

Chapter I

BURNER, SIMPLEX, TYPE CSH9 SERIES

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Introduction

1. The simplex burner, type C.S.H.9, described in this chapter, is of the fixed orifice type and provides a conical spray giving atomisation over the working flow range. The burner comprises a holder assembly and an atomiser with a fixed orifice. The size of the fixed orifice, which may be varied according to different engine requirements, is denoted by suffix letters and numbers. For example, the C.S.H.9/F.A.19 type burner, which is fitted to Derwent Mk. 5 engines, derives its designation from the type of holder, viz., C.S.H.9 and the size of the orifice in the fixed atomiser, viz., F.A.19. For information regarding the type of burner fitted to any particular engine, reference should be made to the relevant engine Air Publication.

DESCRIPTION

General

2. The cylindrical atomiser, which forms the essential part of the burner, has a conical swirl chamber with tangential inlet holes in its side walls and an outlet orifice of closely controlled size at the apex of the cone.
3. The atomiser has a flange by which it is retained between the adapter face of the burner holder and sleeve by an air shroud which is screwed on to the threaded burner adapter and locked with nut and washer.
4. The adapter of the burner holder is connected to the flanged mounting plate by a steel pipe. The mounting plate has an inlet passage incorporating a gauze filter and a union to which the fuel inlet pipe is secured.

5. Fig. 1 shows a typical C.S.H.9 burner, together with a sectioned view of the atomiser assembly.

Atomiser (fig. 1)

6. The atomiser (1), which is of high carbon steel, is cylindrical in shape and has a flange which locates it in the burner adapter and sleeve. Three tangential holes (4) in the walls of the atomiser body serve as inlet holes into the inside of the atomiser body which forms a conical swirl chamber (2) with an outlet orifice (3) of closely controlled size at its apex. The end of the atomiser remote from the orifice is sealed by a blanking plug (10)

Burner assembly

7. The burner assembly comprises the burner mounting plate (11) and burner adapter (5) which are brazed to either end of a steel pipe (14).
8. The burner mounting plate (11) which is of high carbon steel, forms a triangular cover with an inlet passage in which is housed a cylindrical filter (9) of brass gauze. This filter is retained by a helical spring (12) interposed between its end cap and a steel union (13), which is screwed into the inlet connection. The fuel inlet pipe from the manifold is connected to the inlet union.
9. The burner mounting plate has three drilled bosses by means of which the unit is located on the engine.
10. A connecting pipe (14) of steel is brazed at one end to the inlet housing of the mounting plate and at the other to the steel adapter (5).

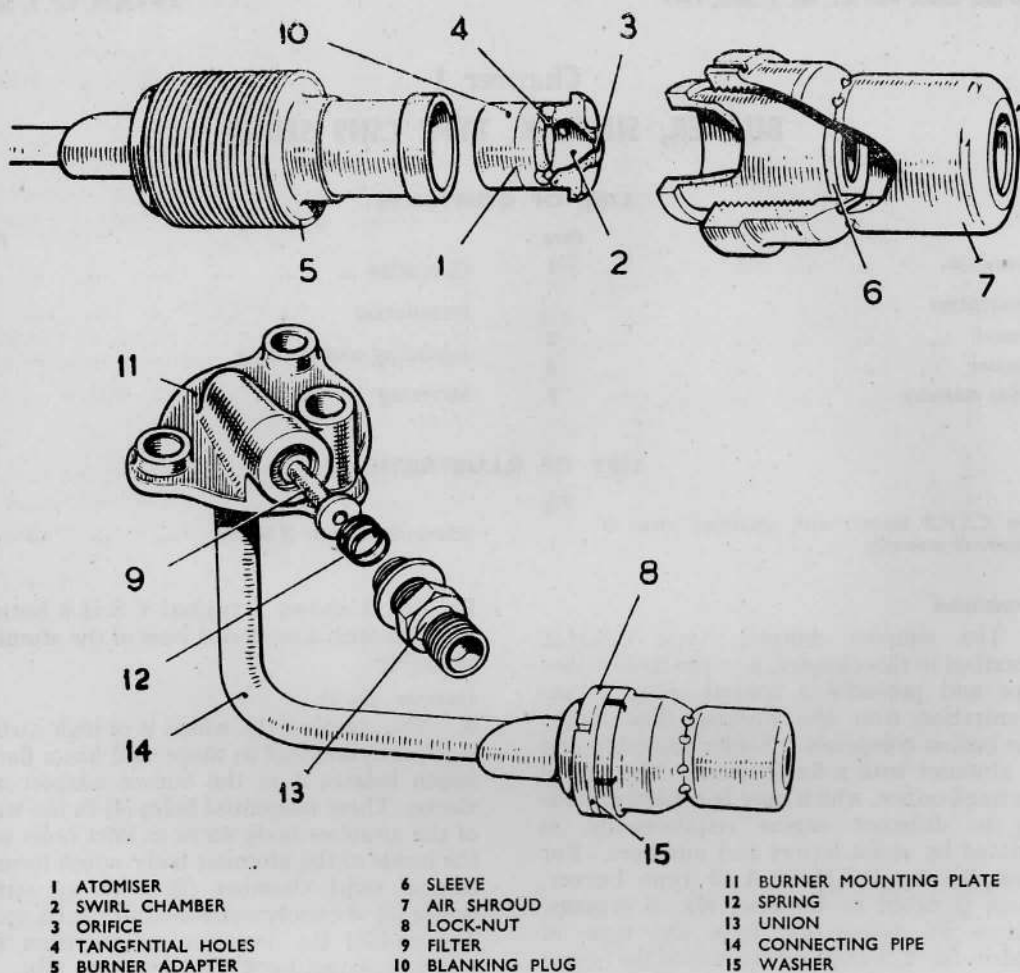


Fig. 1. Type C.S.H.9 burner with sectioned view of atomiser assembly

11. The hollow adapter, which houses the atomiser, has a machined face on its underside upon which the flange of the atomiser seats. The atomiser is secured in the adapter by a dome-shaped steel sleeve (6) having an outlet hole in alignment with the atomiser orifice. The sleeve locates the atomiser with the face of the adapter, and the assembly is secured by an air shroud (7) which is tightened on to the threaded body of the adapter and locked by a lock-nut (8) and washer (15).

12. The air shroud has a series of holes around its circumference which allow air to flow between the sleeve and the shroud and out through the clearance space between the shroud and sleeve flanges. This air flow is directed on to the orifice face and serves to minimise the formation of carbon on the sleeve and orifice.

OPERATION

13. As shown in fig. 2, fuel from the manifold enters the burner assembly and passes through the filter (9) and along the connecting pipe (14) to the space around the atomiser (1). The fuel enters the conical swirl chamber (2) of the atomiser via the tangential inlet holes (4). The angle of these holes causes the fuel to rotate towards the orifice (3) and results in the fuel passing into the combustion chamber in the form of a finely atomised conical spray.

INSTALLATION

14. On the Derwent Mk. 5 engine, each burner is secured to the expansion chamber of its combustion chamber by three $\frac{1}{4}$ in. set-screws in the mounting flange, and removal entails the separation of the expansion chamber from the air casing after the removal of the complete combustion chamber from the engine.

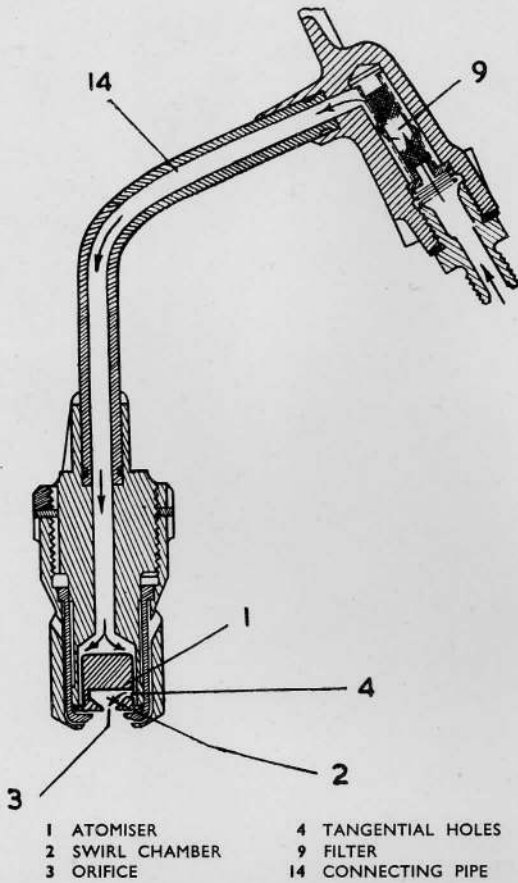


Fig. 2. Schematic diagram of burner

15. The inlet union on the mounting flange of each burner is connected to the burner manifold by a flexible pipe.

INHIBITING AND PACKING

16. The procedure for inhibiting and packing is described in Volume 2, Part 3, Section 7, Chapter 1, para. 49 and 52.

SERVICING

17. Once the burner is installed no servicing is normally necessary except for inspection of pipes and connections for leakage. No leakage is permissible.

18. Whenever pipes are disconnected for attention to leaks 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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