

**DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

E4NE  
Revision 5  
AlliedSignal  
T5508D  
AL5512  
  
September 15, 1997

**TYPE CERTIFICATE DATA SHEET NO. E4NE**

Engines of the models described herein conforming with this data sheet (which is a part of Type Certificate No. E4NE) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER: AlliedSignal Inc.  
111 South 34th Street  
Phoenix, AZ 85034

Model	T5508D	AL5512
Type	Axial-centrifugal flow free turbine turboshaft. Seven stage axial and single stage centrifugal compressor. Reverse flow annular atomizing combustor. Single stage gas generator turbine. Two stage power turbine.	Axial-centrifugal flow free turbine turboshaft. Seven stage axial and single stage centrifugal compressor. Reverse flow annular atomizing combustor. Two stage gas generator turbine. Two stage power turbine.
Ratings (See NOTE 1)		
Maximum continuous at sea level, hp.	2,250	2,975
Takeoff (5 minutes) at sea level, hp.	2,250	4,075
30 minute power rating (one engine inoperative)	—	4,355
Rated output shaft speed, r.p.m.	14,750	16,000
Fuel Control	Hamilton Standard Model JFC 31-20 with integral single element pump	Hamilton Standard Model JFC 31-14 with integral single element pump
Fuel (See NOTE 2)	MIL-T-5624, Grade I (JP-4), MIL-T-5624, Grade II (JP-5), or commercial equivalents specified in T5508D-1 "Operator's Handbook."	ASTMD1655 Jet A, Jet A-1, Jet B MIL-T-5624, Grade JP-4, JP-5, DERD2494
Oil (See NOTE 3)	MIL-L-7808, MIL-L-23699, or commercial equivalents specified in T5508D-1 "Operator's Handbook."	MIL-L-7808 MIL-L-23699
Principal dimensions		
Length, in. nominal	45.457	46.527
Diameter, in. nominal	25.057	28.995
Weight (dry), lb. maximum (Includes essential engine accessories but excludes starter-generator, two tachometer-generators, and torque signal conditioner unit)	618	780

Page No.	1	2	3	4	5
Rev. No.	5	4	4	4	4

Model	T5508D	AL5512
C.G. location (dry weight)		
Aft of main mount (forward) pads centerline, in.	17.200	19.70
Below engine horizontal centerline, in.	0.62	0.65
Ignition system (28 volts D.C.)	Ignition exciter unit, Bendix Corp. P/N 10-383225-1 or Simmonds Precision P/N 43326, with separate spark splitter lead and coil assembly and four shunted surface gap spark plug ignitors.	--
Ignitor plugs	Bendix Corp. P/N 390010-1 or Champion P/N FHE200-7.	--

## NOTES

"- -" Indicates "same as preceding model"

"3/4" Indicates "does not apply"

## Certification Basis

<u>Regulations and Amendments</u>	<u>Model</u>	<u>Application</u>	<u>Date Type Certificate Issued/Amended</u>
FAR 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, and 33-4	T5508D	October 6, 1972	September 16, 1975
FAR 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, 33-4, and Special Condition 33-66-NE-1	AL5512	October 30, 1975	November 7, 1980

NOTE 1. Engine ratings are based on calibrated stand performance at sea level static conditions of 15°C and 29.92 Hg under the following conditions:

T5508D

No airbleed, no duct losses, no external power extraction.

Exhaust configuration as specified by Lycoming drawings EXP5248 and 2-010-040-02.

Use of fuels conforming to and having any of the variations in characteristics permitted by MIL-T-5624, JP-4.

AL5512

No airbleed other than 3% provided for customer bleed, no duct losses, no external power extraction.

Use of an exhaust nozzle, as specified on Lycoming drawing EXP6457, having an area of 460 square inches.

Use of fuel conforming to the fuel specification given in the engine installation instructions.

The maximum continuous rating increases nonlinearly from 2975 shaft horsepower at 59°F to 3292 shaft horsepower at +40°F. The output is flat rated below +40°F.

The takeoff rating increases nonlinearly from 4075 shaft horsepower at 59°F to 4115 shaft horsepower at +56°F. The output is flat rated below +56°F.

The 30 minute power rating (one engine inoperative) increase nonlinearly from 4355 shaft horsepower at 59°F to 4527 shaft horsepower at +46°F. The output is flat rated below +46°F.

The relationship between output shaft horsepower and ambient temperature for the engine ratings is shown in figure 2 of the Installation Instructions, Lycoming Document 124.60.

NOTE 2. The T5508D engine will operate satisfactorily with fuel contaminated to levels specified in MIL-E-5007C.

The AL5512 engine will operate satisfactorily with fuel contaminated to the level as specified in the installation instruction.

NOTE 3. Mixing of these oils is prohibited.

NOTE 4. Maximum power turbine speeds (rpm) are:

	<u>T5508D</u>	<u>AL5512</u>
30 minute power rating (one engine inoperative)	—	16,000
Takeoff	14,750	16,000
Maximum continuous	14,750	16,000
Transient (12 sec.)	14,751 to 16,250	16,001 to 16,400

NOTE 5. Power turbine output shaft torque limits (lb-ft):

	<u>T5508D</u>	<u>AL5512</u>
30 minute power rating (one engine inoperative)	—	1,650
Takeoff	1,050	1,500
Maximum continuous	920	1,200
Transient	1,050	1,950

NOTE 6. Maximum permissible gas producer speeds (rpm) are:

	<u>T5508D</u>	<u>AL5512</u>
30 minute power rating (one engine inoperative)	—	19,770
Takeoff	18,832	19,500
Maximum continuous	18,327	18,280
Transient (2 sec.)	18,833 to 19,397	19,770

NOTE 7. Maximum permissible temperatures are:

Measured gas temperature (°F)

	<u>T5508D</u>	<u>AL5512</u>
Starting maximum	1500	1670
Starting transient	1385-1500 for 5 seconds 1331-1384 for 30 seconds	—
30 minute power rating (one engine inoperative)	—	1670
Takeoff (5 minutes)	1330 @ 130 ambient	1598
Maximum continuous	1278 @ 130 ambient	1391

Maximum permissible gas temperature varies with ambient temperatures as shown in figure 11 of Installation Instructions.

Exhaust gas temperature is measured by three thermocouples located in the exhaust diffuser of the engine.

Measured gas temperature is determined by ten thermocouples located in the combustor housing.

Engine oil maximum temperature is 295°F.

Engine oil maximum temperature is 309°F.

Engine accessories and zone temperature limits are as shown in paragraph 4.3 of Installation Instructions.

Engine accessories and zone temperature limits are as shown in paragraph 4.7 of Installation Instructions.

Transient (30 seconds)

—

1724°F

NOTE 8. Fuel and oil pressure limits:

	<u>T5508D</u>	<u>AL5512</u>
Fuel:	15 psia to 50 psia	5 psia to 50 psia
Oil:	50 psig to 100 psig	17 psig to 90 psig
	30 psig minimum, idle	

NOTE 9. Accessory drive provisions:

T5508D

Accessory Drive <u>Gas Producer Section</u>	Spec	Type	Number Required	Gear Ratio	Maximum Permissible Torque lb-in.			Rotation
					(1) Continuous	(2) Short Time	(3) Static	
Starter Generator	AND20002	X11-D Modified (4)	1	0.4146	140	210	*1340	CW
Tachometer	AND20005	XV-B (7)	1	0.2244	7	—	50	CW
<u>Power Section</u> Tachometer	AND20005	XV-B Modified (6)	1	0.2739	7	—	50	CW

AL5512

Accessory Drive	Spec	Type	Number Required	Gear Ratio	Maximum Permissible Torque lb-in.			Rotation
					(1) Continuous	(2) Short Time	(3) Static	
Starter Generator (9)	AND20002	X11-D Modified	1	0.4146	900 (8)	—	—	CW
Tachometer	AND20005	XV-B Modified	1	0.2244	7	—	50	CW

- (1) Maximum permissible continuous torque at any engine speed.
- (2) Maximum permissible continuous torque for 5-minute periods reoccurring at not less than 4-hour intervals.
- (3) Maximum static torque for any single pad. Remainder of the pads to be unloaded.
- (4) This pad deviates from the AND20002 X11-D in the following values:
- |                 |  |
|-----------------|--|
| Speed           | - 6935 r.p.m. at maximum rated speed for 75% maximum continuous rated sea level static power.  |
| Torque          | - As listed above except that the continuous torque limit of 140 lb.-in. is a generator limit only. The maximum continuous torque during starting is 900 lb.-in. |
| Overhung Moment | - 260 lb.-in. maximum permissible static.  |
- (5) Maximum permissible torque during starting is 1340 lb.-in.
- (6) This pad deviates from the AND20005 XV-B in the following value:
- |       |  |
|-------|--|
| Speed | - 4040 r.p.m. at maximum rated engine speed. |
|-------|--|
- (7) This pad deviates from the AND20005 XV-B in the following value:
- |       |  |
|-------|--|
| Speed | - 4130 r.p.m. at maximum rated engine speed. |
|-------|--|
- (8) Maximum peak torque during starting is 1340 in.-lb.
- (9) The maximum overhung moment permissible is 225 in.-lb.
- \*May be exceeded up to 2004 lb.-in. for 5 times before mandatory replacement of the accessory drive train.

NOTE:	100% (gas generator speed) r.p.m.	18,720
	100% (power turbine speed) r.p.m.	15,333
	100% (tachometer drive pad speed) r.p.m.	4,200

NOTE 10. The T5508D engine starting torque and speed requirements are as shown in figure 10 of Installation Instructions. Figure 10.1 shows the required engine starting times. The AL5512 engine starting torque and speed requirements are shown in figure 7 of Installation Instructions.

NOTE 11. The 5508D allowable pad and flange loads are presented in Figure 6 of the Installation Instructions and on Installation Drawing 2-000-001-45.

The AL5512 allowable pad and flange loads are presented in Table III of the Installation Instructions and on Installation Drawing 2-000-001-48.

NOTE 12. Maximum permissible compressor airbleed is 3% of inlet airflow. The T5508D bleed port is shown on Installation Drawing 2-000-001-45. The AL5512 bleed port is shown on Installation Drawing 2-000-001-48.

- NOTE 13. These engines meet FAA requirements for operation in icing conditions provided:
- T5508D (1) A minimum of 500 shaft horsepower is maintained with customer bleed on.
  - (2) A minimum of 12,600 r.p.m. gas producer speed is maintained with customer bleed off.
  - AL5512 (1) A minimum of 13,100 r.p.m. (70%) gas producer speed is maintained with customer airbleed on.
- NOTE 14. These engines meet FAA requirements for adequate turbine disk integrity and rotor blade containment and do not require airframe mounted armor. An airframe furnished overspeed test switch is required to test the overspeed system.
- NOTE 15. These engines have not been tested to evaluate the effect of bird, ice ball, or foreign objects. Inlet protection against bird, ice ball, or foreign object damage must be provided by the aircraft installation.
- NOTE 16. These engines may use JP-4 and JP-5 kerosene-type fuels separately or mixed in any proportion. Fuel control adjustments are not required when switching fuel types.\*
- NOTE 17. Certain engine parts are life-limited. The T5508D limits are listed in FAA-Approved Service Bulletin No. 5508D-0002. The AL5512 limits are listed in FAA-Approved Service Bulletin No. 5512-0002.
- NOTE 18. Overhaul of the AL5512 is not authorized until an approved overhaul manual is available; otherwise, rebuilt engine utilizing new engine tolerance may be provided by the manufacturer.
- NOTE 19. The T5508D overhaul interval and hot end inspection intervals are specified in FAA-Approved Service Bulletin No. 5508D-0001.
- The AL5512 overhaul interval and hot end inspection intervals are specified in FAA-Approved Service Bulletin No. 5512-0001.

\*Anti-icing additive (MIL-I-27686 or any direct equivalent) at concentrations not exceeding 0.15% by volume is required for the AL5512 at ambient temperatures of -10°F or below.

....END....