Chapter 1

CENTRIFUGAL GOVERNORS, TYPE CFG.2 SERIES

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Introduction

1. The centrifugal governor is employed to control the stroke of the fuel pump and thereby its delivery, thus preventing the engine from exceeding its maximum speed. The unit may be used as a simple overspeed governor in systems employing a variable delivery but in which an ungoverned fuel pump is driven at constant speed. The installation detail and calibration of the unit, which may vary according to differing engine requirements are denoted by type symbols in the form of suffix letters and numbers. For example the CFG 2/2A unit is derived from a basic Centrifugal Governor type 2, 2A being the installation and calibration codes respectively.

2. Where two or more independent turbine shafts are fitted on an engine a governor type pump is driven from one shaft and the maximum speed of the other shafts is controlled separately by means of centrifugal governor units driven from the shafts concerned. They are then connected into the servo system of the fuel pump(s), to decrease the fuel supply pressure to the engine when the maximum speeds for the shafts have been reached. If these separate turbine shafts are linked hydraulically, there can still be a variation of speed, during acceleration or deceleration and it is therefore desirable to govern the maximum speed of each shaft separately.

Description

3. The unit consists of two housings the larger of which contains the rotor (1), which is driven by suitable gearing from the engine through a splined shaft (16) at speeds between 6400 and 7000 r.p.m., and a rocker lever type half-ball valve (12) which controls an orifice (13) leading to the underside of the fuel pump stroke control piston (pump servo 14). The rocker lever is balanced by a spring assembly (10) against a diaphragm (6) which is loaded by a spring and housed in the other casting. The tension of the spring and hence the movement of the diaphragm tappet is adjusted by the screw (9) in the top of the housing.

4. Fuel at delivery pressure is led to the upper side of the diaphragm by way of a restricted bore make-up valve (4), or by a high pressure leakage, from say, the throttle valve, so that the governor chamber is always fully primed and free of air. A bleed valve is included at point (3) to prime the upper side of the diaphragm.

Operation

5. Fuel enters the main inlet (5) and passes via a drilling to the centre of the body casting. This is open to the central bore in the rotor shaft and the fuel is forced under centrifugal pressure through radial passages (2) in the rotor to its periphery where drillings connect with the governor chamber (8) at the upper side of the diaphragm. At a predetermined speed the centrifugal force acting through the fuel on the upper side of the diaphragm is sufficient to move the rocker lever (11) against the spring assembly (10) so that the half ball orifice is opened.

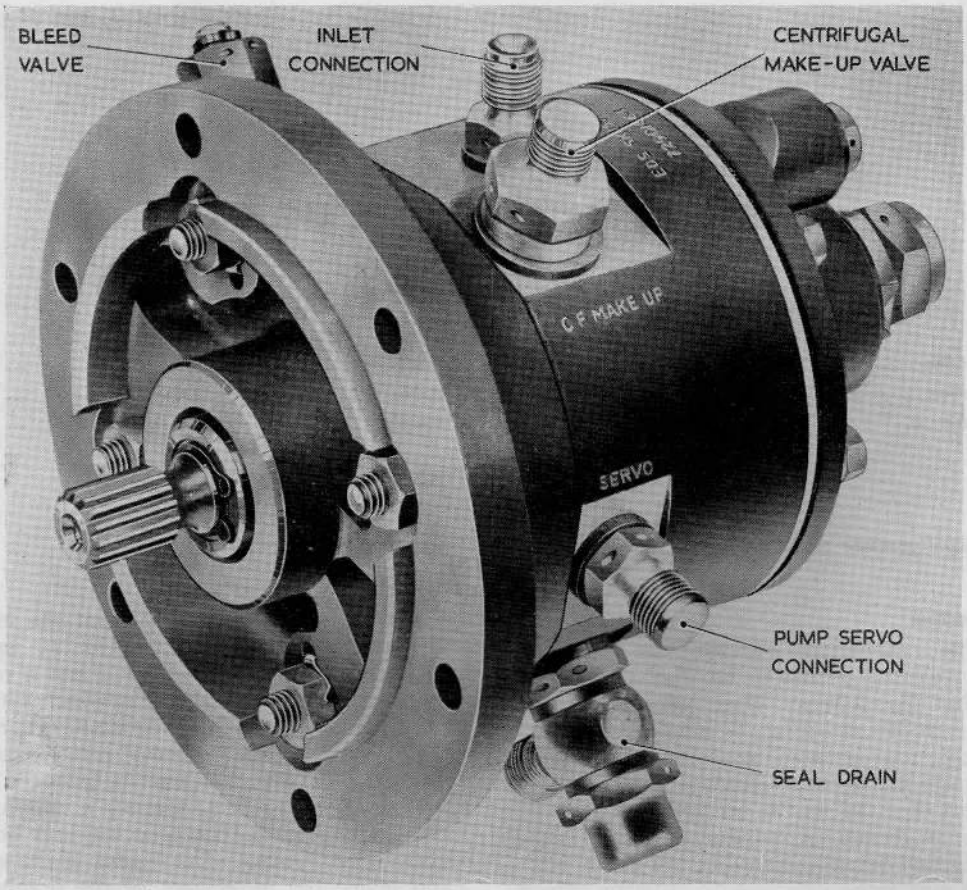

Fig. 1. Centrifugal governor, type CFG.2

This produces a reduction of pressure on the underside of the pump stroke control piston, resulting in a diminution of pump delivery.

6. When the throttle is closed thus reducing the fuel supply to the burners, the centrifugal force of the governor (proportional to the square of the rotor, and therefore the engine speed) acting on the diaphragm is diminished until contact with the rocker lever is broken. The spring assembly now moves the rocker lever to close the half-ball valve so that pressure on the underside of the pump stroke control piston is restored and the piston moves to increase the stroke and delivery of the pump.

Installation

7. A standard mounting flange with six 0·281 in. diameter holes is provided for mounting the unit to the engine. Connections are provided for a main fuel inlet $\frac{1}{8}$ in. B.S.P., a connection to the pump servo connection $\frac{1}{8}$ in. B.S.P. with an alternative position sealed by a $\frac{1}{8}$ in B.S.P. plug, a $\frac{1}{4}/\frac{1}{8}$ in. B.S.P. make-up valve connection, a banjo seal drain connection $\frac{1}{8}$ in. B.S.P. and an air vent connection. Bleeding is effected through a special bleed plug which primes the governor chamber at the inlet side.

Inhibiting

8. The unit must be inhibited with inhibiting oil (O.M.11). Dust caps must be fitted over all connection unions and a protection cover and gasket is to be bolted to the spigot face of the unit using 2 BA nuts, bolts and washers.

Servicing

9. Normally no servicing is required apart from a periodic check of pipe joints and connections for leakage. In the event of leakage, examine sealing washers and pipes for damage and replace them if necessary.

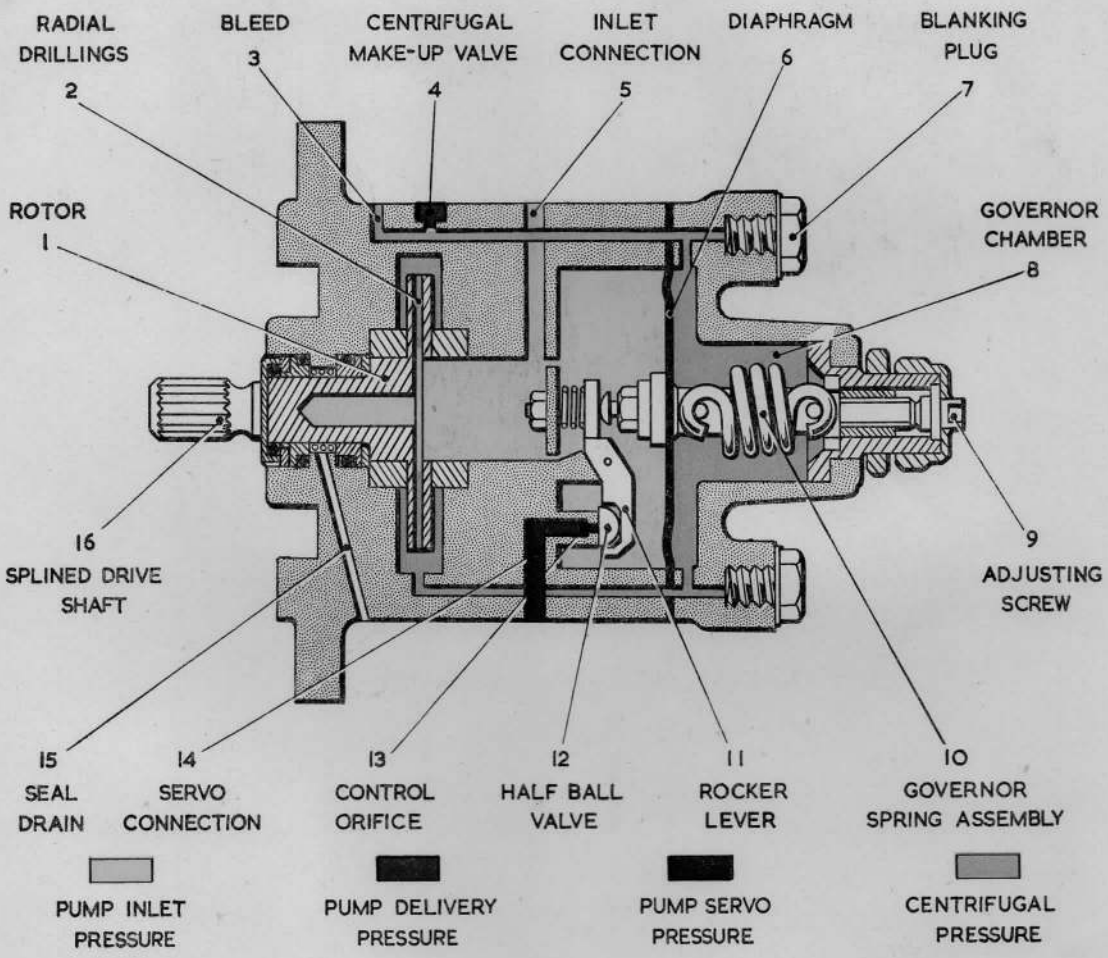

Fig. 2. Functional diagram

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