

## Chapter 3

### BURNERS, DUPLEX 2, Types CSH 37, 39, 67 and 71

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#### Introduction

1. The Duplex burner has a fixed orifice and employs a common inlet for the primary and main fuel supply. A spring-loaded relief valve is incorporated in the burner assembly and is set to allow fuel through the primary

flow ports only, until the pressure in the system exceeds a predetermined figure, when the valve opens to allow fuel to pass through the main port. The type number CSH 71 is derived from Continuous Spray

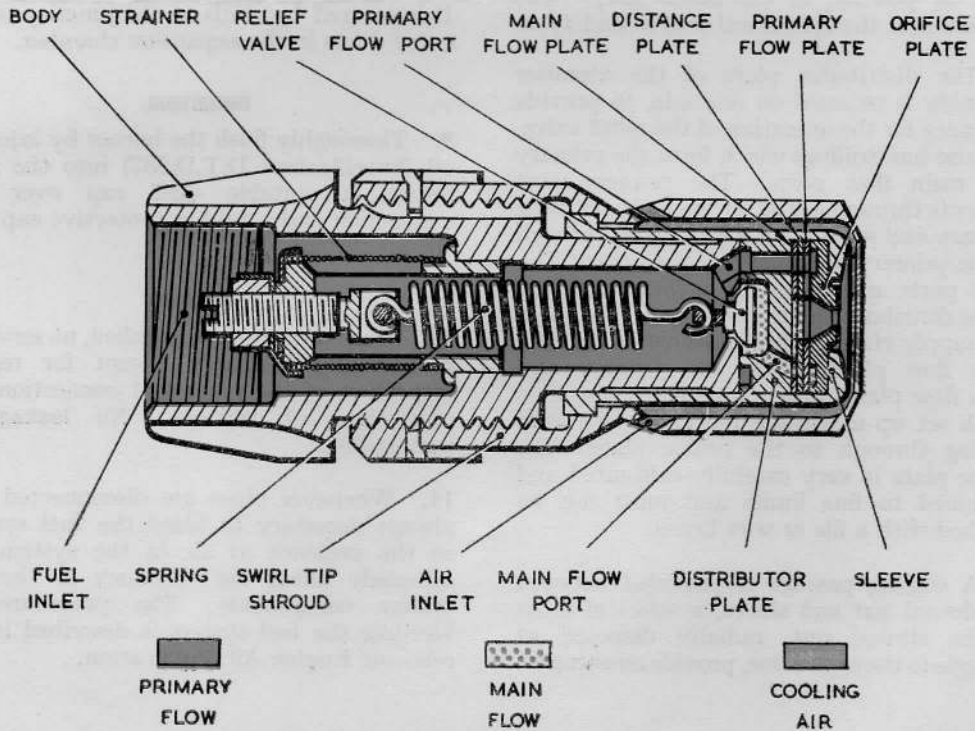


Fig. 1. Burner, Duplex 2, type CSH71

Holder of a type known as 71. All these burners are identical in construction and operation, the only differences being that CSH 37 has a nickel plated sleeve, later types have been subjected to a de-embrittlement process during manufacture and type CSH 67 in addition has anti-carbon slots in the shroud. CSH 71 is identical to CSH 67 but has a plain shroud and sleeve.

#### DESCRIPTION (fig. 1)

2. The burner comprises the body into which is assembled the spring-loaded relief valve and the strainer. The atomiser assembly, consisting of the distributor plate, main flow plate, distance plate, primary flow plate and orifice plate, is located at the forward end of the body and is retained in position by the sleeve and shroud nut. Correct alignment of the individual atomiser components is ensured by two dowel pins which locate at their extremities with holes in both the distributor plate and orifice plate.

3. The forward end of the body has an axial hole in which is accommodated the relief valve, this is retained in position by a spring attached at the rear end to an adjusting bolt. This bolt is carried in, and retains, the strainer body in position in the main body. The strainer is of the cylindrical wire wound type.

4. The distributor plate of the atomiser assembly is recessed on one side, to provide clearance for the operation of the relief valve, and also has drillings which form the primary and main flow ports. The primary port connects through a duct in the body with the primary fuel supply on one side and through to the primary flow plate on the other. The main ports are formed by inclined drillings in the distributor plate and connect the main fuel supply via the relief valve recess with the main flow plate. Both the primary and main flow plates have tangentially cut slots which set up a swirling motion to the fluid passing through to the orifice plate. The orifice plate is very carefully calibrated and machined to fine limits and must not be touched with a file or wire brush.

5. A cooling passage is provided between the shroud nut and sleeve, a series of holes in the shroud nut, radially disposed at an angle to the centre line, provide an entrance

for air which is directed across the burner orifice by the formed end of the shroud nut.

6. The body is screwed at the rear end for attachment to the burner mounting.

#### OPERATION

7. The fuel, at low delivery pressure, enters the burner assembly through the strainer and passes via the primary flow port in the distributor plate, to the primary flow plate where the swirling motion is set up by the tangentially cut entry slots so that a fine, easily ignitable, spray is emitted from the orifice plate. As the pump delivery increases to meet rising engine requirements, a pressure is built up in the body of the burner until it is sufficient to overcome the spring loading of the relief valve. The increased flow of fuel is then admitted through the main flow port, to the main flow plate which imparts the swirling motion so that a combination of main and primary flows now feed the spray.

#### INSTALLATION

8. The burner assembly, comprising the holder and atomizer details, is screwed to the mounting flange and feed pipe of the engine and is inserted into the combustion chamber. It is secured by studs at the junction of the entry ducts in the expansion chamber.

#### INHIBITING

9. Thoroughly flush the burner by injecting oil (Specification D.T.D.587) into the inlet. Secure a suitable dust cap over this connection and a rubber protective cap over the air shroud.

#### SERVICING

10. Once the burner is installed, no servicing is normally necessary except for regular inspection of the pipes and connections for any signs of leakage. No leakage is permissible.

11. Whenever pipes are disconnected it is always necessary to bleed the fuel system, as the presence of air in the system will adversely affect the efficiency of the fuel system components. The procedure for bleeding the fuel system is described in the relevant Engine Air Publication.

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