

Chapter I POWER UNIT

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DESCRIPTION AND OPERATION

General

1. The aircraft is powered by a Ghost Mk. 104 single-stage turbo-jet engine installed, as an engine change unit (E.C.U. Ghost 10401), in a tubular steel mounting at the rear of the fuselage. The air-intakes (*Sect. 3, Chap. 2*) are built into the leading edge of each main plane.

2. Two vertical shafts, borne in the air-intake casing forward of the impeller, are driven by bevel gears which are mounted on a forward extension of the main shaft and, in turn, drive the accessories mounted on the top and bottom wheelcases through chains of spur gearing. The lubrication system is self-contained within the engine, the oil being carried in a sump attached to the underside of the bottom wheelcase. Minor

general servicing requirements are given in Sect. 2, Chap. 2 of this volume and details of the various accessory units mounted on the engine in Sect. 3, and 5. Full descriptive and servicing details of the engine and its constituent systems are given in A.P.4320B, Vol. 1.

Engine mounting (fig. 1)

3. The engine is attached to the mounting frames by four eye-bolts on the front diffuser casing and by two central spigot fittings mounted vertically, one above the other, to eye-bolts on No. 4 bulkhead. The bulkhead serves as a firewall between the engine bay and the fuselage fuel tank. Alignment of the engine mounting frames, and the two

central eye-bolts, is effected by shimming with special mild steel washers.

Engine cowlings

4. The upper and lower front and rear cowlings panels and rear cone together enclose the engine from bulkhead No. 4 to the propelling nozzle. The cone, which is built up with formers and longitudinal stringers covered with light-alloy skin, is secured by screws to the top and bottom surfaces of the main plane. The four cowlings panels are supported on rails mounted on the aft face of bulkhead No. 4, on the engine diffuser casing and at the forward end of the rear cone. The panels are secured on each side by three toggle-type fasteners which engage with adjustable loop-ended tie-rods pivoted from No. 1 rib on each main plane.

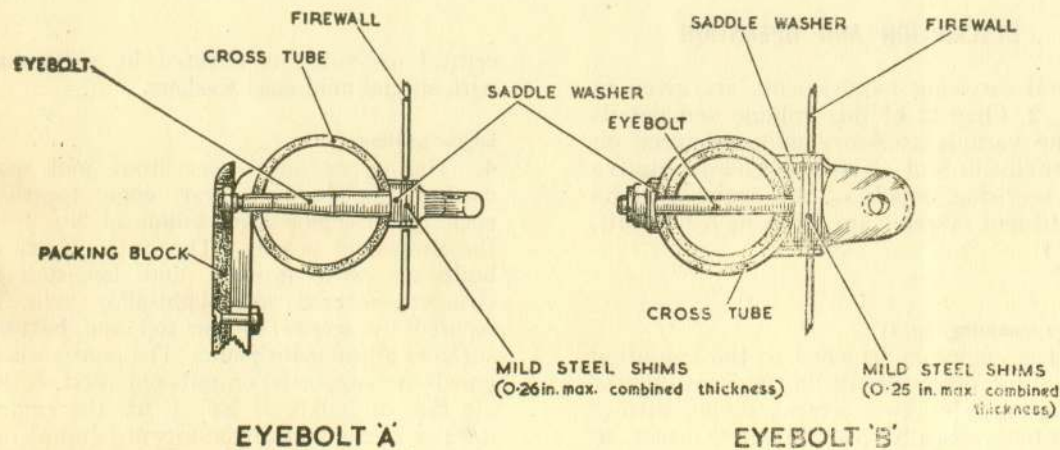
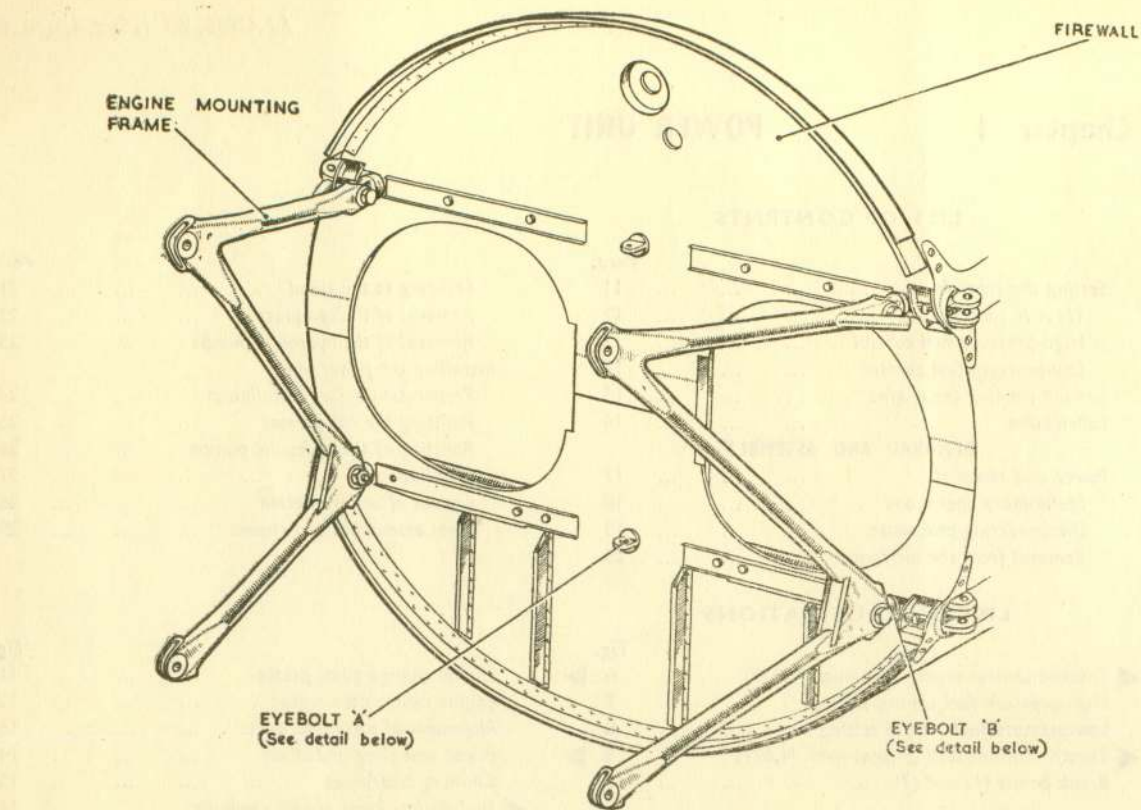


Fig. 1. Engine mounting

Starting system (fig. 2)

5. A twin breech, cartridge-operated Rotax turbo-starter and a high energy igniter system, which is controlled by an automatic sequence from the cabin, comprise the equipment for starting the engine. The starter firing circuit, which is described in Sect. 5, Chap. 1, supplies a high voltage current to the surface discharger plugs fitted in No. 3 and No. 10 combustion chambers. The turbo-starter is mounted on the upper engine wheelcase forward of the twin generators and the exhaust gases are ducted through an opening in the upper front cowling panel (fig. 3). A full description, together with servicing instructions on the starter, is given in A.P.1181, Vol. 1 and 6, Part 1, Sect. 4, Chap. 2 and cartridge loading instructions are given in A.P.4320B, Vol. 1.

Engine-driven accessories (fig. 2)

6. The turbo-starter, tachometer generator, twin generators, and Hymatic compressor are mounted on the upper wheelcase, and the two hydraulic pumps and components of the engine oil and fuel systems are on the lower wheelcase. The twin generators are cooled by air ducted to the casings from a scoop on the upper front cowling panel.

Controls (fig. 4)

7. The throttle and high-pressure and low-pressure fuel cocks constitute the main controls, and their respective levers are located in the engine control box mounted on the port side of the cabin (fig. 5). Movement of the levers is transmitted through Teleflex cables, running in rigid conduits, to Teleflex boxes mounted on the aft face of No. 4 bulkhead. The throttle (pre-mod. N.629) and low-pressure fuel cock controls are each connected to the Teleflex boxes by two cables, and the high-pressure fuel cock by a single cable. The throttle and low-pressure fuel cock cables are adjustable at the turnbuckles which are fitted between bulkhead No. 2 and 3. The drive from the Teleflex boxes is transferred by a system of parallel transverse layshafts, connected chains and tie-rods. The low-pressure fuel cock layshaft, positioned on the lower aft face of No. 4 bulkhead, is connected

directly to the fuel cock mounted on the port side of the bulkhead. The throttle and high-pressure fuel cock shafts, which are concentrically mounted, have integral levers at the outboard ends which are linked by adjustable connecting-rods to the respective control levers on the engine. ◀ The throttle control (post-mod. N.629) consists of a single Teleflex control run from the engine control box to the throttle layshaft on the aft lower starboard face of No. 4 bulkhead and thence by an adjustable connecting-rod to the engine. An adjustable ball end, where the Teleflex control picks up on the throttle layshaft at No. 4 bulkhead, and the connecting-rod to the engine are used for normal adjustments. ▶

Instruments

8. Three gauges are fitted on the pilot's instrument panel to register engine performance. These are:—

- (1) The electrically-operated jet pipe temperature gauge, which is connected to thermocouples in the exhaust cone.
- (2) The oil temperature gauge, connected to a resistance bulb in the high-pressure oil filter.
- (3) The tachometer, operated by a generator mounted on the upper wheelcase.



Air supply connections

9. The engine diffuser casing is tapped at several points (*fig. 10 (2)*), to permit compressed air to assist fuel transfer from the wing tip tanks, for cabin air conditioning, and for gun heating. The fuel transfer system is described in Chap. 2 of this section, the cabin air conditioning system in Sect. 3, Chap. 8 and the gun heating system in Sect. 7, Chap. 3.

SERVICING

Engine cowlings

10. The cowling fasteners must be adjusted in accordance with A.P.1464B, Vol. 1, Part 2,

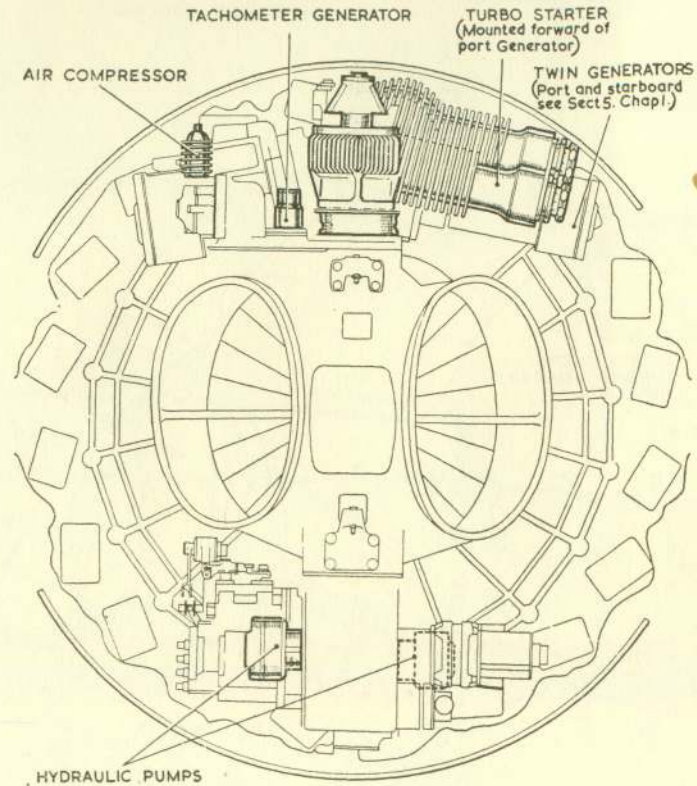


Fig. 2 Engine-driven accessories

Sect. 6, so that the engine cowlings are held firmly in position when the cowling fasteners are locked. If the amount of adjustment is outside the safe limit of the fasteners, the appropriate tie-rod loop-end must be adjusted, ensuring that the loop-end is securely re-locked after adjustment. ◀ Special care is required when fitting the lower front and middle engine cowlings to ensure that the fuel drain seals (*fig. 16*) are correctly fitted. Before offering up the lower *centre* cowling, slacken off the mushroom headed bolts clamping the rubber seal, and tighten them again after the cowling has been secured in position; this allows the seal to align itself without distortion to the combustion chamber drain. Ensure that the rubber seals (*fig. 16, detail A and B*) on both the front and middle

engine cowlings are well lubricated with grease, XG-315. The fireguard drain bellows and the jet pipe drain flexible hose must be fitted *after* the rear cone has been secured in place. ▶

Setting the controls

11. The alignment between the cabin control levers and their layshafts, on the aft face of No. 4 bulkhead, must be checked before making any adjustment to the engine controls. Set the three cabin levers in mid-position and ensure that the lengths of chain on either side of the sprockets, on both the upper and lower layshafts, are equal. Normally no adjustment will be necessary unless this part of the system has been disturbed, minor adjustments effected at the inter-

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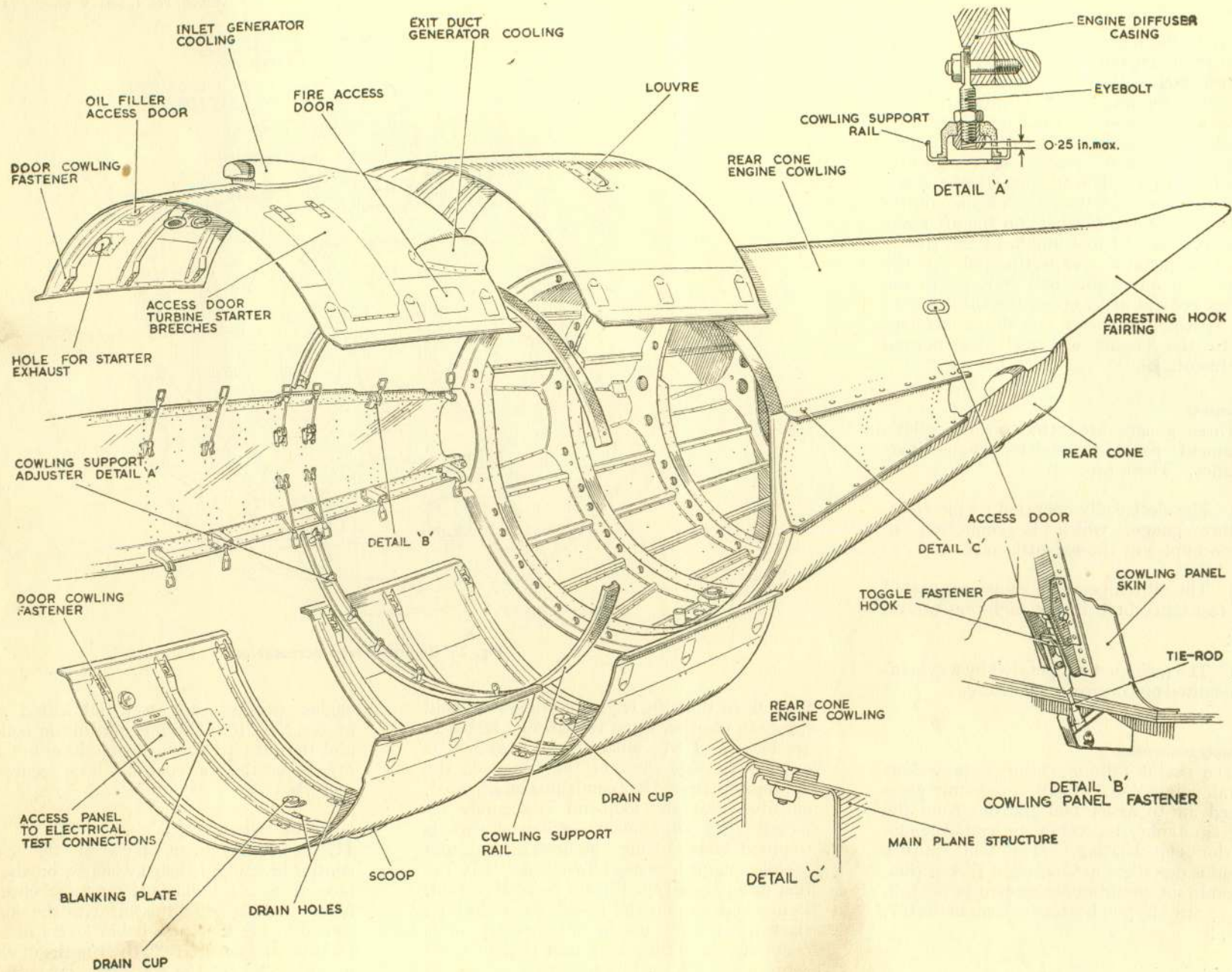


Fig. 3. Engine cowlings

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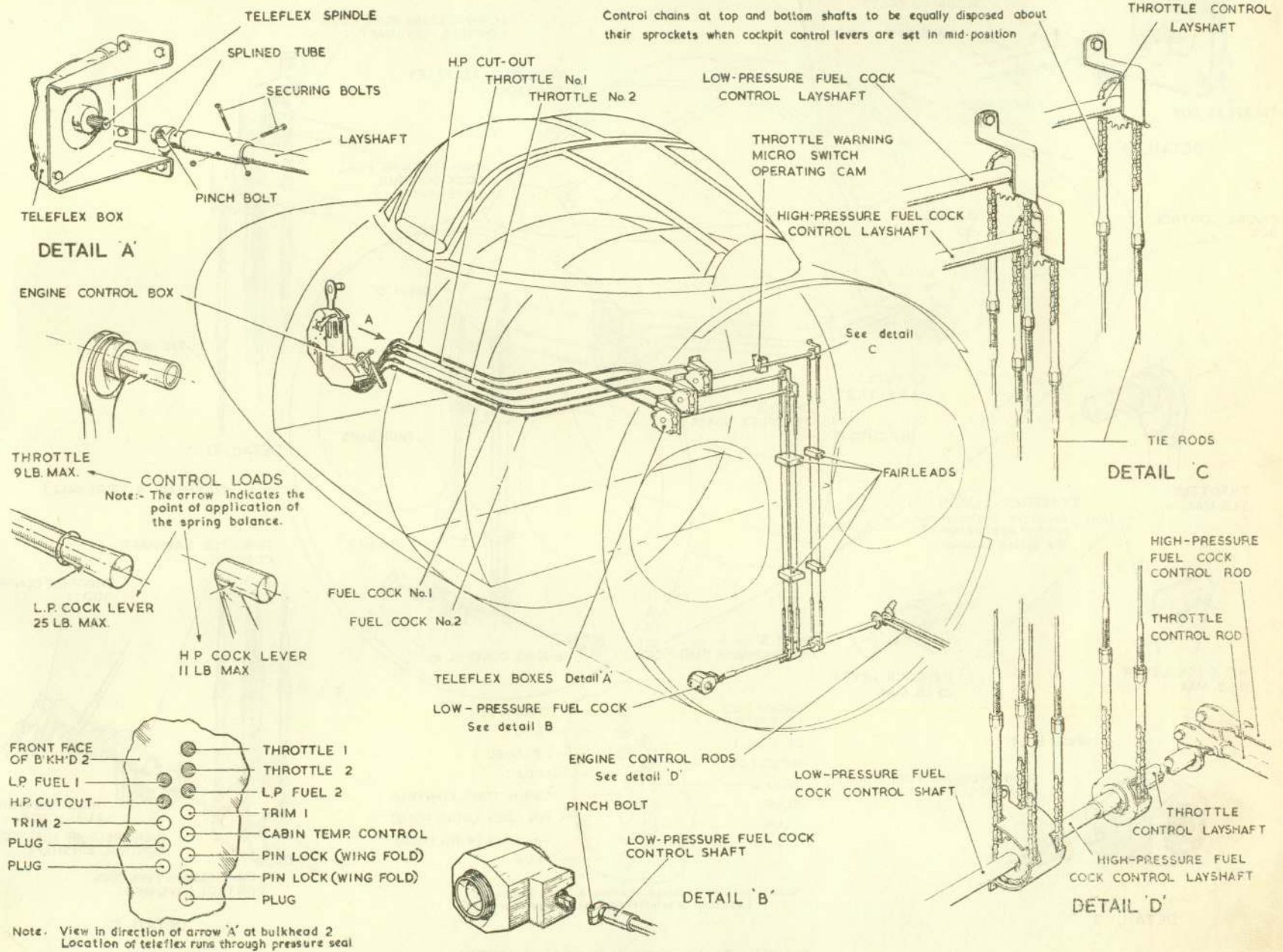


Fig. 4(1). Engine controls (pre-Mod. N.629)

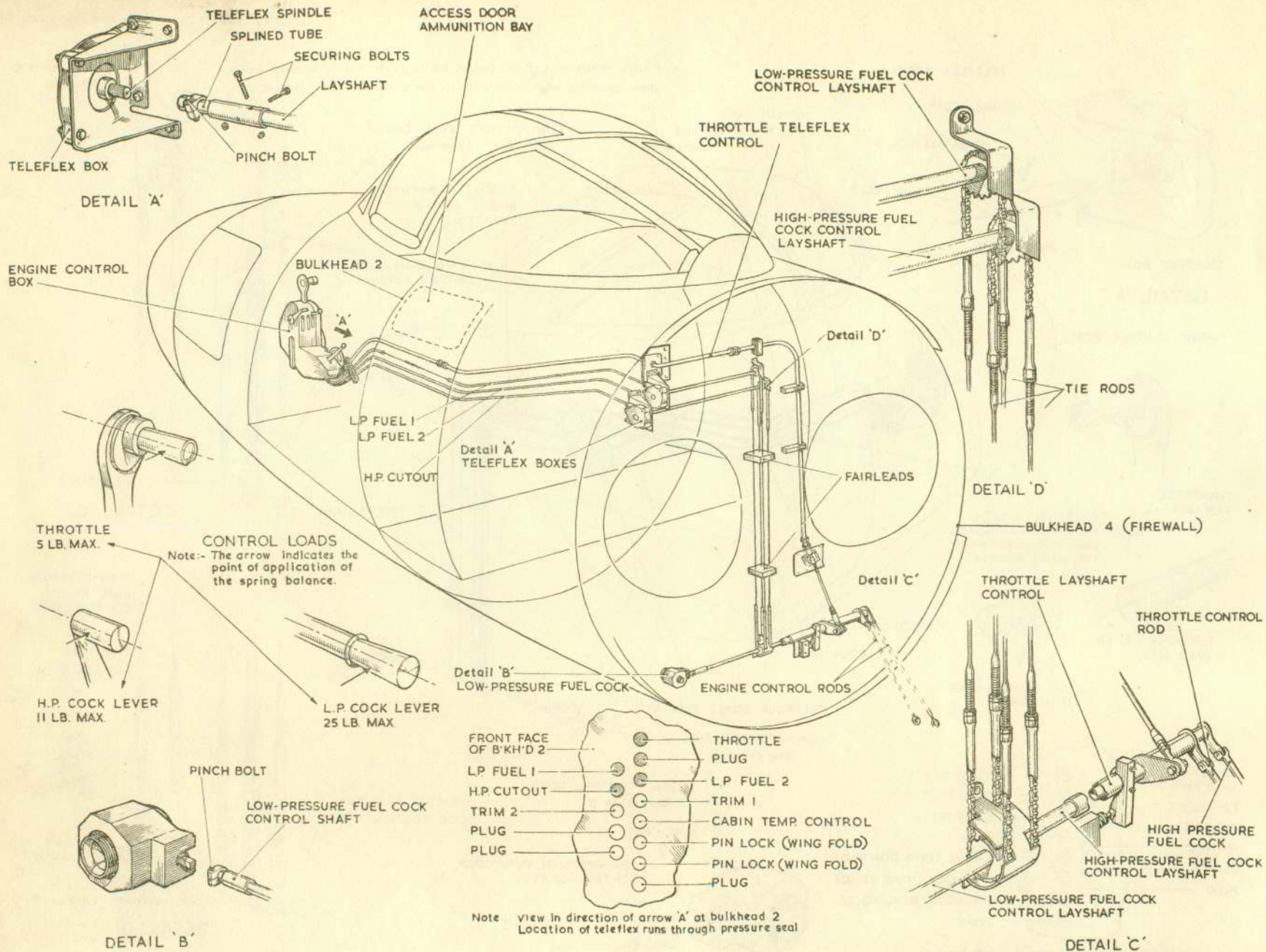


Fig. 4(2). Engine controls (post-Mod. N.629)

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connecting chain tie-rods. Large adjustments are made by releasing the pinch bolt on the appropriate upper layshaft (fig. 4), removing the two bolts from the splined tube, adjusting the socket on the Teleflex shaft and then re-securing. The following three paragraphs describe the procedure for setting the cabin controls in relation to the engine levers.

Throttle control

12. The throttle should be set as follows:—

- (1) Pre-Mod. N.629 (fig. 6):—
 - (a) Set the throttle control in the mid-position.
 - (b) Ensure that there are equal lengths of chain on either side of the upper and lower sprockets (para. 11).
 - (c) Check that the length of the rod connecting the layshaft lever to the engine throttle arm is 16.15 in. (nominal).
 - (d) Screw in the throttle control stop bolts fully at the engine control box and open the throttle until the throttle arm on the engine comes up against its *open* stop.
 - (e) Adjust the throttle *open* stop, until it just contacts the throttle control in the fully OPEN position, then screw the stop bolt back two complete turns and lock.
 - (f) Repeat the above procedure for the SHUT position. Check that the control loadings conform to the limits laid down in fig. 4.
 - (g) If the range of movement of the engine throttle arm does not coincide with that of the throttle control, adjust the connecting-rod as necessary.

Note . . .

If the setting of the upper layshaft, relative to the Teleflex box, has been disturbed, the cam of the throttle warning micro switch (fig. 4) must be adjusted to operate the switch when the throttle control is approximately one quarter open.

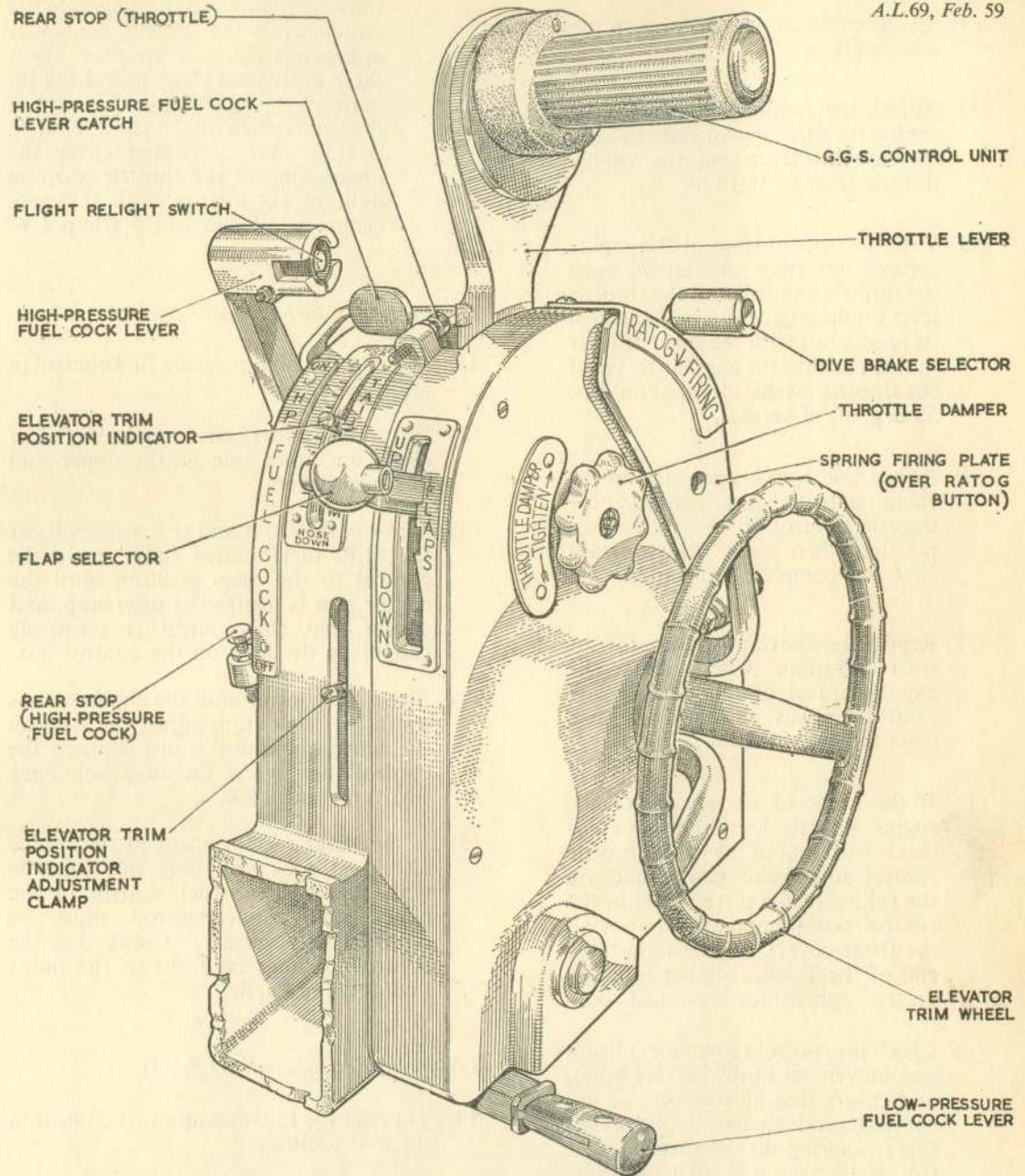


Fig. 5. Engine control box

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(2) ◀ Post-Mod. N.629 (fig. 9):—

- (a) Set the cabin throttle control to the mid-position.
- (b) Adjust the nominal length of the engine throttle control rod between the layshaft lever and the engine throttle lever to 16.15 in.
- (c) With the control stops at the engine control box fully screwed *in*, open the throttle control until the throttle lever on the engine comes up against its *open* stop; with the throttle lever in this position the angular travel of the throttle layshaft lever should be 55 deg. aft of vertical.
- (d) Adjust the throttle *open* stop in the cabin until it just contacts the throttle control in the fully OPEN position, then screw the stop bolt *back* two complete turns and lock.
- (e) Repeat the above procedure for the SHUT position. Check that the angular travel of the throttle layshaft lever has advanced 68 deg. from the *open* position.
- (f) If the range of movements of the engine throttle lever does not coincide with that of the cabin throttle control, adjustments can be made on the splines of the drive wheel in the control box (temporarily removing the front cover), on the adjustable end of the Teleflex sliding tube, or on the engine throttle control rod.
- (g) Check the control system for full and free movement in the correct sense, and ensure that all connections are correctly and securely locked, that there is spring on the throttle control in the OPEN and SHUT positions and that the load required to move the throttle control conforms to the limit shown in fig. 4 (2).

- (h) Adjust the cam of the throttle warning micro switch to operate the switch when the throttle control is approximately one quarter *open*; there must be a clearance of 0.2 in. between the bulkhead and the tip of the cam when the throttle control is fully *shut*. Ground check the functioning of the throttle warning light in accordance with the procedure detailed in Sect. 5, Chap. 1. ▶

High-pressure fuel control (fig. 7)

13. (1) Set the high-pressure fuel control in mid-position.
- (2) Ensure that there are equal lengths of chain on either side of the upper and lower sprockets.
- (3) Screw *in* the front and rear stop bolts of the H.P. fuel control fully, move the control to the OPEN position until the engine arm is against its *open* stop, and ensure that the control is positively caught by the lock on the control box.
- (4) Move the control until the engine arm is against its *shut* stop, adjust the stop on the control box until it just contacts the control then screw the stop bolt *back* two turns and lock.
- (5) If the range of movement of the engine H.P. fuel cock arm does not coincide with that for the fuel control in the cabin, the connecting-rod must be adjusted as necessary. Check that the control loadings conform to the limits laid down in fig. 4.

Low-pressure fuel control (fig. 8)

14. (1) Set the low-pressure fuel control in the mid-position.
- (2) Ensure that there are equal lengths of chain on either side of the upper and lower sprockets.

- (3) Screw *in* the stop bolts of the L.P. fuel control, move the control to the OFF position and check by viewing through the outlet, that the fuel cock is *shut*.
- (4) Adjust the *off* stop until it just contacts the fuel control, then screw *back* two complete turns and lock.
- (5) Move the fuel control to the ON position and check that the fuel cock is fully *open*.
- (6) Adjust the *on* stop until it just contacts the fuel control, then screw *back* two complete turns and lock. Check that the control loadings conform to the limits laid down in fig. 4.

Ground running the engine

15. Full details for ground running the engine are given in A.P.4320B, Vol. 1. Gauges to record oil and fuel burner pressures are not fitted in the aircraft, therefore, if a pressure check is required, the gauges must be incorporated in the respective systems.

Lubrication

16. At the periods laid down in Vol. 4, the engine control Teleflex cables, connecting chains and cowling fasteners, should be lubricated as indicated in Sect. 2, Chap. 4.

REMOVAL AND ASSEMBLY

Power unit removal

17. The power unit must not be removed from the aircraft until the removal instructions contained in A.P.4320B, Vol. 1 have been complied with, because some of these instructions cannot be carried out after the power unit has been removed. The correct method of applying the sling and locating the lifting eyes is shown in fig. 14.

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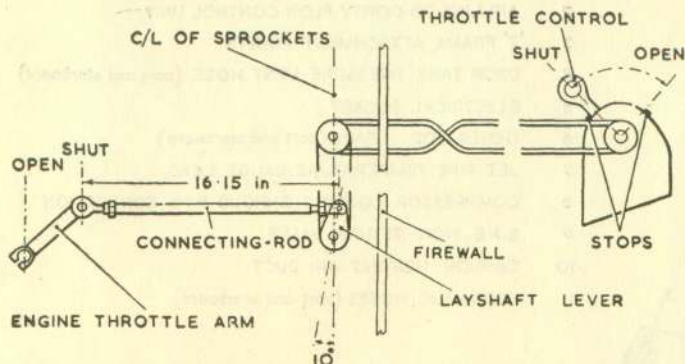


Fig. 6. Throttle control setting (pre-mod. N.629)

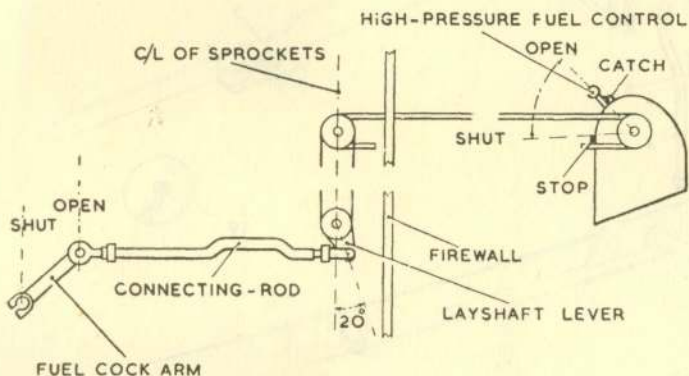


Fig. 7. High-pressure fuel control setting

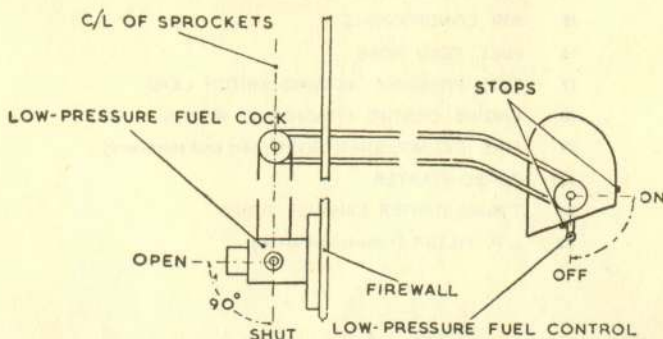


Fig. 8. Low-pressure fuel control setting

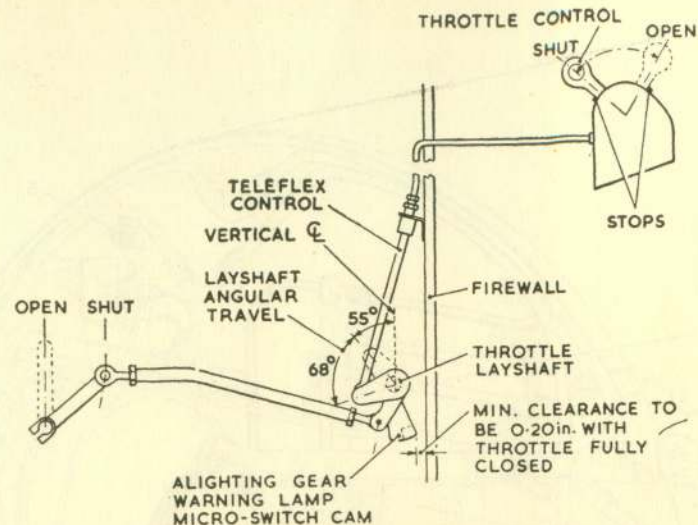


Fig. 9. Throttle control setting (post-mod. N.629)

Preliminary operations

18. (1) With the aircraft resting on the ground, ensure that the brakes are locked on and that the wheels are securely chocked.
- (2) Check that the master and turbo-starter switches are OFF and that the batteries are disconnected.
- (3) Drain the fuel from the fuselage tank only (Sect. 4, Chap. 2).
- (4) Set the high and low-pressure fuel cocks to SHUT and FUEL OFF positions.
- (5) Remove the L.P. filter and blank off the pipe connection, in accordance with A.P. 4320B, Vol. 1.

Note . . .

The throttle and H.P. cock connecting-rods must not be left hanging down from the

engine bulkhead layshafts during engine installation or removal. Both connecting-rods must first be disconnected from the engine end, then unscrewed completely from the fork ends on the engine bulkhead; they must be removed before the power unit is taken out, and replaced after the power unit is installed.

Disconnecting procedure

19. Fig. 10 (1) and 10 (2) indicate the disconnections, which must be made at the correct break points, but the sequence given may be varied to suit particular requirements. Items which must be transferred with the Engine Change Unit, and a list of blanking covers are given in A.P.4320B, Vol. 1. After disconnecting the break-points indicated in fig. 10 (1) and (2), proceed as follows:—

- (1) Lower the main plane flaps to avoid damage to the inboard edges, and uncouple the electrical leads from the fire extinguisher flame switches on each side of the rear cone fairing front former. Remove the bellows, and the flexible hose at the fireguard and jet pipe drain respectively (fig. 16).

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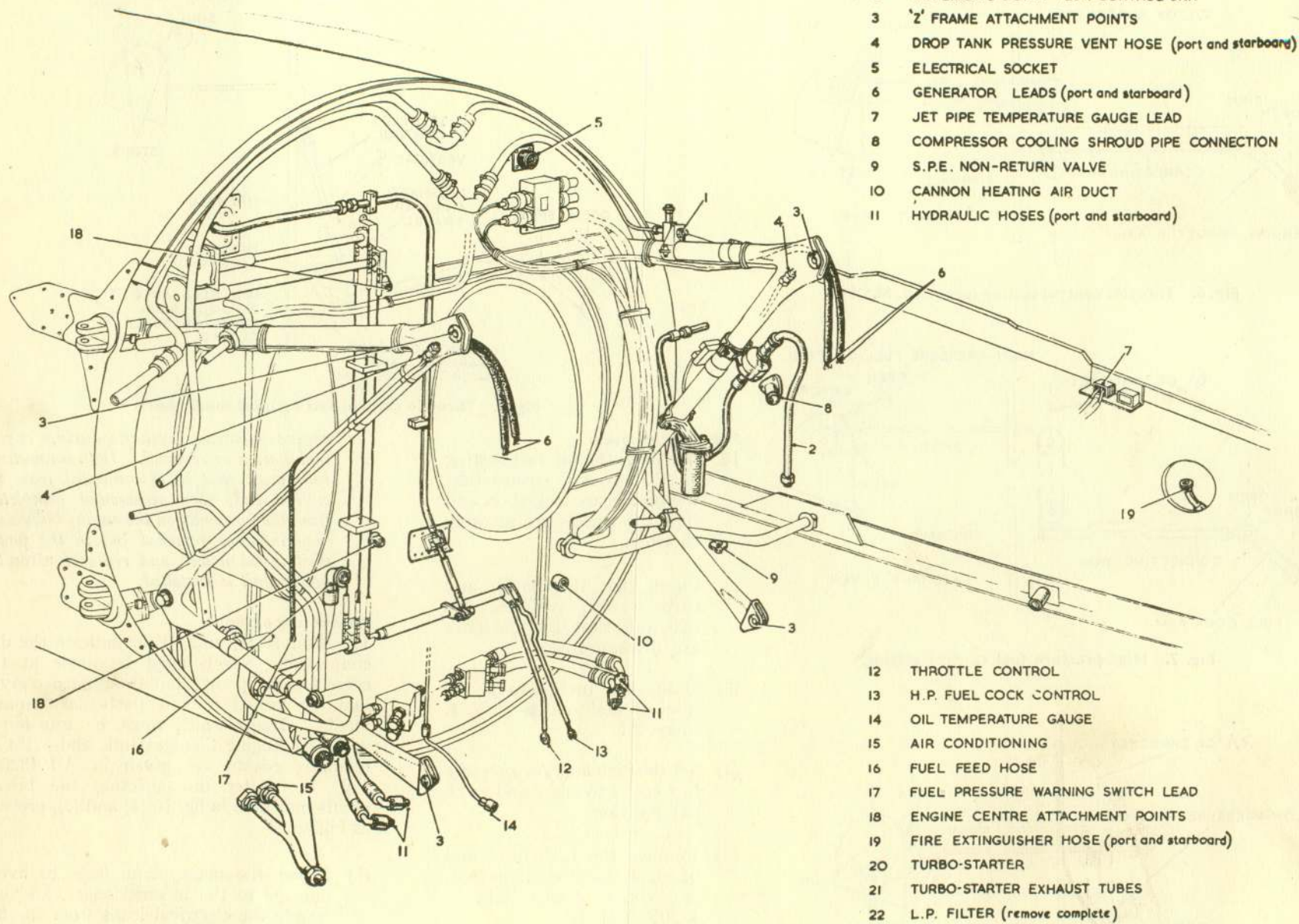


Fig. 10 Break points (1)

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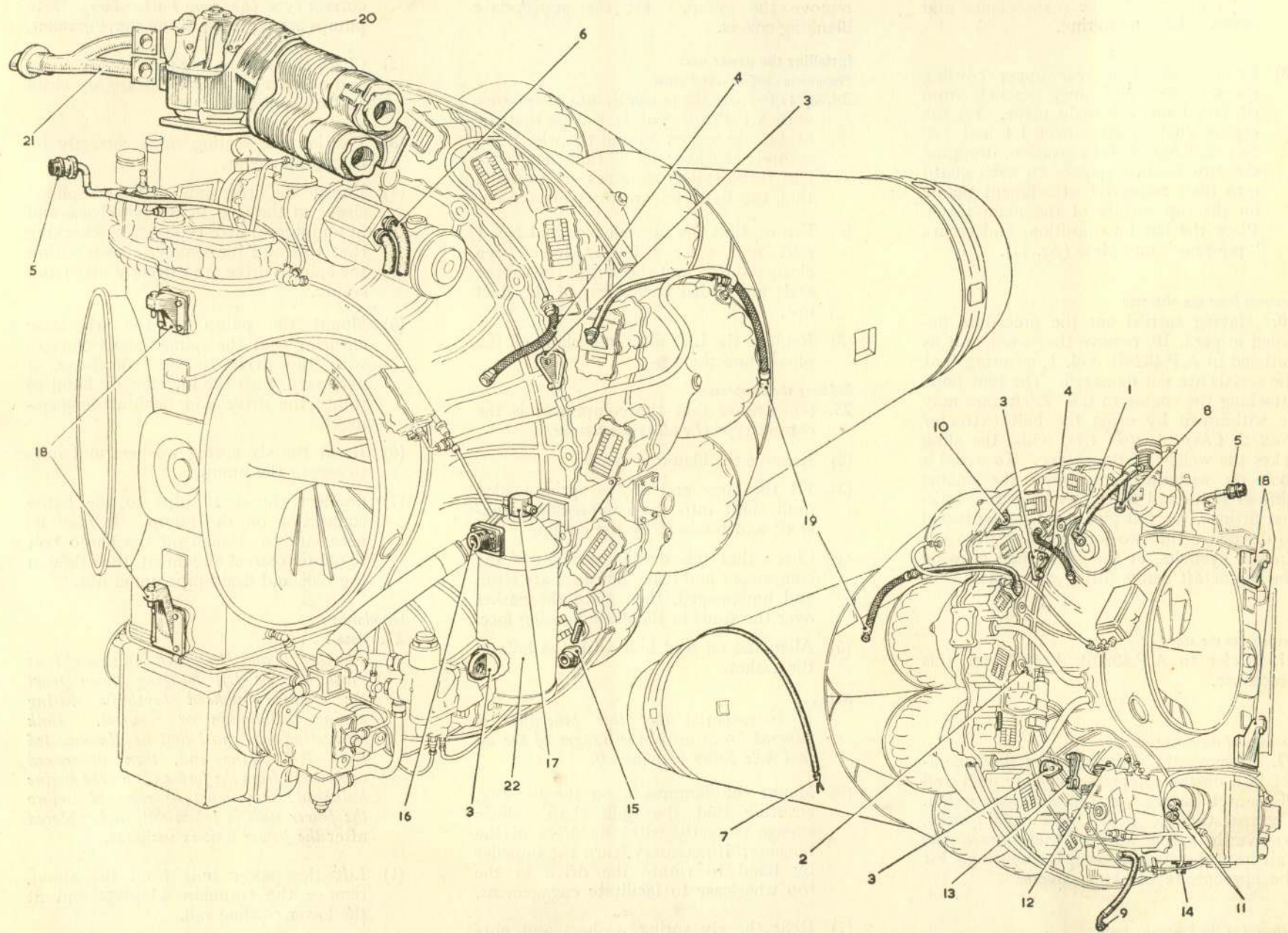


Fig. 10. Break points (2)

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- (2) Remove the arresting hook (*Sect. 3, Chap. 5*), withdraw the bolts securing the rear cone to the main planes and remove the cone fairing.
- (3) Remove the four rear upper cowling panel tie-rods and hinge brackets from rib No. 1 on each main plane. Fit the engine guide plates (*item I.4 and I.5, Sect. 2, Chap. 4*) into position, dropping the two floating spigots on each guard into their respective attachment points on the top surface of the main plane. Place the bar into position, and secure "pip-pins" into place (*fig. 11*).

Removal from the airframe

20. Having carried out the procedure detailed in para. 19, remove the power unit as outlined in A.P.4320B, Vol. 1, ensuring that the aerials are not damaged. The four bolts attaching the engine to the 'Z' frames may be withdrawn by using the bolt extractor (*Sect. 2, Chap. 4, item I.7*), while the sling takes the weight of the engine. To avoid a foul, on withdrawal, between the engine diffuser units and the upper 'Z' frame fork-end fittings, the tail pipe must be depressed to disengage the two forward lugs from the firewall eyebolts, at the same time drawing the engine aft before lifting commences.

Securing to the stand

21. Refer to A.P.4320B, Vol. 1, for this procedure.

Removal of the compressor

22. Remove the whipping from the generator lead on the compressor cooling duct and disconnect the duct at the generator union. Unscrew the six $\frac{1}{4}$ in. B.S.F. plain nuts, remove the spring washers, then remove the unit from the compressor drive housing. Fit the appropriate blanking covers.

Removal of the hydraulic pumps

23. Both pumps are removed in the same manner. Unscrew the union nut from the banjo connection and remove the drain pipe.

Unscrew the six $\frac{1}{4}$ in. B.S.F. plain nuts, remove the spring and plain washers, then remove the pump. Fit the appropriate blanking covers.

Installing the power unit

Preparation before installation

- 24.** (1) Prepare the power unit in accordance with A.P.4320B, Vol. 1. Ensure that the brakes are locked ON and the wheels are securely chocked; check that the master and turbo-starter switches are OFF and that the batteries are disconnected.
- (2) Ensure that the firewall face and No. 1 port and starboard ribs have been cleaned down, and check that the rubber seals are folded back clear of the duct lips.
 - (3) Remove the L.P. filter and blank off the pipe connections. ▶

Refitting the compressor

- 25.** (1) Ensure that the compressor is the correct type (*Leading Particulars*).
- (2) Remove the blanking caps.
 - (3) Fit the large end of the spring-loaded quill shaft into the compressor crankshaft and retain it by the circlip.
 - (4) Check that the mating surfaces of the compressor and drive housings are clean and undamaged, then place the gasket over the studs in the drive housing face.
 - (5) Align the oil feed hole with the hole in the gasket.

Note . . .

It is essential that this procedure is adhered to, to avoid the danger of the oil feed hole being blanked off.

- (6) Mount the compressor on the housing, ensuring that the quill shaft splines engage correctly with the drive in the housing; if necessary, turn the impeller by hand to rotate the drive in the top wheelcase to facilitate engagement.
- (7) Refit the six spring washers and nuts to secure the air compressor.
- (8) Fit the compressor cooling shroud.

Refitting of the hydraulic pumps

- 26.** (1) Ensure that the pumps are the correct type (*Leading Particulars*). Both pumps are replaced in the same manner,
- (2) Check that the mating faces on the pump and adapter on the wheelcase are clean and undamaged.
 - (3) Position the sealing rings correctly on the pump spigot.
 - (4) Engage the drive quill shaft and splined sleeve in the gear in the wheelcase and fit an internal wire-type circlip, checking that this and the smaller circlip within the splined drive are correctly fitted and secure.
 - (5) Mount the pump on the wheelcase ensuring that the splined shaft engages with the drive in the wheelcase, if necessary, turn the impeller by hand to rotate the drive and facilitate engagement.
 - (6) Re-fit the six spring washers and nuts to secure the pump.
 - (7) Connect the drain pipe to the banjo connection on the pump. It may be necessary to slacken off the banjo bolt to obtain correct alignment, then tighten the bolt and drain pipe union nut.

Installation

27. Note . . .

The throttle and H.P. cock connecting-rods must not be left hanging down from the engine bulkhead layshafts during engine installation or removal. Both connecting-rods must first be disconnected from the engine end, then unscrewed completely from the fork ends on the engine bulkhead; they must be removed before the power unit is taken out, and replaced after the power unit is installed.

- (1) Lift the power unit from the stand, remove the trunnion adapters and fit the lower cowling rail.
- (2) Remove the cover plates from the air-intake ducts. When lowering the engine, to line up the attachment lugs with the

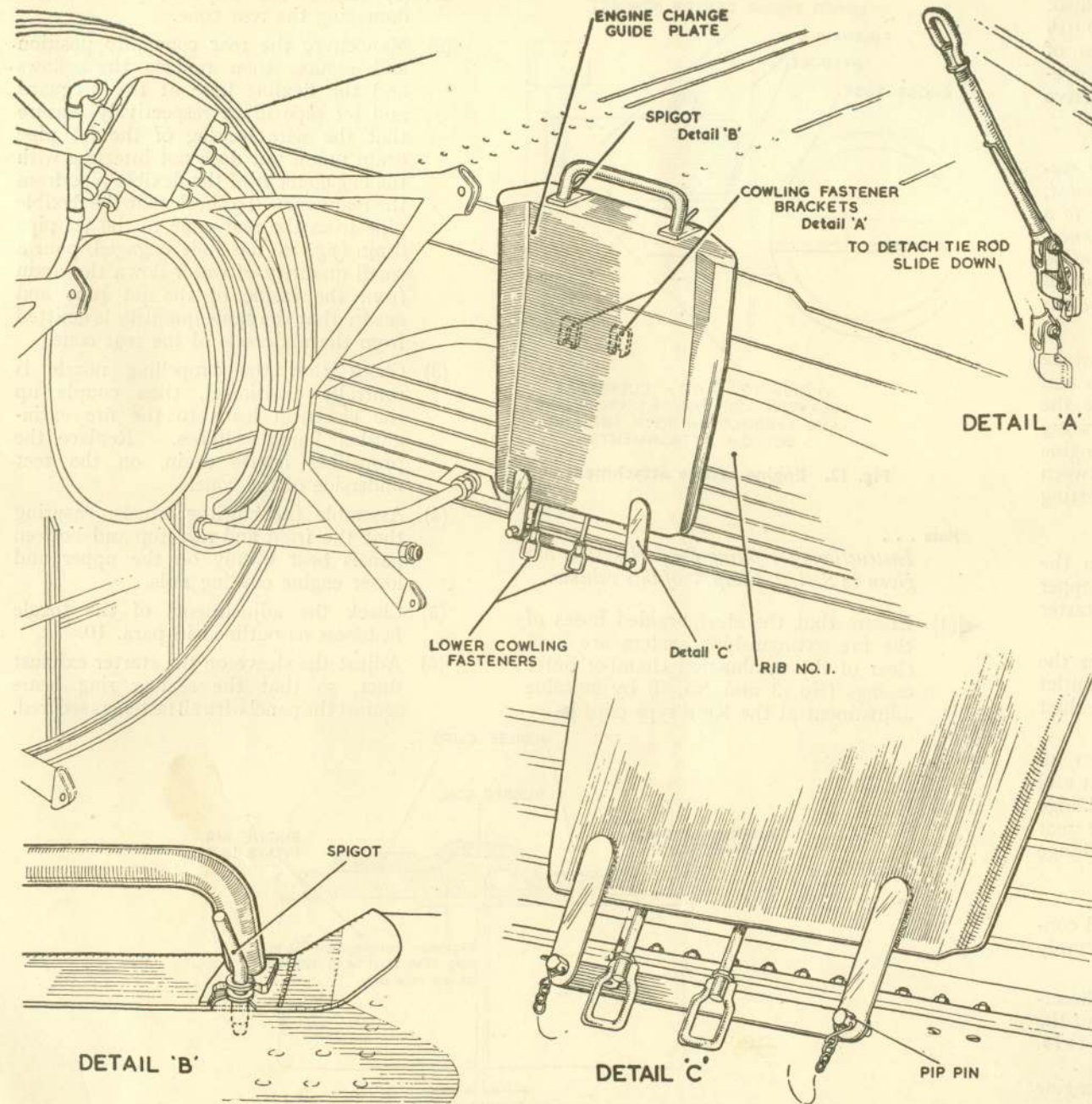


Fig. 11. Engine change guide plate

mountings, ensure that the spigots on the engine front centre lugs line up with the eye-bolts on the firewall and enter easily. Assemble the top two engine mounting bolts first, and then the bottom bolts.

Note . . .

If the power unit has been removed for the purpose of replacing one or both halves of the engine mounting, or replacing either of the centre eye-bolts on the fuselage structure, the alignment jig (Sect. 2, Chap. 4, item I.6) should be used to check that the six pick-up points are correctly lined up to receive the power unit.

- (3) The engine mounting frame attachments port and starboard, and the central eye-bolt attachments on the rear face of the fireproof bulkhead, are assembled to the structure in the initial manufacturing stage with special steel shims. These shims bring the engine attachment points on the mounting into alignment with the eye-bolts on the engine, and if any of the six eye-bolts are changed during the life of the aircraft, the original shims must be replaced. If an engine mounting is changed, it may be necessary to alter the original shimming to align the mounting with the engine. Always use *thin* Duralac compound when assembling shims. If new shims are fitted, ensure that they conform with the limits laid down in fig. 1. After the engine has been bolted into

position, release the weight of the power unit from the sling, and check that there is a clearance of 0.015 in. to 0.150 in. between the face of both the upper and lower centre eye-bolts on the firewall and their respective lug brackets on the engine (fig. 12).

Note . . .

If any of the engine mounting frame eye-bolts (fig. 1, eye-bolt B) are dismantled, they must be re-tightened in position to a torque loading of 500 lb. in.; the thickness of shims used under the engine mounting attachment frame eye-bolts, and the central eye-bolt attachment points, must not be less than 0.080 in.

- (4) Check the alignment of the air-intake ducts (fig. 13), fit the rubber seals and the large Jubilee clips. Assemble the arresting hook, and check by operating the hook up and down that the engine venturi cuff is located centrally between the 'A' frame. Remove the arresting hook.
- (5) Remove the blanking covers from the starter mounting face on the upper wheelcase, and mount the turbo-starter as detailed in A.P.4320B, Vol. 1.
- (6) Remove the blanking covers from the starter exhaust and emergency outlet flanges, and assemble the exhaust duct with the Heldite gaskets.
- (7) Install the L.P. filter and connect all the services between the power unit and fuselage, remove the two engine change guide plates, re-assemble the four rear upper cowling panel tie-rods and hinge brackets to each rib No. 1.

Checks after installation

28. (1) Ensure that all couplings and connections are made correctly and securely locked.
- (2) Ensure correct rigging, sense of direction and full and free movement of the engine controls as detailed in para. 11 to 14.
- (3) Prime the engine fuel system, engine rear bearing and the turbo-starter gear box in accordance with A.P.4320B, Vol. 1.

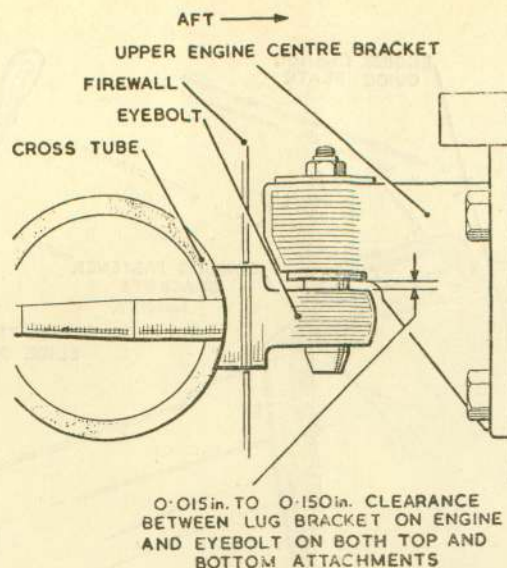


Fig. 12. Engine centre attachment

Note . . .

Instructions for filling the fuel system are given in Sect. 2, Chap. 2 of this volume.

- ◀ (4) Ensure that the steel braided hoses of the fire extinguishing system are kept clear of the combustion chamber outer casings (No. 3 and No. 9) by suitable adjustment at the King type clips. ▶

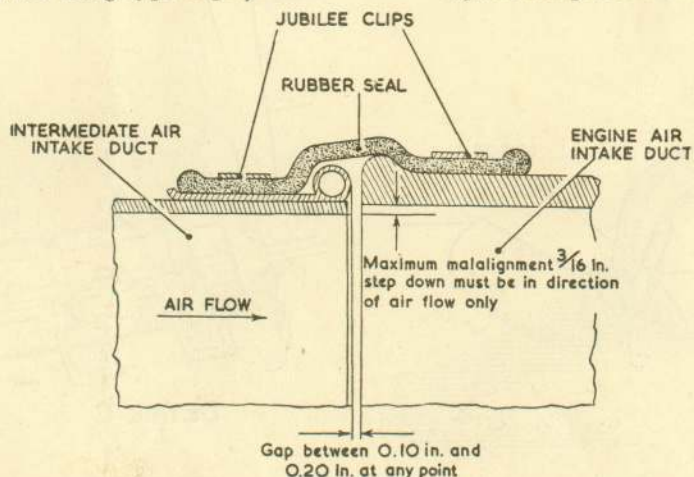


Fig. 13. Alignment of air-intake ducts

Final assemblies and checks

29. (1) Lower the flaps fully to avoid damaging the rear cone.
- (2) Manoeuvre the rear cone into position and secure, then replace the bellows and the flexible hose at the fireguard and jet pipe drain respectively (ensure that the wire locking of the jet pipe drain union nut does not interfere with the engagement of the flexible pipe from the rear cone). To check that the flexible pipe from the rear cone to the jet pipe drain (fig. 16) has fully engaged, pour a small quantity of water down the drain from the inside of the jet pipe and ensure that the same quantity is emitted from the underside of the rear cone.
- (3) Check that the propelling nozzle is centrally positioned, then couple up the electrical leads to the fire extinguisher flame switches. Replace the propelling nozzle drain, on the rear underside of the cone.
- (4) Assemble the cowling panels, ensuring that the front and rear top and bottom panels bear evenly on the upper and lower engine cowling rails.
- (5) Check the adjustments of the toggle fasteners as outlined in para. 10.
- (6) Adjust the sleeve on the starter exhaust duct, so that the sealing ring bears against the panel with all fasteners secured.

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(7) Bind any of the pipes which are liable to be chafed by other pipes or structural members with waxed twine over Empire tape.

(8) Re-assemble the arresting hook and check that it functions satisfactorily.

(9) Check that the limits and clearances on the engine installation conform with those shown in fig. 15.

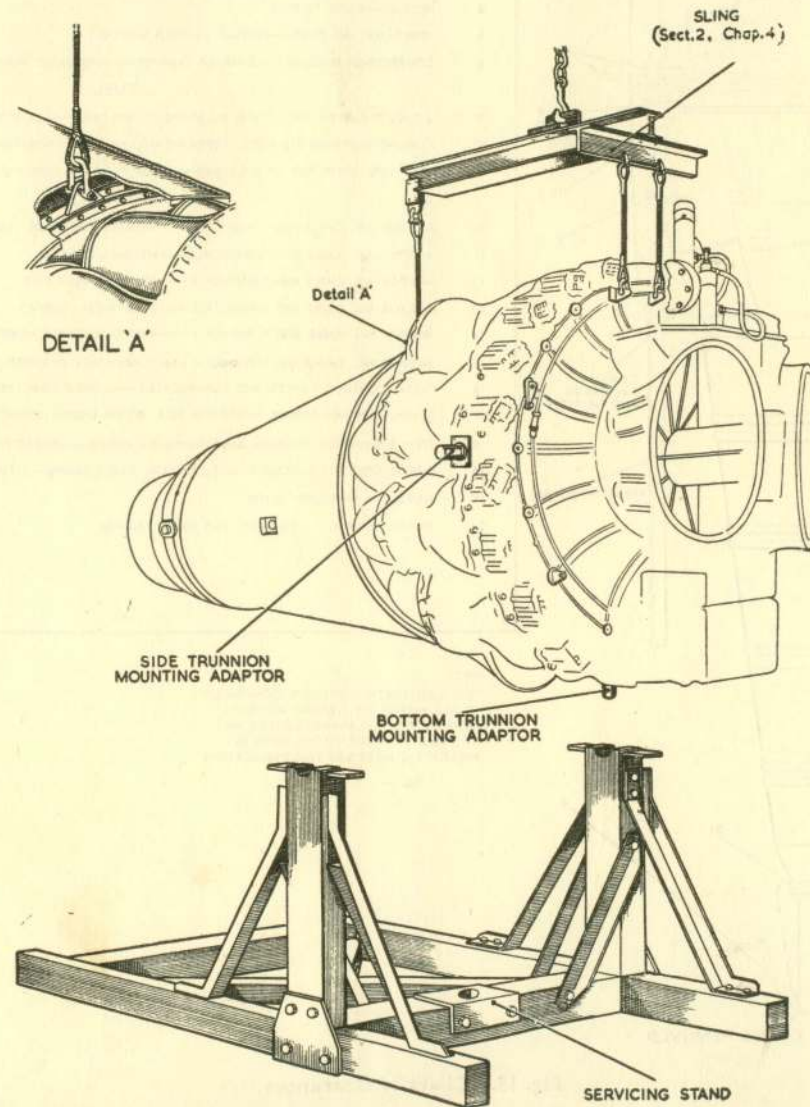
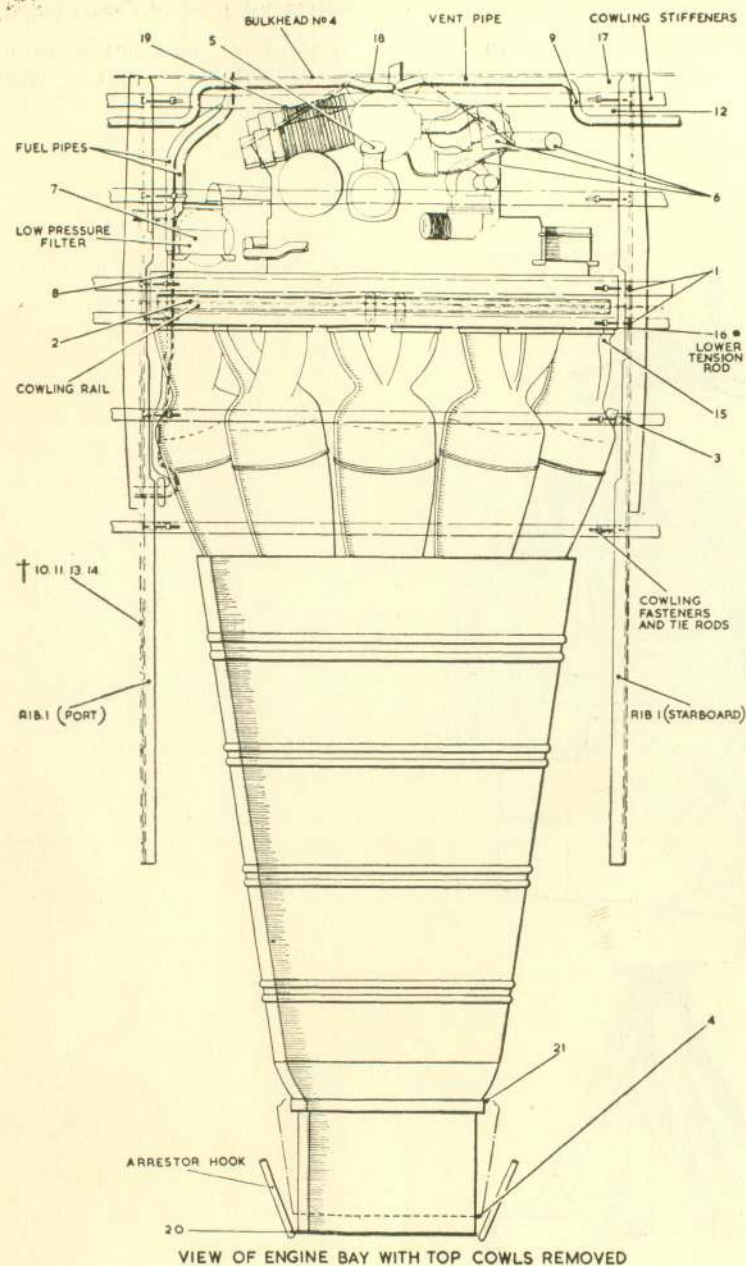


Fig. 14. Power unit sling and stand

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ITEM	PARTS BETWEEN WHICH A FOUL MIGHT OCCUR	POSITION	MINIMUM CLEARANCE
ENGINE			
1	ALL COWLING FASTENERS IN LINE WITH DIFFUSER CASING — DIFFUSER CASING	PORT AND ST'BD	0.10 in
2	COWL RAIL (MOUNTED ON ENGINE) — DIFFUSER CASING	PORT AND ST'BD	0.05 in
3	MID FASTENER BRACKET OF REAR TOP COWLING — COMBUSTION CHAMBER	STARBOARD	0.20 in
4	NOZZLE — CONE FAIRING	ALL ROUND	0.30 in
5	GENERATOR AIR VENT — NUT ON STARTER MOTOR	—	0.05 in
6	COMPRESSOR HOUSING — STARTER EXHAUST — HYDRAULIC PUMP	—	0.05 in
FUEL			
7	2 FUEL TRANSFER PIPES FROM BULKHEAD TO N°1 TANK — LOW PRESSURE FILTER	PORT	0.12 in
8	COWLING FASTENER TIE RODS (UNDERNEATH) — FUEL TRANSFER PIPE	PORT	0.15 in
9	VENT PIPE FROM TOP OF BULKHEAD — TOP FORWARD COWLING STIFFENER	PORT AND ST'BD	0.20 in
CONTROLS			
10	AILERON BAL. CABLE AND TURNBUCKLE — TELEFLEX CONTROL TUBES	ALONG RIB 1	0.15 in
11	AILERON BAL. CABLE AND TURNBUCKLE — HYDRAULIC PIPES	ALONG RIB 1	0.20 in
12	AILERON BAL. CABLE AND TURNBUCKLE — N°1 TANK VENT PIPE	ALONG RIB 1	0.20 in
13	AILERON BAL. CABLE AND TURNBUCKLE — ELECTRICAL CABLES	ALONG RIB 1	0.50 in
14	AILERON BAL. CABLE AND TURNBUCKLE — RUBBER FLEXIBLE HOSES	ALONG RIB 1	0.30 in
15	AILERON BAL. CABLE AND TURNBUCKLE — COMBUSTION CHAMBER FUEL HOSE (ENGINE PART)	ALONG RIB 1	0.20 in
16	FLYING CONTROL CABLES AND TURNBUCKLES — LOWER COWLING FASTENERS	ALONG RIB 1	0.10 in *
17	FLYING CONTROL CABLES — BOTTOM PICK UPS OF ENGINE MOUNTING AT BULKHEAD	—	0.03 in
18	ENGINE CONTROL TENSION BARS DOWN BULKHEAD — FRONT OF ENGINE CASING	—	0.05 in
19	ENGINE CONTROL LAYSHAFT — ELECTRICAL CABLE GUARD — TURBO STARTER CYLINDER	—	NIL
20	NOZZLE — ARRESTOR HOOK	PORT AND ST'BD	0.30 in
21	FLAME GUARD FORMER N°5 CONE FAIRING	ALL ROUND	0.30 in

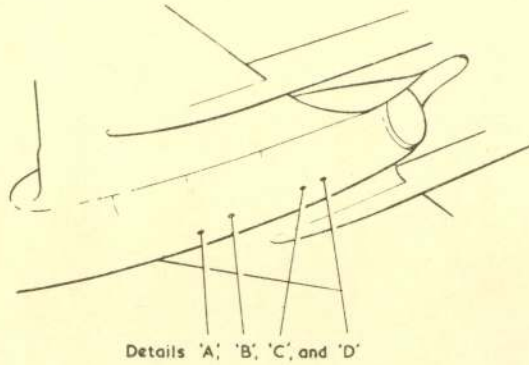
NOTE
THIS ILLUSTRATION APPLIES GENERALLY
TO ALL MARKS OF VEHOM AIRCRAFT.
SOME OF THE CLEARANCES GIVEN MAY
NOT BE APPLICABLE TO THE MARK OF
AIRCRAFT COVERED BY THIS PUBLICATION

* CONTROL CABLES AND LOWER MID
COWLING FORWARD FASTENER
TENSION ROD, 0.06 in MIN WILL BE
ACCEPTABLE IF NECESSARY
(STARBOARD ONLY)

† ITEMS NOS 10, 11, 13 AND 14 ARE CLEARANCES
REQUIRED ON CABLE RUNS ALONG RIB 1
(PORT AND STARBOARD) AND ACROSS
BULKHEAD N°4.

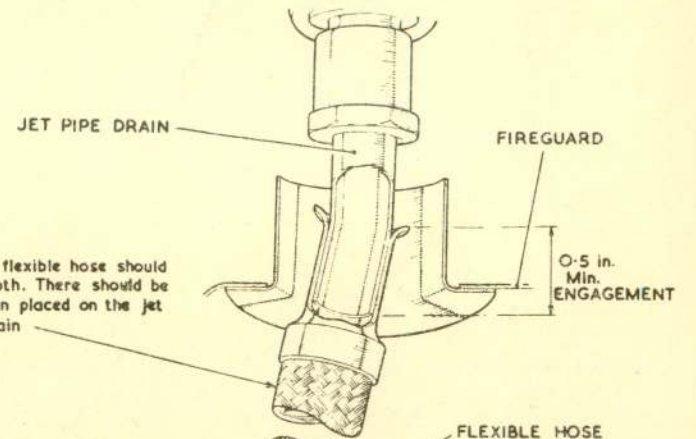
Fig. 15. Chart of clearances

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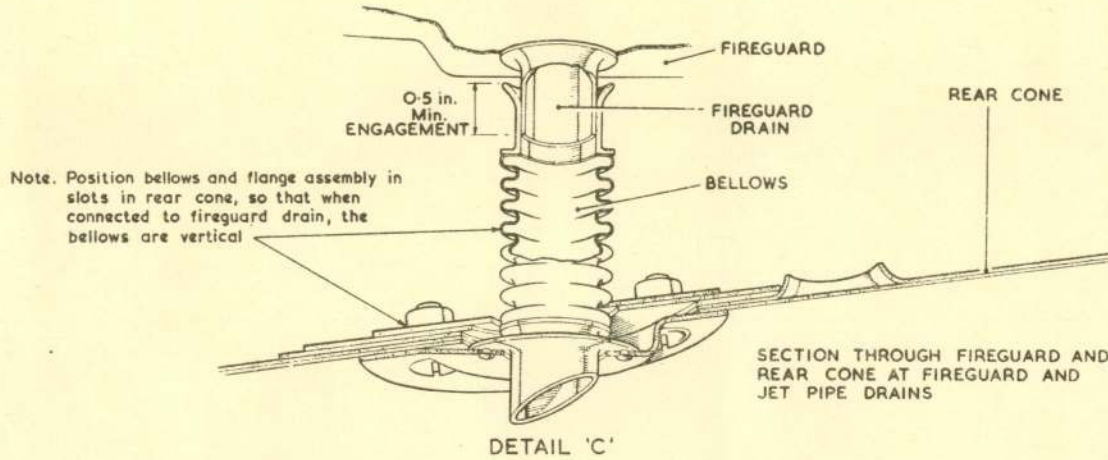


Details 'A', 'B', 'C', and 'D'

Note. Lubricate rubber seals as laid down in Sect. 2, Chap. 4



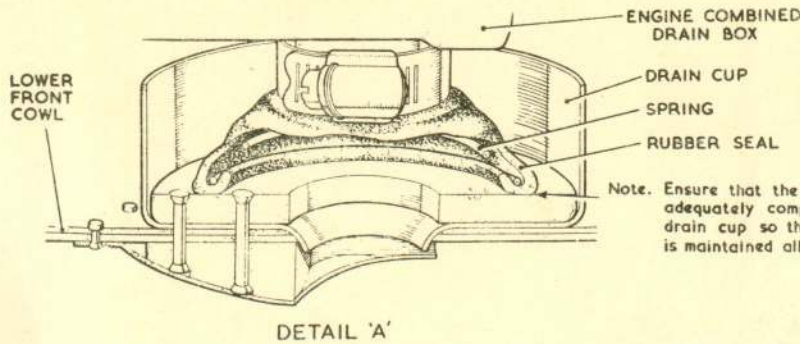
Note Bend in flexible hose should be smooth. There should be no strain placed on the jet pipe drain



Note. Position bellows and flange assembly in slots in rear cone, so that when connected to fireguard drain, the bellows are vertical

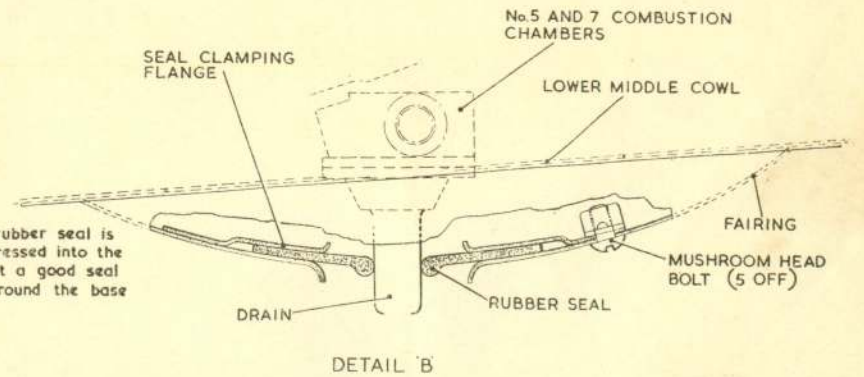
SECTION THROUGH FIREGUARD AND REAR CONE AT FIREGUARD AND JET PIPE DRAINS

DETAIL 'D'



Note. Ensure that the rubber seal is adequately compressed into the drain cup so that a good seal is maintained all round the base

DETAIL 'A'



DETAIL 'B'

Fig. 16. Fuel drains, lower engine cowlings

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