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AD 869088

PROGRESS REPORT NO. 11  
Covering Period 1 March through 31 March 1970

T55-L-11 ENGINE SUPPORT FOR  
CH-47C AIRCRAFT U.S. ARMY TEST PROGRAMS

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April 1970

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23) Descriptors

~~(\* Helicopters, Helicopter engines),~~  
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25) Identifiers

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PROGRESS REPORT NO. 11  
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DAAJ01-69-C-0590(55)

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TITLE T55-L-11 Engine Support for CH-47C Aircraft U. S.  
Army Test Programs

PURPOSE To provide services and supplies (exclusive of spare parts) required through July 1970 to support T55-L-11 aircraft engines being used in the U. S. Army CH-47C Test Programs at Eglin Air Force Base, Florida; Fort Rucker, Alabama; Edwards Air Force Base, California, and other sites.

### ENGINE ALLOCATIONS AND CUMULATIVE ENGINE OPERATING TIME

Under this program, Avco Lycoming is responsible for support of engines being used in the U. S. Army CH-47C/T55-L-11 Test Programs. However, since Avco Lycoming does not control either shipping destination or usage of engines shipped, it is not possible to establish a clear allocation of actual engines to be used in the test aircraft covered under this contract. Information provided in Table I covers only those engines actually used, serviced, and firmly assigned during the reporting period.

Table I records the status of T55-L-11 engines under the support program for the current reporting period, including monthly operating time and cumulative engine time.

### TEST SITE/AVCO LYCOMING ACTIVITY

Monthly test site activity of the T55-L-11 engines and Avco Lycoming investigations and repairs, as well as technical difficulties encountered on individual engines, are presented below under the site where the engines are assigned.

#### Fort Rucker Engines

##### LE-19138 and LE-19191

Engines LE-19138 and LE-19191 are operational and installed in CH-47C Aircraft No. 68-15858. LE-19138 (T. T. 330 hours) was installed on 29 March 1970 to replace LE-19269 (T. T. 444 hours), which was removed for a scheduled hot-end inspection. Engine LE-19138 had been removed from CH-47C Aircraft No. 68-15860 on 18 March for low torque and high turbine inlet temperature during starting. The engine was sent to Avco Lycoming where inspection revealed that the variable inlet guide vane feedback rod was not properly rigged. This problem was corrected and the engine was returned to Fort Rucker. Engine LE-19191



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(T.T. 317 hours) was installed in this aircraft on 21 March to replace LE-19237 (T.T. 152 hours), which was removed for oil contamination. LE-19191 had been removed from CH-47C Aircraft No. 68-15860 on 17 March for a scheduled hot-end inspection. The fourth turbine disc assembly (P/N 2-141-170-01, S/N M76181) was shipped to Avco Lycoming for inspection of the blade outer shroud gaps, and replaced by the disc assembly (S/N M76245) from engine LE-19269. LE-19191 was returned to service on CH-47C Aircraft 68-15858.

#### LE-19216 and LE-19244

Engines LE-19216 and LE-19244 are operational and installed in CH-47C Aircraft No. 68-15860. LE-19216 (T.T. 0 hours) is new to the support program and was installed on 18 March to replace LE-19191, which had been removed for a scheduled hot-end inspection. Engine LE-19244 (T.T. 211 hours) was installed on 18 March to replace LE-19233, which had been removed for low torque.

#### LE-19237 and LE-19369

Engines LE-19237 and LE-19369 are operational and installed in CH-47C Aircraft No. 68-15861. LE-19237 (T.T. 152 hours) was installed on 31 March to replace LE-19181 (T.T. 706 hours), which had been removed for oil system contamination.

#### LE-19119

Engine LE-19119 (T.T. 449 hours) is undergoing investigation at Fort Rucker for excessive oil consumption.

#### LE-19122

Engine LE-19122 (T.T. 146 hours) was removed during the last reporting period for excessive oil consumption. The number two bearing assembly (F/N 2-101-640-08, S/N 11811) was replaced by the assembly (S/N 90001) from Engine LE-19225. During reassembly, it was not possible to obtain proper face runout on the first gas producer disc. The engine is now awaiting disposition.

#### LE-19225

Engine LE-19225 is a flight spare engine. The engine has been used for spare parts to support other engines.



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LE-19231 and LE-19233

Engines LE-19231 (T.T. 555 hours) and LE-19233 (T.T. 453 hours) are at Fort Rucker awaiting test stand run for investigation of low torque conditions.

LE-19181

Engine LE-19181 (T.T. 706 hours) was removed from CH-47C Aircraft No. 68-15861 on 30 March for investigation of continued chip detector activations. The engine had undergone a scheduled hot-end inspection on 21 March (T.T. 672 hours). The power turbine assembly (P/N 2-141-140-03, S/N LC-177) was replaced due to tip clearances below limits on the first power turbine disc assembly. Power turbine assembly (P/N 2-141-140-03, S/N LC 146) was installed as the replacement. The engine will be shipped to Lycoming for investigation of the chip detector activations.

LE-19243

Engine LE-19243 is a flight spare engine. The engine is awaiting the return of the fourth turbine disc assembly (P/N 2-141-170-01), which was sent to Lycoming for inspection of tip shroud clearance.

LE-19269

Engine LE-19269 (T.T. 444 hours) was removed at the end of this reporting period from CH-47C Aircraft No. 68-15858 to undergo a scheduled hot-end inspection.

LE-19298

Engine LE-19298 (T.T. 75 hours) was removed from CH-47C Aircraft No. 68-15860 on 17 March for investigation of excessive oil consumption. The engine had consumed 18 quarts of oil in five hours of operation.

Engine LE-19118

Engine LE-19118 (T.T. 258 hours) is at Avco Lycoming for investigation of high oil consumption.

LE-19280

Engine LE-19280 (T.T. 205 hours) is at Avco Lycoming for investigation of a circumferential crack in the fourth turbine nozzle assembly. AVSCOM-A-PWB Message No. 771-S authorized use of parts from Engine LE-19118 hot section to rebuild LE-19280.



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LE-19230

Engine LE-19230 (T. T. 147 hours) is at Avco Lycoming for repair of broken studs (P/N 2-131-097-01) that mount the fuel manifolds and fireshield.

LE-19295

Engine LE-19295 (T. T. 190 hours) is at Avco Lycoming for repair of foreign object damage sustained during the last reporting period.

LE-19130

Engine LE-19130 (T. T. 598 hours) is being rebuilt at Avco Lycoming after undergoing a detailed engineering inspection. The rebuild will incorporate an improved combustor liner (P/N 2-131-110-17) and the new power turbine bearing face seal and jet pump package.

Boeing Vertol Engines

LE-19240 and LE-19260

Engines LE-19240 and LE-19260 are operational and installed in CH-47C Aircraft No. 66-19103.

LE-19208 and LE-19213

Engines LE-19208 and LE-19213 have been dropped from the test program and returned to production engine status. The engines had been used in torque system accuracy testing at Boeing Vertol and at Lycoming.

LE-19187

Engine LE-19187 is currently at Boeing Vertol and will be shipped to Avco Lycoming and returned to the production engine status. The engine had been used in torque system accuracy testing at Boeing Vertol and Lycoming.

Edwards Air Force Base Engines

LE-19110 and LE-19146

Engines LE-19110 and LE-19146 are operational and installed in CH-47C Aircraft No. 68-15859.



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### LE-19258

Engine LE-19258 (T. T. 45 hours) was returned to Avco Lycoming during the last reporting period for investigation of an excessive vibration condition. This problem was not confirmed in testing at Lycoming. The engine will be calibrated and returned to Edwards AFB.

## AVCO LYCOMING ENGINE SERVICE AND SUPPORT

### Engineering Effort (Item 1AA)

Engineering assistance was provided during this reporting period to aid in coordination of activities under this program. Technical assistance was also provided to the various facility engineering staffs, and liaison with these facilities was maintained throughout the reporting period. Specific sites visited were Boeing Vertol and Fort Rucker.

One time mandatory inspection of free manifold studs, Per TB 55-1520-227-20/9, then at 25-hour intervals, was initiated 30 March 1970.

### Field Service Representative (Item 1AB)

One field service representative was assigned to the flight test program at Boeing Vertol during this reporting period. Specific activities included continuous support of torque system tests being conducted using CH-47C Aircraft No. 66-19103.

### Engine Calibration (Item 1AC)

No T55-L-11 engines were calibrated at Avco Lycoming under this contract during this reporting period.

### Engine Inspection (Item 1AD)

Engine LE-19130 (T. T. 598 hours) is at Avco Lycoming completing a detailed engineering inspection. The engine will be rebuilt using an improved combustor liner (P/N 2-131-110-17) and the new power turbine bearing face seal and jet pump package.





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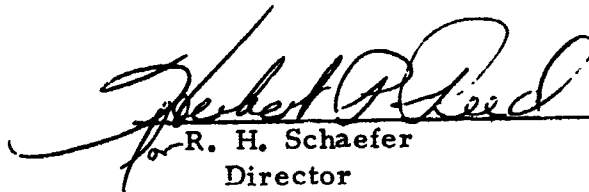
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Engine Tools and Ground Handling/Ground Support Equipment (Item 1AE)

During this reporting period, work was continued on the engine torque system comparator tool, LTCT 13608, which is being evaluated and demonstrated under this program.

Special Engine Test Instrumentation (Item 1AF)

No special engine test instrumentation was required during this reporting period.



for R. H. Schaefer  
Director  
Engineering Projects



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TABLE I

ENGINE STATUS UNDER T55-L-11/CH-47C  
SUPPORT PROGRAM

	<u>Engine S/N</u>	<u>Aircraft Number</u>	<u>Time This Month</u>	<u>Total Engine Time</u>	<u>Current Status</u>
<u>Fort Rucker</u>					
(1)(2)(3)	LE-19138	68-15858	1	331	Operational
(1)	LE-19191	68-15858	109	352	Operational
	LE-19244	68-15860	52	263	Operational
	LE-19216	68-15860	51	51	Operational
(1)	LE-19237	68-15861	125	152	Operational
(1)	LE-19369	68-15861	124	125	Operational
(2)	LE-19119	-	-	449	Investigation at Ft. Rucker
	LE-19122	-	-	146	Investigation at Ft. Rucker
	LE-19181	-	123	706	Investigation at Lycoming
	LE-19225	-	-	-	Awaiting parts
	LE-19231	-	-	555	Awaiting test stand run
	LE-19233	-	-	453	Awaiting test stand run
(2)	LE-19243	-	-	488	Awaiting parts
(1)	LE-19280	-	-	205	Investigation at Lycoming
(1)	LE-19298	-	74	75	Investigation at Ft. Rucker
	LE-19118	-	-	258	Investigation at Lycoming
(2)(3)	LE-19130	-	-	598	Lycoming for inspection
	LE-19230	-	-	147	Repair at Lycoming
(1)(2)	LE-19269	-	159	444	Inspection at Ft. Rucker
(1)(2)	LE-19295	-	-	190	Repair at Lycoming
<u>Edwards AFB</u>					
*	LE-19110	68-15859	2	27	Operational
*	LE-19146	68-15859	2	100	Operational
*	LE-19258	-	-	45	Lycoming for investigation

(1) Ten-point T<sub>t7</sub> Thermocouple system, and ECP LY-GT-55-56 fuel manifold teflon seals.

(2) Improved combustor liner P/N 2-131-110-17.

(3) Power turbine bearing face seals.

\* Calibrated engines



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TABLE I (Cont'd)  
ENGINE STATUS UNDER T55-L-11/CH-47C  
SUPPORT PROGRAM

<u>Engine S/N</u>	<u>Aircraft No.</u>	<u>Time This Month</u>	<u>Total Engine Time</u>	<u>Current Status</u>
<u>Boeing Vertol</u>				
LE-19240	66-19103	5	22	Operational
LE-19260	66-19103	5	41	Operational
LE-19187	-	-	-	At Boeing Vertol
LE-19208	-	-	-	Dropped from program
LE-19213	-	-	-	Dropped from program

Total time accumulated this period 832 Hrs.  
Total time accumulated since program inception 6,431 Hrs.