

CHAPTER

12

SERVICING

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GENERAL

This chapter deals with regulation for:

- filling of fuel tanks
- filling of shock absorber of nose landing gear
- filling of shimmy damper of nose landing gear
- inflation of landing gear tires
- filling of airplane brake system
- filling of lower flange plate of wing spar
- filling of lube oil to engine.

Further on the chapter contains instructions for scheduled and on-condition maintenance.

FILLING AND FLUID REPLENISHMENT

REFUELLING

CAUTION

REFUEL AIRPLANE FUEL TANKS WITH CORRECT TYPE OF FUEL.

- a) Refuel first main fuel tanks (2x61 liters; 2x16.1 US gal)
- b) Shut filler caps of main fuel tanks and start fuelling the outboard wing tanks (2x51 litres).
- c) Check quantity of fuel in tanks.

Safety measures during refuelling:

- a) The fuel tank refuelling may be carried out by properly instructed and certified personnel acquainted with safety measures.
- b) It is prohibited to refuel airplane fuel tanks:
 - in rain or storm;
 - in enclosed space;
 - with engine running or with electric board network turned on.
- c) Ground fuel filler with airplane extending grounding pin at fuel filler neck and interconnect it with filler gun.
- d) The person refuelling the airplane tanks should not wear any garment creating static charge.
- e) It is prohibited to smoke or handle with open fire in the vicinity of refueled airplane.

Kinds of fuel

Use aviation gas meeting MIL-G-5572F or ASTM-D 910-75 specification, as of 100 (green) or 100 LL (blue) octane number.

Further additional information on engine fuel are issued is Service instruction No. 1070 (last effective edition) of engine manufacturer.

Never use aviation fuel of less than grade 100 or any type of car gas.

FILLING OF SHOCK ABSORBER AND SHIMMY DAMPER OF NOSE LANDING GEAR

NOTE

Air pressure and fluid filling of nose landing gear dampers are also described in maintenance and operation manual on condition of the nose landing gear type 793-HPK-185-19, 793-HPK-185-19-7.

Specification of nose landing gear:

Name		Oleo-pneumatic shock absorber (Fig. 32-5, item.4)	Shimmy damper (Fig. 32-5, item 5)
Fluid	kind	MIL-H-5606 (A) or MIL-H-5606 F(A) specification (as AeroShell Fluid 4; AeroShell Fluid 41)	
	quantity	216 cm ³ (132 cu in)	50 cm ³ (30 cu in)
Stroke		190 ± 1 mm (7.5 ± 0.04 in)	± 40 mm (± 1.6 in)
Gas pressure	In filling	400 ± 10 kPa (58 ± 2 p.s.i.)	No pressure
	operational	400 ⁺¹⁰ ₋₄₀ kPa (58 ⁺² ₋₆ p.s.i.)	

1) Filling of oleo shock absorber with gas

WARNING

NEVER USE OXYGEN FOR FILLING THE OLEO SHOCK ABSORBERS AS THERE IS IMMINENT DANGER OF EXPLOSION.

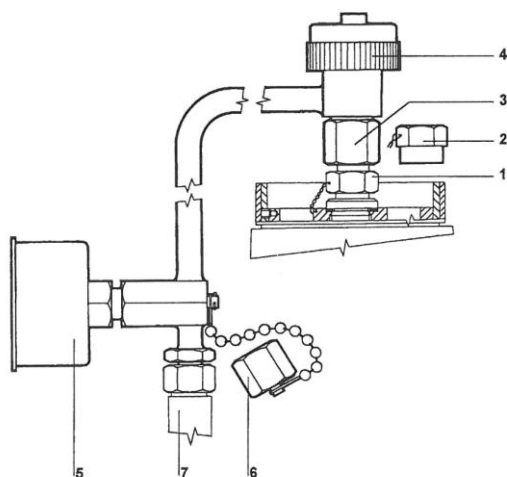
- a) Unload the nose landing gear so that the piston rod of oleo shock absorber is fully extended.
- b) Unscrew cap nut of filling valve (Fig. 12-1, item 2)
- c) Turn control knob (4) of filling fixture fully anticlockwise and screw cap nut (3) of filling fixture upon the filling valve (1) of oleo shock absorber.
- d) Unscrew plugging cap nut (6) and couple instead of plugging cap nut the hose (7) of air pressure source.
- e) Turn control knob (4) clockwise to open filling valve (1).
- f) Fill the oleo shock absorber to about 500 kPa (72 p.s.i.).
- g) Turn control knob (4) anticlockwise to shut filling valve (1). Shut supply of compressed air.
- h) Unscrew hose (7) of air pressure source, and screw and tighten the plugging cap nut.
- i) Turn control knob (4) clockwise to check pressure in oleo shock absorber at pressure gauge (5). Release cap nut (6) with care to reduce pressure to 400 ± 10 kPa (58 ± 2 p.s.i.).
- j) Turn control knob (4) fully anticlockwise.
- k) Unscrew nut (3) from the filling valve (1).
- l) Check tightness of filling valve (1) by soap solution or oil. No bubble may occur within 10 minutes of check. Replace filling valve (1) or gasket under the valve in case of detected untightness.
- m) Provide filling valve (1) with cap nut (2) and lock it with safety wire..

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- 2) Filling the damping fluid into the oleo shock absorber
 - a) Lift the airplane by fuselage jacks.
 - b) Drain slowly compressed air from the oleo shock absorber by means of filling fixture (Fig. 12-1) so that the filled in damping fluid is not snatched away with escaping air.
 - c) Unscrew filling valve (1) and remove gasket.
 - d) Extend piston rod of shock absorber fully and pour in about 30 to 50 cm³ (2-3 cu in) of damping fluid.
 - e) Push slowly the shock absorber piston rod fully in. Make sure the piston rod movement is not limited with leather cover.
 - f) Suck the excessive damping fluid from the oleo shock absorber scupper so that the damping fluid is levelled with fitting plane of filling valve. In case no fluid poured out it is necessary to repeat above procedure again.
 - g) Screw filling valve (1) in using new gasket.
 - h) Pull the piston rod from oleo shock absorber.
 - i) Fill the oleo shock absorber with compressed air and check filling valve tightness according to point 1.
- 3) Filing of shimmy damper
 - a) Unscrew plugs from filler ports (Fig. 32-8, item 17)
 - b) Fill damping fluid into the ports to be leveled with upper level of ports.
 - c) Check quantity of fluid after 30 minutes and replenish fluid if needed.
 - d) Screw filler port plugs in.



- | | |
|--|----------------------|
| 1 ... filling valve of oleo shock absorber | |
| 2 ... plug cap nut of filling valve | |
| 3 ... cap nut | |
| 4 ... control knob | |
| 5 ... pressure gauge | > plnění
zařízení |
| 6 ... cap nut | |
| 7 ... air supply hose | |

Fig. 12-1 Filling nose landing gear oleo shock absorber

EFFECTIVITY: All

INFLATION OF LANDING GEAR TIRES

- a) The tires (BARUM and GOODYEAR) of nose and main landing gear should be inflated to 250 ± 10 kPa (36 ± 2 p.s.i.).

NOTE

The fixture for tire inflation and pressure gauge for pressure check is supplied with airplane toolkit.

- b) Check tire valve serviceability and screw the dust protecting cap on.

FILLING OF BRAKE SYSTEM

Fill each circuit of airplane brake system independently. Fill the second brake circuit after proper filling and deaeration of the first one.

Use brake fluid meeting MIL-H-5606 (A) or MIL-H-5606 F(A) specification Aero Shell Fluid 4 or Aero Shell Fluid 41 for filling the airplane brake system.

Procedure of filling and deaeration of airplane brake system

- a) Couple transparent hoses (5) to deaerating valves (Fig. 12-2, item 4) of pedal brake units and submerge the ends of hoses into the vessels containing brake fluid.
- b) Unscrew plug-in cap nut from filling valve (2) and screw there hose of brake fluid filler (6) instead.

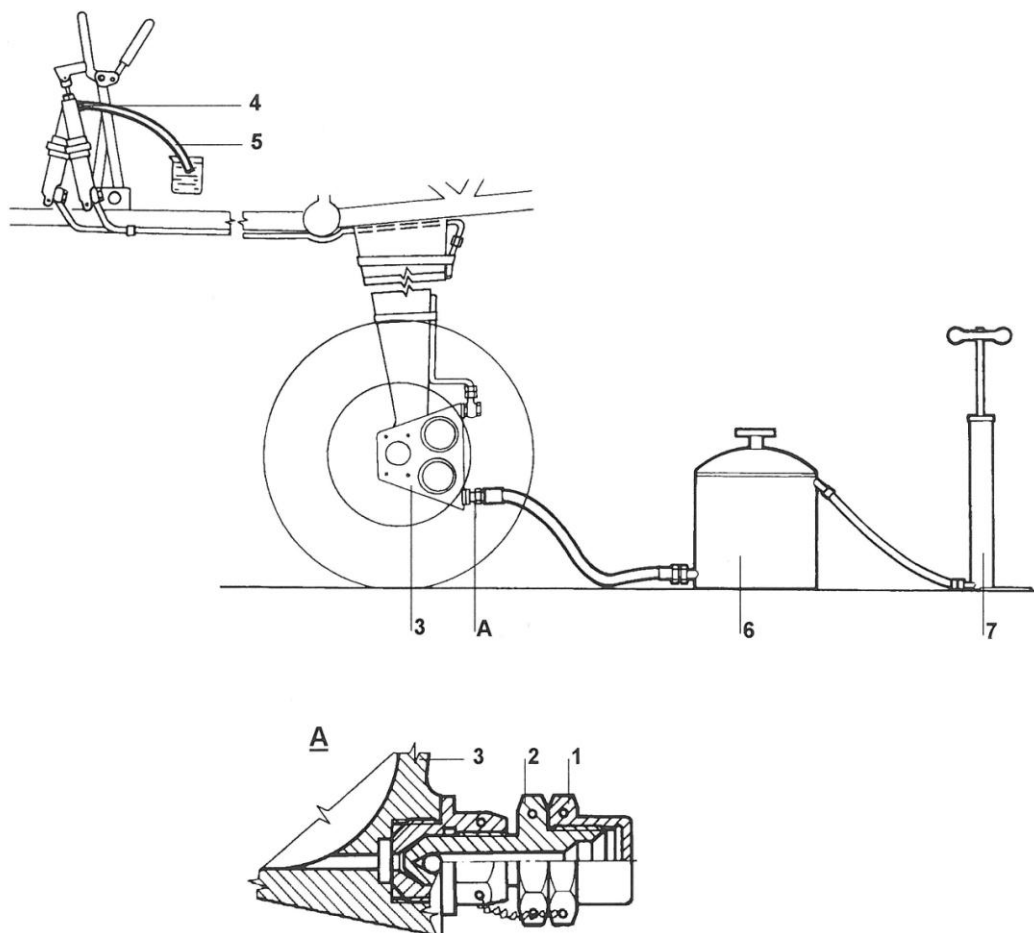
NOTE

The brake fluid filler (6) and tire inflator (7) belong among optional equipment.

- c) Release deaerating valve (4) and filling valve (2) for one to two turns.
- d) Increase pressure in brake fluid filler (6) by means of tire inflator (7) slowly filling the airplane brake system. Press brake pedals during filling process slowly several times.
- e) Shut deaerating valves tightened if the clean brake fluid pours out of deaerating valves (4) without bubbles.
- f) Proceed the same way with second pedal brake unit.
- g) Tighten filling valve (2), disconnect brake fluid filler hose (6), provide filling valve with cap nut (1) and lock both filling valve (2) and cap nut.
- h) Fill and deaerate second airplane brake system.

FILLING OF LOWER FLANGE PLATE OF MAIN WING SPAR

- a) The lower flange plate of main wing spar should be filled with compressed nitrogen at 200 kPa. It is filled through the valve located upon right panel beneath the instrument panel (section 31-20-00).
- b) Check pressure gauge reading.
- c) Provide valve with cap nut with rubber hose, lock it with safety wire and provide with seal.



A ... inlet port of brake body (drawn in locked position)

- 1 ... cap nut of filling valve
- 2 ... filling valve
- 3 ... brake body
- 4 ... deaerating valve
- 5 ... hose
- 6 ... brake fluid filler
- 7 ... tire inflator

Fig. 12-2 Filling of brake system

FILLING OF ENGINE OIL

NOTE

Replace oil filter element during any oil replacement (Fig. 79-1, item 2).

a) Fill the oil to the engine through the oil filler port accessible through access door in the upper side of engine covers and after removal of filler cap. Use filling of oil the funnel with sieve.

b) Check quantity of oil.

Recommended quantity of oil in the engine:

- cat. N: max. 12 l (12 quarts) min. 5 l (5 quarts)

- cat. U: max. 8 l (8 quarts) min. 6 l (6 quarts)

Oil kinds

Use only mineral (petroleum) oils during first 50 hours of engine run. For further engine operation either petroleum or disperse or synthetic oils may be used.

Recommended oil types (according to specification of engine manufacturer):

Average ambient air temperature		Recommended oil viscosity rating - SAE	
°C	°F	Petroleum oils MIL-L-6082 or SAE J 1966	Disperse oils MIL-L-22851 or SAE J 1889
above + 27	above + 80	60	60
above + 16	above + 60	50	40 or 50
- 1 to + 32	+ 30 to + 90	40	40
- 18 to + 21	0 to + 70	30	40, 30 or 20 W 40
below - 12	below + 10	20	30 or 20 W 30
Celý rozsah provozních teplot		-----	15 W 50 or 20 W 50

NOTE

The further information on engine oil are issued in User Guide of LYCOMING engines and Service manual No. 1014 (last effective edition) of engine manufacturer.

The synthetic and semi-synthetic oils should not be mixed with other types of oil.

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Marks of commercial oils (example):

SAE viscosity rating	Mineral oils (MIL-L-6082)	Disperse oils (MIL-L-22851)
60	Aero Shell 120 BP Aero Oil 120 Castrolaero S 120 - - Mobil Mineral 120	Aero Shell W 120 BP Aero D 120 Castrolaero AD 120 Elf Aviation AD 120 Esso Aviation E 120 Mobil Aero Oil 120
50	Aero Shell 100 BP Aero 100 Castrolaero S 100 Elf Aviation 100 Esso Aviation 100 Mobil Mineral 100 Total Aero 100	Aero Shell W 100 BP Aero D 100 Castrolaero AD 100 Elf Aviation AD 100 Esso Aviation E 100 Mobil Aero Oil 100 Total Aero D 100
40	Aero Shell 80 BP Aero 80 Castrolaero S 80 Elf Aviation 80 Esso Aviation 80 - Total Aero 80	Aero Shell W 80 BP Aero D 80 Castrolaero AD 80 Elf Aviation AD 80 Esso Aviation E 80 Mobil Aero Oil 80 Total Aero D 80
30	Aero Shell 65 BP Aero 65 Castrolaero S 65 Elf Aviation 65 Esso Aviation 65 Total Aero 65	Aero Shell W 65 BP Aero D 65 Castrolaero AD 65 - Esso Aviation E 65 Total Aviation D 65
20 W 50	-	Mobil AV1 (synthetic) Total Aero DM (semi-synthetic)
15 W 50	-	Aero Shell Oil W (semi-synthetic)

SCHEDULED MAINTENANCE

CLEANING OF LACQUERED SURFACES

CAUTION

DO NOT WIPE DUST DRY. IT CAUSES DETERIORATION OF SURFACE QUALITY.

REPAIR DEFECTIVE LACQUERED SPOTS WITH LACQUER (subsection 51-72-00), GRIND THESE SPOTS WITH GRINDING PASTE AND POLISH THEM.

The external metal sheet and laminate surfaces are painted with long lasting lacquer that under standard condition does not require often polishing. In standard operation, e.g. after flying day, it is enough to clean dirty surface with detergent or neutral soap water solution and wipe it dry.

It is recommended to renew surface preservation twice a year, e.g. during preparation for winter and summer operation. It is made by application of some car polish upon washed and dry surface and its polishing with soft rag.

Recommended car polishes

Autobalsam, Autowax, Autopolish, Cleanerpolish, Carwax, Speedwax, B 2000.

When using grinding, polishing and preservation agent it is recommended to apply and use them as described upon agent cover.

CLEANING OF COCKPIT WINDOWS

CAUTION

NEVER USE WHITE SPIRIT, ACETONE, ALCOHOL, TETRACHLORMETHANE OR OTHER COMMERCIAL WINDOW CLEANER AS IT MAY DAMAGE ORGANIC GLAZING OF COCKPIT.

NEVER CLEAN COCKPIT GLAZING WITH DRY RAG WITHOUT CLEANING PASTE AS THE ORGANIC GLASS IS SOFT AND DEPOSITED DUST DAMAGES IT WHEN WIPED DRY .

Clean dirty cockpit canopy with flow of water. Wash the glazing thoroughly. It is recommended to use PERSPEX 3 antistatic agent to cleaning water. Use special polishing paste as PERSPEX POLISH or VIAM-2 for cockpit glass polishing. Apply paste in thin layer with soft rag and move the rag with light pressure until all the dirt disappears. Polish glazing after it is dry.

CLEANING OF AIRPLANE INTERIOR

Clean fabric upholstery with brush and vacuum cleaner. When cleaning fabric upholstery use detergent cleaning agents upon dampened surface of upholstery and wipe it dry. The dirty spots that cannot be cleaned with detergent should be cleaned with suitable fabric cleaner.

Artificial leather upholstery, handles and push buttons should be wiped with rag soaked in detergent solution.

Clean leather covers with leather cleaner to maintain the cover suppleness.

Clean the cockpit from dust and dirt with vacuum cleaner.

EFFECTIVITY: All

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ON-CONDITION MAINTENANCE

SNOW AND ICE REMOVAL FROM THE AIRPLANE

The snow deposited upon the wings, tail unit, in control slots and flaps should be wiped off with soft brush.
Remove icing with hot air.