71

POWERPLANT

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POWER PLANT

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The powerplant of the TB 9 is installed in the aircraft front section, isolated from the airframe by a stainless steel firewall.

The installation consists of :

- a LYCOMING engine, O-320-D2A or O-320-D1A (with constant speed propeller) - refer to 72-00-00,
- a propeller - refer to 61-00-00,
- cowlings,
- an engine mount and silent-blocks assembly,
- an air inlet system.

2. DESCRIPTION

A. Cowlings - refer to 71-10-00

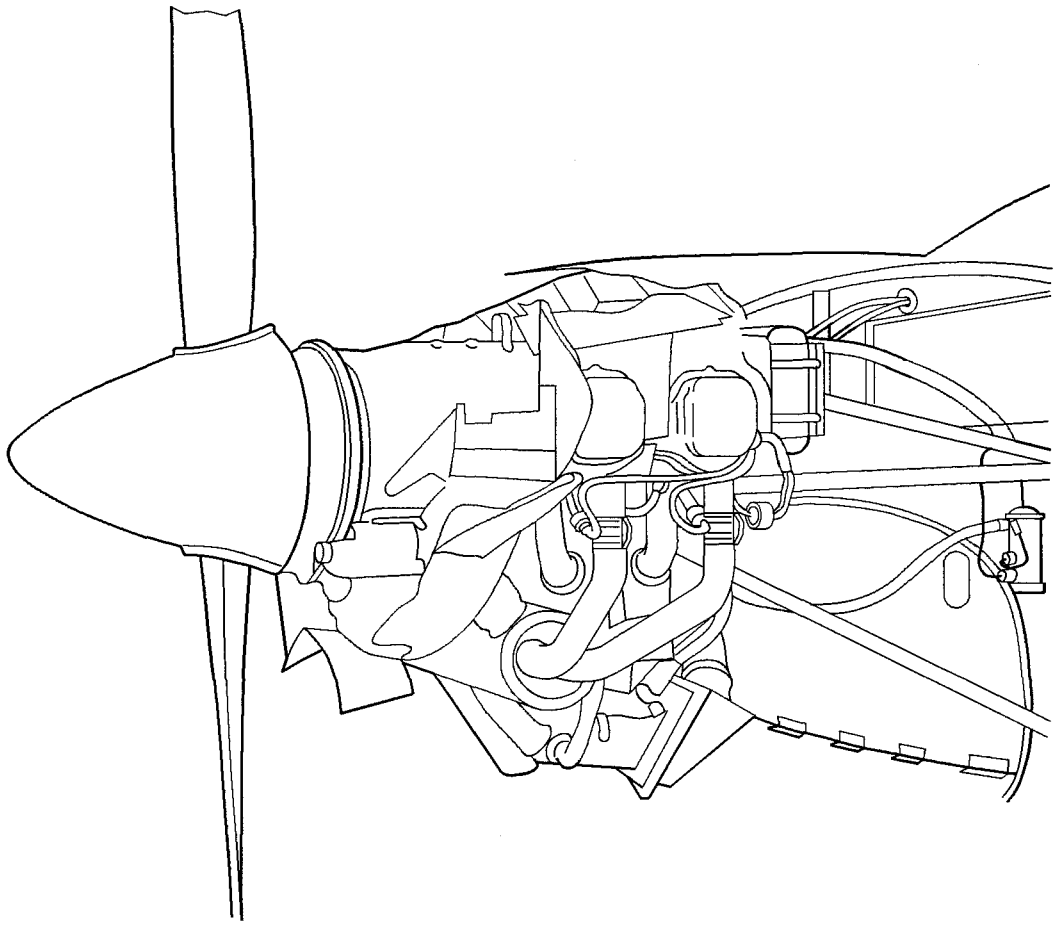
Cowlings protect the engine and provide a regular air flow.

B. Engine mount - refer to 71-20-00

The engine mount and silent-blocks assembly attaches the engine to the airframe.

C. Air inlet - refer to 71-60-00

The air inlet system canalizes the air necessary for engine proper operation.



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Power plant
Figure 1

POWER PLANT

REMOVAL / INSTALLATION

1. REMOVAL OF POWER PLANT (Figure 401)

A. Tools and consumable materials

- Hoisting device
- Padded support for frame C8
- Drain receptacle
- Blanking caps

B. Procedure

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE ENGINE, EXHAUST PIPE AND MANIFOLDS ARE COLD. IF NOT, TAKE NECESSARY PRECAUTIONS TO AVOID SEVERE BURNS.

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE KEY IS REMOVED FROM MAGNETO SELECTOR AND THAT "MAIN SWITCH" IS OFF.

1) Apply the parking brake and install wheel chocks.

2) Disconnect the battery - refer to 24-30-02.

CAUTION : TO AVOID DAMAGING THE STRUCTURE, THE SUPPORT MUST PERFECTLY FIT THE FUSELAGE PROFILE AND HAVE PADDED AREAS.

3) Place a padded support under the rear fuselage at frame C8.

4) Remove the engine cowlings - refer to 71-10-01.

5) Disconnect the power plant ignition harnesses - refer to 74-20-01.

6) Remove the propeller - refer to 61-10-00.

7) Drain the oil system - refer to 12-12-02.

8) Disconnect hot air hose(s) (10) and (13) from cabin air mixer (11) and demisting box (14) (if installed) on firewall side. Blank off.

9) Disconnect breather hose (1) on engine side. Blank off.

S / N 301 - 9999 and S / N 1 - 300 Post-Kit OPT10 907100

10) Disconnect oil pressure hose (22) on transmitter side - see Detail J. Blank off.

NOTE : Details K and L are installation variants of Detail J.

S / N 1 - 764, 766 - 878 with constant speed propeller

11) Disconnect manifold pressure hose (18) from manifold pressure filter (19) of manifold pressure system. Blank off.

S / N 1 - 822, 850 - 887, 889 - 947

12) Disconnect mechanical tachometer control (6) on power plant side. Blank off.

S / N 1 - 9999

13) Disconnect fuel hose (26) on the electric pump. Blank off.

14) Disconnect engine pump air vent hose (24) on firewall by cutting tie-wrap (25) linking the hose and breather (23). Blank off.

15) If installed, remove the exhaust and cylinder head temperature probes.

16) Mark the routing and disconnect the engine controls :

- carburetor heating control (16),
- throttle control (15),
- mixture control (17),

S / N 1 - 764, 766 - 878 with constant speed propeller

- propeller governor control (5).

17) Mark the electrical cables and their routing, then disconnect the electrical cables :

- engine ground on firewall,
- starter power supply,
- alternator power supply,
- fuel pressure switch,
- oil temperature probe,
- magnetos,

S / N 1 - 300 Pre-Kit OPT10 907100

- oil pressure transmitter,

S / N 1 - 300, 969, 1185, 1214, 1478, 1506 - 1508, 1513 - 9999

- fuel pressure transmitter,

S / N 823 - 849, 888, 948 - 9999

- tachometer sensor (electronic tachometer).

S / N 301 - 968, 970 - 1184, 1186 - 1213, 1215 - 1477, 1479 - 1505, 1509 - 1512

18) Disconnect hose (27) of fuel pressure transmitter (28) on transmitter side. Blank off.

S / N 1 - 9999

19) Disconnect hose (2) of vacuum pump (4) (if installed), on firewall side. Blank off.

20) Install the engine hoisting device (winch or pulley block) and hook it onto engine hoisting ring (12).

21) Remove all attaching components for electrical cables, ducts, engine controls, hoses, etc., attached to the engine mount.

CAUTION : BEFORE REMOVING THE ENGINE, MAKE SURE NOTHING IMPEDES ITS FREE REMOVAL (WIRING, HOSES, ETC.).

22) Remove the 12 bolts (20) and washers (21) attaching the engine mount to the firewall, while keeping the engine balanced on the winch or pulley block.

23) Disengage the power plant from the fuselage.

2. INSTALLATION OF POWER PLANT (Figure 401)

A. Tools and consumable materials

- Hoisting device
- Padded support for frame C8
- Tie-wraps
- Loctite (TB 09-906)
- Red paint
- Adhesive tape (TB 08-917) or protective tape (TB 05-938)

B. Procedure

1) Prior to power plant installation, carry out the following operations :

a) Check engine mount condition, surface condition, absence of cracks, elongation of attachment holes, weld condition.

CAUTION : IF A SILENT-BLOCK IS DAMAGED, REPLACE THE 4 SILENT-BLOCKS AT THE SAME TIME.

b) Check condition of silent-blocks , replace them if necessary.

c) Check condition of the firewall, especially at the location of the engine mount fasteners.

d) Check condition of the hoses, replace them if necessary.

NOTE 1 : If new hose(s) of the "Spiragaine" type is (are) installed, no traces of release grease (silicone) must remain inside the hose(s). Any traces must be removed with a dry cloth.

NOTE 2 : When installing a new power plant or if a taper union has been replaced, it is necessary to install the new union(s) with Loctite (TB 09-906).

CAUTION : AFTER INSTALLATION OF A NEW, REMANUFACTURED OR REPAIRED ENGINE, PERFORM A PARTICULAR INSPECTION AFTER 25 HOURS OF OPERATION.

2) Place the engine in position on the fuselage using a pulley block or winch.

3) Secure the engine and its mount in position using bolts (20) and washers (21).

4) Torque according to "Specific cases" tightening procedure - refer to 20-00-01.

5) Mark the heads of bolts (20) with a red paint line.

6) Remove the engine hoisting device and the padded support.

7) Remove the blanking caps and connect hose (2) to vacuum pump (4). Tighten clamp (3).

8) Connect the electrical cables as marked during removal :

- engine ground on firewall,
- starter power supply,
- alternator power supply,
- fuel pressure switch,
- magnetos,
- oil temperature probe,

S / N 1 - 300 Pre-Kit OPT10 907100

- oil pressure transmitter,

S / N 1 - 300, 969, 1185, 1214, 1478, 1506 - 1508, 1513 - 9999

- fuel pressure transmitter,

S / N 823 - 849, 888, 948 - 9999

- tachometer sensor (electronic tachometer).

S / N 1 - 9999

9) Connect the engine controls, in accordance with the initial routing :

- carburetor heating control (16) - refer to 76-10-02,
- throttle control (15) - refer to 76-10-01,
- mixture control (17) - refer to 76-10-03,

S / N 1 - 764, 766 - 878 with constant speed propeller

- propeller governor control (5) - refer to 61-20-01.

10) Remove the blanking caps, position engine pump air vent hose (24) and secure it to breather (23) using a new tie-wrap (25).

11) Remove the blanking caps and connect fuel hose (26) to the electric pump.

S / N 1 - 822, 850 - 887, 889 - 947

12) Remove the blanking caps and connect mechanical tachometer control (6) on power plant side.

S / N 1 - 764, 766 - 878 with constant speed propeller

13) Remove the blanking caps and connect manifold pressure hose (18) to manifold pressure filter (19).

NOTE : If manifold pressure filter (19) has been replaced, install it with the arrow pointing towards the indicator - see Figure 2/3, Detail G.

S / N 1 - 9999

14) Remove the blanking caps and connect breather hose (1).

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15) Remove the blanking caps and connect oil pressure hose (22).

S / N 301 - 968, 970 - 1184, 1186 - 1213, 1215 - 1477, 1479 - 1505, 1509 - 1512

16) Remove the blanking caps and connect hose (27) of fuel pressure transmitter (28).

S / N 1 - 9999

17) Remove the blanking caps and connect hot air hoses (10) and (13) to cabin air mixer (11) and demisting box (14).

CAUTION : TO AVOID PREMATURE WEAR OF ENGINE AND LANDING GEAR MOUNTS, IT IS RECOMMENDED TO REPLACE "ALPLA" BAND WHICH ATTACHES "SPIRAGAINE" HOSES ON MOUNTS BY TIE-WRAPS AND CONNECTION RINGS. INSTALL ADHESIVE TAPE (TB 08-917) OR PROTECTION TAPE (TB 05-938) UNDER TIE-WRAPS.

18) Attach the electrical cables, ducts, engine controls, hoses, etc., to the engine mount using new tie-wraps.

19) If installed, install the cylinder head and exhaust temperature probes.

20) Mark the position of the hose unions with a red paint line.

21) Install the propeller - refer to 61-10-00.

22) Fill the oil tank - refer to 12-12-01.

23) Connect the power plant ignition harnesses - refer to 74-20-01.

24) Connect the battery - refer to 24-30-02.

25) Make sure all the tools and materials are removed and the work area is clean and free from debris.

26) Install the engine cowlings - refer to 71-10-01.

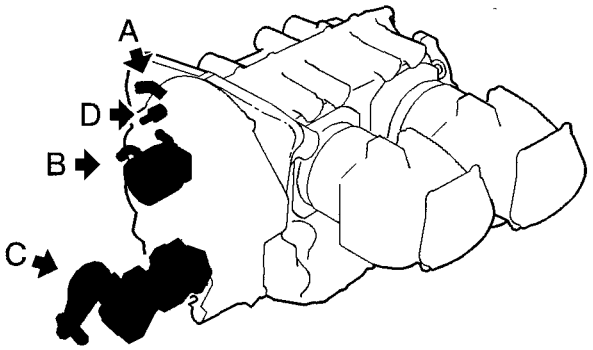
27) Remove the wheel chocks.

28) Perform a test run-up - refer to 05-30-02.

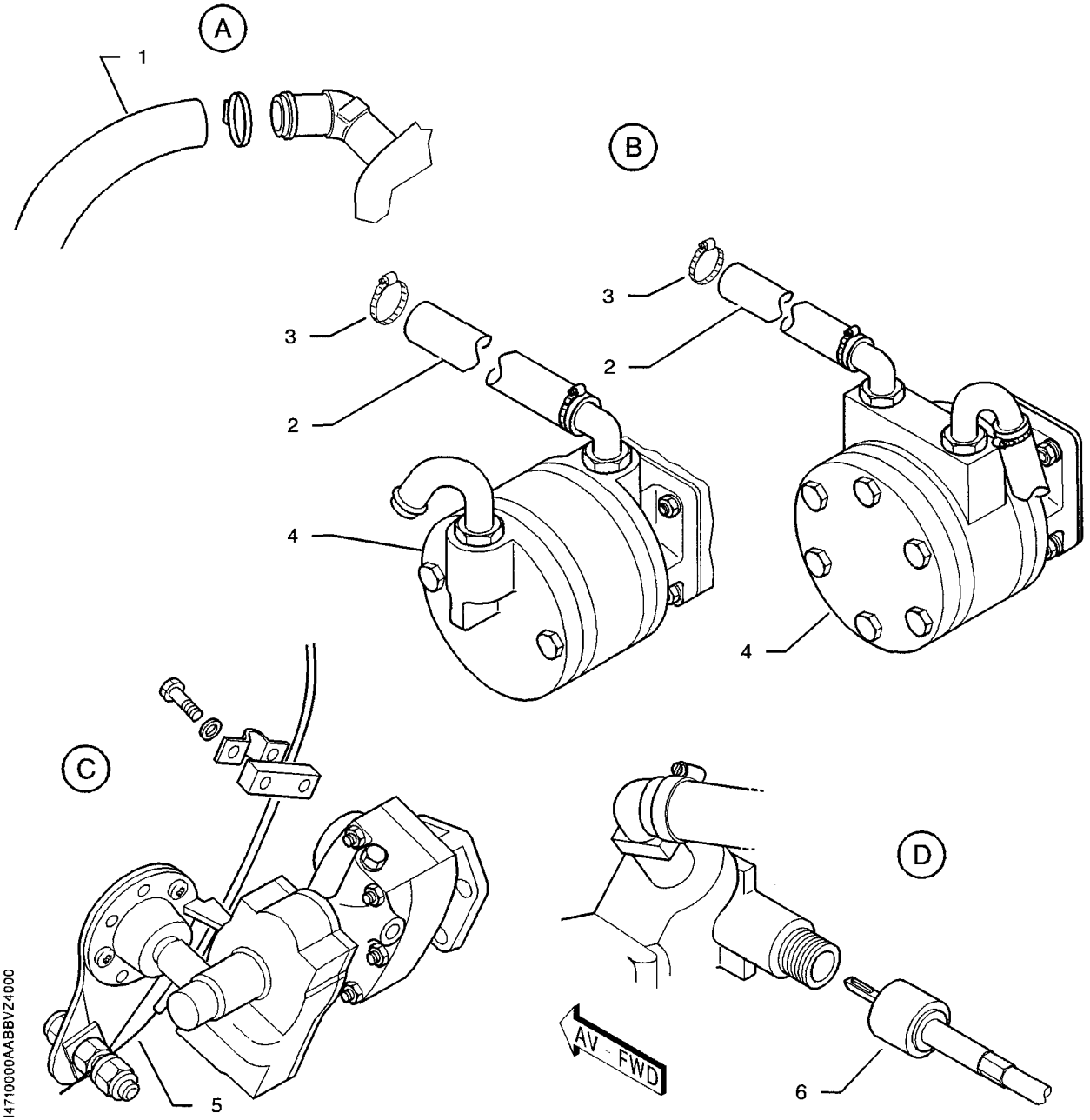
29) Remove the engine cowlings to check for leaks (oil and fuel).

30) Install the engine cowlings - refer to 71-10-01.

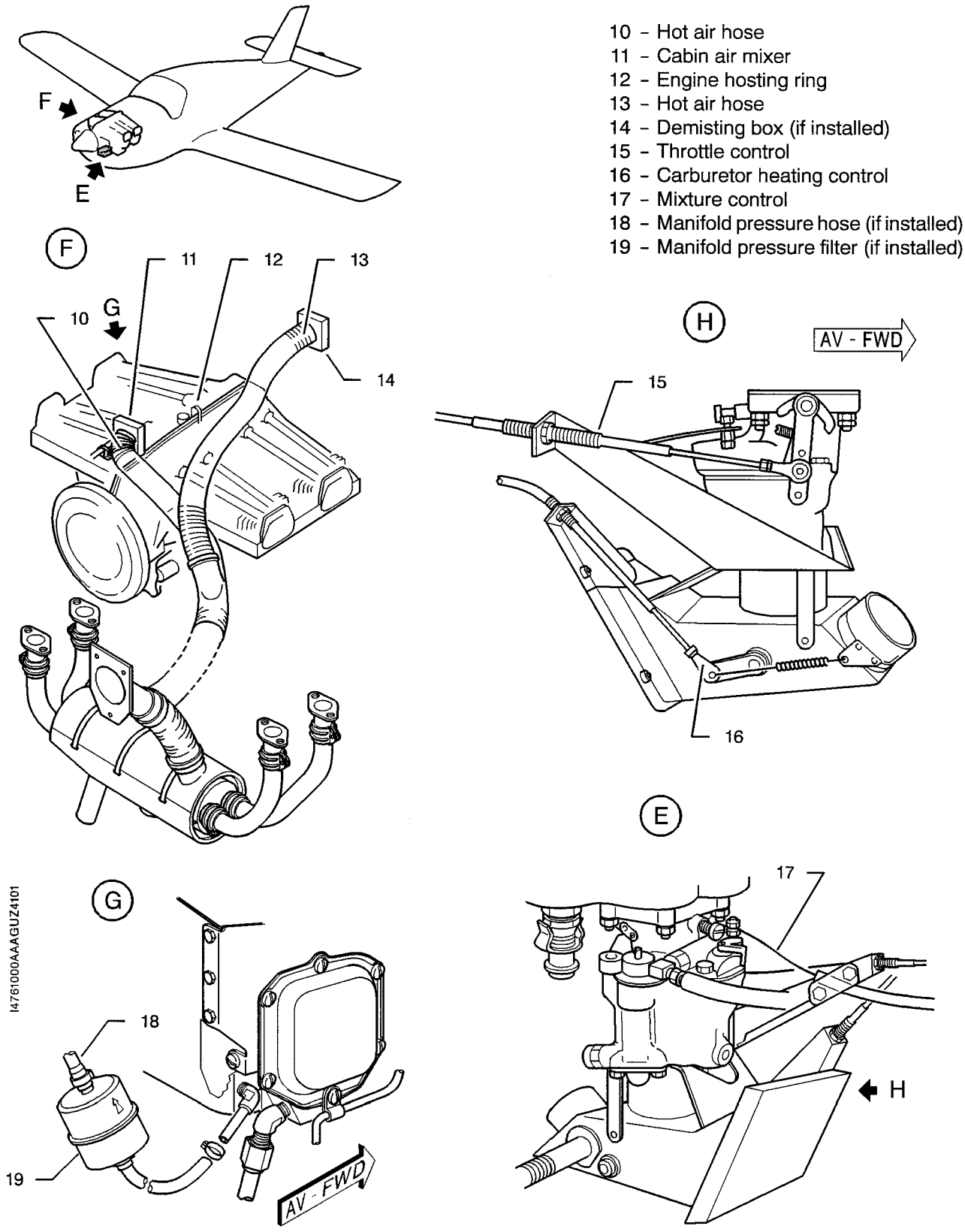
31) Perform a test flight - refer to 05-30-00.



1 - Breather hose
2 - Hose
3 - Clamp
4 - Vacuum pump
5 - Propeller governor control
6 - Mechanical tachometer control



Power plant - Removal / Installation
Figure 401 (1/3)



10 - Hot air hose
11 - Cabin air mixer
12 - Engine hosting ring
13 - Hot air hose
14 - Demisting box (if installed)
15 - Throttle control
16 - Carburetor heating control
17 - Mixture control
18 - Manifold pressure hose (if installed)
19 - Manifold pressure filter (if installed)

Power plant - Removal / Installation
Figure 401 (2/3)

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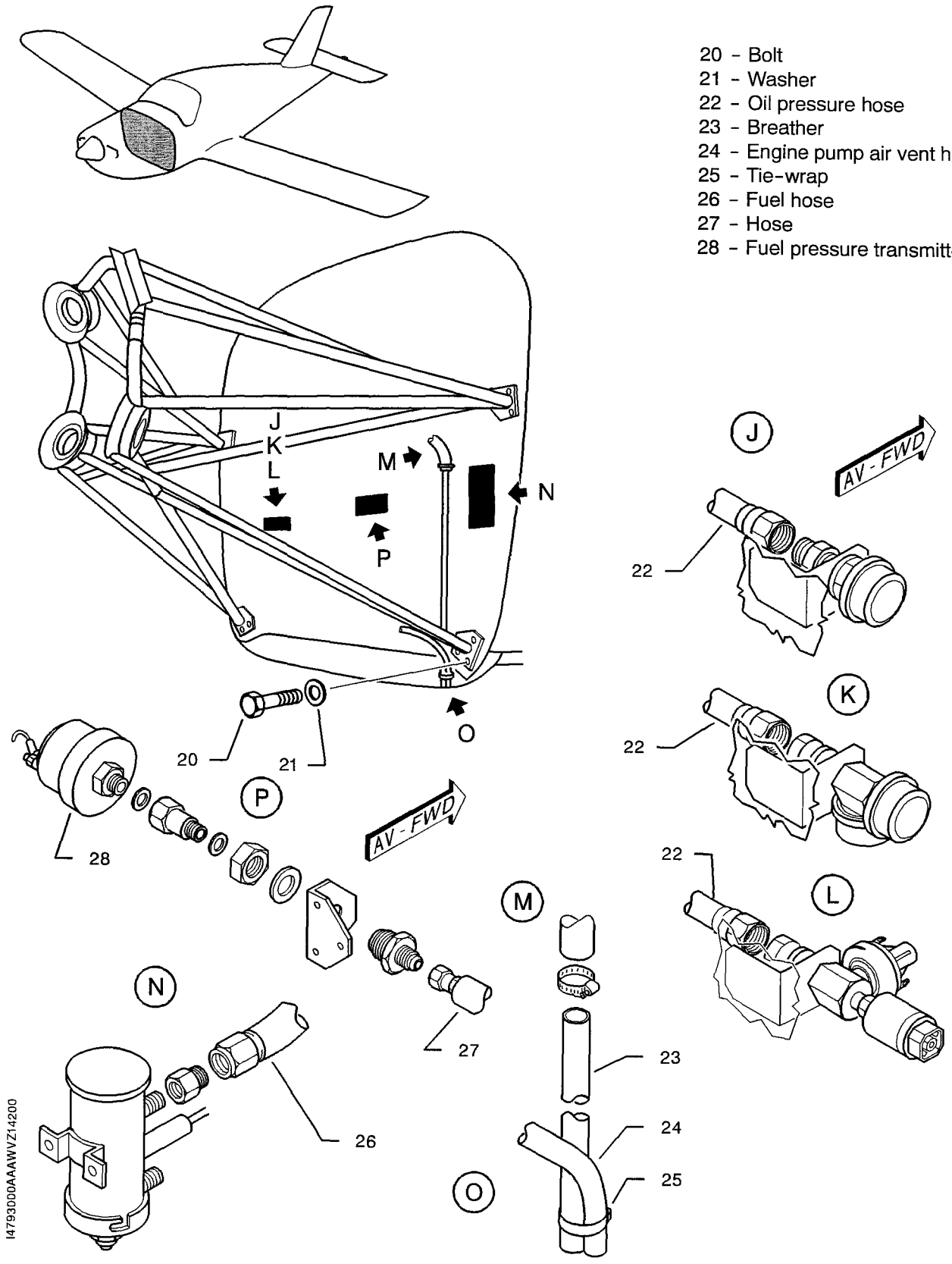
Validity : S / N 1 - 9999



Power plant - Removal / Installation
Figure 401 (3/3)

AEAA
Validity : S / N 1 - 9999

COWLING

DESCRIPTION AND OPERATION

1. GENERAL

The cowling is the part of the system made up of the removable panels which surround the power plant.

The main elements are :

- the upper engine cowling 121,
- the lower engine cowling 131,
- the engine bulkheads.

2. LOCATION (Figures 1 and 1A)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Upper engine cowling 121	1	100	/	71-10-01
Lower engine cowling 131	1	100	/	71-10-01
Engine bulkheads	6	100	121 / 131	71-10-02

3. DESCRIPTION

A. Engine cowlings

The engine cowlings ensure an aerodynamic air-flow around the engine, the routing of air for the cooling system, the air intake for air conditioning and the supply of air to the engine for the air / fuel mixture.

The engine cowl is a laminate cantilever structure, secured to the firewall by screws and made of two elements :

- the upper engine cowling 121, fitted with an inspection door provided to check oil level - refer to 06-30-00,
- the lower engine cowling 131, fitted with incorporated air intakes and which can be fitted, as an option, with inspection doors - refer to 06-30-00.

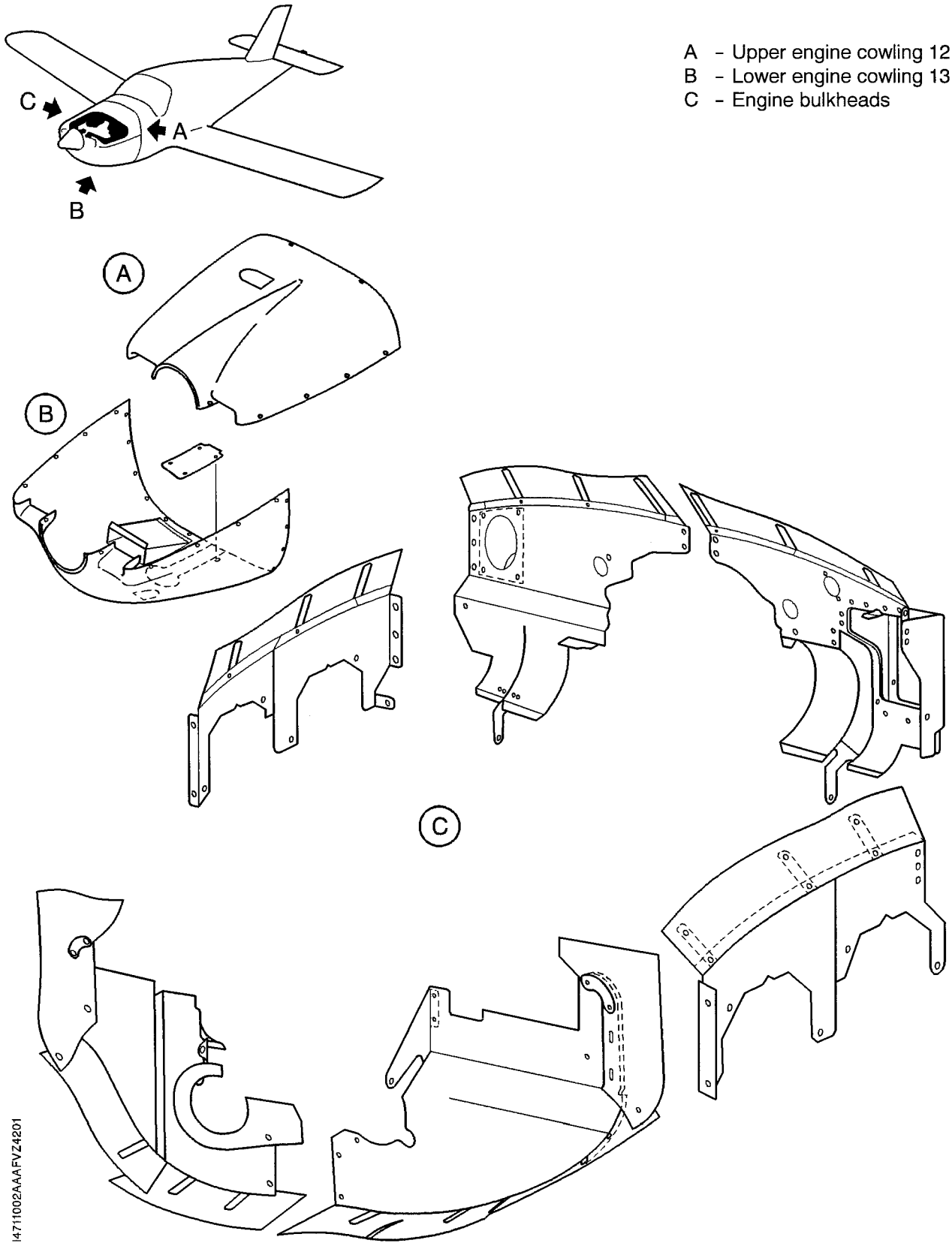
Both cowlings, secured to each other with 1/4 turn fasteners, are completely removable without requiring removal of the propeller.

B. Engine bulkheads

The engine bulkheads are used to route the cooling air around the cylinders and the alternator cooling air. They are located around the cylinders.

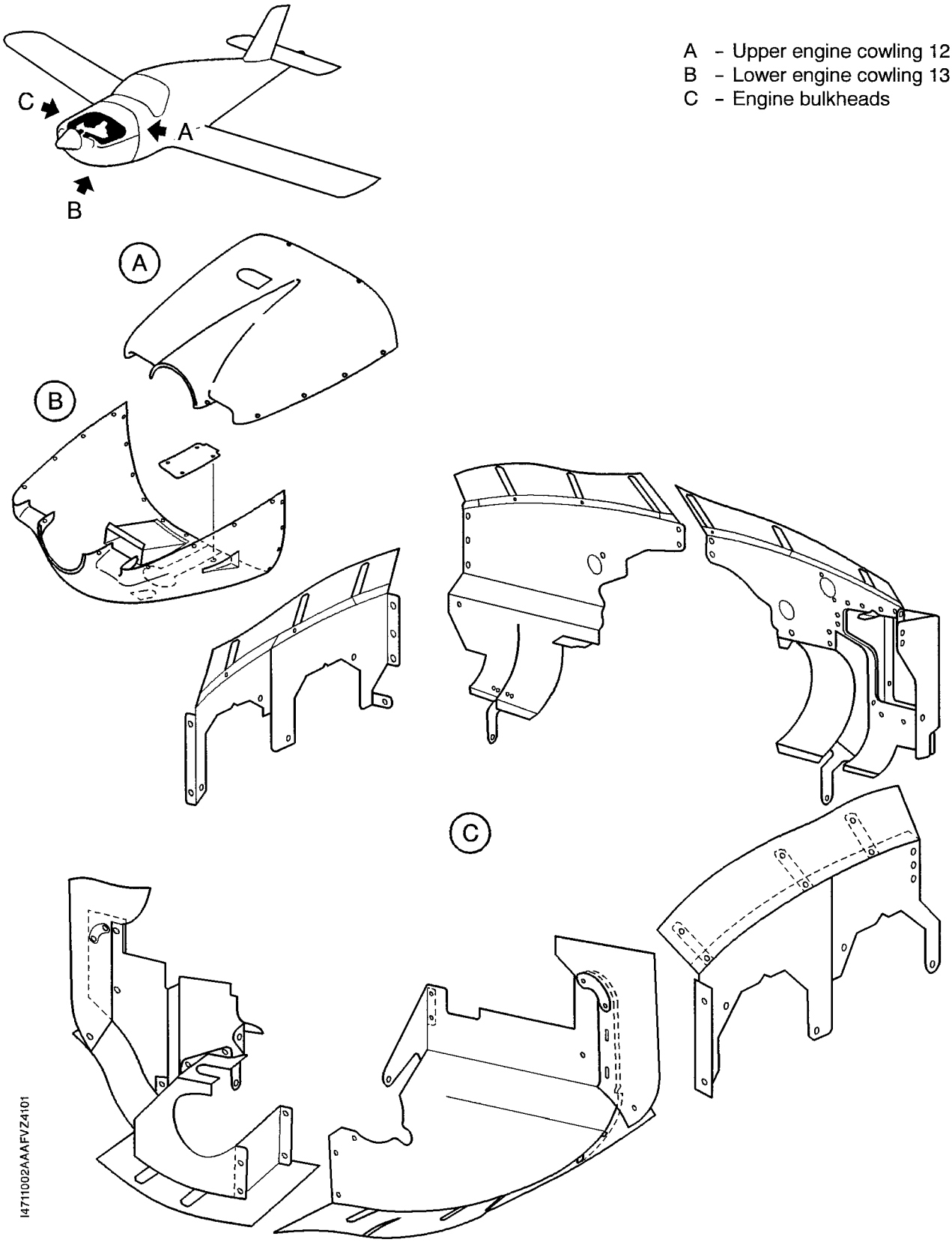
Engine and accessories cooling is provided by a downwards airflow. Air penetrates through holes located on the cowling, on each side of the propeller cone, is guided around the engine by airproof deflectors, then conducted to two air outlets located on the lower cowling.

A - Upper engine cowling 121
B - Lower engine cowling 131
C - Engine bulkheads



Cowling - Identification and location of components
Figure 1 - S / N 1 - 387, 393 Pre-Kit OPT10 917900

A - Upper engine cowling 121
B - Lower engine cowling 131
C - Engine bulkheads



Cowling - Identification and location of components
Figure 1A - S / N 388 - 392, 394 - 9999 and S / N 1 - 387, 393 Post-Kit OPT10 917900

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Validity : S / N 1 - 9999

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ENGINE COWLINGS

REMOVAL / INSTALLATION

1. REMOVAL OF ENGINE COWLINGS (Figure 401)

A. Tools and consumable materials

- Blanking caps

B. Procedure

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE ENGINE, EXHAUST PIPE AND MANIFOLDS ARE COLD. IF NOT, TAKE NECESSARY PRECAUTIONS TO AVOID SEVERE BURNS.

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE KEY IS REMOVED FROM MAGNETO SELECTOR AND THAT "MAIN SWITCH" IS OFF.

1) Unscrew 1/4 turn fasteners (4) and remove upper cowling (3).

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2) Loosen clamp (12), disconnect carburetor cool air hose (11) and blank off.

S / N 1 - 9999

3) Remove bolts (8), washers (7) and closing plate (2).

4) Remove screws (6), cup washers (5) and lower cowling (1).

2. INSTALLATION OF ENGINE COWLINGS (Figure 401)

A. Tools and consumable materials

None

B. Procedure

CAUTION : EVERY FIVE REMOVALS OF THE LOWER ENGINE COWLING, INSTALL NEW SCREWS (6).

1) Check the condition of the cowlings, centering pins (9), centering bushes (10), 1/4 turn fasteners (4) and receptacles (14).

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S / N 1 - 387, 393 Post-Kit OPT10 917900

2) Inspect hose (11) and NACA air intake (13) end fitting for cracks. If the end fitting is cracked, apply Kit OPT10 917300.

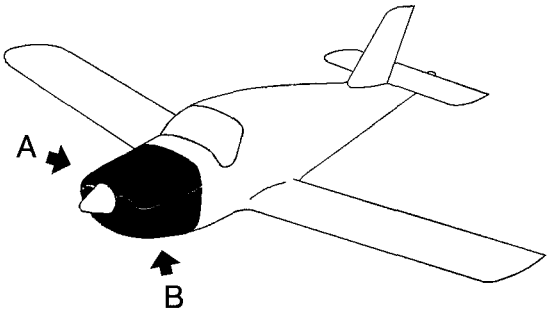
NOTE : If a new hose (11) is installed, no traces of release grease (silicone) must remain inside the hose. Any traces must be removed with a dry cloth.

S / N 1 - 9999

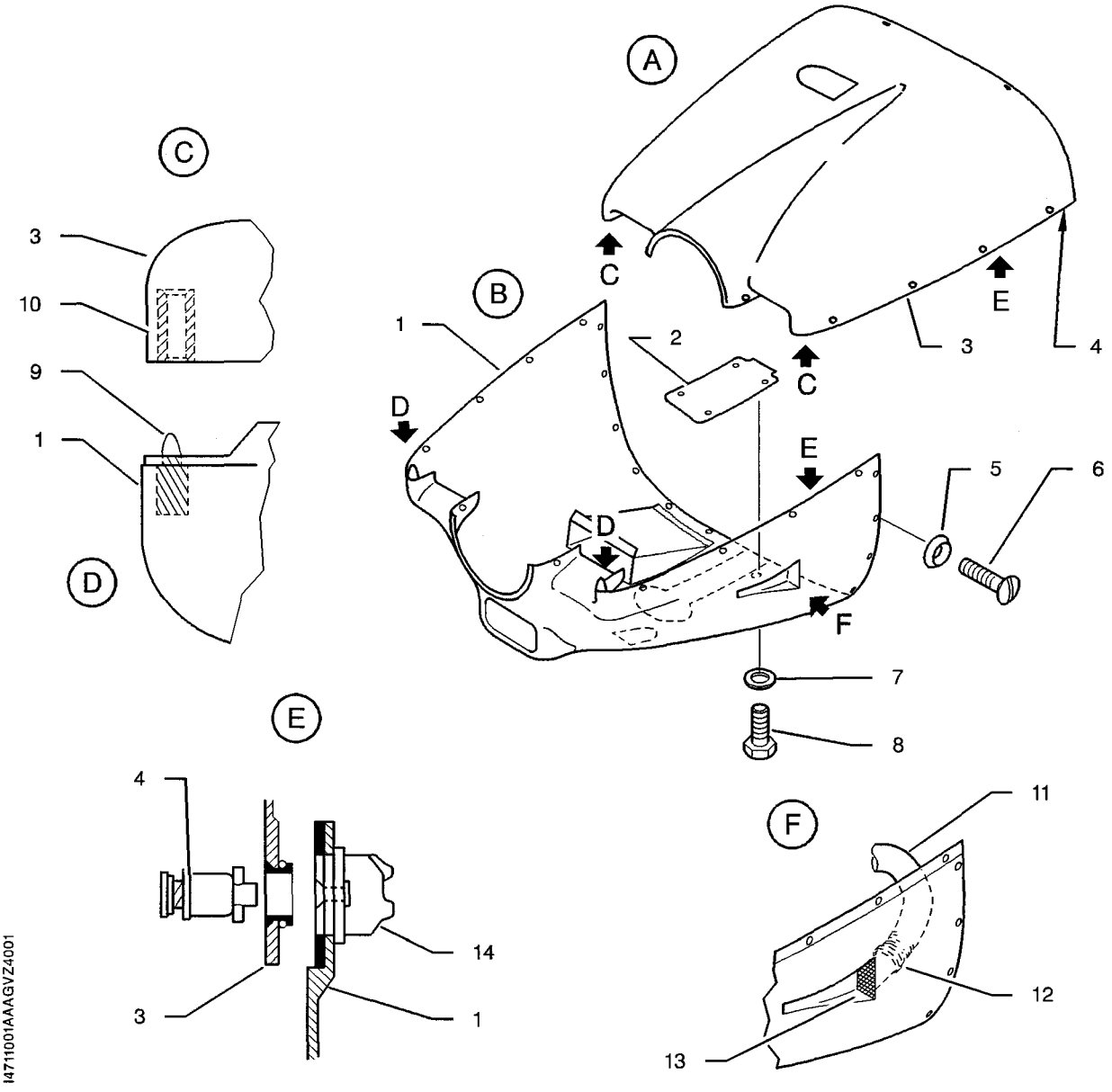
3) Install lower cowling (1) and secure it with screws (6) and cup washers (5).

4) Make sure the seals of the side and front bulkheads lie flat against lower cowling (1).

5) Install closing plate (2) and secure it with bolts (8) and washers (7).
6) Remove the blanking cap and reconnect carburetor cool air hose (11).
7) Install clamp (12), tighten.
8) Make sure all the tools and materials are removed and the work area is clean and free from debris.
9) Install upper cowling (3) by engaging centering pins (9) into centering bushes (10).
10) Lock 1/4 turn fasteners (4).
11) Measure the clearance between the propeller spinner and the cowling. This clearance must be 0.5 in ± 0.157 in (13 mm ± 4 mm), with a maximum misalignment of 0.157 in (4 mm).



1 - Lower cowling
2 - Closing plate
3 - Upper cowling
4 - 1/4 turn fastener
5 - Cup washer
6 - Screw
7 - Washer
8 - Bolt
9 - Centering pin
10 - Centering bush
11 - Hose
12 - Clamp
13 - NACA air intake
14 - Receptacle



Engine cowlings - Removal / Installation
Figure 401

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ENGINE BULKHEADS

REMOVAL / INSTALLATION

1. REMOVAL OF ENGINE BULKHEADS (Figures 401, 401A, 402 and 403)

A. Tools and consumable materials

- Blanking caps

B. Procedure

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE ENGINE, EXHAUST PIPE AND MANIFOLDS ARE COLD. IF NOT, TAKE NECESSARY PRECAUTIONS TO AVOID SEVERE BURNS.

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE KEY IS REMOVED FROM MAGNETO SELECTOR AND THAT "MAIN SWITCH" IS OFF.

1) Remove the engine cowlings - refer to 71-10-01.

2) Remove the oil cooler - refer to 79-20-01.

3) Disconnect the power plant upper ignition harnesses - refer to 74-20-01.

4) Remove and discard nuts (4) and (26), remove washers (5) and (24), bolts (7) and (23) and grommets (8) and (25).

CAUTION : BE CAREFUL NOT TO PEEL THE PROTECTIVE SLEEVE OF THE IGNITION HARNESSES.

5) Remove the ignition harnesses from R.H. side bulkhead (6) (or R.H. rear bulkhead (1)) and L.H. rear bulkhead (22).

S / N 1 - 387, 393 Pre-Kit OPT10 917900

6) Remove clamps (13), (27) and (29), and disconnect hoses (14), (28) and (30). Blank off.

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S / N 1 - 387, 393 Post-Kit OPT10 917900

6) Remove clamps (27) and (29), and disconnect hoses (28) and (30). Blank off.

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6) Remove clamps (16), (27) and (29), then disconnect alternator cooling hose (15) and hoses (28) and (30). Blank off.

7) Remove nut (19), washers (18) and bolt (17) attaching R.H. front bulkhead (3) to the alternator.

S / N 1 - 9999

8) Remove all nuts, washers and bolts securing the bulkheads together. Discard the nuts.

9) Remove and discard the "Daudé" rivets securing the front bulkheads to the side bulkheads.

10) Remove starter attachment(s) (31) securing L.H. front bulkhead (21).

Pre-MOD. 123 or Kit OPT10 923300

11) Cut and discard the lockwire, then remove springs (2).

Post-MOD. 123 or Kit OPT10 923300

11) Cut and discard the lockwire, then remove and discard nuts (44).

12) Remove washers (45), bolts (47), spacers (46) and springs (2).

13) Remove bolt (41) and lockwasher (42). Discard lockwasher (42).

All

14) Remove all screws, lockwashers and washers securing the bulkheads to the powerplant. Discard the lockwashers.

15) Remove screw (11), lockwasher (10) and washer (9). Discard lockwasher (10).

16) Remove R.H. front bulkhead (3), L.H. front bulkhead (21), R.H. side bulkhead (6), L.H. side bulkhead (32), R.H. rear bulkhead (1) and L.H. rear bulkhead (22).

2. INSTALLATION OF ENGINE BULKHEADS (Figures 401, 401A, 402 and 403)

A. Tools and consumable materials

- Loctite (TB 08-013C)
- 2 "Daudé" rivets
- Stainless steel lockwire, dia. 0.032 in (0.8 mm)

B. Procedure

1) Check the engine bulkheads for :
   - absence of cracks,
   - elongation of attachment holes,
   - cooler support condition,
   - condition of seals and clamping springs (if installed),
   - condition of springs,
   - presence and condition of seals (43) on the rear and front bulkheads.

2) Install and secure the engine bulkheads to the power plant with the screws, new lockwashers and washers.

3) Coat screw (11) with Loctite (TB 08-013C) and install it with a new lockwasher (10) and washer (9).

Post-MOD. 123 or Kit OPT10 923300

4) Install bolt (41) and new lockwasher (42).

All

5) Secure the bulkheads together using the bolts, washers and new nuts.

NOTE : Pre-MOD. 123, it is recommended to apply Kit OPT10 923300 "Engine bulkheads".

6) Install starter attachment(s) (31) securing L.H. front bulkhead (21).

Pre-MOD. 123 or Kit OPT10 923300

7) Install springs (2) and, using stainless steel lockwire, secure the springs to the inlet pipe clamp.

Post-MOD. 123 or Kit OPT10 923300

7) Install bolts (47), equipped with spacers (46) and springs (2), on the bulkhead lugs.

8) Install washers (45) and new nuts (44) and, using stainless steel lockwire, secure them to the inlet pipe clamps.

S / N 401 - 9999

9) Install bolt (17), washers (18) and new nut (19) securing R.H. front bulkhead (3) to the alternator.

10) Remove the blanking caps and connect alternator cooling hose (15) and hoses (28) and (30). Install clamps (16), (27) and (29).

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S / N 1 - 387, 393 Post-Kit OPT10 917900

9) Remove the blanking caps and connect hoses (28) and (30). Install clamps (27) and (29).

S / N 1 - 387, 393 Pre-Kit OPT10 917900

9) Remove the blanking caps and connect hoses (14), (28) and (30). Install clamps (13), (27) and (29).

S / N 1 - 9999

CAUTION : BE CAREFUL NOT TO PEEL THE PROTECTIVE SLEEVE OF THE IGNITION HARNESSES.

11) Route the ignition harnesses through R.H. side bulkhead (6) (or R.H. rear bulkhead (1)) and L.H. rear bulkhead (22).

12) Install and attach grommets (8) and (25) with bolts (7) and (23), washers (5) and (24) and new nuts (4) and (26).

13) Connect the power plant ignition harnesses - refer to 74-20-01.

14) Install the "Daudé" rivets securing the front bulkheads to the side bulkheads.

15) Install the oil cooler - refer to 79-20-01.

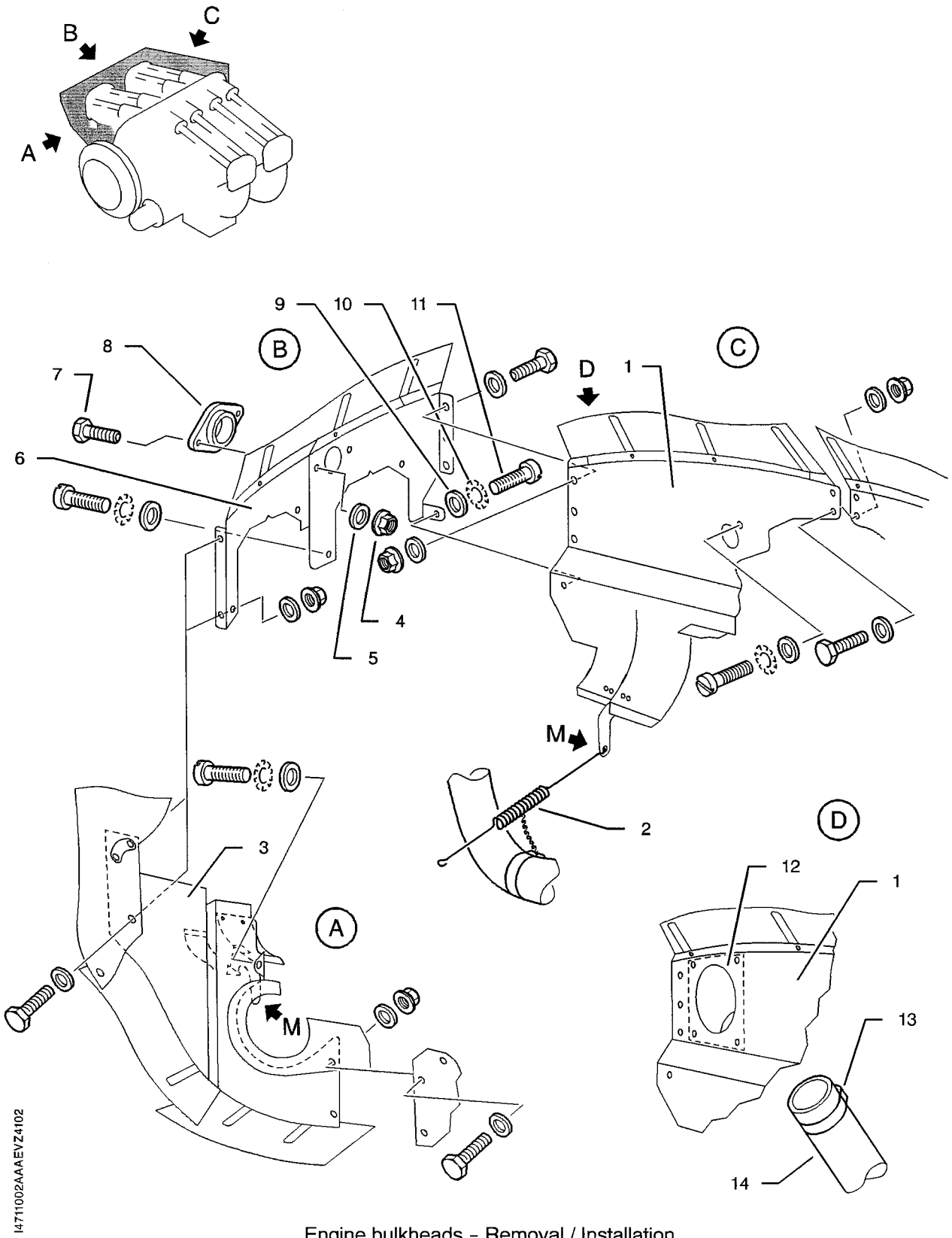
16) Make sure all the tools and materials are removed and the work area is clean and free from debris.

17) Install the engine cowlings - refer to 71-10-01.

18) Perform a test run-up - refer to 05-30-02.

1 - R.H. rear bulkhead
2 - Spring
3 - R.H. front bulkhead
4 - Nut
5 - Washer
6 - R.H. side bulkhead
7 - Bolt
8 - Grommet
9 - Washer
10 - Lockwasher
11 - Screw
12 - Air intake
13 - Clamp
14 - Hose

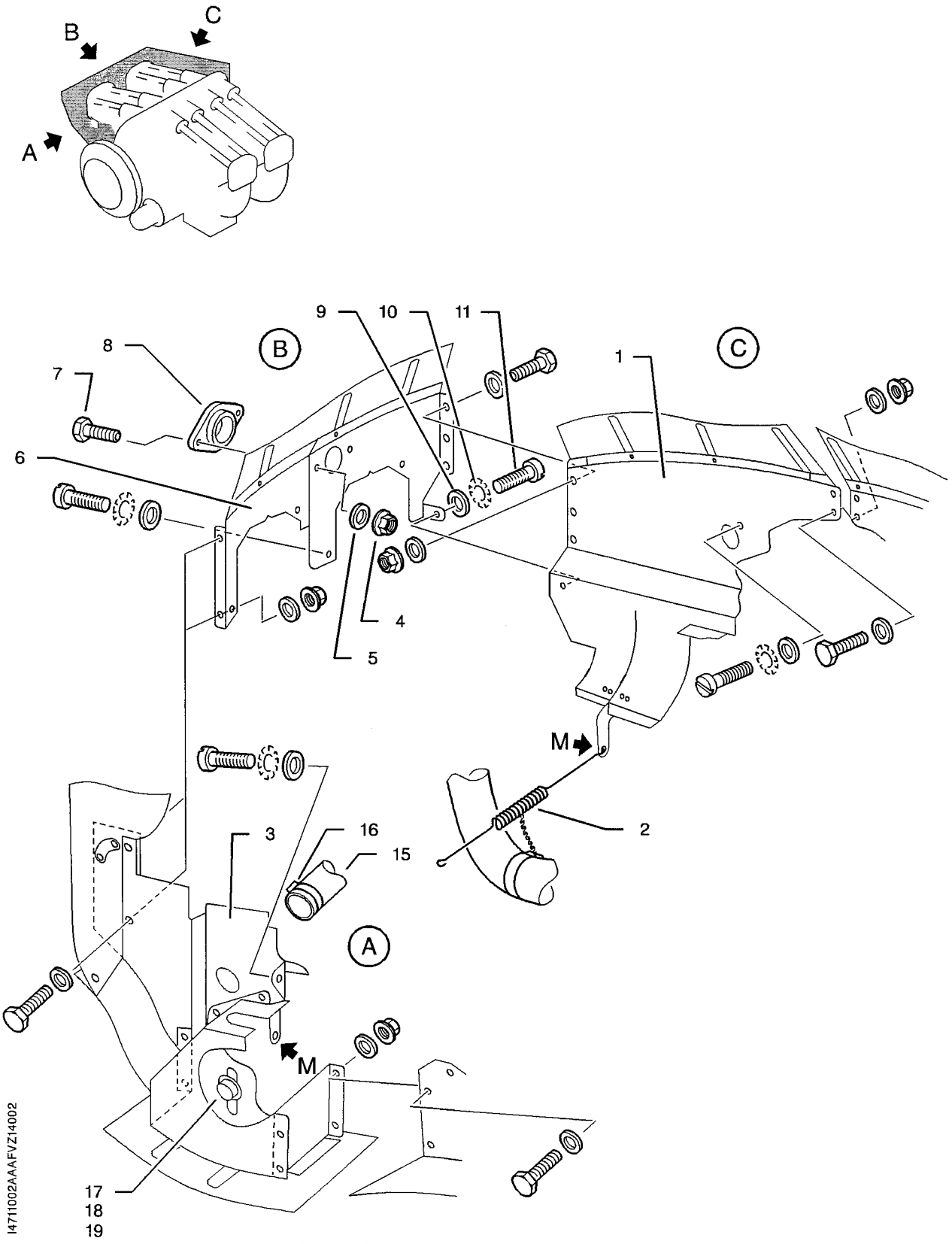
Engine bulkheads - Removal / Installation
Key to Figure 401 - S / N 1 - 400



Engine bulkheads - Removal / Installation
Figure 401 - S / N 1 - 400

AAAA
Validity : S / N 1 - 9999

1 - R.H. rear bulkhead
2 - Spring
3 - R.H. front bulkhead
4 - Nut
5 - Washer
6 - R.H. side bulkhead
7 - Bolt
8 - Grommet
9 - Washer
10 - Lockwasher
11 - Screw
15 - Alternator cooling hose
16 - Clamp
17 - Bolt
18 - Washer
19 - Nut

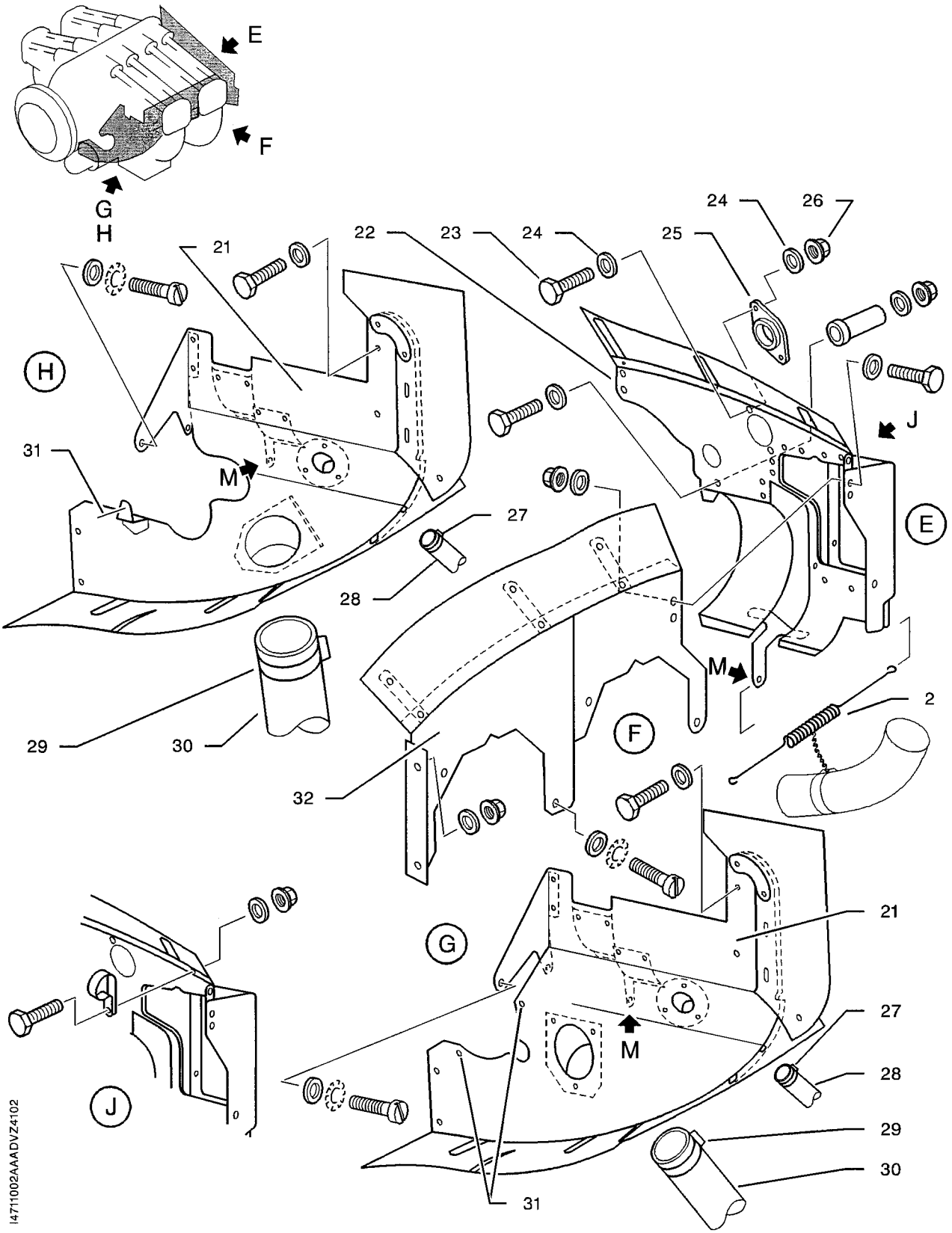


Engine bulkheads - Removal / Installation
Figure 401A - S / N 401 - 9999

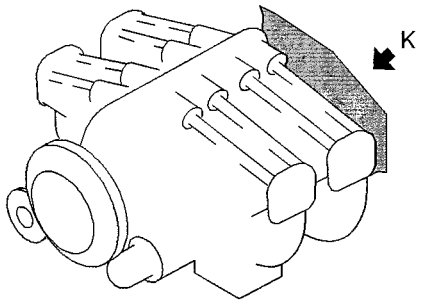
AAAA
Validity : S / N 1 - 9999

2 - Spring
21 - L.H. front bulkhead
22 - L.H. rear bulkhead
23 - Bolt
24 - Washer
25 - Grommet
26 - Nut
27 - Clamp
28 - Hose
29 - Clamp
30 - Hose
31 - Starter attachment
32 - L.H. side bulkhead

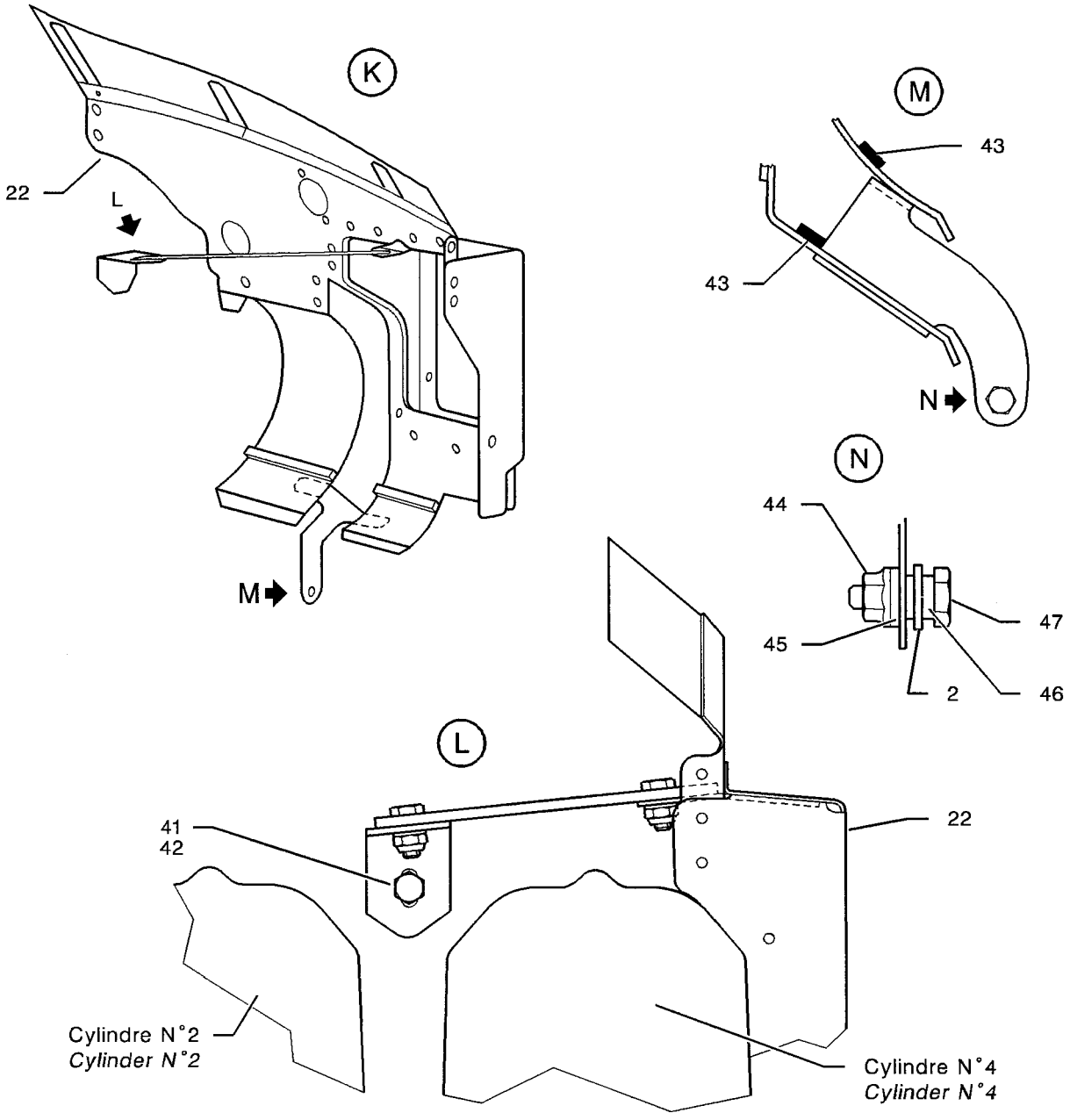
Engine bulkheads - Removal / Installation
Key to Figure 402



Engine bulkheads - Removal / Installation
Figure 402



22 - L.H. rear bulkhead
41 - Bolt
42 - Lockwasher
43 - Seal
44 - Nut
45 - Washer
46 - Spacer
47 - Bolt



Engine bulkheads - Removal / Installation
Figure 403 - Post-MOD. 123 or Kit OPT10 923300

ENGINE MOUNT

DESCRIPTION AND OPERATION

1. GENERAL

The engine mount assembly connects the engine to the airframe.

It consists of :

- an engine mount,
- four silent-blocks.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Engine mount	1	120 / 130	121 / 131	71-20-00
Silent-block	4	130	121 / 131	71-20-00

3. DESCRIPTION

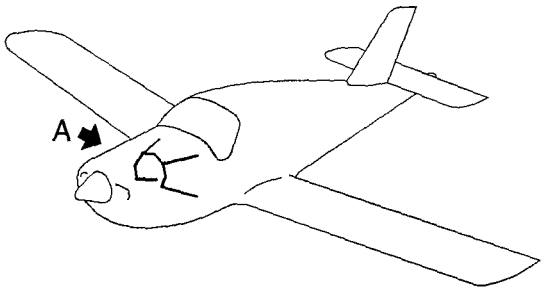
A. Engine mount

The engine mount is composed of a framework of steel tubes welded together, with four attachments for the power plant and four mounting plates for attachment to the firewall.

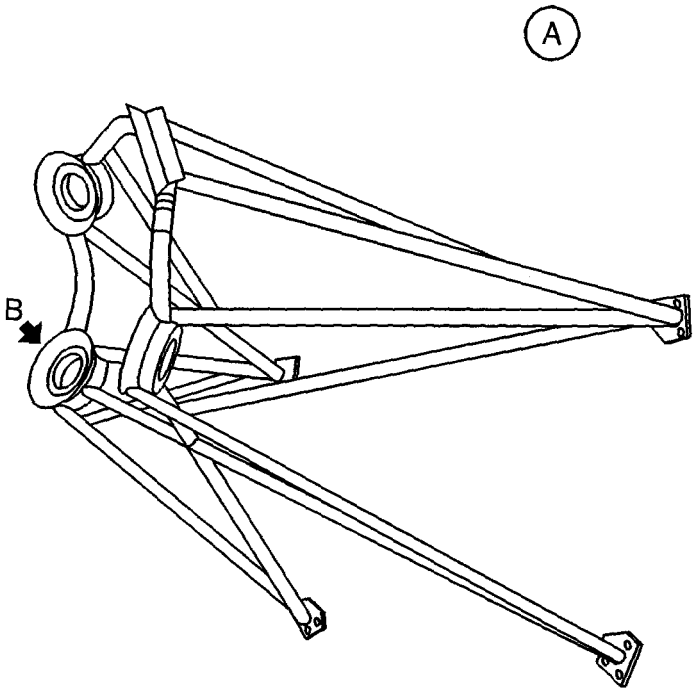
The engine mount is secured to the firewall by means of twelve bolts (three per mounting plate), and supports the power plant by means of four attachment fittings equipped with silent-blocks.

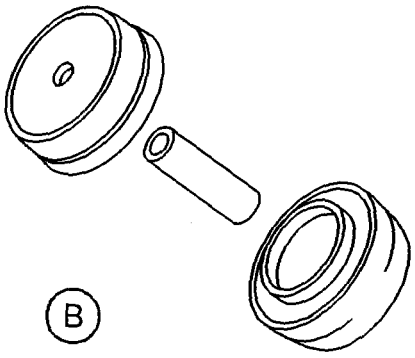
B. Silent-blocks

The silent-blocks located at the power plant attachments on the engine mount are designed to absorb the engine vibrations and to reduce to a minimum their spreading to the airframe thanks to the rubber vibration absorbers.



A - Engine mount
B - Silent-block





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Engine mount - Identification and location of components
Figure 1

ENGINE MOUNT

REMOVAL / INSTALLATION

1. REMOVAL OF ENGINE MOUNT (Figures 401 and 402)

A. Tools and consumable materials

- Blanking caps

B. Procedure

1) Remove the power plant - refer to 71-00-00.
2) Disconnect the 2 oil system hoses on the cooler - refer to 79-20-01. Blank off.
3) Disconnect the ignition harnesses - refer to 74-20-01.

S / N 1 - 387, 393

4) Disconnect the carburetor cool air hose. Blank off.

S / N 1 - 9999

5) Disconnect the fuel hose which connects the carburetor to the engine pump. Blank off.

With constant speed propeller

6) Remove clamps (22) and unscrew propeller governor tube (21). Blank off.

All

7) If installed, remove the vacuum pump and the filter - refer to 37-11-01.
8) Make sure the clamps, "Alpla" band and tie-wraps used as fasteners on the engine mount have been removed.
9) Remove and discard cotter pins (10). Remove nuts (9) and washers (8).
10) Relieve engine mount (1) and clear it without damaging engine attachments (7).
11) Remove bolts (2), washers (11), wide washers (3), silent-blocks (4), reinforced silent-blocks (6) and spacers (5).

2. INSTALLATION OF ENGINE MOUNT (Figures 401 and 402)

A. Tools and consumable materials

- Adhesive tape (TB 08-917)

B. Procedure

1) Check engine mount (1) - refer to Page 601.
2) Check firewall condition at engine mount attachments.

CAUTION : IN CASE OF DAMAGE, REPLACE ALL FOUR SILENT-BLOCKS SIMULTANEOUSLY.

3) Check the condition of the silent-blocks, spacers (5) and bolts (2), replace them if necessary.

4) Check the condition of the hoses, replace them if necessary.

NOTE : If new hose(s) of the "Spiragaine" type is (are) installed, no traces of release grease (silicone) must remain inside the hose(s). Any traces must be removed with a dry cloth.

CAUTION : OBSERVE THE SILENT-BLOCK MOUNTING DIRECTION. UPPER REINFORCED SILENT-BLOCKS (6) MUST BE INSTALLED AT THE BACK, LOWER REINFORCED SILENT-BLOCKS (6) MUST BE INSTALLED AT THE FRONT - SEE FIGURE 401, DETAILS A AND B.

5) Secure the engine mount to the engine with reinforced silent-blocks (6), spacers (5), silent-blocks (4), bolts (2), wide washers (3), washers (8) and (11), and nuts (9).

6) Torque according to "Specific cases" tightening procedure - refer to 20-00-01.

7) Install new cotter pins (10).

8) Install the vacuum pump and the filter, if installed - refer to 37-11-01.

With constant speed propeller

9) Remove the blanking caps and install propeller governor tube (21).

10) Install clamps (22) and mark the unions with a red paint line.

All

11) Remove the blanking caps and connect the fuel hose wich connects the carburetor to the engine pump.

S / N 1 - 387, 393

12) Remove the blanking caps and connect the carburetor cool air hose.

S / N 1 - 9999

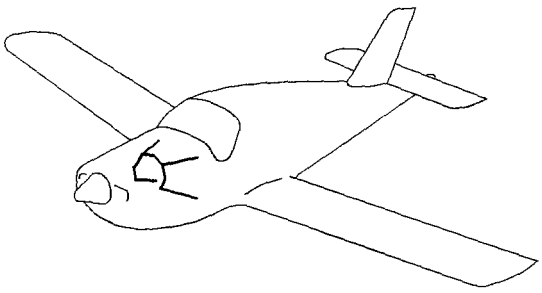
13) Connect the ignition harnesses - refer to 74-20-01.

14) Remove the blanking caps and connect the oil hoses to the oil cooler - refer to 79-20-01.

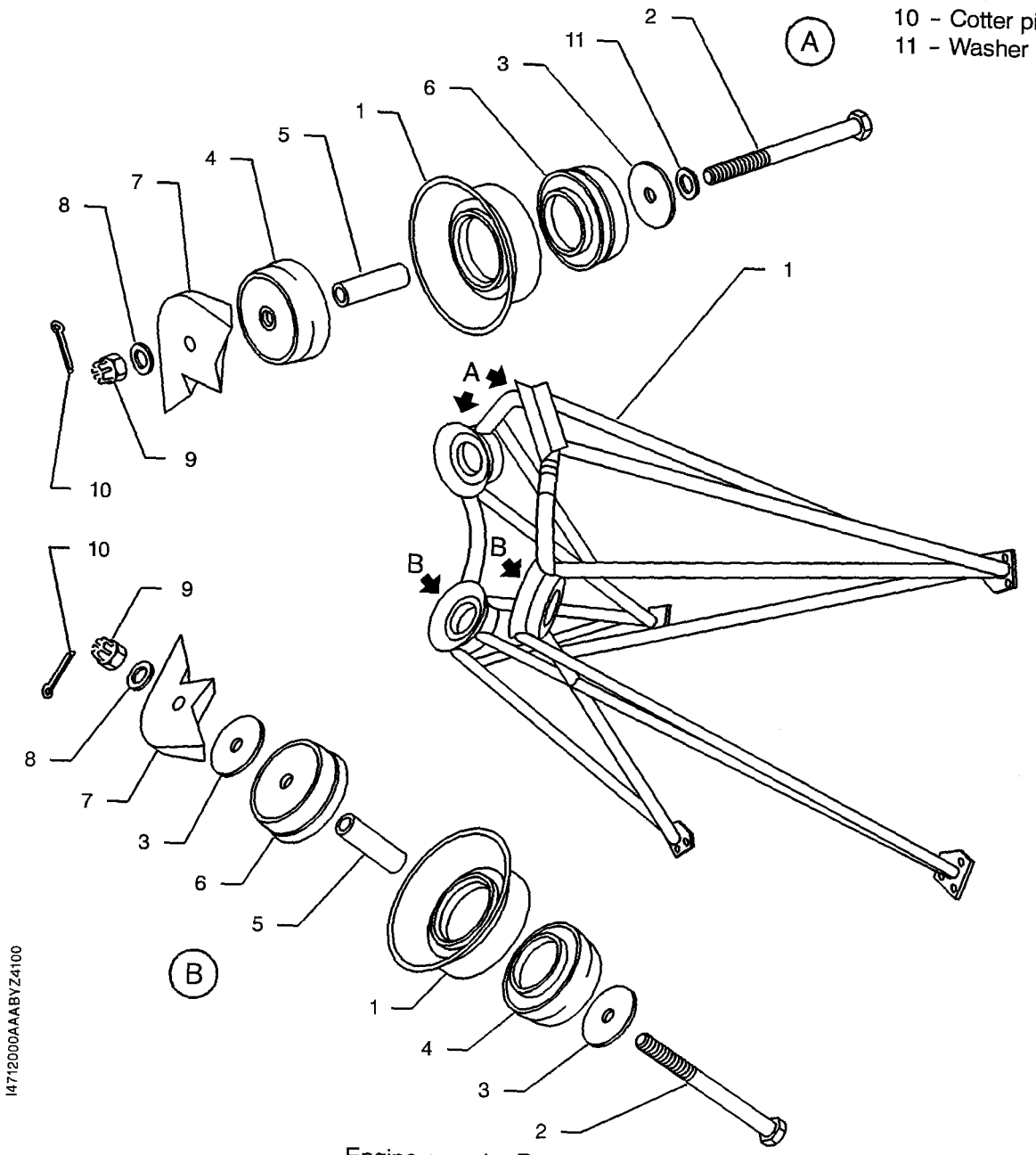
CAUTION : TO AVOID PREMATURE WEAR OF ENGINE AND LANDING GEAR MOUNTS, IT IS RECOMMENDED TO REPLACE "ALPLA" BAND WHICH ATTACHES "SPIRAGAINE" HOSES ON MOUNTS BY TIE-WRAPS AND CONNECTION RINGS AND TO INSTALL ADHESIVE TAPE (TB 08-917) UNDER TIE-WRAPS.

15) Install all clamps, "Alpla" band and new tie-wraps as marked during removal.

16) Install the power plant - refer to 71-00-00.

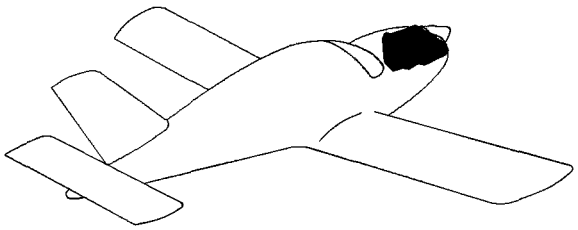


1 - Engine mount
2 - Bolt
3 - Wide washer
4 - Silent-block
5 - Spacer
6 - Reinforced silent-block
7 - Engine attachment
8 - Washer
9 - Nut
10 - Cotter pin
11 - Washer

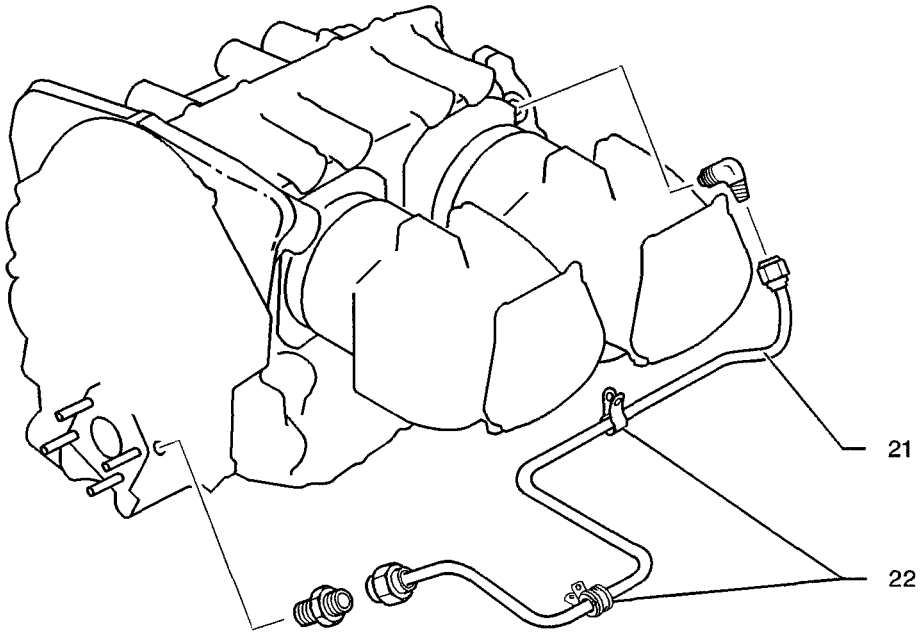


Engine mount - Removal / Installation
Figure 401

AAAA
Validity : S / N 1 - 9999



21 - Tube
22 - Clamp



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Engine mount - Removal / Installation
Figure 402

ENGINE MOUNT

INSPECTION / CHECK

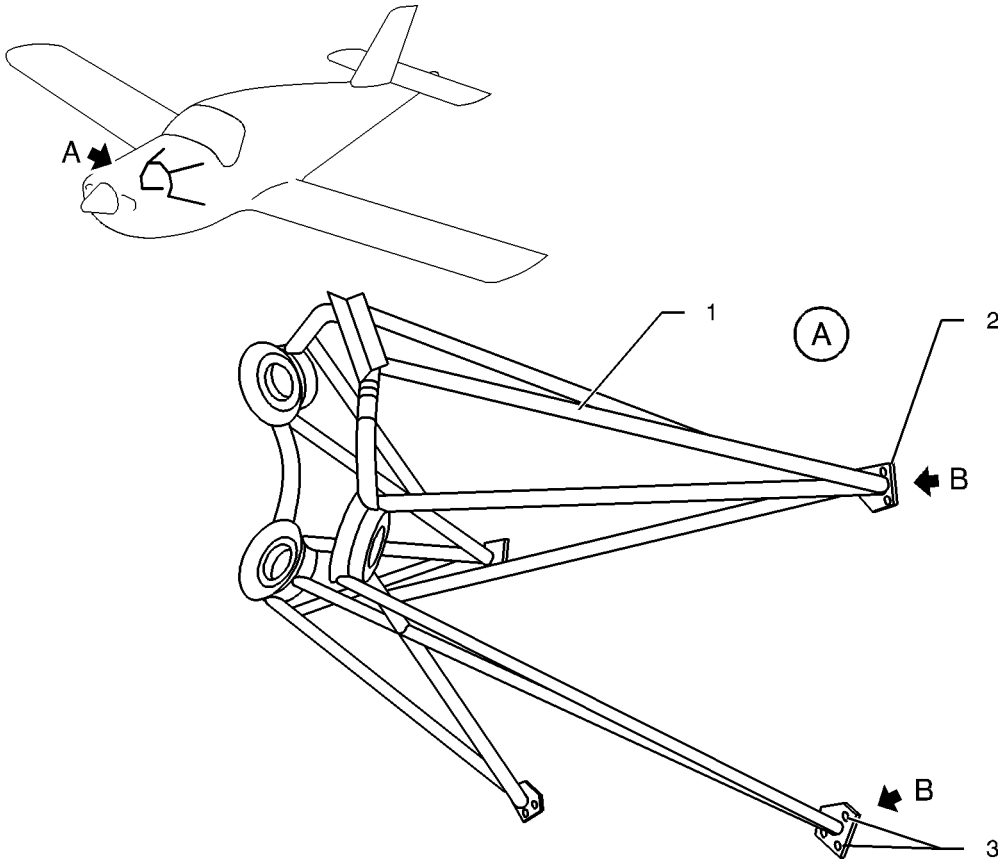
1. CHECK OF ENGINE MOUNT

A. Tools and consumable materials

- Surface plate
- 6 x magnifying glass
- Cleaning agent (TB 11-003)
- Clean lintfree cloths

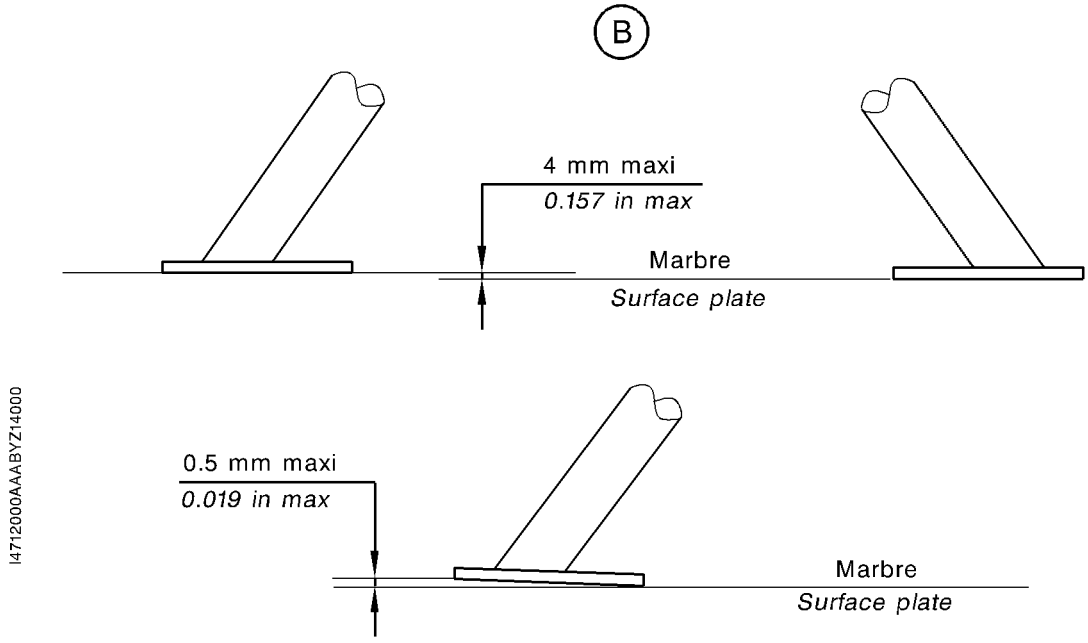
B. External check of engine mount (Figures 601 and 602)

1) Remove the engine mount - refer to Page 401.
2) Clean the engine mount using clean lintfree cloths moistened with cleaning agent (TB 11-003).
3) Place engine mount (1) on a surface plate and check that each mounting plate (2) is parallel to the surface of the surface plate - max. permissible gap : 0.019 in (0.5 mm).
4) With the engine mount on the surface plate, check that, with three mounting plates (2) resting on the surface plate, the gap of the fourth one does not exceed 0.157 in (4 mm).
5) Check bores (3) :
   - theoretical dimension : dia. 0.3149 / 0.3172 in (8.0 / 8.058 mm),
   - max. wear dimension : dia. 0.3208 in (8.150 mm).
6) Visually inspect the engine mount for :
   - chafing marks,
   - corrosion,
   - cracks.
7) Perform a penetrant inspection - refer to 20-00-14, or a magnetic particle inspection.
8) Should a crack be detected on a tube, contact the manufacturer.
9) Should a defect be detected on a tube, check which type of repair is authorized - refer to Page 801.
10) Install the engine mount - refer to Page 401.



1 - Engine mount
2 - Mounting plate
3 - Bores

Engine mount - Inspection / Check
Figure 601



Engine mount mounting plate flatness check
Figure 602

ENGINE MOUNT

REPAIR

1. REPAIRS AUTHORIZED ON ENGINE MOUNT (Table 801 and Figure 801)

CAUTION : ONLY ONE DEFECT PER TUBE IS AUTHORIZED. IN CASE OF SEVERAL DEFECTS ON ONE TUBE, RETURN THE ENGINE MOUNT TO THE MANUFACTURER.

TUBE	STRESSES	DIAMETER	ACCEPTABLE DEFECTS	RECOMMENDED SOLUTION
Upper	Traction	0.79 in (20 mm)	Yes (See Note 3)	Repair
Central	Traction	0.79 in (20 mm)	Yes (See Note 3)	Repair
Lower	Buckling	0.79 in (20 mm)	None (See Note 1)	Replacement (See Note 2)
Cross-brace	Buckling	0.79 in (20 mm)	Yes (See Note 3)	Repair

NOTE 1 : For a defect beyond the L dimension (see Figure 801), repair may be considered after approval of the manufacturer's Design Office.

NOTE 2 : For tube replacement, return the engine mount to the manufacturer.

NOTE 3 : Only one defect per tube is authorized.

Table 801

2. PERMISSIBLE DEFECTS (Table 802 and Figure 802)

	Tube dia. 0.79 in (20 mm)
ß within 65° and 90°	L = 0.216 in (5.5 mm) l = 0.118 in (3 mm) P = 0.007 in (0.2 mm)
ß within 15° and 65°	L = 0.216 in (5.5 mm) / sin ß **Max. 0.47 in (12 mm)** l = 0.118 in (3 mm) P = 0.015 in (0.4 mm)
ß within 0° and 15°	L = 0.216 in (5.5 mm) l = 0.118 in (3 mm) P = 0.023 in (0.6 mm)

Table 802

NOTE : For a defect more than 0.023 in (0.6 mm) deep, replace the tube ; return the engine mount to the manufacturer.

3. REPAIR (Table 802 and Figure 801)

A. Tools and consumable materials

- Filler metal 8CD12
- Siccative oil (TB 05-914)
- Cleaning agent (TB 11-003)
- Protection product (TB 05-939)
- Primer (TB 16-901)
- Paint (TB 16-903)
- Filtered compressed air
- Syringe
- Extra smooth file
- Abrasive cloth (TB 05-916A)
- Pop riveting pliers

B. Repair procedure for a defect depth less than 0.007 in (0.2 mm)

1) Strip the area to be repaired.
2) Trim the defect (do not increase its depth) using an extra smooth file then abrasive cloth (TB 05-916A).
3) Protect the bared metal by applying, using a pad, a mixture of protection product (TB 05-939) and water (75 % in volume).
4) Rinse with clean water. Dry and immediately apply the paint scheme.
5) Apply a coat of primer (TB 16-901).
6) Apply two coats of paint (TB 16-903).

Engine mount P / N TB10 51002000, T200 5100000, T200 51001000, T200 5100000000

CAUTION : FOR ENGINE MOUNTS P / N TB10 51000000 AND TB10 51001000, REPAIR SHALL ONLY BE PERFORMED BY THE MANUFACTURER. AS THESE ENGINE MOUNTS HAVE BEEN MANUFACTURED IN TWO DIFFERENT MATERIALS (35CD4 AND 15CDV6), IT IS IMPERATIVE TO DETERMINE THE MATERIAL PRIOR TO PERFORMING THE REPAIR.

C. Repair procedure for a defect depth within 0.007 in (0.2 mm) and 0.023 in (0.6 mm)

1) Remove the rivets plugging the degassing holes. Take care not to enlarge the holes.
2) Remove the round stickers blanking the holes behind the mounting plates.
3) Using a syringe, fill the tubes with cleaning agent (TB 11-003).
4) Shake the engine mount to impregnate the protection which covers the inside of the tubes.
5) Allow the cleaning agent to act for one hour, then drain by positioning the holes downwards.
6) Repeat steps 3) to 5) three times. At the last draining, make sure the recovered product is clean.
7) Ventilate the tubes to remove residual vapors.

8) Trim the defect (do not increase its depth) using an extra smooth file then abrasive cloth (TB 05-916A).

CAUTION : THIS TYPE OF REPAIR SHALL ONLY BE PERFORMED IN AN APPROVED WORKSHOP AND BY QUALIFIED PERSONNEL.

9) Perform welding (T.I.G. process). Blow argon into the tube during the entire operation, until complete cooling of the tube.

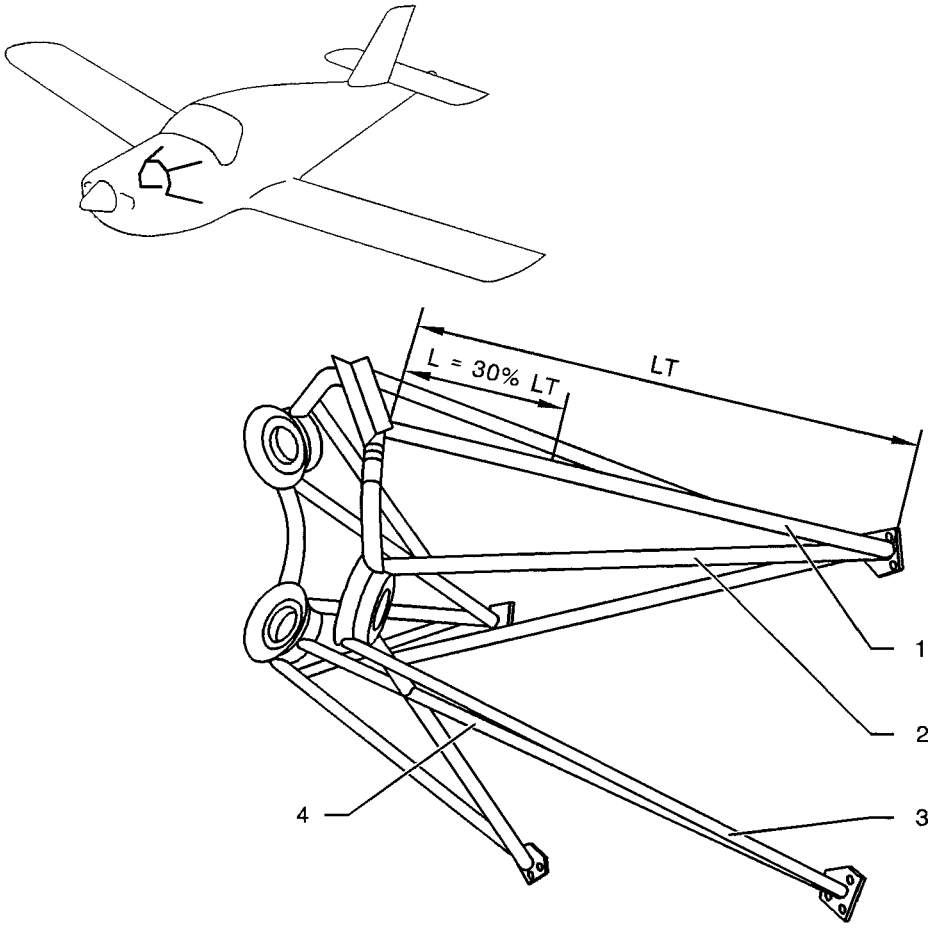
10) Check the weld by magnetic particle inspection.

11) Using a syringe, protect the inside of the tubes with siccative oil (TB 05-914) - refer to 20-00-16.

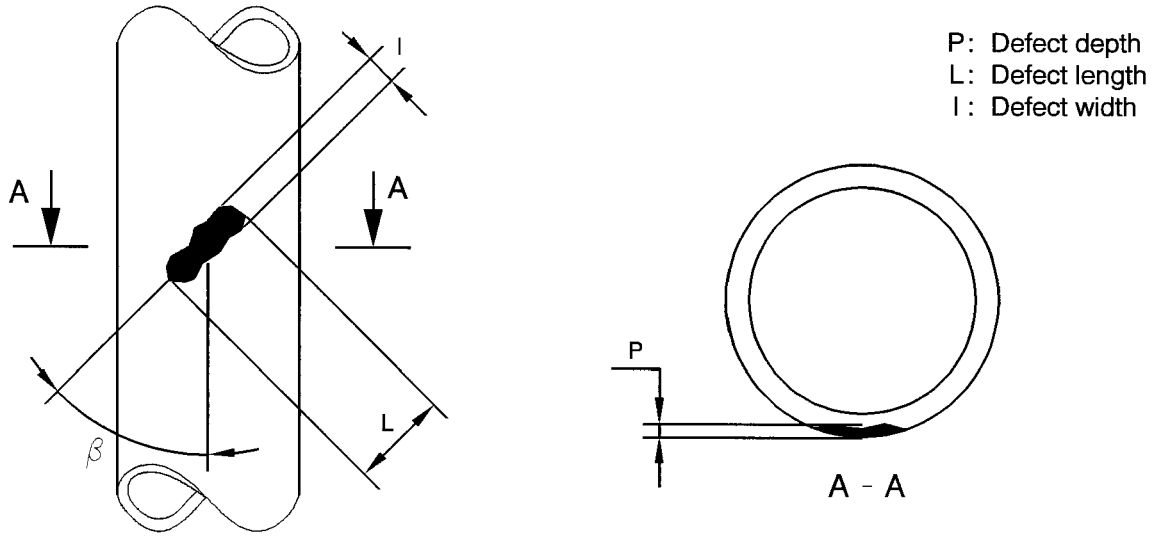
12) Protect the bores and unpainted surfaces.

13) Apply one coat of primer (TB 16-901).

14) Apply two coats of paint (TB 16-903).



Defects authorized on engine mount
Figure 801



Method for measuring a defect on an engine mount tube
Figure 802

AIR INLET

DESCRIPTION AND OPERATION

1. GENERAL

The air inlet is the element which routes the outside air through a filter to the engine. The air inlet is equipped with a carburetor heating system installed in the air intake duct. It can be used when icing conditions are unintentionally encountered.

The main elements are :

- air intake box,
- filter assy,
- air intake duct.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Air intake box	1	100	131	71-60-00
Filter assy	1	100	131	71-60-00
Air intake duct	1	100	131	71-60-00

3. DESCRIPTION

A. Air intake box

S / N 1 - 387, 393 Pre-Kit OPT10 917900

The air intake box is the element which enables continuous air flow between the air intake located on the R.H. rear engine bulkhead and the air intake duct.

S / N 388 - 392, 394 - 9999

S / N 1 - 387, 393 Post-Kit OPT10 917900

The air intake box is the element which enables continuous cold air flow between the NACA located on the L.H. side of the lower engine cowling and the air intake duct.

B. Filter assy

The filter is the element which purifies the air penetrating the carburetor of all impurities liable to be absorbed by the engine and affect its operation.

It is composed of an aluminum box containing a foam air filter.

It is placed between the air intake box and the air intake duct.

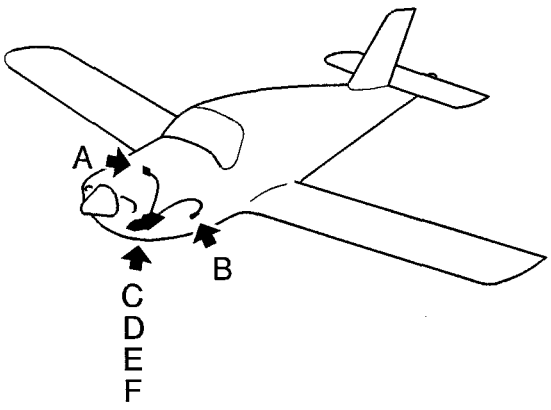
Pre-SB 10-118-71

An additional air filter can be installed in the filter assy, downstream from the first filter, to prevent ingestion of very fine particles.

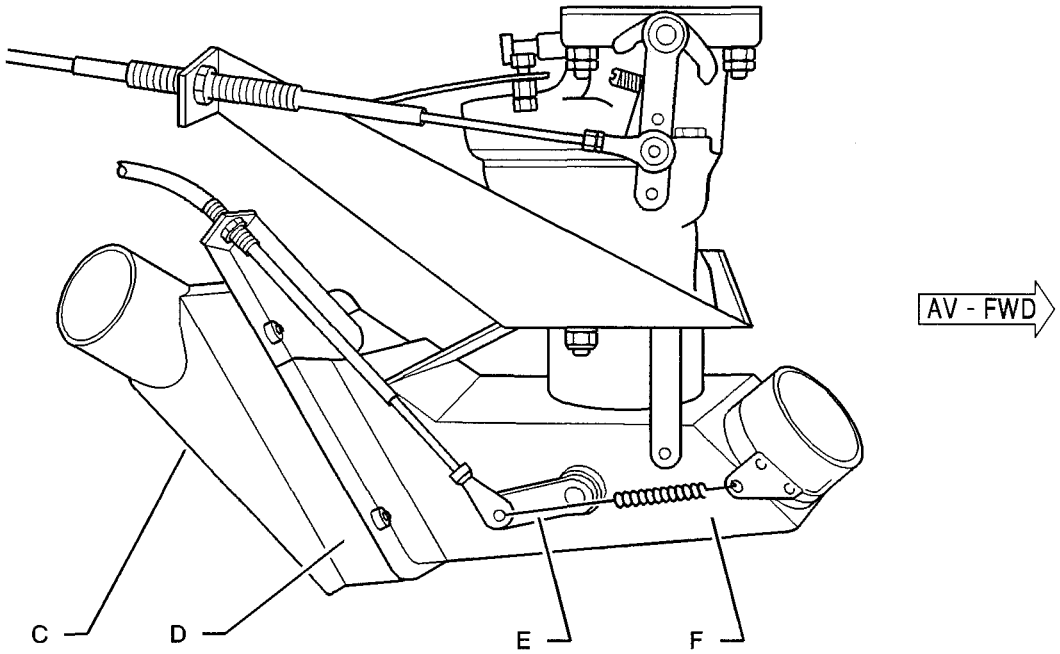
C. Air intake duct

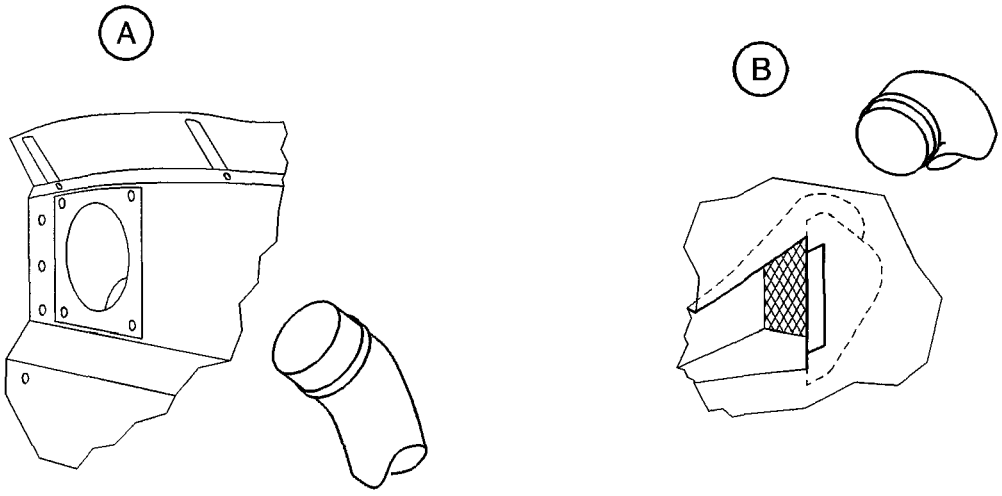
The air intake duct is fitted with a mechanical shutter which admits cold or heated air to the carburetor.

The carbureted air temperature is controlled by the carburetor heating control located on the control pedestal on the L.H. side. If control lever is in forward position, the outside temperature air is carried through the air filter to the carburetor, if in the aft position, exchanger heated air, mixed with outside temperature air, is directly carried to the carburetor.



A - Air intake on R.H. rear bulkhead
B - Air intake on lower engine cowling NACA
C - Air intake box
D - Filter assy
E - Carburetor heating control
F - Air intake duct





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Air inlet - Identification and location of components
Figure 1

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AIR INLET

REMOVAL / INSTALLATION

1. REMOVAL OF AIR INLET (Figures 401 and 401A)

A. Tools and consumable materials

- Blanking caps

B. Procedure

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE ENGINE, EXHAUST PIPE AND MANIFOLDS ARE COLD. IF NOT, TAKE NECESSARY PRECAUTIONS TO AVOID SEVERE BURNS.

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE KEY IS REMOVED FROM MAGNETO SELECTOR AND THAT "MAIN SWITCH" IS OFF.

1) Remove the engine cowlings - refer to 71-10-01.
2) Loosen clamp (13) and disconnect hose (14). Blank off.
3) Loosen clamp (11) and disconnect hose (10). Blank off.
4) Loosen clamp (2) and disconnect hose (1). Blank off.
5) Disconnect the carburetor heating control and clear it from support (18) - refer to 76-10-02.
6) Hold air intake duct (12) assy. Remove and discard nuts (15).
7) Remove washers (16) and air intake duct (12) assy. Retain gasket (17).
8) If necessary, remove and discard nuts (19), remove washers (20), screws (4), air intake box (3) and filter assy (9).
9) Remove screws (5), grid (6) and air filter (7).

With additional air filter, Pre-SB 10-118-71

10) Remove and discard additional air filter (8).

2. INSTALLATION OF AIR INLET (Figures 401 and 401A)

A. Tools and consumable materials

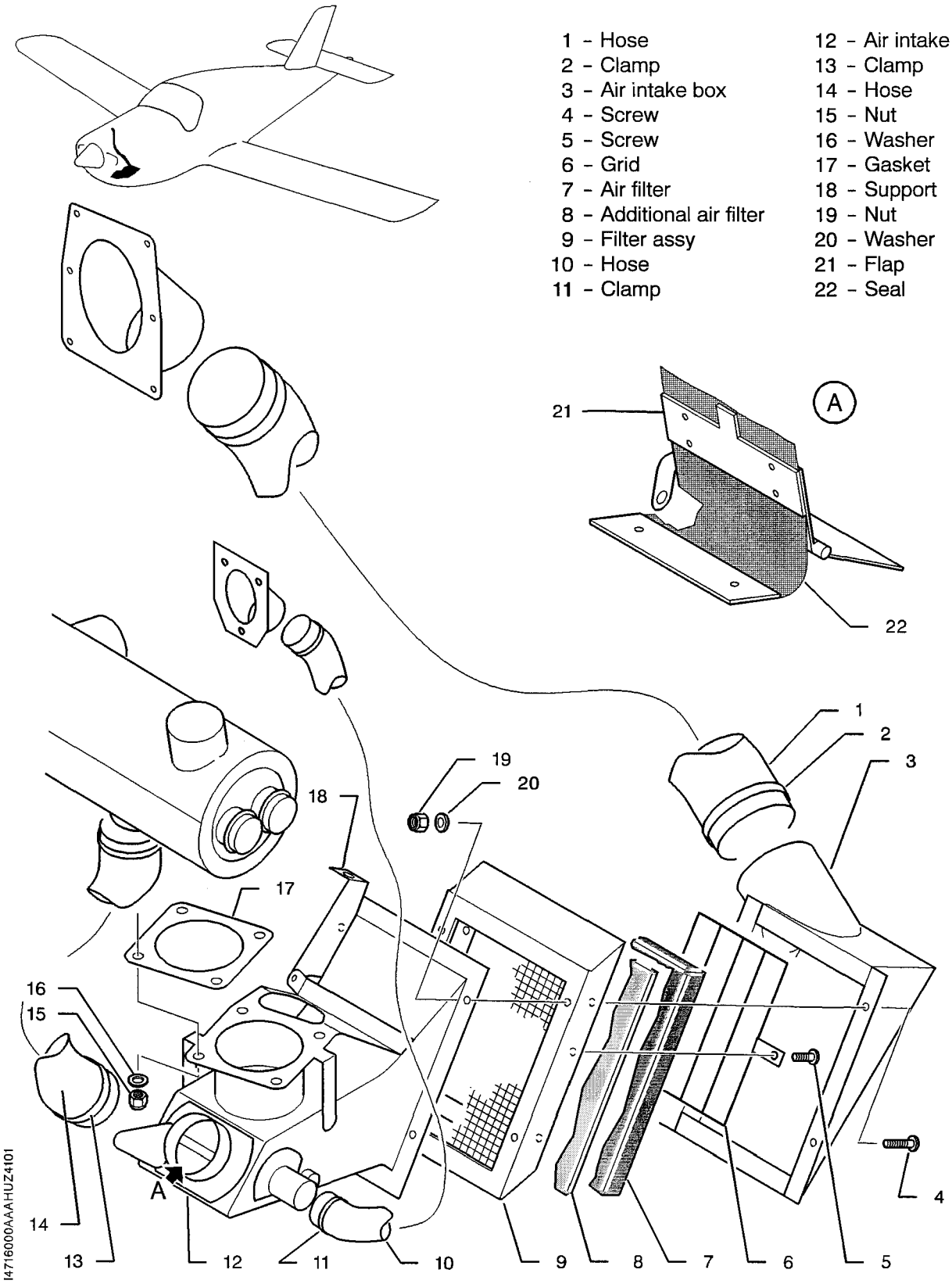
- Lubricant (TB 06-903)
- Grease (TB 04-004A)

B. Procedure

NOTE : If a new hose is installed, no traces of release grease (silicone) must remain inside the hose. Any traces must be removed with a dry cloth.

1) Check seal (22) of flap (21) - refer to Page 601.
2) Check gasket (17), replace it if necessary.
3) Check air intake duct (12), filter assy (9) and air intake box (3) for condition.
4) Lubricate the hinge pin and the flap seal - refer to 12-21-01.
5) Check air filter (7) for condition and cleanliness, replace it if necessary.

6) Insert air filter (7) in filter assy (9), then install grid (6) with screws (5).
7) Assemble air intake duct (12), filter assy (9) and air intake box (3). Install screws (4), washers (20) and new nuts (19).
8) Using washers (16) and new nuts (15), install gasket (17) and the air inlet on the power plant.
9) Secure the carburetor heating control to support (18). Connect the carburetor heating control - refer to 76-10-02.
10) Operate the carburetor heating control and check for correct operation.
11) Remove the blanking caps and connect hose (14).
12) Remove the blanking caps and connect hose (10).
13) Remove the blanking caps and connect hose (1).
14) Tighten clamps (2), (11) and (13).
15) Make sure all the tools and materials are removed and the work area is clean and free from debris.
16) Install the engine cowlings - refer to 71-10-01.



Air inlet - Removal / Installation
Figure 401

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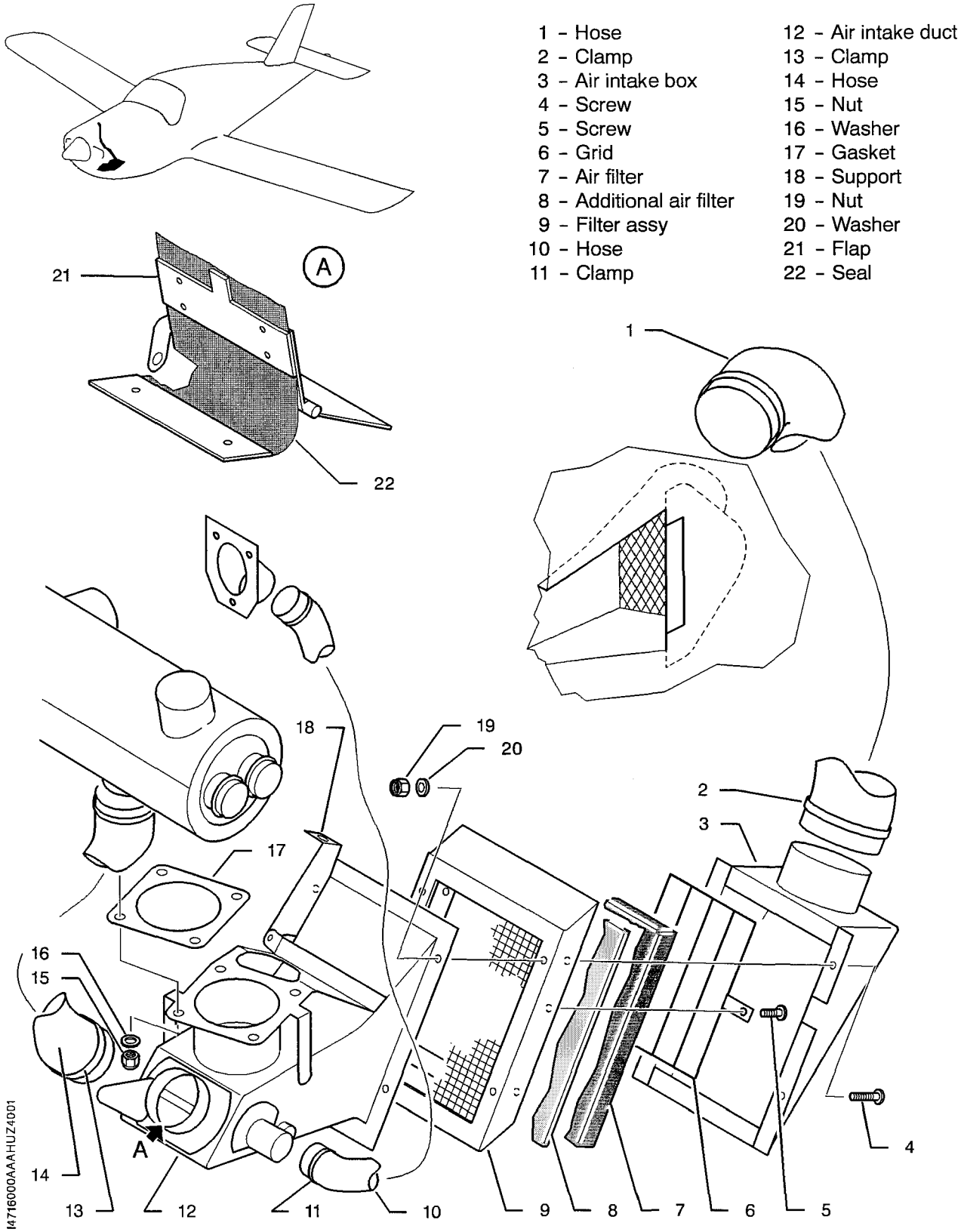
Validity : S / N 1 - 9999



Air inlet - Removal / Installation
Figure 401A

AIR INLET

INSPECTION / CHECK

1. CHECK OF AIR INLET FLAP SEAL (Figure 601)

A. Tools and consumable materials

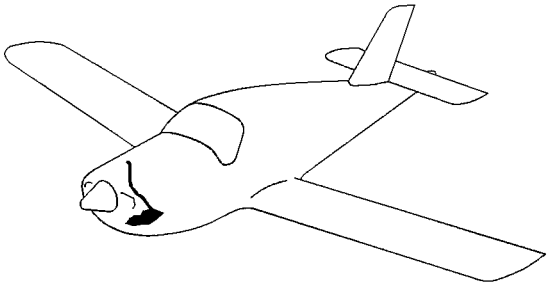
- Blanking caps
- Lubricant (TB 06-903)
- Grease (TB 04-004A)

B. Procedure

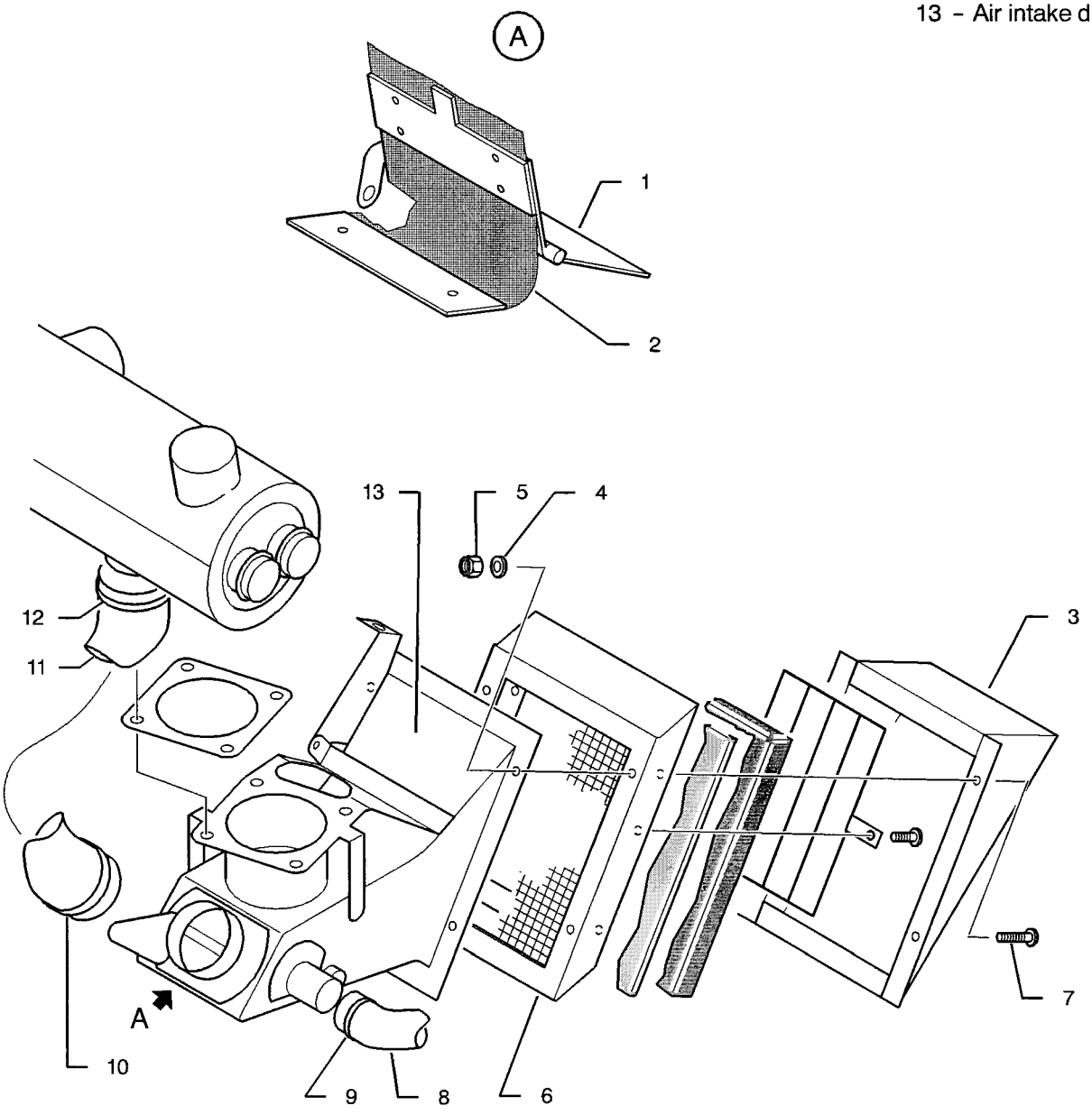
WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE ENGINE, EXHAUST PIPE AND MANIFOLDS ARE COLD. IF NOT, TAKE NECESSARY PRECAUTIONS TO AVOID SEVERE BURNS.

WARNING : PRIOR TO ANY OPERATION, ENSURE THAT THE KEY IS REMOVED FROM MAGNETO SELECTOR AND THAT "MAIN SWITCH" IS OFF.

1) Remove the engine cowlings - refer to 71-10-01.
2) Loosen clamp (9) and disconnect hose (8). Blank off.
3) Loosen clamps (10) and (12) and remove hose (11).
4) Remove and discard nuts (5), remove washers (4), screws (7), air intake box (3) and filter assy (6).
5) Position flap (1) to full hot position.
6) Through the air inlet, check seal (2).
7) Position flap (1) to full cold position.
8) Through the cold and hot air inlets, check seal (2).
9) If seal (2) is torn or crazed, replace it - refer to Page 801.
10) Lubricate the hinge pin and the flap seal - refer to 12-21-01.
11) Assemble air intake duct (13), filter assy (6) and air intake box (3) then install screws (7), washers (4) and new nuts (5).
12) Operate the carburetor heating control and check for correct operation.
13) Connect hose (11) and tighten clamps (10) and (12).
14) Remove the blanking cap, connect hose (8) and tighten clamp (9).
15) Make sure all the tools and materials are removed and the work area is clean and free from debris.
16) Install the engine cowlings - refer to 71-10-01.



1 - Flap
2 - Seal
3 - Air intake box
4 - Washer
5 - Nut
6 - Filter assy
7 - Screw
8 - Hose
9 - Clamp
10 - Clamp
11 - Hose
12 - Clamp
13 - Air intake duct



Check of air inlet flap seal
Figure 601

AIR INLET

REPAIR

1. REPLACEMENT OF AIR INLET FLAP SEAL (Figure 801)

A. Tools and consumable materials

- Lubricant (TB 06-903)
- Grease (TB 04-004A)

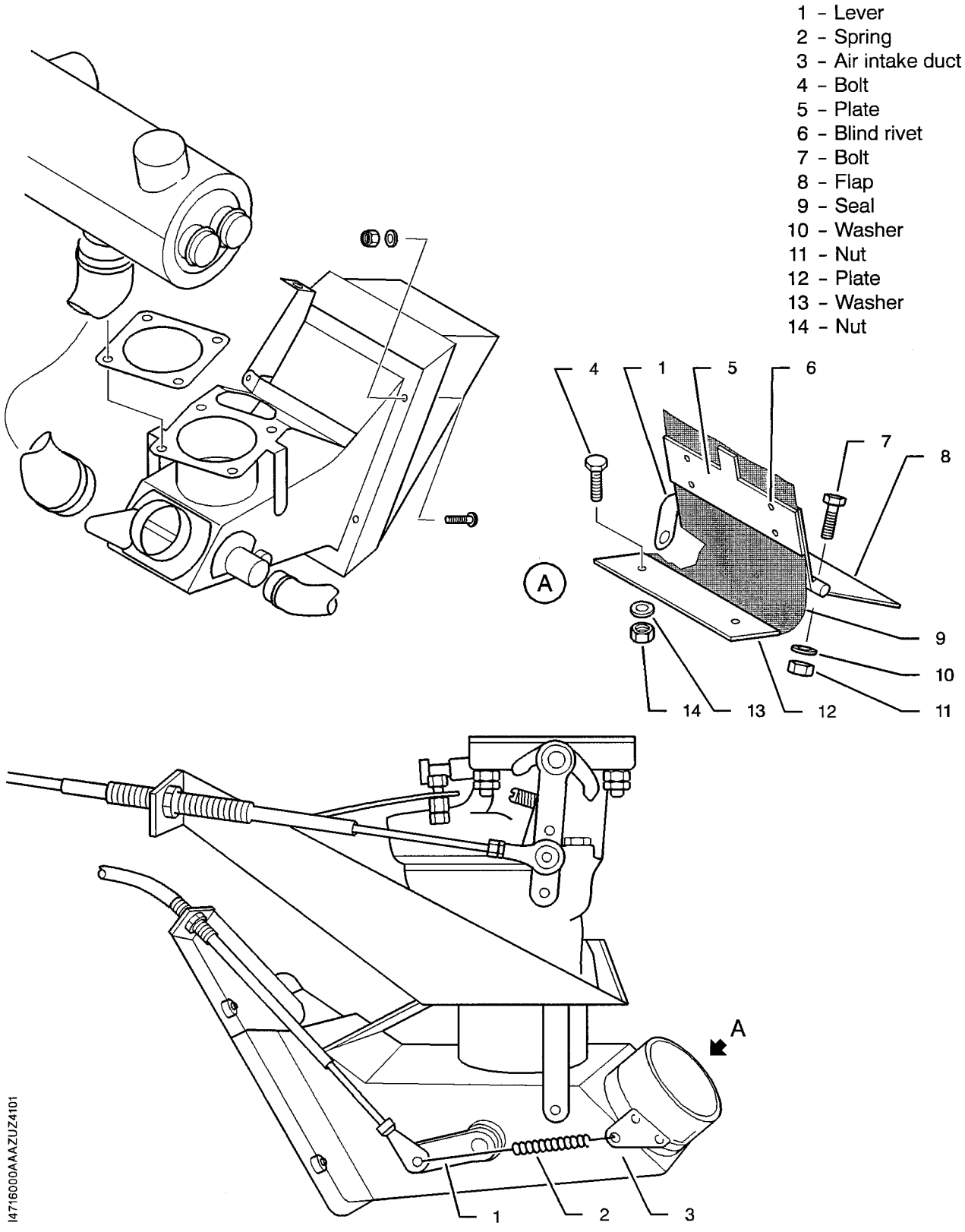
NOTE : For spare parts, refer to the Illustrated Parts Catalog.

B. Procedure

1) Remove the air inlet - refer to Page 401.
2) Remove and discard nuts (14), remove washers (13), bolts (4) and plate (12).
3) Position flap (8) to full hot position.
4) Remove and discard nuts (11), remove washers (10) and bolts (7).
5) Remove lever (1) then remove flap (8) equipped with seal (9).
6) Remove and discard blind rivets (6) - refer to 51-40-02.
7) Retain plate (5) and discard seal (9).
8) Position new seal (9) between flap (8) and plate (5). Install new blind rivets (6) - refer to 51-40-02.
9) Lubricate the hinge pin and the flap seal - refer to 12-21-01.
10) Position flap (8) assy in air intake duct (3) and engage lever (1).

    NOTE : Direct lever (1) towards the rear of air intake duct (3).

11) Install bolts (7), washers (10) and new nuts (11).
12) Secure seal (9) and plate (12) to air intake duct (3) with bolts (4), washers (13) and new nuts (14).
13) Temporarily secure spring (2) to lever (1) and check the flap for correct operation.
14) Make sure all the tools and materials are removed and the work area is clean and free from debris.
15) Install the air inlet - refer to Page 401.



Replacement of air inlet flap seal
Figure 801