

CHAPTER

71

POWER PLANT

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EFFECTIVITY: All

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GENERAL

The engine is suspended in four dampers fixed in engine mount structure. The engine mount is fixed to fwd bulkhead of fwd fuselage latticework. The fwd and bottom engine cowlings are made from glass laminate white upper and side cowlings are of duralumin sheet. The fwd part of bottom engine cowling carries the air filter, through which air is driven to carburetor (Z 143 L) or to the injector (Z 143 LSi).

EFFECTIVITY: All

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ENGINE COWLINGS

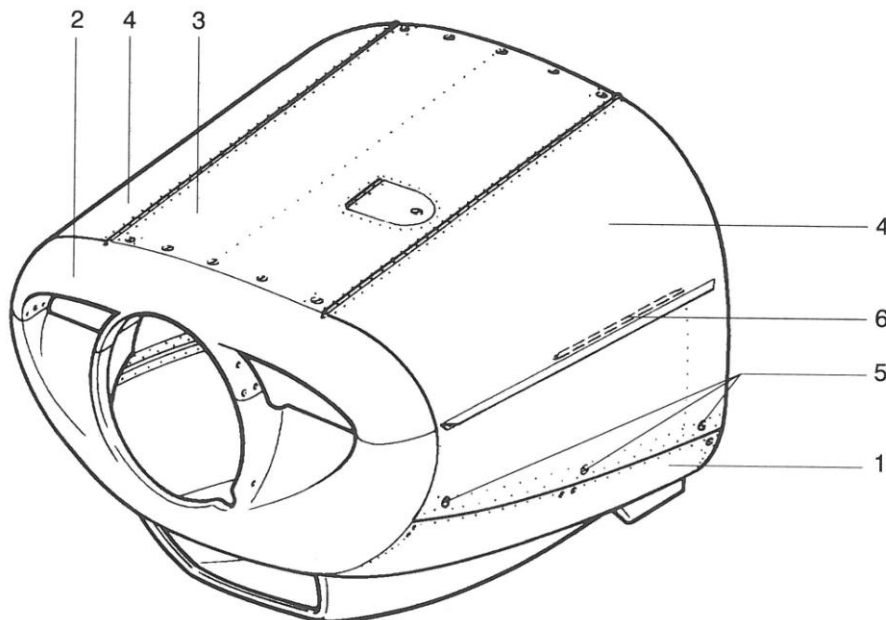
DESCRIPTION AND OPERATION

The bottom engine cowling (Fig. 71-1, item 1) is joined by draw bar to nose landing gear and by screws to firewall border.

The fwd engine cowling (2) is crewed to fwd part of bottom engine cowling.

The upper engine cowling (3) is screwed to fwd engine cowling and to the firewall border.

The side engine cowlings (4) are hinged to upper engine cowling. The side engine cowlings in the shut position are locked by locks (5). The lock springs are in bottom engine cowling (1) white lock screws with groove for screwdriver are in side engine cowlings (4). The locks (5) are locked by turning the lock screw clockwise and unlocked by turning the lock screw in opposite direction. The side cowlings (4) are held in open position by strut (6).



- 1 ... bottom engine cowling
- 2 ... forward engine cowling
- 3 ... upper engine cowling
- 4 ... L; R engine cowling
- 5 ... locks
- 6 ... strut of side engine cowling

Fig. 71-1 Engine cowlings

MAINTENANCE

REMOVAL / INSTALLATION

REMOVAL OF ENGINE COWLINGS

- a) Remove side engine cowlings (Fig. 71-1, item 4) with upper engine cowling (3):
- unlock locks (5) of side engine cowlings (4)

NOTE

Open the locks of side engine cowlings by turning the lock screws through 90° anti-clockwise by screwdriver.

- disconnect bonding between upper engine cowling (3) and firewall
- unlock fasteners joining the upper engine cowling (3) to the firewall border and to the fwd engine cowling (2)
- remove the cowling set (3, 4) from the engine.

NOTE

Remove if necessary the side cowlings (4) as follows:

- disconnect bondings between side and upper engine cowlings (3)
- pull the wire-like pins from the cowling hinges.

- b) Remove fwd engine cowling (2):
- remove screws fixing the fwd cowling to bottom engine cowling (1)
 - remove fwd engine cowling (2) from the engine.
- c) Remove bottom engine cowling (1):
- disconnect bonding between bottom cowling and firewall
 - remove cover sheet behind nose landing gear that is crewed to bottom engine cowling
 - push in the protruding hoses from the carburetor heating (Z 143 L) or from the injector heating (Z143 LSi) and engine oil draining
 - open fasteners joining the bottom engine cowling (1) to firewall
 - release locking pin of draw bar joining the bottom engine cowling to nose landing gear
 - remove bottom engine cowling from the engine by sliding it down along the oleo shock absorber and pulling it forward).

INSTALLATION OF ENGINE COWLINGS

- a) Grease locks fasteners of engine cowlings.
- b) Install bottom engine cowling (1) following way:
- fit the bottom engine cowling to the airplane from forward and join the draw bar to nose landing gear by inserting the pin into the fork of draw bar
 - fix the bottom engine cowling with fastener to border of firewall
 - insert the hoses of oil draining and carburetor heating (Z 143 L) or from injector (Z 143 LSi) into the holes in the bottom engine cowling
 - screw the cover sheet behind the nose landing gear to bottom engine cowling
 - connect the bonding between bottom engine cowling and firewall.
- c) Install fwd engine cowling (2):
- fit the fwd engine cowling upon bottom engine cowling (1) and fix it with screws.

EFFECTIVITY: All

- d) Install upper engine cowling (3) and side engine cowlings (4):
- join upper engine cowling (3) with side engine cowlings (4) by inserting the greased pins to cowling hinges
 - connect bondings between side and upper engine cowlings
 - install the set of cowlings (3, 4) to the airplane
 - join upper engine cowling (3) by means of fasteners to fwd engine cowling (2) and to firewall border
 - connect bondings between upper engine cowling (3) and firewall
 - fasten the side engine cowlings (4) with locks (5).

APPROVED REPAIRS

REPAIR OF ENGINE COWLINGS

Fault	Remedy
1) Faulty engine cowlings: a) metal cowlings (Fig. 71-1, items 3, 4) b) laminated cowlings (Fig. 71-1, items 1, 2).	Repair metal cowlings according to subsection 51-12-00. Repair laminated cowlings according to subsection 51-13-00.
2) Faulty locks.	Replace unserviceable locks.

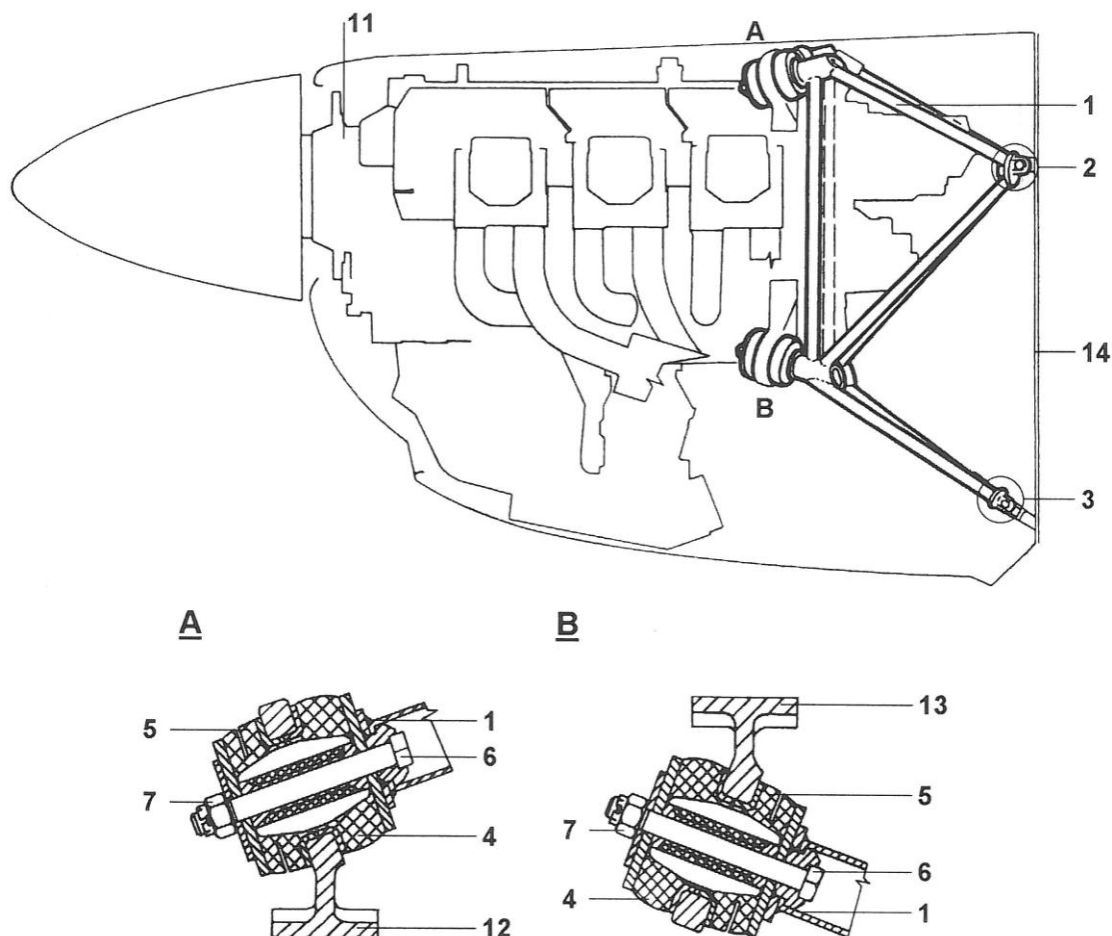
EFFECTIVITY: All

ENGINE MOUNT

DESCRIPTION AND OPERATION

The engine mount (Fig. 71-2, item 1) is joined to upper (2) and bottom hinges (3) upon fwd bulkhead of fwd fuselage latticework by four fitted bolts.

The engine (11) is suspended in four dampers that are installed to engine mount. The upper mounts (12) as well as the bottom engine mounts (13) provided with dampers (4) and dampers with insertion piece (5) are joined by bolts (6) and nuts (7) to engine mount (1).



A ... joining the damper to upper engine mount (12)

B ... joining the damper to bottom engine mount (13)

1 ... engine mount

2 ... joining engine mount to upper engine hinge upon fuselage latticework

3 ... joining engine mount to bottom engine hinge upon fuselage latticework

4 ... damper

5 ... damper with insertion piece

6 ... bolt

7 ... nut

For information only:

11 ... engine

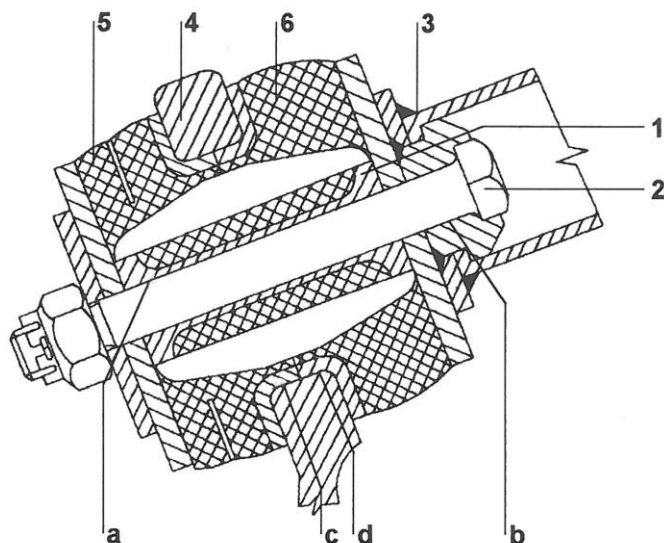
12 ... upper engine hinge

13 ... bottom engine hinge

14 ... firewall

Fig. 71-2 Engine mount

EFFECTIVITY: All



Joint	Item	Name	Dimensions (mm)		
			Original		
			D1	T1	V min./max.
a	1	Spacers	Ø 11,354 Ø 11,125	+ 0,354 + 0,125	<u>0,005</u> 0,254
	2	Bolt	Ø 11,120 Ø 11,100	+ 0,120 + 0,100	
b	3	Engine mount	Ø 11,150 Ø 11,130	+ 0,150 + 0,130	<u>0,010</u> 0,050
	2	Bolt	Ø 11,120 Ø 11,100	+ 0,120 + 0,100	
c	4	Engine hinge	Ø 51,150 Ø 51,100	+ 0,150 + 0,100	<u>0,081</u> 0,223
	5	Damper with insertion piece	Ø 51,054 ± 0,127	+ 0,181 - 0,073	
d	4	Engine hinge	Ø 51,150 Ø 51,100	+ 0,150 + 0,100	<u>0,081</u> 0,223
	6	Damper	Ø 51,054 ± 0,127	+ 0,181 - 0,073	

Fig. 71-3 Dimensions, allowances and plays in engine mount suspensions

MAINTENANCE

REMOVAL / INSTALLATION

REMOVAL AND INSTALLATION OF ENGINE COWLINGS

Procedure of removal/installation of engine mount is issued in section 72-10-00 (REMOVAL / INSTALLATION).

EFFECTIVITY: All

71-20-00

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APPROVED REPAIRS

REPAIRS OF ENGINE MOUNT

Fault	Remedy
1) Faulty of rubber dampers: cracks, excessive deformation	Replace faulty dampers
2) Faulty of engine mount: a) cracks b) bent braces c) corrosion.	Weld cracks by TIG method according to section 53-10-00, APPROVED REPAIRS and repair paint. Grind cracks in welds before welding. Allowed brace bending should not exceed 1 mm (0.04 in). Level or replace more bent braces. Remove corrosion and repair paint. The permissible depth of fault removal is 0,1 mm (0.004 in).
3) Dented holes in mounts. Check is made by micrometer after any engine removal.	Repairs according to subsection „Reaming of Holes in Engine Mount“.

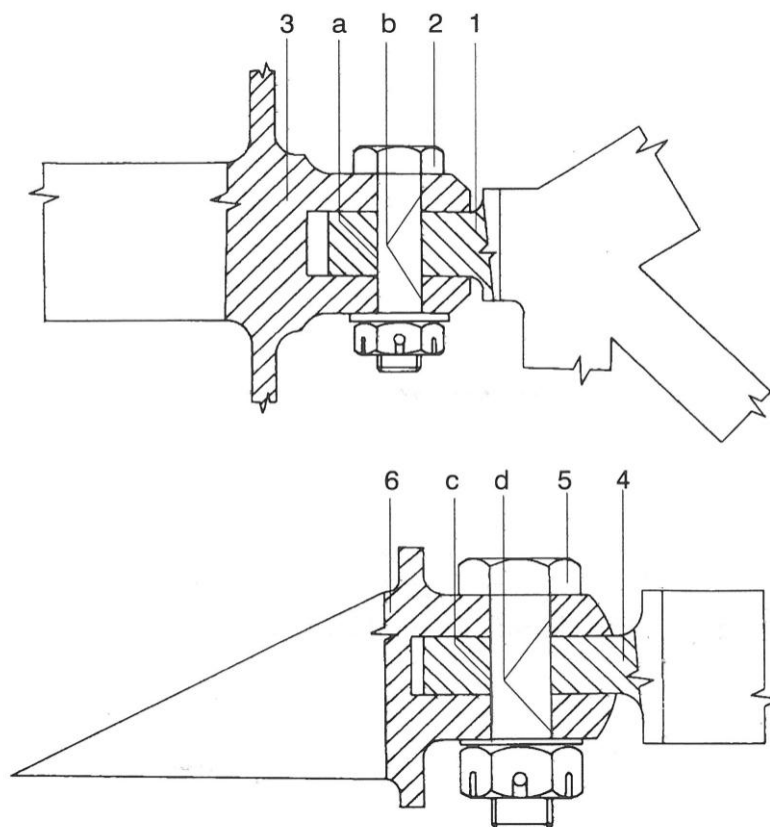
REAMING OF HOLES IN ENGINE MOUNT

General instructions for hole reaming are issued in subsection 20-21-00.

Hole in mount (Fig. 71-4, item 1; 3; 4; 6; 7; 9; 10; 12)		Recommended reamer	Recommended caliper
Original dimension	Ø 8 H7	-----	-----
Dimension after repair	Ø 8,1 H7	Ø 8,1 H7 000-224-5001	Ø 8,1 H7 000-511-1004
	Ø 8,2 H7	Ø 8,2 H7 000-224-5002	Ø 8,2 H7 000-511-1005
	Ø 8,3 H7	Ø 8,3 H7 000-224-5003	Ø 8,3 H7 000-511-1006
	Ø 8,4 H7	Ø 8,4 H7 000-224-5004	Ø 8,4 H7 000-511-1007

Mount bolt (Fig. 71-4, item 2; 5; 8; 11)		Bolt designation (Fig. 71-4)	
		item 2; 8	item 5; 11
Original dimension	Ø 8 f8	8 x 35 ONL 3120.14	8 x 31 ONL 3120.14
Dimensions after repair	Ø 8,1 f8	8,1 x 35 MoN 1167	8,1 x 31 MoN 1167
	Ø 8,2 f8	8,2 x 35 MoN 1167	8,2 x 31 MoN 1167
	Ø 8,3 f8	8,3 x 35 MoN 1167	8,3 x 31 MoN 1167
	Ø 8,4 f8	8,4 x 35 MoN 1167	8,4 x 31 MoN 1167

EFFECTIVITY: All



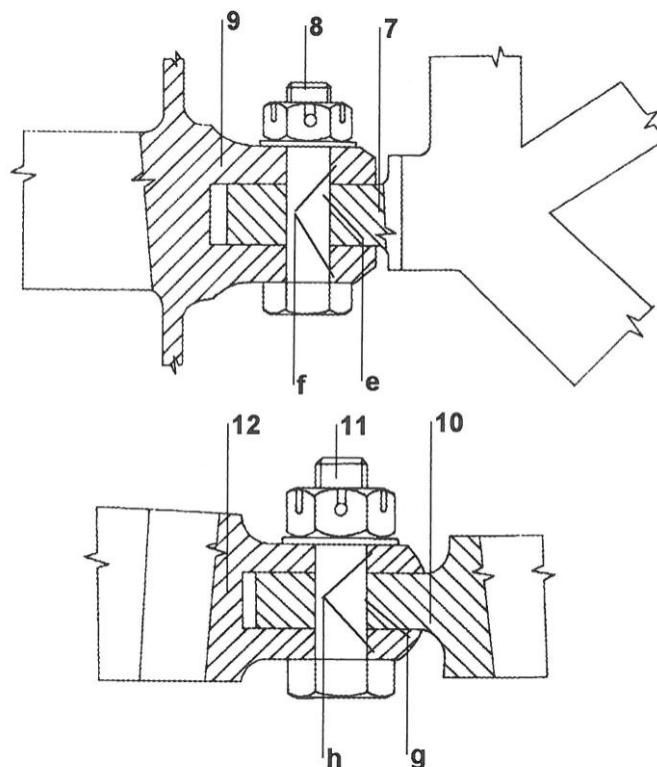
Joint	Item	Name	Dimensions (mm)				
			Original			Operation	Repaired
			D1	T1	V min./max.	T2 max.	D2 max.
a	1	Mount in fuselage latticework	Ø 8 H7	0 + 0,015	<u>0,013</u> 0,050	+ 0,020	Ø 8,4 H7
	2	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
b	3	Left upper mount	Ø 8 H7	0 + 0,015	<u>0,013</u> 0,050	+ 0,020	Ø 8,4 H7
	2	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
c	4	Mount in fuselage latticework	Ø 8 H7	0 + 0,015	<u>0,013</u> 0,050	+ 0,020	Ø 8,4 H7
	5	Fitted bolt	Ø 8 h8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
d	6	Right bottom mount	Ø 8 H7	0 + 0,015	<u>0,013</u> 0,050	+ 0,020	Ø 8,4 H7
	5	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8

Fig. 71-4 Dimensions, allowances and plays in fuselage latticework engine mounts
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EFFECTIVITY: All

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Joint	Item	Name	Dimensions (mm)				
			Original			Operation	Repaired
			D1	T1	V min./max.	T2 max.	D2 max.
e	7	Engine mount in fuselage latticework	Ø 8 H7	0 + 0,015	$\frac{0,013}{0,050}$	+ 0,020	Ø 8,4 H7
	8	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
f	9	Left upper mount	Ø 8 H7	0 + 0,015	$\frac{0,013}{0,050}$	+ 0,020	Ø 8,4 H7
	8	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
g	10	Engine mount in fuselage latticework	Ø 8 H7	0 + 0,015	$\frac{0,013}{0,050}$	+ 0,020	Ø 8,4 H7
	11	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8
h	12	Left bottom mount	Ø 8 H7	0 + 0,015	$\frac{0,013}{0,050}$	+ 0,020	Ø 8,4 H7
	11	Fitted bolt	Ø 8 f8	- 0,013 - 0,035		- 0,045	Ø 8,4 f8

Fig. 71-4 Dimensions, allowances and plays in fuselage latticework engine mounts
(page 2 of 2)

FIRE EXTINGUISHING SYSTEM

DESCRIPTION AND OPERATION

The fire extinguishing system in engine compartment consists of:

- 1) Firewall dividing engine compartment from the airplane cockpit the structure of which is made from three layers, i. e. steel sheet, NETES fabric, and duralumin sheet.
- 2) Fireproof fuel and oil systems where the rubber hoses are provided with fireproof cover and AEROQUIP hoses are made from fireproof material.

EFFECTIVITY: All

ENGINE INDUCTION SYSTEM

DESCRIPTION AND OPERATION

Z 143 L

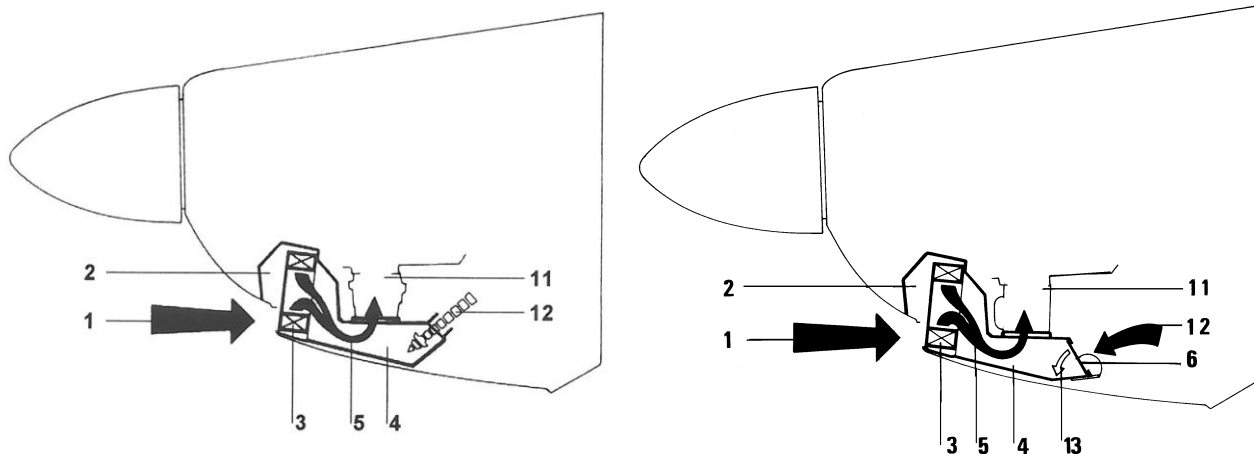
The ambient air (Fig. 71-5, item 1) enters through hole in bottom engine cowling the air filter casing (2). Further on the air proceeds through the air filter element (3) and chamber (4) to carburetor (11).

The hot air for carburetor heating (12) is supplied according to necessity through the controlled flap valve (open/close) in chamber (4). The flap valve is controlled manually by carburetor heater control (section 75-10-00) in airplane cockpit. In case the carburetor heating is used the engine receives unfiltered air.

Z 143 LSi

The ambient air (Fig. 71-5, item 1) enters through hole in bottom engine cowling the air filter casing (2). Then the air proceeds through air filter element (3) and air filter chamber (4) to the injector (11).

There is a flap valve (6) in the rear part of the chamber (4). If the air filter (3) gets clogged during the flight, the flap valve is opened automatically. In such cases, air is led to the injector (11) from the space around the engine.



- 1 ... ambient air entry
- 2 ... air filter casing
- 3 ... air filter element
- 4 ... chamber
- 5 ... air to carburetor

For information only:

- 11 ... carburetor
- 12 ... hot air supply for carburetor heating

- 1 ... ambient air entry
- 2 ... air filter casing
- 3 ... air filter element
- 4 ... chamber
- 5 ... air to injector
- 6 ... flap

- 11 ... injector
- 12 ... air inlet through flap
- 13 ... flap open direction

Fig. 71-5 Engine induction system

MAINTENANCE

REMOVAL / INSTALLATION

REMOVAL OF AIR FILTER ELEMENT

Preparatory works

- a) Remove bottom engine cowling (section 71-10-00, REMOVAL/INSTALLATION).

Removal of air filter element

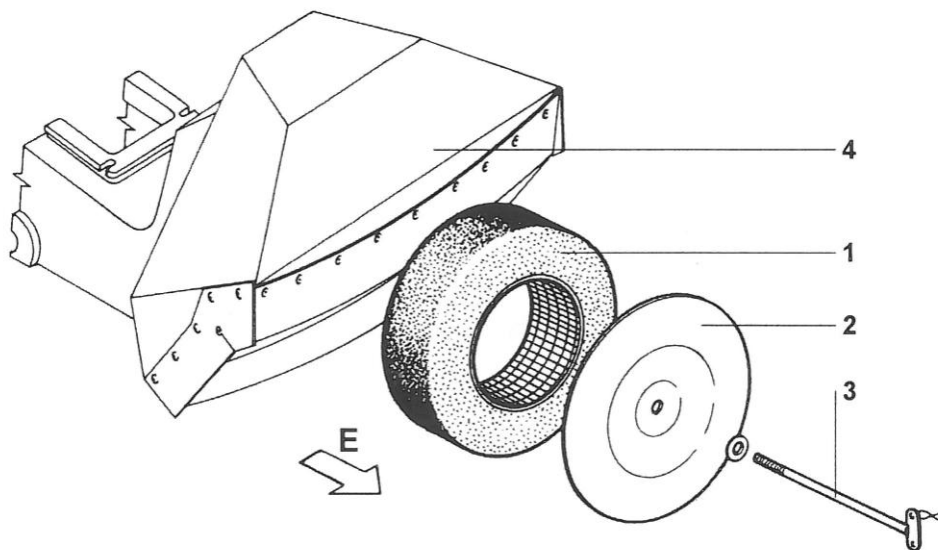
- a) Unlock and unscrew the bolt (Fig. 71-6, item 3); and remove washer and lid (2).
- b) Remove air filter element (1) from the casing (4).
- c) Clean the air filter casing (4) with degreasing agent.

INSTALLATION OF AIR FILTER ELEMENT

- a) Insert air filter element (1) into the air filter casing (4).
- b) Fit the lid (2) and washer in and screw the bolt (3).
- c) Tighten the bolt (3) and lock in with safety to the air casing (4).

Final works

- a) Install bottom engine cowling (section 71-10-00, REMOVAL / INSTALLATION).



- 1 ... air filter element
- 2 ... lid
- 3 ... bolt
- 4 ... air filter casing

Fig. 71-6 Air filter

EFFECTIVITY: All

INSPECTION / CHECK

CHECK OF CLEANNESS OF AIR FILTER ELEMENT

CAUTION (ONLY FOR Z 143 L AIRPLANE)

CHECK IN CASE THE BULKY DIRT IS DETECTED (STRAW, HAY ETC.) IN AIR FILTER THE CLEANNESS OF CARBURETOR HEATING SYSTEM (section 75-10-00).

Check the air filter cleanness (Fig. 71-5, item 3) during pre-flight inspection through the hole in bottom engine cowl as follows:

- bottom side of filter element visually
- upper (invisible) side of filter element by hand.

Replace air filter element:

- after 200 flight hours
- at least once per 12 month
- if at least 50 % filter element is covered with foreign objects.

Paper filter element should be replaced according to instructions (see recommendation) of filter element manufacture.

Recommendation

Paper air filter element, e. g. FRAM CA 144 PL should be used in very dusty environment.

NOTE

If the BRACKET BA-105 filter is used replace only BA-10 filter element.