires.



3. Position switch (6) in console (4). Install washer (2) and nut (3).

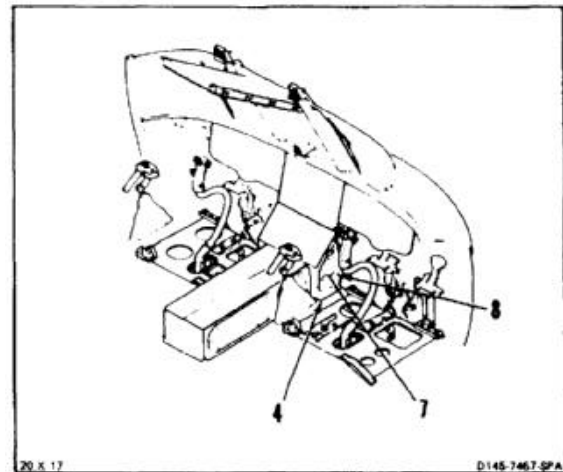
INSPECT



4. Position panel (7) on console (4). Tighten 7 fasteners (8).

FOLLOW-ON MAINTENANCE:

Perform operational check of ignition system (TM 55-1520-240-T).



END OF TASK

SECTION VIII
POWER CONTROLS

INITIAL SETUP

Applicable Configurations:

Without **18** and **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

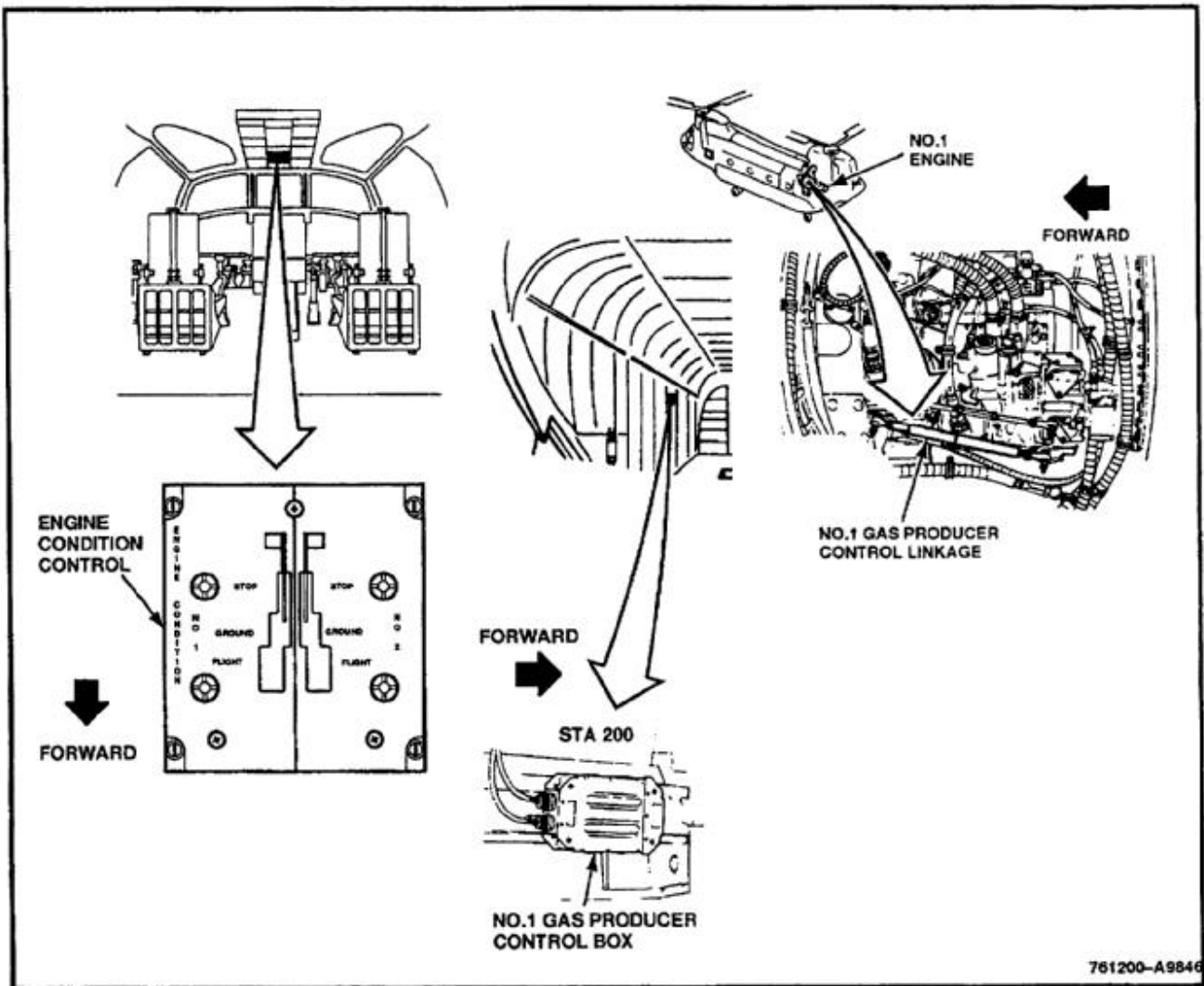
None

Personnel Required:

Aircraft Powerplant Repairer (2)

Equipment Condition:

Battery Connected (Task 1-39)
Electrical Power On
Hydraulic Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

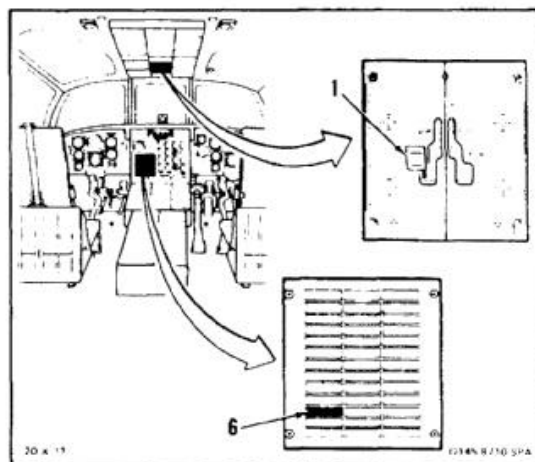


NOTE

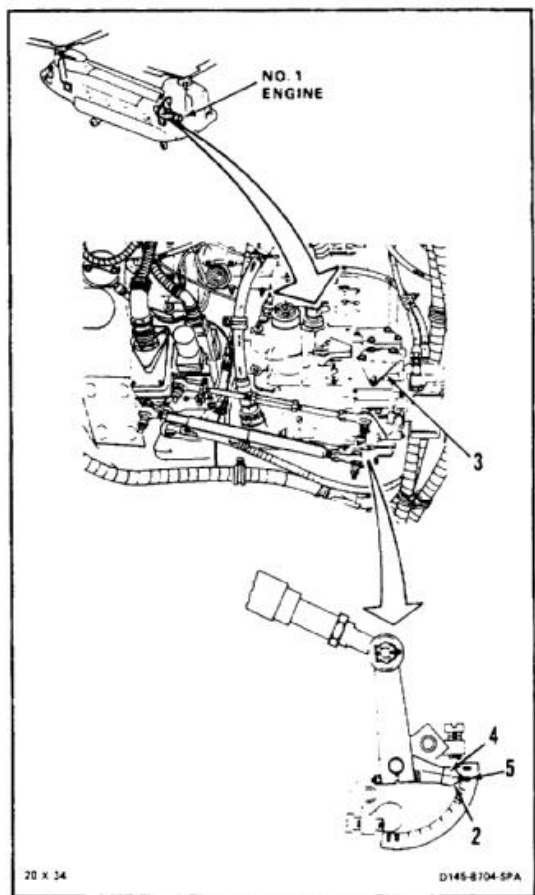
This procedure is for systems using control box P/N 114ES283-1. For adjustment of systems using control box 234ES283-1, go to Task 4-102.1.

Procedure is same to adjust gas producer control system for No. 1 or No. 2 engine. Adjustment of No. 1 engine is shown here.

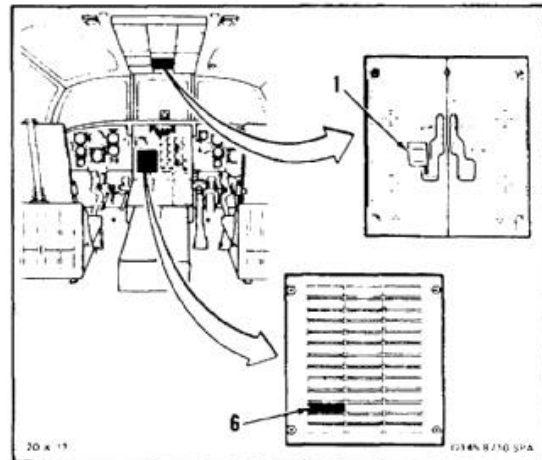
1. Set No. 1 engine condition control lever (1) to GROUND detent.



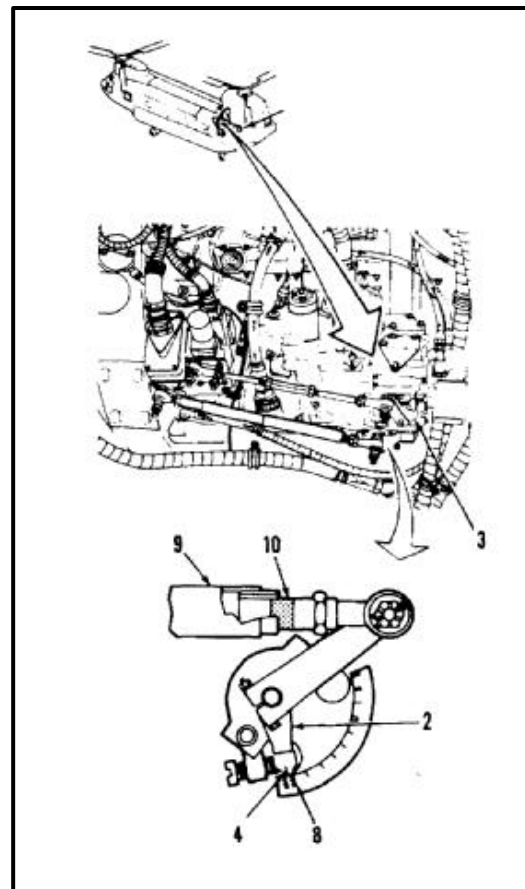
2. Have helper check gas producer pointer (2) on fuel control (3). If index mark (4) on pointer is centered on G1 band (5), go to step 3. If not, go to step 7.



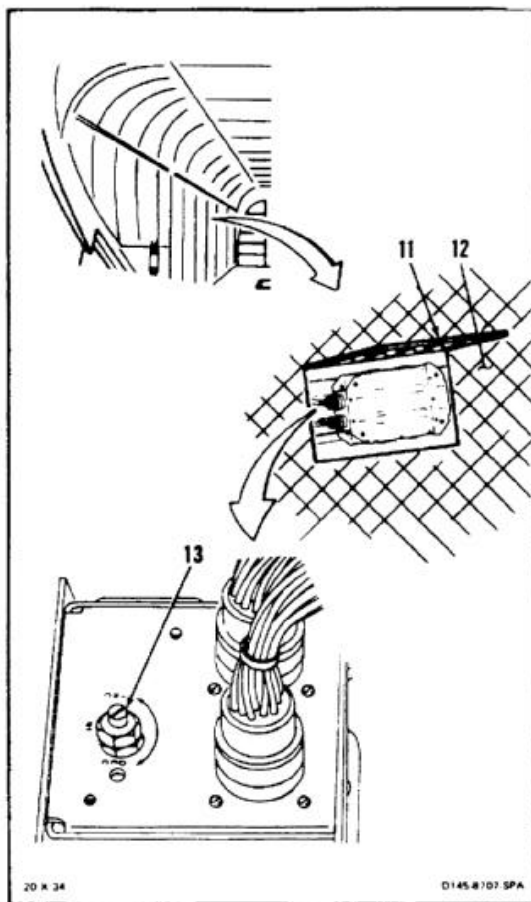
3. Set lever (1) to FLIGHT detent.
4. Wait for No. 1 ENG N1 COND light capsule (6) on master caution panel (7) to go out.



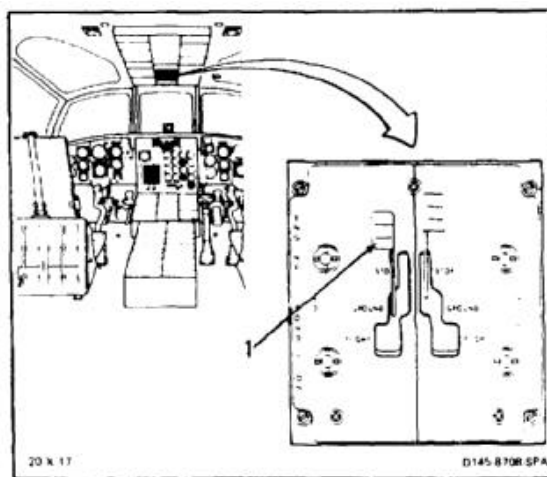
5. Have helper check pointer (2) on fuel control (3). If index mark (4) on pointer is centered on MAX band (8), go to next step. If not, go to step 7.
6. Have helper check rod (9). If band (10) on rod is partially covered, go to step 15. If band is completely covered, go to step 7.



7. Open access flap (11) in acoustic blanket (12).
8. Loosen locknut (13).



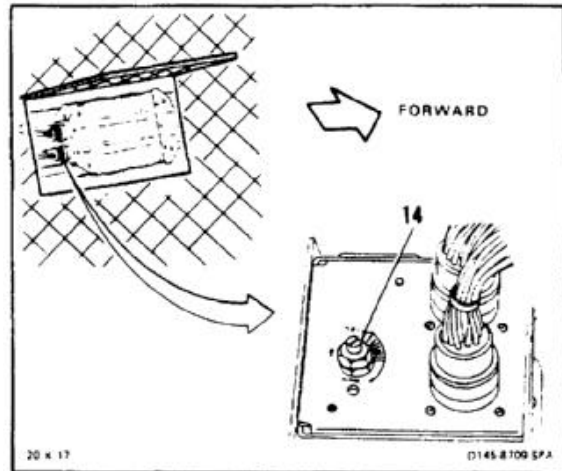
9. Set lever (1) to GROUND detent.



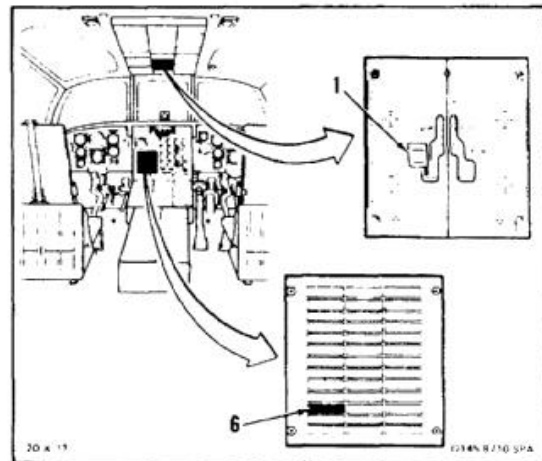
10. Adjust resistor shaft (14) one index mark at a time.

NOTE

Turning resistor shaft clockwise will cause pointer to move to the right. Counterclockwise adjustment will cause pointer to move left.



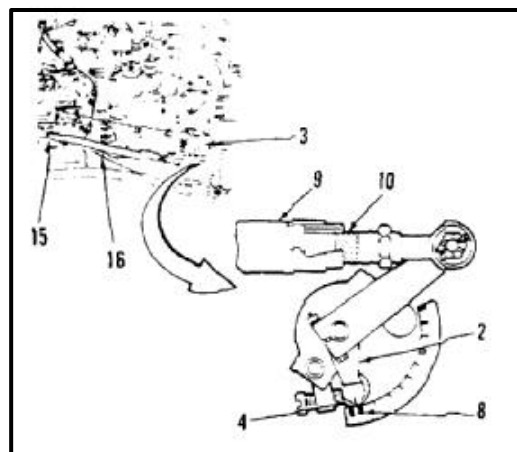
11. Set lever (1) to FLIGHT. Wait for NO. 1 ENG COND light capsule (6) to go out.



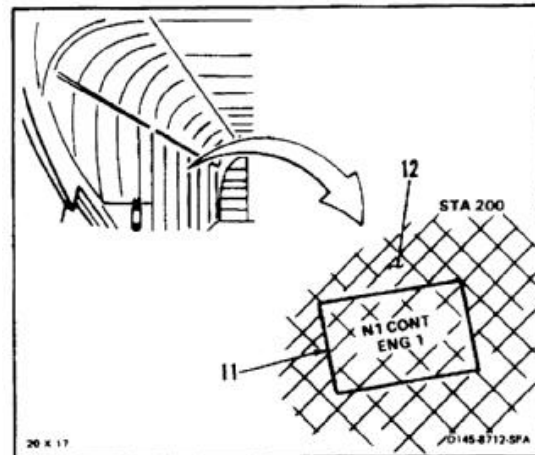
12. Have helper check pointer (2) on fuel control (3). Make sure index mark (4) on pointer is centered on MAX band (8). If not, repeat steps 9 thru 11.

13. Make sure band (10) on rod (9) is partially covered. If not, do the following:

- a. Cut lockwire and loosen nut (15).
- b. Rotate cylinder (16) until index mark (4) on pointer (2) is centered on MAX band (8).
- c. Tighten and lockwire nut (15).



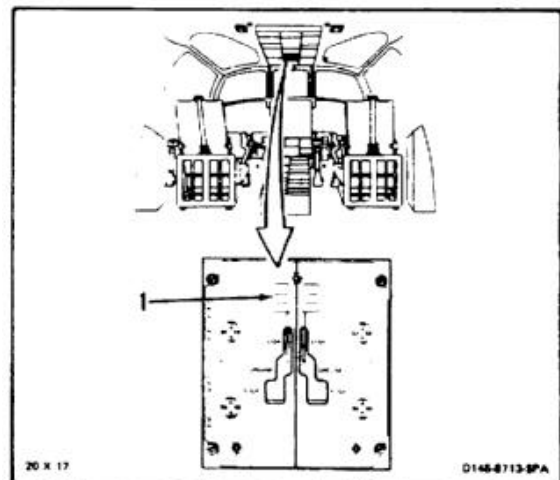
14. Close access flap (11) on blanket (12).



15. Set lever (1) to STOP.

FOLLOW-ON MAINTENANCE:

- Electrical power off.
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **18** and Without **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

None

Personnel Required:

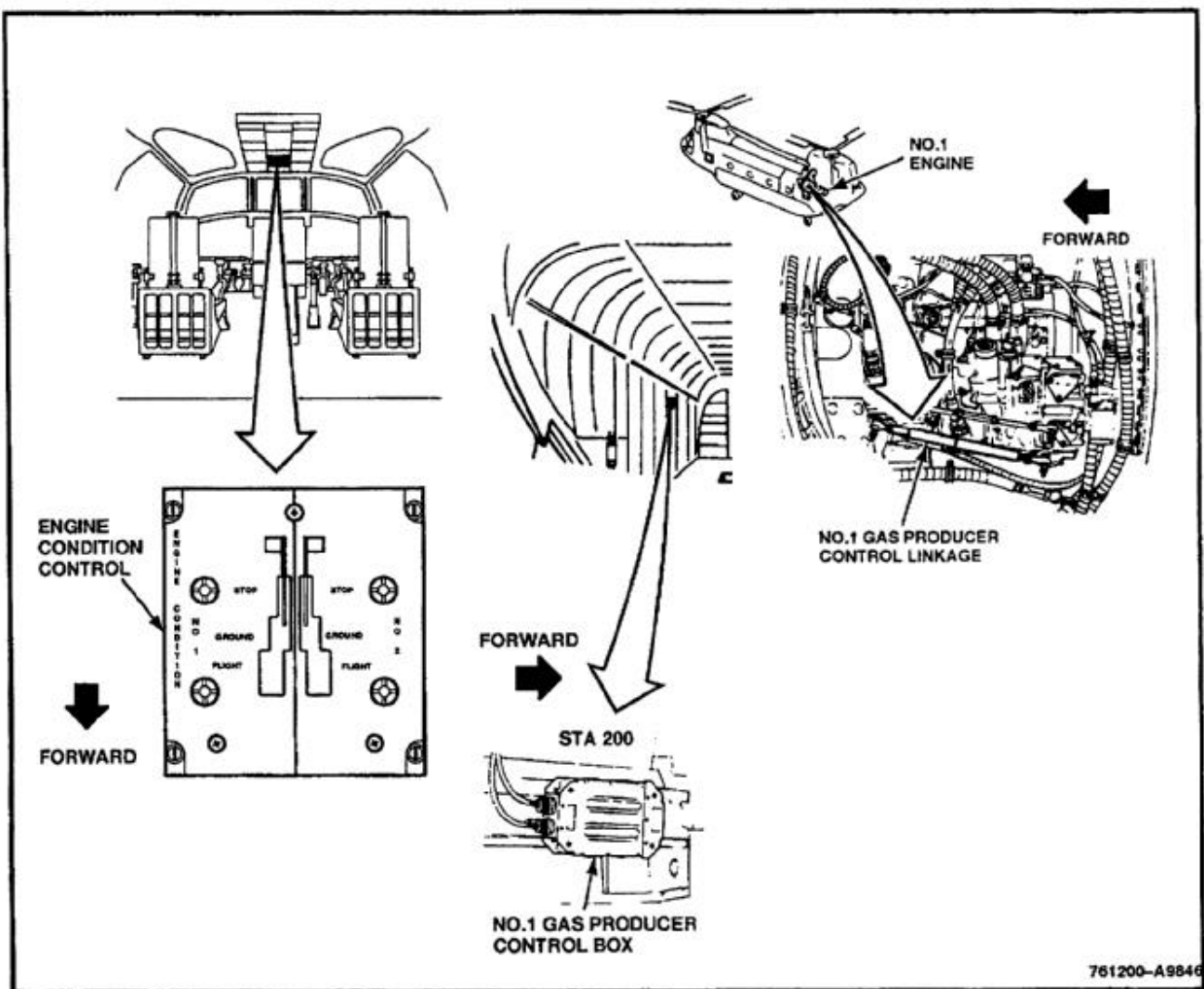
Aircraft Powerplant Repairer (2)

Equipment Condition:

- Battery Connected (Task 1-39)
- Electrical Power On
- Hydraulic Power Off
- Engine Work Platform Open (Task 2-2)
- Engine Access Cover Open (Task 4-49)

References:

- Task 4-102
- TM 55-2840-254-23



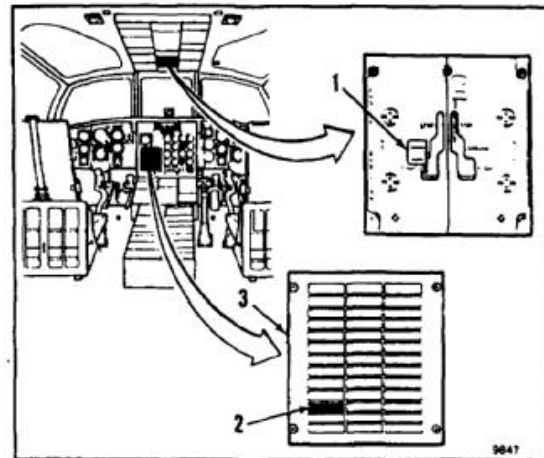
CAUTION

Do not adjust mechanical stops on fuel control. Engine performance will be altered.

NOTE

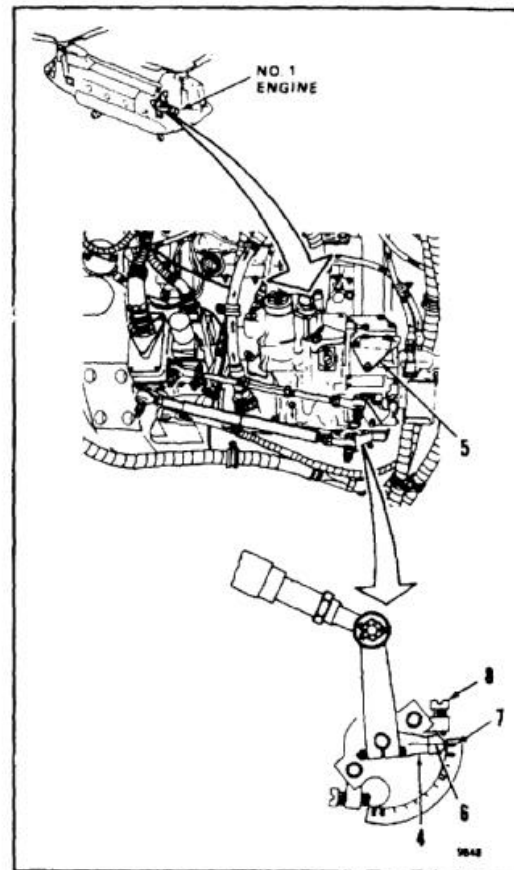
Procedure is same to adjust gas producer control system for No. 1 or No. 2 engine. Adjustment of No. 1 engine is shown here.

This procedure is for systems using control box 234ES283-1. For adjustment of systems using control box 114ES283-1, go to Task 4-102.



1. Set No. 1 engine condition lever (1) to FLIGHT detent. Wait for No. 1 ENG N1 COND light capsule (2) on master caution panel (3) to go out.
2. Set lever (1) to STOP detent. Wait for No. 1 ENG N1 COND light capsule on master caution panel (3) to go out.

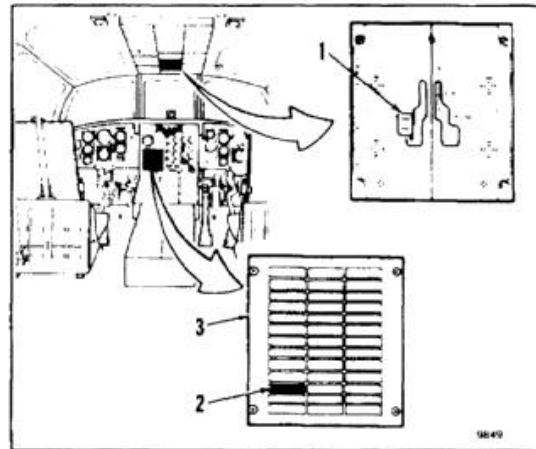
3. Have helper check gas producer pointer (4) on fuel control (5). If index mark (6) on pointer is approximately centered on OFF band (7) and in contact with mechanical stop (8), go to step 4. If not, go to step 8.



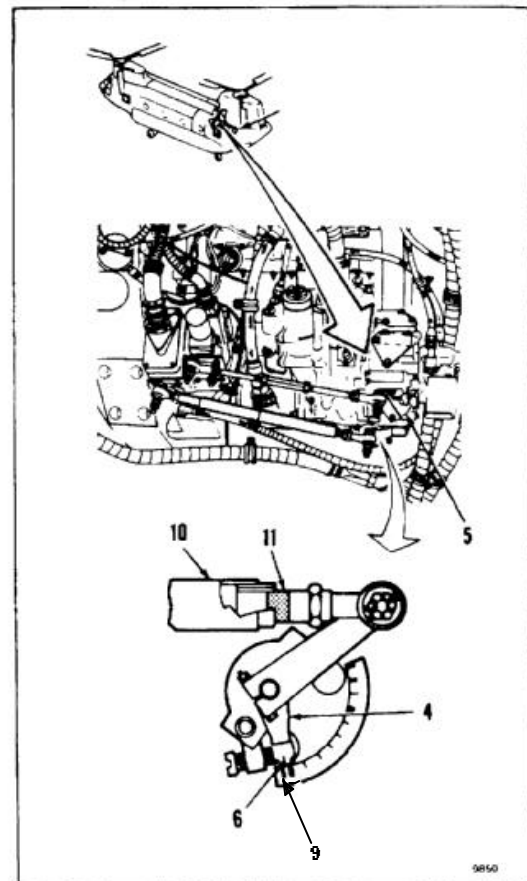
NOTE

Do not change FLIGHT adjustment until STOP adjustment is correct.

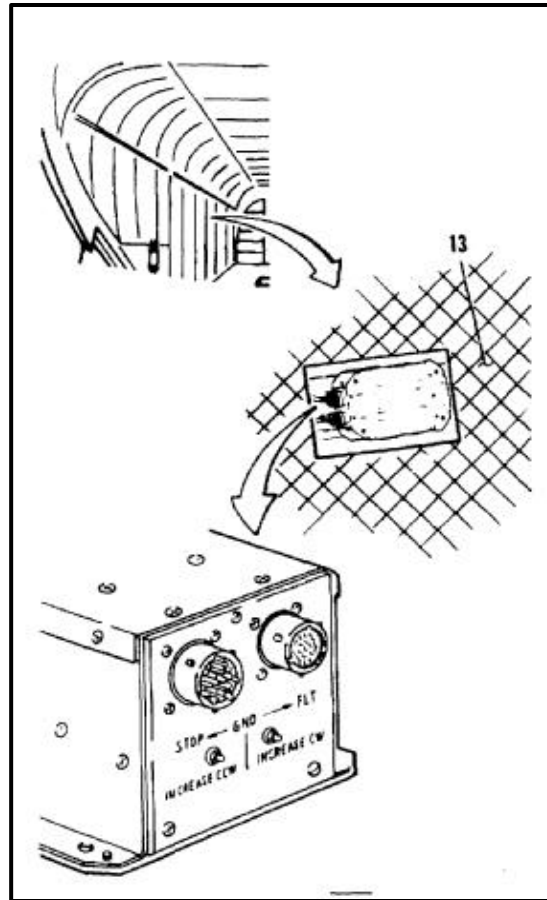
4. Set lever (1) to FLIGHT detent.
5. Wait for No. 1 ENG N1 COND light capsule (2) on master caution panel (3) to go out.



6. Have helper check pointer (4) on fuel control (5). If index mark (6) on pointer is approximately centered on EMER band (9) and the pointer is in contact with the mechanical stop, go to step 7. If not, go to step 11.
7. Have helper check rod (10). If band (11) on rod is partially covered, go to step 16. If band is completely uncovered or covered, go to step 11.



8. Open acoustic blanket (13).



CAUTION

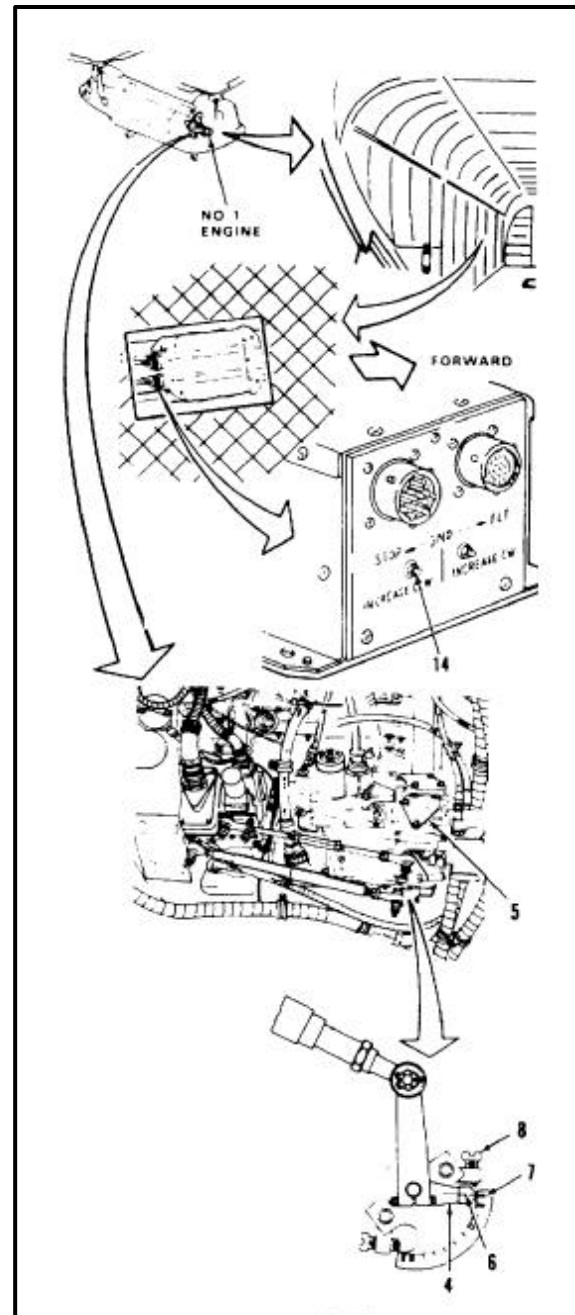
Do not adjust locknut on N1 control box.

9. Adjust resistor shaft (14) until index mark (6) on pointer (4) is approximately centered on OFF band (7) and pointer is in contact with mechanical stop (8).

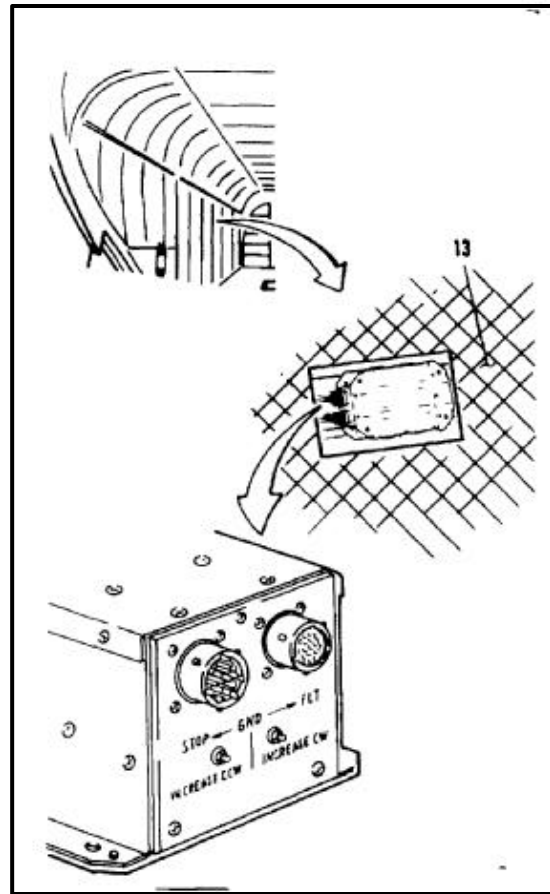
NOTE

Turning resistor shaft clockwise will cause pointer to move away from the stop. Counterclockwise adjustment will cause pointer to move toward stop.

10. Have helper check pointer (4) on fuel control (5). Make sure index mark (6) on pointer is approximately centered on OFF band (7) and pointer is in contact with mechanical stop (8). If so, go to step 15. If not, repeat steps 9 and 10.



- 11. Open acoustic blanket (13).



CAUTION

Do not adjust locknut on N1 control box.

12. If the index mark (6) on pointer (4) is not approximately centered on EMER band (9) and pointer is not in contact with mechanical stop (8), adjust resistor shaft (15) until index mark (6) on pointer (4) is approximately centered on EMER band (9) and pointer is in contact with mechanical stop (8).

NOTE

Turning resistor shaft clockwise will cause pointer to move toward mechanical stop. Counterclockwise adjustment will cause pointer to move away from mechanical stop.

13. If dark band (11) on rod (10) is not partially covered (as illustrated), adjust resistor shaft (15) until dark band (11) is partially covered.

NOTE

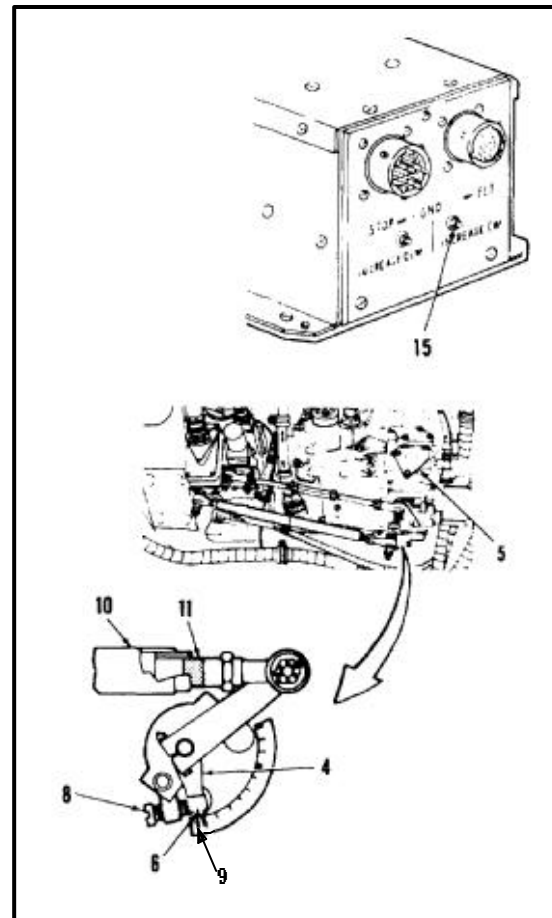
Turning resistor shaft clockwise will tend to cover band (11). Counterclockwise adjustment will tend to uncover band (11).

14. Have helper check pointer (4) on fuel control (5). Make sure index mark (6) on pointer is centered on EMEG band (9). If so, go to step 15. If not, repeat steps 12, 13, and 14.

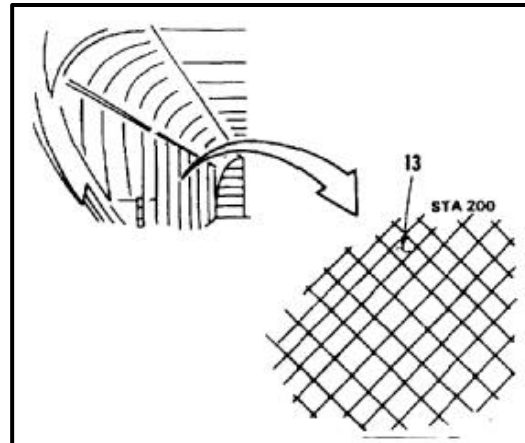
NOTE

If proper adjustment cannot be obtained and gas producer control box has been changed, refer to TM 55-2840-254-23.

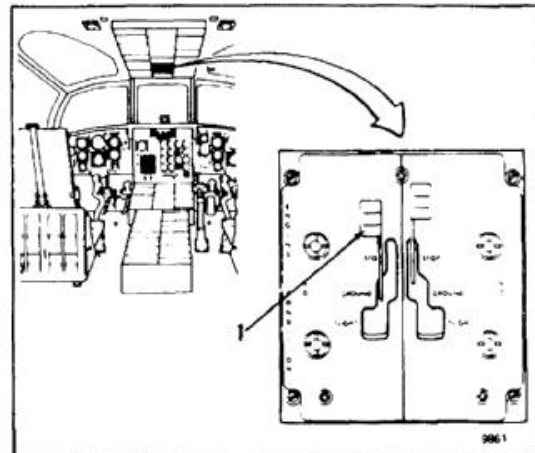
15. Make sure band (11) on rod (10) is partially covered. If so, go to step 16. If not, repeat steps 12, 13, and 14.



16. Close acoustic blanket (13).



17. Set lever (1) to STOP.



FOLLOW-ON MAINTENANCE:

- Electrical power off.
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Dial Indicating Scale, 0 to 10 Pounds

Materials:

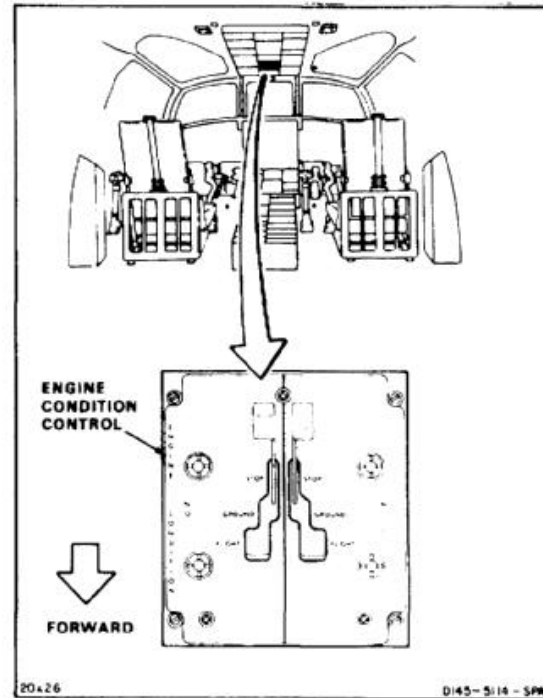
None

Personnel Required:

Inspector

Equipment Condition:

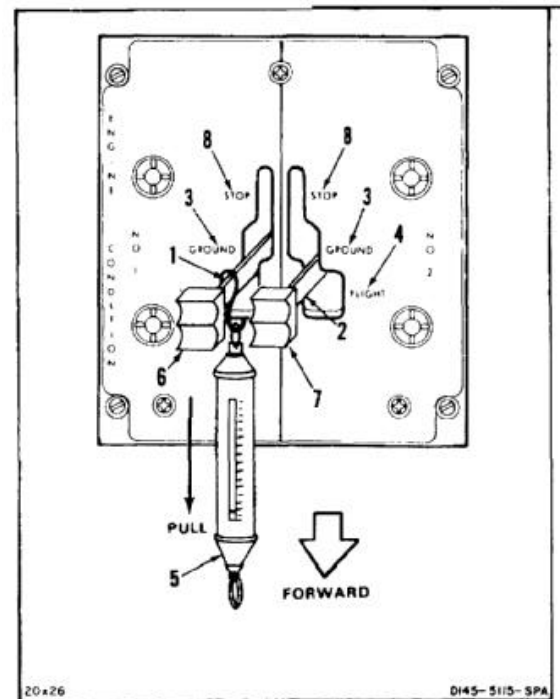
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off



1. Set No. 1 lever (1) and No. 2 lever (2) between GROUND (3) and FLIGHT (4).
2. Hook dial indicating scale (5) to No. 1 lever (1) behind knob (6).
3. Pull scale (5) forward until lever (1) moves. Force to move lever shall be **4 to 5 pounds**. Unhook scale from lever.
4. Hook scale (5) to No. 2 lever (2) behind knob (7).
5. Pull scale (5) forward until lever (2) moves. Force to move lever shall be **4 to 5 pounds**. Unhook scale from lever.
6. Set levers (1 and 2) to STOP (8).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

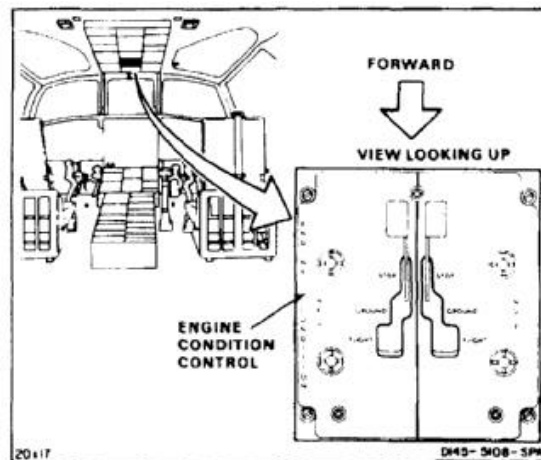
Paper Tags (E264)

Personnel Required:

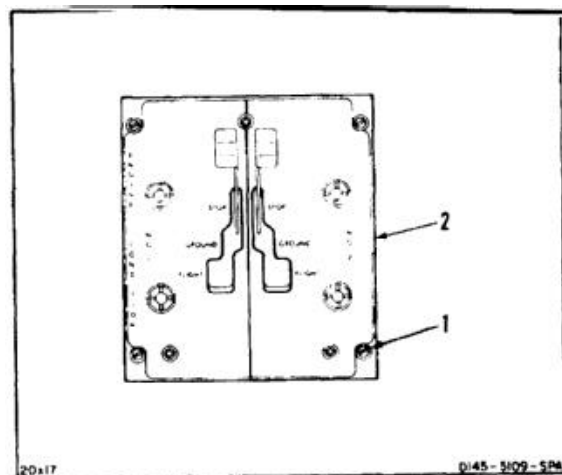
Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off



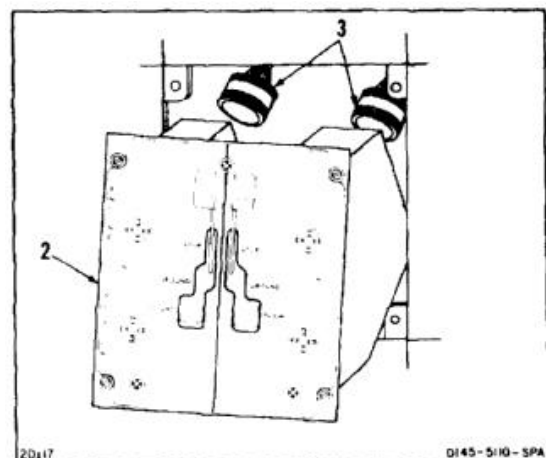
1. Release four fasteners (1) on control (2).



2. Lower control (2) enough to reach electrical connectors (3). Tag and disconnect two electrical connectors.
3. Remove control (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

None

Personnel Required:

Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P

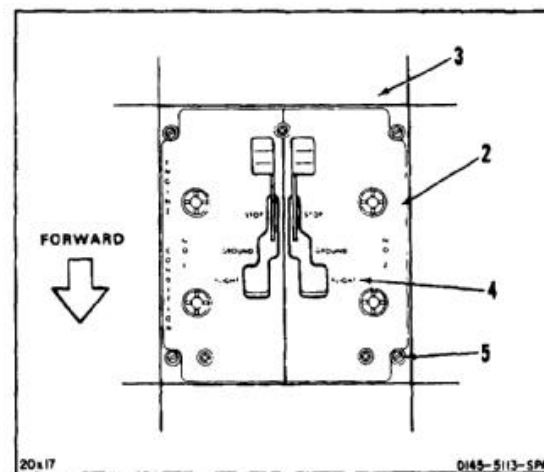
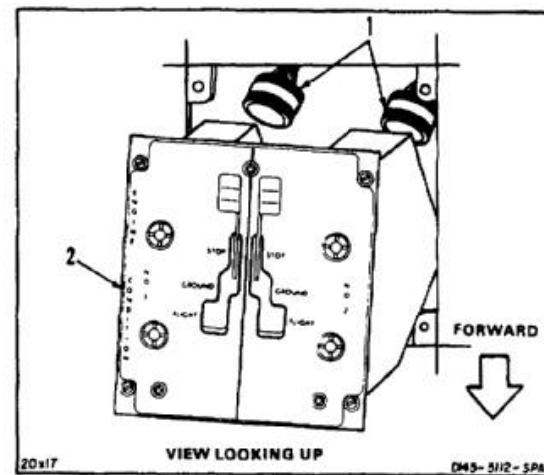
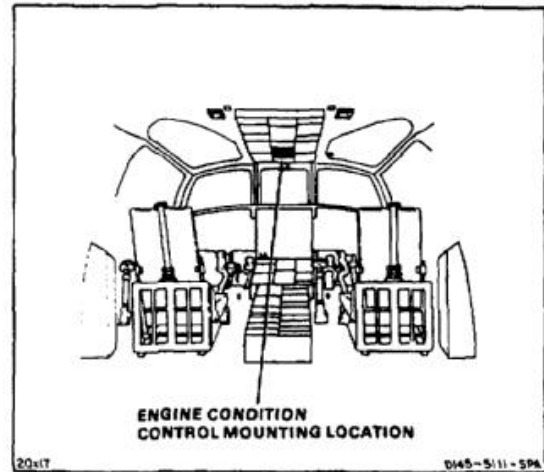
1. Connect two electrical connectors (1) to control (2). Remove tags.

INSPECT

2. Position control (2) on panel (3). Make sure FLIGHT marking (4) is forward.
3. Secure four fasteners (5).

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Mechanic's Tool Kit, NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

Personnel Required:

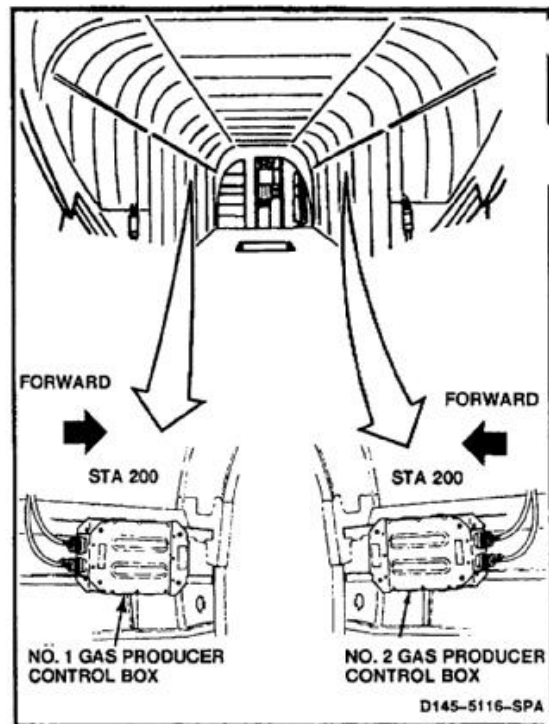
Aircraft Electrician

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

No. 1 Gas Producer Control Box Access Panel Open (Task 2-2) or No. 2 Gas Producer Control Box Access Panel (Task 2-2)



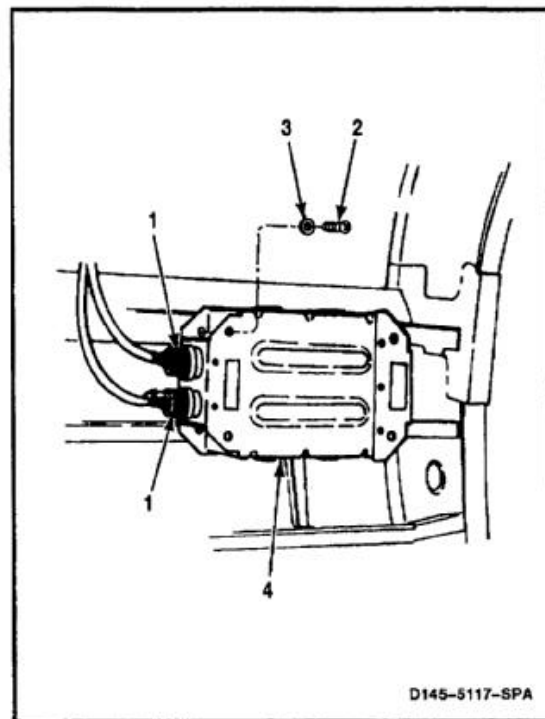
NOTE

Procedure is same to remove No. 1 or No. 2 gas producer control box. Removal of No. 1 box is shown here.

1. Tag and disconnect two electrical connectors (1).
2. Remove four screws (2) and washers (3).
3. Remove box (4).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

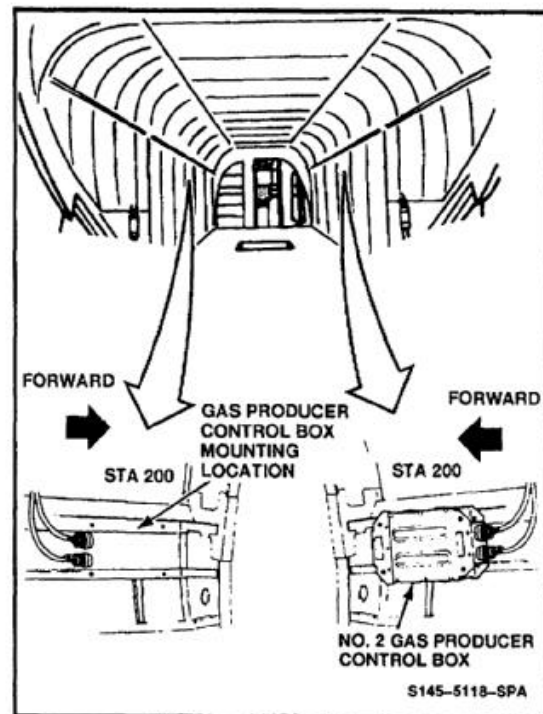
None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23P



NOTE

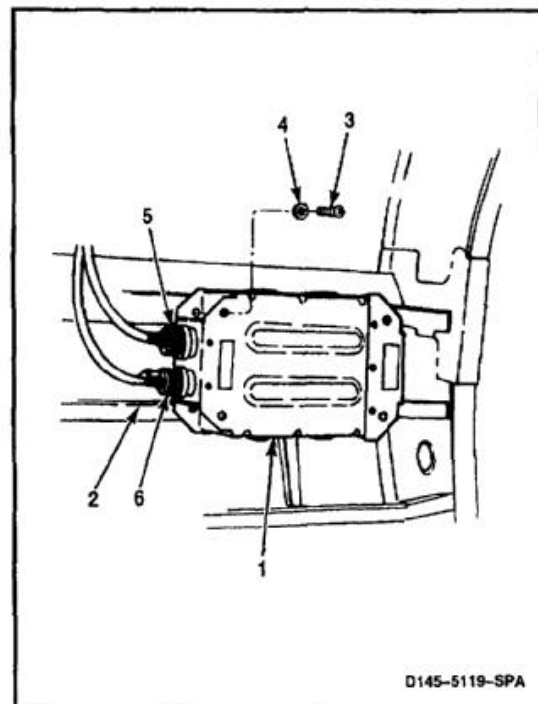
Procedure is same to install No. 1 or No. 2 gas producer control box. Installation of No. 1 control box is shown here.

1. Position box (1) on fuselage (2).
2. Install four screws (3) and washers (4).
3. Connect two electrical connectors (5 and 6). Remove tags.

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).

Close No. 1 gas producer control box access panel (Task 2-2) or No. 2 gas producer control box access panel (Task 2-2).



END OF TASK

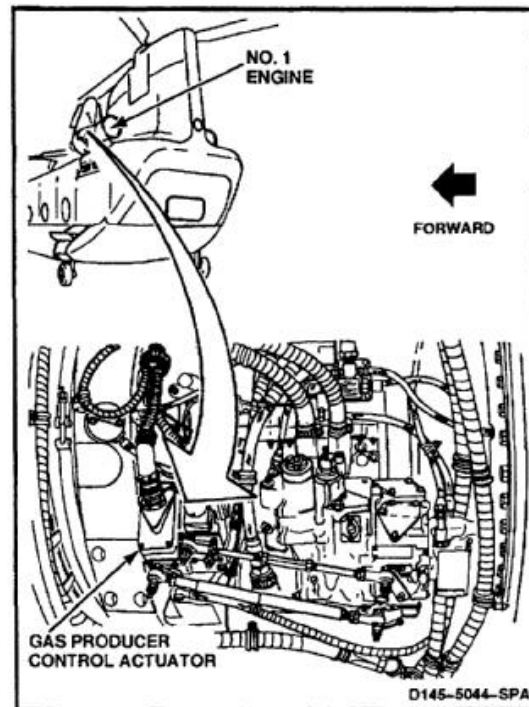
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944**Materials:**

None

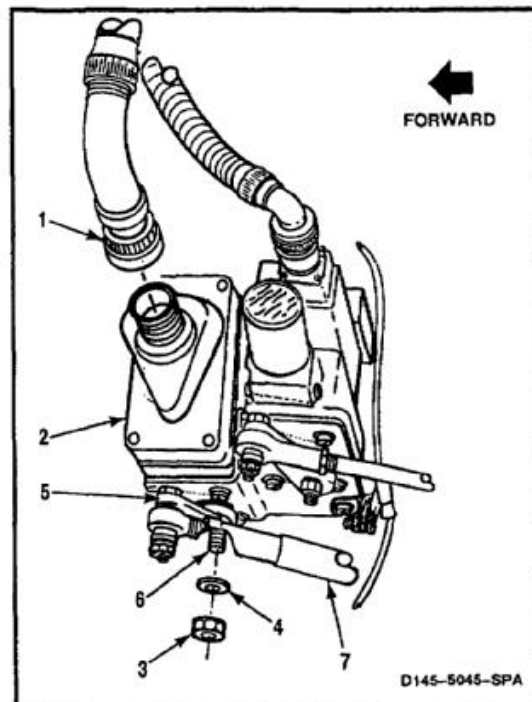
Personnel Required:

Aircraft Powerplant Repairer

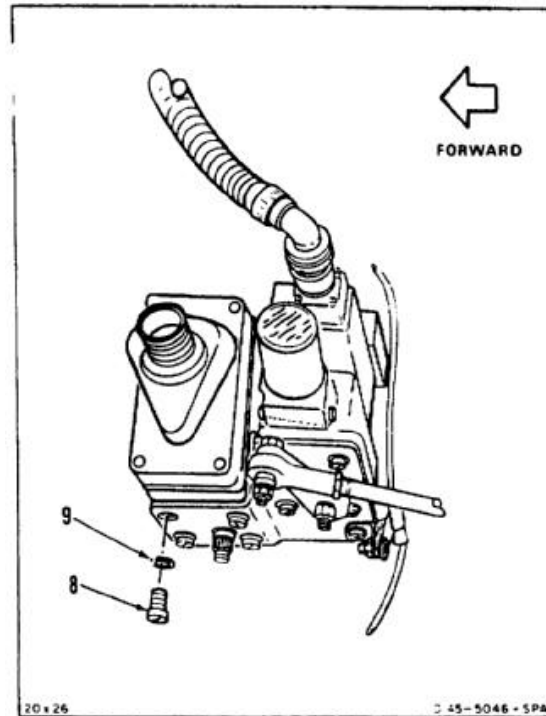
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to remove gas producer control actuator from No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Disconnect cable connector (1) from actuator (2).
2. Remove nut (3) and washer (4). Slide lever (5) off shaft (6). Move rod (7) up and aft.



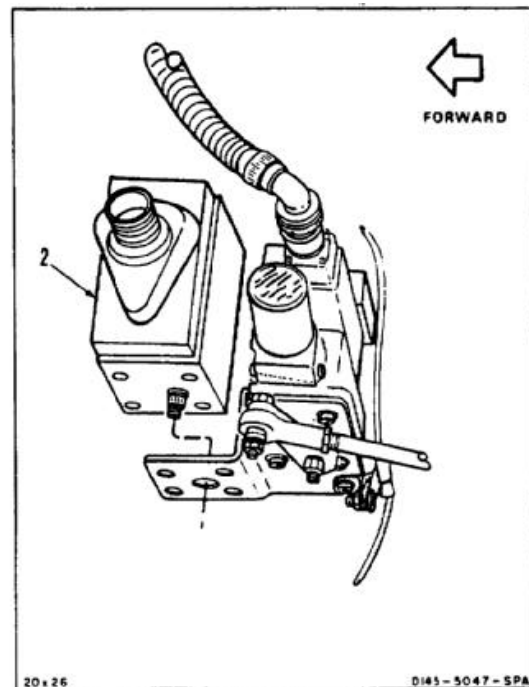
3. Remove lockwire from four screws (8). Remove four screws and washers (9).



4. Remove actuator (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Torque Wrench, 5 to 50 Inch-Pounds

Materials:

Lockwire (E231)

Personnel Required:Aircraft Powerplant Repairer
Inspector**References:**

TM 55-1520-240-23P

NOTE

Procedure is same to install gas producer control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Position actuator (1) on bracket (2). Check index mark (3) on actuator shaft (4). Index mark shall align with index mark (5) on bracket.



Screws must be lockwired left to right. Interference or damage to control rod could result if screws are lockwired up and down.

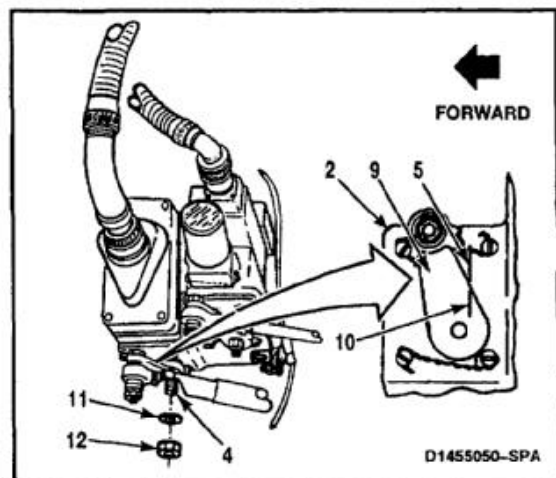
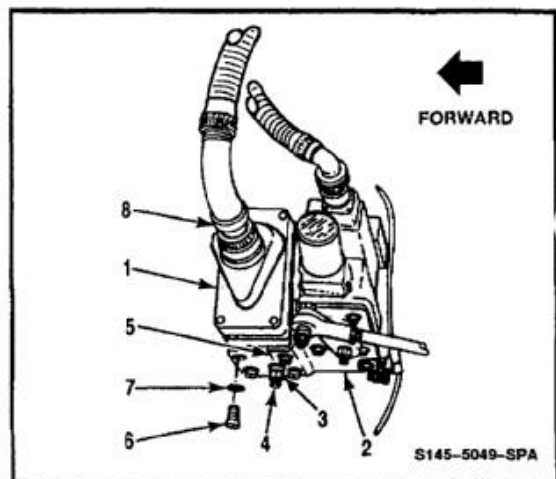
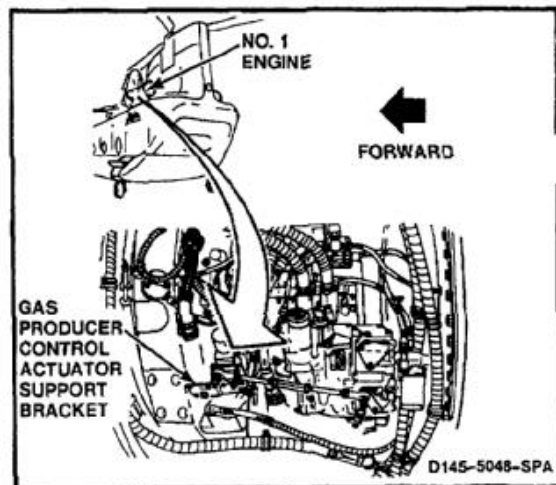
2. Install four screws (6) and washers (7). Lockwire screws left to right. Use lockwire (E231).
3. Connect cable connector (8).
4. Position lever (9) on shaft (4). Index mark (10) on lever shall align with index mark (5) on bracket (2). Install washer (11) and nut (12) on shaft. Torque nut to **35 inch-pounds**.

INSPECT**FOLLOW-ON MAINTENANCE:**

Perform operational check of gas producer control system (TM 55-1520-240-T).

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).



END OF TASK

4-394

4-110 REMOVE ACTUATOR SUPPORT BRACKET

4-110

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Container, 2 Quart

Materials:

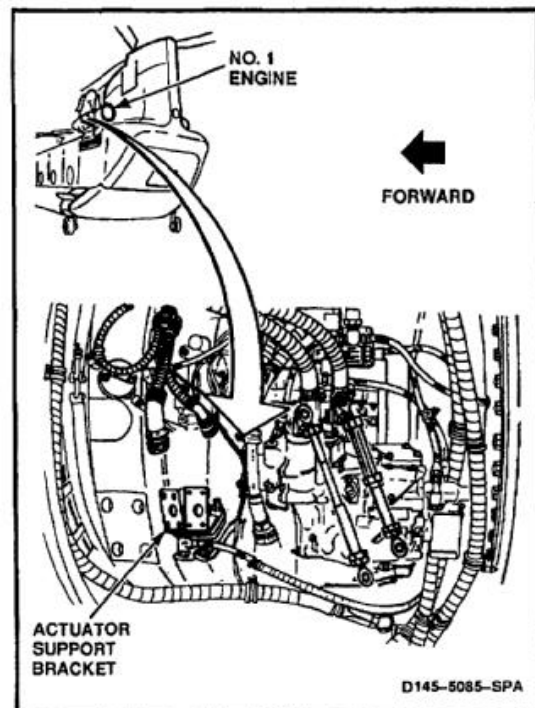
Cloths (E135)

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)
Gas Producer Control Actuator Removed (Task
4-108)
Power Turbine Control Actuator Removed (Task
4-138)

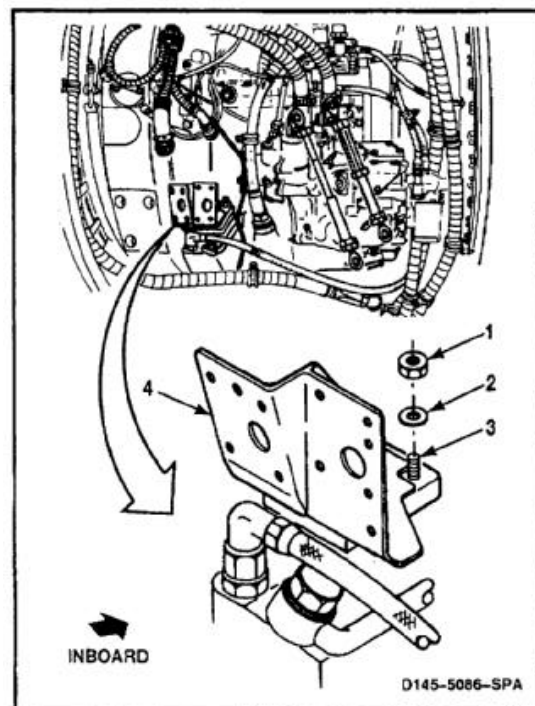
**NOTE**

Procedure is same to remove actuator support on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Remove four nuts (1) and washers (2) from studs (3).
2. Remove bracket (4). Use container to catch any oil spill. Clean up spilled oil. Use cloths (E135).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

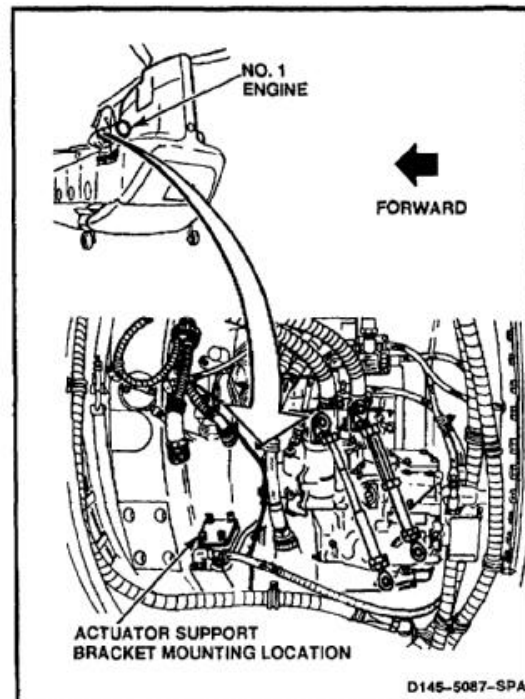
Torque Wrench, 5 to 50 Inch-Pounds

Materials:

None

Personnel Required:Aircraft Powerplant Repairer
Inspector**References:**

TM 55-1520-240-23P

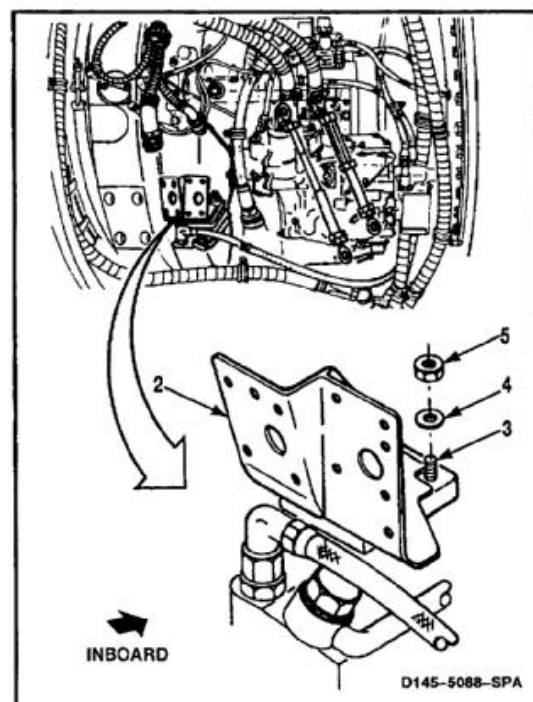
**NOTE**

Procedure is same to install actuator support bracket on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Make sure gasket (1) is in serviceable condition.
2. Position bracket (2) on studs (3). Install four washers (4) and nuts (5) on studs.
3. Torque four nuts (5) to **35 inch-pounds**.

INSPECT**FOLLOW-ON MAINTENANCE:**

Install gas producer control actuator (Task 4-109).
Install power turbine control actuator (Task 4-139).
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

4-396

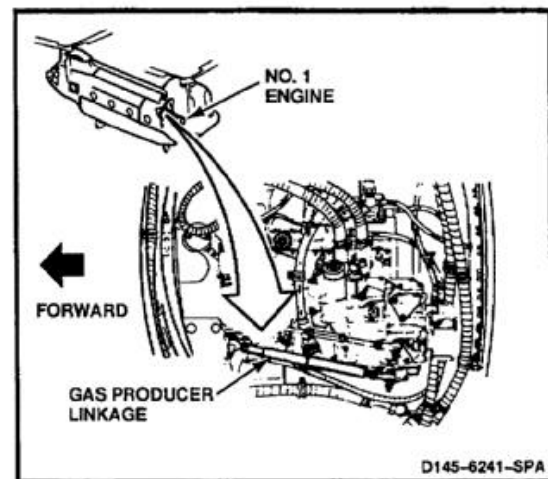
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944**Materials:**

Twine (E433)

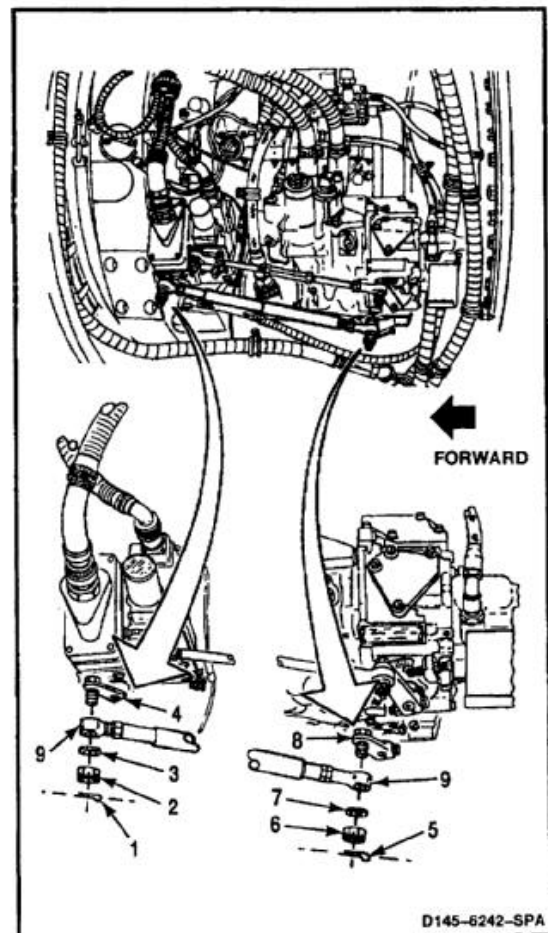
Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)**NOTE**

Procedure is same to remove gas producer linkage from No. 1 or No. 2 engine. No. 1 engine is shown here.

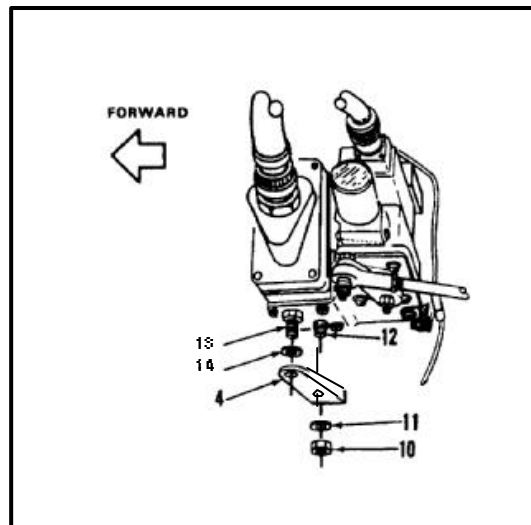
1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



NOTE

If special washers are not bonded to lever at removal, secure them to lever with twine.

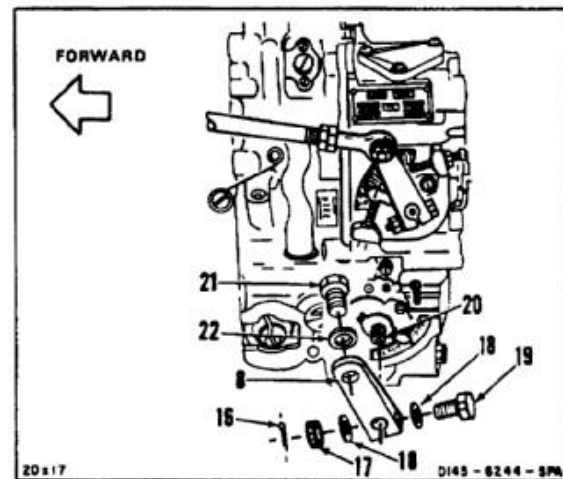
4. Remove nut (10) and washer (11) from actuator shafts (12). Slide and remove lever (4) from shafts. Remove bolts (13) and washer (14) from lever.



5. Remove cotter pin (16), nut (17), two washers (18), and bolt (19). Slide and remove lever (8) from shaft (20). Remove bolt (21) and washer (22) from lever.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds

Materials:

Lockwire (E230)

Parts:

Cotter Pins

Personnel Required:

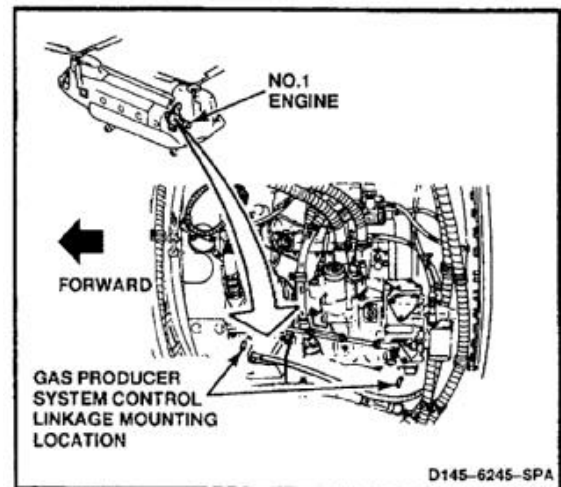
Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

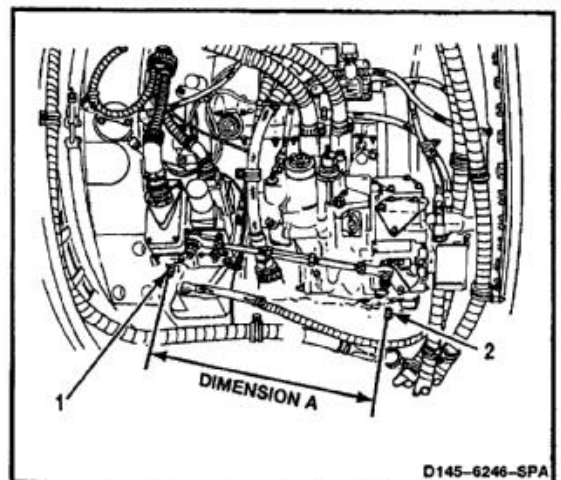
DC Power On (Task 1-37)

**NOTE**

Procedure is same to install and rig gas producer system control linkage on No. 1 or No. 2 engine. Installation and rigging on No. 1 engine is shown here.

Check that control link 114P2035-19 is used. Otherwise, the fault indicator light on the master caution panel may give a false indication during operation.

1. Measure dimension A between actuator shaft (1) and fuel control shaft (2).



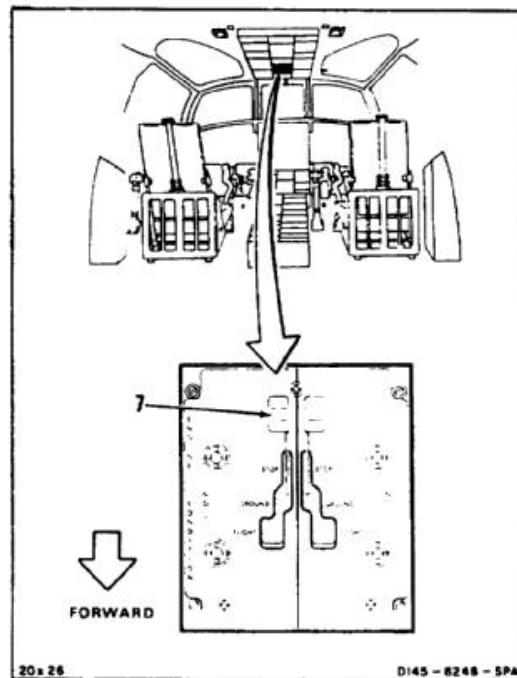
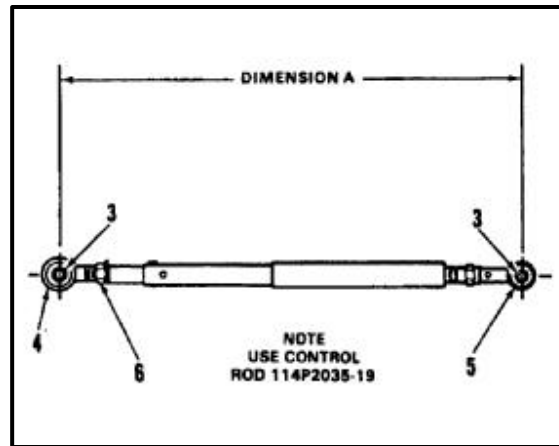
2. Measure distance between centers of holes (3) in rod end bearings (4 and 5). If length is same as dimension A found in step 1, go to step 3. If not, do the following:
 - a. Remove lockwire and loosen nut (6).
 - b. Rotate rod end bearing (4) until distance between centers of holes (3) is same as dimension A.
 - c. Make sure rod ends (4 and 5) are aligned.
 - d. Tighten nut (6).

NOTE

Nominal distance between centers of holes in rod ends is **13.16 to 13.28 inches**.

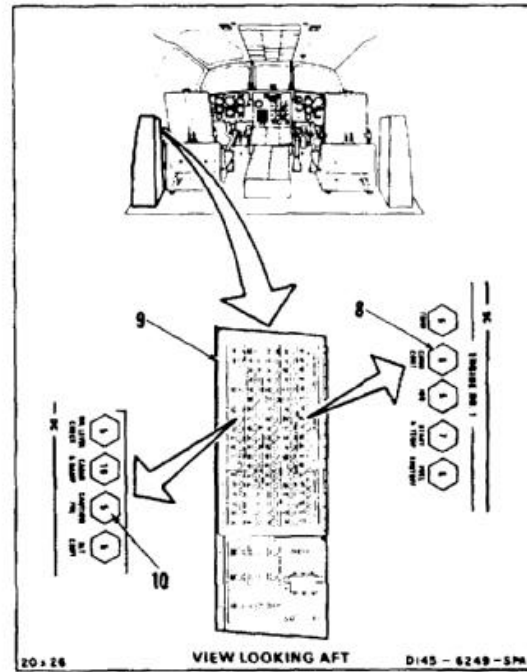
Do not lockwire nut at this time.

3. Make sure No.1 ENG COND lever (7) is at STOP.

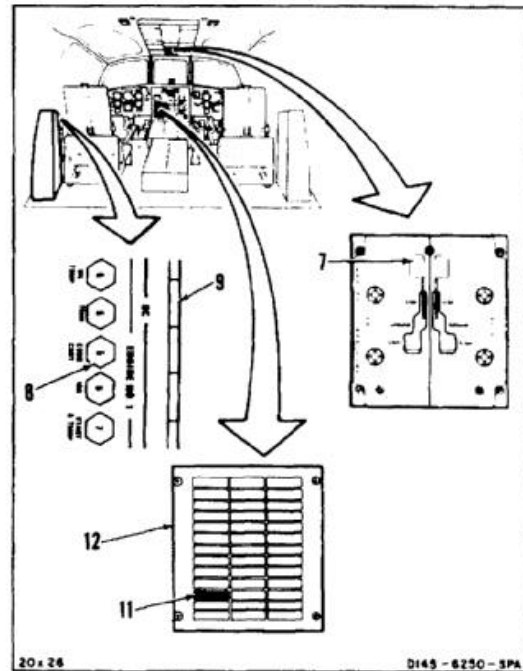


4-113 INSTALL AND RIG GAS PRODUCER CONTROL LINKAGE (Continued)

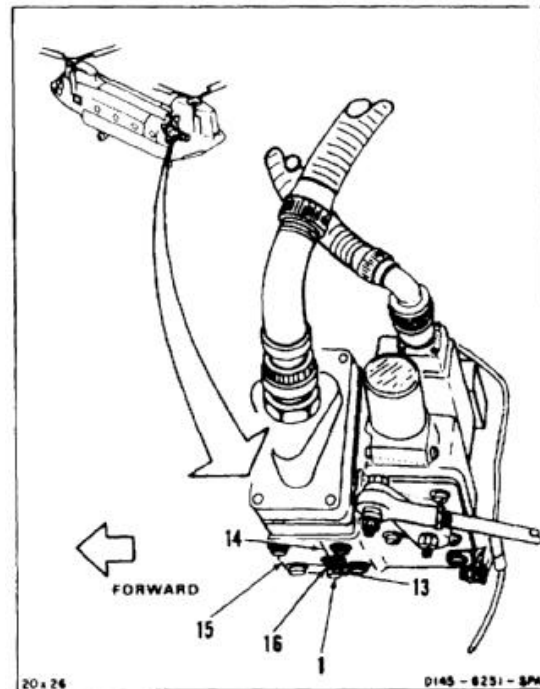
4. Make sure No. 1 ENG COND CONT circuit breaker (8) on No. 1 power distribution panel (9) is closed.
5. Make sure CAUTION PNL circuit breaker (10) on No. 1 power distribution panel (9) is closed.



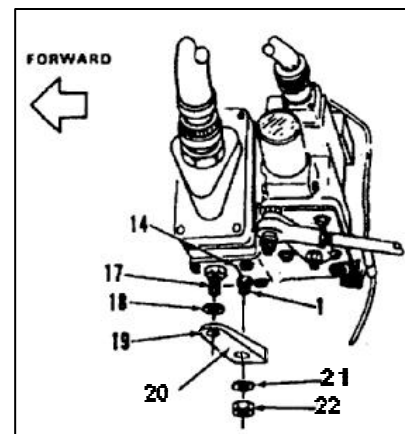
6. Set lever (7) to GROUND.
7. Set lever (7) to FLIGHT.
8. Set lever (7) to GROUND.
9. Wait for ENG N1 COND light capsule (11) on master caution panel (12) to go out.
10. Open No. 1 ENG COND CONT circuit breaker (8) on No. 1 power distribution panel (9).



11. Check index mark (13) on actuator shaft (1). Index mark shall align with index mark (14) on bracket (15) within **one tooth** on spline (16).

INSPECT

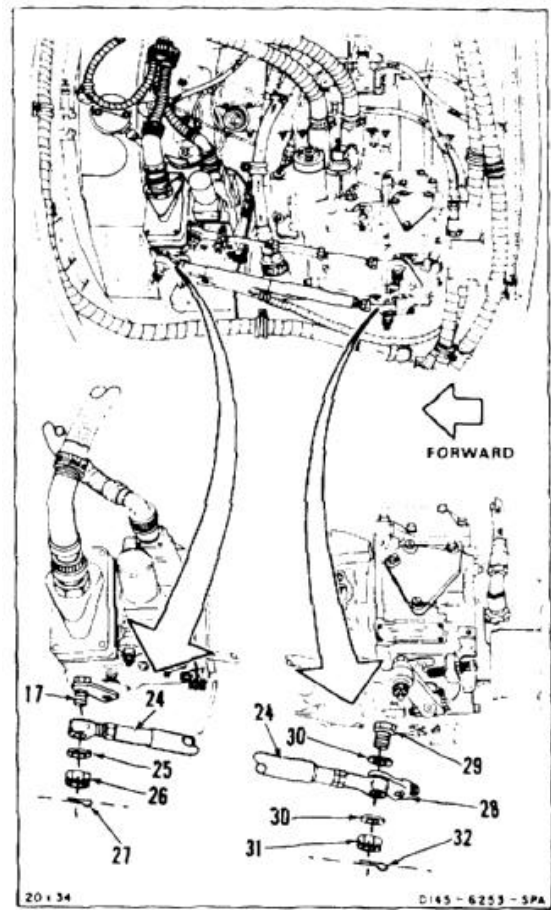
12. Install bolt (17) and washer (18) in lever (19).
13. Slide lever (19) on shaft (1). Index mark (20) on lever shall align with index mark (14).
14. Install washer (21) and nut (22) on shaft (1). Torque nut to **35 inch-pounds**.



15. Position rod (24) on bolt (17). Install washer (25) and nut (26). Torque nut to **30 to 60 inch-pounds**. Install cotter pin (27).

INSPECT

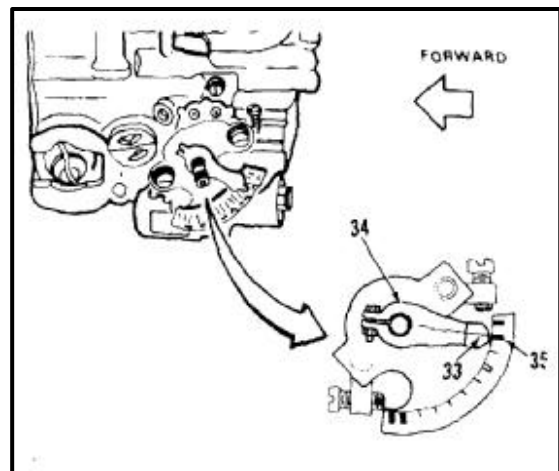
16. Position lever (28) behind rod (24). Install bolt (29), two washers (30), and nut (31). Torque nut to **30 to 60 inch-pounds**. Install cotter pin (32).



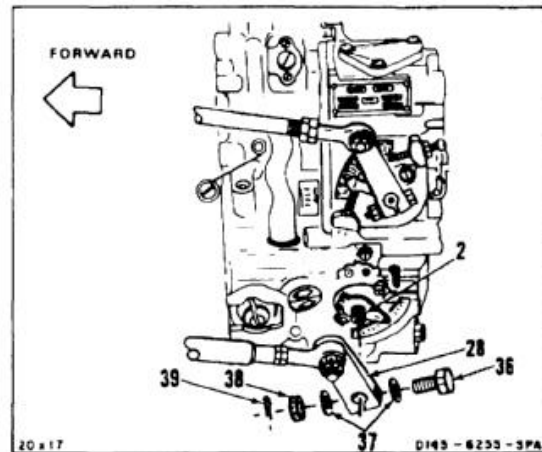
NOTE

Control linkage is omitted for clarity.

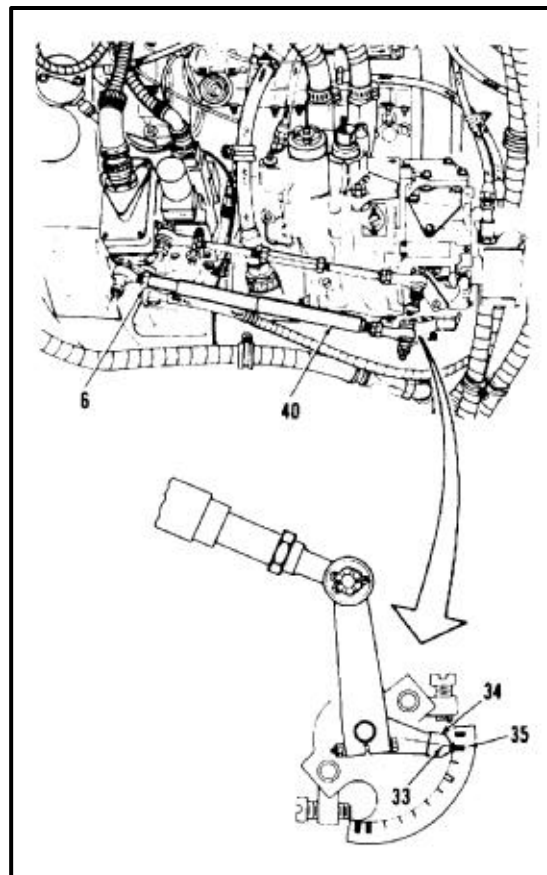
17. Align index mark (33) on fuel control pointer (34) with center of G1 band (35).



18. Slide lever (28) on shaft (2). Install bolt (36), two washers (37), nut (38), and cotter pin (39).



19. Make sure index mark (33) on pointer (34) is centered on GI band (35). If it is not, do the following:
- Loosen nut (6).
 - Rotate cylinder (40) until index mark (33) on pointer (34) is centered on GI band (35).
 - Tighten nut (6).
20. Lockwire nut (6).



INSPECT

FOLLOW-ON MAINTENANCE:

- Perform operational check of gas producer system (TM 55-1520-240-T).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).
 DC power off (Task 1-37).

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

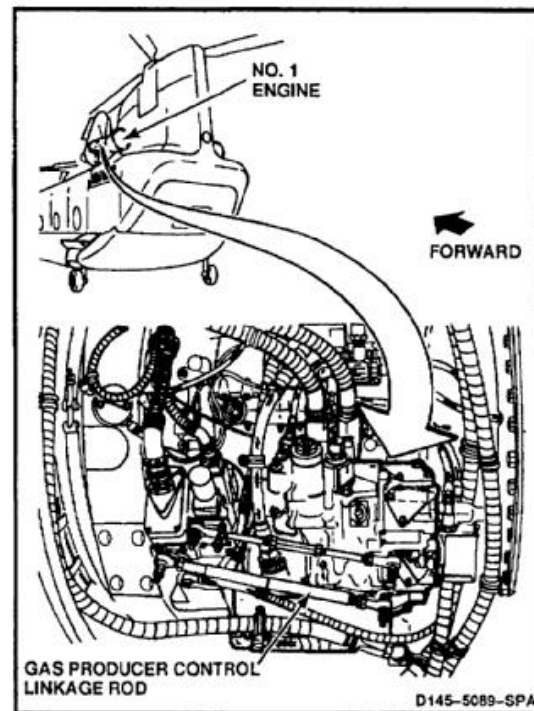
None

Personnel Required:

Aircraft Powerplant Repairer

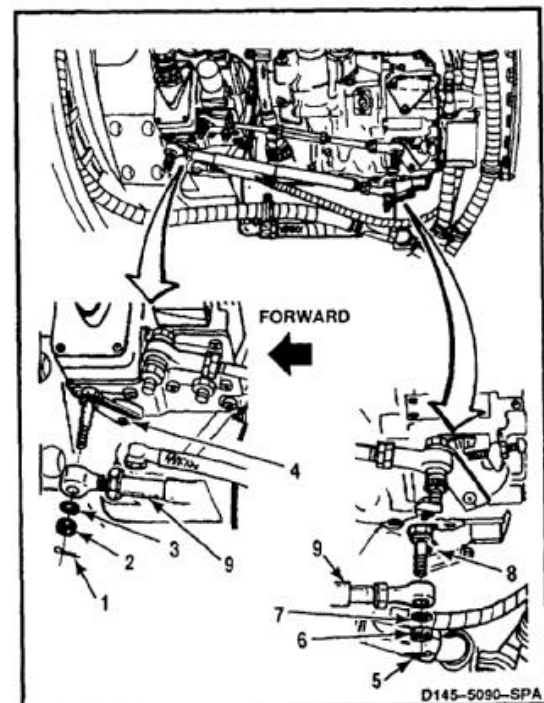
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

**NOTE**

Procedure is same to remove gas producer control linkage rod from No. 1 or No. 2 engine. Removal of No. 1 rod is shown here.

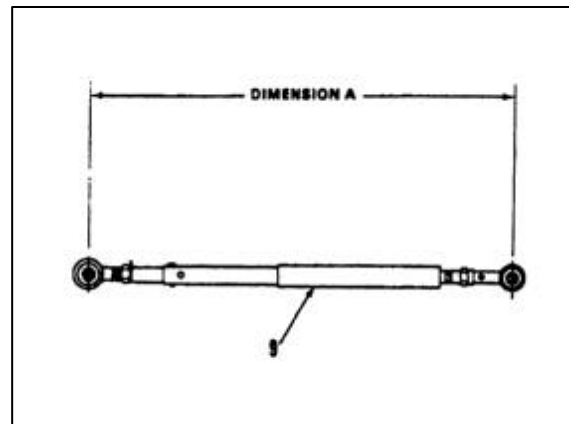
1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



4. Measure and record dimension A on rod (9).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-406

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Dial Indicator
 Dial Indicating Scale, 0 to 50 Pounds
 Vise

Materials:

None

Personnel Required:

Inspector

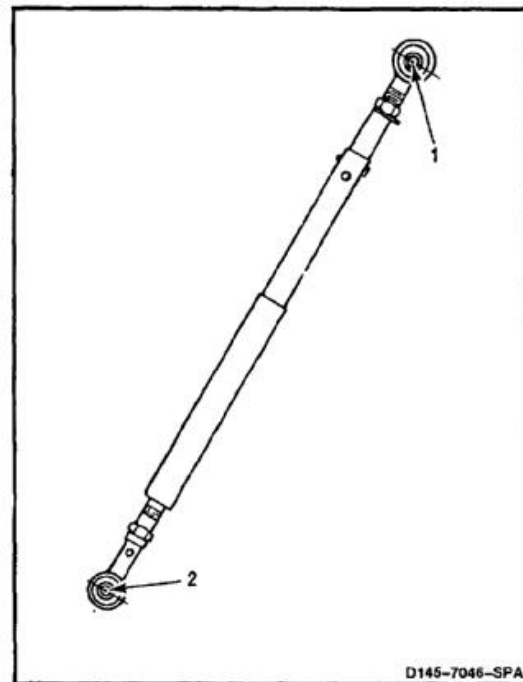
Equipment Condition:

Off Helicopter Task

1. Apply **5 to 15 pound** load to bearing (1) in radial direction.
2. Apply **5 to 15 pound** load to bearing (1) in opposite direction.
3. Measure radial play of bearing (1). Radial play shall not be more than **0.005 inch**.
4. Repeat steps 1 thru 3 three times. Rotate bearing (1) to a different position each time.
5. Repeat steps 1 thru 4 on bearing (2).
6. Apply **5 to 15 pound** load to bearing (1) in an axial direction.
7. Apply **5 to 15 pound** load to bearing (1) in opposite direction.
8. Measure axial play of bearing (1). Axial play shall not be more than **0.025 inch**.
9. Repeat steps 6 thru 8 to bearing (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Measuring Tape

Materials:

Antiseize Compound (E75)

Parts:

Rod Ends (2)

Personnel Required:

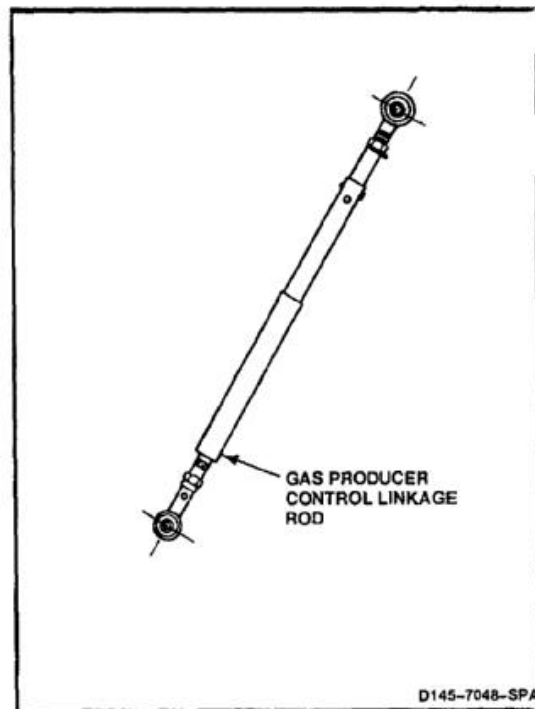
Aircraft Powerplant Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

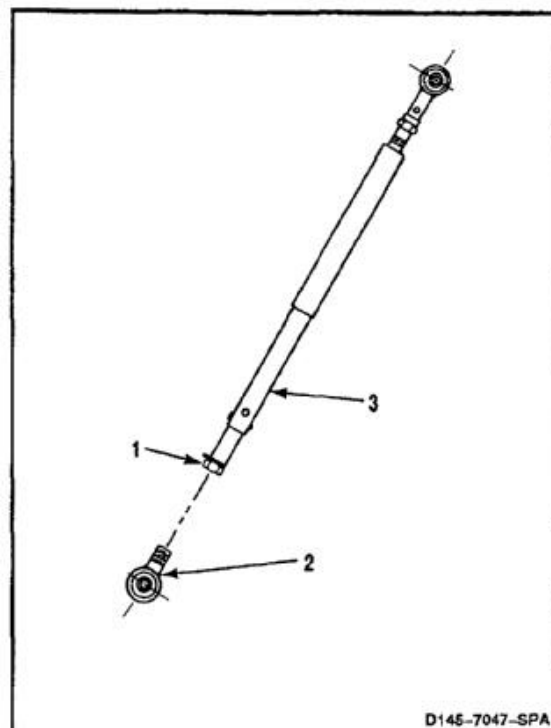
Off Helicopter Task



1. Remove lockwire from nut (1).
2. Loosen nut (1).
3. Remove rod end (2) from rod (3).
4. Coat thread of replacement rod end (2) with antiseize compound (E75).
5. Install rod end (2) in rod (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-408

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Aircraft Maintenance Tool Kit, NSN 5180-00-323-4944
- Torque Wrench, 30-150 Inch-Pounds
- Measuring Tape

Materials:

Lockwire (E229)

Parts:

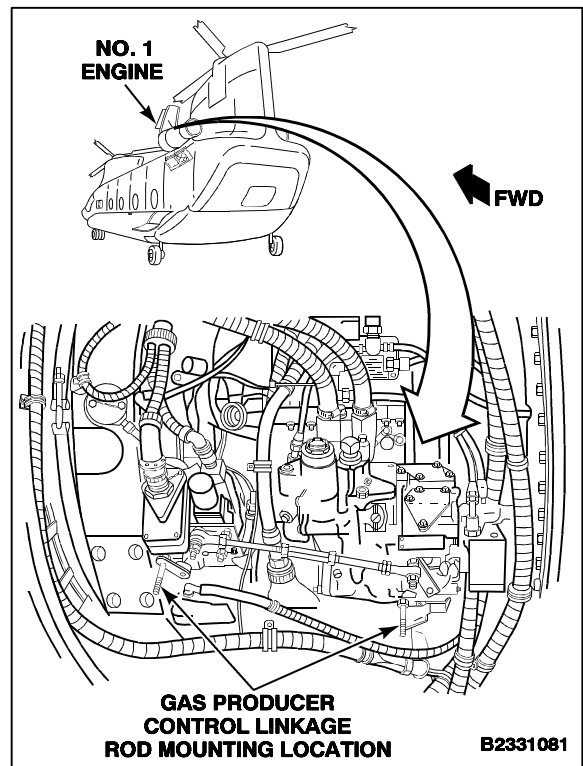
Cotter Pins

Personnel Required:

- Aircraft Powerplant Repairer (2)
- Inspector

References:

TM 55-1520-240-23P



NOTE

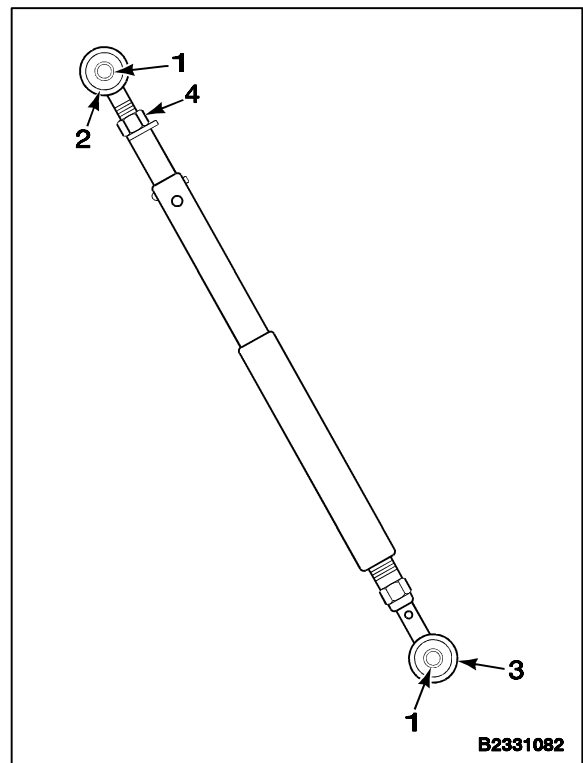
Procedure is same to install gas producer control linkage rod on No. 1 or No. 2 engine. Installation of No. 1 rod is shown here.

1. Measure distance between centers of holes (1) in rod ends (2 and 3). If length is same as dimension "A" found in removal, go to step 2. If length is not same, do the following:
 - a. Loosen nut (4).
 - b. Rotate rod end (2) until distance between centers of holes (1) in rod ends (2 and 3) is same as dimension "A".
 - c. Make sure rod ends (2 and 3) are aligned.
 - d. Tighten nut (4).

NOTE

Nominal distance between centers of holes in rod ends is **13.16 to 13.28 inches**.

Do not lockwire nut at this time.



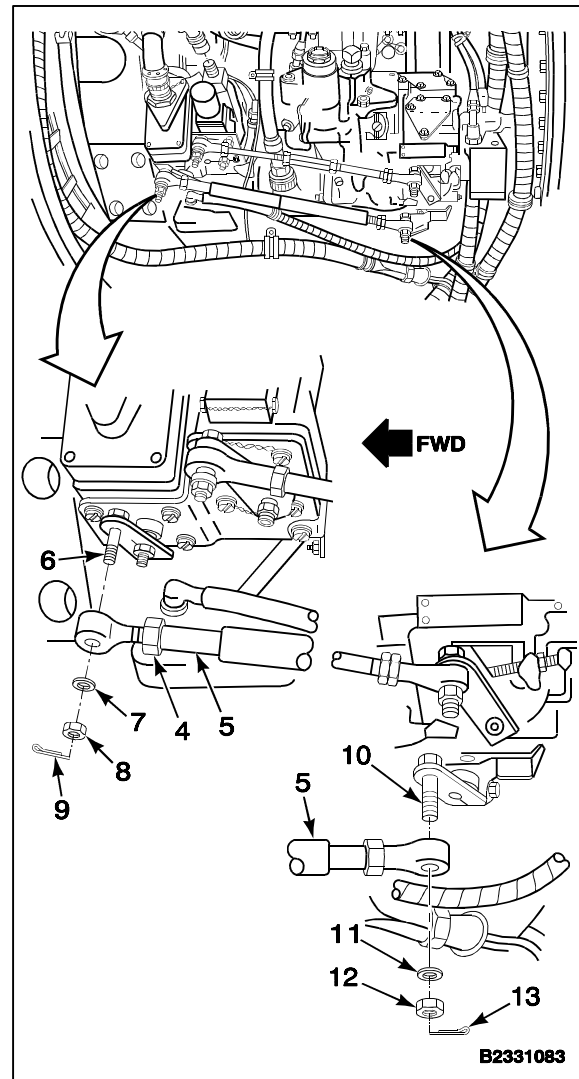
NOTE

To determine if washers are required at the two locations, the bearing width is to be measured. If the bearing width measures **0.437 inch**, a washer is required under both head and nut, an additional washer may be required under the nut for stack-up purposes. If the bearing width measures **0.593 inch**, no washer is required under the head. However, a washer may be required under the nut for stack-up purposes.

2. Position rod (5) on bolt (6). Make sure end with nut (4) on rod is forward. Install washer (7) and nut (8). Torque nut to **30-60 inch-pounds**. Install cotter pin (9).

INSPECT

3. Position rod (5) on bolt (10). Install washer (11) and nut (12). Torque nut to **30-60 inch-pounds**. Install cotter pin (13).

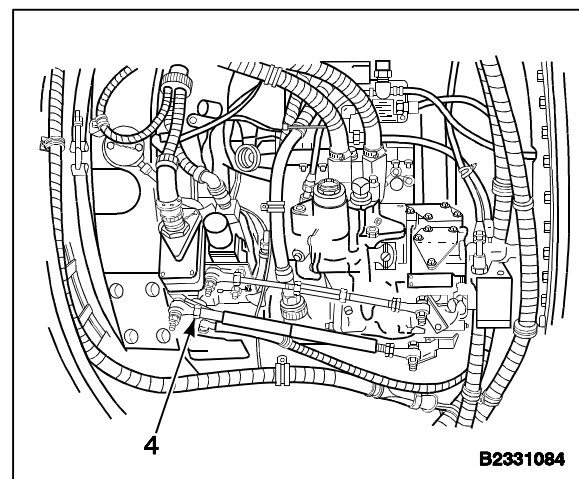


4. Lockwire nut (4). Use lockwire (E229).

INSPECT

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).



END OF TASK

4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS

4-118

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
 Torque Wrench, 5 to 50 Inch-Pounds
 Thrust Pallet Rigging Pin (T133)
 Multimeter

Materials:

None

Personnel Required:

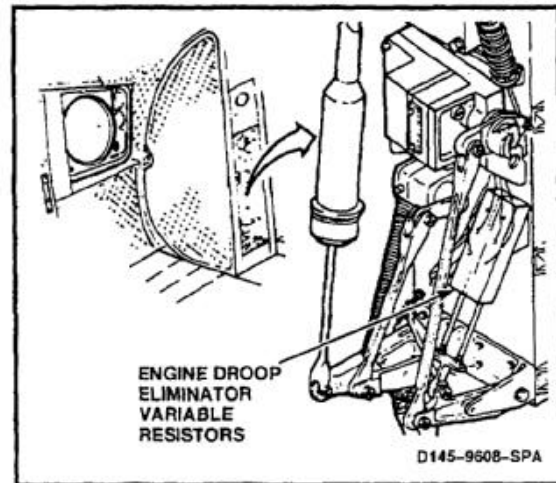
Aircraft Electrician
 Army Rotary-Wing Aviator (2)
 Inspector

References:

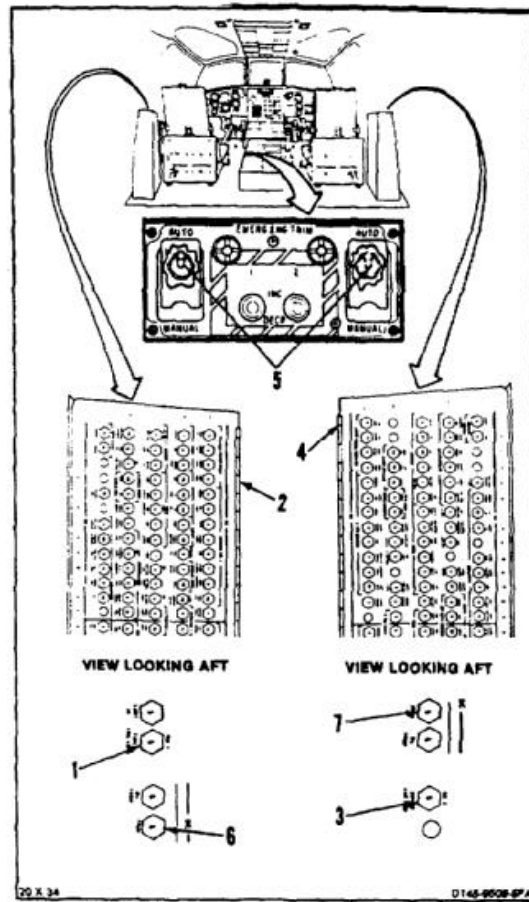
TM 55-1520-240-MTF

Equipment Condition:

Battery Connected (Task 1-39)
 Electrical Power On
 Hydraulic Power On
 Adjust Engine Condition Control Resistors (Task 4-129)
 Controls Closet Acoustic Blanket Removed (Task 2-107)
 Controls Closet Panel Removed (Task 2-2)
 Rig Power Turbine Control Linkage (Task 4-140)



1. Open No. 1 EMERG ENG TRIM circuit breaker (1) on No. 1 power distribution panel (2).
2. Open No. 2 EMERG ENG TRIM circuit breaker (3) on No. 2 power distribution panel (4).
3. Set two switches (5) to MANUAL.
4. Open DC TRIM circuit breaker (6) on No. 1 power distribution panel (2).
5. Open DC TRIM circuit breaker (7) on No. 2 power distribution panel (4).

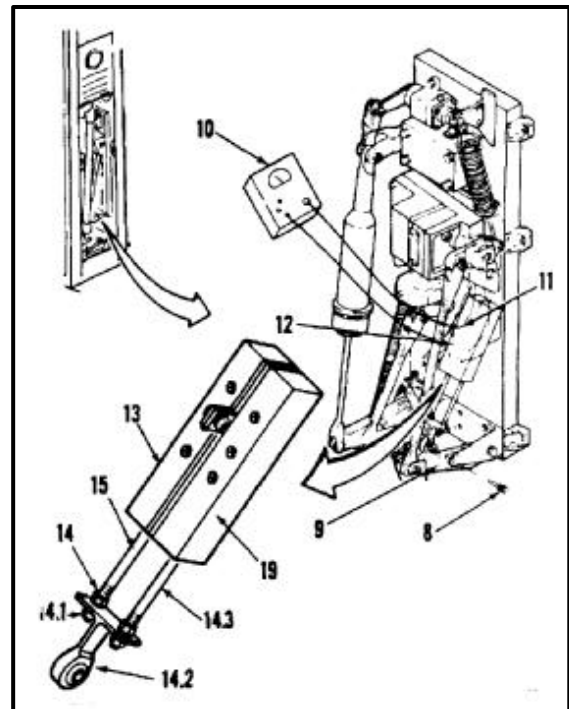


RIG VARIABLE RESISTORS**NOTE**

Adjustments for the No. 1 and the No. 2 resistors are the same. The No. 1 resistor is described.

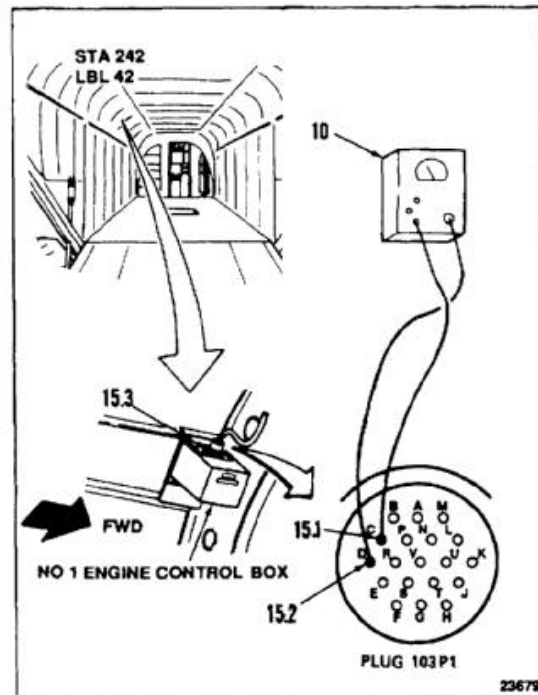
Steps 12.1 thru 12.10 describes the preferred method of rigging the variable resistor because it checks the active portion of the circuit and the wiring from the resistor to the control box. This has been added as an option to steps 6 thru 12 which checks only the inactive portion of the variable resistor.

6. Install rig pin (T133) (8) in thrust control idler (9).
7. Connect multimeter (10) to terminals 1 (11) and 2 (12) on No. 1 potentiometer (13).
8. Check multimeter (10). If multimeter reads **31 to 35 ohms**, go to step 13. If not, go to step 9.
9. Loosen one nut (14) above and one nut (14.1) below the link assembly on No. 1 potentiometer shaft (15).
10. Adjust shaft until multimeter reads **31 to 35 ohms**. If multimeter reads **31 to 35 ohms**, go to step 10.2. If not, go to step 10.1.
- 10.1. Check nuts for thread protrusion. If all threads of nuts are not engaged, replace engine droop eliminator potentiometer (13 and 19) (Task 4-119 and 4-122).
- 10.2. Make sure link assembly (14.2) is parallel to resistor shafts (15 and 14.3).
- 10.3. Tighten one nut (14) above and one nut (14.1) below the link assembly (14.2). Apply Loctite to one nut (14). Torque nuts to **25 inch-pounds**.
11. Disconnect multimeter (10) from terminals 1 (11) and 2 (12). Go to step 13.
12. Repeat steps 6 thru 11 for the No. 2 potentiometer (19).

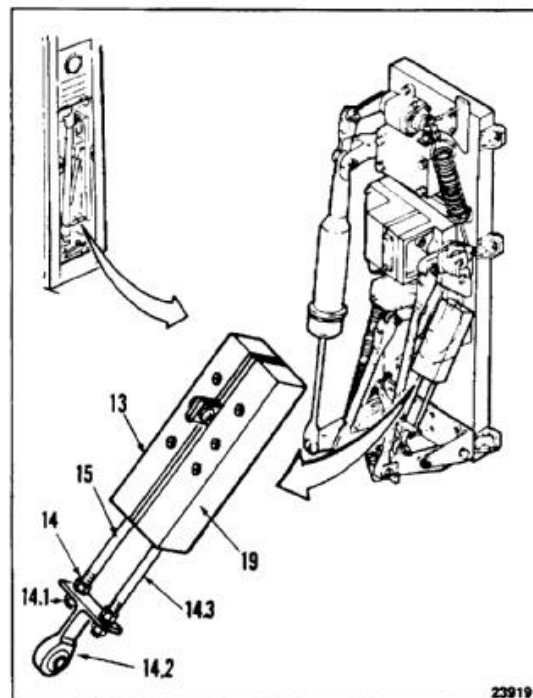


RIG VARIABLE RESISTORS (OPTIONAL METHOD)

- 12.1. Install rig pin (T133) in thrust control idler (step 6).
- 12.2. Connect multimeter (10) to pins C (15.1) and D (15.2) on plug 103P1 (15.3) of the No. 1 engine control box.
- 12.3. Check multimeter (10). If multimeter reads **92 to 96 ohms**, go to step 13. If not, go to step 12.4.



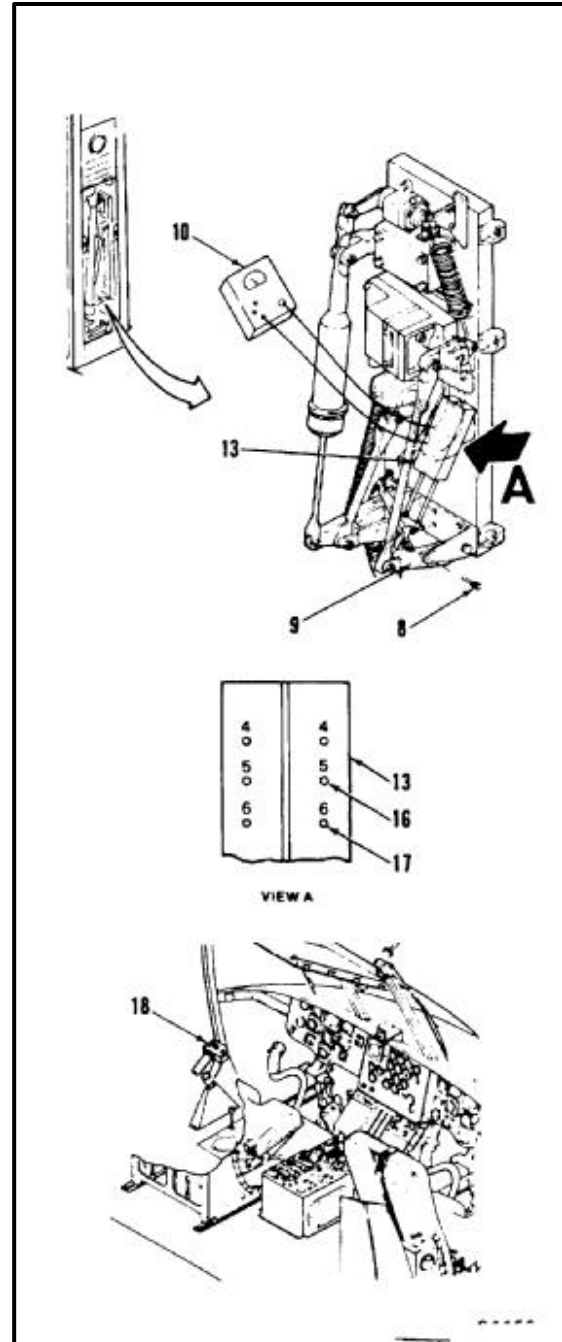
- 12.4. Loosen one nut (14) above and one nut (14.1) below the link assembly on the No. 1 potentiometer shaft (15).
- 12.5. Adjust shaft until multimeter reads **92 to 96 ohms**. If multimeter reads **92 to 96 ohms**, go to step 12.7. If not, go to step 12.6.
- 12.6. Check nuts for thread protrusion. If all threads of nuts are not engaged, replace engine droop eliminator potentiometers (13 and 19) (Tasks 4-119 and 4-122).
- 12.7. Make sure link (14.2) is parallel to resistor shafts (15 and 14.3).
- 12.8. Tighten one nut (14) above and one nut (14.1) below the link assembly. Torque nuts to **25 inch-pounds**. Apply Loctite to one nut (14).
- 12.9. Disconnect multimeter from pins C and D. Go to step 13.
- 12.10. Repeat steps 12.1 thru 12.9 for the No. 2 engine control box. The No. 2 control box is located in the right electrical equipment compartment then go to step 13.



4-118 ADJUST ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

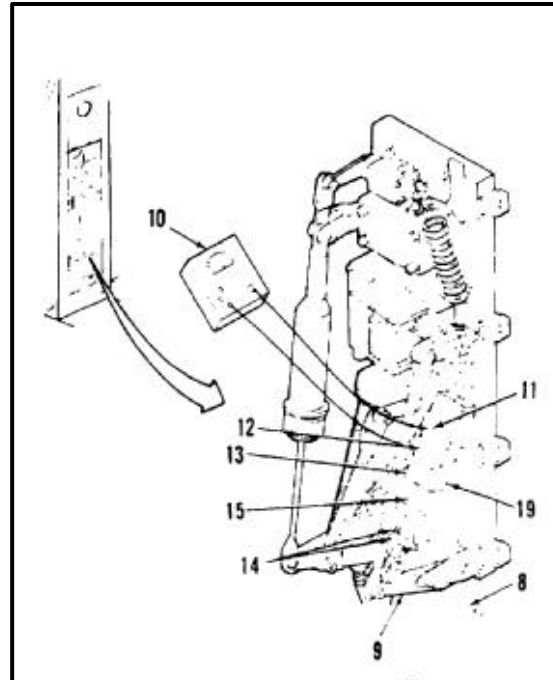
4-118

13. Connect multimeter (10) to terminals 5 (16) and 6 (17) on No. 1 resistor (13).
14. Remove rigging pin (8) from thrust control idler (9).
15. Set thrust control (18) to ground detent.
16. Check multimeter (10). Multimeter shall read **133 to 147 ohms**. Disconnect multimeter. Set thrust control (18) to neutral.



ADJUST RESISTORS FOR EXCESSIVE ROTOR RPM

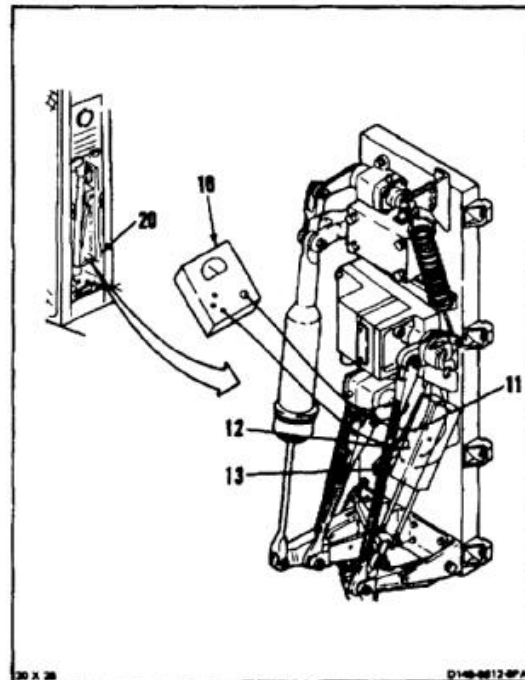
17. Have pilot perform Droop Eliminator Flight Check (TM 55-1520-240-MTF). If rotor rpm is **98 to 100 percent**, go to step 29. If not, go to step 18.
18. Record rotor rpm percent. Subtract rpm percent from 100 if rpm is **97 percent** or less. Subtract 100 from rotor rpm percent if rpm is greater than **100 percent**. Multiply result by 10. Record number.
- 18.1. Install rig pin (T133) (8) in thrust control idler (9).
19. Connect multimeter (10), set to RX1, to terminals 1 (11) and 2 (12) on No. 1 resistor (13). Record reading.
20. Add number recorded in step 18 to reading recorded in step 19 if rotor rpm is **97 percent** or lower. Subtract number found in step 18 from reading found in step 19 if rotor rpm is greater than **100 percent**.
21. Loosen four nuts (14) on resistor shaft (15).
22. Adjust shaft (15) until multimeter (10) reads number of ohms equal to number found in step 20.
23. Tighten four nuts (14) on shaft (15). Torque nuts to **25 inch-pounds**.
24. Check multimeter (10). If multimeter reads amount recorded in step 20, go to step 25. If not, repeat steps 21 thru 24.
25. Disconnect multimeter (10).
26. Repeat steps 19 thru 24 on No. 2 resistor (19).
- 26.1. Remove rig pin (T133) (8) from thrust control idler (9).



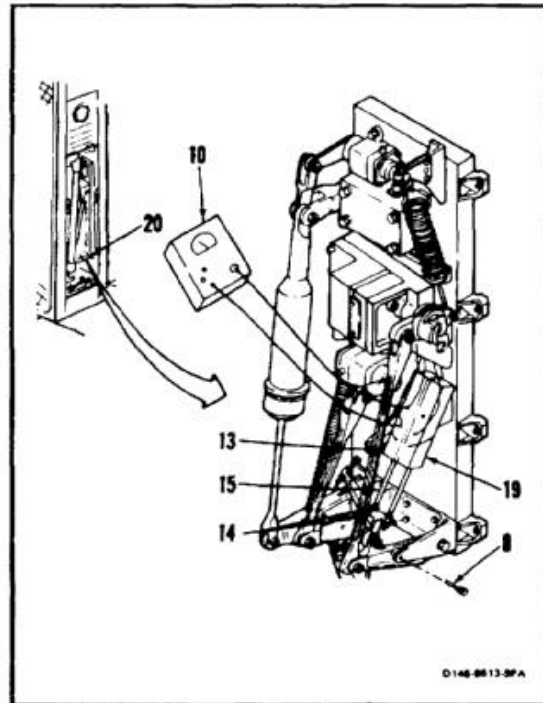
27. Have pilot move thrust control through entire range. There shall be no interference in resistor installation (20) movement or thrust control movement.
28. Have pilot perform Droop Eliminator Flight Check (TM 55-1 520-240-MTF). Maximum steady state change in rotor rpm shall be **0 to -1 percent**. If rotor RPM is out of limits, repeat steps 18 thru 28. Maximum torque split between No. 1 and No. 2 engines shall not exceed **6 percent**. If torque split is out of limits, go to step 29. If rpm and torque are in limits, go to Follow-On Maintenance.

ADJUST RESISTORS FOR EXCESSIVE ENGINE TORQUE SPLIT

29. Record difference between engine torques percentages and multiply by 0.6. Record number.
30. Connect multimeter (10), set to RX1, to terminals 1 (11) and 2 (12) on No. 1 resistor (13). Record reading.



31. If the No. 1 engine had a higher torque reading, subtract the number recorded in step 29 from the result found in step 30. If the No. 1 engine had a lower torque reading, add the result found in step 29 to the result found in step 30.
32. Loosen four nuts (14) on resistor shaft (15).
33. Adjust resistor shaft (15) until multimeter (10) reads amount of ohms equal to number recorded in step 31.
34. Tighten four nuts (14). Torque four nuts to **25 inch-pounds**.
35. If multimeter (10) reads amount recorded in step 33, go to step 37. If not, repeat steps 32 thru 36.
36. Disconnect multimeter (10) from No. 1 resistor (13).
37. Repeat steps 30 thru 36 on No. 2 resistor (19).
38. Close No. 1 EMERG ENG TRIM circuit breaker (1) on No. 1 power distribution panel (step 1).



39. Close No. 2 EMERG ENG TRIM circuit breaker (3) on No. 2 power distribution panel (step 2).
40. Close DC TRIM circuit breaker (6) on No. 1 power distribution panel (step 4).
41. Close DC TRIM circuit breaker (7) on No. 2 power distribution panel (step 5).
42. Have pilot move thrust control through entire range. There shall be no interference in resistor installation (20) movement or thrust control movement.
43. Have pilot perform Droop Eliminator Flight Check (TM 55-1520-240-MTF). If difference between engine torque readings is **6 percent** or more, repeat steps 29 thru 43. If not, go to Follow-On Maintenance.

FOLLOW-ON MAINTENANCE:

- Adjust Engine Condition Control Resistor (Task 4-129).
- Electrical power off.
- Disconnect battery (Task 1-39).
- Hydraulic power off.
- Install controls closet panel (Task 2-2).
- Install controls closet acoustic blanket (Task 2-108).

END OF TASK

4-119 REMOVE ENGINE DROOP ELIMINATOR VARIABLE RESISTORS

4-119

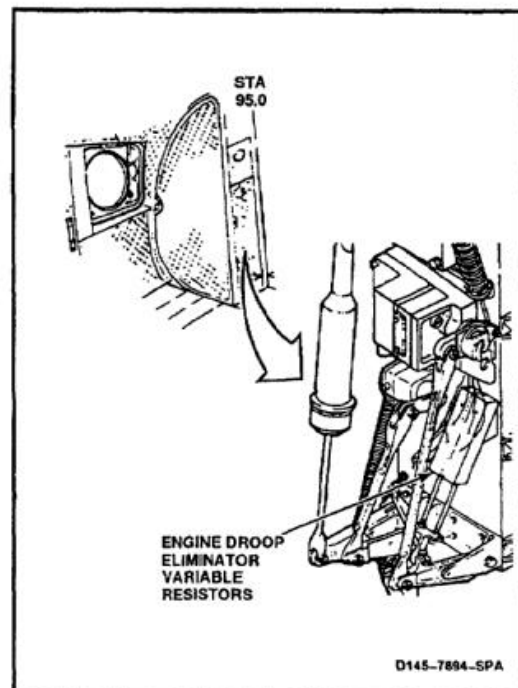
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:Tape (E385)
Paper Tags (E264)**Personnel Required:**

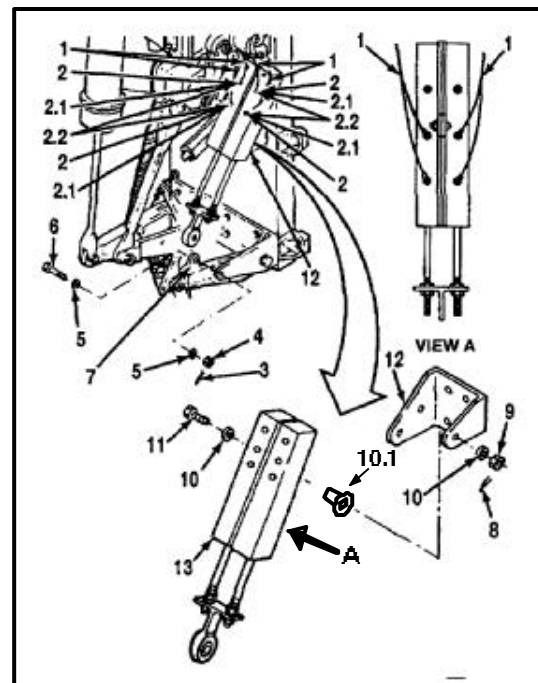
Aircraft Electrician

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Controls Closet Acoustic Blanket Removed (Task 2-101)
Controls Closet Panel Removed (Task 2-2)

1. Tag eight wires (1). Use paper tags (E264).
2. Disconnect eight wires (1) by removing eight screws (2). Remove eight washers (2.1) and eight lockwashers (2.2), if installed. Remove twine from resistors, if installed.
3. Remove cotter pin (3), nut (4), two washers (5), and bolt (6) from idler (7).
4. Remove cotter pin (8), nut (9), two washers (10), bushing (10.1), and bolt (11) from support bracket (12).
5. Remove resistors (13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

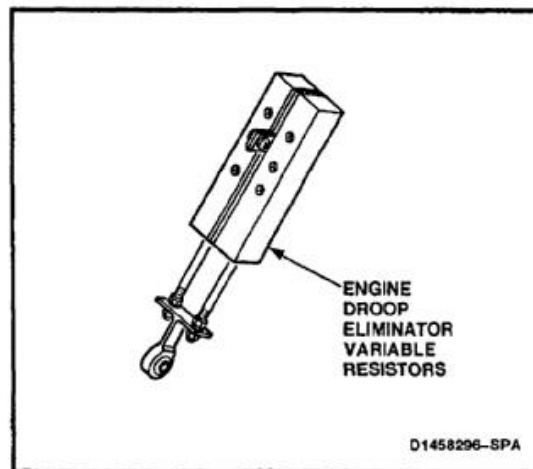
None

Personnel Required:

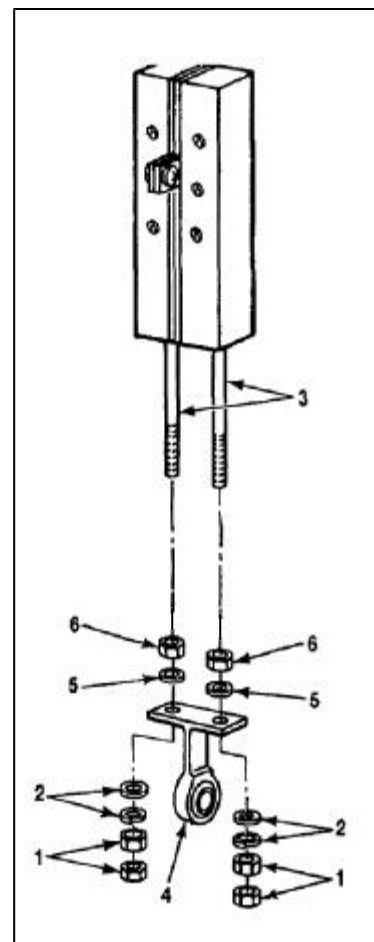
Aircraft Electrician

Equipment Condition:

Off Helicopter Task



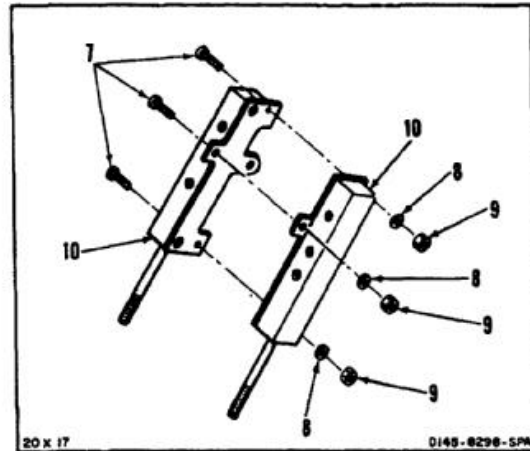
1. Remove two nuts (1) and four washers (2) from resistor shafts (3). Remove link (4).
2. Remove two washers (5) and two nuts (6) from shafts (3).



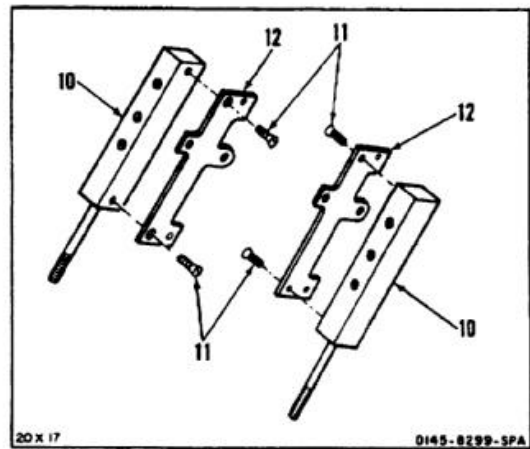
4-120 DISASSEMBLE ENGINE DROOP ELIMINATOR VARIABLE RESISTORS (Continued)

4-120

3. Remove three screws (7), washers (8), and nuts (9). Separate resistors (10).



4. Remove four screws (11). Separate resistors (10) and plates (12).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:

None

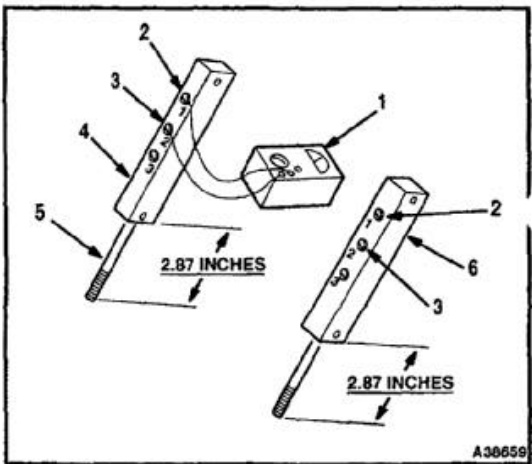
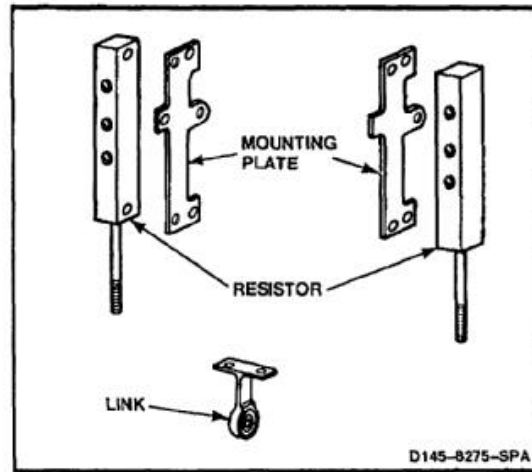
Personnel Required:

Aircraft Electrician
Inspector

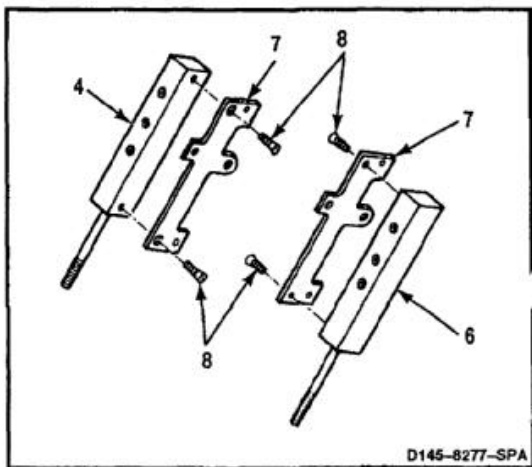
References:

TM 55-1520-240-23P

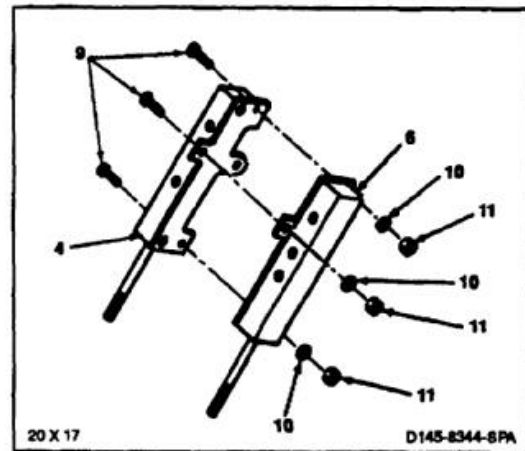
1. Connect multimeter (1) to terminals 1 (2) and 2 (3) on resistor (4). Set multimeter to RX1. Extend shaft (5) to **2.87 inches**. Multimeter shall indicate **58 to 62 ohms**.
2. Repeat step 1 on resistor (6).



3. Position two resistors (4 and 6) on two plates (7). Secure two resistors to two plates with four screws (8).



4. Position two resistors (4 and 6) together. Install three screws (9), washers (10), and nut (11).



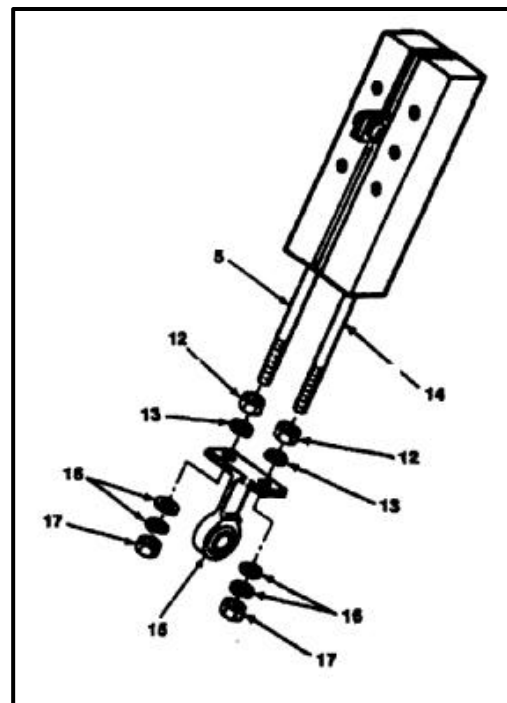
5. Install two nuts (12) and two washers (13) on resistor shafts (5 and 14).
6. Position link (15) on shafts (5 and 14). Install four washers (16) and two nuts (17) on resistor shafts (5 and 14).

NOTE

Do not tighten nuts at this time.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

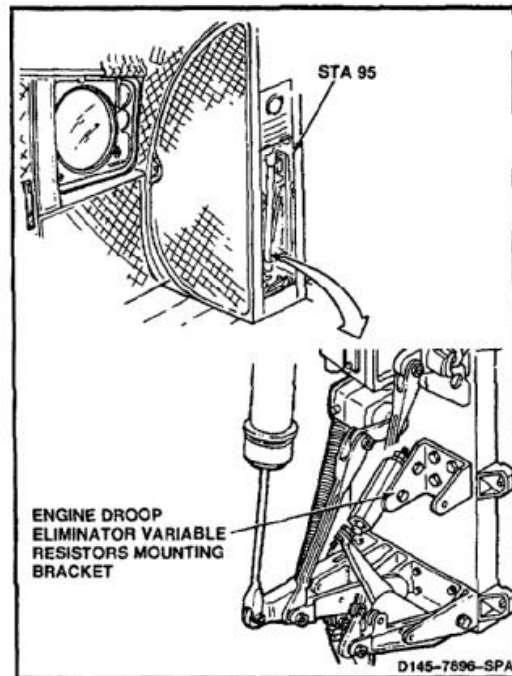
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter**Materials:**

Twine (E433)

Parts:

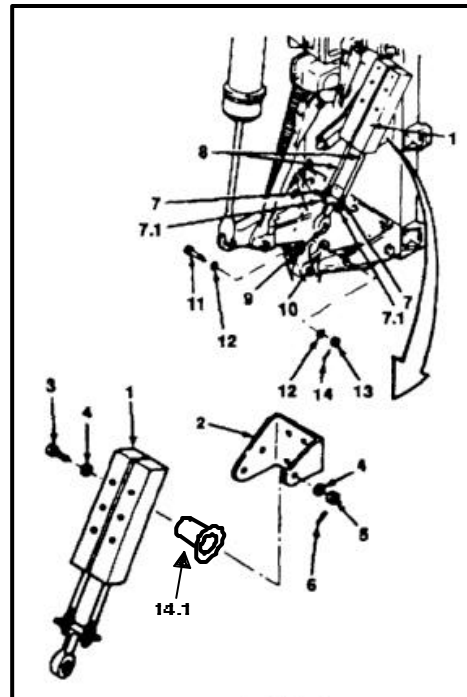
Cotter Pins

Personnel Required:Aircraft Electrician
Inspector**References:**TM 55-1520-240-23P
Task 4-119**Equipment Condition:**Flight Controls Rigged in Neutral Position (Task
11-33)

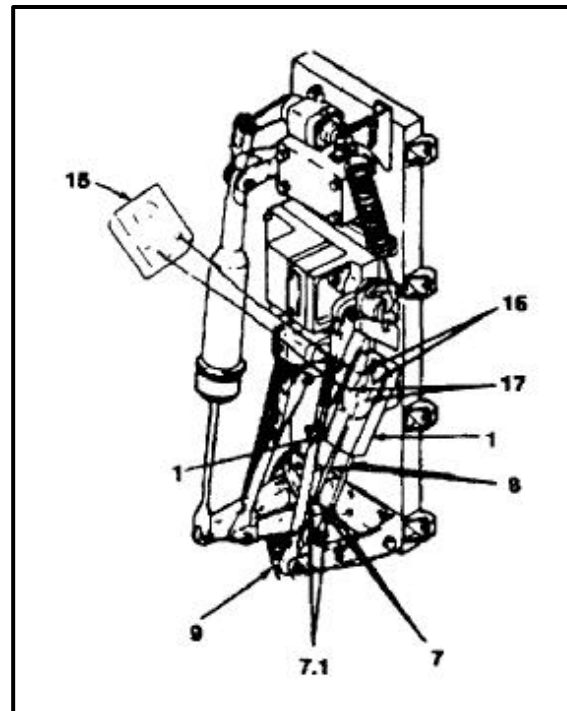
INSTALL VARIABLE RESISTORS**NOTE**

Ensure bushing is installed. Without the bushing installed, unreliable resistor and engine performance will occur.

1. Position resistors (1) on bracket (2). Install bolt (3), two washers (14), bushing (14.1), and nut (5). Install cotter pin (6).
2. Loosen four nuts (7 and 7.1) on resistor shafts (8).
3. Align hole in link (9) with lug of idler (10). Install bolt (11), two washers (12), nut (13), and cotter pin (14).

**RIG VARIABLE RESISTORS**

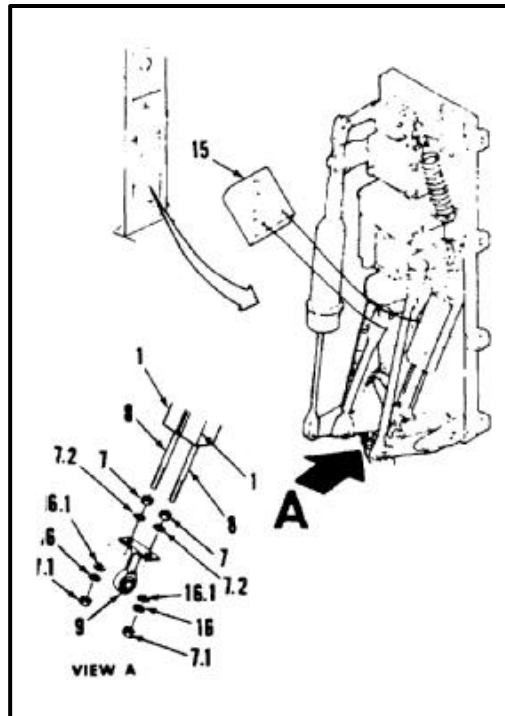
4. Set multimeter (15) to RX1. Connect multimeter to terminals 1 (16) and 2 (17) on resistors (1). Move resistor shafts (8) until multimeter indicates **30 to 35 ohms**. Tighten four nuts (7 and 7.1). Make sure link (9) is parallel with resistor shafts.
5. Check multimeter (15). If multimeter indicates **30 to 35 ohms**, go to step 9. If not, go to step 6.



6. Remove two nuts (7.1) and two washers (16).
7. Adjust shaft (8) until multimeter (15) reads **30 to 35 ohms**.
8. Install two washers (16), two lockwashers (16.1) and two nuts (7.1). Torque nuts to **25 inch-pounds**. Check nuts for thread protrusion. If all threads on nut are not engaged, replace engine droop eliminator variable resistors (1) (Tasks 4-119 and 4-122).
9. Tighten two nuts (7) against link (9). Torque nuts to **25 inch-pounds**. Make sure link (9) is parallel to resistor shafts (8).

NOTE

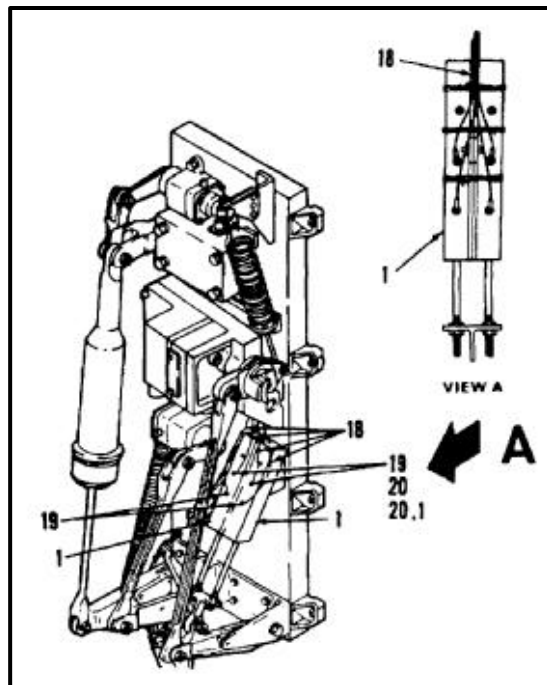
Use the following hardware to connect wiring to resistors: screws MS35275-202, washers AN960C3L, and lockwashers MS35340-39 or equivalent.



10. Remove tape from ends of eight wires (18). Connect eight wires to resistors (1) by installing eight screws (19), eight lock washers (20), and eight washers (20.1). Remove tags from wires.
11. Secure wires (18) to resistors (1). Use twine (E433).

FOLLOW-ON MAINTENANCE:

- Adjust engine droop eliminator variable resistors (Task 4-118).
- Install controls closet panel (Task 2-2).
- Install controls closet acoustic blanket (Task 2-108).



END OF TASK

4-123 REMOVE ENGINE TRIM RELAY

4-123

INITIAL SETUP

Applicable Configurations:

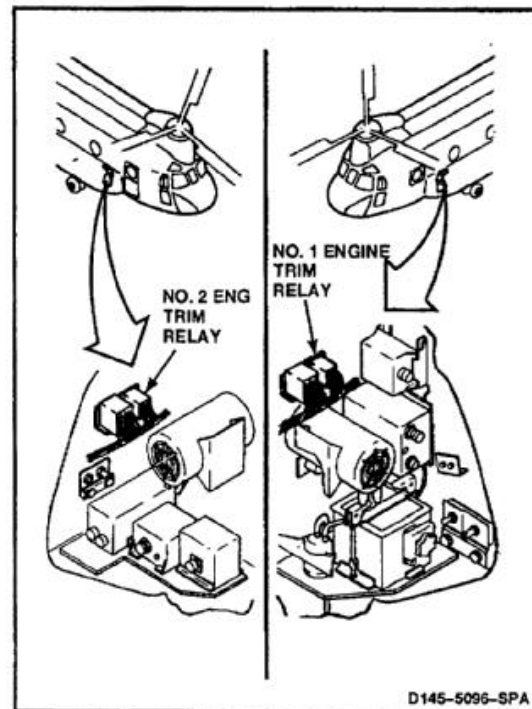
Without 74

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

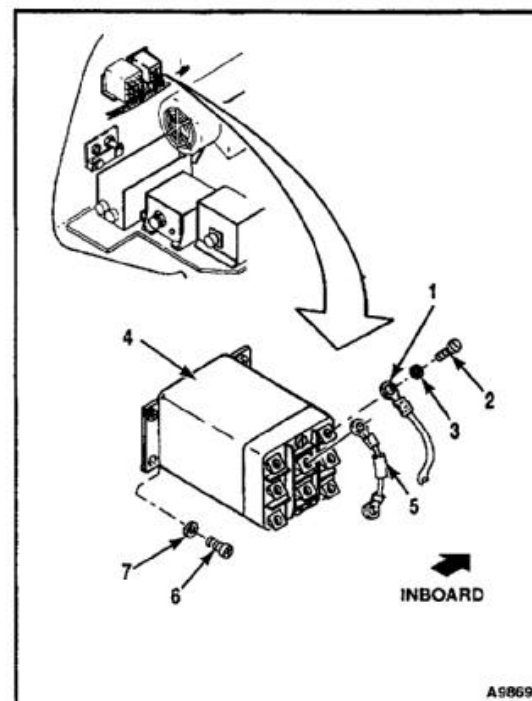
Materials:Paper Tags (E264)
Tape (E385)**Personnel Required:**

Aircraft Electrician Repairer

Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Left or Right Electrical Compartment Access Door
Open (Task 2-2)**NOTE**

Procedure is similar to remove No. 1 or No. 2 engine trim relay. Removal of No. 2 (right) relay is shown here.

1. Tag eight wires (1). Remove eight screws (2) and washers (3) from relay (4). Disconnect eight wires and one diode (5). Tape exposed ends of wires. Use tape (E385).
2. Remove four screws (6) and washers (7).
3. Remove relay (4).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

4-427

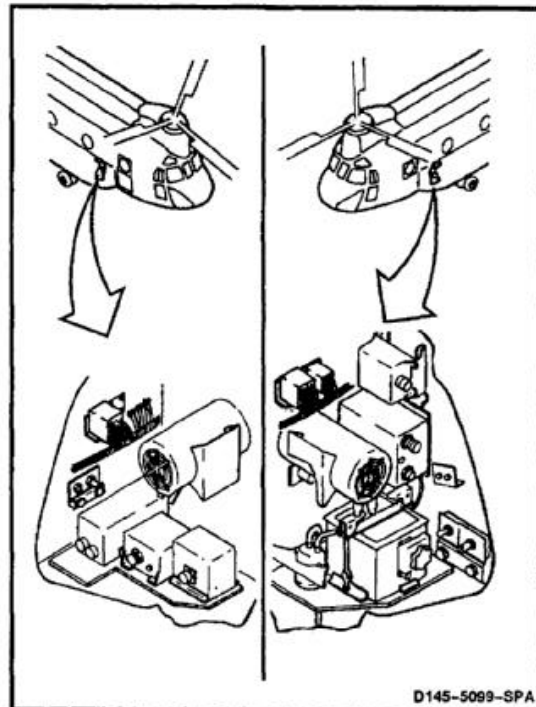
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

None

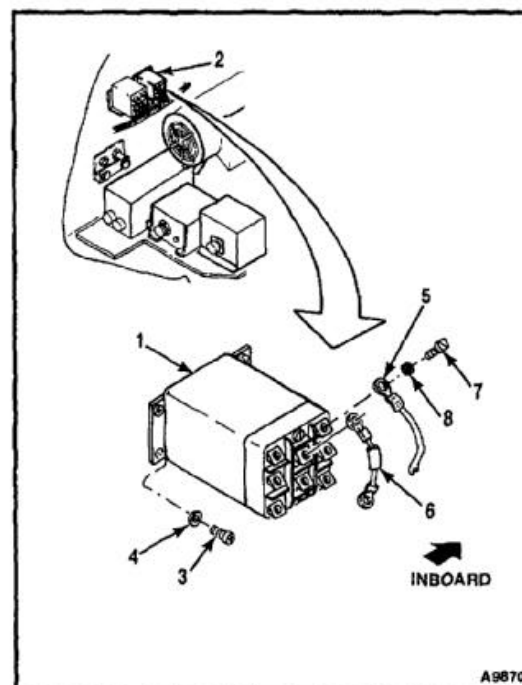
Personnel Required:Aircraft Electrician
Inspector**References:**TM 55-1520-240-23P
TM 55-1520-240-T**NOTE**

Procedure is same to install No. 1 or No. 2 engine trim relays. Installation of No. 2 (right) relay is shown here.

1. Position relay (1) on fuselage (2). Install four screws (3) and washers (4).
2. Remove tape from eight wires (5). Connect eight wires and one diode (6) to relay (1) by installing eight screws (7) and washers (8) (TM 55-1520-240-T). Remove tags.

INSPECT**FOLLOW-ON MAINTENANCE:**

Close left or right electrical compartment access door (Task 2-2).
Perform operational check of power turbine system (TM 55-1520-240-T).



END OF TASK

4-428

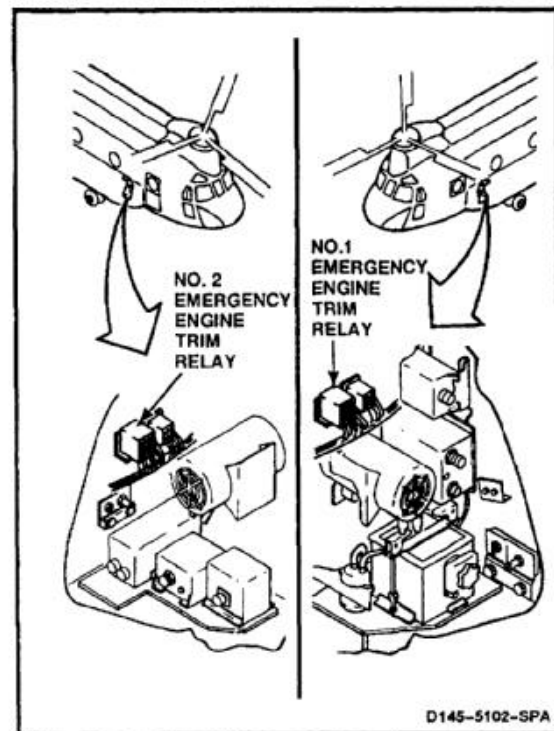
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:Paper Tags (E264)
Tape (E385)**Personnel Required:**

Aircraft Electrician

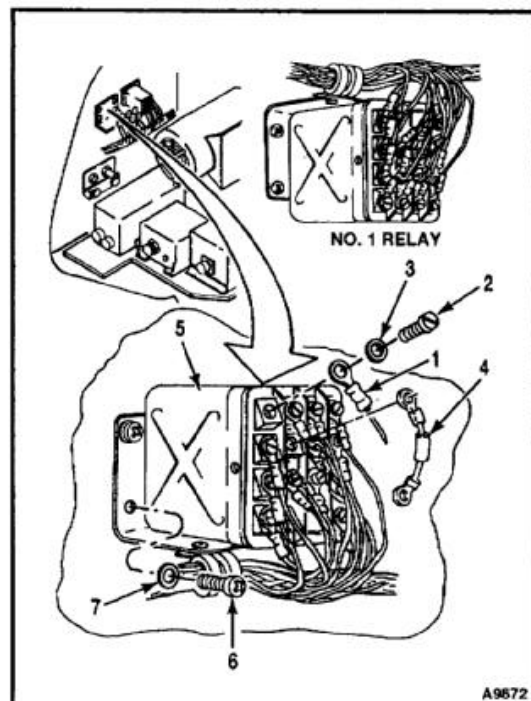
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Left Or Right Side Electrical Compartment Access
Door Open (Task 2-2)**NOTE**

Positioning of No. 1 emergency engine trim relay is **180°** from No. 2 installation. Removal is same for both. Removal of No. 2 (right) relay is shown here.

1. Tag 14 wires (1). Remove 14 screws (2) and washers (3). Disconnect 14 wires and one diode (4) from relay (5). Tape exposed ends of wires. Use tape (E385).
2. Remove four screws (6) and washers (7).
3. Remove relay (5).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

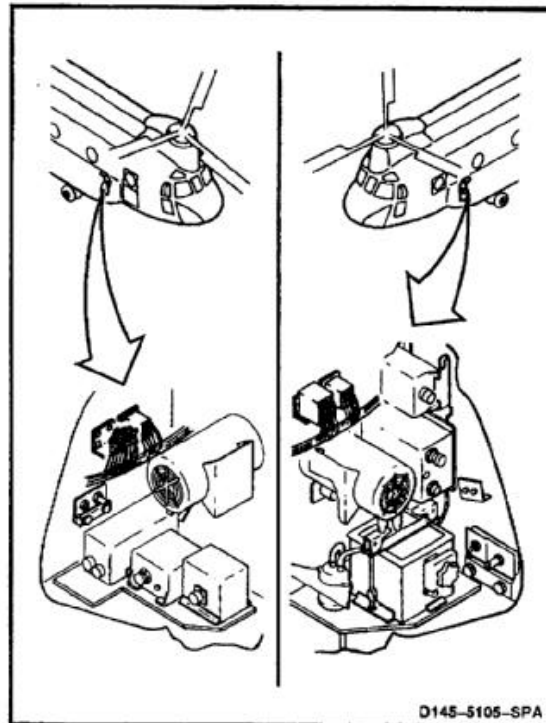
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

None

Personnel Required:Aircraft Electrician
Inspector**References:**TM 55-1520-240-23P
TM 55-1520-240-T**NOTE**

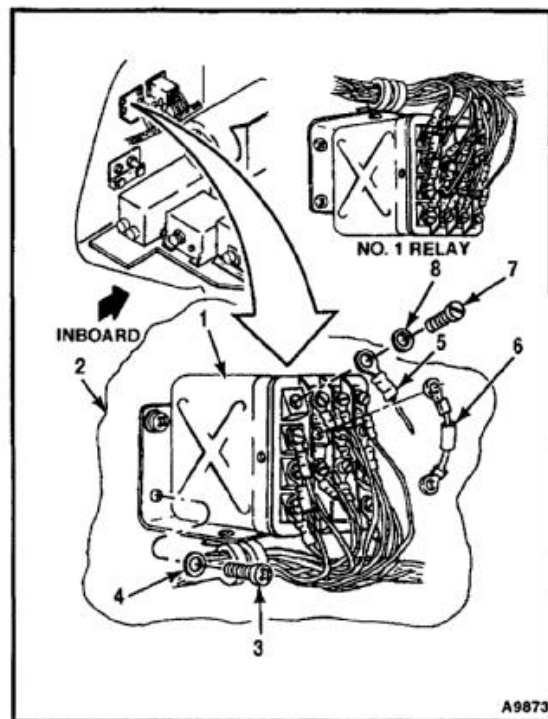
Positioning of No. 1 emergency engine trim relay is **180°** from No. 2 installation. Installation procedure is same for both. Installation of No. 2 (right) relay is shown here.

1. Position relay (1) on fuselage (2). Install four screws (3) and washers (4).
2. Remove tape from 14 wires (5). Connect 14 wires and one diode (6) to relay (1) by installing 14 screws (7) and washers (8) (TM 55-1520-240-T). Remove tags.

INSPECT**FOLLOW-ON MAINTENANCE:**

Close left or right electrical compartment access door (Task 2-2).

Perform operational check of power turbine system (TM 55-1520-240-T).



END OF TASK

4-430

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Aircraft Mechanic's Tool Kit, NSN 51 80-00-323-4692

Materials:

None

Personnel Required:

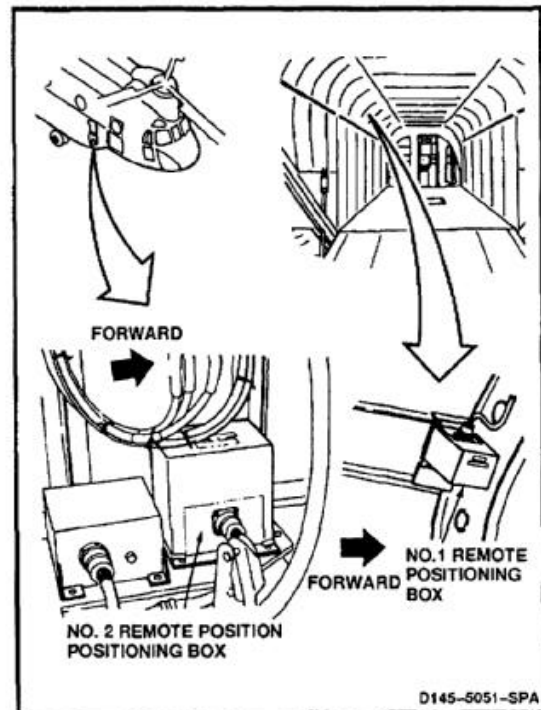
Medium Helicopter Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)

Electrical Power Off

Right Electrical Compartment Access Door Open

(Task 2-2), Or No. 1 Remote Positioning Box
Access Cover Removed (Task 2-2)**NOTE**

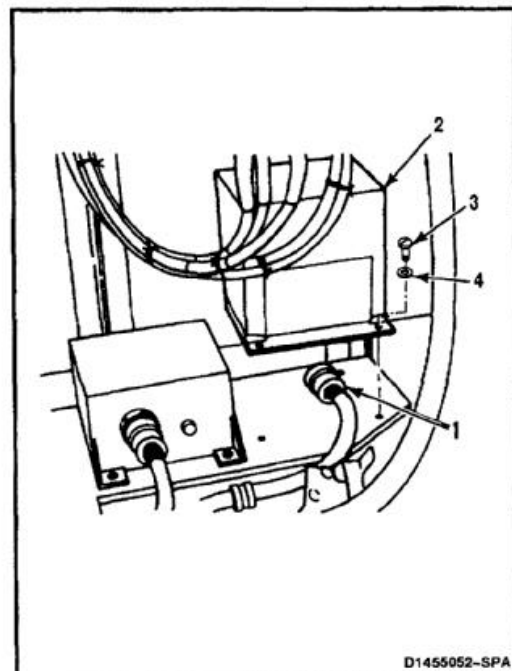
Procedure is same to remove No. 1 or No. 2 remote positioning control box. Removal of No. 2 box is shown here.

Two types of boxes are used (SYLZ7561-3 and SYLZ7561-4). Procedure is same for both.

1. Disconnect electrical connector (1) from box (2).
2. Remove four screws (3) and washers (4).
3. Remove box (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

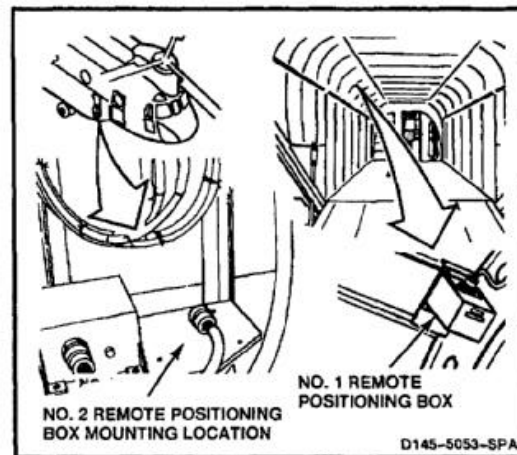
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

Materials:

None

Personnel Required:Medium Helicopter Repairer
Inspector**References:**

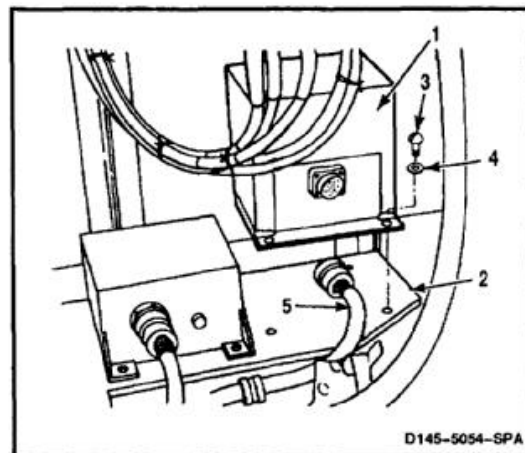
TM 55-1520-240-23P

**NOTE**

Procedure is same to install No. 1 or No. 2 remote positioning control. No. 2 box is shown here.

Two types of boxes are used (SYLZ7561-3 and SYLZ7561-4). Procedure is same for both.

1. Position box (1) on shelf (2).
2. Install four screws (3) and washers (4).
3. Connect electrical connector (5).

**INSPECT****FOLLOW-ON MAINTENANCE:**

Install No. 1 remote positioning control box access cover (Task 2-2) or close right electrical compartment access door (Task 2-2).

Perform operational check of power turbine system (TM 55-1520-240-T).

END OF TASK

4-432

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Stop Watch

Materials:

None

Personnel Required:

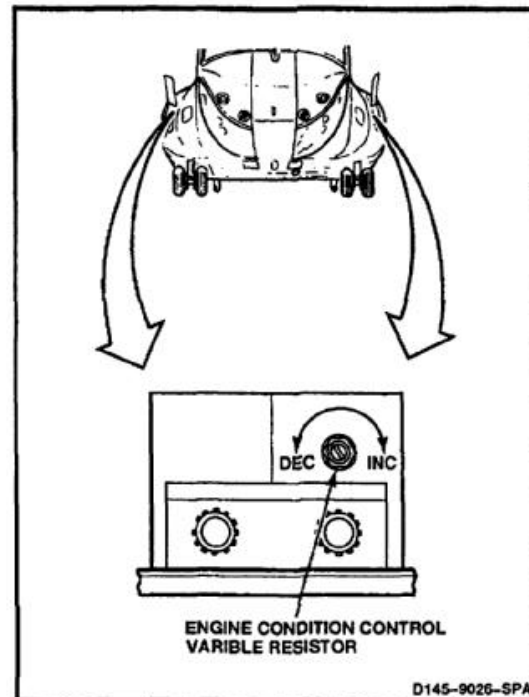
Aircraft Powerplant Repairer
Army Rotary-Wing Aviator (2)

References:

TM 55-1520-240-MTF
TM 55-2840-254-23

Equipment Condition:

Battery Connected (Task 1-39)
Adjust Fuel Control (TM 55-2840-254-23)
Adjust Engine Droop Eliminator Variable Resistors
(Task 4-118)
Rig Power Turbine Control Linkage (Task 4-140)
Electrical Power On
Right and Left Electrical Compartment Open (Task
2-2)



NOTE

See TM 55-1520-240-10 for operational procedures performed by pilot.

1. Have pilot set thrust control to ground detent.
2. Have pilot set NO. 1 & NO. 2 ENGINE BEEP trim switch to RPM DECREASE for **8 seconds**.
3. Have pilot operate No. 1 engine in FLIGHT.
4. If minimum rotor rpm is **91 to 94 percent**, go to step 6. If not, go to step 5.



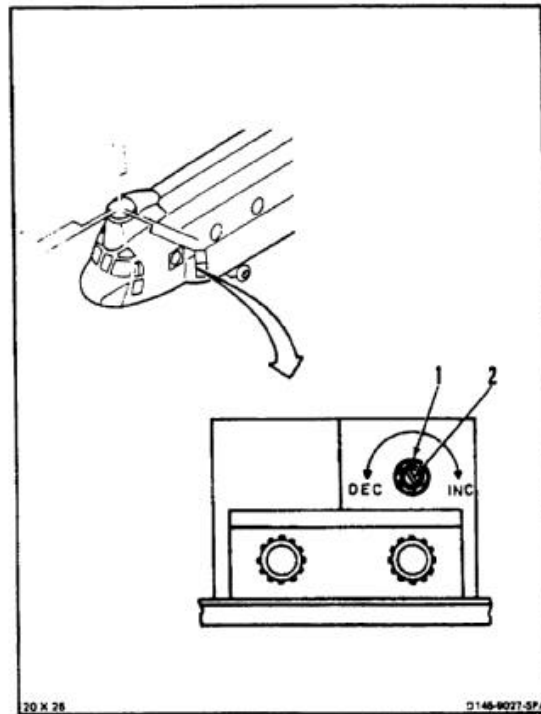
Do not force resistor at either limit of its range. Internal damage to resistor can result.

NOTE

Variable resistor for No. 1 engine is in left electrical compartment. Variable resistor for No. 2 engine is in right electrical compartment.

Turning shaft clockwise will increase rotor rpm. Counterclockwise adjustment will decrease rotor rpm.

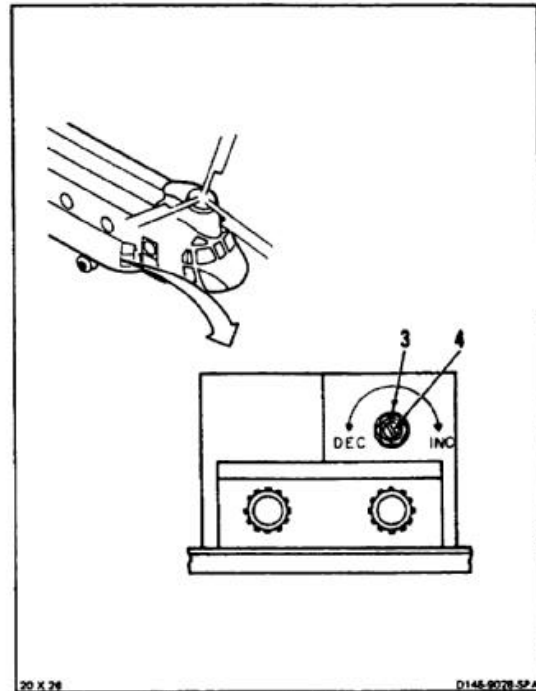
5. Loosen nut (1) on variable resistor shaft (2). Adjust resistor shaft slowly until rotor rpm is **92.5 percent**. Tighten nut. Make sure rotor rpm is **92.5 percent**.
6. Have pilot shut down No. 1 engine.



7. Have pilot operate No. 2 engine in FLIGHT.
8. If rotor rpm is **91 to 94 percent**, go to step 10. If not, go to step 9.
9. Loosen nut (3) on variable resistor shaft (4). Adjust resistor shaft slowly until rotor rpm is **92.5 percent**. Tighten nut. Make sure rotor rpm is **92.5 percent**.
10. Have pilot shut down No. 2 engine.

FOLLOW-ON MAINTENANCE:

- Electrical power off.
- Close right and left electrical compartment (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron

Materials:

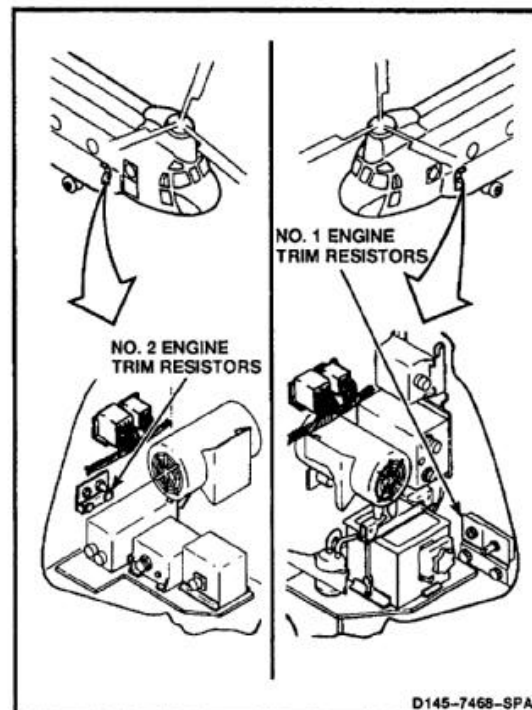
Paper Tags (E264)
Tape (E385)

Personnel Required:

Aircraft Electrician

Equipment Condition:

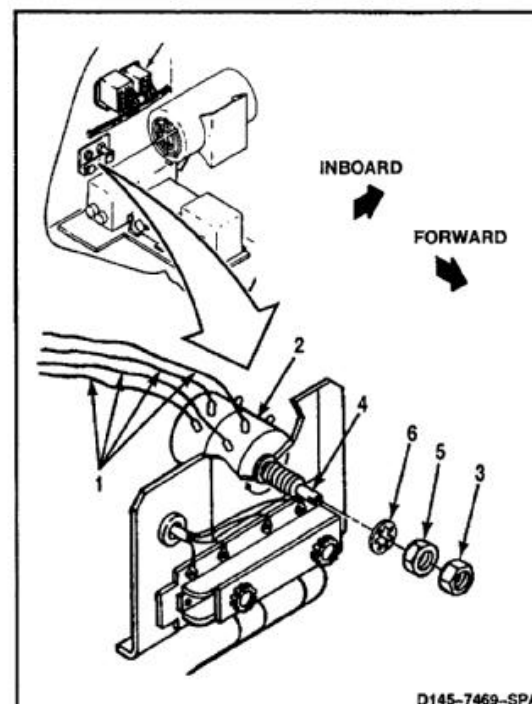
Battery Disconnected (Task 1-39)
Electrical Power Off
Left or Right Electrical Compartment Access Door
Open (Task 2-2)

**NOTE**

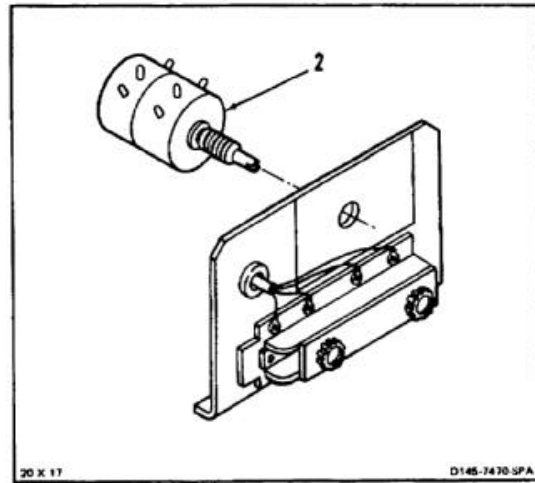
Procedure is same to remove No. 1 or No. 2 engine trim resistors. Removal of No. 2 (right) resistors is shown here.

REMOVE ADJUSTABLE RESISTOR

1. Tag and unsolder four wires (1) from resistor (2). Tape exposed ends of wires. Use tape (E385).
2. Remove locknut (3) from shaft (4).
3. Remove nut (5) and washer (6) from shaft (4).

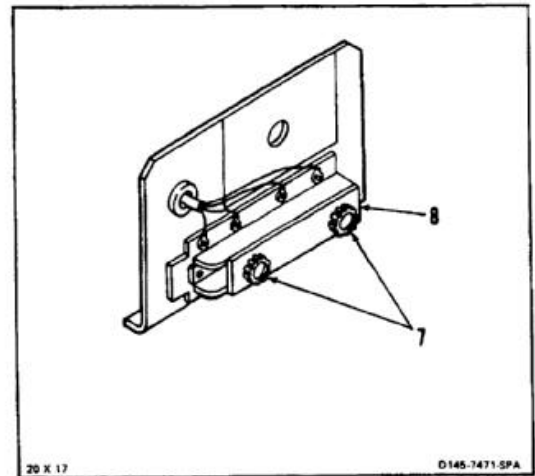


4. Remove resistor (2).



REMOVE FIXED RESISTOR

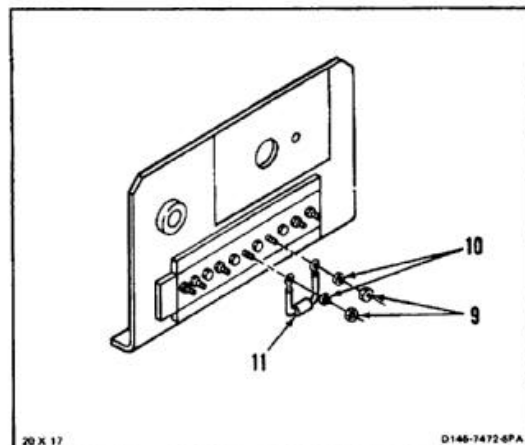
5. Loosen two screws (7). Remove cover (8).



6. Remove two nuts (9) and washers (10). Disconnect and remove resistor (11).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials

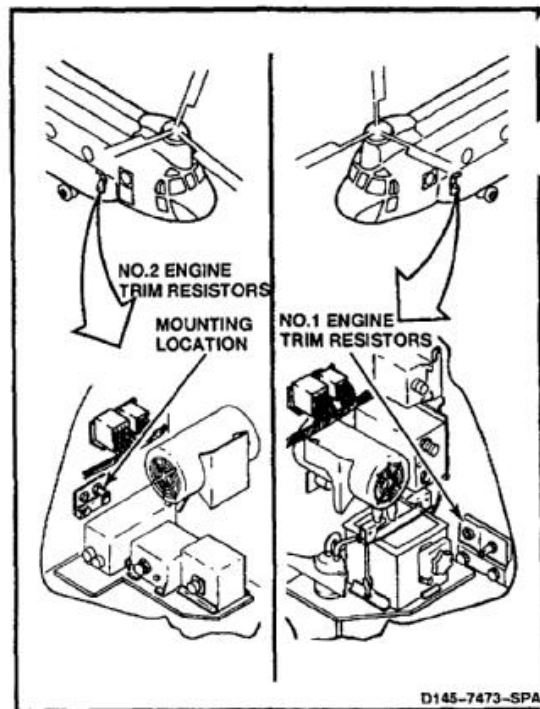
Solder (E360)

Personnel Required:

Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P

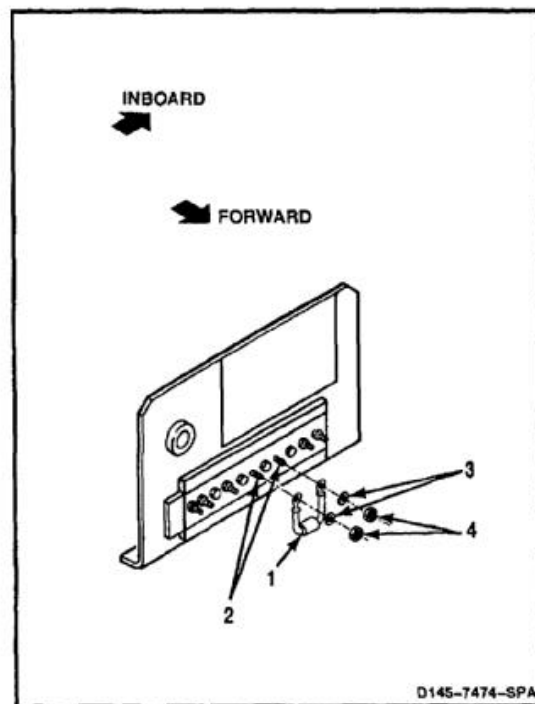


NOTE

Procedure is same to install No. 1 or No. 2 engine trim resistors. Installation of No. 2 (right) resistors is shown here.

INSTALL FIXED RESISTOR

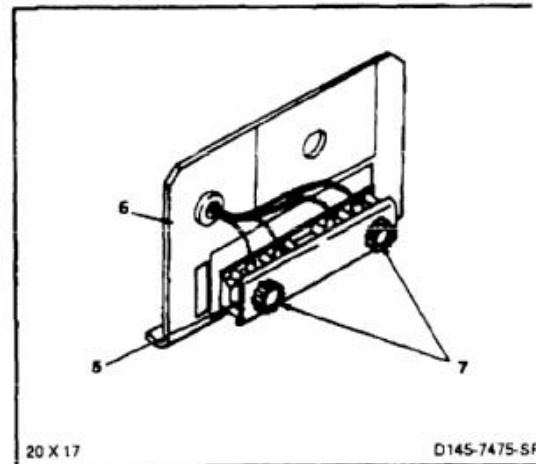
1. Connect resistor (1) to two terminals (2).
2. Install two washers (3) and nuts (4).



4-131 INSTALL ENGINE TRIM RESISTORS (Continued)

4-131

- Position cover (5) on bracket (6). Tighten two screws (7).

INSPECT**INSTALL ADJUSTABLE RESISTOR**

- Position resistor (8) through hole in bracket (6). Install washer (9) and nut (10) on shaft (11). Install locknut (12) on shaft.

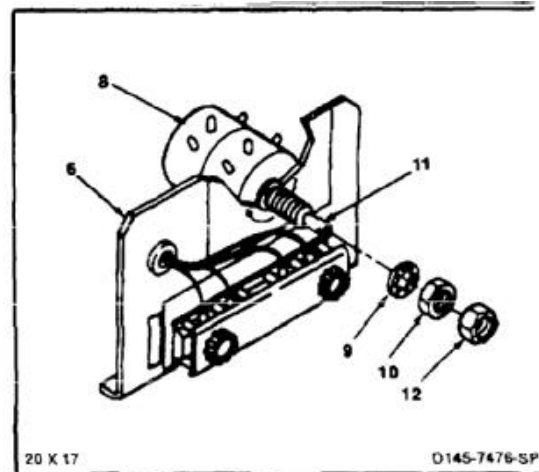
NOTE

Do not tighten locknut at this time.

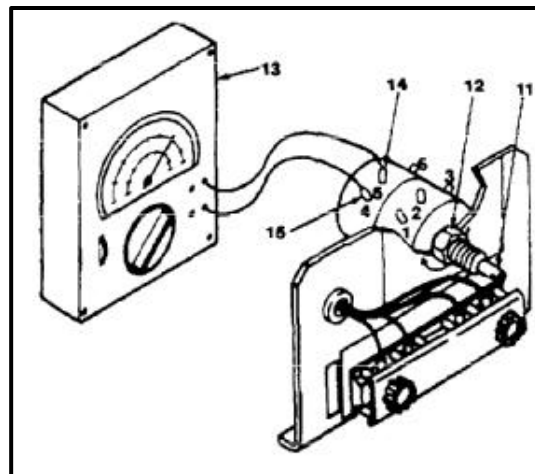
- Set multimeter (13) to RX1. Connect multimeter between terminals (5) and (6).



Do not force resistor at either limit of its range. Internal damage to resistor can result.



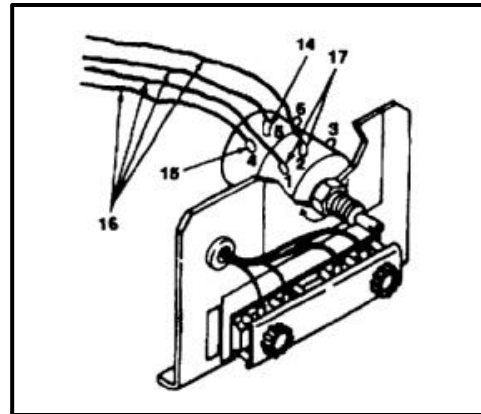
- Adjust resistor shaft (11) until multimeter (13) indicates **60 ohms**.
- Tighten shaft locknut (12).
- Check multimeter (13). Resistance shall read **60 ohms**.
- Disconnect multimeter (13).



10. Remove tape from ends of four wires (16).
Solder four wires to four terminals (2, 3, 5, and 6). Use solder (E360). Remove tags from wire.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Adjust minimum rotor rpm (Task 4-129).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close left or right electrical compartment access door (Task 2-2).



END OF TASK

4-440

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Measuring Tape

Materials:

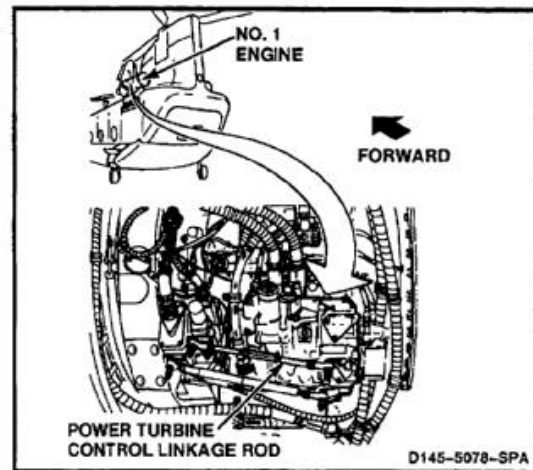
None

Personnel Required:

Aircraft Powerplant Repairer

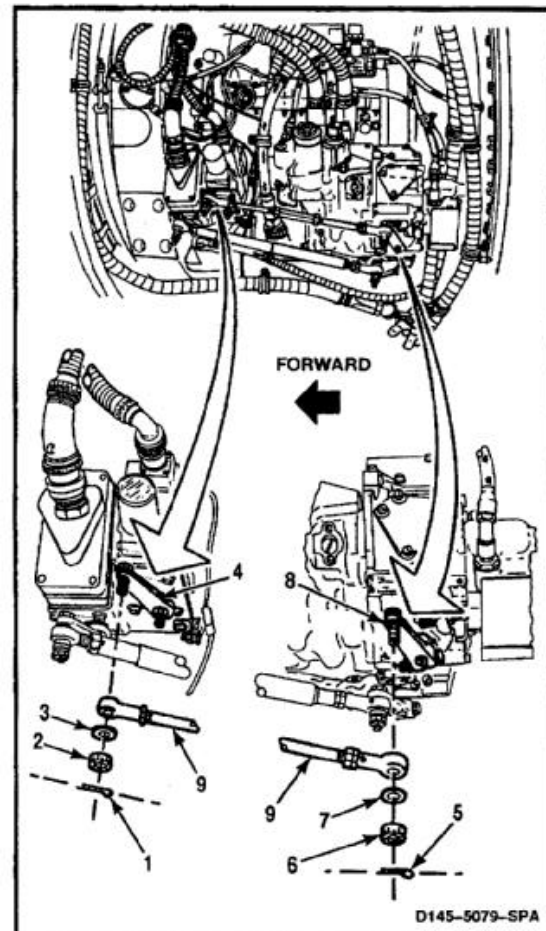
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

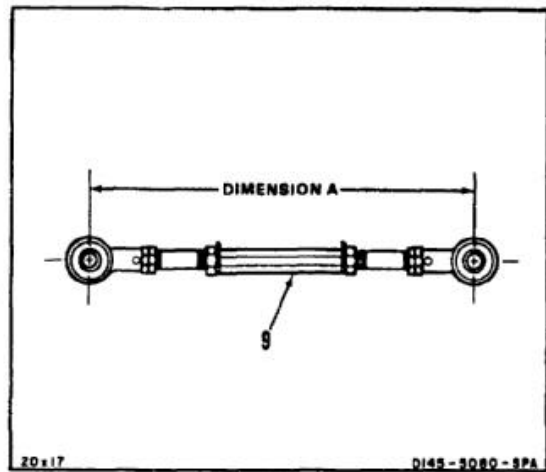
**NOTE**

Procedure is same to remove power turbine control linkage rod from No. 1 or No. 2 engine. Removal of No. 1 rod is shown here.

1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



4. Measure and record dimension A on rod (9).



FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-442

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Dial Indicator
 Dial Indicating Scale, 0 to 50 Pounds
 Vise

Materials:

None

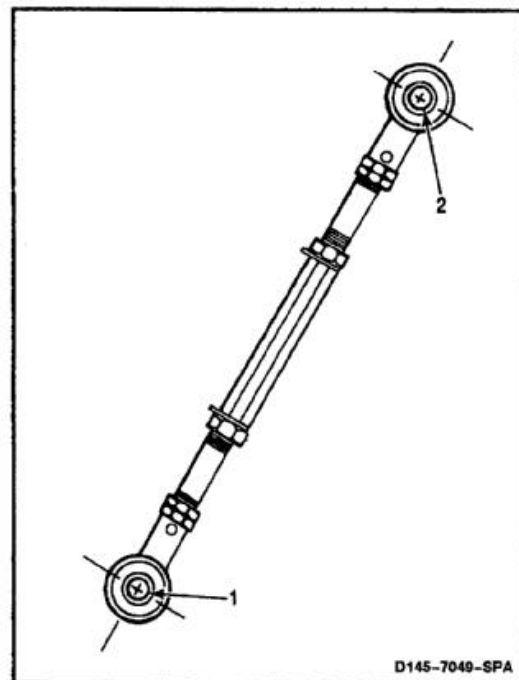
Personnel Required:

Inspector

Equipment Condition:

Off Helicopter Task

1. Apply **5 to 15 pound** load to bearing (1) in radial direction.
2. Apply **5 to 15 pound** load to bearing (1) in opposite direction.
3. Measure radial play of bearing (1). Radial play shall not be more than **0.005 inch**.
4. Repeat steps 1 thru 3 three times. Rotate bearing (1) to a different position each time.
5. Repeat steps 1 thru 4 on bearing (2).
6. Apply **5 to 15 pound** load to bearing (1) in an axial direction.
7. Apply **5 to 15 pound** load to bearing (1) in opposite direction.
8. Measure axial play of bearing (1). Axial play shall not be more than **0.025 inch**.
9. Repeat steps 6 thru 8 on bearing (2).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Airframe Repairer's Tool Kit, NSN 5180-00-323-4944

Materials:

Antiseize Compound (E75)

Epoxy Primer (E292)

Gloves (E184.1)

Parts:

Rod Ends (2)

Rivets

Personnel Required:

Aircraft Structural Repairer

References:

TM 55-1520-240-23P

Equipment Condition:

Off Helicopter Task

1. Remove lockwire from two nuts (1 and 2).
2. Loosen nuts (1 and 2).
3. Remove rods (3 and 4) from turnbuckle (5).
4. Drill out two rivets (6). Remove bearings (7) from rods (3 and 4).

WARNING

Epoxy primer (E292) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

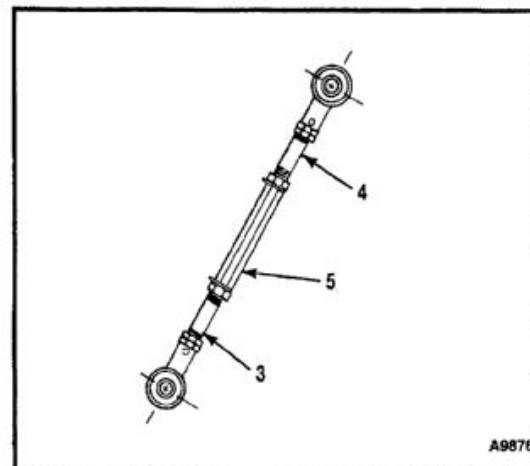
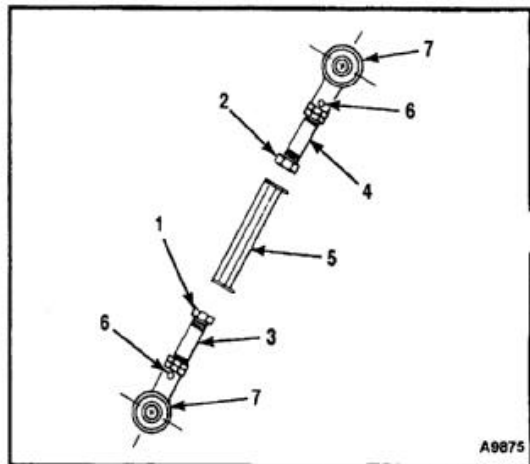
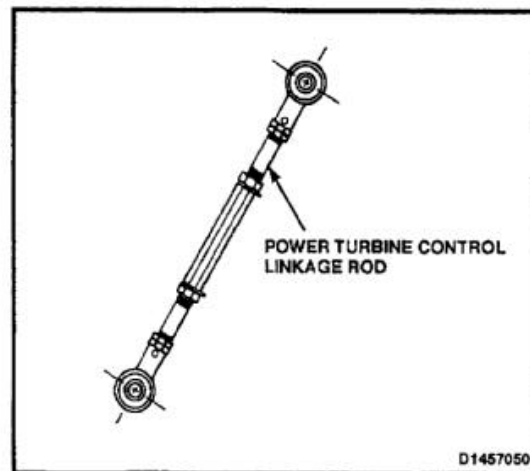
5. Install new bearings (7) on rods (3 and 4). Install rivets wet. Use epoxy primer (E292). Wear gloves (E184.1).
6. Coat thread of replacement rods (3 and 4) with antiseize compound (E75).
7. Install rods (3 and 4) in turnbuckle (5).

FOLLOW-ON MAINTENANCE:

None

END OF TASK

4-444



INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds
Measuring Tape

Materials:

Lockwire (E229)

Parts

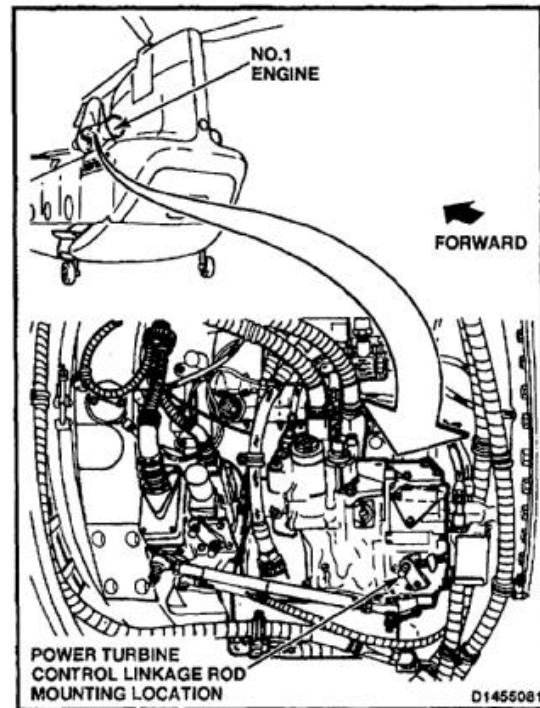
Cotter Pins

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P

**NOTE**

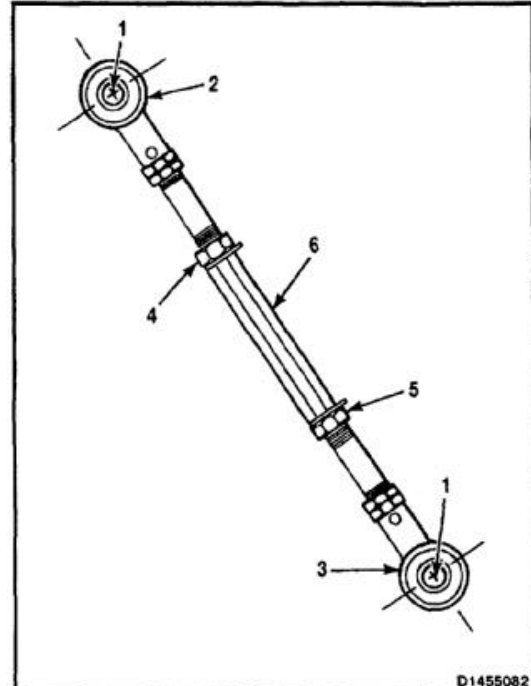
Procedure is same to install power turbine control linkage rod on No. 1 or No. 2 engine. Installation of No. 1 rod is shown here.

1. Measure distance between centers of holes (1) in rod ends (2 and 3). If length is same as dimension A found in removal, go to step 2. If length is not same, do the following:
 - a. Loosen nuts (4 and 5).
 - b. Rotate turnbuckle (6) until distance between holes (1) in rod ends (2 and 3) is same as dimension A found in removal.
 - c. Make sure rod ends (2 and 3) are aligned.
 - d. Tighten nuts (4 and 5).

NOTE

Nominal distance between centers of holes in rod ends is **10-17/32 to 10-9/16 inches**.

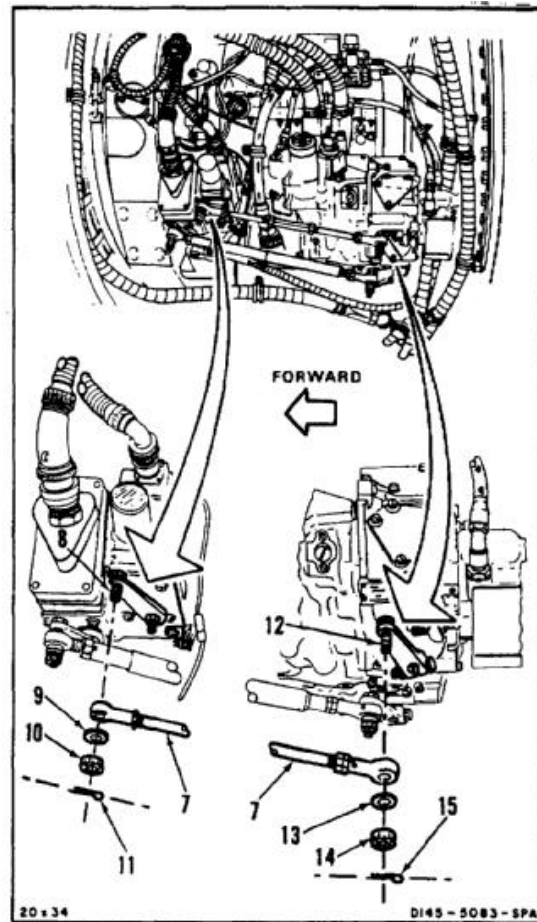
Do not lockwire nuts at this time.



- Position rod (7) on bolt (8). Install washer (9) and nut (10). Torque nut to **30 to 60 inch-pounds**. Install cotter pin (11).

INSPECT

- Position rod (7) on bolt (12). Install washer (13) and nut (14). Torque nut to **30 to 60 inch-pounds**. Install cotter pin (15).

INSPECT

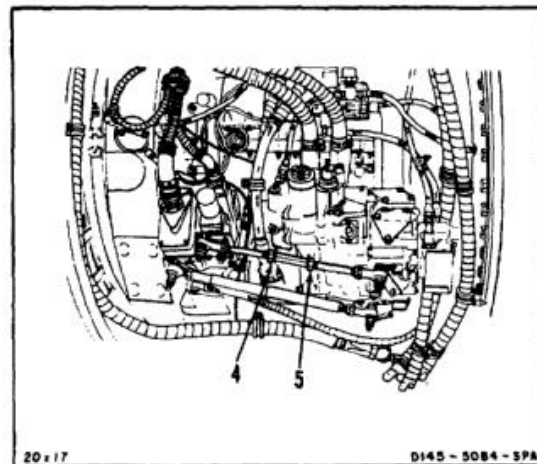
- Lockwire nuts (4 and 5). Use lockwire (E229).

INSPECT**FOLLOW-ON MAINTENANCE:**

Perform operational check of power turbine system (TM 55-1520-240-T).

Close engine access cover (Task 4-50).

Close engine work platform (Task 2-2).



END OF TASK

4-446

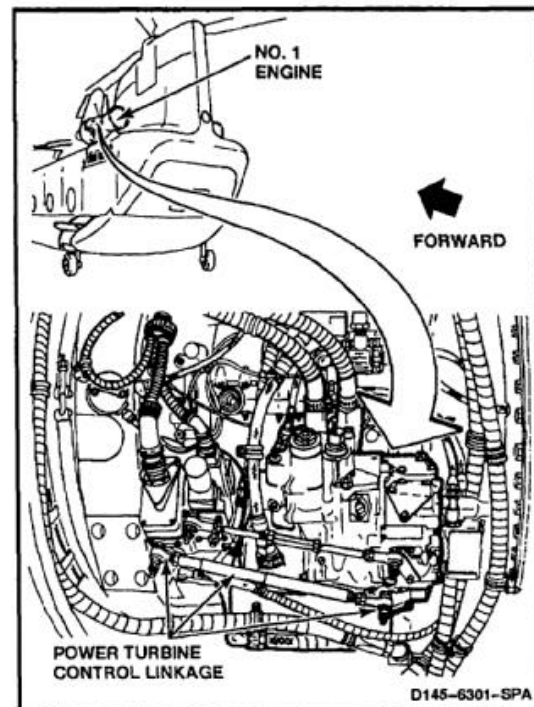
INITIAL SETUP

Applicable Configurations:Without **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944**Materials:**

None

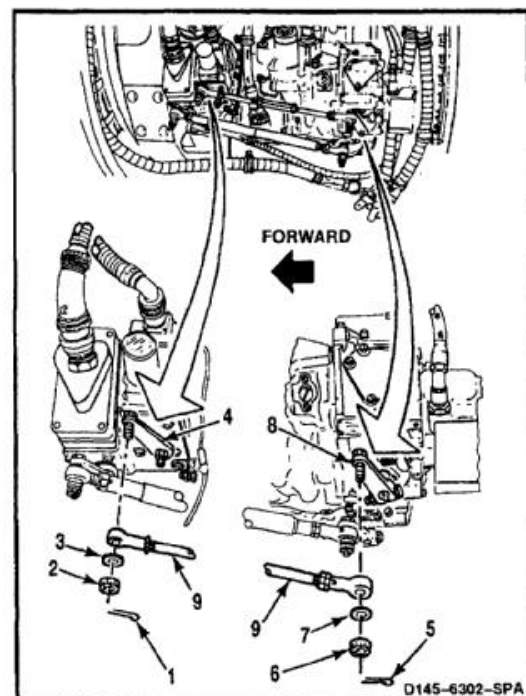
Personnel Required:

Aircraft Powerplant Repairer

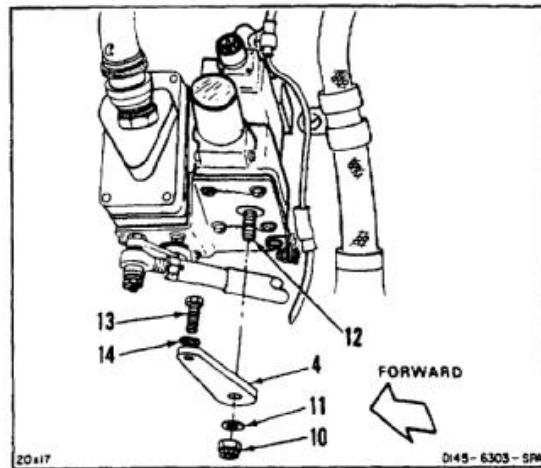
Equipment Condition:Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-50)**NOTE**

Procedure is same to remove power turbine control linkage from No. 1 or No. 2 engine. Removal of linkage from No. 1 engine is shown here.

1. Remove cotter pin (1), nut (2), and washer (3) from lever (4).
2. Remove cotter pin (5), nut (6), and washer (7) from lever (8).
3. Remove rod (9).



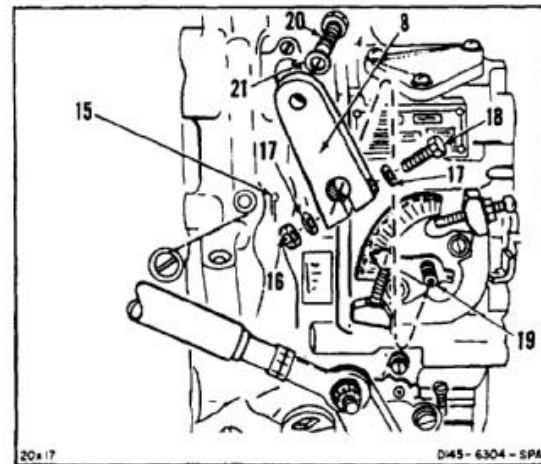
4. Remove nut (10) and washer (11). Slide lever (4) from shaft (12). Remove bolt (13) and washer (14) from lever.



5. Remove cotter pin (15), nut (16), two washers (17), and bolt (18), from lever (8). Slide lever from shaft (19). Remove bolt (20) and washer (21) from lever.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-137 REPLACE POWER TURBINE RPM LIMITING STOP

4-137

INITIAL SETUP**Applicable Configurations:**Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

Lockwire (E229)

Personnel Required:

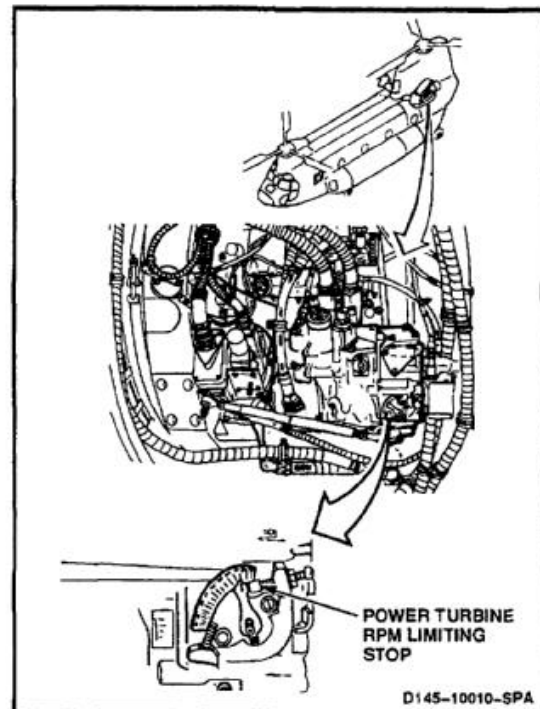
Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

**NOTE**

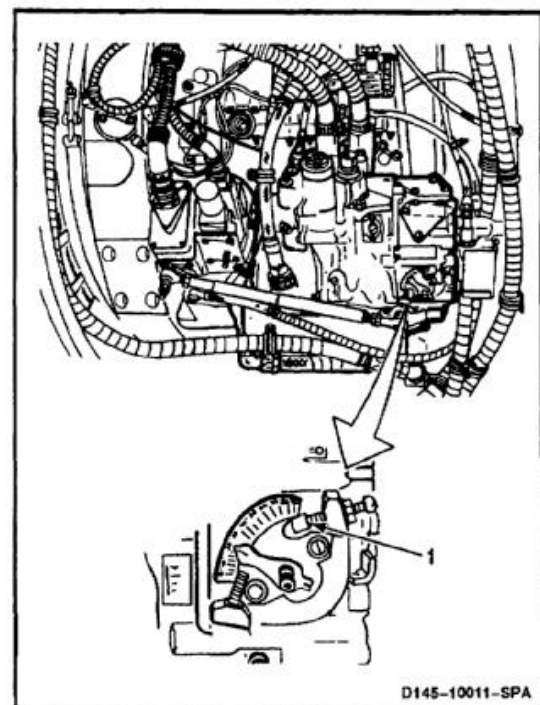
Procedure is same to replace power turbine RPM Limiting Stop on No. 1 or No. 2 engine. No. 1 engine is shown.

Power Turbine control linkage omitted for clarity.

1. Cut lockwire and remove stop (1).
2. Install new stop (1) and lockwire. Use lockwire (E229).

INSPECT**FOLLOW-ON MAINTENANCE:**

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

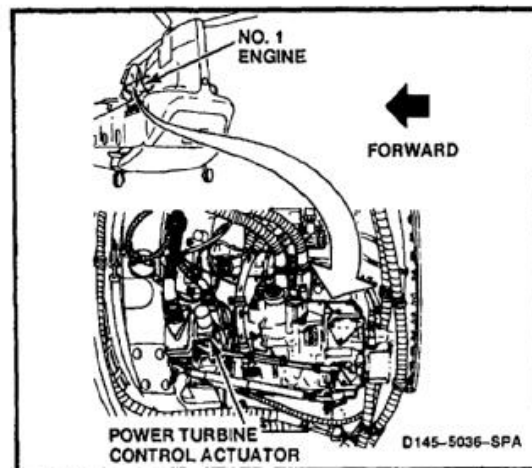
None

Personnel Required:

Aircraft Powerplant Repairer

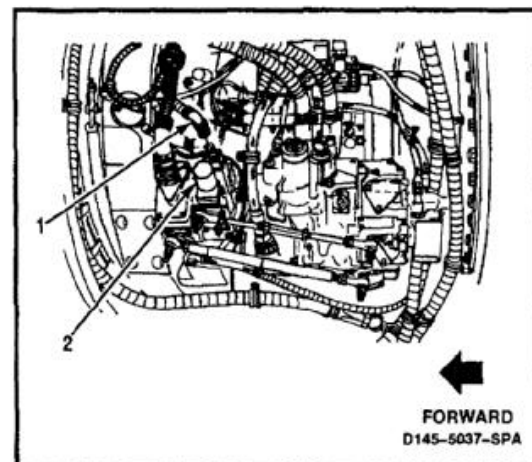
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)

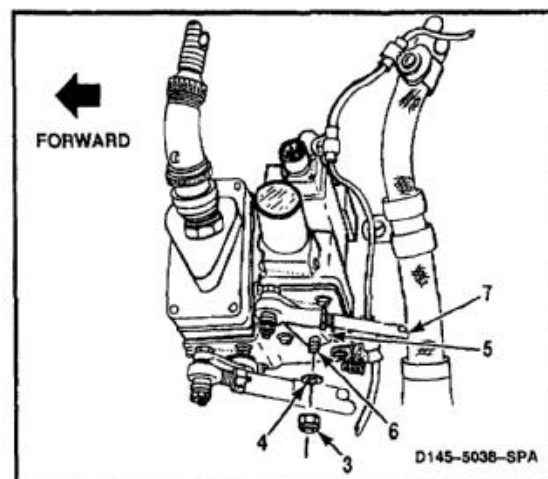
**NOTE**

Procedure is same to remove power turbine control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Disconnect cable connector (1) from actuator (2).



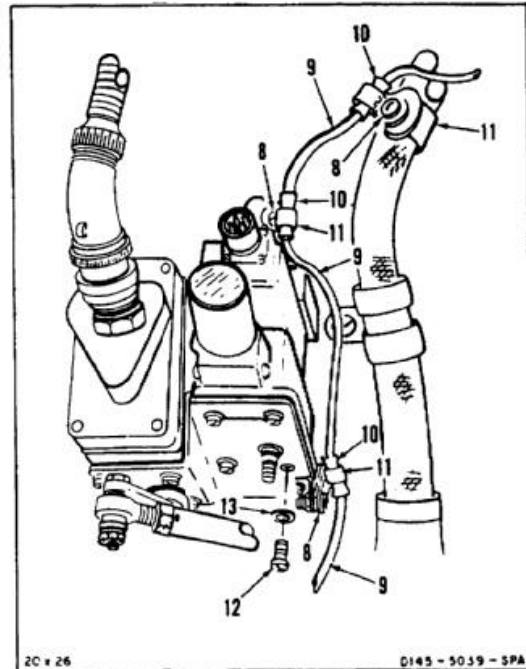
2. Remove nut (3) and washer (4). Slide lever (5) from shaft (6). Move rod (7) up and aft.



CAUTION

Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

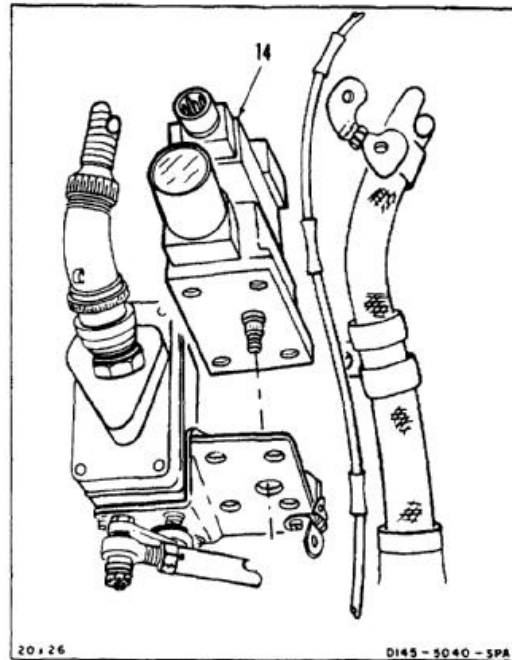
3. Turn fastener (8) counterclockwise and release element (9) and bushing (10) from three clamps (11). Move element to side.
4. Remove lockwire from four screws (12). Remove four screws and washers (13).



5. Remove actuator (14).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

Without **74**

Tools:

- Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944
- Torque Wrench, 5 To 50 Inch-Pounds

Materials:

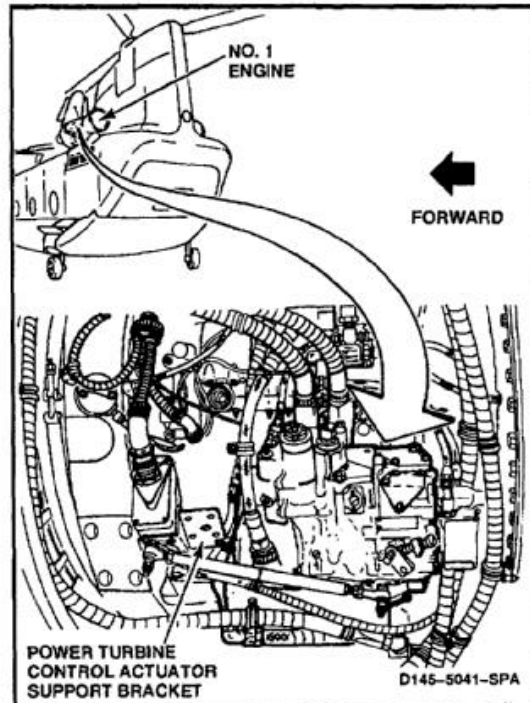
Lockwire (E231)

Personnel Required:

- Medium Helicopter Repairer
- Inspector

References:

TM 55-1520-240-23P



NOTE

Procedure is same to install power turbine control actuator on No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Position actuator (1) on bracket (2).



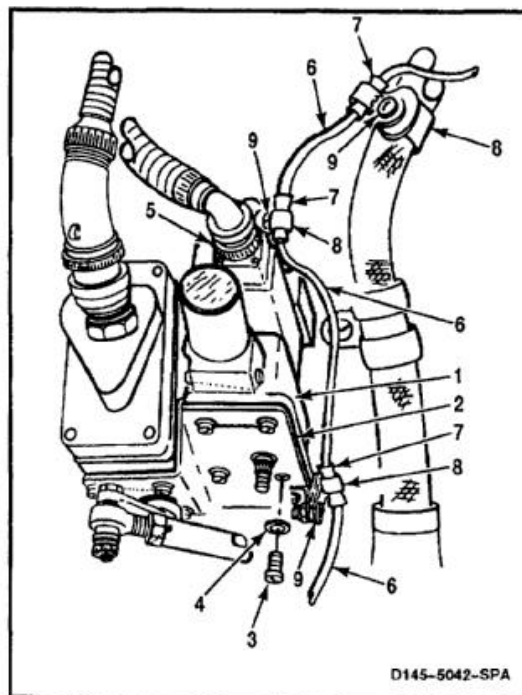
Screws must be lockwired left to right. Interference or damage to control rod could result if screws are lockwired up and down.

2. Install four screws (3) and washers (4). Lockwire screws left to right. Use lockwire (E231).
3. Connect cable connector (5).



Do not pinch, crush, kink, or make sharp bends in fire detection element. Element can be damaged.

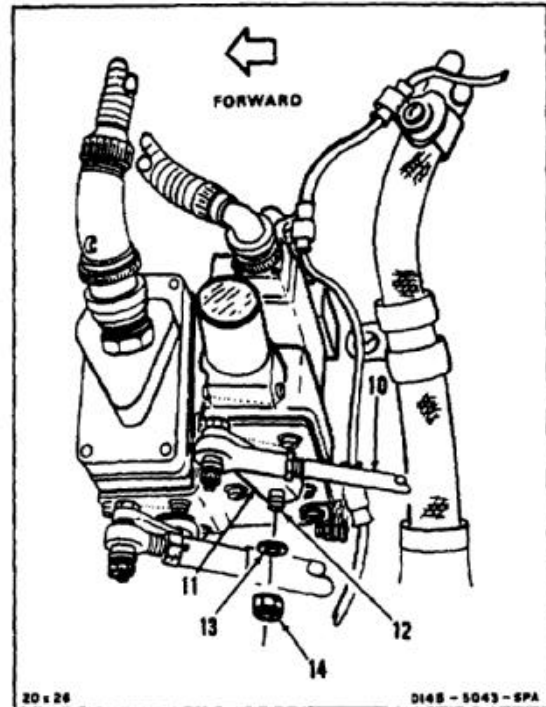
4. Press element (6) and bushing (7) into clamps (8) at three locations. Bushings shall be centered in clamps.
5. Lock each clamp (8) with fasteners (9).



6. Move rod (10) forward and down. Position lever (11) on shaft (12). Install washer (13) and nut (14). Torque nut to **35 inch-pounds**.

FOLLOW-ON MAINTENANCE:

- Install and rig power turbine control linkage (Task 4-140).
- Perform operational check of power turbine control system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).



END OF TASK

INITIAL SETUP

Applicable Configurations:Without **74****Tools:**

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Torque Wrench, 30 to 150 Inch-Pounds
Thrust Control Rigging Pin (T122)
Stopwatch

Materials:

Lockwire (E229)

Parts:

Cotter Pins

Personnel Required:

Aircraft Powerplant Repairer (2)
Inspector

References:

TM 55-1520-240-23P

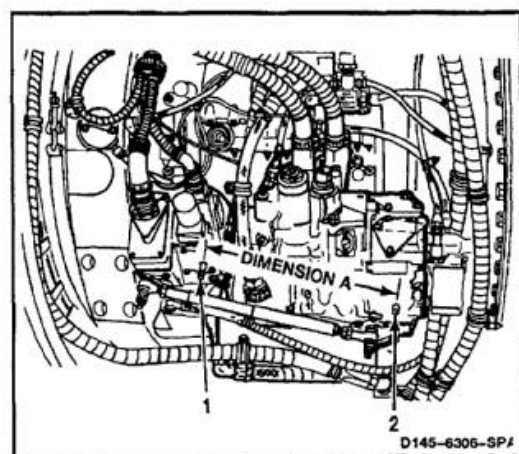
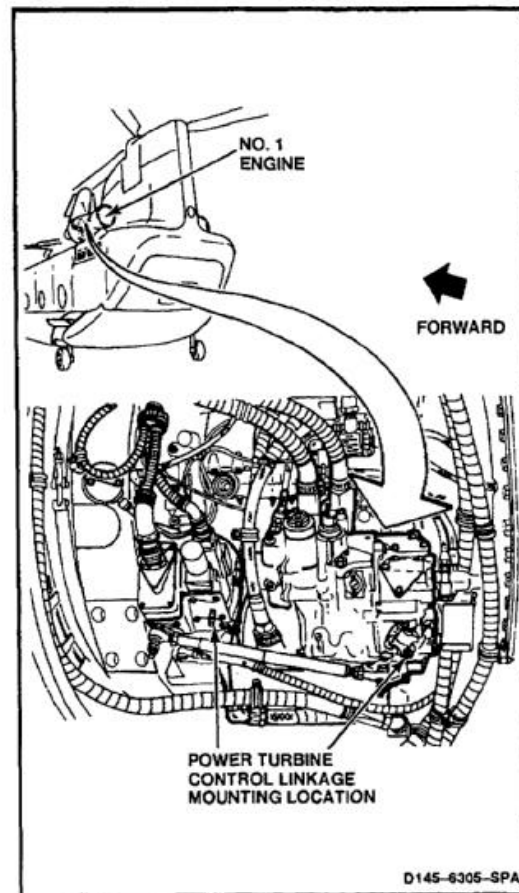
Equipment Condition:

Battery Disconnected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Forward Floor Panels Removed (Task 2-81)
Electrical Compartment Access Door Open (Task 2-2)
Adjust Engine Droop Eliminator Variable Resistors
(Task 4-118)
Replace Power Turbine RPM Limiting Stop (Task
4-137)

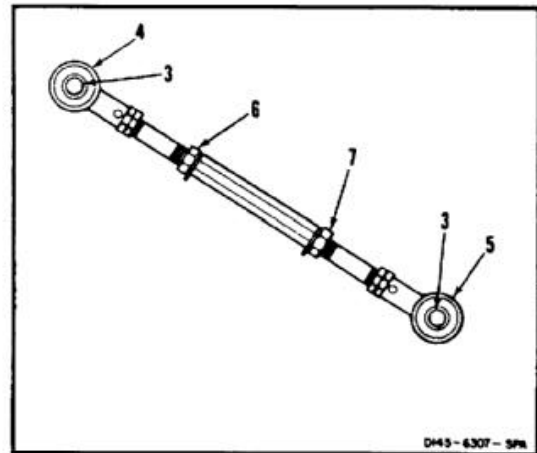
NOTE

Procedure is same to install and rig power turbine control linkage on No. 1 or No. 2 engine. Installation and rigging for No. 1 engine is shown here.

1. Measure dimension A from actuator shaft (1) to fuel control shaft (2).



2. Measure distance between centers of holes (3) in rod end bearings (4 and 5). If length is same as dimension A found in step 1, go to step 3. If not, do the following:
 - a. Remove lockwire and loosen two nuts (6 and 7).
 - b. Rotate two bearings (4 and 5) alternately until distance between centers of holes (3) is same as dimension A.
 - c. Make sure bearings (4 and 5) are aligned.
 - d. Tighten nuts (6 and 7). Do not lockwire nuts at this time.



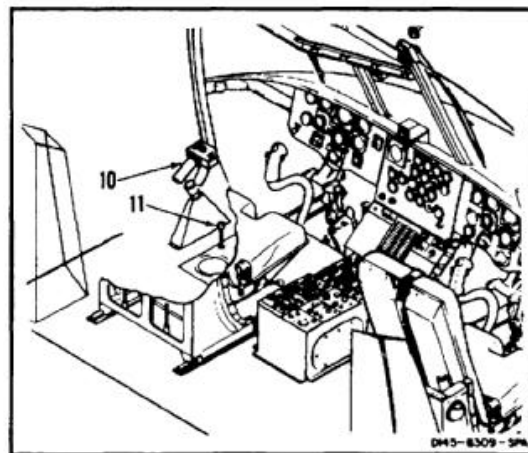
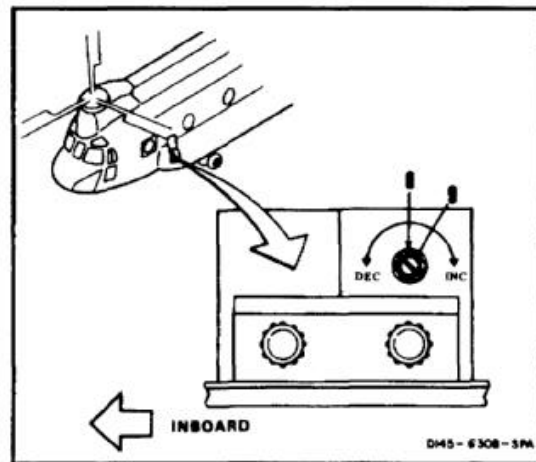
CAUTION

Do not force resistor at either limit of its range. Internal damage to resistor can result.

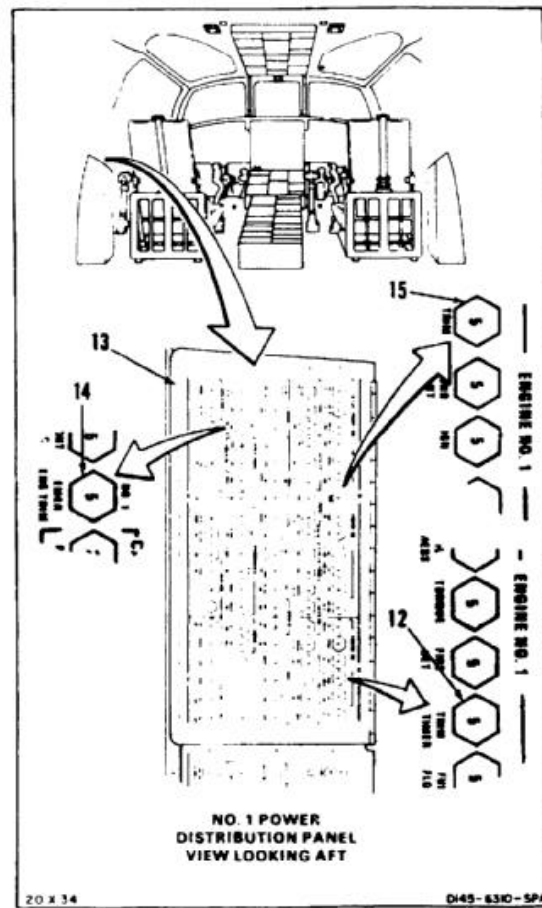
NOTE

Nominal distance between centers of holes in rod end bearings is **10.55 inches**.

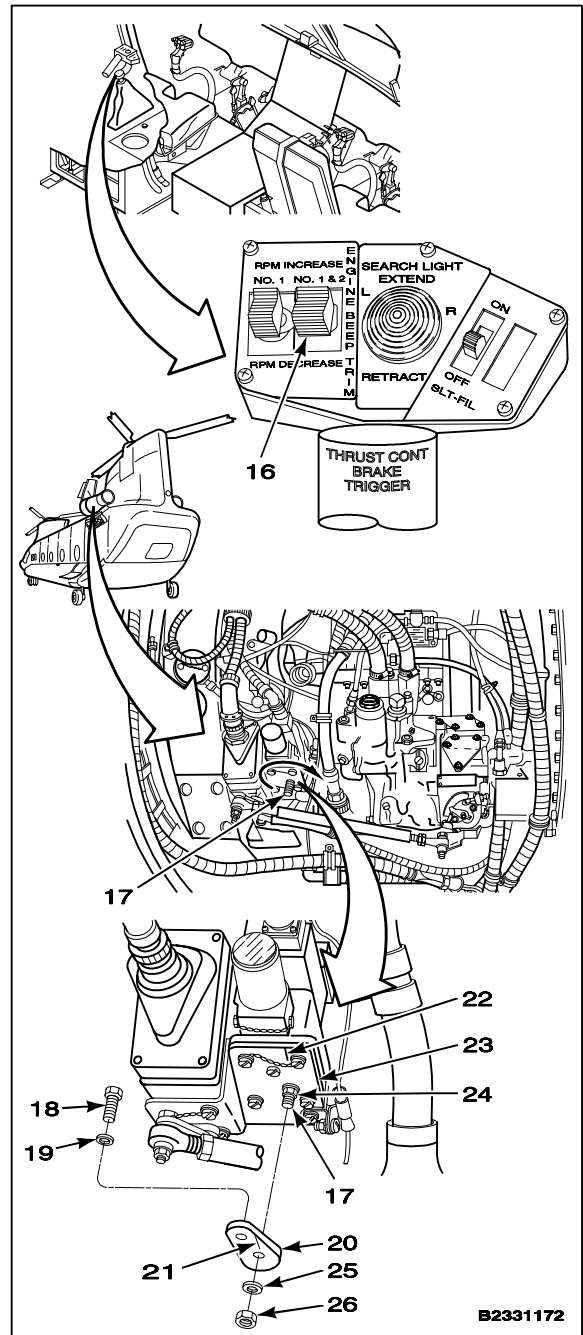
3. Loosen nut (8). Set variable resistor shaft (9) to halfway between full clockwise and counterclockwise positions.
 - 3.1. Connect the battery (Task 1-39), turn on the electrical power, and the hydraulic power.
4. Set thrust control (10) to neutral. Install rigging pin (T122) (11).



5. Check that TRIM & TIMER circuit breaker (12) on No. 1 power distribution panel (13) is closed. Check that No. 1 EMERG ENG TRIM circuit breaker (14) and TRIM circuit breaker (15) are closed.



6. Have helper set ENGINE BEEP TRIM NO. 1 & 2 switch (16) to RPM INCREASE for **3 to 5 seconds**. Check that N2 actuator shaft (17) moves clockwise.
7. Have helper set switch (16) to RPM DECREASE until shaft (17) stops turning.
8. Install bolt (18) and washer (19) in lever (20). Slide lever (20) into position on shaft (17). Make sure index mark (21) on lever aligns with index mark (22) on bracket (23), within **one tooth** on spline (24).
9. Install washer (25) and nut (26). Torque nut to **35 inch-pounds**.



10. Position rod (27) on bolt (18). Install washer (28) and nut (29) on bolt. Torque nut to **30-60 inch-pounds**. Install cotter pin (30).

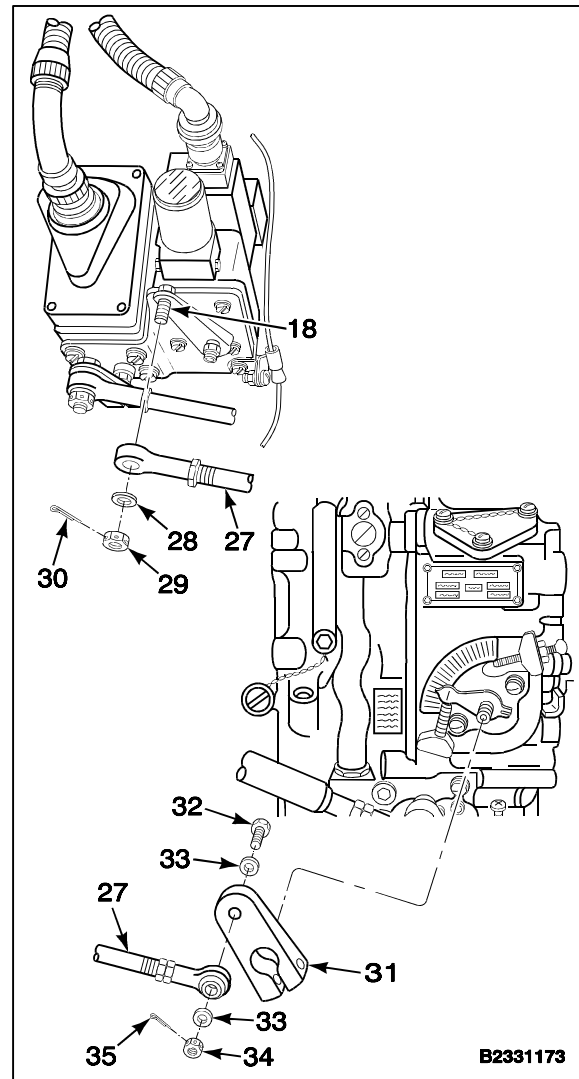
NOTE

To determine if washers are required at the two locations, the bearing width is to be measured. If the bearing width measures **0.437 inch**, a washer is required under both head and nut, an additional washer may be required under the nut for stack-up purposes. If the bearing width measures **0.593 inch**, no washer is required under the head. However, a washer may be required under the nut for stack-up purposes.

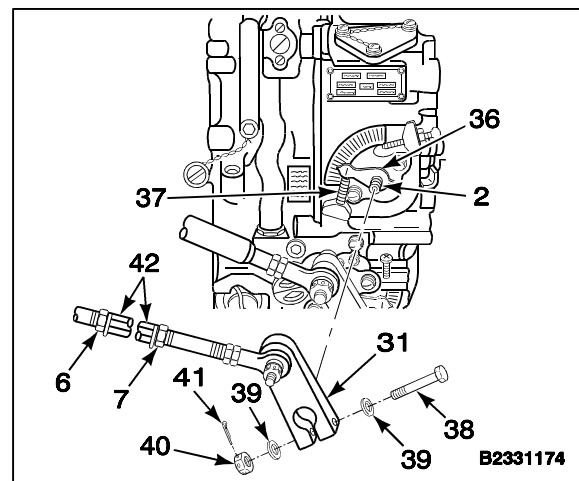
INSPECT

11. Position lever (31) behind rod (27). Install bolt (32), two washers (33), and nut (34). Torque nut to **30-60 inch-pounds**. Install cotter pin (35).

INSPECT



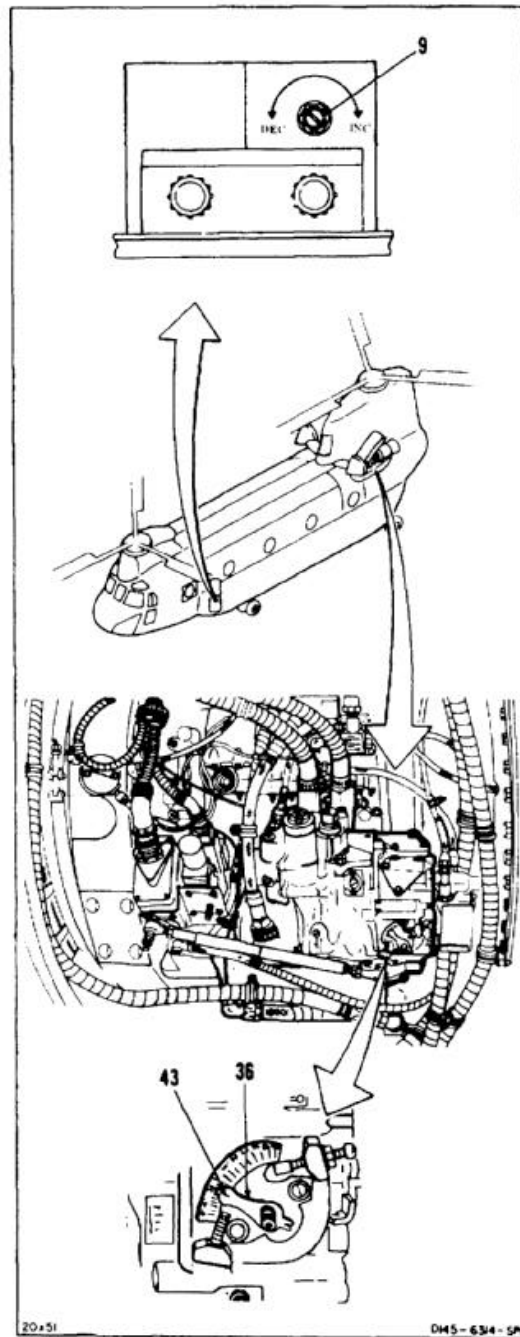
12. Rotate pointer (36) on fuel control shaft (2) to MIN stop (37).
13. Slide lever (31) onto shaft (2). Install bolt (38), two washers (39), nut (40), and cotter pin (41).
14. Make sure pointer (36) contacts MIN stop (37). If pointer (36) does not contact MIN stop (37), do the following:
 - a. Remove lockwire and loosen two nuts (6 and 7).
 - b. Rotate turnbuckle (42) until pointer (36) contacts stop (37).
15. Tighten and lockwire nuts (6 and 7). Use lockwire (E229).



16. Have helper rotate resistor shaft (9) until index mark (43) on pointer (36) is at 20° .

NOTE

Control linkage not shown for clarity.

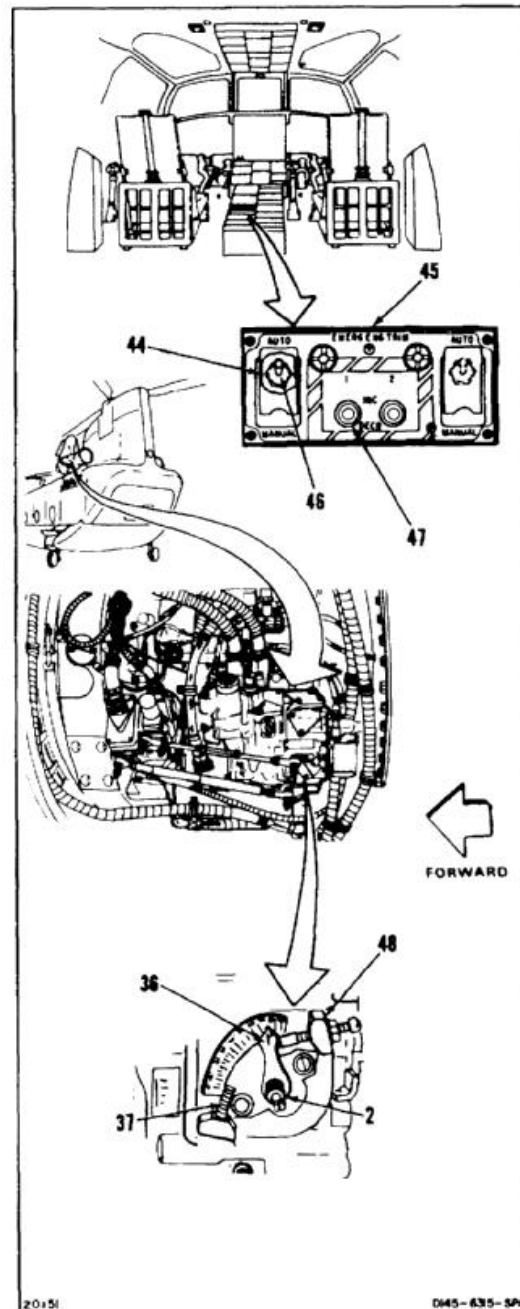


17. Lift switch guard (44) on panel (45). Set left switch (46) to MANUAL. Set EMERG ENG TRIM No. 1 switch (47) to INCR for **8 to 10 seconds**.

NOTE

Refer to Task 4-137 to install power turbine limiting stop.

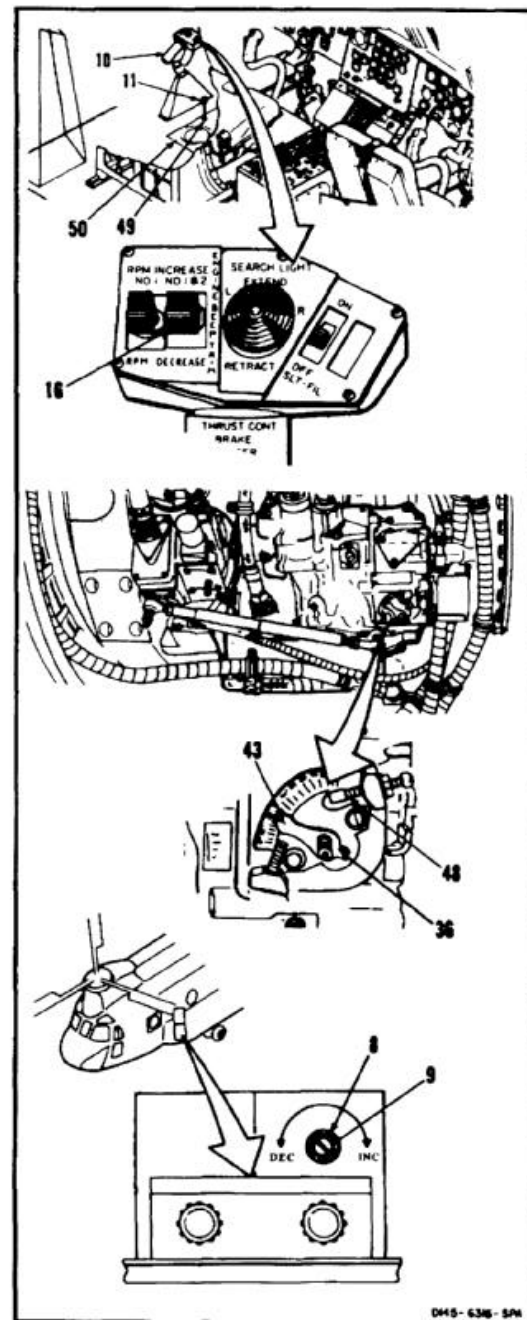
18. Check pointer (36) on fuel control shaft (2). Pointer shall contact N2 RPM limiting stop (48).
19. Have helper set switch (47) to DECR for **8 to 10 seconds**.
20. Check pointer (36). Pointer shall contact MIN stop (37).
21. Lower switchguard (44).



22. Remove rigging pin (11) from hole (49) in floor (50). Set thrust control (10) to detent position.
23. Have helper hold No. 1 & 2 switch (16) to RPM INCREASE for **8 to 10 seconds**.
24. Check pointer (36). Pointer shall contact N2 RPM limiting stop (48).
25. Have helper hold switch (16) to RPM DECREASE for **8 to 10 seconds**. Index mark (43) on pointer (36) shall be between **19° and 21°**. If pointer is not between **19° and 21°**, rotate resistor shaft (9) until pointer is at **20°**.
26. Tighten locknut (8).

FOLLOW-ON MAINTENANCE:

- Install forward floor panels (Task 2-82).
- Close left electrical compartment access door (Task 2-2).
- Perform operational check of power turbine system (TM 55-1520-240-T).
- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).
- Electrical power off.
- Hydraulic power off.
- Disconnect battery (Task 1-39).



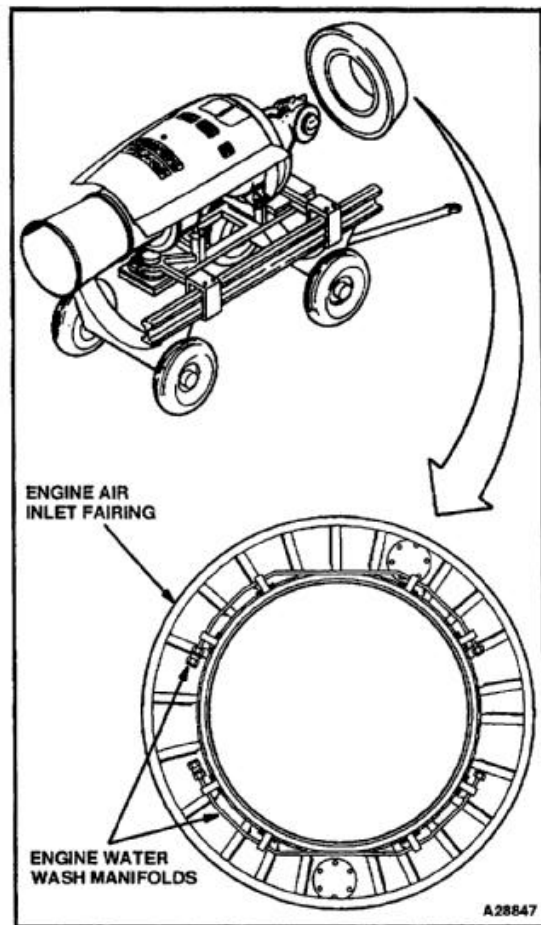
END OF TASK

SECTION IX
ENGINE COMPRESSOR CLEANING AND PRESERVATION SYSTEM
(WITH T55-GA-714A ENGINE)

INITIAL SETUP

Applicable Configurations:With **74****Tools:**Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944**Materials:**Cloths (E120)
Sealant (E336)
Lockwire (E229)
Gloves (E184.1)
Dry Cleaning Solvent (E162)**Personnel Required:**Aircraft Powerplant Repairer
Inspector**References:**

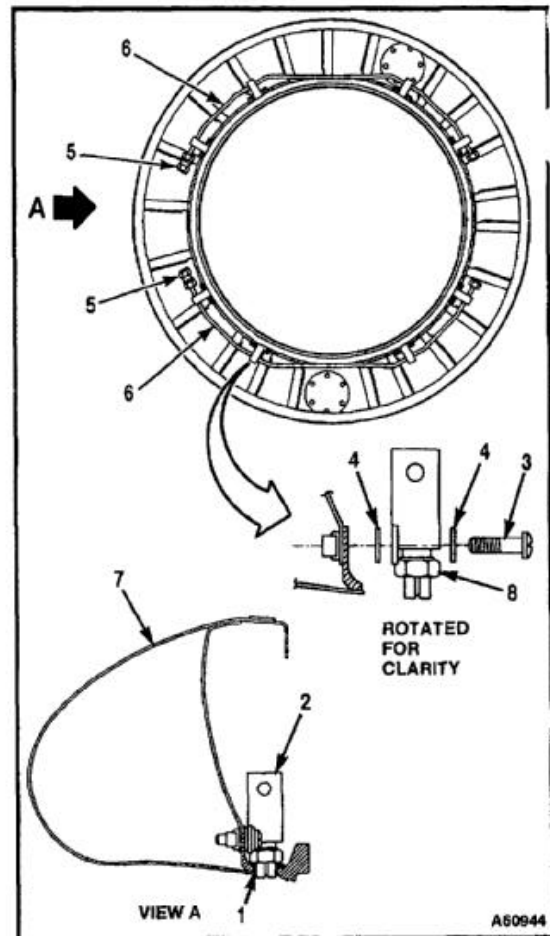
TM 55-1520-240-23P

Equipment Condition:Engine Transmission Fairing Removed (Task 4-70)
Off Helicopter Task

NOTE

Procedure is same to replace No. 1 or No. 2 engine water wash manifolds.

1. Remove sealant (1) from eight manifold fittings (2), in engine air inlet fairing (7).
2. Remove sixteen screws (3) and thirty-two washers (4).
3. Remove lockwire and caps (5).
4. Remove manifold assemblies (6).
5. Remove eight vee jet nozzles (8) from manifold fittings (2).



WARNING

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

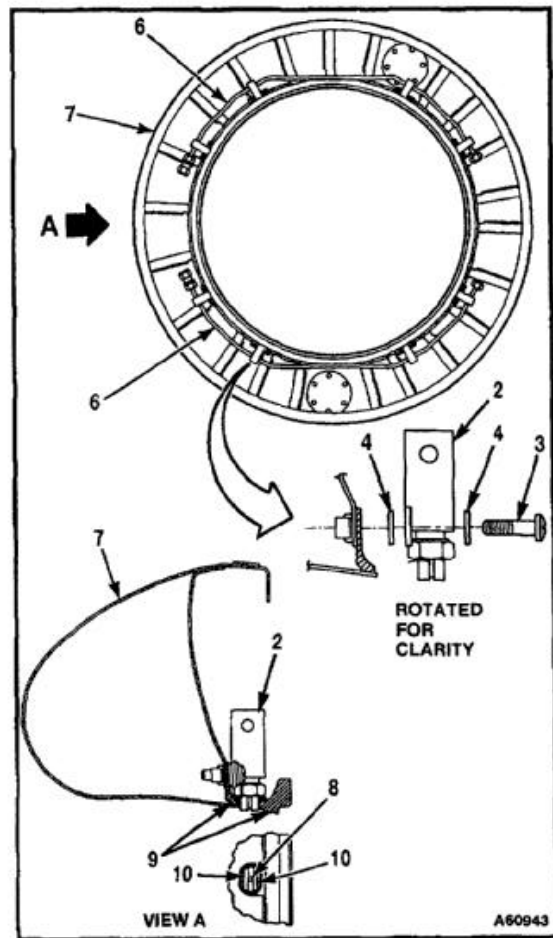
6. Clean eight vee jet nozzles (8) and fairing slot openings (9) in fairing surface (7). Use solvent (E162) and cloths (E120). Wear gloves (E184.1).
7. Install eight vee jet nozzles (8) in manifold fittings (2).
8. Insure that vee jet nozzle flats (10) are locked in place by slot openings (9) in fairing (7), but DO NOT extend into fairing airstream.
9. Align manifold assemblies (6) in fairing slot openings (9).
10. Install sixteen screws (3) and thirty-two washers (4).

INSPECT**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

CAUTION

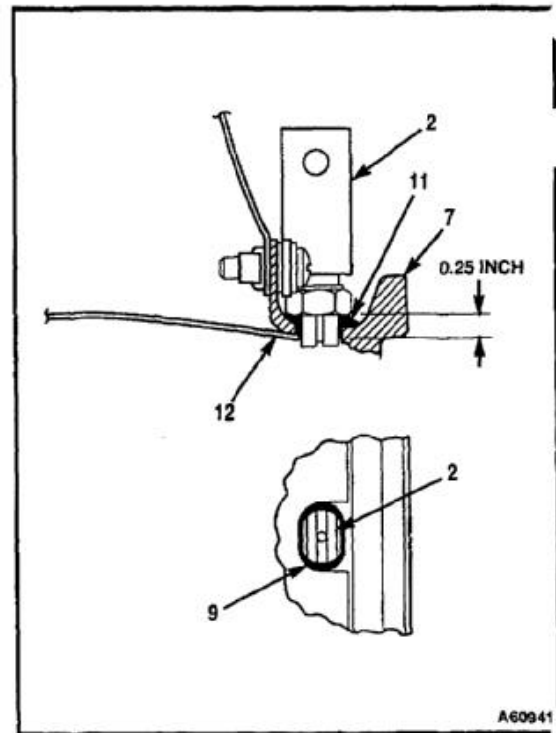
If sealant (E336) is allowed to enter vee jet nozzle slot, water wash system operation will be impaired.



4-141 REPLACE ENGINE WATER WASH NOZZLES AND MANIFOLDS (Continued)

4-141

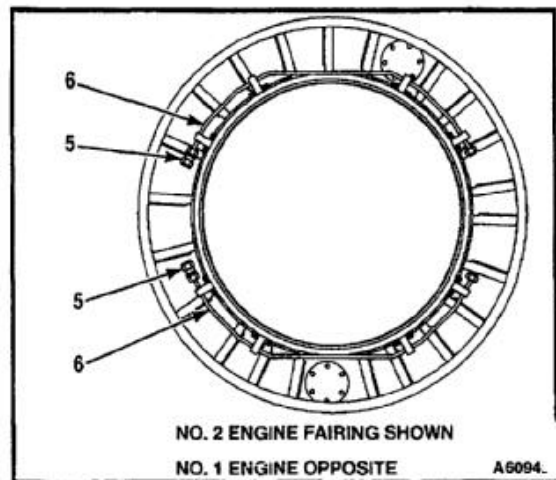
11. Apply sealant (E336) to manifold fittings (2) and fairing surface (7).
12. Fill gaps between manifold fittings (2) and fairing slots (9) with sealant (E336). Wear gloves (E184.1).
13. Apply a minimum bead of **0.025 inch** of sealant (E336) around the manifold nozzle base (11) and fairing surface (7).



14. Ensure that sealant (E336) is flush with inlet side of fairing (12).

INSPECT

15. Install two caps (5) on manifold assemblies (6). Lockwire (E229).
16. Allow sealant (E336) to cure for **24 hours** after application.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944
Container, 2 Quart

Materials:

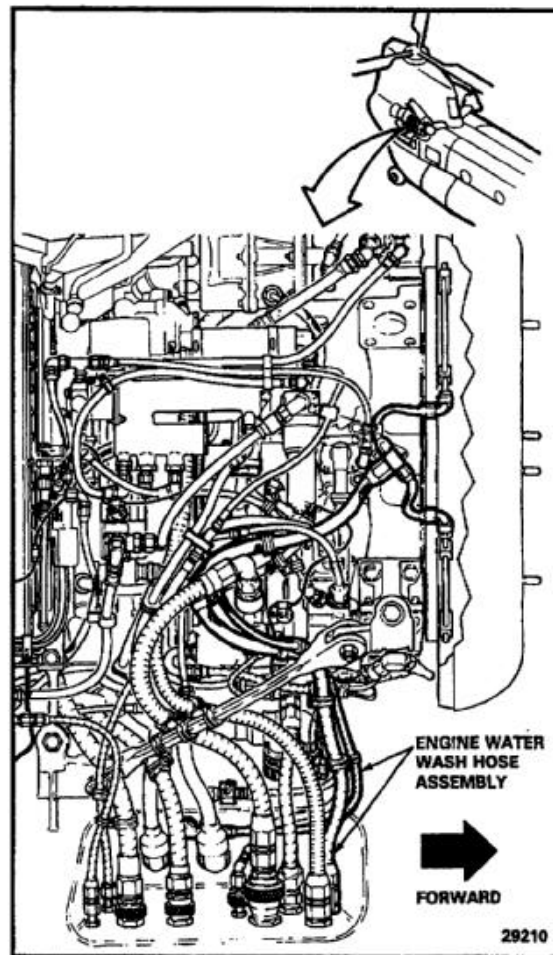
Cloths (E120)
Tape (E388)

Personnel Required:

Aircraft Powerplant Repairer

Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Work Platform Open (Task 2-2)
Engine Access Cover Open (Task 4-49)



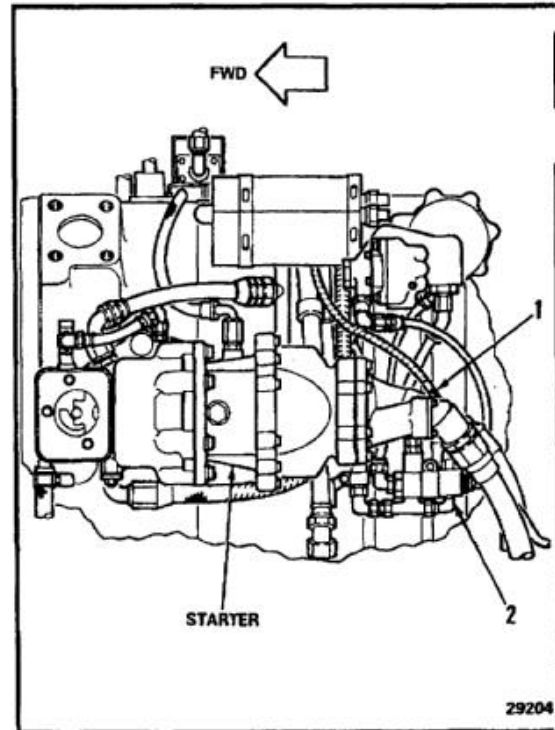
4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-142

NOTE

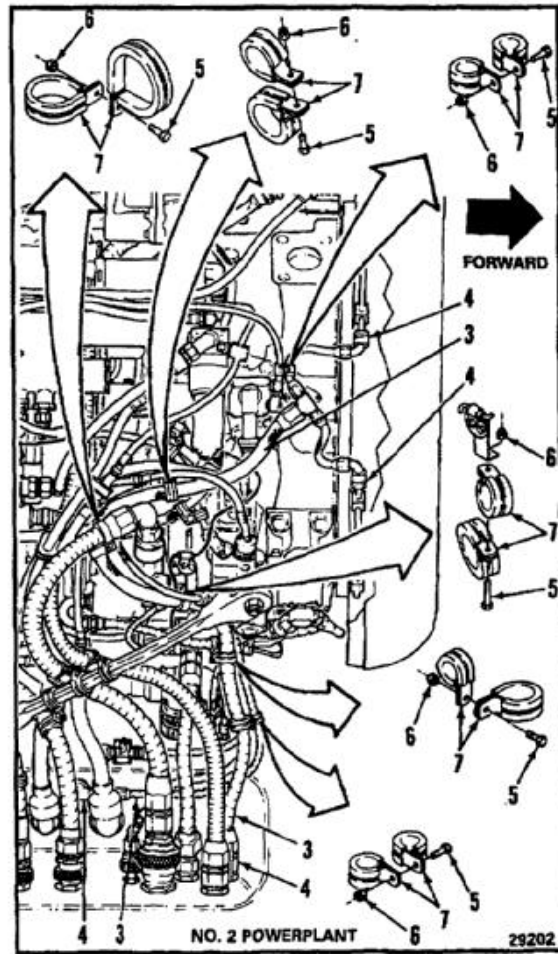
Procedure is same to remove engine water wash hoses from No. 1 or No. 2 engine, except as noted. No. 2 engine is shown here.

1. Disconnect air pressure hose (1) from fitting (2).



4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

2. Disconnect hoses (3) from fittings (4).
3. Remove six screws (5), and nuts (6), from twelve clamps (7).
4. Use tape (E388) to mark clamp locations.
5. Remove hoses (3). Use cloths (E120) to clean spilled water.



4-142 REMOVE NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

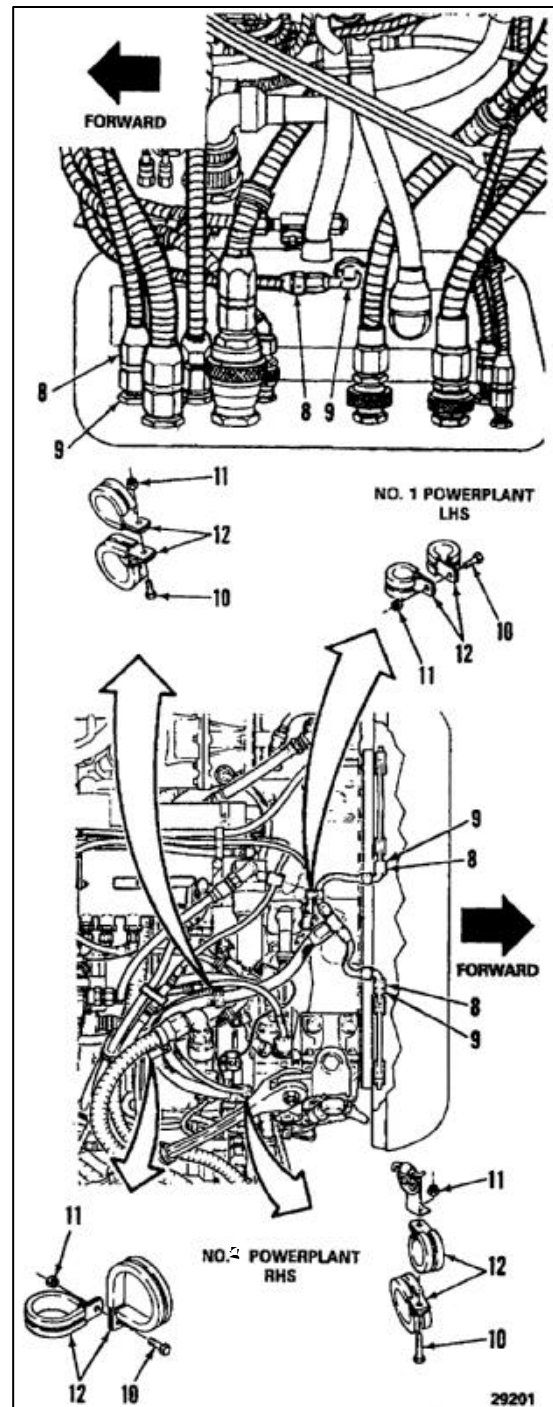
4-142

NO. 1 POWERPLANT

6. Disconnect hoses (8) at fittings (9).
7. Remove four screws (10) and nuts (11) from eight clamps (12).
8. Use tape (E388) to mark clamp locations.
9. Remove hoses (8). Use cloths (E120) to clean spilled water.

FOLLOW-ON MAINTENANCE:

None



END OF TASK

4-471

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Powerplant Repairer's Tool Kit, NSN
5180-00-323-4944

Materials:

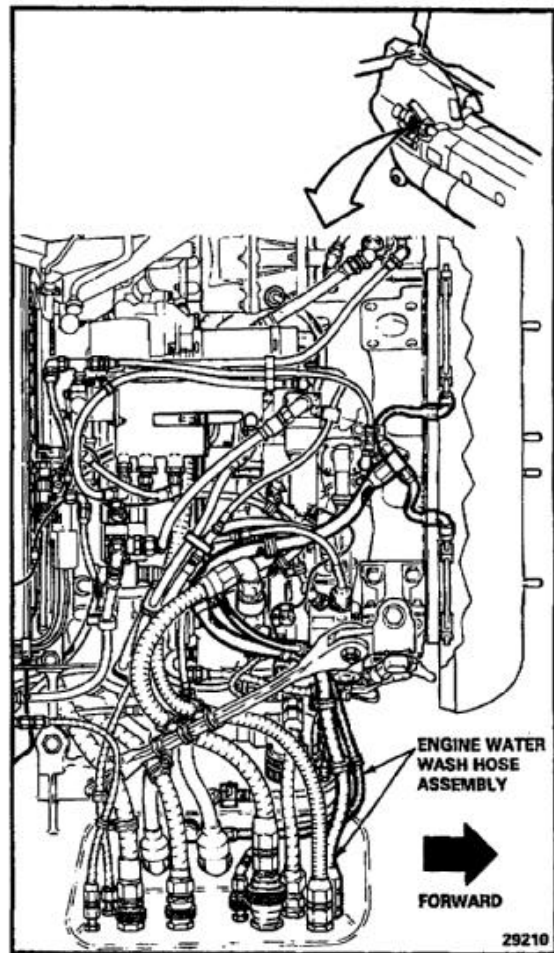
None

Personnel Required:

Aircraft Powerplant Repairer
Inspector

References:

TM 55-1520-240-23P



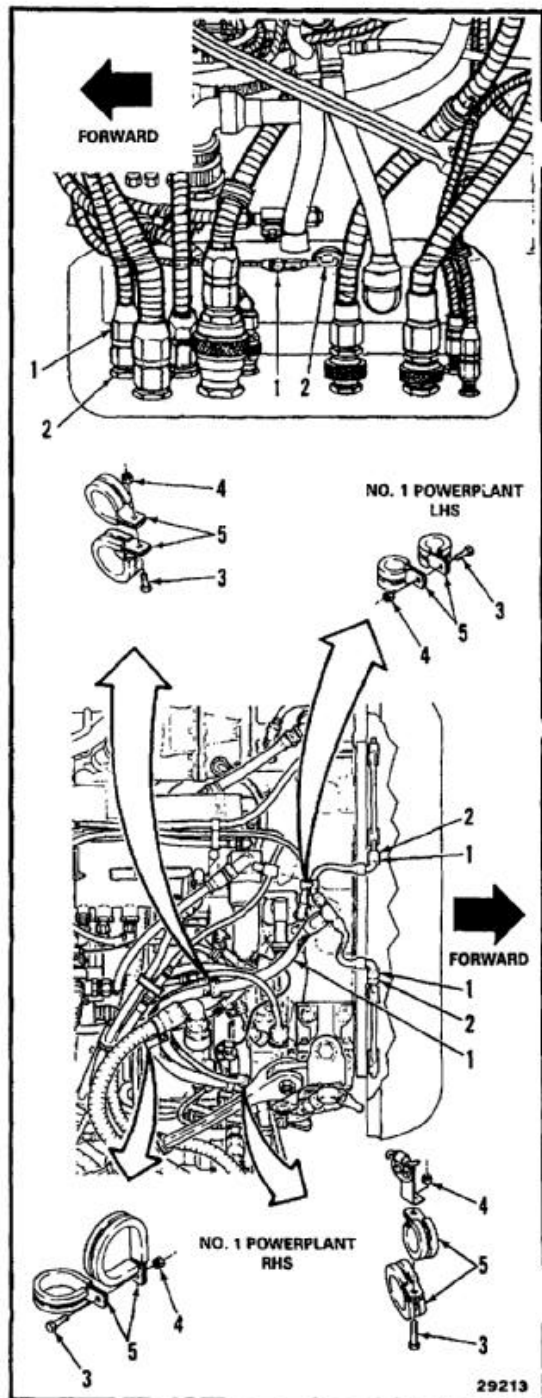
4-143 INSTALL NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-143

NOTE

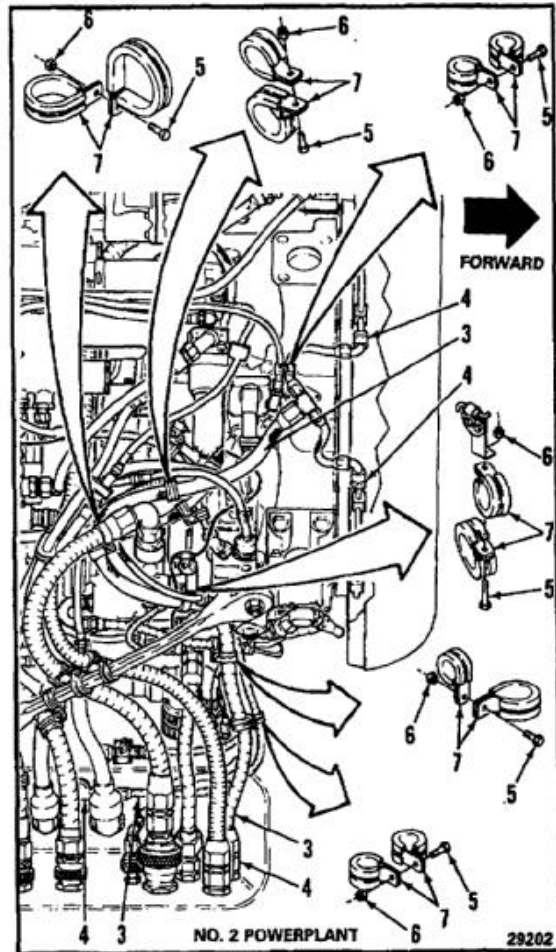
Procedure is same to install engine water wash hoses from No. 1 or No. 2 engine. No. 1 engine is shown here.

1. Install hoses (1) at fittings (2).
2. Install four screws (3), and nuts (4), in eight clamps (5). Remove tape.



NO. 2 POWERPLANT

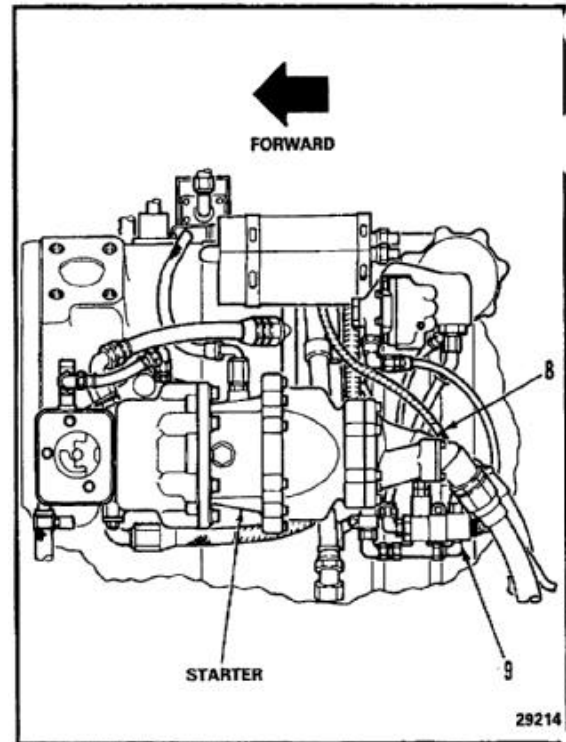
3. Install hoses (3) at fittings (4).
4. Install six screws (5), and nuts (6), in twelve clamps (7). Remove tape.



4-143 INSTALL NO. 1 OR NO. 2 ENGINE WATER WASH HOSE AND AIR PRESSURE HOSE (Continued)

4-143

5. Connect hose (8) at fitting (9).

INSPECT**FOLLOW-ON MAINTENANCE:**

- Close engine access cover (Task 4-50).
- Close engine work platform (Task 2-2).

END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Portable Cleaning and Preservation Unit LTCT
 23980-01 (T-26)
 Stopwatch

Materials:

Cloths (E135)
 Gloves (E184.1)
 Methanol (E243)
 Dry Cleaning Solvent, Type II (E162)
 Water Soluble Cleaner (E466 or E467)

Personnel Required:

Rotary-Wing Aviator (2)
 Medium Helicopter Repairer

References:

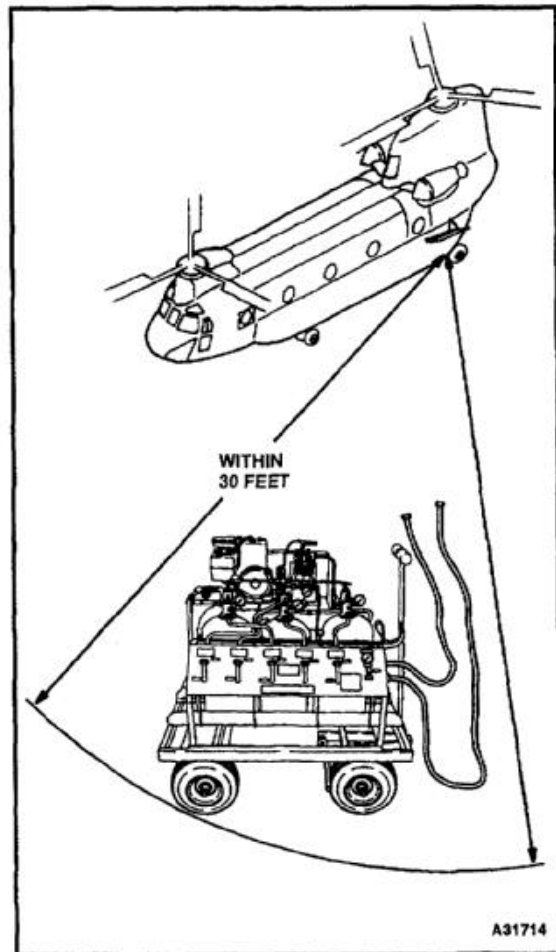
Task 4-145
 Task 4-146
 TM 55-1520-240-10
 Vendor Manual for LTCT 23980-01

Equipment Condition:

Electrical Power On
 Hydraulic Power On
 Engine Work Platform Open (Task 2-2)

General Safety Instructions:

Throughout cleaning operation, ensure combustor drain valve is operative and fluids are drained from combustor before starting engine. Puddling of flammable liquids can cause a hot start.

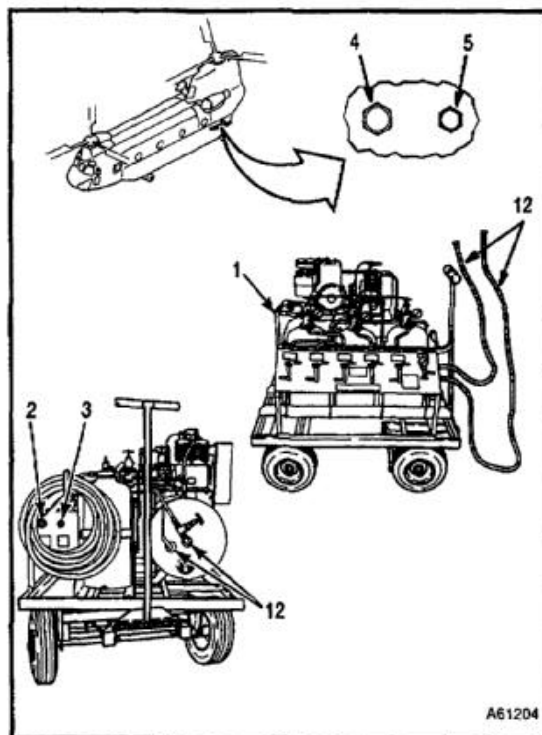


WARNING

Methanol (E243) is flammable and toxic. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. Do not inhale. Do not contact eyes, skin, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

WARNING

Dry cleaning solvent (E162) is combustible and toxic. Avoid contact eyes, skin, or clothing. Avoid inhaling. Use only with adequate ventilation, away from heat open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**NOTE**

At an ambient temperature below **35°F (2°C)**, use a **40 percent** methanol (E243), and **60 percent** water mixture in lieu of fresh water. This will prevent freezing.

If water soluble cleaners (E466 or E467) and dry cleaning solvent (E162) are not available, go to Task 4-145.

Procedure is the same for both No. 1 and No. 2 engine. No. 1 engine shown.

1. Position portable cleaning and preservation unit (1) (T-26) within **30 feet** of aircraft.
2. Install portable cleaning unit hoses (12) on fittings (2 and 3) and on aircraft fittings (4 and 5).

CAUTION

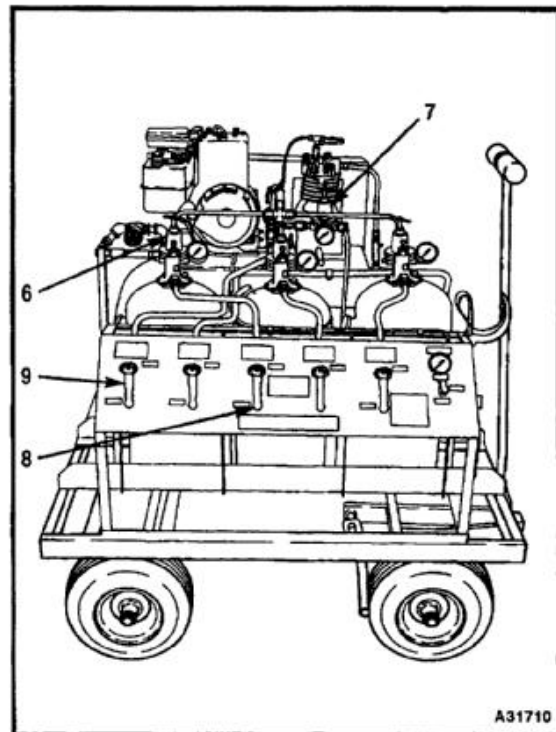
Allow engine to cool for a minimum of **45 minutes** prior to cleaning engine compressor. Cooling period is mandatory to prevent warpage of internal components.

3. Start portable cleaning and preservation unit (1). (Refer to vendor manual.)

4. Adjust cleaner reservoir air regulator (6) to **50 psi** and customer air source regulator (7) to **60 psi** to close bleed band.
5. Motor engine. Position CLEANER valve (8) to OPEN for **20 seconds**. Position CLEANER valve (8) to CLOSE.
6. Stop engine motoring.
7. During engine coastdown, position AIR/PURGE valve (9) to OPEN, until lines are purged of solvent. Position AIR/PURGE valve (9) to CLOSE.

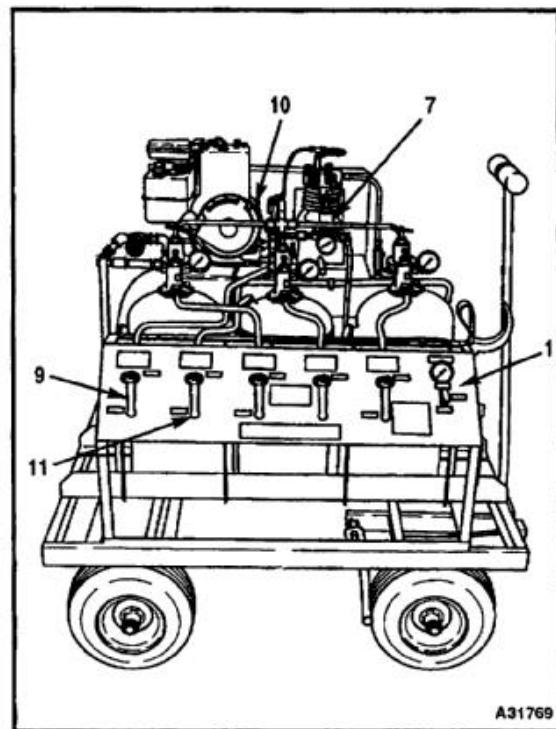
NOTE

Check that outlet pressure gage indicates **35 psi**.



A31710

8. Adjust air regulator (10) to **100 psi**.
9. Motor engine. Position WATER valve (11) to OPEN for **40 seconds**.
10. Stop motoring. Position WATER valve (11) to CLOSE.
11. During engine coastdown, position AIR/PURGE valve (9) to OPEN, until lines are purged of water. Position AIR/PURGE valve (9) to CLOSE.
12. Decrease compressed customer air source valve (7) to **0 psi** open bleed band.
13. Start engine and run at idle for **two minutes** minimum to dry out engine.
14. Shut down engine and portable cleaning and preservation unit (1). (Refer to vendor manual.)

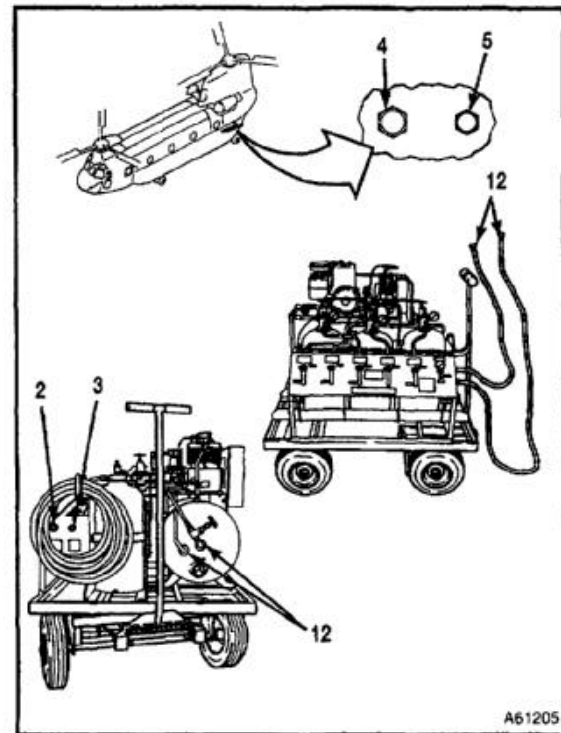


A31769

15. Remove portable cleaning unit hoses (12) from fittings (2 and 3), and from aircraft fittings (4 and 5).

FOLLOW-ON MAINTENANCE:

Perform engine compressor preservation procedure (Task 4-146).



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Stopwatch
 Portable Cleaning and Preservation Unit LTCT
 23980-01 (T-26)

Materials:

Methanol (E243)
 Cloths (E135)

Personnel Required:

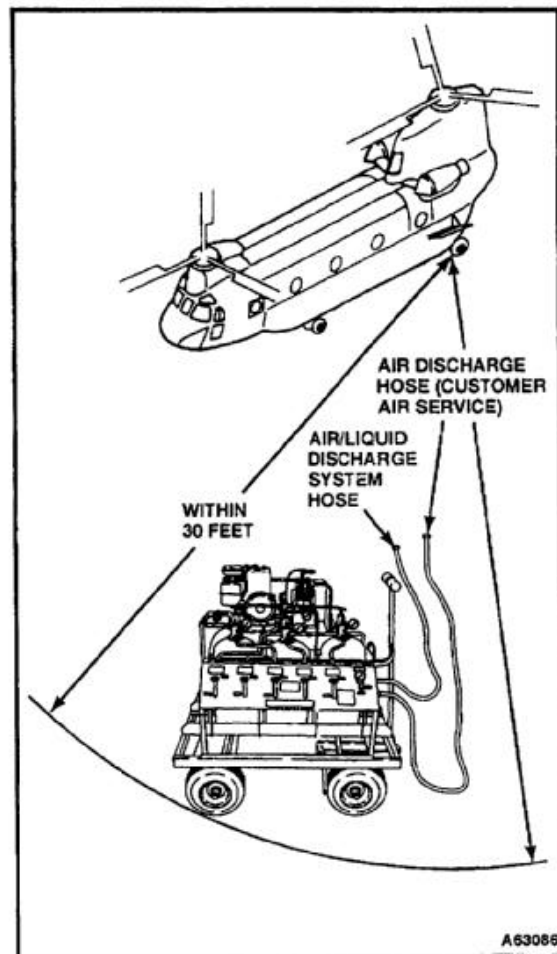
Medium Helicopter Repairer
 Rotary-Wing Aviator (2)
 Inspector

References:

Task 4-146
 TM 55-1520-240-10
 Vendor Manual for LTCT 23980-01

Equipment Condition:

Hydraulic Power On
 Electrical Power On
 Engine Work Platform Open (Task 2-2)
 LTCT 23980-01 (T-26) Connected

**GENERAL SAFETY INSTRUCTIONS:**

Throughout cleaning operation, ensure combustor drain valve is operative and fluids are drained from combustor prior to starting engine.

WARNING

Methanol (E243) is flammable and toxic. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. Do not inhale. Do not contact eyes, skin, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

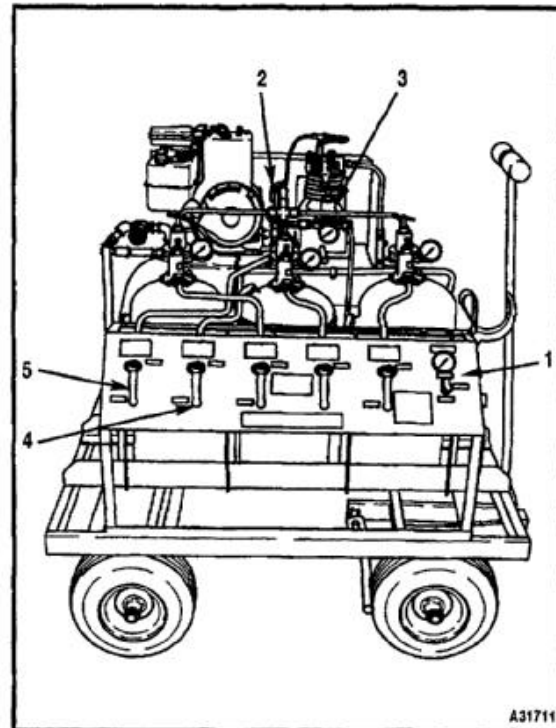
NOTE

This procedure is to be used only for the cleaning of salt deposits, and as an alternate cleaning procedure when water soluble compressor cleaners (E466 or E467) or solvent (E162) are not available.

At an ambient temperature of below **35°F (2°C)**, use a **40 percent** methanol (E243) and **60 percent** water mixture to prevent line freezing.

Procedure is same for No. 1 or No. 2 engine wash. No. 1 engine shown.

1. Start portable cleaning and preservation unit (1) (T-26). (Refer to vendor manual.)
2. Set main air regulator (2) to **100 psi**. Adjust customer air source (3) to **60 psi** to close bleed band.
3. Position WATER valve (4) to OPEN.
4. After **10 seconds**, motor engine for **30 seconds**.
5. Stop motoring the engine, and position WATER valve (4) to CLOSE.
6. During engine coastdown, position AIR/PURGE valve (5) to OPEN until lines are purged of water, then position AIR/PURGE valve (5) to CLOSE.
7. Inspect compressor for cleanliness, repeat steps 3 thru 7 if necessary.

**INSPECT**

8. Decrease compressed customer air source (3) to zero to open bleed band.
9. Start engine and run at idle for **two minutes** minimum to dry out engine.
10. Shut down engine and portable cleaning and preservation unit (1). (Refer to vendor manual.)

FOLLOW-ON MAINTENANCE:

Perform engine compressor preservation procedure (Task 4-146).

END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Portable Cleaning and Preservation Unit LTCT
 23980-01 (T-26)

Materials:

Engine Preservative (E154.1)
 Lockwire (E231)
 Cloths (E135)

Personnel Required:

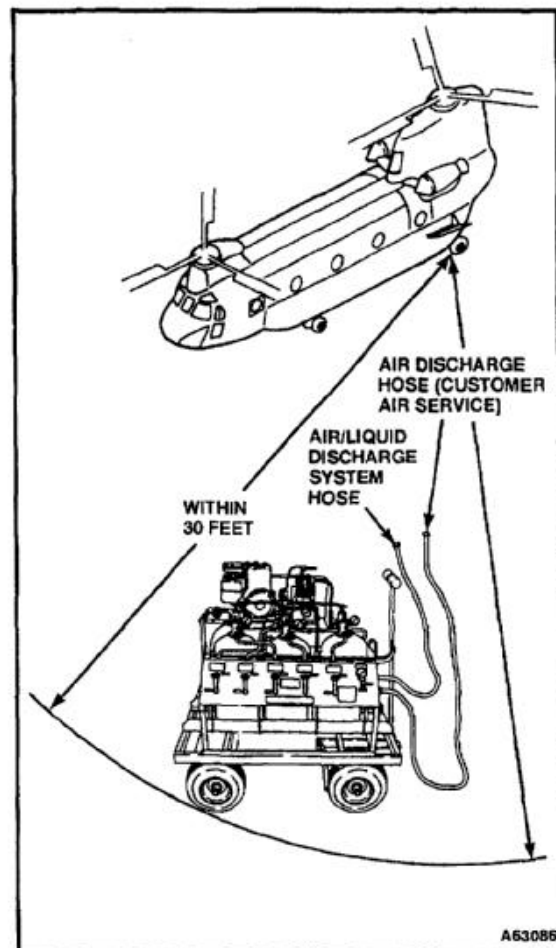
Medium Helicopter Repairer
 Army Rotary Aviator (2)
 Inspector

References:

Vendor Manual for LTCT 23980-01

Equipment Condition:

Engine Work Platform Open (Task 2-2)
 Portable Cleaning and Preservation Unit (T-26)
 Connected
 Task 4-144 or 4-145 Completed
 Hydraulic Power On
 Electrical Power On

**General Safety Instructions:**

Allow engine to cool for a minimum of **45 minutes** prior to preserving the engine compressor. Cooling period is mandatory to prevent warpage of internal components.

WARNING

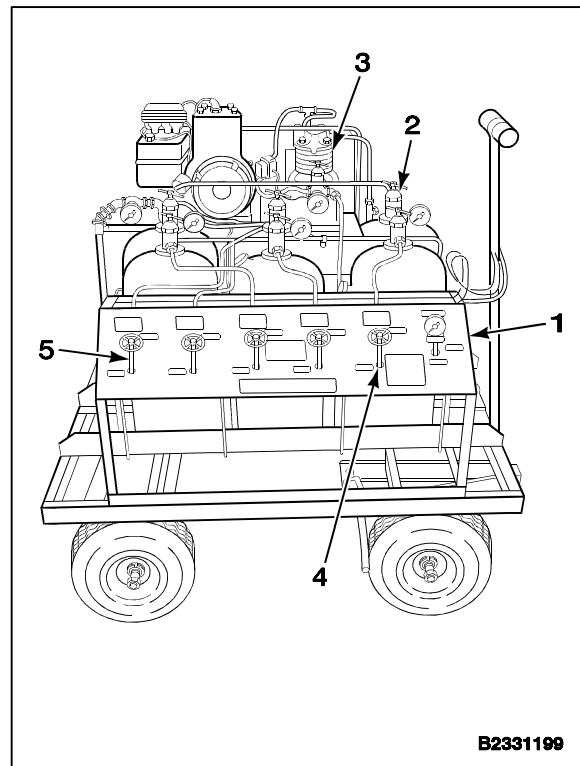
Engine compressor must be cleaned and dry before the compressor can be preserved; otherwise, damage to compressor may occur.

NOTE

Ensure dirt, oil, and salt deposits are removed (Task 4-144 or 4-145) and compressor is dry prior to engine compressor preservation. To preserve use engine preservative (E154.1).

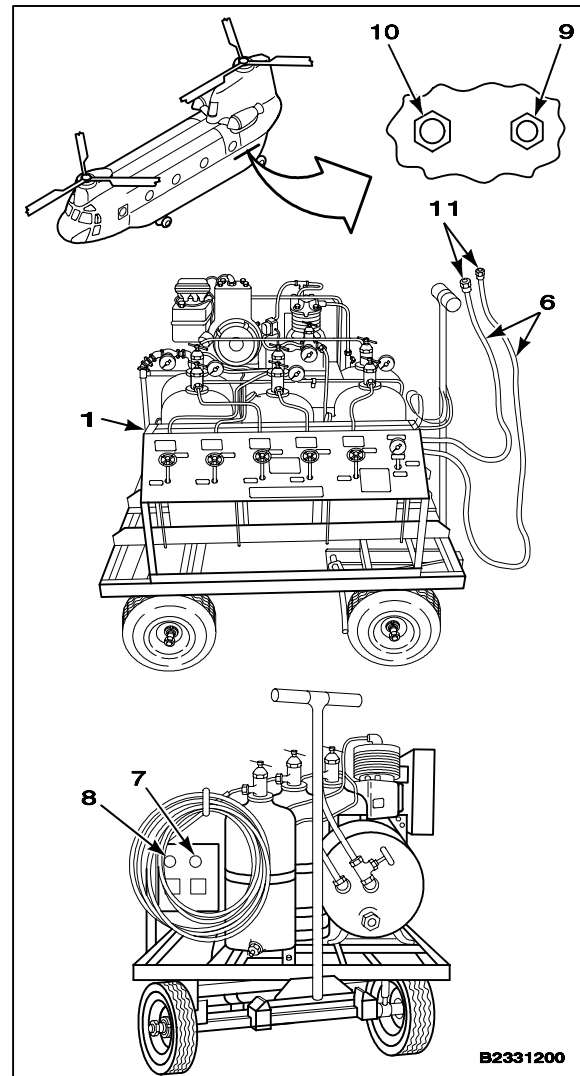
Procedure is same to preserve No. 1 or No. 2 engine compressor. No. 1 engine preservation is shown here.

1. Start portable cleaning and preservation unit (1) (T-26). (Refer to vendor manual.)
2. Adjust preservative reservoir air regulator (2) to **20 psi**.
3. Adjust customer air source regulator (3) to **60 psi** to close bleed band.
4. Motor engine.
5. Position PRESERVATIVE valve (4) to OPEN for **one second**. Immediately position PRESERVATIVE valve (4) to CLOSE.
6. Stop motoring engine.
7. Position AIR/PURGE valve (5) to OPEN until lines are purged of preservative, then position AIR/PURGE valve (5) to CLOSE.



B2331199

8. Shut down portable cleaning and preservation unit (T26) (1). (Refer to vendor manual.)
9. Disconnect hoses (6) from portable cleaning unit fittings (7 and 8) and from aircraft fittings (9 and 10). Clean residual fluid with cloths (E135).
10. Install caps on end fittings of hoses (11), and on fittings (9 and 10).
11. Lockwire (E231) fittings (9 and 10).

**INSPECT****FOLLOW-ON MAINTENANCE:**

- Turn electrical power off.
- Turn hydraulic power off.
- Close engine work platform (Task 2-2).

END OF TASK

SECTION X
FADEC CONTROL SYSTEM (WITH T55-GA-714A ENGINE)

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Electrical Mechanic's Tool Kit, NSN 5180-00-323-4915
 Low Resistance OHM Meter (Biddle) (T7)

Materials:

Cloths (E120)
 Gloves (E184.1)
 Paper Tags (E264)
 Aliphatic Naphtha, Type II (E245)

Personnel Required:

Aircraft Powerplant Repairer (2)
 Inspector

References:

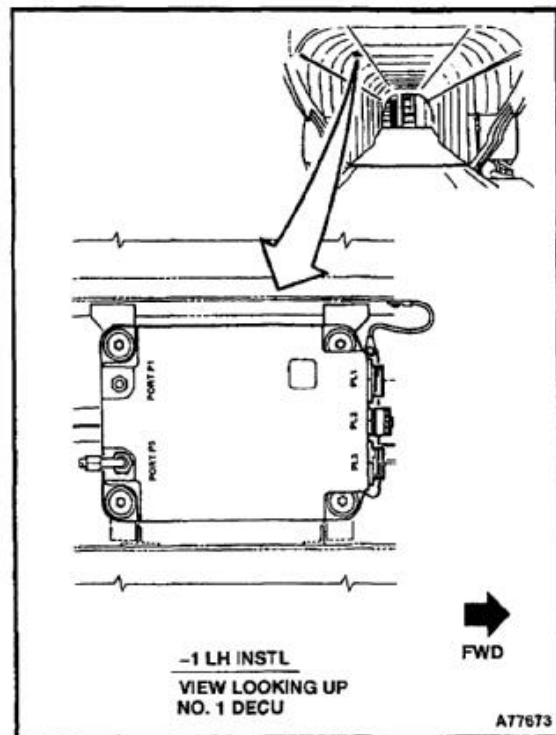
TM 9-6625-975-35

Equipment Condition:

Digital Electronic Control Unit Historical Files
 Downloaded (Task 4-149)
 Electrical Power Off
 Hydraulic Power Off
 Battery Disconnected (Task 1-39)

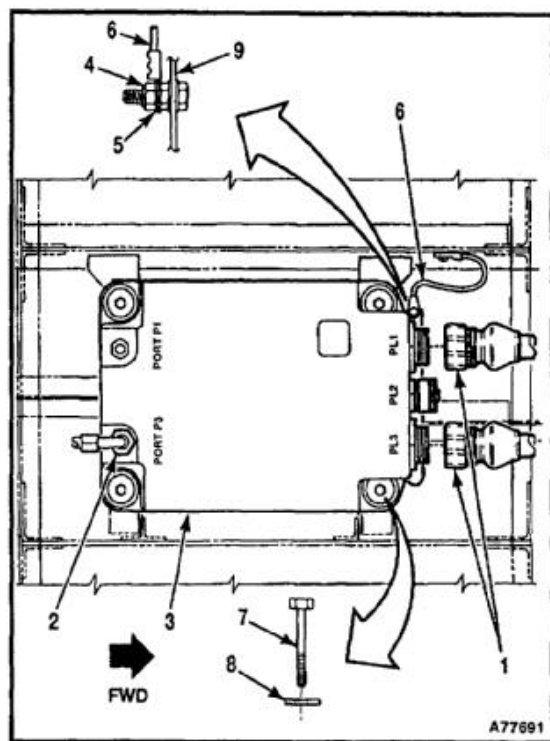
General Safety Instructions:**WARNING**

Aliphatic naphtha (E245) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



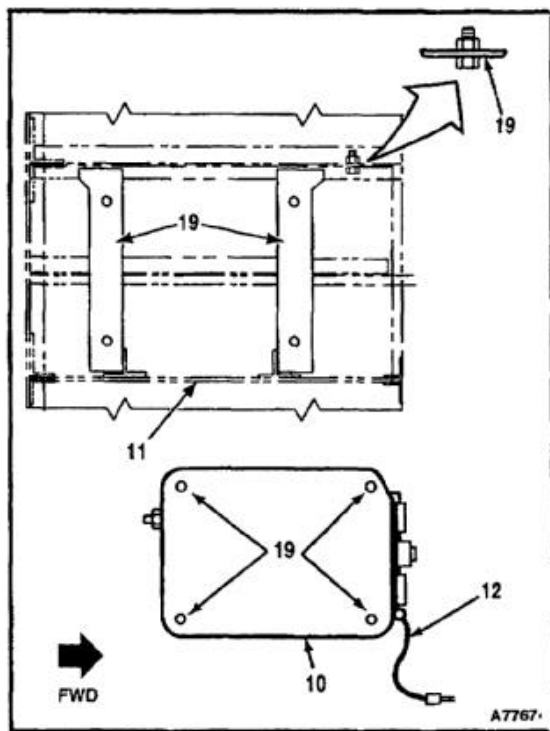
REMOVE

1. Tag and disconnect two electrical connectors (1) and hose (2) from digital electronic control unit (3). Use tags (E264). Cap hose (2).
2. Remove nut (4), washer (5), and bonding jumper (6) from fuselage (9).
3. With helper supporting the digital control unit, remove four bolts (7) and washers (8).
4. Remove digital electronic control unit (3).



INSTALL

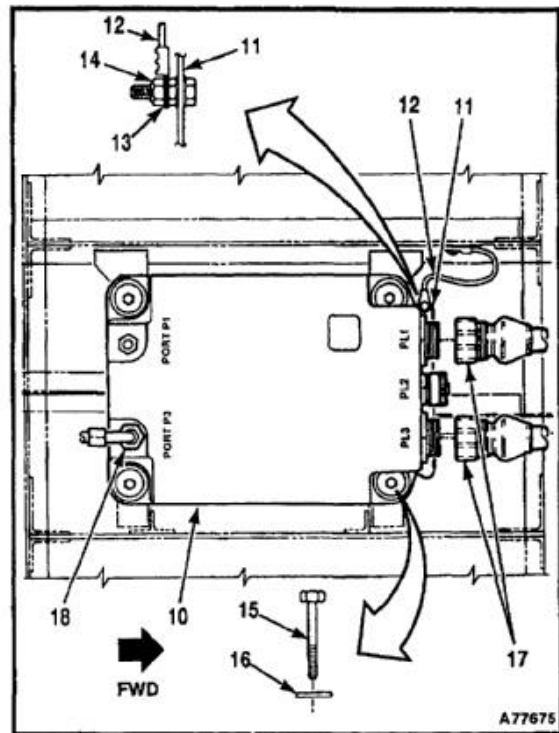
5. Clean bonding and mating surfaces (19) of digital control unit (10), fuselage (11), and bonding jumper (12) with aliphatic naphtha (E245) and cloths (E120). Wear gloves (E184.1).



6. Position digital control unit (10) on fuselage (11).
7. With helper supporting digital electronic control unit (10), install four bolts (15) and washers (16).
8. Install bonding jumper (12) with washer (13) and nut (14).
9. Connect two electrical connectors (17). Remove tags.
10. Remove cap and tag from hose (20). Connect hose (20) to P3 port (18).
11. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between digital control unit (10) and fuselage (11). Resistance shall be no greater than **0.003 ohms**.
12. Using low resistance ohmmeter (T7), perform electrical low bonding check (TM 9-6625-975-35) between bonding jumper (12) and digital control unit (10). Resistance shall be no greater than **0.0025 ohms**.

INSPECT**FOLLOW-ON MAINTENANCE:**

- Digital electronic control unit historical files uploaded (Task 4-149).
- Perform operational check of digital electronic control unit (TM 55-1520-240-T).



END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Electrical Mechanic's Tool Kit, NSN 5180-00-323-4915
 Low Resistance OHM Meter (Biddle) (T7)

Materials:

Gloves (E184.1)
 Cloths (E120)
 Aliphatic Naphtha, Type II (E245)
 Paper Tags (E264)

Personnel Required:

Aircraft Powerplant Repairer (2)
 Inspector

References:

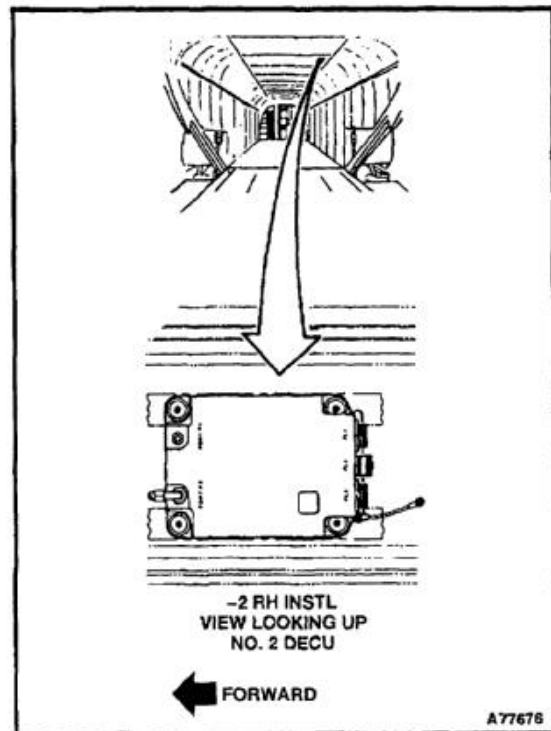
TM 9-6625-975-35

Equipment Condition:

Digital Electronic Control Unit Historical Files
 Downloaded (Task 4-149)
 Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off

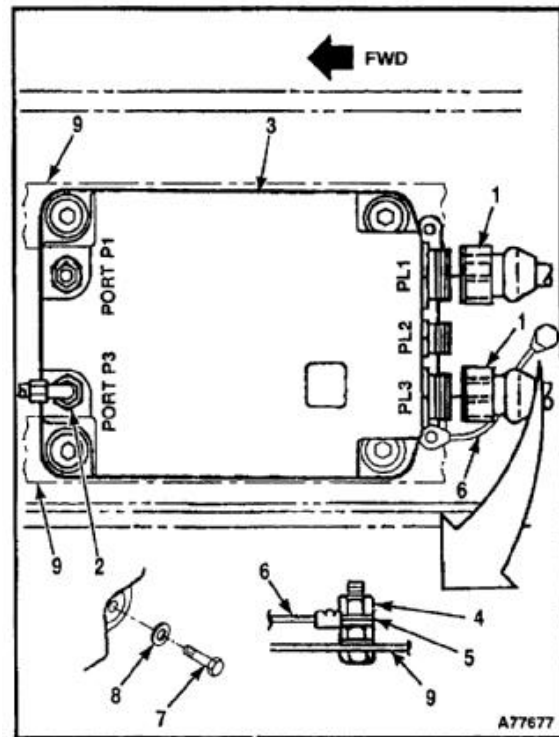
General Safety Instructions:**WARNING**

Aliphatic naphtha (E245) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



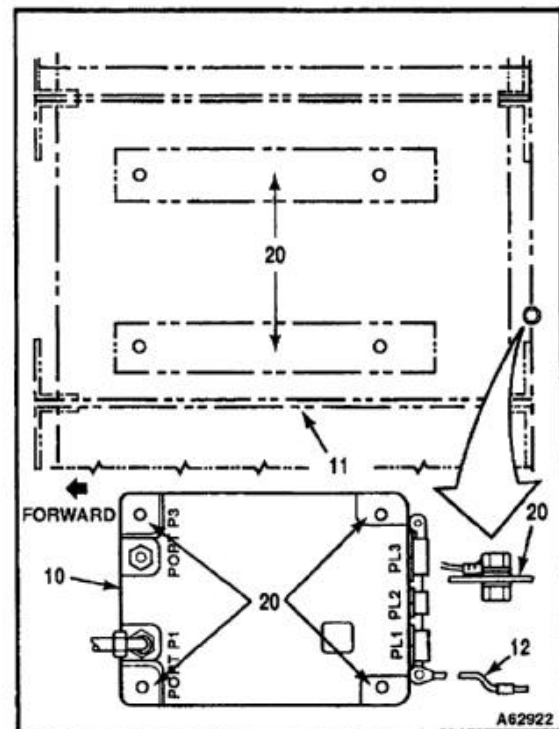
REMOVE

1. Tag and disconnect two electrical connectors (1) and hose (2) from digital electronic control unit (3). Use tags (E264). Cap hose (2).
2. Remove nut (4), washer (5), and bonding jumper (6) from fuselage (9).
3. With helper supporting the digital control unit, remove four bolts (7) and washers (8).
4. Remove digital electronic control unit (3).



INSTALL

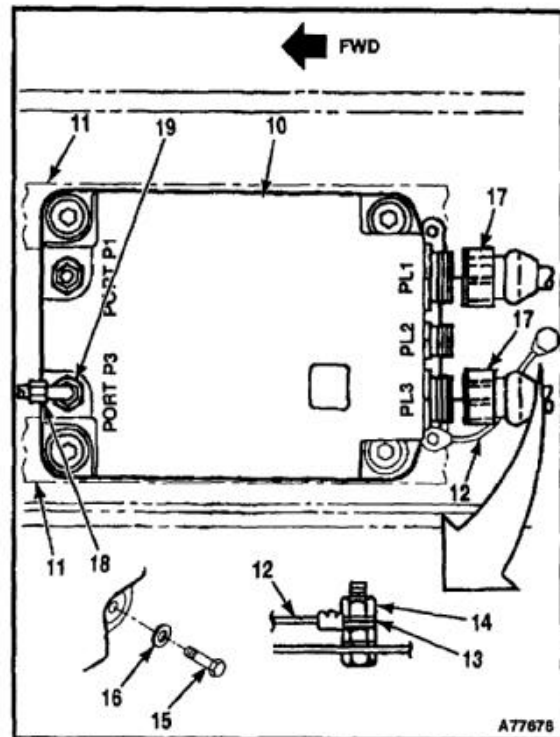
5. Clean bonding surfaces (20) of digital control unit (10), fuselage (11), and bonding jumper (12) with aliphatic naphtha (E245) and cloths (E120). Wear gloves (E184.1).



4-148 REPLACE NO. 2 DIGITAL ELECTRONIC CONTROL UNIT (Continued)

4-148

6. Position digital control unit (10) on fuselage (11).
7. With helper supporting digital electronic control unit (10), install four bolts (15) and washers (16).
8. Install bonding jumper (12) with washer (13) and nut (14).
9. Connect two electrical connectors (17). Remove tags.
10. Remove cap and tag from hose (18). Connect hose (18) to P3 port (19).
11. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between digital control unit (10) and fuselage (11). Resistance shall be no greater than **0.003 ohms**.
12. Using low resistance ohmmeter (T7), perform electrical bonding check (TM 9-6625-975-35) between bonding jumper (12) and digital control unit (10). Resistance shall be no greater than **0.0025 ohms**.

**FOLLOW-ON MAINTENANCE:**

- Digital electronic control unit historical files uploaded (Task 4-149).
- Perform operational check of digital electronic control unit (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-3234915
EMC-32T-2 (Husky)

Materials:

None

Personnel Required:

Aircraft Electrician

References:

Operators Manual EMC-32T-2, Engine Historical
Record Terminal
TM 1-2840-265-23

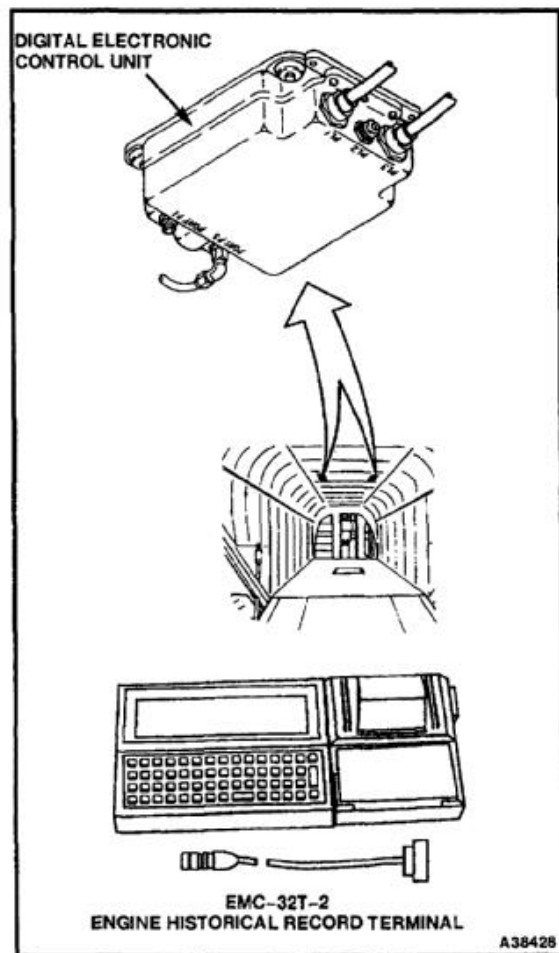
Equipment Condition:

Electrical Power On
ENGINE CONDITION Lever Set to GROUND
PRI/REV Switch on FADEC Panel Set to PRI

General Safety Instructions:

Rough handling of the EMC-32T-2
Engine Historical Record Terminal
could cause damage.

1. Upload or download historical files from the digital electronic control unit (DECU) (TM 1-2840-265-23).



END OF TASK

4-492

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

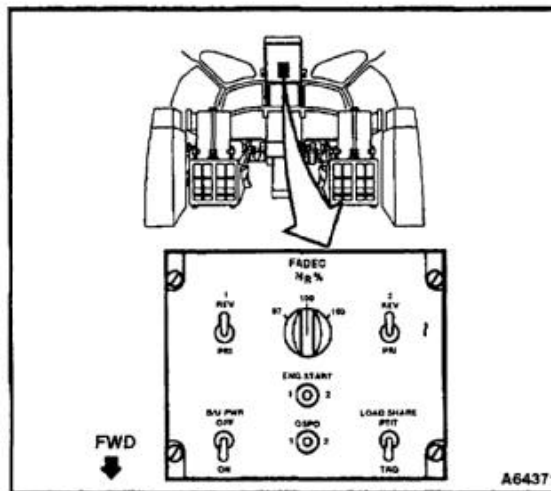
Paper Tags (E264)

Personnel Required:

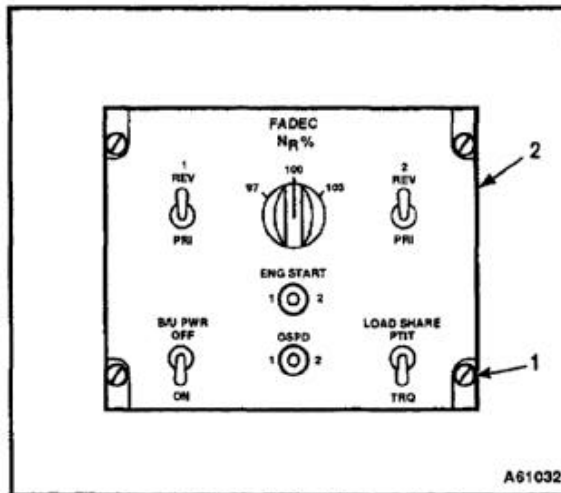
Aircraft Electrician

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off



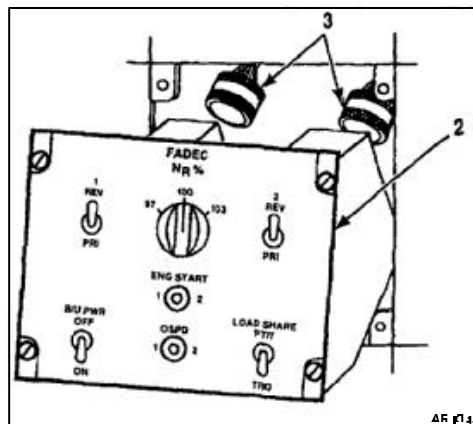
1. Release four fasteners (1) on control panel (2).



2. Lower control panel (2) enough to reach electrical connectors (3). Tag and disconnect two electrical connectors.
3. Remove control panel (2).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

None

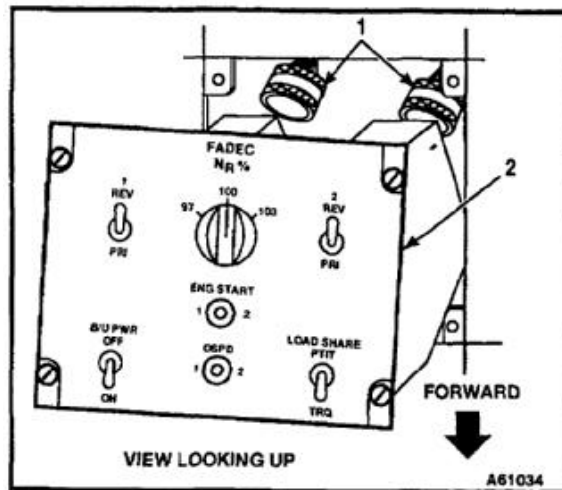
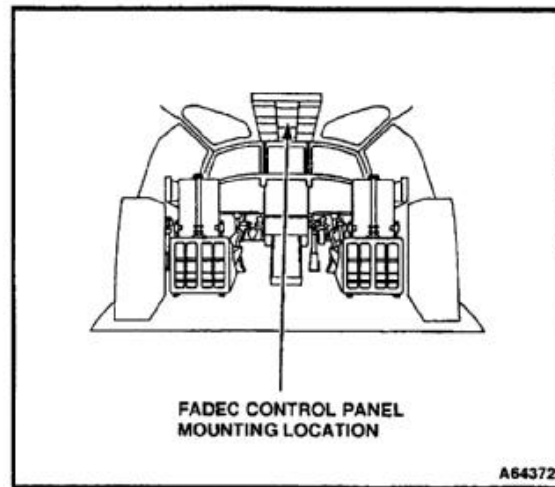
Personnel Required:

Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P
TM 55-1520-240-T

1. Connect two electrical connectors (1) to control panel (2). Remove tags.



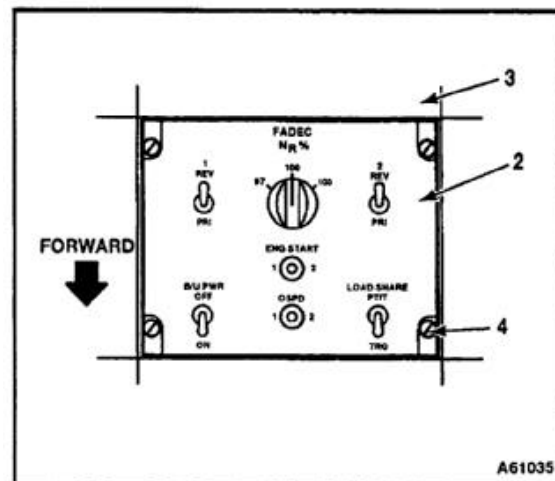
INSPECT

2. Position control panel (2) on overhead panel (3).
3. Secure four fasteners (4).

INSPECT

FOLLOW-ON MAINTENANCE:

Perform operational check of gas producer system (TM 55-1520-240-T).



END OF TASK

4-152 REMOVE THRUST CONTROL POSITION TRANSDUCER ASSEMBLY

4-152

INITIAL SETUP**Applicable Configurations:**With **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

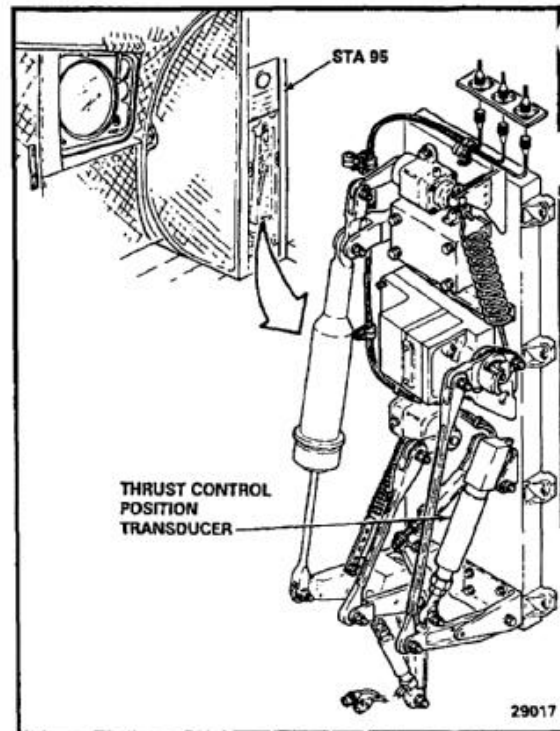
Paper Tags (E264)

Personnel Required:

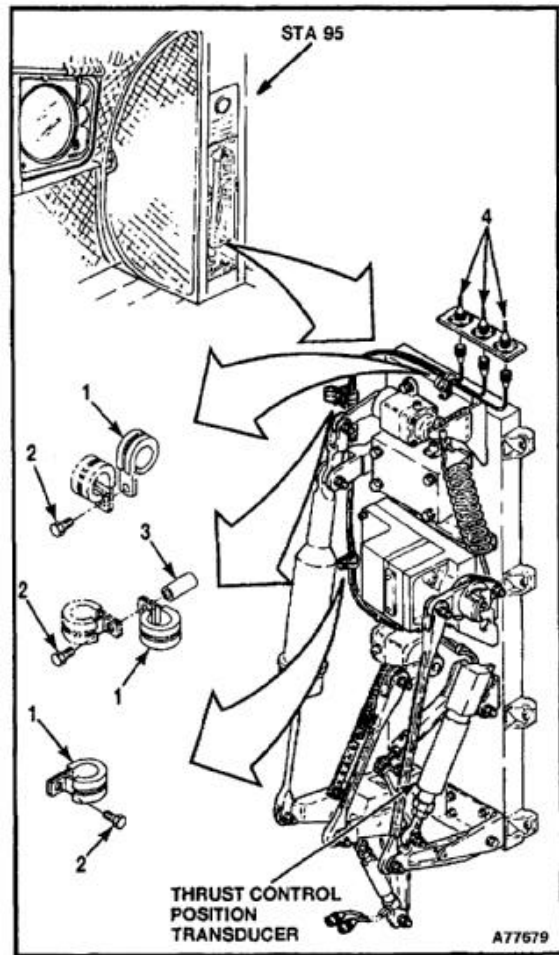
Aircraft Electrician

Equipment Condition:

- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off
- Controls Closet Acoustic Blanket Removed (Task 2-208)
- Controls Closet Panel Removed (Task 2-2)



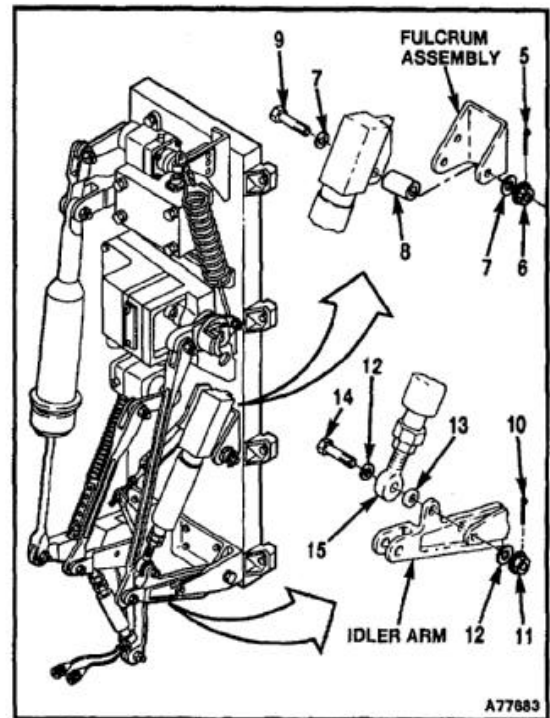
1. Remove five clamps (1), three bolts (2), and one spacer (3).
2. Tag (E264) and disconnect three connectors (4).



4-152 REMOVE THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

4-152

3. Remove cotter pin (5), nut (6), two washers (7), bushing (8), and bolt (9). Discard washers (7).
4. Remove cotter pin (10), nut (11), washers (12), bushing (13), and bolt (14). Discard washers (12).
5. Remove thrust control position transducer assembly (15).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
 Digital Multimeter (T-27)
 LVDT Test Harness (APP E-319)

Materials:

Lockwire (E231)

Parts:

Washers

Personnel Required:

Aircraft Electrician (2)
 Inspector

References:

Task 1-37
 Task 1-38
 TM 55-1520-240-23P
 Appendix E

Equipment Condition:

Electrical Power On
 Hydraulic Power On
 Flight Controls Rigged in Neutral Position (Task 11-33)

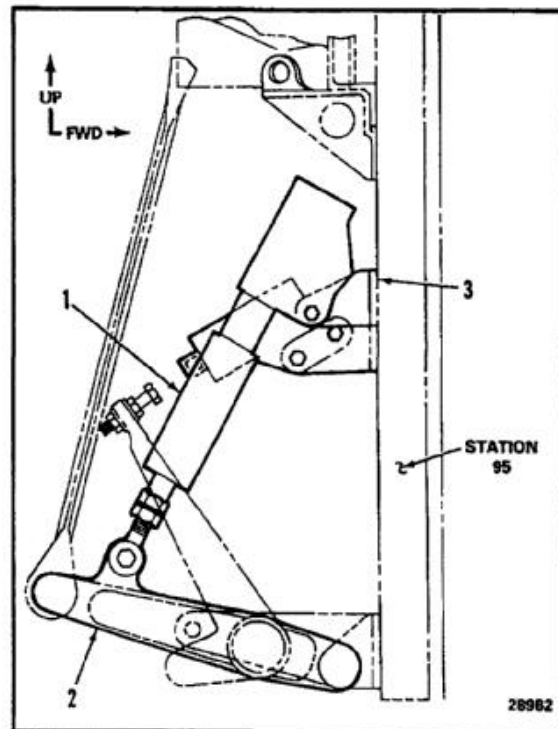
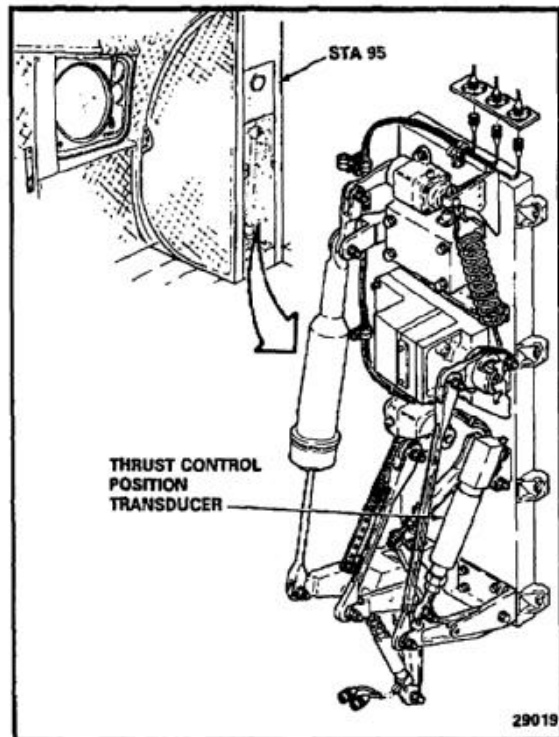
1. Position thrust control position transducer assembly (1) on idler arm (2) and fulcrum (3).



When a light washer is used under the nut prior to applying nut torque, make certain that washer does not hang up in the bolt retaining groove. If this condition is allowed to exist, damage can result to associated hardware and/or prevent proper clamp-up.

NOTE

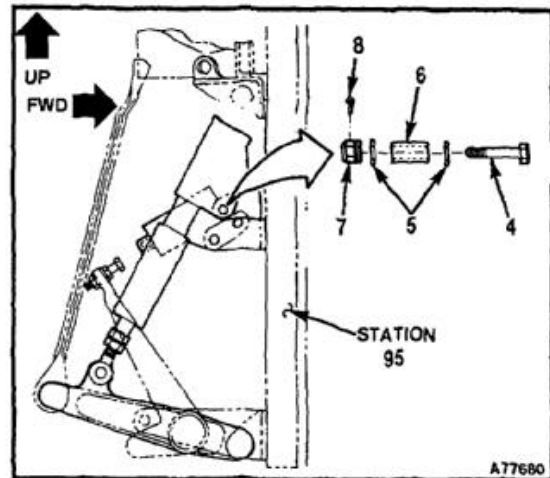
Bolt and nut installation is not acceptable if, after tightening nut to torque value, the bolt and nut assembly can be rotated with a torque less than **10 inch-pounds** and/or any axial looseness exists. If either condition is present, add washer under nut and retorque.



4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

4-153

- Install bolt (4), two new washers (5), bushing (6), nut (7), and cotter pin (8) through fulcrum assembly.



INSPECT

NOTE

Before adjusting thrust control position transducer rod end, ensure that flight controls have been rigged to neutral position (Task 11-33).

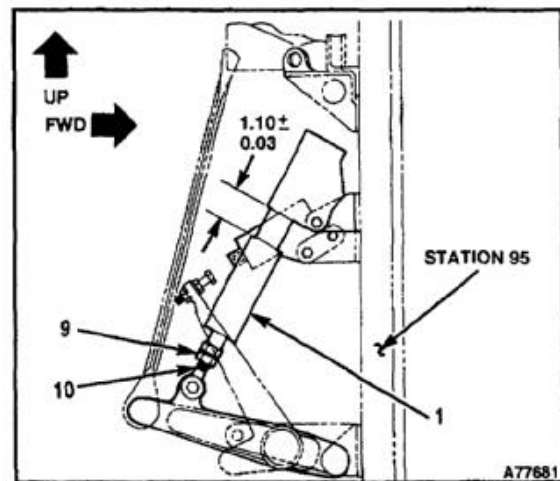
- Loosen jamnut (9). Adjust rod end (10) to achieve clearance dimension of not more than **1.13 inches** or less than **1.07 inches** on thrust control transducer assembly (1).



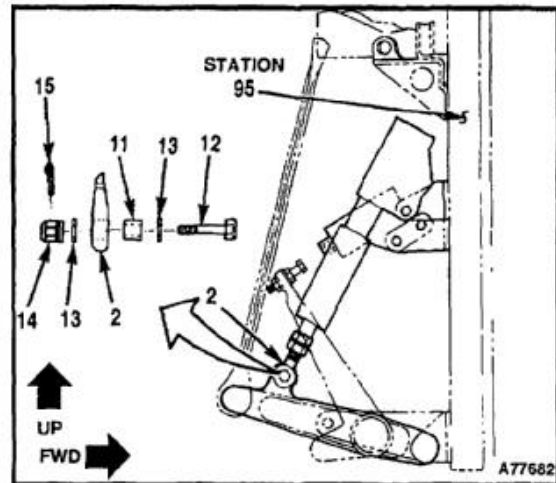
When a light washer is used under the nut prior to applying nut torque, make certain that washer does not hang up in the bolt retaining groove. If this condition is allowed to exist, damage can result to associated hardware and/or prevent proper clamp-up.

NOTE

Bolt and nut installation is not acceptable if, after tightening nut to torque value, the bolt and nut assembly can be rotated with a torque less than **10 inch-pounds** and/or any axial looseness exists. If either condition is present, add washer under nut and retorque.



4. Install bushing (11), bolt (12), two new washers (13), nut (14), and cotter pin (15) through idler arm (2).

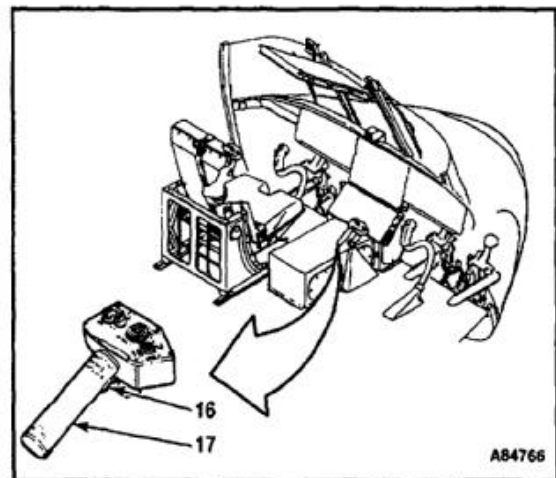


INSPECT

5. With magnetic brake (16) released, depress the pilot thrust lever (17) until contact is made at the thrust lever down stop.
6. Using minimum force required, maintain thrust lever down stop contact.

NOTE

Each cable is banded with a color code on pigtail. Channel 1 cable is banded red, Channel 2 is banded blue, Channel 3 is banded yellow.

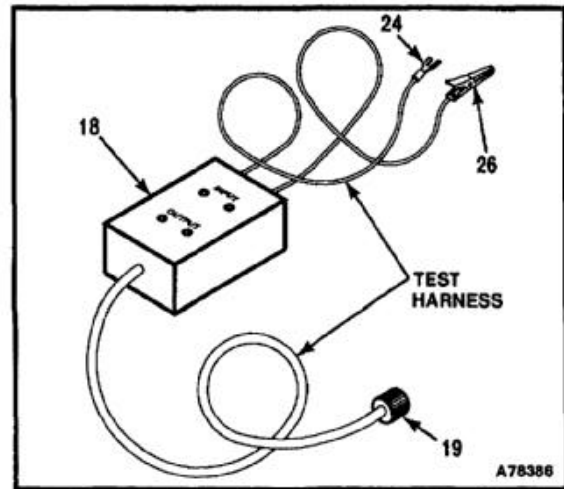


4-153 **INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)**

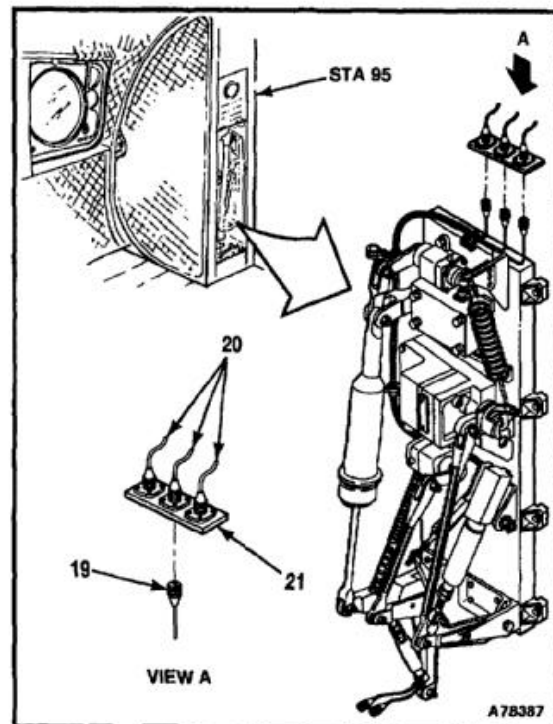
NOTE

Before the collective position sensor rigging can be done, the mechanical flight controls system must be rigged. Refer to Aircraft Rigging Procedure (Task 11-33).

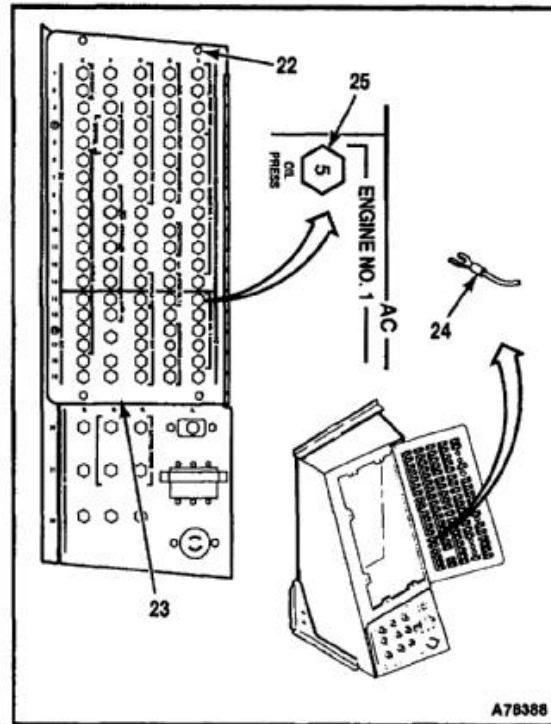
7. Disconnect electrical power (Task 1-37) prior to connecting LVDT test harness (APP E-319).
8. Lay out the two test wire harnesses from test box (18) so that they reach from the cockpit to the flight controls closet at sta. 95.



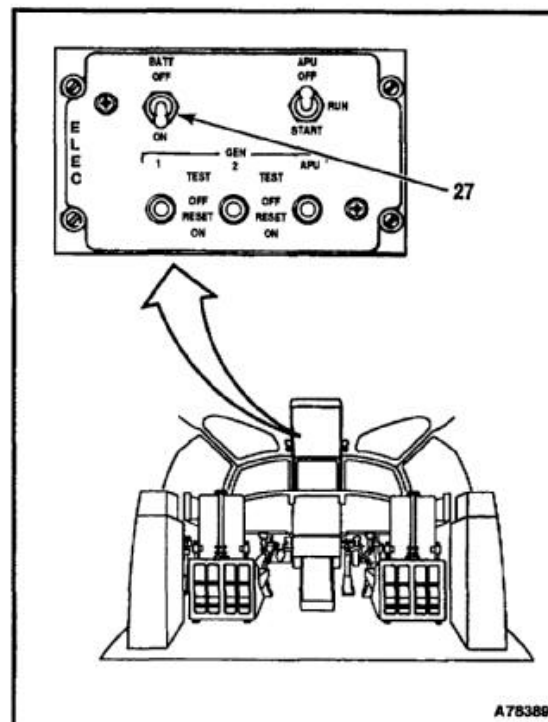
9. At sta. 95, connect test wire harness plug (19) to either red or blue marked channel (20) of the collective pitch LVDT assembly (21), adjacent to connector 104J7.



10. Loosen six fasteners (22) and open No. 1 PDP (23) to gain access to the rear of circuit breaker panel.
11. Attach LVDT test harness power lead lug (24) to rear contact of ENGINE NO. 1 OIL PRESS circuit breaker (25).



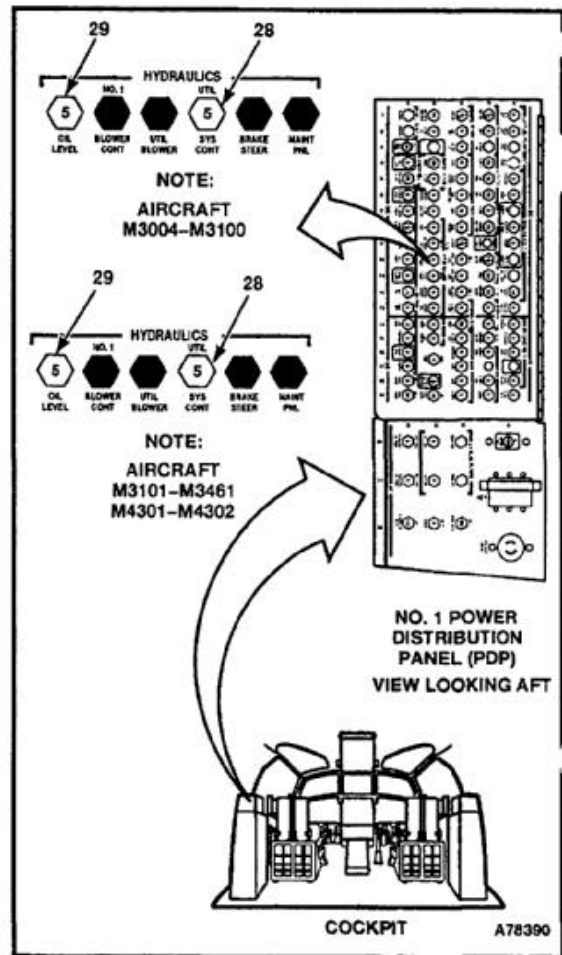
12. Attach LVDT test wire harness ground lead clip (26) to helicopter ground.
13. On the cockpit overhead panel, set the ELECT BATT switch (27) to ON.



4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

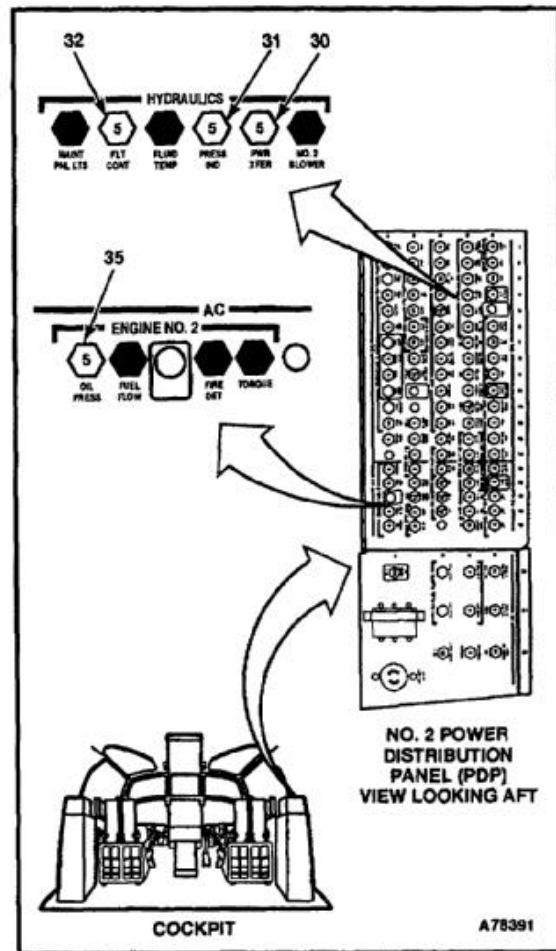
14. Apply electrical power to helicopter (Task 1-37).
15. Apply hydraulic power to helicopter (Task 1-38).
16. Close the following circuit breakers on No. 1 DC PDP:

HYDRAULICS UTIL SYS CONT (28) or
 HYDRAULICS SYS CONT (28)
 HYDRAULICS OIL LEVEL (29)



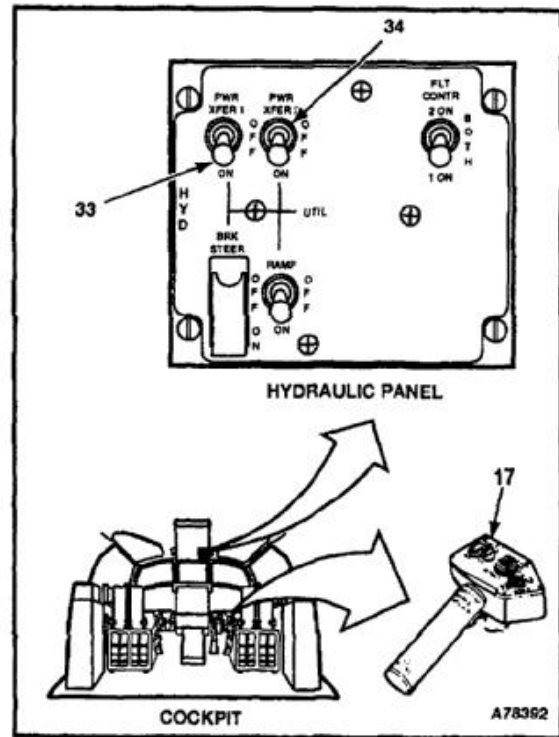
17. Close the following circuit breakers on No. 2 DC PDP:

HYDRAULICS PWR XFER (30)
 HYDRAULICS PRESS IND (31)
 HYDRAULICS FLT CONT (32)

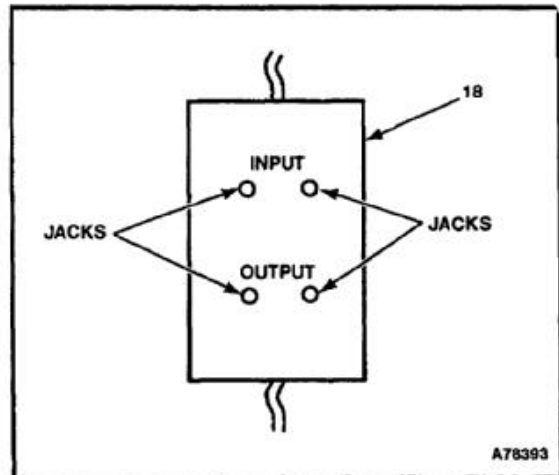


4-153 **INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)**

- 18. On the cockpit overhead panel, set PWR XFR NO. 1 (33) and PWR XFR NO. 2 (34) switches to ON.
- 19. Close the ENGINE NO. 1 OIL PRESS circuit breaker (35) on the No. 1 AC PDP.
- 20. Move the pilot or copilot thrust lever (17) to the full down position, hard against the stop.



- 21. Connect a multimeter to the LVDT test box (18) input jacks. Measure the input voltages at pins 1 and 2 and pins 6 and 7. Input voltages shall be **26.000 to 29.000 vac**.
- 22. Record the readings to three decimal places.
- 23. Connect a multimeter to the LVDT test box (18) output jacks. Measure the output voltages at pins 3 and 4 and pins 8 and 9.
- 24. The output voltage readings shall be within the Max and Min range that corresponds to the input voltage shown in the table on the following page. For example, if the input voltage is **27.70 vac**, the output voltage should be between **1.928 and 1.920 vac**.



4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

Input Voltage (Vac)	Output Voltage (Vac)	
	Max	Min
26.00	1.809	1.802
26.05	1.813	1.805
26.10	1.816	1.809
26.15	1.820	1.812
26.20	1.823	1.816
26.25	1.827	1.819
26.30	1.830	1.823
26.35	1.834	1.826
26.40	1.837	1.830
26.45	1.841	1.833
26.50	1.844	1.836
26.55	1.848	1.840
26.60	1.851	1.843
26.65	1.855	1.847
26.70	1.858	1.850
26.75	1.862	1.854
26.80	1.865	1.857
26.85	1.868	1.861
26.90	1.872	1.864
26.95	1.875	1.868
27.00	1.879	1.871
27.05	1.882	1.875
27.10	1.886	1.878
27.15	1.889	1.881
27.20	1.893	1.885
27.25	1.896	1.888
27.30	1.900	1.892
27.35	1.903	1.895
27.40	1.907	1.899
27.45	1.910	1.902
27.50	1.914	1.906

Input Voltage (Vac)	Output Voltage (Vac)	
	Max	Min
27.50	1.914	1.906
27.55	1.917	1.909
27.60	1.921	1.913
27.65	1.924	1.916
27.70	1.928	1.920
27.75	1.931	1.923
27.80	1.935	1.927
27.85	1.938	1.930
27.90	1.942	1.933
27.95	1.945	1.937
28.00	1.949	1.940
28.05	1.952	1.944
28.10	1.955	1.947
28.15	1.959	1.951
28.20	1.962	1.954
28.25	1.966	1.958
28.30	1.969	1.961
28.35	1.973	1.965
28.40	1.976	1.968
28.45	1.980	1.972
28.50	1.983	1.975
28.55	1.987	1.979
28.60	1.990	1.982
28.65	1.994	1.985
28.70	1.997	1.989
28.75	2.001	1.992
28.80	2.004	1.996
28.85	2.008	1.999
28.90	2.011	2.003
28.95	2.015	2.006
29.00	2.018	2.010

**4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER
ASSEMBLY (Continued)**

4-153

25. If the voltages do not fall within those specified in the table, remove the safety wire, and adjust the LVDT until voltage is within range limits.

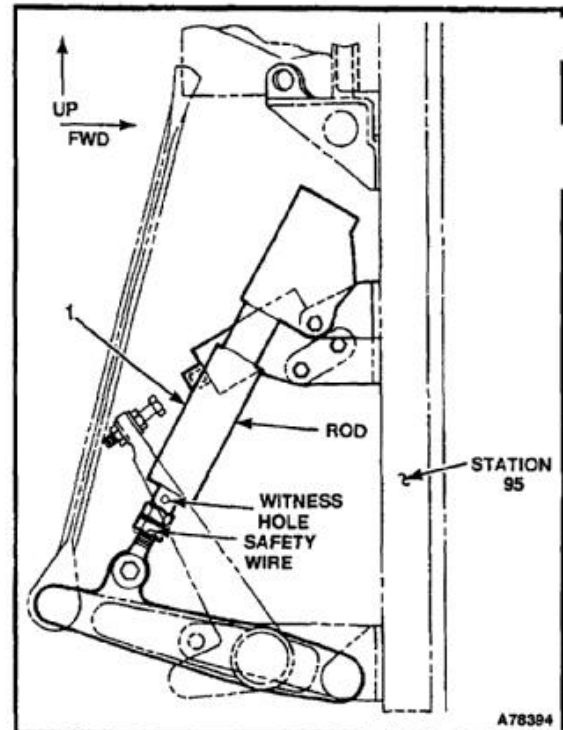
NOTE

Ensure that the threads of the rod end can be seen through the witness hole.
If the threads are not visible, a new rod will be required.

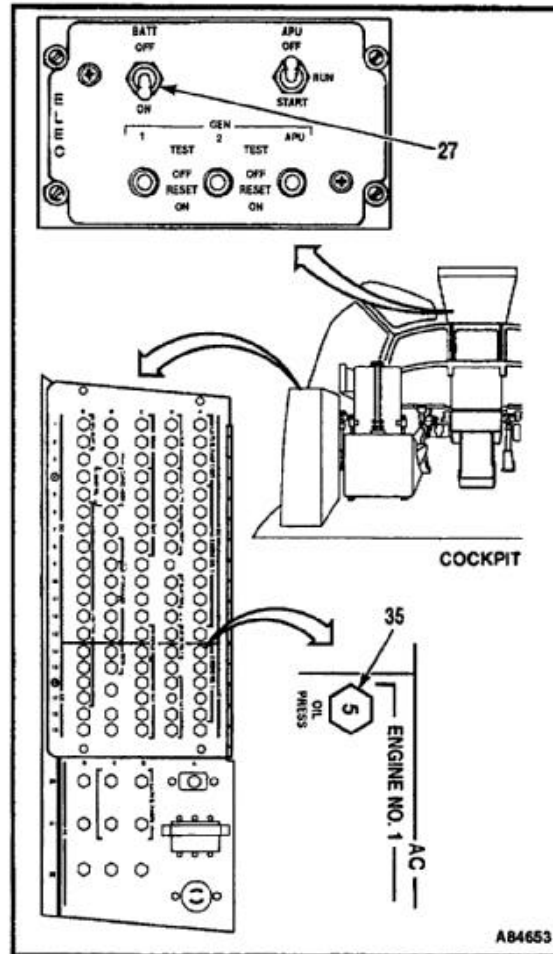
26. Lockwire the rod end after adjustment is completed. Use lockwire (E231).

INSPECT

27. Ensure that the voltage ranges are correct.
Repeat steps 20 thru 24.



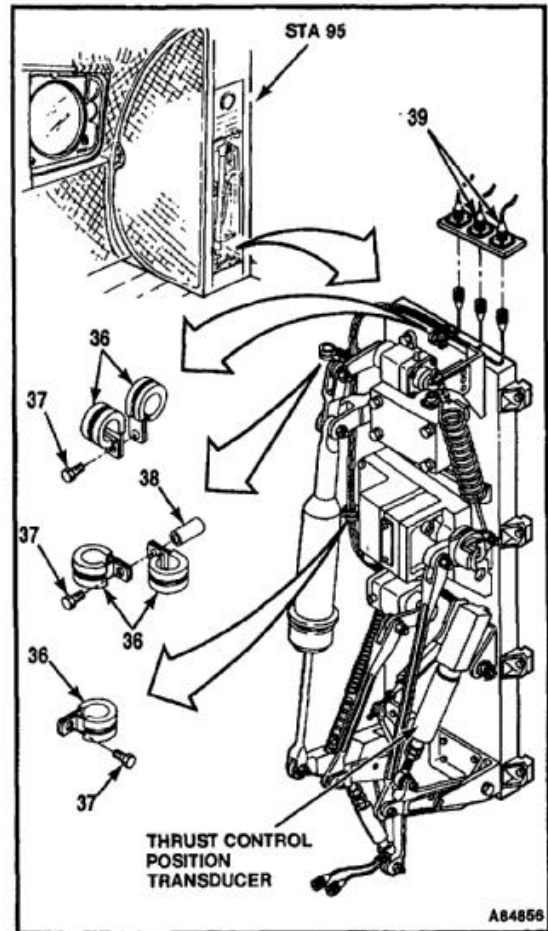
28. Open ENGINE NO. 1 OIL PRESS circuit breaker (35) on the No. 1 AC PDP.
29. Remove electrical power from the aircraft (Task 1-37).
30. Set the BATT switch (27) to OFF.
31. Remove hydraulic power from the aircraft (Task 1-38).
32. Disconnect and remove the LVDT test harness. Close the No. 1 PDP and tighten six fasteners.
33. Stow the appropriate channel of the collective pitch LVDT assembly.



4-153 INSTALL AND RIG THRUST CONTROL POSITION TRANSDUCER ASSEMBLY (Continued)

4-153

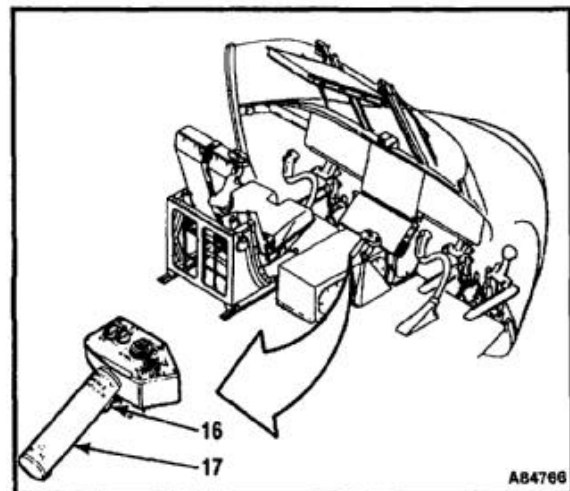
34. Install five clamps (36). Secure clamps (36) with bolts (37) and spacer (38).
35. Connect tagged electrical connectors (39) to their respective receptacles.



36. Release thrust lever (17) and engage magnetic brake (16).

FOLLOW-ON MAINTENANCE:

Install controls closet acoustic blanket (Task 2-210).
 Install controls closet panel (Task 2-2).
 Perform operational check of thrust control position transducer (TM 55-1520-240-T).



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

Paper Tags (E264)

Personnel Required:

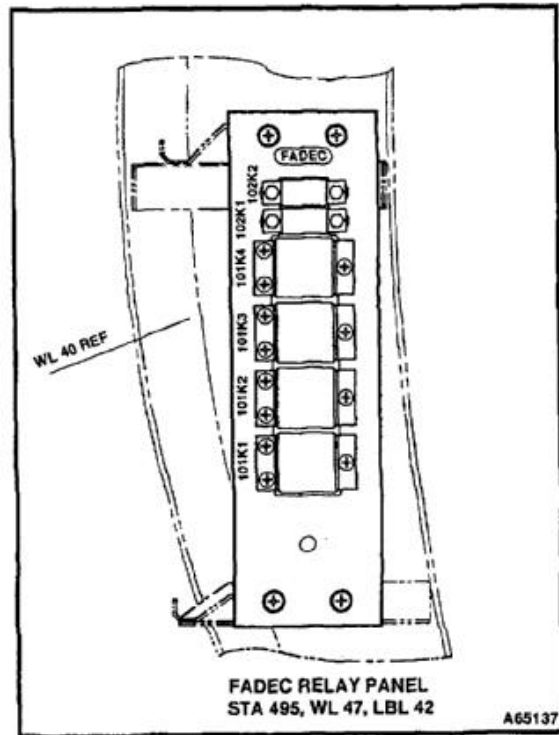
Aircraft Electrician

References:

TM 55-1520-240-23P

Equipment Condition:

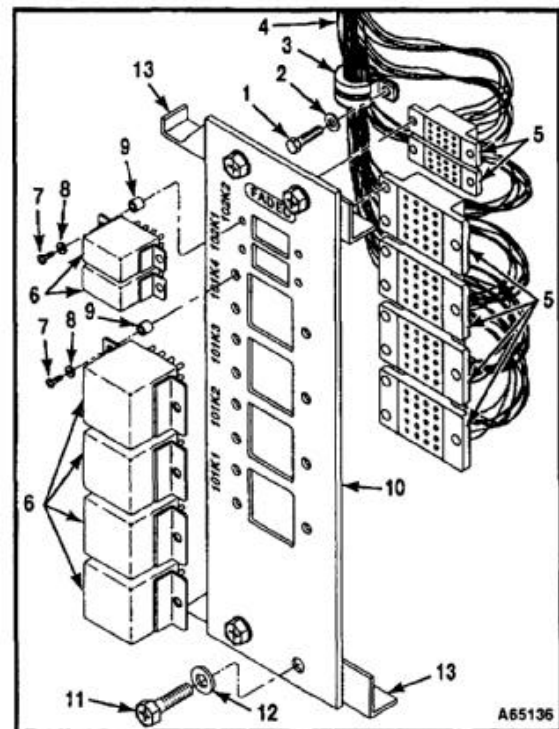
- Battery Disconnected (Task 1-39)
- Electrical Power Off
- Hydraulic Power Off



1. Remove screw (1) and washer (2) from clamp (3).
2. Remove clamp (3) from wire bundle (4).
3. Tag and disconnect six connectors (5) from relays (6). Use tags (E264).
4. Remove screws (7), washers (8), and spacers (9) from relays (6).
5. Remove relays (6) from FADEC relay panel (10).
6. Remove screws (11) and washers (12) from FADEC relay panel (10).
7. Remove FADEC relay panel (10) from mounting brackets (13).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

None

Personnel Required:

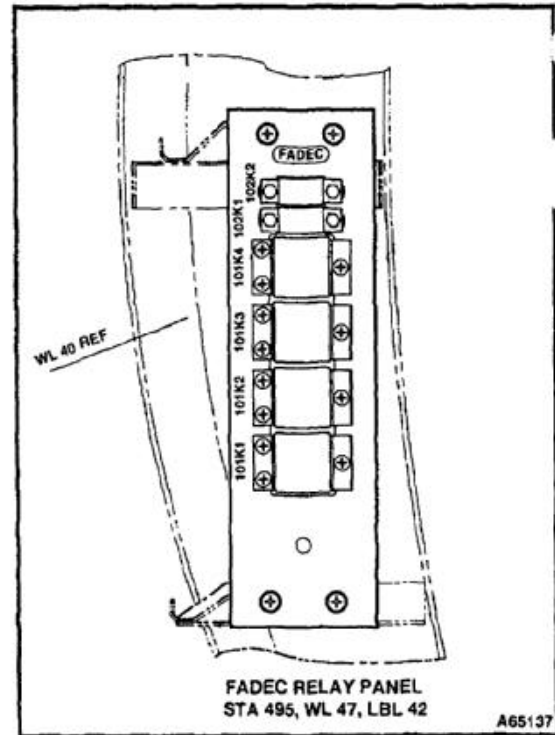
Aircraft Electrician
Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

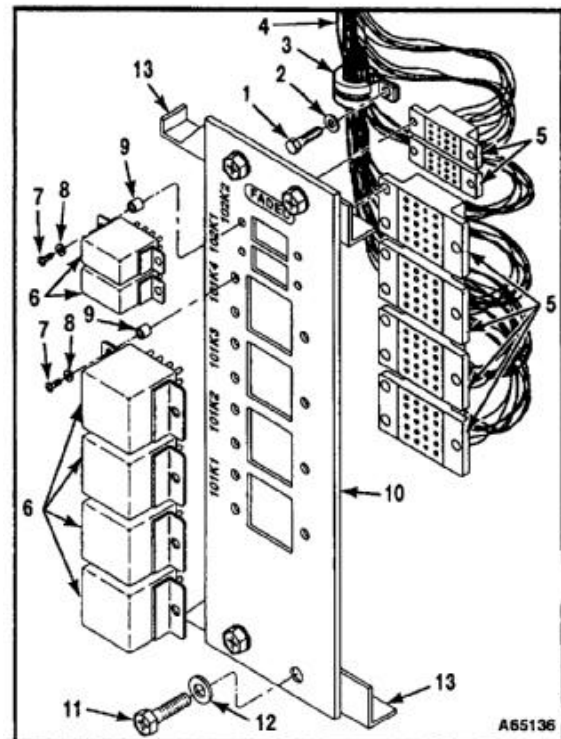
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Position FADEC relay panel (10) on mounting bracket (13).
2. Install screws (11) and washers (12) on FADEC relay panel (10).
3. Position relays (6) on FADEC relay panel (10).
4. Install screws (7), washers (8), and spacers (9) on relays (6).
5. Connect six connectors (5) to relays (6). Remove tags.
6. Position clamp (3) on wire bundle (4).
7. Install screw (1) and washer (2) on clamp (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:

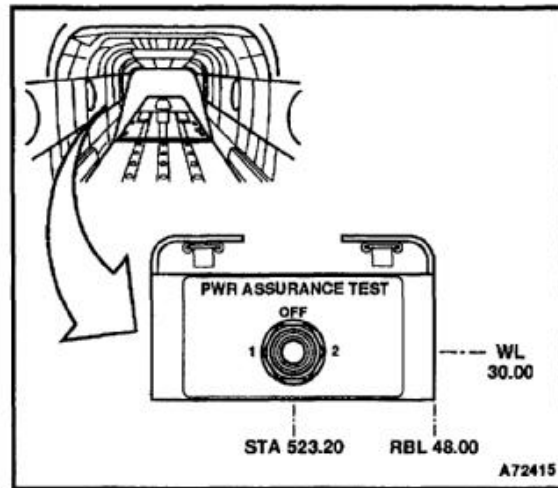
Paper Tags (E264)

Personnel Required:

Aircraft Electrician

Equipment Condition:

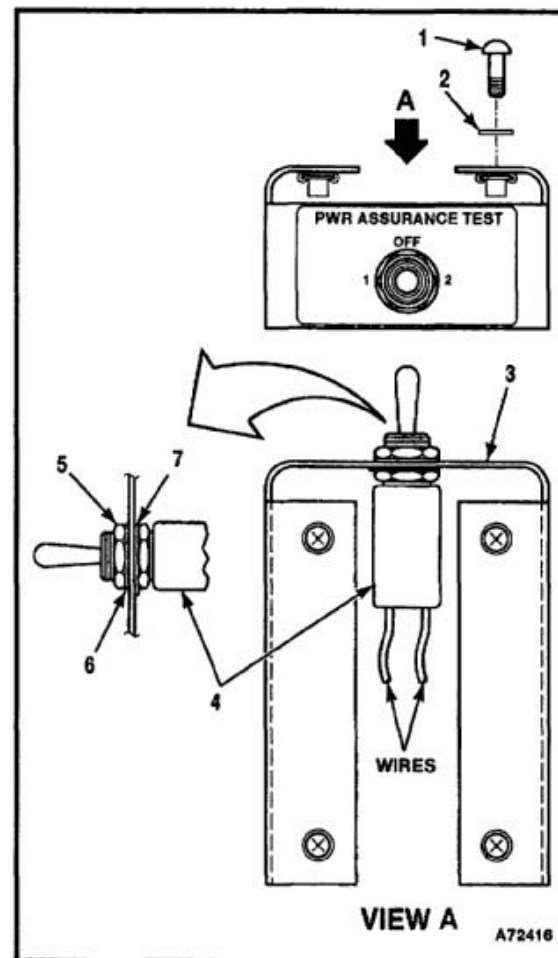
Battery Disconnected (Task 1-39)
Electrical Power Off



1. Remove screws (1) and washers (2) from panel (3).
2. Tag and disconnect wires from the test switch (4).
3. Remove nut (5) and lockwasher (6).
4. Remove switch (4) and lockring (7) from panel (3).

FOLLOW-ON MAINTENANCE:

None



END OF TASK

INITIAL SETUP

Applicable Configurations:With **74****Tools:**

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Ohmmeter

Materials:

Paper Tags (E264)

Personnel Required:

Aircraft Electrician

References:

TM 9-6625-975-35
TM 55-1520-240-T

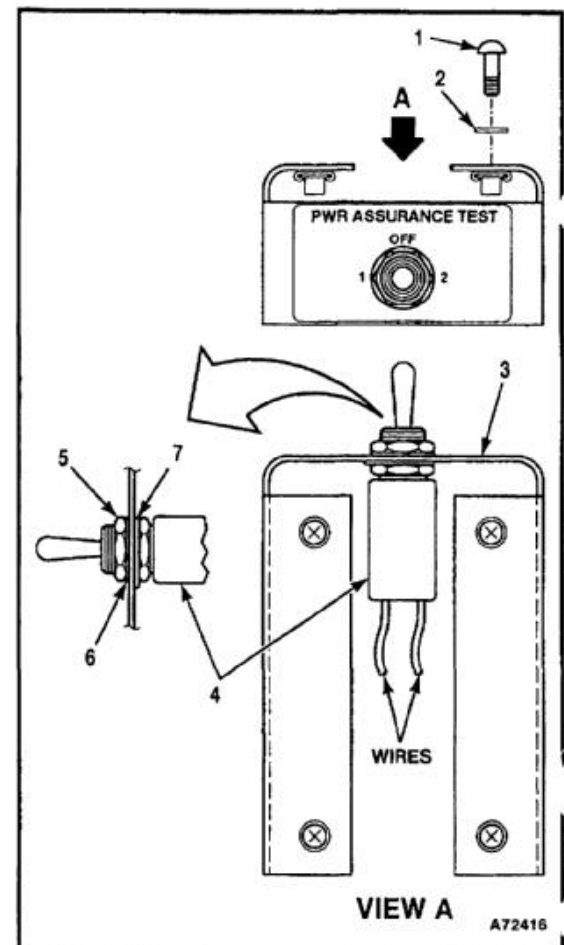
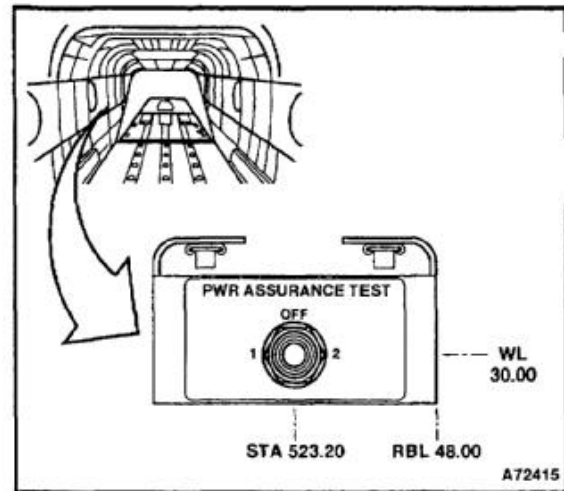
Equipment Condition:

Battery Disconnected (Task 1-39)
Electrical Power Off

1. Position switch (4) and lockring (7) on panel (3).
2. Install lockwasher (6) and nut (7) on the switch (4).
3. Attach the wires to the switch (4). Discard the tags.
4. Position the panel (3) and install the washers (2) and screws (1).
5. Perform bonding and grounding check per TM 9-6625-975-35. The maximum resistance between the switch (4) and the panel (3) is **0.0025 ohms**.

FOLLOW-ON MAINTENANCE:

Perform the operational check of the power assurance test switch (TM 55-1520-240-T).



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Fuel Resistant Container, 2 Gallon
 Hose (APP E-317)

Materials:

Cloths (E121)
 Gloves (E184.1)

Personnel Required:

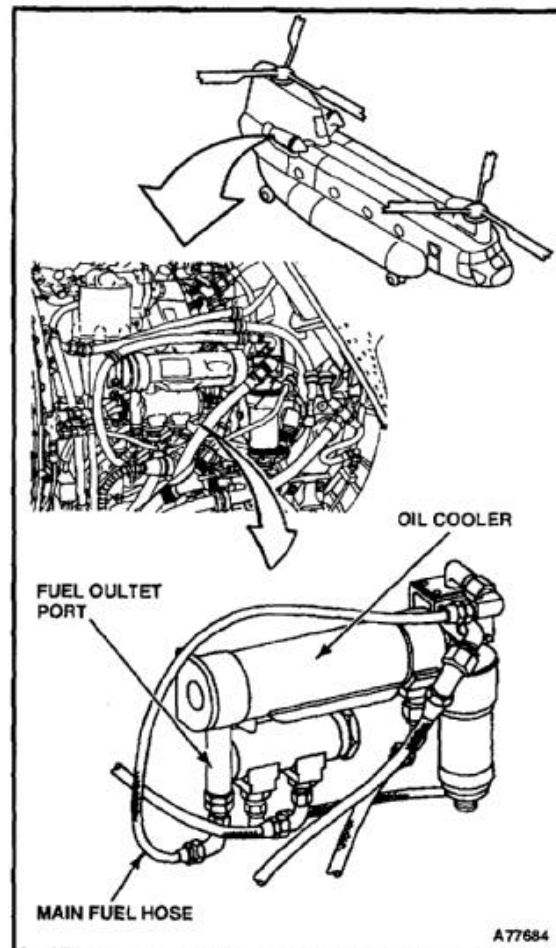
Army Rotary-Wing Aviator (2)
 Medium Helicopter Repairer
 Inspector

References:

TM 55-1520-240-10
 TM 1-2840-265-23
 Appendix E

Equipment Condition:

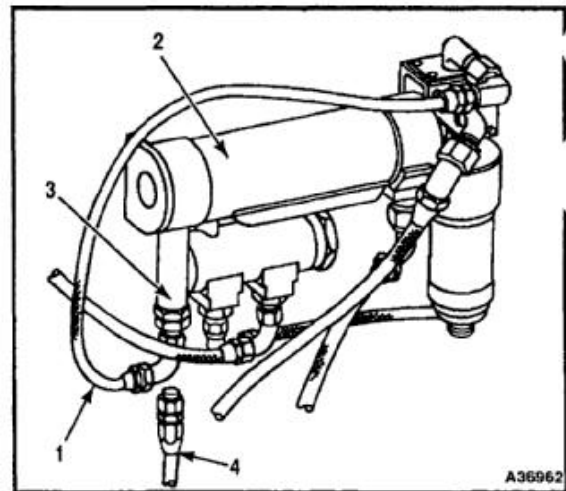
Battery Connected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Engine Oil Tank Serviced (Task 1-52)
 Helicopter Grounded (Task 1-29)
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)
 All Covers and Barrier Material Removed From
 Engine
 Engine Inlet and Exhaust Inspected for FOD
 All Bypass Indicators on Engine Fuel Filters Reset
 (TM 1-2840-265-23)



NOTE

This procedure is the same for the No. 1 or the No. 2 engine. The No. 2 engine is shown here.

1. Disconnect and cap the main fuel hose (1) from the oil cooler (2) at the fuel outlet port (3).
2. Attach the drain hose (4) (APP E-317) to the fuel outlet port (3).

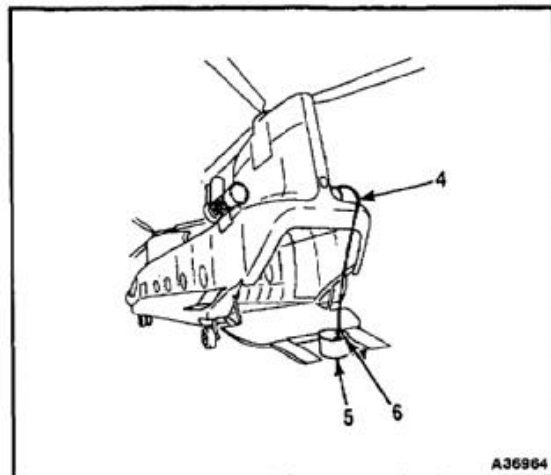


3. Place the free end of the drain line (4) into the grounded fuel resistant container (5).
4. Attach a grounding wire (6) from the fuel container (5) to the drain line (4).

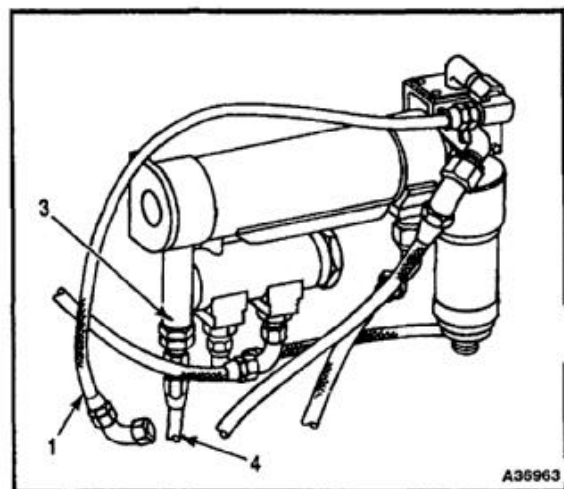
NOTE

An external ac power and external hydraulic power may be used.

5. Prepare and start the APU (5) (TM 55-1520-240-10).



6. Have the rotary-wing aviators motor the engine.
7. Continue motoring the engine until approximately **one gallon** of fuel has drained into the grounded fuel container (5).
8. Stop motoring the engine.
9. Remove the drain line (4) from the fuel outlet port (3).
10. Remove the cap and connect the main fuel hoses (1) to the oil cooler outlet port (3).



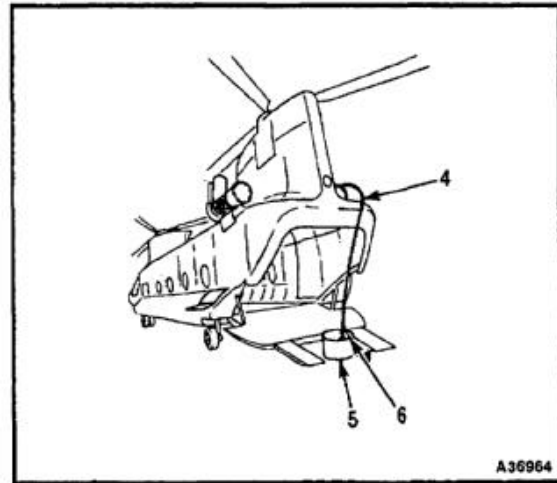
11. Remove the grounding wire (6) from the fuel drain line (4) and the fuel container (5).
12. Clean up any spilled fuel. Use cloths (E121) and wear gloves (E184.1).

NOTE

The Digital Electronic Control Unit (DECU) may show a fault indication. This indication will clear at the next engine start.

INSPECT**FOLLOW-ON MAINTENANCE:**

Close the engine access cover (Task 4-50).
Close the work platform (Task 2-2).
Disconnect the battery (Task 1-39).
Install all covers and barrier material removed from engine.



END OF TASK

INITIAL SETUP

Applicable Configurations:

With **74**

Tools:

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
 Fuel Resistant Container, 1 Gallon Minimum
 144 Inch Hose Assembly Compatible with the Chosen
 Air Source and Having a 1/4 Inch Male Flared
 End Fitting Compatible with the Engine Hose
 Connection
 Gauge, 0 to 150 Psi
 Face Shield

Materials:

Cloths (E121)
 Gloves (E184.1)
 Soap (E351)
 Air Source, Regulated, 0 to 100 Psi
 Nitrogen (E248)

Personnel Required:

Medium Helicopter Repairer (2)
 Inspector

References:

TM 55-1520-240-23P

Equipment Condition:

Battery Disconnected (Task 1-39)
 Electrical Power Off
 Hydraulic Power Off
 Cabin Acoustic Blankets Removed As Required
 Test Setup Assembled (If Required)
 Engine Work Platform Open (Task 2-2)
 Engine Access Cover Open (Task 4-49)

General Safety Instructions:**WARNING**

During high pressure operations, care must be taken to ensure that all connections and fittings are properly and tightly secured prior to applying pressure. All system components must be compatible with pressure applied. Personnel must be protected at a distance sufficient to prevent injury. Perform high pressure pneumatic operations in a well-ventilated, protected area.

CAUTION

Although nitrogen (E248) is not toxic, exposure to large quantities can cause suffocation. Use only in a well-ventilated area.

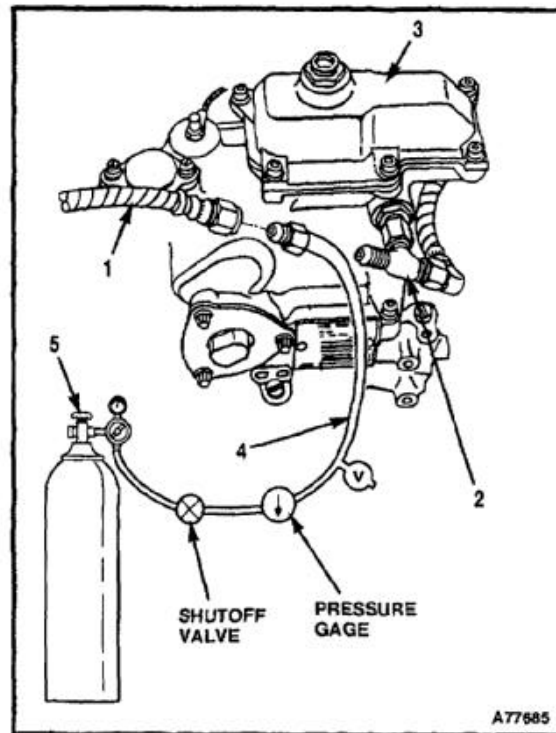
CAUTION

Eye protection will be worn when using air or gas pressurized above **30 psi**.

NOTE

This procedure must be accomplished whenever the powerplant, Digital Electronic Control Unit (DECU), Hydromechanical Assembly (HMA), or the drain cartridge are changed; or when the P3 system is breached.

1. Disconnect the P3 hose (1) from P3 tee (2) on the HMA (3).
2. Install compressed air source (or nitrogen (E248)) hose (4) in P3 hose (1).
3. Open the supply valve (5) on the pressure source and slowly increase the pressure to **100 psi**.



4. If there is no significant drop in pressure after **one minute**:
 - a. Working on one connection joint at a time, apply a liberal coating of soap solution to each joint in the P3 system.
 - b. Outside of the cabin, apply soap (E351) to the P3 fitting and the coupling on the engine shelf.
 - c. In the cabin starting from the DECU fitting and working aft, apply a liberal coating of soap (E351) to each connection joint including around the drain cartridge.
 - d. If leaks are observed, mark them with a grease pencil.
 - e. De-pressurize the system, and repair the leaks as required.
 - f. Slowly pressurize the system to **100 psi** and inspect for leaks.
 - g. Upon successful completion of the leak check, go to step 6.
5. If there is a significant drop in pressure:
 - a. Reduce the pressure to **0 psi** and inspect all P3 connections and repair as necessary.
 - b. Go to step 3.
6. Close the valve (5) on the pressure source.
7. At the drain cartridge, push up on the cartridge condensate release mechanism to relieve the pressure in the P3 system.
8. Remove the air source hose (4) from the P3 hose (1).



Before reconnecting the P3 pressure hose to the P3 tee fitting on the HMA, make sure that the **0.060 inch** orifice in the tee fitting is visible and unobstructed. If not visible, the tee fitting is installed backwards and must be rotated. Remove any obstruction from the orifice.

9. Connect the P3 pressure hose (1) to the P3 tee fitting (2).

INSPECT

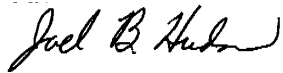
FOLLOW-ON MAINTENANCE:

Install acoustic blankets as required.
 Close engine access cover (Task 4-50).
 Close engine work platform (Task 2-2).
 Disassemble test setup.

END OF TASK

By Order of the Secretary of the Army:

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0220707

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

DISTRIBUTION:

To be distributed in accordance with Initial Distribution Number (IDN) 311199, requirements for TM 55-1520-240-23-3.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@wherever.army.mil>

To: 2028@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS <small>For use of this form, see AR 25-30; the proponent agency is ODISC4.</small>	Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)	DATE <h1 style="text-align: center;">8/30/02</h1>
--	---	--

TO: (<i>Forward to proponent of publication or form</i>)(<i>Include ZIP Code</i>) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, 35898	FROM: (<i>Activity and location</i>)(<i>Include ZIP Code</i>) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565
--	--

PART 1 - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER <h2 style="text-align: center;">TM 9-1005-433-24</h2>	DATE <h2 style="text-align: center;">16 Sep 2002</h2>	TITLE Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System
--	--	---

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON
1	WP0005 PG 3		2			Test or Corrective Action column should identify a different WP number. <div style="text-align: center; border: 2px solid black; padding: 50px;"> <h1 style="font-size: 100px; margin: 0;">SAMPLE</h1> </div>

* Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE <h2 style="text-align: center;">MSG, Jane Q. Doe, SFC</h2>	TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION <h2 style="text-align: center;">788-1234</h2>	SIGNATURE
--	---	-----------

TO: (Forward direct to addressee listed in publication) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, 35898	FROM: (Activity and location) (Include ZIP Code) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565	DATE 8/30/02
---	--	------------------------

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER			DATE	TITLE				
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
SAMPLE								

PART III - REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE MSG, Jane Q. Doe, SFC	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 788-1234	SIGNATURE
---	--	-----------

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS <small>For use of this form, see AR 25-30; the proponent agency is ODISC4.</small>	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)	DATE
--	--	------

TO: (Forward to proponent of publication or form)(Include ZIP Code)	FROM: (Activity and location)(Include ZIP Code)
---	---

PART 1 - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER TM 9-1005-433-24	DATE 16 Sep 2002	TITLE Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System
--	----------------------------	---

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION	SIGNATURE
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TO: (Forward direct to addressee listed in publication)	FROM: (Activity and location) (Include ZIP Code)	DATE
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PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	C
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