

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

A-723  
Revision 23  
LOCKHEED  
18  
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AIRCRAFT SPECIFICATION NO. A-723

This aircraft specification which is part of Type Certificate No. 723 prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Civil Air Regulations.

Type Certificate Holder Lockheed Martin Aeronautics Company  
86 South Cobb Drive  
Marietta, GA 30063

Type Certificate Holder Record Lockheed Aircraft Corporation  
Burbank, California

I- Model 18 (See NOTE 11 for original civil and military designations and dates of approval and NOTE 12 for "Learstar" modification) Engines

- (1) 2 P&W Hornets S1E2-G, with 3:2 reduction gearing and two 4 1/2N dampers.
- (2) 2 P&W Hornets S1E3-G, with 3:2 reduction gearing and two 4 1/2N dampers.
- (3) 2 P&W Twin Wasps SC3-G, with 3:2 reduction gearing and one 3 1/2N damper.
- (4) 2 P&W Twin Wasps S1C3-G, with 3:2 reduction gearing or 16.9 spline coupled reduction gearing and one 3 1/2N damper.
- (5) 2 P&W Military R-1830-75 or -94, with 16:9 spline coupled reduction gearing and one 3 1/2N damper.
- (6) 2 P&W Twin Wasps S4C4-G, with 3:2 reduction gearing and one 3 1/2N damper.
- (7) 2 Wright Cyclones GR1820G-102A, with 16:11 reduction gearing and two 4 1/2N dampers.
- (8) 2 Wright Cyclones GR1820-G202A, 702C9GC1 or 2, with 3:2 reduction gearing and two 4 1/2N dampers.
- (9) 2 Wright Military R1820-56, -66, -72 or -72A with 3:2 reduction gearing and two 4 1/2N dampers. (Mixed engines permissible)
- (10) 2 Wright Cyclones 730C9GD1, 2, 3 or 4, with 3:2 reduction gearing and two 4 1/2N dampers.
- (11) 2 Wright Cyclones 704C9GC1, 2, 3 or 4, with 3:2 reduction gearing and two 4 1/2N dampers.
- (12) 2 Wright Military R1820-40, -60, -87 or -95, with 3:2 reduction gearing and two 4 1/2N dampers.

Engine limits

Engines (1) & (2) Fuel 87 Min. Grade

	Takeoff (1 Min.)	Maximum Continuous	
		S.L.	5500 ft.
In. Hg.	41.0/39.5	36.5	34.5
RPM	2300/2500	2250	2250
HP	900/885	800	800

Engine (3) Fuel 87 Min. grade

	Takeoff (1 Min.)	Maximum Continuous	
		S.L.	12000 ft.
In.Hg.	42.0	36.0	34.0
RPM	2700	2550	2550
HP	1050	900	900

Engines (4) Fuel 91 Min. Grade

	Takeoff (1 Min.)	Maximum Continuous	
		S.L.	5500 ft.
In. Hg.	48.0	41.5	39.5
RPM	2700	2550	2550
HP	1200	1050	1050

Engine (5) Fuel 100 Min. grade

	Takeoff (1 Min.)	Maximum Continuous	
		S.L.	12000 ft.
In.Hg.	52.0	41.5	41.0
RPM	2800	2550	2550
HP	1350*	1050	1050

\*Ref NOTE 9(b) for requirements for aircraft with engine takeoff ratings in excess of 1200 R.H.P.

Engine (6) Fuel 91 Min. grade

	Low Ratio Supercharger	High Ratio Supercharger

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	Takeoff (1 Min.)	<u>Maximum Continuous</u> S.L.      7500 ft.		<u>Maximum Continuous</u> 15,400 ft.
In. Hg.	48.0	41.5	39.0	35.5
RPM	2700	2550	2550	2550
HP	1200	1050	1050	900

Engines (7) Fuel 91 Min. Grade

	Takeoff (1 Min.)	<u>Maximum Continuous</u> S.L.      5500 ft.	
In. Hg.	43.5	37.5	35.4
RPM	2300	2300	2300
HP	1100	900	900

Engine (8) Fuel 91 Min. grade

	Takeoff (1 Min.)	<u>Maximum Continuous</u> S.L.      6900 ft.	
In. Hg.	45.5	39.5	37.2
RPM	2500	2300	2300
HP	1200	1000	1000

Engine (9) \*Fuel 91 & 100 Min. grade

	Low Ratio	Supercharger		High Ratio Supercharger	
	Takeoff (1 Min.)	<u>Maximum Continuous</u> S.L.      7500 ft.		<u>Maximum Continuous</u> 11,100 ft.      17,000 ft.	
In. Hg.	44.0 (S.L.)	39.0	38.50	42.0	40.0
RPM	2500	2400	2400	2500	2500
HP	1200	1050	1050	900	900

\*The above limits are applicable for both 91 and 100 min. grade fuel with appropriate carburetor adjustments in accordance with Wright Aeronautical Company instructions.

Engine (10) Fuel 91 Min. Grade

	Takeoff (1 min.)	<u>Maximum Continuous</u> S.L.      6900 Ft.	
In. Hg.	45.0	39.0	36.7
RPM	2500	2300	2300
HP	1200	1000	1000

Engine (11) Fuel 91 Min. Grade

		Low Ratio Supercharger		High Ratio Supercharger
	Takeoff (1 min.)	<u>Maximum Continuous</u> S.L.      6900 ft.		Max Cont 15,200 ft.
In. Hg.	45.5	39.5	37.2	40.0
RPM	2500	2300	2300	2300
HP	1200	1000	1000	900

Engine (12) \*Fuel 91 & 100 Min. grade

	Low Ratio	Supercharger		High Ratio Supercharger
	Takeoff (1 Min.)	<u>Maximum Continuous</u> S.L.      6900 ft.		<u>Maximum Continuous</u> 15,200 ft.
In. Hg.	45.5	39.5	37.2	40.0
RPM	2500	2300	2300	2300
HP	1200	1000	1000	900

\*The above limits are applicable for both 91 and 100 min. grade fuel with appropriate carburetor adjustments in accordance with Wright Aeronautical Company instructions.

Airspeed limits

VI (Level flight or climb)	238 mph (207 knots) True Ind.
Vne (Never exceed)	279 mph (243 knots) True Ind.
Vf (Flaps extended)	115 mph (100 knots) True Ind.

Usable ceilings Engines (1) & (2)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	Deicers	
				Prop	Wing
6400	17500	122 (106)	1(c)	No	No
4800	17500	122 (106)	1(c)	No	Yes

Engines (3) & (4)

Ceiling (Ft.)	Weight (Lbs.)	TIAS MPH (Knots)	Prop. (Items)		Fuel Grade	De-Icers	
			Eng (3)	Eng (4)		Prop	Wing
11800	17500	127 (110)	1(c)	1(c)	87 or 91	No	Yes
9600	18500	128 (111)	1(c)	1(c)	91	No	Yes
9100	18500	126 (110)	1(c)	1(c)	91	Yes (See Note 11)	Yes
8300	18500	128 (111)	-	1(a)	91	No	Yes

6900	18500	127 (110)	1(c)	1(c)	87	No	Yes
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## Engine (5)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	Deicers	
				Prop	Wing
11300	17500	127	1(b)	No	No
10300	18500	127	1(b)	No	Yes

## Engine (6)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	Deicers		Supercharger Ratio
				Prop	Wing	
13750	17500	123 (107)	1(c)	No	No	High
11800	18500	123 (107)	1(c)	No	No	Low

## Engine (7)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	Deicers	
				Prop	Wing
10000	17500	123 (107)	1(c)	No	Yes
8900	18500	124 (108)	1(c)	No	No

## Engines (8) &amp; (10)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	Deicers	
				Prop	Wing
12700	17500	121 (105)	1(c) or (d)	No	No
12200	17500	124 (105)	1(c)	Yes (See Note 11)	No
10800	18500	124 (108)	1(c) or (d)	No	No
10300	18500	124 (108)	1(c)	Yes (See Note 11)	No

## Engines (9), (11), &amp; (12)

Ceiling (Ft.)	Weight (lbs.)	TIAS MPH (Knots)	Propeller (Item)	(Supercharger Ratio High) Fuel Grade		De-icers	
				Eng. (9), (11), (12)	Eng. (9) (12)	Prop	Wing
15100	17500	120 (104)	1(c) or (d)	91	100	No	Yes
14600	17500	120 (104)	1(c)	91	100	Yes (See Note 11)	Yes
13350	18500	120 (104)	1(c) or (d)	91	100	No	Yes
12850	18500	120 (104)	1(c)	91	100	Yes (See Note 11)	Yes

- Conditions for Usable Ceilings:
- (1) Standard Air
  - (2) Either engine inoperative
  - (3) Inoperative propeller fully feathered
  - (4) Carburetor air intake on "cold air" and carburetor air filter in "off" position.
  - (5) Operative engine at maximum continuous power at altitudes below the engine critical altitude and at rated rpm and full throttle at altitudes above the engine critical altitude.

C.G. range	Forward limit	(28.1% MAC)	(+0.3)
(Gear down)	Aft limit	(37.2% MAC)	(+10.8)
	Moment change due to landing gear retraction		+30050 in.lbs.

Maximum weights	(Airplanes incorporating engines (1) or (2) and which have not been modified in accordance with NOTE 5 are limited to a landing and takeoff weight of 17,500 lbs.) Landing 17,500 lbs. Landing as cargo carrier 18,500 lbs. Takeoff 18,500 lbs. (See NOTE 3 for dump valve requirements, NOTE 4 for weight increase when de-icers are installed, NOTE 5 for modifications required for 18,500 lb. takeoff weight, NOTE 7 for modifications for 18,500 lb. landing weight and NOTE 9 for requirements for certification at or in excess of 19,500 lbs. takeoff and 18,500 lbs. landing weights.)		
Number of seats	17 (Crew 2, 3 or 4 including 2 pilots (-52.5), stewardess (+242.5) and radio operator (-21.5)).		
Maximum baggage	Maximum capacity of compartments: No. 1 (nose) 1500 lbs. (- 133.5) No. 2 (fwd. belly) 800 lbs. (- 68.5) No. 3 (mid belly) 400 lbs. (- 20.5) No. 4 (rear belly) 700 lbs. (+ 30.5) Buffet 50 lbs. (+184.5)		
Fuel capacity	644 gals.	(4 tanks in center section wing: 2 front tanks 150 gals. each (- 20.5) 2 rear tanks 172 gals. each (+22.5))	
Oil capacity	40 gals.	(1 tank in each nacelle 20 gals. each (-15))	
	or	44 gals. (1 tank in each nacelle 22 gals. each (-52.5))	
Control surface movements	Elevators	34° up	23.5° down
	Elevator trim tab	25° up and down	
	Elevator anti-servo tab	12° elev. up	6.5° elev. down
	Ailerons	25° up	9° down
	Aileron trim tab	20° up	26° down
	(L.H. tab only)		
	Aileron servo tab	3° up	14.5° down
	Rudders	31° right and left	
	Rudder trim tabs	25° right and left	
	Rudder servo tabs	6° right and left	
Serial Nos. eligible	2001 and up 2626, 6124, 6333, 6378, 6608, 7419, manufactured by Gordon S. Hamilton Co. as Lockheed licensee.		
Required equipment	In addition to the pertinent required basic equipment specified in CAR 4a, the following items of equipment must be installed: Items 1(a), (b), (c), or (d), 101(a) or (b), 201(a), 202(a), 203(a), 204(a), 205(a), 206(a), 207(a) or (b), 601, 602(a) and (b).		

#### Specifications Pertinent to All Models

Datum	Spar centerline on underside of wing (fuse. sta. 188)
MAC	115.84 in. L.E. MAC fuse. sta. 155.75
Leveling means	Cabin window base line
Certification basis	Type Certificate No. 723 (CAR 4a)
Production basis	None. After February 1, 1944, prior to original certification, a CAA agent must perform a detailed inspection for workmanship, materials, and conformity with the approved technical data, and a check of the flight characteristics.
Export eligibility	Eligible for export to all countries subject to the provisions of MOP 2-4 except as follows: Canada: Landplane -eligible Skiplane - not eligible

Equipment: Approval for the installation of all items of equipment listed herein has been obtained by the aircraft manufacturer except those items preceded by an asterisk (\*). The asterisk denotes that approval has been obtained by other than the aircraft manufacturer. An item marked with an asterisk may not have been manufactured under a CAA monitored or approved quality control system, and therefore attention should be paid to workmanship and conformity with pertinent data called for in this specification.

#### Propellers and Propeller Accessories

- |            |  |                 |
|------------|--|-----------------|
| 1. (a) (1) | 2 propellers - Ham. Std., hubs 23E50, blades 6179A-0.<br>For interchangeable blade models see Prop. Spec. No. 603 (NOTE 6).<br>Dia.: Max. 10' 6-3/8", min. allowable for repairs 10' 3-5/8".<br>No further reduction permitted.<br>Low pitch setting 24° at 42 in. sta.<br>(Eligible only with S1C3G engines having 16:9 spline-coupled reduction gearing and one 3 1/2N damper.)<br>Placarded required: "Avoid continuous operation between 1200 and 1400 RPM and between 1940 and 2050 RPM." | 706 lbs. (-110) |
| (b) (2)    | 2 propellers - Ham. Std., hubs 23E50, blades 6353-30.<br>For interchangeable blade models see Prop. Spec. No. 603 (NOTE 6).<br>Round or square tipped blades eligible.<br>Dia.: Max. 10' 6-3/8", min. allowable for repairs 10' 3-5/8".<br>No further reduction permitted.<br>Low pitch setting 21° at 42 in. sta. for 1200 hp T.O. rating and 17° at 42 in. sta. for 1350 hp T.O. rating.<br>(Eligible with "(5)" engines having spline-coupled 16:9 reduction gears.)                        | 790 lbs. (-105) |
| (c)(101)   | 2 propellers - Ham. Std., hubs 23E50, blades 6139-12.<br>For interchangeable blade models see Prop. Spec. No. 603 (NOTE 6).<br>Dia.: Max. 10' 6-3/8", min. allowable for repairs 10' 3-5/8".<br>No further reduction permitted.<br>Low pitch setting at 42 in. sta.: 17° for engines "(3), (4) and (7)"; 18° for engines "(1), (2), (8), (11) and (12)"; 20° for engine "(6)".<br>21° for engines "(9) and (10)".<br>(Eligible for all engines except those having 16:9 reduction gearing).    | 758 lbs. (-110) |
| (d)(203)   | 2 propellers - Ham. Std., hubs 33D50, blades 6259-12, 6459-12, 6505-12, 6511-12 or 6529-12.<br>Dia.: Max. 10' 7", min. allowable for repairs 10' 4-1/4".<br>No further reduction permitted.<br>Low pitch setting at 42 in. sta.: 20° for engines "(8), (11) and (12)"; 21° for engines "(9) and (10)".<br>With blades model 6511-12 or 6529-12, following placard required:<br>"Avoid continuous operation in flight below 1450 RPM and between 1650 and 1850 RPM."                            | 610 lbs. (-106) |
| *(e)       | 2 propellers - Ham. Std., hubs 33D50, blades 6511-12S or 6529-12S.<br>Dia.: Max. 10' 7", min. allowable for repairs 10' 4-1/4".<br>No further reduction permitted.<br>Low pitch setting at 42 in. sta.: 21.5°<br>Feathered pitch setting at 42 in. sta.: 88.5°.<br>(For engines listed in "Learstar" Modification in NOTE 12.)<br>Placard required: "Avoid continuous operation in flight below 1450 RPM and between 1650 and 1850 RPM."   | 630 lbs. (-106) |

#### Engine and Engine Accessories - Fuel and Oil System

- |                  |   |                 |
|------------------|---|-----------------|
| 101. (a) (102 a) | Residual fuel and oil for models with single row engines                                | 35 lbs. (-79)   |
| (b) (102 b)      | Residual fuel and oil for models with P&W Twin Wasp engines                             | 45 lbs. (-79.5) |
| *(c)             | System fuel and oil ("Learstar" modification)   | 48 lbs. (-79)   |
| 102. (a)(201)    | Fuel dump valve installation (Lockheed Dwg. No. 54418)<br>(See NOTE 3 for restrictions) | 53 lbs. (+8)    |
| *(b)             | 2 fuel dump valves, General Controls AV16B1165  | 6 lbs. (+5)     |

Landing Gear

201. Main Wheel and Brake Assemblies
- (a) (15.00-16)  
2 Goodyear wheels (No. 530161) 161 lbs. (-29)  
2 Goodyear brakes (No. 510967-2)
  - \*(b) (12.50-16)  
2 Goodyear wheels (No. 9540512) 196 lbs. (-29)  
2 Goodyear brakes (No. 9540622)  
(Eligible for use on Model 18 when modified in accordance with  
Lear Dwg. 6048190. Eligible for use on "Learstar" when modified  
in accordance with Lear Dwg. 6048179.)
  - (c) (15.00-16)  
Goodrich wheel-brake assembly (Dwg. No. H-14-957)  
2 Goodrich wheels (No. H-3-857)  
2 Goodrich brakes (No. G-2-626)
202. Main gear Tires and Tubes
- (a) 2 Firestone 10-ply HD, 15.00-16, with regular tubes 225 lbs. (-29)
  - \*(b) 2 Goodyear 10-ply type III, 15.00-16, with regular tubes 240 lbs. (-29)
203. Tail Wheel Assembly
- (a) 18 in. Hayes (Lockheed Dwg. 660058) (swiveling) 5 lbs. (+395)
  - \*(b) 17 in. Hayes D254A (swiveling) 5 lbs. (+395)
204. Tail Wheel Tire and Tube
- (a) 18 in. Firestone 6-ply with cactus-proof tube 19 lbs. (+395)
  - \*(b) 17 in. Goodyear 8-ply with regular tube 14 lbs. (+395)
205. Main Gear Shock Struts
- (a) 2 Aerol XY-450 LB 454 lbs. (-29)
  - \*(b) 2 Aerol XY-450 LB (Eligible for use on Model 18 with Item 201(b) when  
modified in accordance with Lear Dwg. 6048190. Eligible for use on "Learstar"  
with Item 201(b) when modified in accordance with Lear Dwgs. 6048179 and 6048201). 454 lbs. (-29)
206. Tail Gear Shock Strut
- (a) Aerol 7976 27 lbs. (+382)
  - \*(b) Aerol 7976 per Lear Dwg. 6048189 27 lbs. (+382)
  - (c) Aerol B-250 LA 27 lbs. (+382)
207. Main Gear Emergency Extension System
- (a) Independent oil-draulic system, manually operated 8 lbs. (0)
  - (b) Nitrogen (Lockheed Dwg. 75346) 15 lbs. (-58)
  - \*(c) Nitrogen (Lear Dwg. 603625) 15 lbs. (-95)

Interior Equipment

401. CAA Approved Airplane Flight Manual (Learstar modification)  
(The manual may be carried as part of, or bound with, the  
operator's "Operations Manual", but must remain in the airplane  
and must retain its identity as an individual manual.)
402. (401) Automatic pilot
- \*(a) Lear Model L-5 (3 servos Model 118, 1 elevator tab servo  
Model 866 or 2204, and 1 rudder servo (optional) Model 2204B).  
Installation per Lear Dwg. 82525 (with installation of rudder  
tab servo per Lear Dwg. 700211) 77 lbs. (+23)  
(without installation of rudder tab servo) 75 lbs. (+13.5)  
Installation per Lear Dwg. 82825F with servo in wing 93 lbs. (+67)  
Main servo slip clutch torques: 175 ( $\pm$  10) in. lbs.

## 402. (401) Automatic pilot (cont'd)

- (a) Lear L-5 autopilot for installation Learstar modification of NOTE 12 this specification, with following servo stall torques in inch pounds measured at servos: rudder 70-90, aileron 135-165, elevator 80-100. Satisfactory for automatic approach with above values. Servos are: 118 AB, main , and 2218C-1, rudder and elevator tabs.

Placards required in full view of automatic pilot controller:

"Caution - when approach coupler is engaged, elevator trim must be checked by momentarily disengaging the auto-pilot by means of the quick-disconnect button."

(Note: This placard may be deleted if trim indicators for both pitch and yaw axes are installed.)

"When using autopilot in cruise configuration, minimum terrain clearance is 250 ft. When using autopilot during approach, minimum altitude is 200 ft."

(Minimum altitude for each case does not override any higher minimum operational altitude.)

- \*(b) Lear Model L-2C installation in accordance with Lear Dwg. 91350A 60 lbs. (+103)

Main servo Model 118K and trim tab servo Model 868G.

Main servo slip clutch torques: 175 in. lbs.

Placards required in full view of automatic pilot controller:

"When using autopilot for cruising operations the minimum terrain clearance is 250 ft. When using autopilot during approach, minimum altitude is 200 ft., pilot's seat belt fastened and hand on control wheel."

(Minimum altitude for each case does not override any higher minimum operational altitude.)

"Do not override autopilot to increase angle of bank."

- \*(c) Pioneer PB-10, 3 main servos 15601-1A, elevator tab servo 207 lbs. (-23)

15602-1B, throttle servo 15620-2A. Installation per Grand Central Aircraft, Glendale, California Dwg. 20493, 20495, 20497, 20499, 20536, 20537 and photos 1 through 6. Airplane Flight Manual Revision dated 4-11-55 required.

Servo stall torque inch pounds measured @ servos are satisfactory for FPC: Aileron 372 - 480, Elevator 325 - 400, Rudder 272 - 413.

Miscellaneous

601. (103) Fixed wing slot installation 25 lbs. (-7)
602. (a)(104a) Wing trailing edge extension (Lockheed Dwg. 74349 or 79310) 35 lbs. (+94)
- (b)(104b) Elevator control system damping unit (Lockheed Dwg. No. 73975) (When complete automatic pilot is installed, or when changes described in Lockheed Service Bulletin Bo. 18-44 are incorporated, this item may be omitted.) 12 lbs. (-16)

- NOTE 1. (a) An approved Lockheed weight and balance report including list of equipment included in certificated weight empty, and loading instructions when necessary, must be in each aircraft at the time of original certification and at all times thereafter, except in the case of air carrier operators having an approved weight control system.
- (b) Lear Report No. 17 "Weight and Balance and Equipment List" showing interior arrangement and locations and capacities of cargo and luggage compartments shall be in each "Learstar" modification of the Lockheed Model 18 at the time of original approval and at all times thereafter.

- NOTE 2. (a) Placard lavatory door as follows: "This room not to be occupied during takeoff and landing."
- (b) A placard which states the order in which the fuel tanks are to be used must be installed at the fuel selector valve. The order of using fuel shall be the same as indicated in the loading instructions. (In lieu of posting such a placard in air carrier airplanes, and subject to the approval of the Chief, Air Carrier Safety Division, definite instructions must be issued by the operator to the effect that fuel tanks should be filled and used in order indicated in their approved loading instructions.)

## NOTE 2. (cont'd)

- (c) For those airplanes requiring an "Airplane Flight Manual", the following placard shall be placed on the instrument panel in full view of the pilot, and when appropriate, the instruments should be properly marked: "This airplane shall be operated in compliance with the operating limitations specified in the CAA Approved Airplane Flight Manual."
- (d) The following propeller placards shall be placed on the instrument panel in full view of the pilot and the tachometer appropriately marked for those airplanes on which the propellers listed below are installed.
  - (1) Item 1(a): "Avoid continuous operation between 1200 and 1400 RPM and between 1944 and 2050 RPM."
  - (2) Item 1(d) with blades Model 6511-12 or 6529-12 and Item 1(e): "Avoid continuous operation in flight below 1450 RPM and between 1650 and 1850 RPM."

NOTE 3. Fuel jettisoning provisions are not required for aircraft having not more than 1000 lbs. spread between maximum takeoff and maximum landing weight. If dump valves other than Item 102(a) are installed, the former shall be removed or made positively inoperative.

NOTE 4. Maximum landing or takeoff weight may be increased 105 lbs. when complete de-icer system is installed. Applicable to aircraft up to 19,500 lbs. takeoff weight only.

NOTE 5. For certification at 18,500 lbs. takeoff weight (or landing weight as cargo carrier) Model 18 airplanes of Serial Nos. 2001 to 2024, inclusive, must be modified structurally to conform with drawing changes and new drawings listed on Lockheed Service Project Drawing No. 1037. Airplanes of Serial Nos. 2025 and up have had the structural revisions necessary for eligibility at 18,500 lbs. takeoff weight (or landing weight as cargo carrier) incorporated in the airplanes at the factory.

NOTE 6. Replacement surfaces which incorporate flush type riveting may be substituted for surfaces having external head type rivets except that in the event that an outer wing panel or wing tip (with external head rivet) is being replaced by a flush type rivet panel, both left and right surfaces must be replaced.

NOTE 7. All Model 18 aircraft which have been modified in accordance with NOTE 5 are eligible as cargo carriers with a maximum landing weight of 18,500 lbs. when the passenger seats are removed and the cabin is revised in accordance with Lockheed Service Project Dwg. 1221A and 1222. When airplanes of these models are certificated as cargo carriers, no passengers may be carried and satisfactory loading instructions must be provided.

NOTE 8. The various Air Force and Navy models were originally built as commercial aircraft but the cabins were converted for Military use by removal of seats and the installation of troop benches or cargo provisions. Also, the military models differed from the Model 18 for certain powerplant installation details, minor structural differences and were equipped with a 12-volt electrical system. Prior to certification as a civil aircraft, the following must be accomplished in addition to compliance with Lockheed Service Technical Report No. 1 and applicable AIRWORTHINESS DIRECTIVES:

- (a) Each airplane must satisfactorily pass an inspection for conformity, possible hidden damage, and for workmanship and materials used in making any repairs and/or alternations. Particular attention should be paid to placards, instrument markings and windshield equipment.
- (b) The following military equipment should be removed: Propane priming, auxiliary fuel tanks and supporting structure. Such brackets and supporting structure as will not interfere with the safe operation of the aircraft may, at the operator's discretion, be left in the aircraft as long as the equipment has been rendered inoperative. Operators may retain the oil dilution system and hopper type oil tank upon compliance with paragraph 1 of Airworthiness Directive 46-13-3. Otherwise the installation of a conventional oil tank and rework of the standpipe will be required in accordance with paragraphs 2 and 3 of Airworthiness Directive 46-13-3.
- (c) If the Jack & Heintz automatic pilot directional gyro control unit, Part No. JH5000 and climb and turn control unit, Part No. JH6000, are installed, they should be of the modified version identified by a yellow "M" adjacent to name plate, as covered in Jack & Heintz Service Bulletin No. P-1. If the Jack & Heintz A-3A autopilot servo units are installed, they should be of the modified version in which the over-power differential pressure is limited to  $175 \pm 15$  psi, as covered in Jack & Heintz Service Bulletin No. P-4. The modified unit is identified by a new name plate (JH11609) on which CAA approval is indicated. CAA approved model numbers will be one of the following: M11-D3-A, M8-D3-A, M6-D3-A or M6-D3-B. Also, the JH6000 bank and climb gyro control head incorporated as a component of the A-3A autopilot must be the modified version incorporating a placard warning that "the bank-climb gyro limit as an altitude reference is forty-five degrees (45°) in bank, climb or dive", as covered in Jack & Heintz Service Bulletin No. P-5.
- (d) If the airplane is to be used in scheduled air-carrier operation, the oil inlet line installed forward of the firewall shall be of fire-resistant material.

- (e) Each airplane must be weighed to determine its weight and balance and an approved loading chart or device must be installed. The loading chart or device should be prepared in accordance with Lockheed Service Information Letter No. 18-33. An equipment list must be prepared. This list, the approved loading chart or device, and the weight and balance data will constitute the Weight and Balance Report for the particular airplane. If any changes have been made which would adversely affect the flight characteristics, the airplane must be flight tested.
- In compiling the equipment list for an airplane, reference should be made to the Lockheed Master Equipment List to determine that all Class 100 items or satisfactory alternates are installed. Certain Class 200 items on the Master List may also be required by the type of operation which is to be authorized. If any of the equipment items installed bear Air Force designations, their acceptability for civil use should be determined or they should be replaced.
- (f) All Aero Supply PK-3 type fuel selector valves manufactured prior to 1943 must be reworked to incorporate the new metal retainer washer (cup type) and the new Hycar seals. The year of manufacture can be determined from the prefix of the number stamped on the mounting bolt hole boss, i.e., 2-567 means 1942 and 3-567 means 1943. Stamp the reworked valves with the designation letters CPRW-H (cup plate - Hycar) to show the rework has been accomplished. (Lockheed Service Telegram dated November 17, 1943, covers this same subject.)
- (g) (Applies only to serial numbers 1954, 1956, 1957 and 2001 through 2075.) The Vickers AA-14000 accumulator must be removed and Bendix 401531 7-1/2 inch accumulator and AN 6234-3 filter installed. Also the 55285 hydraulic reservoir must be reworked to increase its capacity to 2.3 gallons. (Lockheed Service Bulletin 18/SN-120 dated April 21, 1945, covers this same subject.)
- (h) On airplanes with low pressure brakes equipped with deboosters, it may be necessary to install a longer hose in the inboard end of each debooster to eliminate interference with the drag strut knee bolt. (Lockheed Service Information Letter dated August 1, 1945, revised December 10, 1945, covers this same subject.)
- (i) On all Wright C9GC (G-200 Series) engines, remove the upper valve washers, Part Nos. 69271 and 113171. Engines equipped with the two spring combination are satisfactory without change. For engines equipped with the three spring combination, it will be satisfactory to use Part Nos. 118815, 113171 or No. 113171J. If either of the latter two is used, it should be of the high dimension type (0.60) inch total height.) (Wright Service Bulletin no. C912A covers this same subject.)

- NOTE 9. (a) Model 18 aircraft are authorized to be operated at a takeoff weight of 19,500 lbs. and a landing weight of 18,500 lbs. provided NOTE 5 has been complied with and, provided compliance is shown with the requirements of CAR No. SR-407. For certificated weights in excess of the above, compliance is also required with CAR No. SR-407.
- (b) Model 18 aircraft incorporating engines of more than 1830 cu.in. displacement or with takeoff power ratings in excess of 1200 BHP shall comply with the requirements of CAR No. SR-407.

NOTE 10. Goodrich propeller de-icer fluid feed strips, Part No. 37572, eligible on propellers (Items 1(d) and 1(e) when installed not to extend beyond the 48 1/2 inch blade station. Install in accordance with B.F. Goodrich Installation Manual 4-7195-NS. Weight change is negligible.

NOTE 11. The various model dash numbers appearing in previous specifications are actually versions of the basic Model 18 series aircraft, the certification basis for which is Type Certificate No. 723. These dash numbers were selected by Lockheed primarily for engine designation and clerical purposes, and should not be considered to define different models of airplanes. Any one version may be converted to another by incorporation of pertinent required equipment and complete conformity with corresponding approved drawings.

In the future, all aircraft may be considered as basic Model 18 airplanes and all references to the dash numbers in the model designation, including the identification plates in the cockpit, may be disregarded. The original model designation and dates of approval are listed below for reference purposes only.

MODEL			DATE APPROVED
Civil	Air Force	Navy	
18-07	C-59	R50-2	March 30, 1940
18-08	C-57 C-57B	R50-3	August 17, 1940
18-14	----	----	August 17, 1940
18-40	----	R50-1	August 17, 1940
18-50	----	----	Dec 20, 1940
18-56	C-60 C-60A	R50-5 R50-6	May 30, 1942

NOTE 12. "Learstar" Modification.

Basic configuration approved January 21, 1955 for Lear, Inc., Aircraft Engineering Division, Santa Monica Airport, California. Aircraft conforming to any "Learstar" modification version described in Lear Report No. 18 "Lockheed Model 18 - Lodestar - Learstar Modification - Specification and Drawing List" dated December 29, 1954, and complying with this specification are eligible for certification.

- Engines (1) 2 Wright R1820-76A  
 (2) 2 Wright R1820-76B  
 (3) 2 Wright 987C9HD1

## Engine limits Engine (1) and (2) Fuel 100/130 grade

	MAXIMUM CONTINUOUS				
	Low Ratio Supercharger			High Ratio Supercharger	
	TAKEOFF (4 Min.)	Sea Level	Altitude (3500 ft.)	Alt. (Min.) (12000 ft.)	Alt. (Max.) (18300 ft.)
In. Hg.	51.5 (S.L.)	46.5	45.2	43.5	42.0
RPM	2700	2500	2500	2500	2500
HP	1425	1275	1275	975	975

## Engine (3) Fuel 100/130 Grade

	MAXIMUM CONTINUOUS				
	Low Ratio Supercharger			High Ratio Supercharger	
	TAKEOFF (4 Min.)	Sea Level	Altitude (3300 ft.)	Alt. (Min.) (12000 ft.)	Alt. (Max.) (18300 ft.)
In. Hg.	52.5 (S.L.)	47.5	46	43	42.0
RPM	2700	2500	2500	2500	2500
HP	1425	1275	1275	975	975

Airspeed limit	Vno (Normal Operation)	260 mph (226 knots) True Ind.
	(Above 17000 ft. reduce speed	6 mph (5 knots) per 1000 ft.)
	Vne (Never Exceed	289 mph (251 knots) True Ind.
	(Above 17000 ft. reduce speed	5 mph (5 knots) per 1000 ft.)
	Va (Maneuvering)	168 mph (146 knots) True Ind.
	Vf (Approach position - 20%)	215 mph (187 knots) True Ind.
	Vf (Landing position - 100%)	158 mph (137 knots) True Ind.
	Vlo (Landing gear operation)	167 mph (145 knots) True Ind.
	Vle (Landing gear extended)	200 mph (174 knots) True Ind.

C.G. range	(Gear Down) Forward limit	(27.8% MAC) (+0)
	Aft limit	(37.2% MAC) (+10.8)
	Moment change due to main gear retraction	+34,100 in.lb.
	Moment change due to tail gear retraction	negligible.

Maximum weights	Landing 20,400 lbs.; Takeoff 22,500 lbs.
	Note: Maximum landing and takeoff weights may be increased to 21,500 lbs. and 24,000 lbs. respectively when provisions of Lear Dwg. No. 600030A are incorporated and appropriate Airplane Flight Manual is provided.

Minimum crew	Pilot and copilot at (-53.0)
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Passengers	(See Lear Report No. 17, Weight and Balance and Equipment List for number and location.)
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Maximum baggage	Maximum capacity of compartments:	
	No. 2 (Fwd. belly)	800 lbs. (-65.5)
	No. 3 (Mid belly)	400 lbs. (-20.5)
	No. 4 (Rear belly)	700 lbs. (+30.5)
	Galley	100 lbs. (-22.0)
	Cloakroom	100 lbs. (+236.0)

Fuel capacity	1114 gals. (4 tanks in center section wing, 2 tanks in outer wing)		
	2 front center section tanks	150 gals. ea.	(-20.5)
	2 rear center section tanks	172 gals. ea.	(+22.5)
	2 outer wing tanks	235 gals. ea.	(-13.0)
Oil capacity	40 gals. (1 tank in each nacelle)	20 gals. ea.	(-15.0)
Alcohol capacity	30 gals. (1 tank in each nacelle)	15 gals. ea.	(-18.0)
Control surface movements	Elevators	34° up	23.5° down
	Elevator trim tab	21.5° up	18.5° down
	Elevator spring tab	3° up	3° down
	Ailerons	25° up	8.5° down
	Aileron trim tab (L.H. tab only)	22.5° up	26.5° down
	Aileron servo tab (both tabs)	3° up	13.5° down
	Rudders	20° inboard	30° outboard (quadrant travel)
	Rudder trim tab	25° right	24.5° left
	Rudder servo tab	5.5° right and left	
	Rudder spring tab	20° right and left	
Serial Nos. eligible	2001 to 2024, inclusive, when modified in accordance with NOTE 5 and 2025 and up.		
Required equipment	In addition to the pertinent required basic equipment specified in CAR 4(a) and 4(b) the following items of equipment must be installed: 1(e), 101(c), 102(b), 201(b), 202(b), 203(b), 204(b), 205(b), 206(b), 207(c), 401(a).		
Certification basis	Type Certificate No. 723 (CAR 4a as revised by CAR No. SR 407, effective date Sept. 10, 1954) whereby structural requirements of CAR 4a, as amended to April 7, 1950, were complied with, and flight and powerplant requirements of CAR 4b, as amended to December 31, 1953, were complied with.		

NOTE 13. In the revision dated November 15, 1955, to this specification the equipment items were renumbered. The old item numbers are also included in the Equipment Section of the specification and appear in brackets to the right of the new numbers. Elsewhere in the specification, only the new numbers are used.

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