

# TECHNICAL SERVICE BULLETIN

NO. 3 D 13



December, 1970

SUBJECT:  Soft Engagement Device	MODELS:  Austin America Automatic
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This device was described on Bulletin #3 D 11. The following are schematic diagrams and a description of operation.

1. Engagement of Forward Gear.

Starting in 'N' the driver selects a forward gear, moving the selector valve to feed oil to 'A'. Oil flows through shuttle valves 'B' & 'C' and fills servos 'D' & 'E', thus applying 3rd and reverse gear brake bands and bringing the gearbox rotating parts gently to rest. Simultaneously oil flows to the engagement control valve and onto ball 'F'.

2. At a pre-determined pressure (approx. 60 p.s.i.) the ball is pushed out of its bore and oil flows around the ball to act on valve 'G' which opens port 'H' and closes exhaust port 'J' allowing the forward clutch to be filled. When the clutch is clamped, there is little or no relative movement between driving and driven members and so the engagement is smooth.
- Oil is also fed to pistons 'K' & 'L' which move the shuttle 'B' & 'C' across, connecting ports 'M' to 'N' and 'P' to 'Q', exhausting servos 'D' & 'E' through the selector valve in the valve block and releasing the 3rd and reverse brake bands to complete the operating sequence.
- When 3rd gear is selected oil flows from the selector valve to port 'M', around the shuttle valve 'B' to port 'N' to feed the 3rd gear servo.

### Selection of 'N'.

The driver selects 'N', moving the selector valve to connect port 'A' to exhaust.

As oil pressure drops the engagement control valve spring closes valve 'G' pushing ball 'F' back into its bore, connecting port 'J' to exhaust and evacuating and releasing the forward clutch. Note the effective area of valve 'G' is approximately twice that of ball 'F'. The valve therefore closes when pressure is reduced to approximately half the operating pressure. This is to make the valve less sensitive to momentary drops in oil pressure which may occur.

As the oil pressure on pistons 'K' & 'L' drops, the shuttle valve springs push back shuttle valves 'B' & 'C' to complete the cycle.

### 3. Selection of Reverse.

The driver selects 'R', moving the selector valve to feed oil to 'S'.

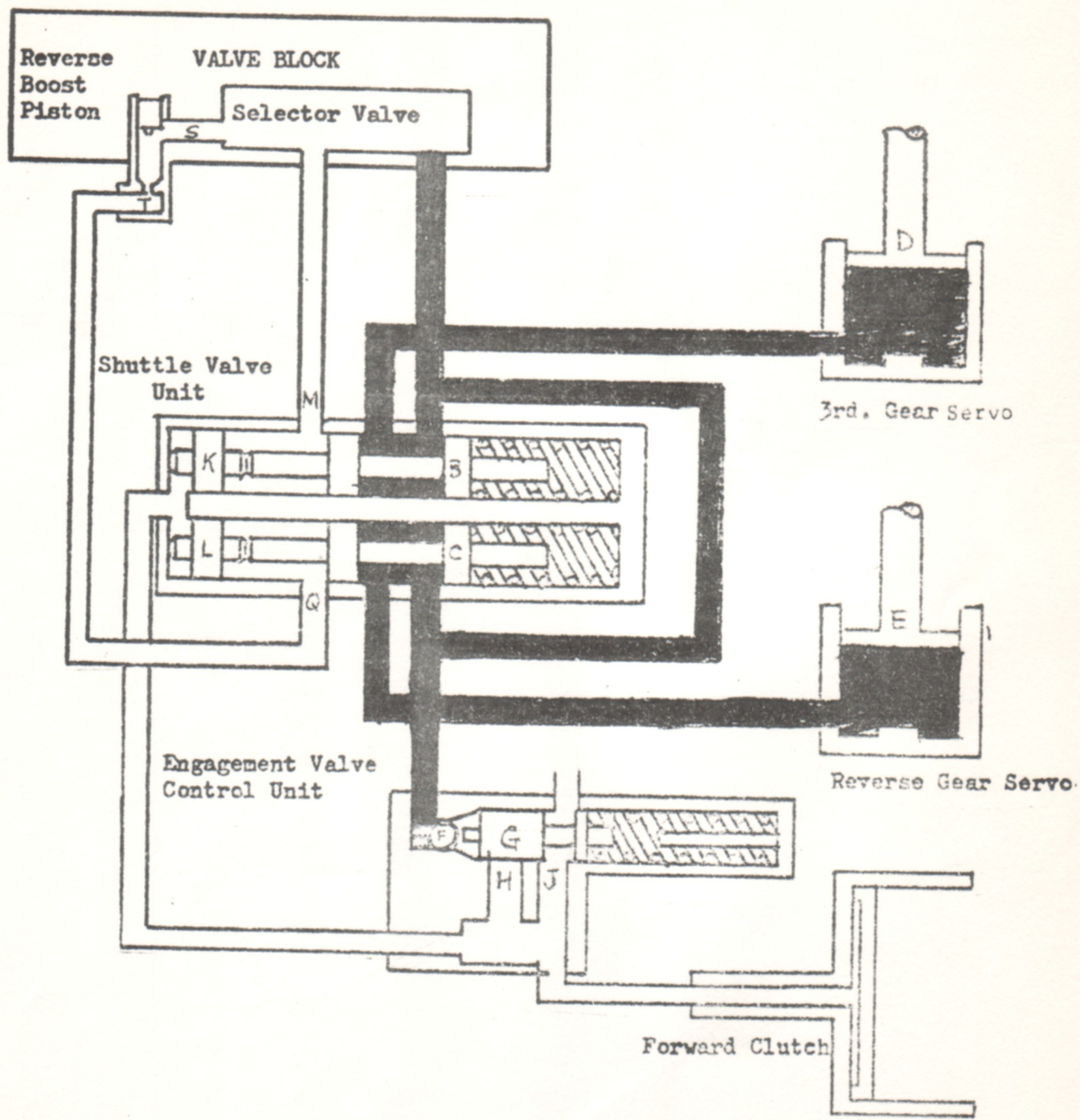
This operates the reverse boost piston and feeds oil through restrictor 'T' to port 'Q'. The restrictor controls the rate of filling of the reverse servo to ensure a soft engagement.

The oil pressure separates piston 'L' & valve 'C' and connects port 'Q' to port 'P' so filling the reverse servo and applying the reverse gear brake band.

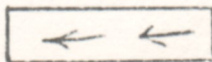
When 'N' is again selected oil is exhausted through ports 'P' & 'Q' to 'S' and out of the selector valve until oil pressure drops sufficiently for the shuttle valve to return and connect port 'P' to port 'U' to allow the oil to exhaust through 'A'.

FORWARD SELECTED

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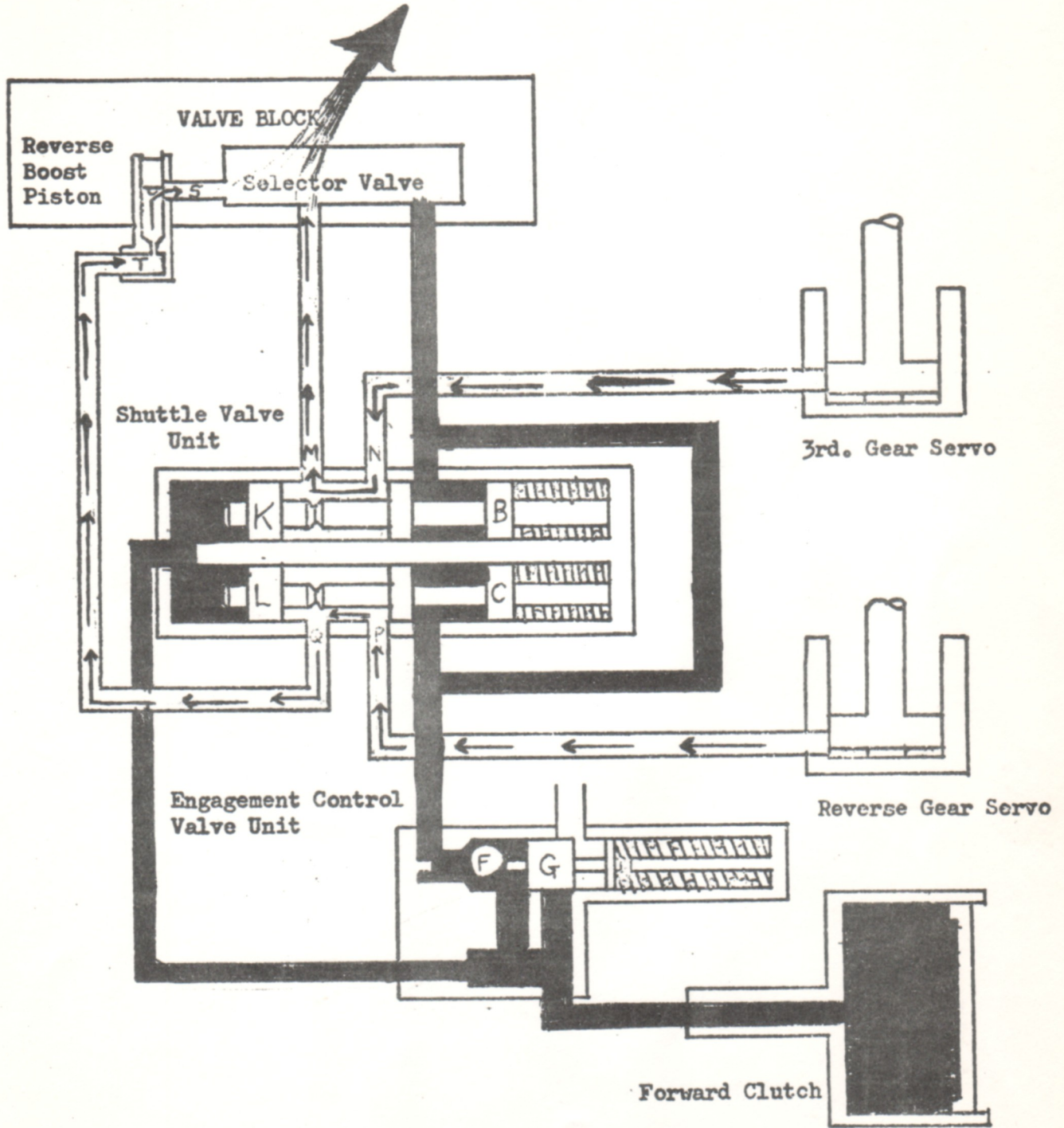


OIL  
PRESSURE



EXHAUST

FORWARD ENGAGED



REVERSE SELECTED

