Chapter 2

AIR FLOW CONTROL SYSTEM

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LIST OF ILLUSTRATIONS

General

1. This chapter details the removing, replacing and adjusting of air flow control system units. Refer to Sect. 1 for a list of the special tools supplied for these operations, and to Sect. 2, Chap. 1, for the general precautions to be observed when working on the engine and for torque loading data and the lubricants to be used during assembly.

2. The fuel passages and chambers of units supplied with fuel in operation are to be inhibited (A.P.4471A) when they are removed from an engine for storage.

Bleed valve control unit

Removing

3. Disconnect the pipes from the unit, releasing the rigid pipes at both ends; unscrew the retaining nuts and remove the unit and filter (fitted between unit and casing) from the compressor casing. Store the unit in dry conditions; it is not to be inhibited.

Replacing

4. Replacing is the reverse of removing. Clean and inspect all joint faces, before assembly. Clean the filter carefully in clean kerosine, dry thoroughly, and inspect for damage; if necessary, renew the filter.

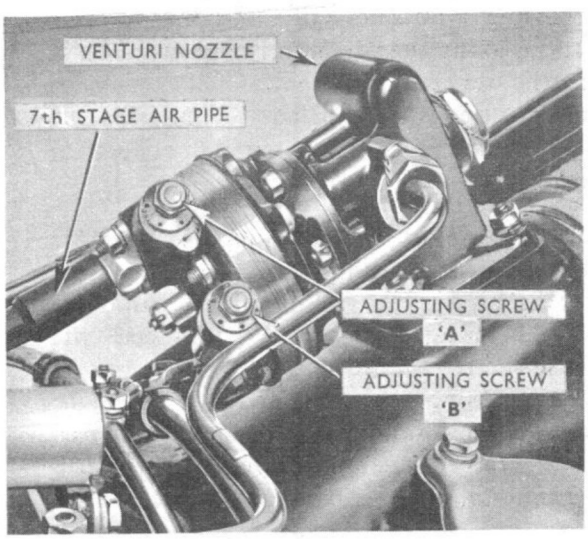

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Fig. 1 Air Bleed valve control unit

5. Ground run the engine and check bleed valve operation (Vol. 1, Part 2, Sect. 2, Chap. 2). Adjust the b.v.c.u., if necessary (para. 6).

Note . . .

Check that the intake guide vane ram is

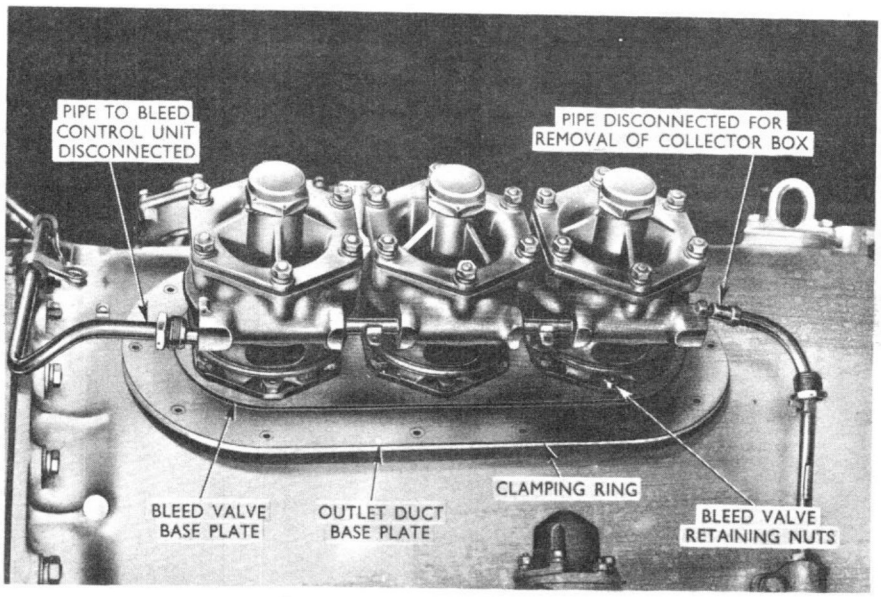

Fig. 2 Air bleed valves

correctly adjusted before attempting to adjust the b.v.c.u.

Adjusting

6. Adjuster B (fig. 1) alters the valve opening and closing points, equally and in the same direction, along the rev/min range. Adjuster A alters the rev/min differential between valve opening and closing; and has secondarily and, to a smaller extent, a similar effect to Adjuster B.

7. Turning adjuster B anti-clockwise will move the opening and closing points of the bleed valve higher up the rev/min range and vice versa. Turning adjuster A clockwise will increase the rev/min difference between opening and closing and, secondarily, move the opening and closing points, together, higher up the rev/min range, and vice versa. Adjuster B is five times more sensitive than adjuster A.

8. Effective adjusting of the bleed valve control unit to the correct settings (Vol. 1, Part 2, Sect. 2, Chap. 2) normally requires the use of both adjusters, taking into consideration their effects (para. 6 and 7). Lock each adjuster after each alteration to its setting.

Air bleed valves

9. The three valve units mounted together on each side of the upper half compressor casing (fig. 2) are connected by short rigid pipes which prevent the removing of an individual valve unit.

Removing

10. To remove each three-valve assembly, disconnect the pipe or blanking plug from the front, and the pipe from the rear, this latter pipe is also to be disconnected from the b.v.c.u. Lift off the collector box. Unscrew the retaining nuts at the base of each valve and lift off the three valves together. Individual valves may then be renewed. Removing the single valve on the lower half compressor casing is straightforward.

Replacing

11. Replacing is the reverse of removing. Ensure that the mating faces are clean and undamaged. Do not use jointing compound at the joint with the compressor casing.

Serviceability check

12. Ground run the engine and check bleed valve operation (Vol. 1, Part 2, Sect. 2, Chap. 2).

Intake guide vane ram

Removing

13. Remove the pipes from the i.g.v. ram at the gland housing face joints. Release the spring coupling from the split trunnion attaching it to the i.g.v. operating lever. Remove the ram retaining nuts or setscrews and withdraw the ram, with its locating dowels, from the engine. Inhibit the unit (para. 2).

Replacing

14. Replacing is the reverse of removing. Ensure that all joint faces are clean, and flush out pipes with clean kerosine before fitting. Do not, at this stage, fit the i.g.v. operating lever.

15. After fitting, check by hand that ram piston travel is limited only by its front and rear internal stops then, with the ram fully extended, measure the clearance between the flat of the i.g.v. operating lever and the adjacent datum point on the lever bearing housing (fig. 3). The clearance should be 0·150 in. If necessary, adjust by unscrewing the locknut between the ram piston rod and the spring coupling and turning the large front nut in the required direction. When adjusting is complete, with the i.g.v. operating lever fitted, fully tighten the locknut.

16. Lock the locknut by bending all four locking tabs against the nut, using pliers. Do not bend the locking tabs with a drift, because shock loading may loosen the nut.

17. Bleed the fuel system (Chap. 6) and check the ram and intake guide vanes for full and free movement.

Serviceability check

18. Ground run the engine; check for leaks at the disturbed joints and check ram operation (Vol. 1, Part 2, Sect. 2, Chap. 2).

Adjusting

19. To adjust the i.g.v. ram setting, slacken the adjuster (fig. 3) locknut and turn the adjuster clockwise to increase the rev/min at which the ram operates, and vice versa. Tighten the locknut each time the adjuster is turned.

Governor pump

Removing

20. Unscrew the setscrews securing the bulk head panel next to the pump (fig. 4) and remove the panel.

21. Disconnect the three pipes from the pump; the rigid pipes are best disconnected at their elbow connections to the unit.

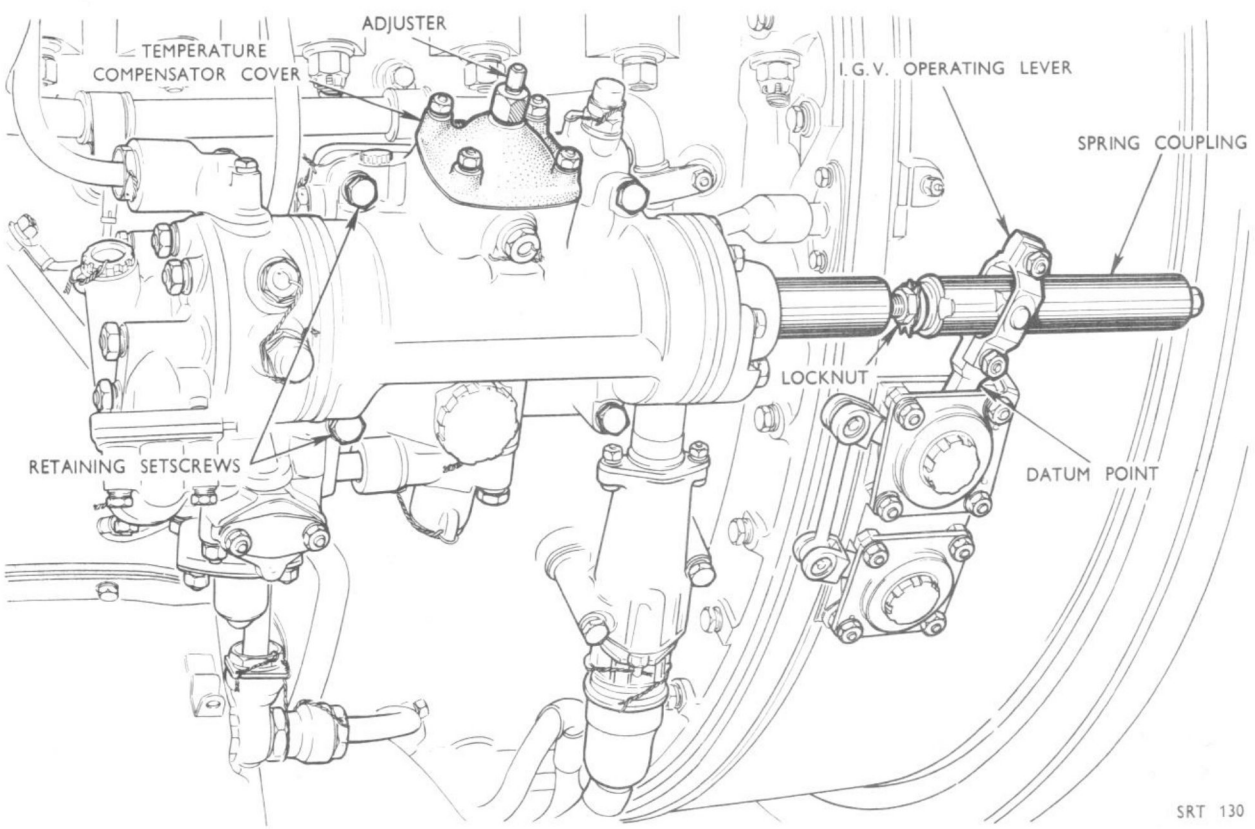

Fig. 3 Intake guide vane ram

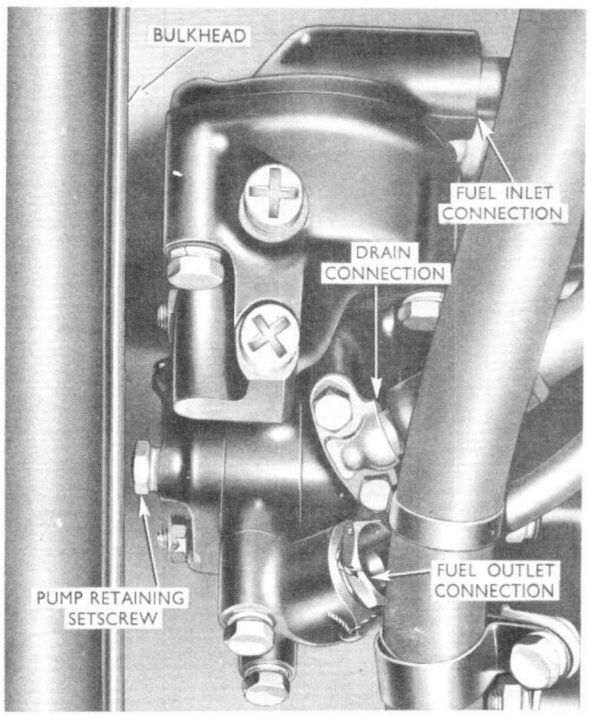

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Fig. 4 Governor pump

22. Unscrew the governor pump retaining setcrews, then withdraw and remove the pump rearward, to disengage the captive quill drive shaft. Inhibit the unit (para. 2).

Replacing

23. Replacing is the reverse of removing. Renew the jointing between the pump and wheelcase and torque load the retaining setscrews to 75 lbf in. If there is insufficient room to apply a torque wrench, use a set-spanner $4\frac{1}{2}$ in. long.

Serviceability check

24. Bleed the fuel system (Chap. 6). Ground run the engine; check for leaks at the disturbed joints, and check the operation of the intake guide vane ram (Vol. 1, Part 2, Sect. 2, Chap. 2).

Air dipping unit (Mk. 121 and 122)

Removing

25. Unscrew the electrical connection and remove the three pipes at their seal housing joints (fig. 5); disconnect the rigid pipes at their

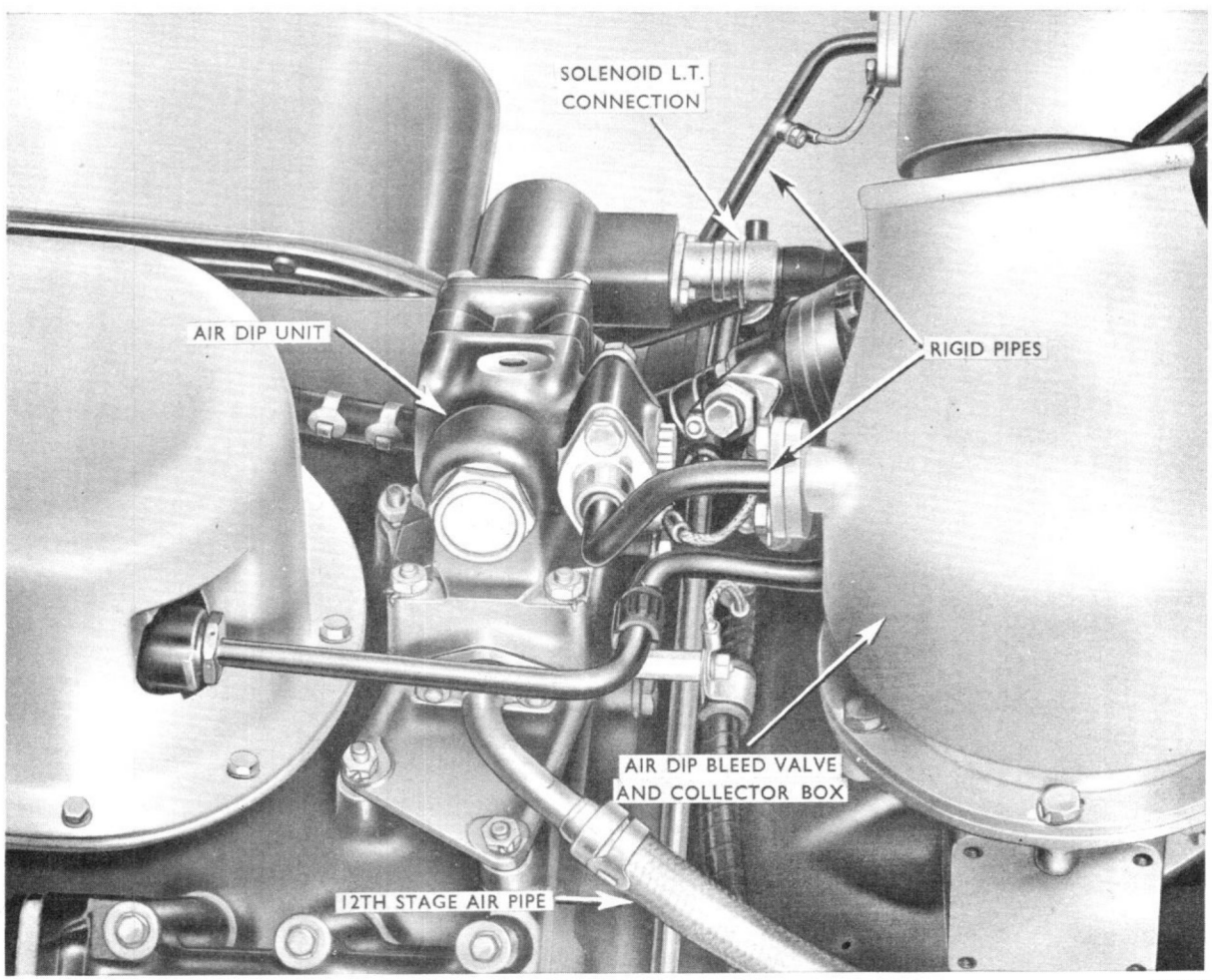

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Fig. 5 Air dipping unit

opposite ends. Unscrew the retaining nuts and remove the unit.

26. Do not inhibit this unit, but store it under dry conditions.

Replacing

27. Replacing is the reverse of removing. When applying jointing compound to the joint faces of the unit and the 12-stage air supply, take care that jointing does not enter the air passages otherwise operation of the unit may be affected.

Serviceability check

28. Ground run the engine and check operation of the air dipping unit (Vol. 1, Part 2, Sect. 2, Chap. 2).

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