Chapter 4

FLOW DISTRIBUTOR, TYPE FD.31/35U

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LIST OF ILLUSTRATIONS

Introduction

1. The flow distributor meters the fuel evenly to the burners under all conditions. Designed for use with Duplex 3 burners, it operates as a splitter or pressurizing valve and corrects recovery pressure variations. All main flow passages are separate, the primary flow being tapped off the inlet supply.

2. The unit incorporates an automatic dump valve to drain the fuel from the burners and manifolds when the engine is stopped. In view of this it is desirable to mount the unit as low as possible on the engine. The unit illustrated is designated FD.31/35U; FD.31 being the basic type, 35 the installation code and U the calibration code.

Description

3. The unit comprises three attaching bodies in which are housed a spring-loaded metering plunger and a cemented carbon bush operating in a cylindrical sleeve. The extremity at the fuel inlet end of the plunger is chamfered to form a metering edge.

4. Eight tapered metering slots in the wall of the sleeve are uncovered progressively by the metering edge as the plunger moves under the influence of fuel pressure. The metering slots terminate in drillings through the wall of the sleeve and communicate with ducts which transfer fuel to delivery ports connected to the burner supply lines.

5. Each slot, therefore, supplies an individual burner with a metered flow of fuel and, if desired, differentiation in flow can be supplied to suit special requirements of certain burner positions; such differentiation is obtained either by calibrating the appropriate metering slots during manufacture or by fitting specially calibrated unions to the distributor outlet ports.

6. To prevent hydraulicing of the plunger, a pressure-balance drilling in the body permits inlet fuel to enter the spring housing chamber, this being shown diagrammatically as a hole in the plunger.

7. An adjustment screw in the end of the housing is set during calibration to proportion the fuel flow relative to fuel pressure.

8. Primary fuel to the burners is controlled by a spring-loaded piston operating in a sleeve situated in the spring housing end of the distributor. The piston head is of differential area and is subjected to fuel inlet pressure whereby the valve is opened to permit fuel to the primary side of the burners. The

assembly functions also as a dump valve in which the spring closes the valve when the engine is stopped and so allows fuel to drain from the burners and manifolds.

Operation

9. When the engine is started, fuel pressure acts upon the smaller area of the dump valve piston to overcome the spring loading. The valve partially opens to admit fuel to the extra area of the piston whereupon the valve snaps fully open; the outlet to the dump drain is now sealed off and primary fuel passes to the burners.

10. As the inlet pressure to the distributor commences to increase, the metering plunger moves to uncover a portion of the metering slots. At these relative low flows the pressure-drop across the slots is sufficient to overcome all other effects, thus equalizing the flow to each burner. Increasing inlet pressure will move the plunger further up the sleeve until the slots become fully uncovered; the pressure-drop across the slots is then less

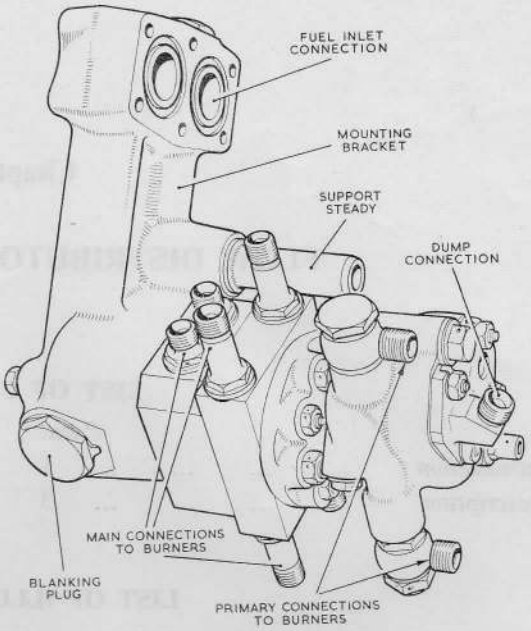

Fig. 1. Exterior view

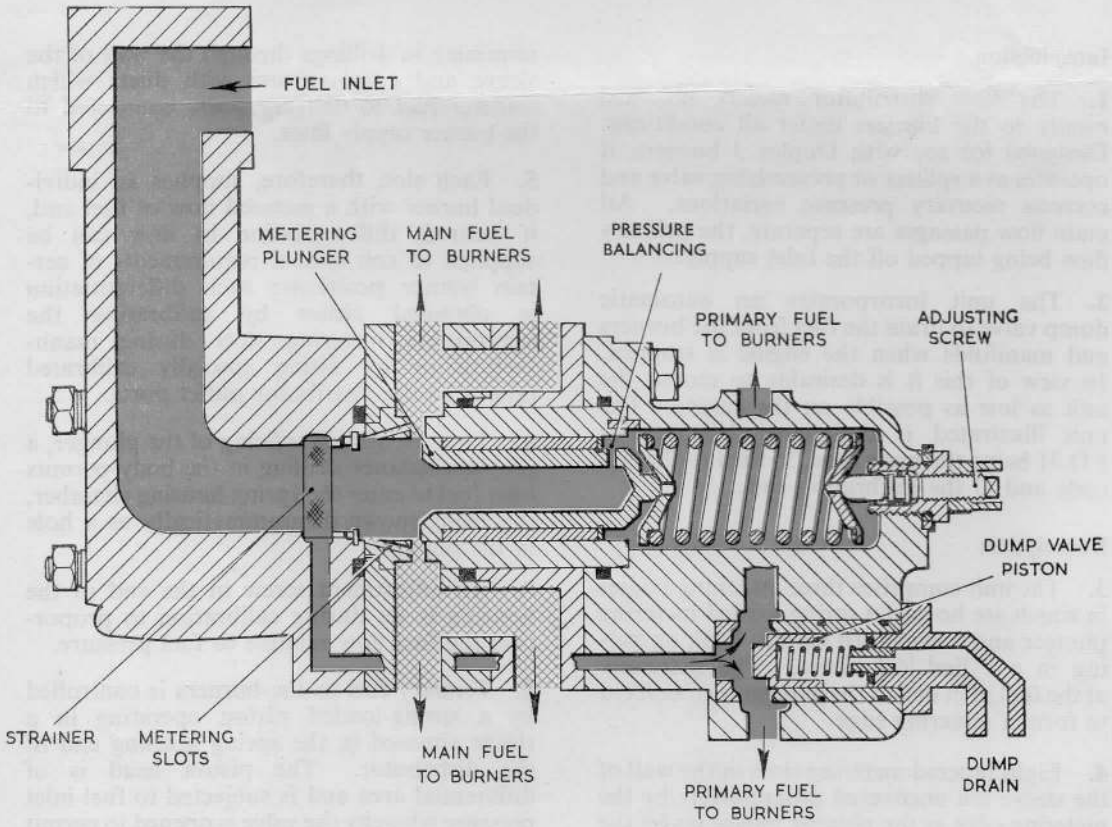

Fig. 2. Functional diagram

and the equalization of flow is dependent upon the accuracy with which the burner sets are matched.

11. When the engine is stopped, the reverse action takes place until finally the dump valve spring closes the piston and in this position passage is afforded at the back of the piston for fuel to flow from the burners and manifolds to the dump drain.

Installing and servicing

12. The unit is attached to the engine by way of the mounting bracket which also serves as the fuel inlet connection. Detailed instructions are contained in the relevant engine Air Publication.

13. No servicing is necessary except for the inspection of the connections and mounting attachment. When fuel connections are disturbed, the complete fuel system should be bled and primed to expel all air.

14. The unit must be inhibited as detailed in A.P.4471A.

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