DANA SPICER CLARK-HURTH

ELECTRIC CONTROL VALVE

SPICER CLARK-HURTH

OFF-HIGHWAY COMPONENTS

DIVISION

4 SPEED TRANSMISSION MODELS:
28000

32000

33000

T40000

HYDRAULIC SCHEMATIC AND OIL FLOW DIAGRAM

SERVICE DEPARTMENT

STATESVILLE, NC USA

FILE: ELEC-CONT-VALVE CS.DOC

6.1.5 The transmission controls (refer to hydraulic diagram)

The transmission is controlled by the control valve. The control valve assembly may be mounted directly on the side of the convertor housing or front transmission cover, or remote mounted and connected to the transmission by means of flexible hoses. The function of the control valve assembly is to direct oil under pressure to the desired directional and speed clutch. A provision is made on certain models to neutralize the transmission when the brakes are applied (inching or declutch). This is accomplished through use of a brake actuated shutoff valve.

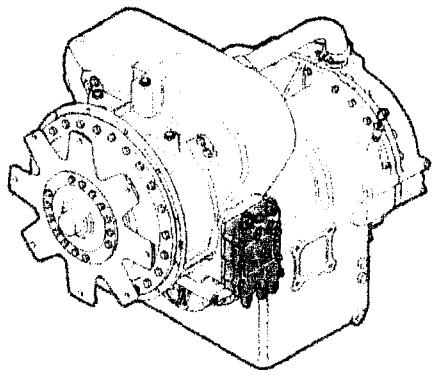
The control valve has 5 solenoids and 5 shift spools. A control valve with optional neutral has an extra spool and solenoid.

Operation of the valve

Forward can be selected by activating the forward solenoid. The forward solenoid will then allow pilot pressure to move the forward shift spool. Due to this movement of the shift spool the forward clutch is fed with oil pressure.

When the reverse solenoid is activated, pilot pressure will move the reverse shift spool.
The reverse clutch will be fed with oil pressure.

The shift spools of forward and reverse are located opposite each other separated by a return spring.
This ensures that only one direction can be selected.



THE TRANSMISSION CONTROLS

Selection of range

If the range solenoids 1st, 2nd and 3rd are activated, regulated pressure is fed through the shift spools to the 1st clutch.

If the range solenoids 2nd and 3rd are activated, regulated pressure is fed through the shift spools to the 2nd clutch.

If the range solenoid 3rd is activated, regulated pressure is fed through the shift spool to the 3rd clutch.

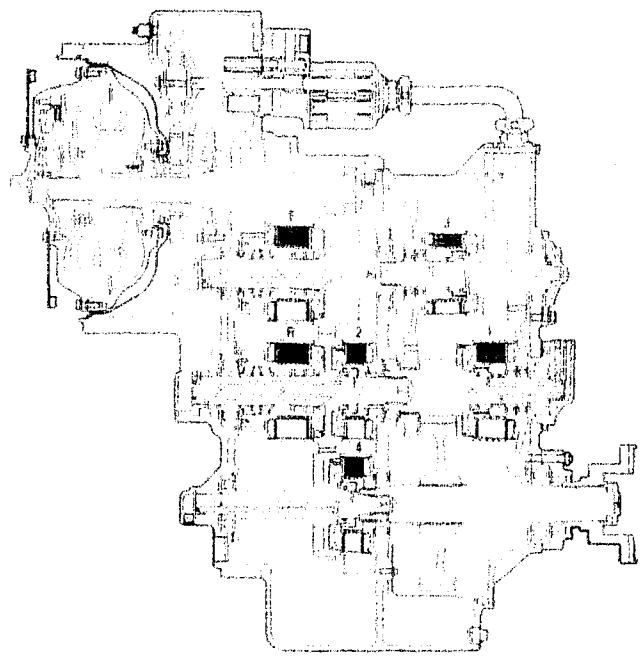
If no range solenoids are activated, the regulated pressure is fed to the 4th clutch.

6.2 ELECTRIC SOLENOID CONTROLS

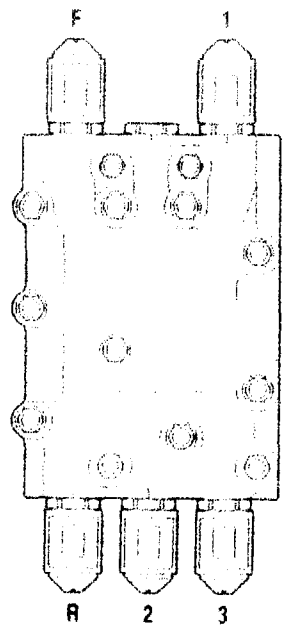
Transmission gear	Activated solenoids	Activated clutches
Forward 4	Forward	Forward 4th
Forward 3	Forward 3rd	Forward 3rd
Forward 2	Forward 2nd / 3rd	Forward 2nd
Forward 1	Forward 1st / 2nd / 3rd	Forward 1st
Neutral 4	—	Neutral 4 th
Neutral 3	3rd	Neutral 3 rd
Neutral 2	2nd / 3rd	Neutral 2 nd
Neutral 1	1st / 2nd / 3rd	Neutral 1 st
Reverse 4	Reverse	Reverse 4 th
Reverse 3	Reverse / 3rd	Reverse 3 rd
Reverse 2	Reverse / 2nd / 3rd	Reverse 2 nd
Reverse 1	Reverse / 1st / 2nd / 3rd	Reverse 1 st

6.3 POWER FLOWS, ACTIVATED SOLENOIDS, SPOOLS AND HYDRAULIC CIRCUIT

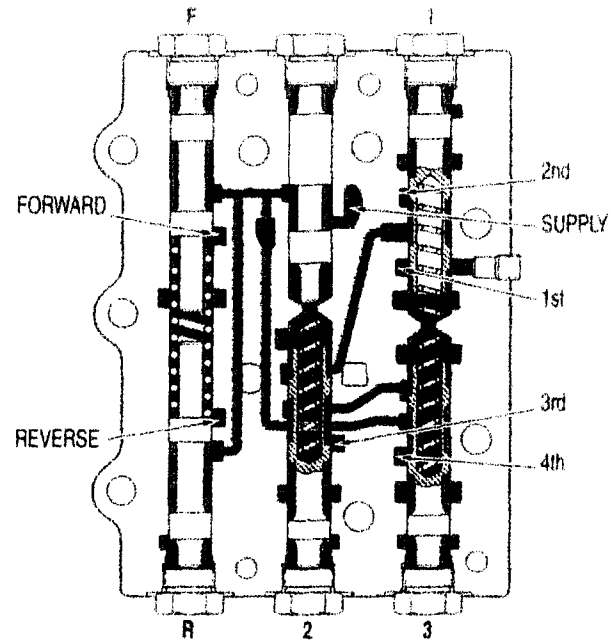
6.3.1 Neutral and 4th clutch engaged



NEUTRAL (POWERFLOW)

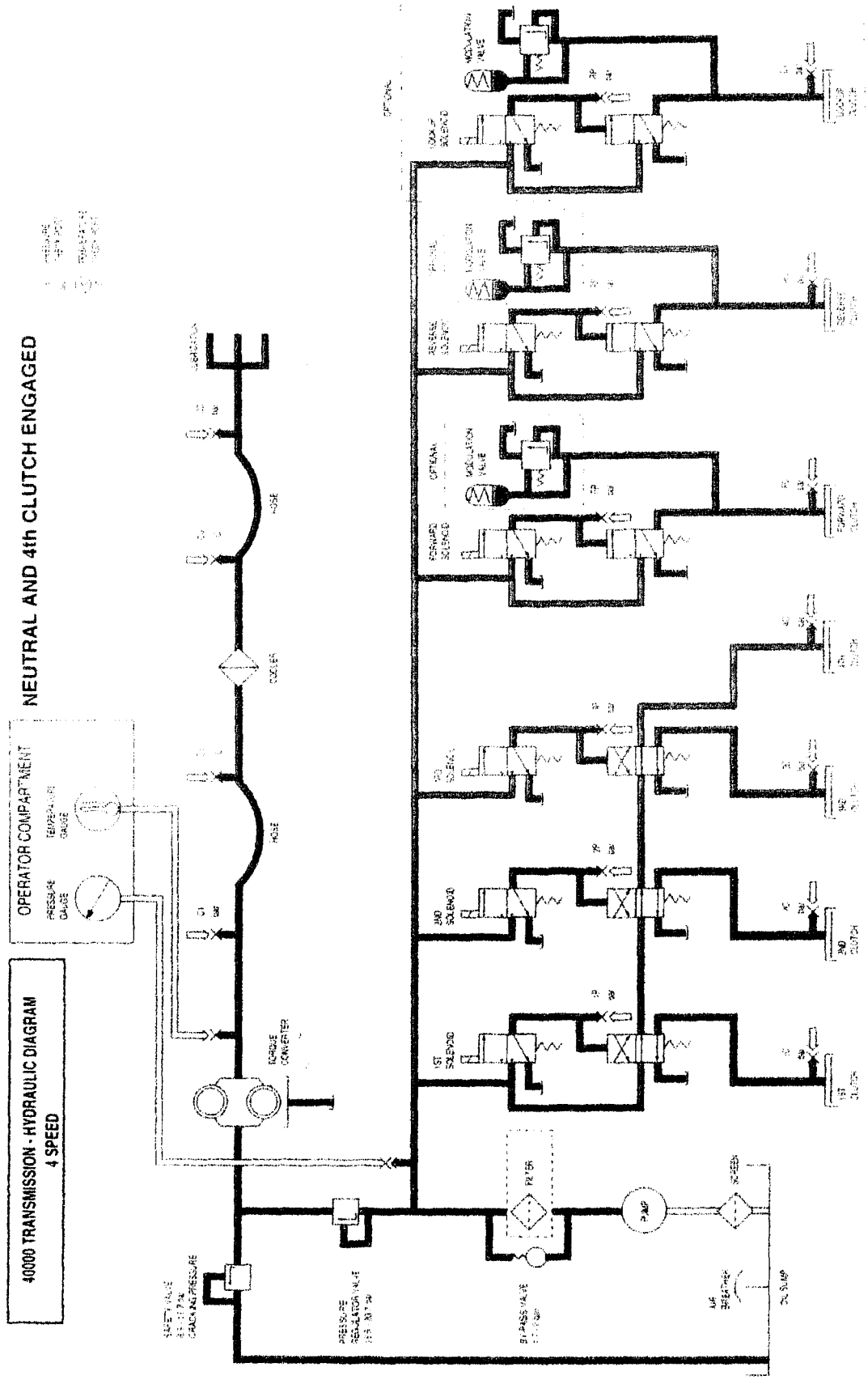


NEUTRAL (ACTIVATED SOLENOIDS)

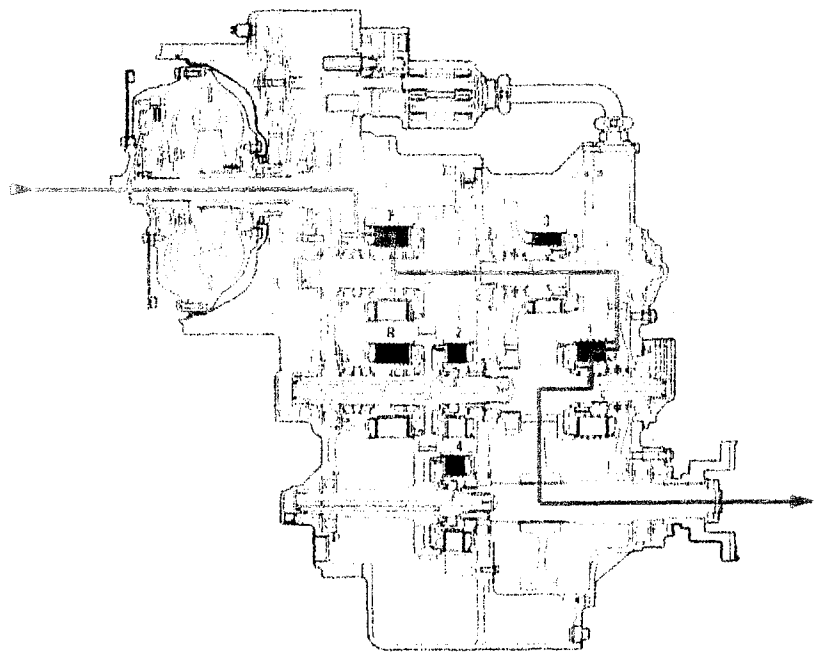


NEUTRAL (ACTIVATED SPOOLS)

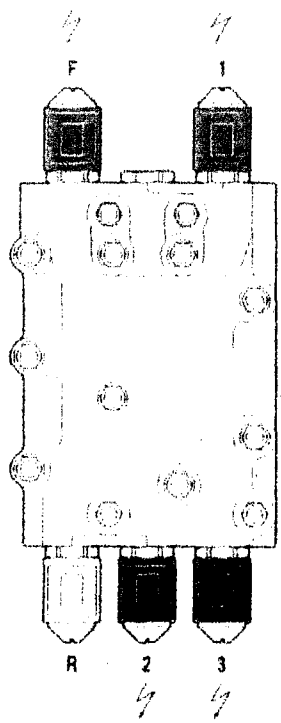
6.3.1 Neutral and 4th clutch engaged (Continued)



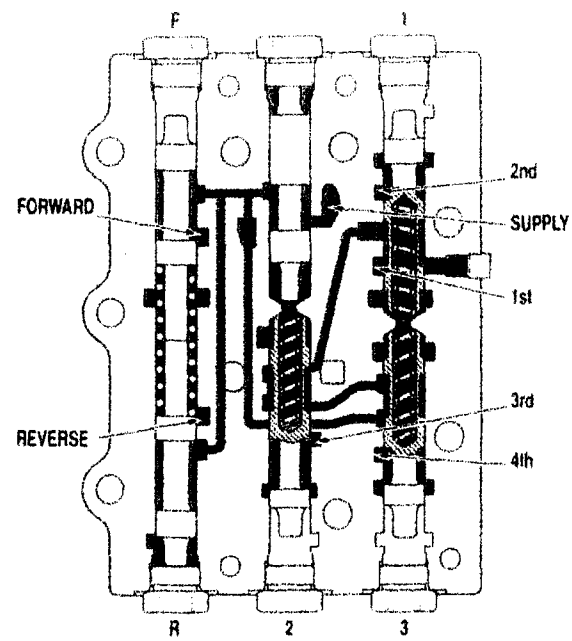
6.3.2 Forward 1st speed



1st SPEED FORWARD (POWERFLOW)

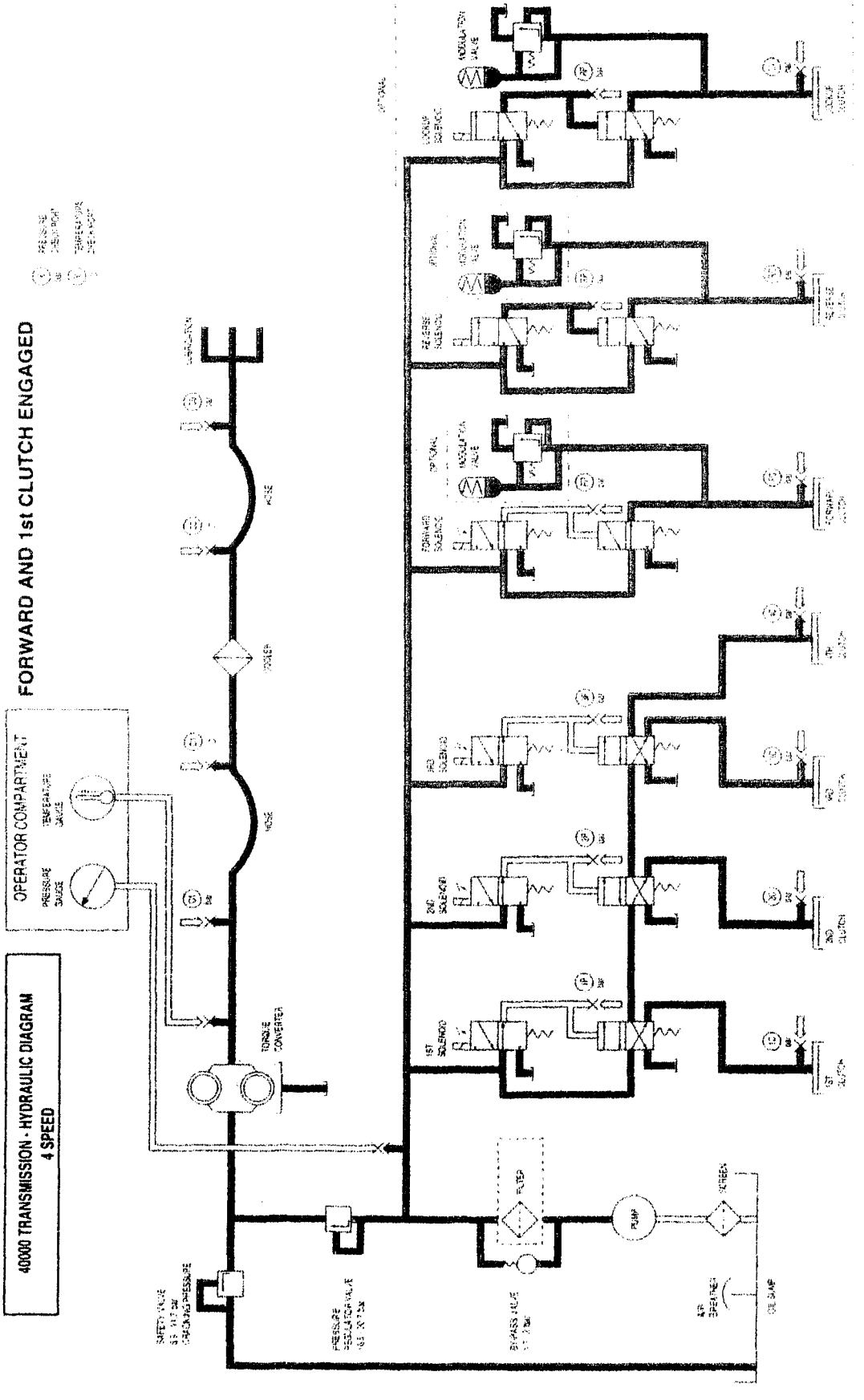


1st SPEED FORWARD (ACTIVATED SOLENOIDS)

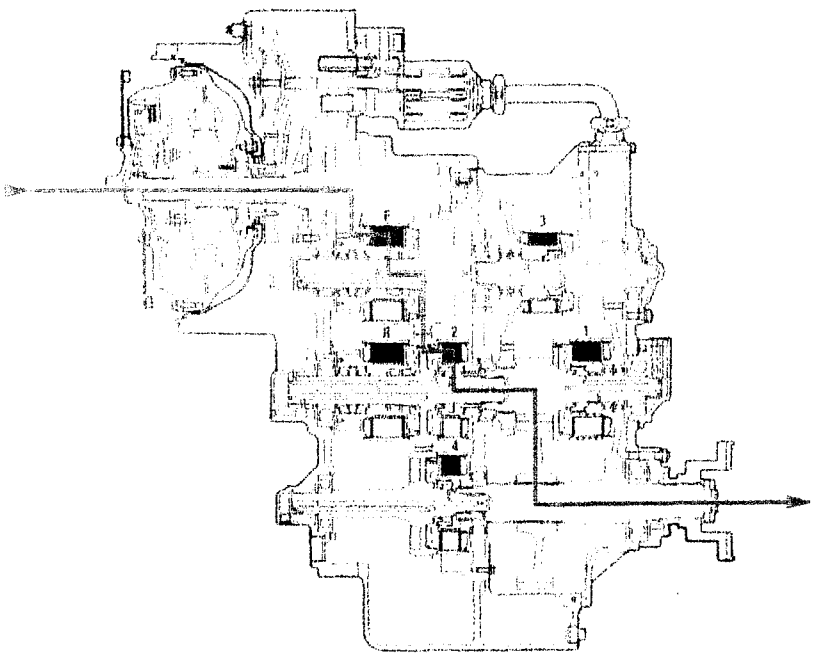


1st SPEED FORWARD (ACTIVATED SPOOLS)

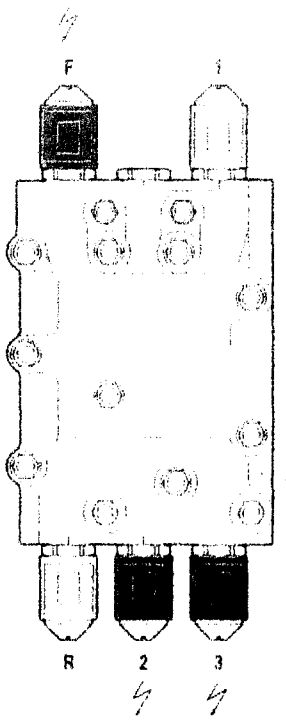
6.3.2 Forward 1st speed (Continued)



6.3.3 Forward 2nd speed



2nd SPEED FORWARD (POWERFLOW)



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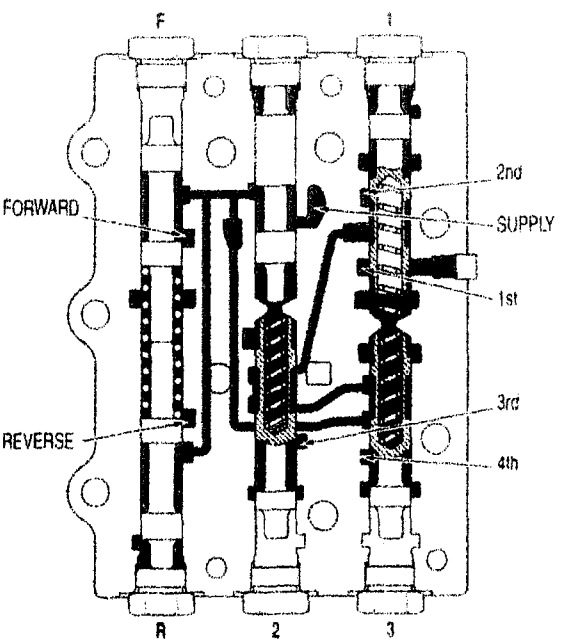
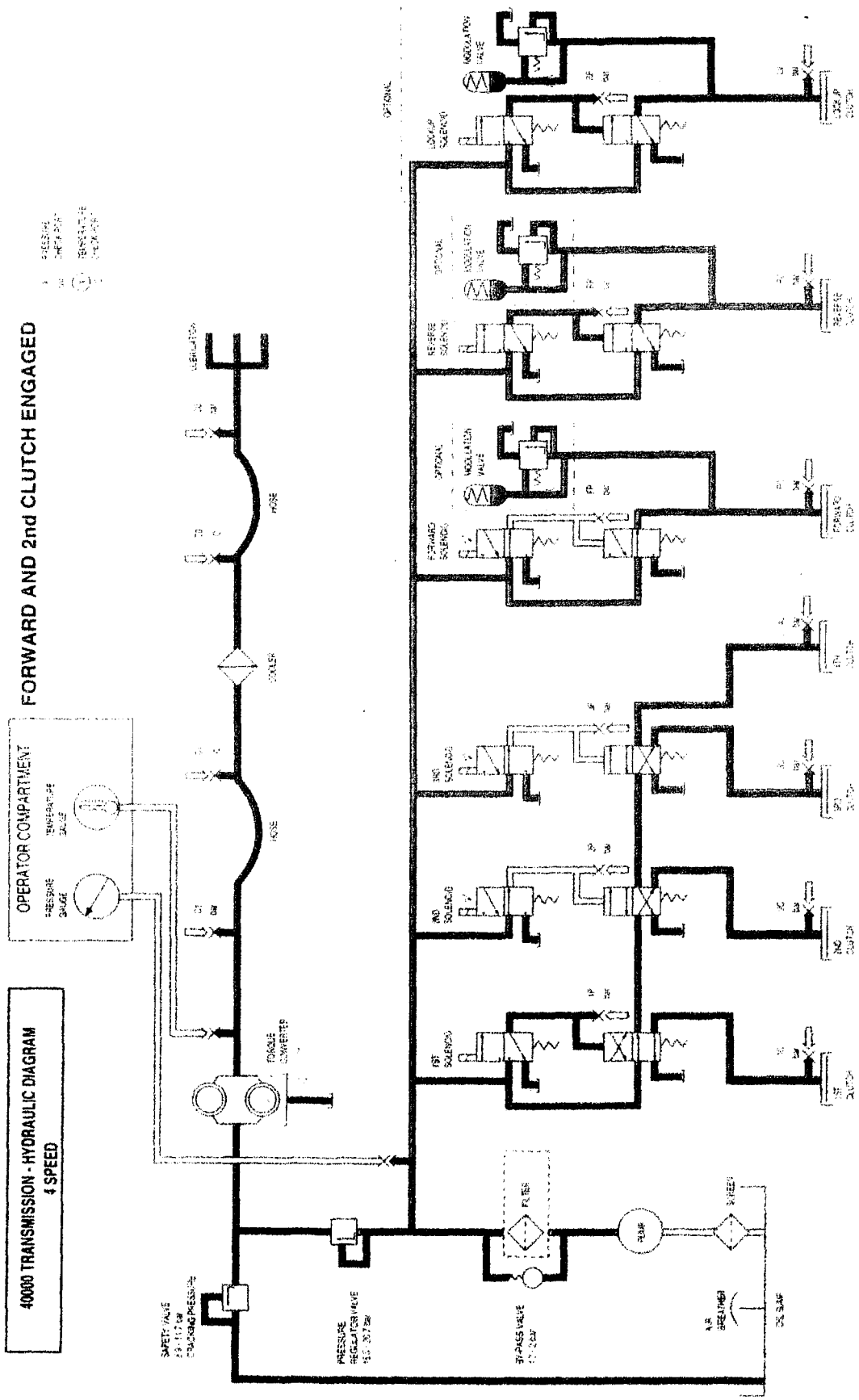
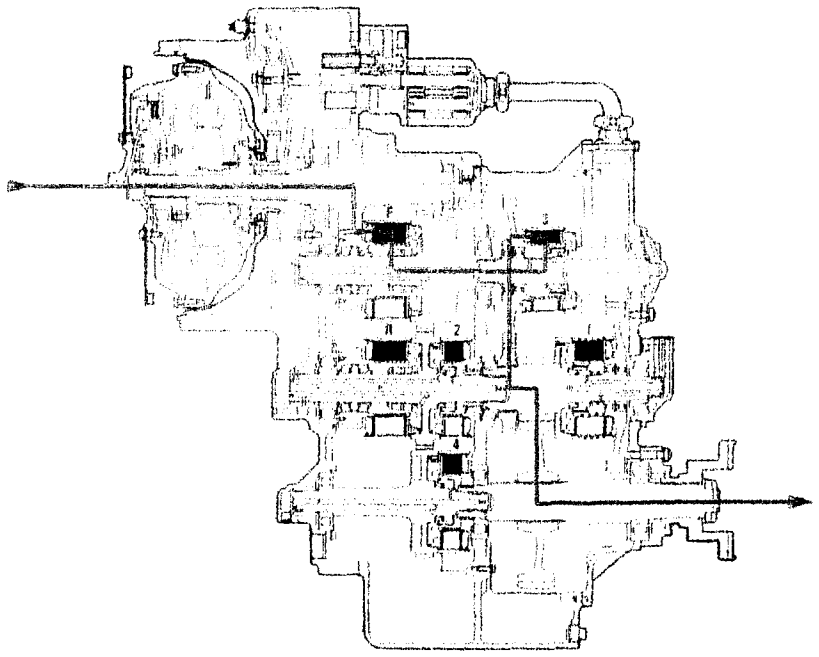


2nd SPEED FORWARD (ACTIVATED SPOOLS)

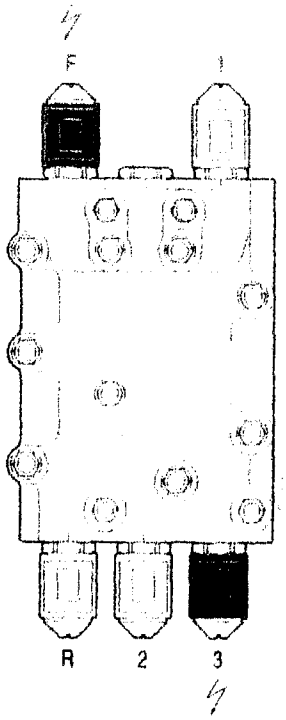
6.3.3 Forward 2nd speed (Continued)



6.3.4 Forward 3rd speed



3rd SPEED FORWARD (POWERFLOW)



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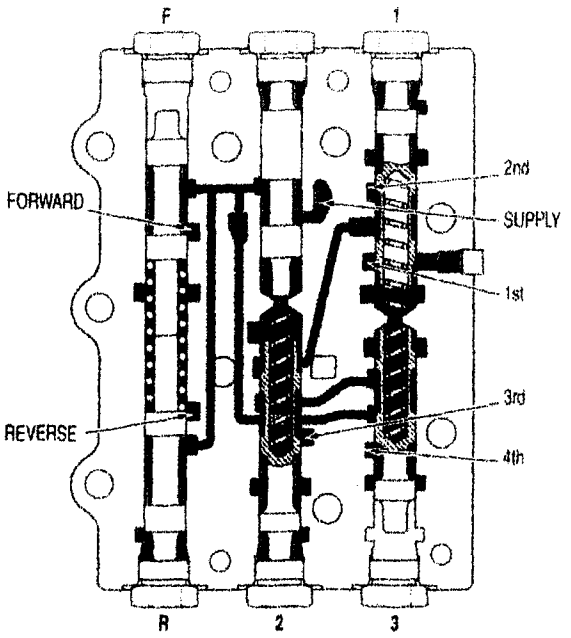
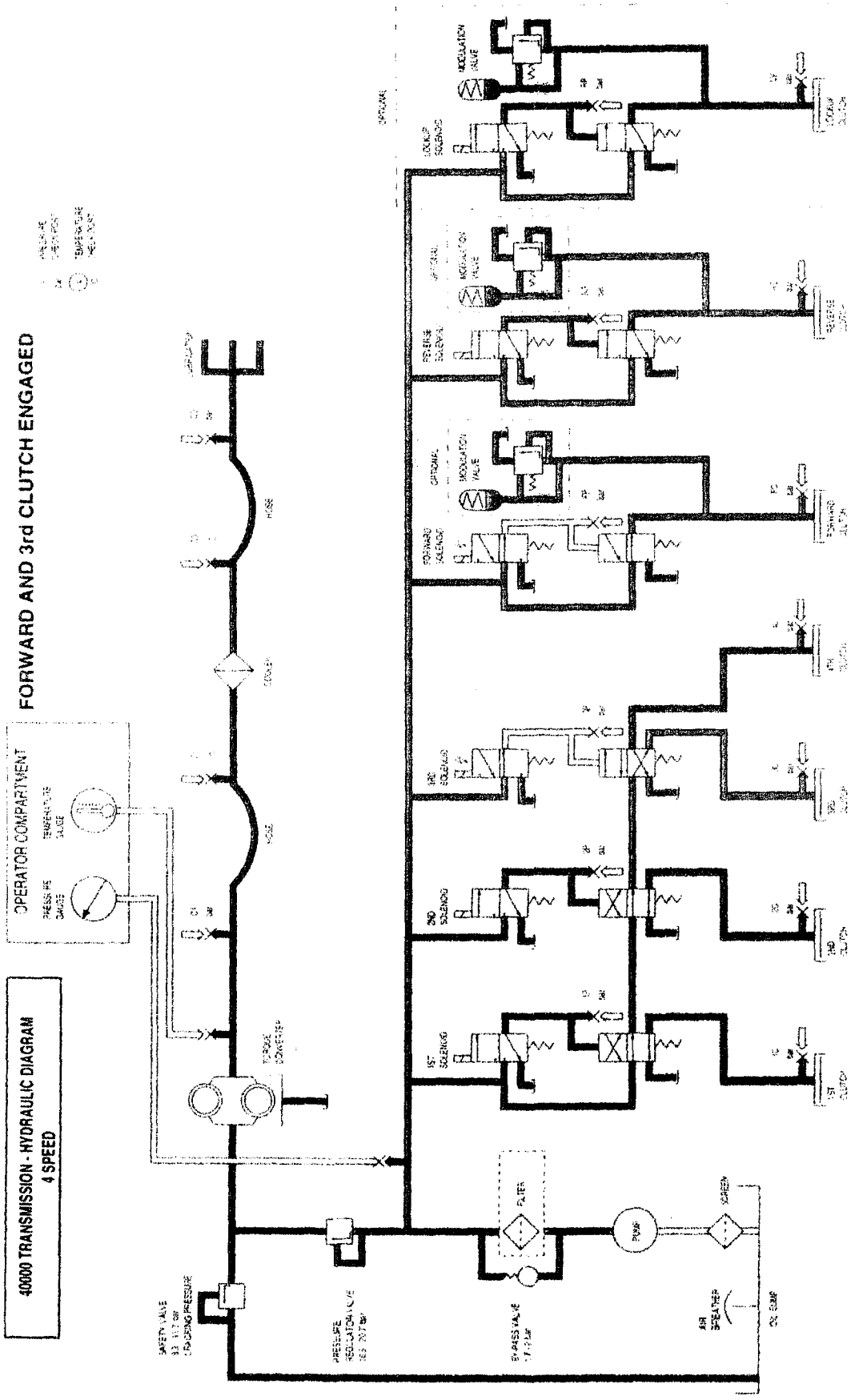
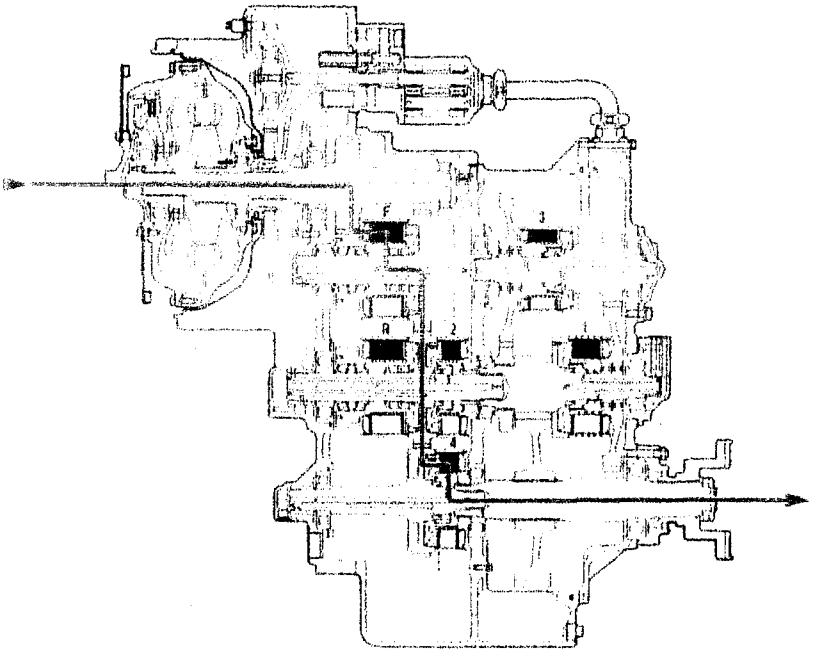


3rd SPEED FORWARD (ACTIVATED SPOOLS)

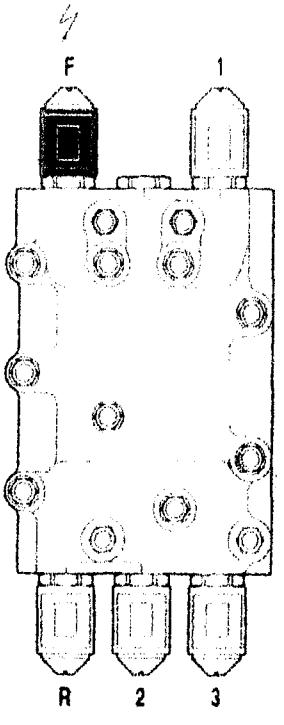
6.3.4 Forward 3rd speed (Continued)



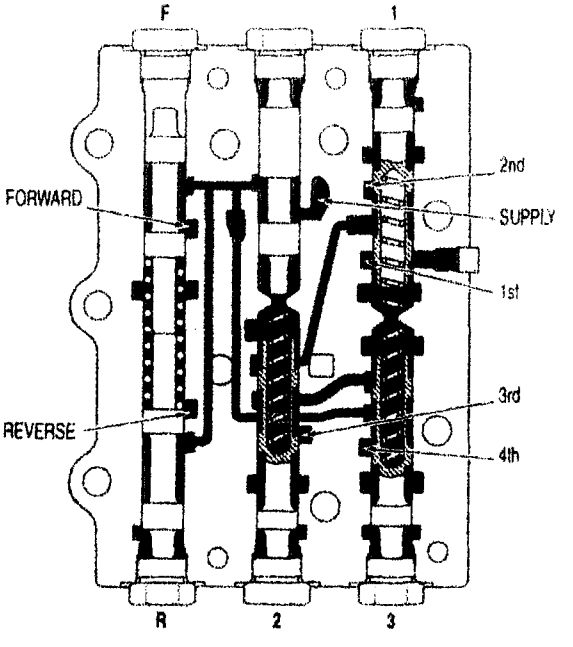
6.3.5 Forward 4th speed



4th SPEED FORWARD (POWERFLOW)

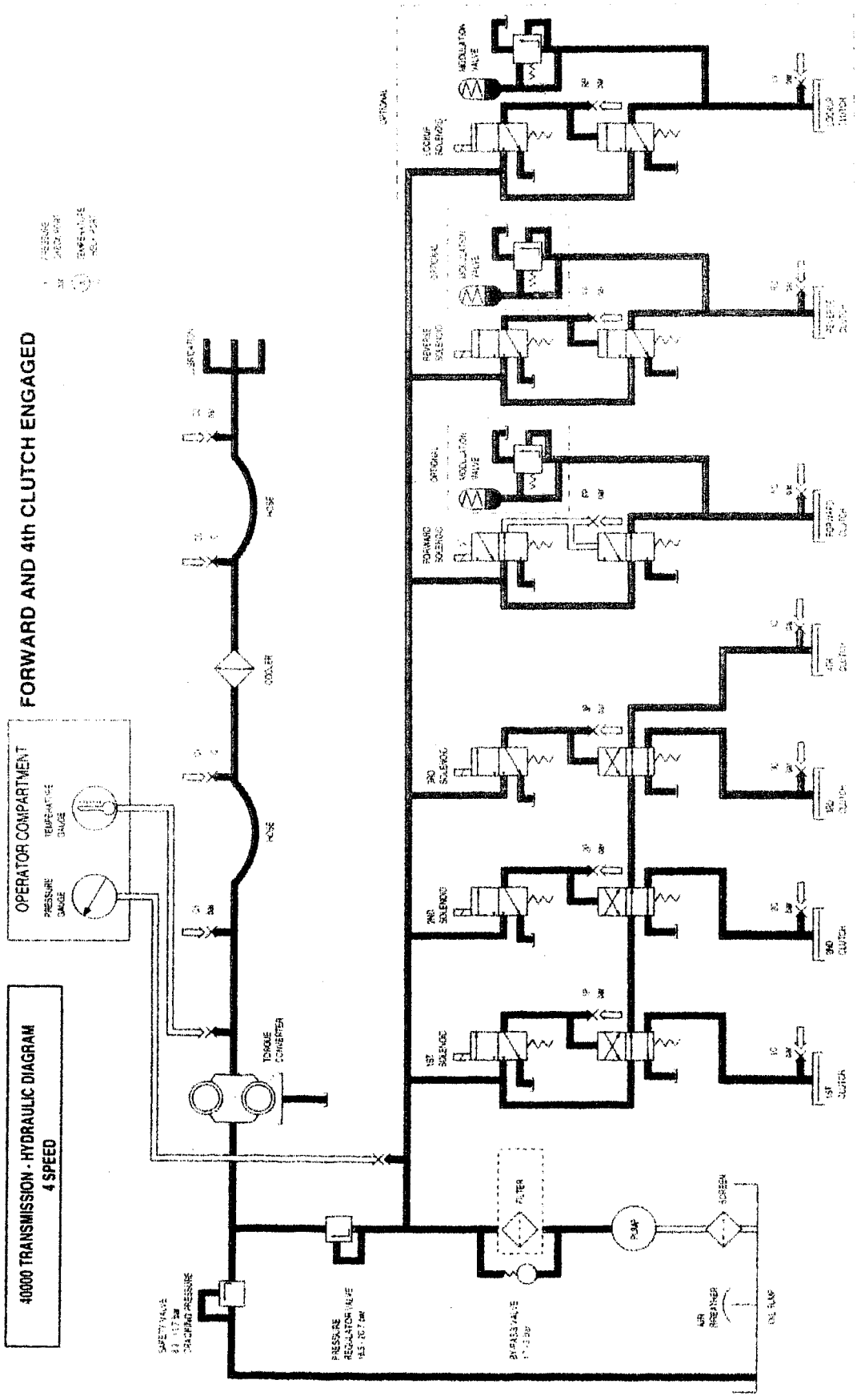


4th SPEED FORWARD (ACTIVATED SOLENOIDS)

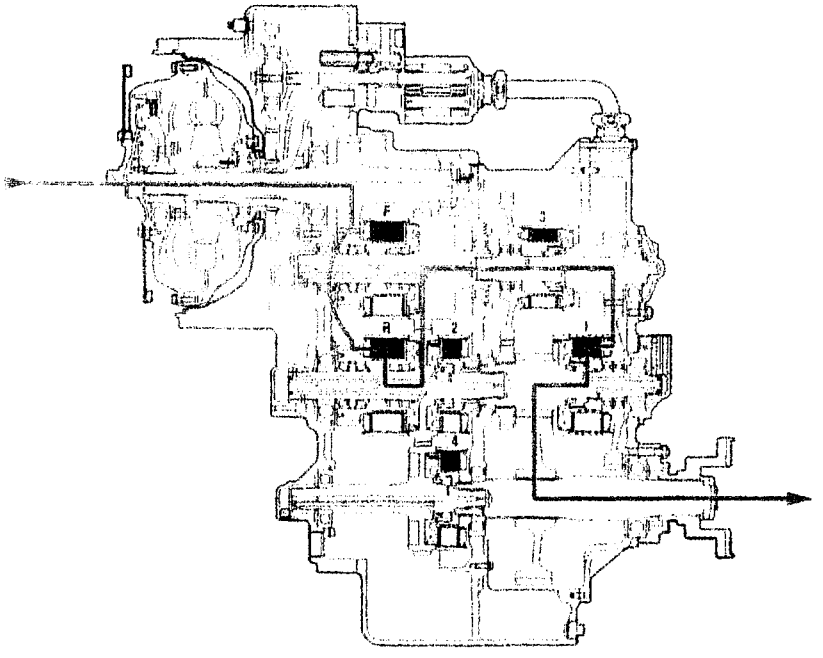


4th SPEED FORWARD (ACTIVATED SPOOLS)

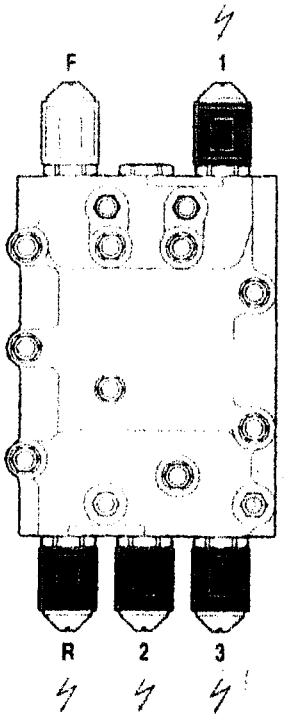
6.3.5 Forward 4th speed (Continued)



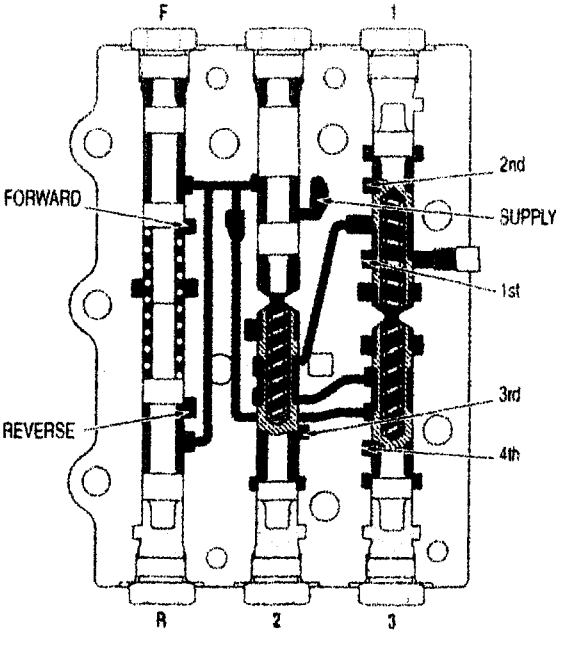
6.3.6 Reverse 1st speed



1st SPEED REVERSE (POWERFLOW)



1st SPEED REVERSE (ACTIVATED SOLENOIDS)



1st SPEED REVERSE (ACTIVATED SPOOLS)

6.3.6 Reverse 1st speed (Continued)