BRISTOL SIDDELEY

AERO ENGINE SCHOOL

SECTION 13

13.1 AIRCRAFT FUEL SYSTEM

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The tanks are located five in each wing and four in the fuselage. They are arranged symetrically about the aircraft centre line and are numbered one to seven on each side.

The seven tanks on each side of the aircraft are divided into engine groups comprising tanks 1, 4, 5 and 7 to the outboard and tanks 2, 3 and 6 to the inboard engines.

A cross-feed cock is provided between each group and between port and starboard side of the aircraft. Thus any one tank can feed any engine in an emergency.

Due to the shape of the aircraft the fuel tanks are dispersed forward and aft of the aircraft centre of gravity, it is therefore important that fuel balance is maintained through a flight. This is provided for by the incorporation of two sequence timers, by use of which a small quantity of fuel is pumped from each tank in turn. The quantity of fuel pumped from each tank during one cycle of the sequence timers is proportioned to the tank capacity, and thus the fuel centre of gravity is kept constant. A sequence timer consists of seven pairs of contacts operated by seven irregularly profiled cams, mounted on a shaft which is rotated at a constant speed by an electric motor. Four of the cams control the tank pump motors of No.1 engine group whilst the remaining three cams control the motors of No.2 engine tank group. Each cam is profiled so that the contacts break for a part of each revolution of the cam shaft and make for the remaining part. The motor wiring is connected so that when the contacts are broken the motor runs at full speed, and a reduced speed when the contacts are made. The two groups of cams are arranged on the shaft so that for each revolution of the cam shaft each pair of contacts break for a set period, thus only one tank pump motor in each group will be running at full speed at any particular time ...

particular time.

The controls for the fuel system are arranged on a console located between the 1st and 2nd pilots seats, and are grouped to represent a plan view of the aircraft fuel system. All fuel tanks and pipe-lines are shown diagrammatically in contrasting colours to distinguish the various tank groups. The colour code is as follows :-

Broken White Line (No.2 engine tank group - port side
Broken White Line (No.3 " " " Starboard side

Solid Yellow Line (No.1 " " " port side
Solid Yellow Line (No.4 " " " Starboard side

Blue - Transfer - Fuel trim No.1 to No.7 tank on each side.

Tank Pump Switches and Tank Content Switches

Positioned in the diagrammatical representation of each fuel tank are two switches, one press button switch for selecting a fuel contents reading for the tank concerned and one ON/OFF toggle switch controlling the pump motor of the same tank.

Rate of Flow Switches

The four press button switches operate a fuel flow indicator, situated on the 2nd pilots' instrument panel, which indicates the rate of fuel flow in lbs/hr for each particular engine.

Cross Feed Switches and Indicators

Three two position toggle switches with magnetic indicator are positioned on the console between the rate of flow selector switch. They control and indicate the position of the two engine cross feed cocks, and the single aircraft cross feed cock.

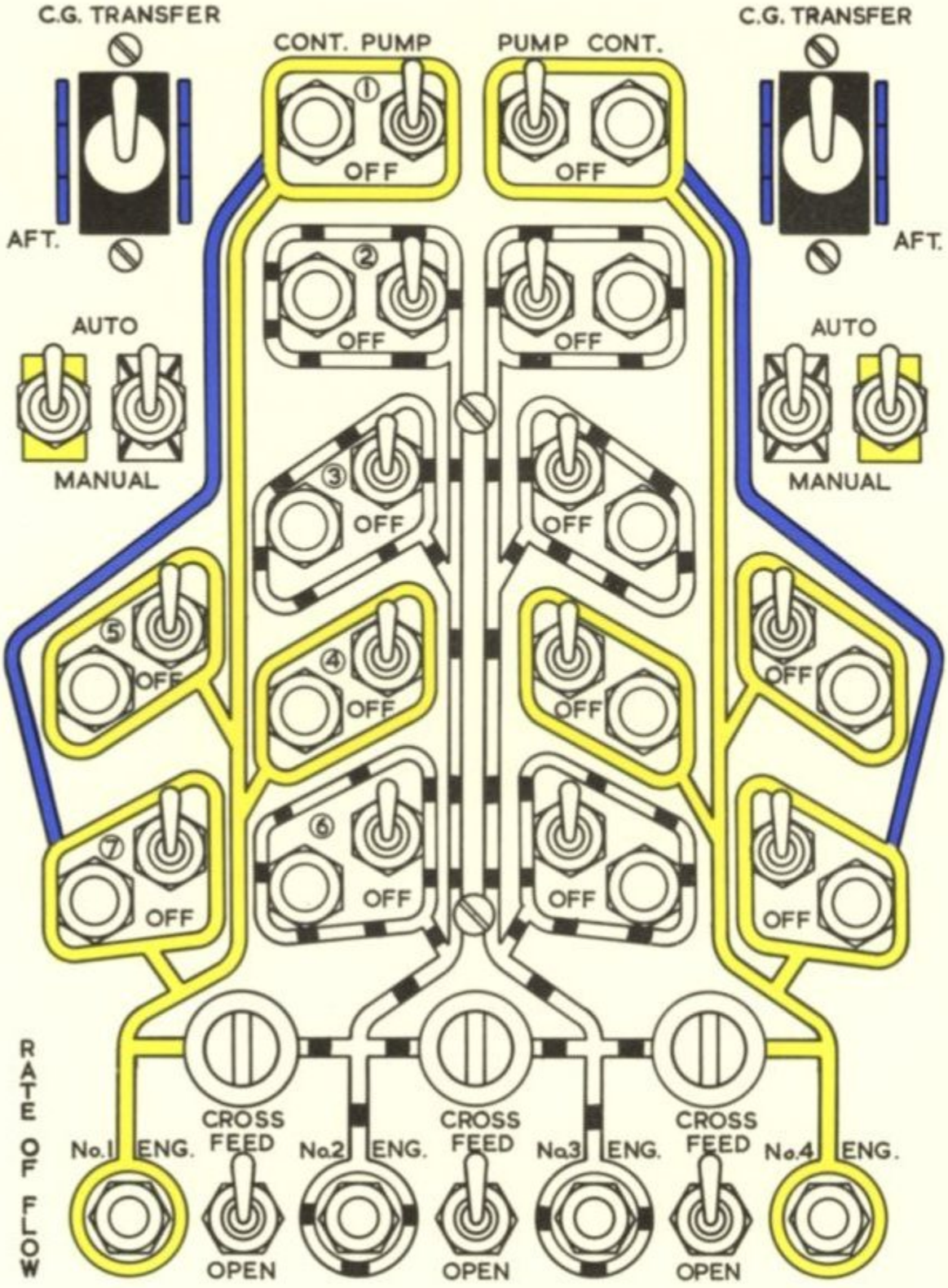
Transfer pump Switches

Two, three positioned, toggle switches, are located one at each corner of the centre console. These switches are spring loaded each way to a central 'OFF' position and control the transfer of fuel from No.1 to No.7 tank or vice versa.

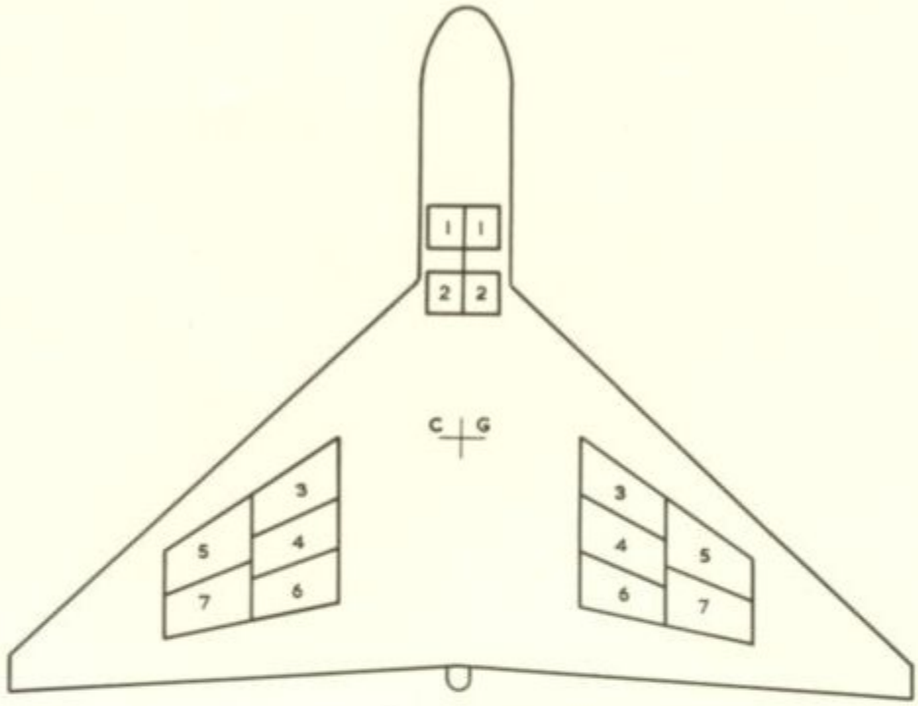
Auto-Manual .....

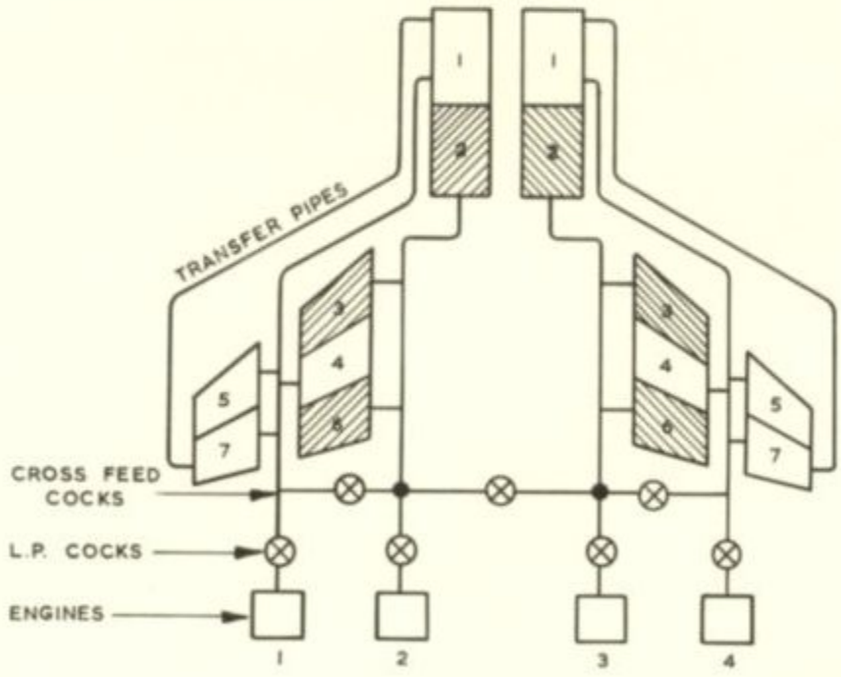
Auto Manual Control Switches

Four, two positioned toggle switches referenced "AUTO-MANUAL" are positioned two on each side of the centre colsole, immediately below the C.G. transfer switches. Each switch selects the manual or automatic control of one Engine tank group. When "MANUAL" control is selected the sequence timer controlling that particular group is interrupted so that any tank pump in that group which is switched "ON" will run at full speed.



AVRO-VULCAN FUEL PANEL





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LAYOUT OF FUEL TANKS.