



GENERAL MOTORS 4L80E NEUTRALS DURING OR AFTER THE UP SHIFT TO 4TH GEAR

COMPLAINT: Before or after overhaul, a GM vehicle equipped with the 4L80E transmission exhibits a complaint of a neutral condition either during the shift to 4th gear, or immediately after the shift.

CAUSE: One cause may be a loss of Actuator Feed Limit (AFL) Valve oil pressure in the valve body, or a leak in the Shift Solenoid B circuit.

The Actuator Feed Limit valve is used to control the amount of solenoid pressure that is fed to Shift Solenoid A, Shift Solenoid B, and the Force Motor/EPC Solenoid. If AFL pressure is inadequate, the solenoids cannot function properly. AFL pressure can be lost because of a worn bore in the Actuator Feed Limit Valve line up, or a damaged or worn O-ring on the Actuator Feed Limit Valve Filter located in the valve body behind the manual valve. A pressure leak in the AFL circuit can lead to reduced pressure at the 2-3 shift valve. If this occurs, the 2-3 shift valve spring may push the valve back into the 1st gear position. This causes the transmission to immediately make a shift back to 1st gear, which feels like neutral because 1st gear is in a over speed condition. The reason an issue with the 2-3 Shift Valve occurs before a problem with the 1-2 Shift Valve is because the Shift Valve Spring is heavier on the 2-3 Shift valve causing the valve to return easier to its resting position. Additionally, a leak in the Shift Solenoid B circuit can create the same condition. The transmission can make a shift back into 1st gear during or immediately after an up shift into 4th. A loss of Shift Solenoid B oil pressure, can be caused by a defective solenoid, a leaking solenoid O-ring or an inadequately sized solenoid feed hole in the separator plate. A scan tool may help the technician diagnose this problem by monitoring the parameters for gear ratio during the up shift into 4th gear. Fourth gear ratio for the 4L80E is .75, while 1st gear ratio is 2.48. If a ratio of 2.48 is indicated on the scan tool when the shift takes place it would indicate the transmission has shifted back to 1st gear. Refer to Figure 1 for a gear ratio and shift solenoid apply chart. Refer to Figure 2 for a partial hydraulic schematic of the Actuator Feed Limit Valve, 2-3 Shift Valve, and Shift Solenoid B circuits.

CORRECTION: Check the AFL bore in the valve body and inspect the O-ring on the AFL filter. Replace the O-ring if it is damaged. If the AFL bore is worn, there is a boring tool and a sleeve and valve kit available from Sonnax as well as a Shift Valve Spring Replacement Kit for both the 1-2 and 2-3 Shift Valves. Refer to Figure 3 for a valve body breakdown showing listed components.

If the AFL valve and the Filter are in good condition, then it may be necessary to replace Shift Solenoid B. In addition, the solenoid feed hole in the separator plate may be enlarged slightly to overcome this condition. Using a .035" drill bit, carefully enlarge solenoid feed hole. **DO NOT ENLARGE SOLENOID FEED HOLE MORE THAN .035"**. Refer to Figure 4 for Shift Solenoid B feed hole location in the separator plate.

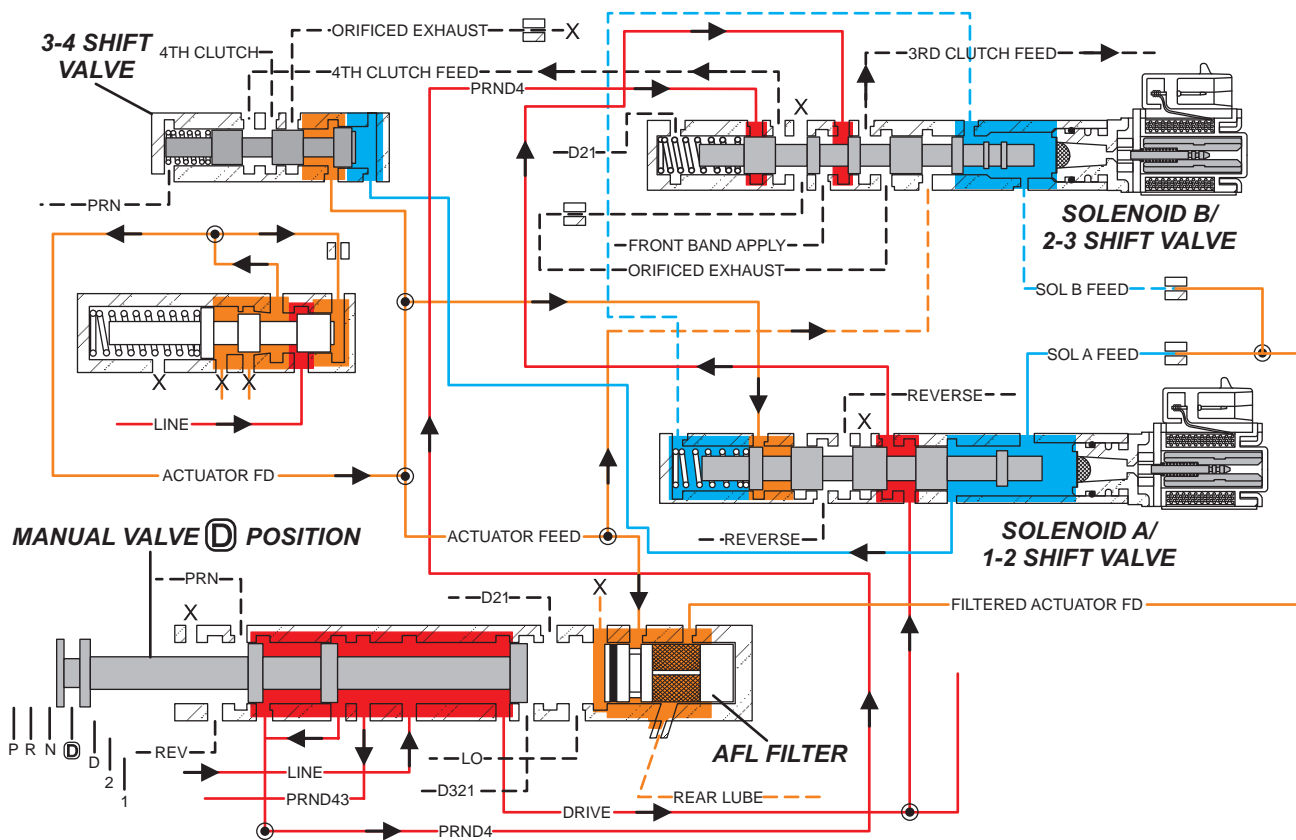
SOLENOID APPLY AND GEAR RATIO CHART

GEAR	SOLENOID A	SOLENOID B	GEAR RATIO
P/N	ON	OFF	2.08
REV	ON	OFF	2.08
1	ON	OFF	2.48
2	OFF	OFF	1.48
3	OFF	ON	1.00
4	ON	ON	.75

Copyright © 2009 ATSG

Figure 1

PARTIAL 4TH GEAR HYDRAULIC AFL PRESSURE LOSS

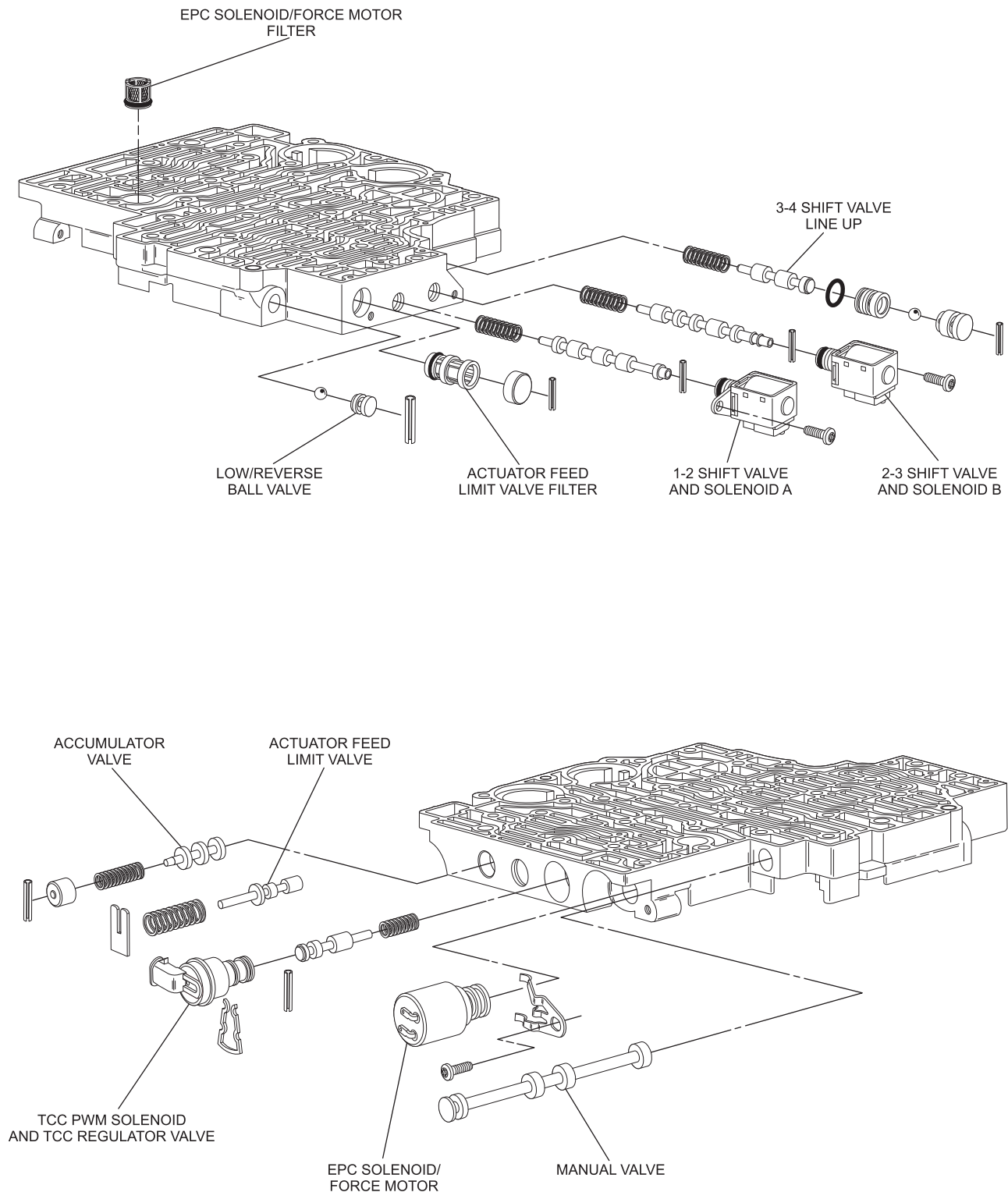


This 4th Gear partial hydraulic diagram depicts AFL pressure loss due to a flattened AFL Filter O-ring and a worn AFL Valve bore. Note the loss of Actuator Feed pressure to the 2-3 Shift Valve and also Sol. B Feed. The 2-3 Shift Valve is affected before the 1-2 Shift Valve because the 2-3 Shift Valve Spring is heavier. This loss of AFL pressure moves the 2-3 Shift Valve into the 1st gear position, and 1st gear is obtained regardless of the position of the 3-4 Shift Valve.

Copyright © 2009 ATSG

Figure 2

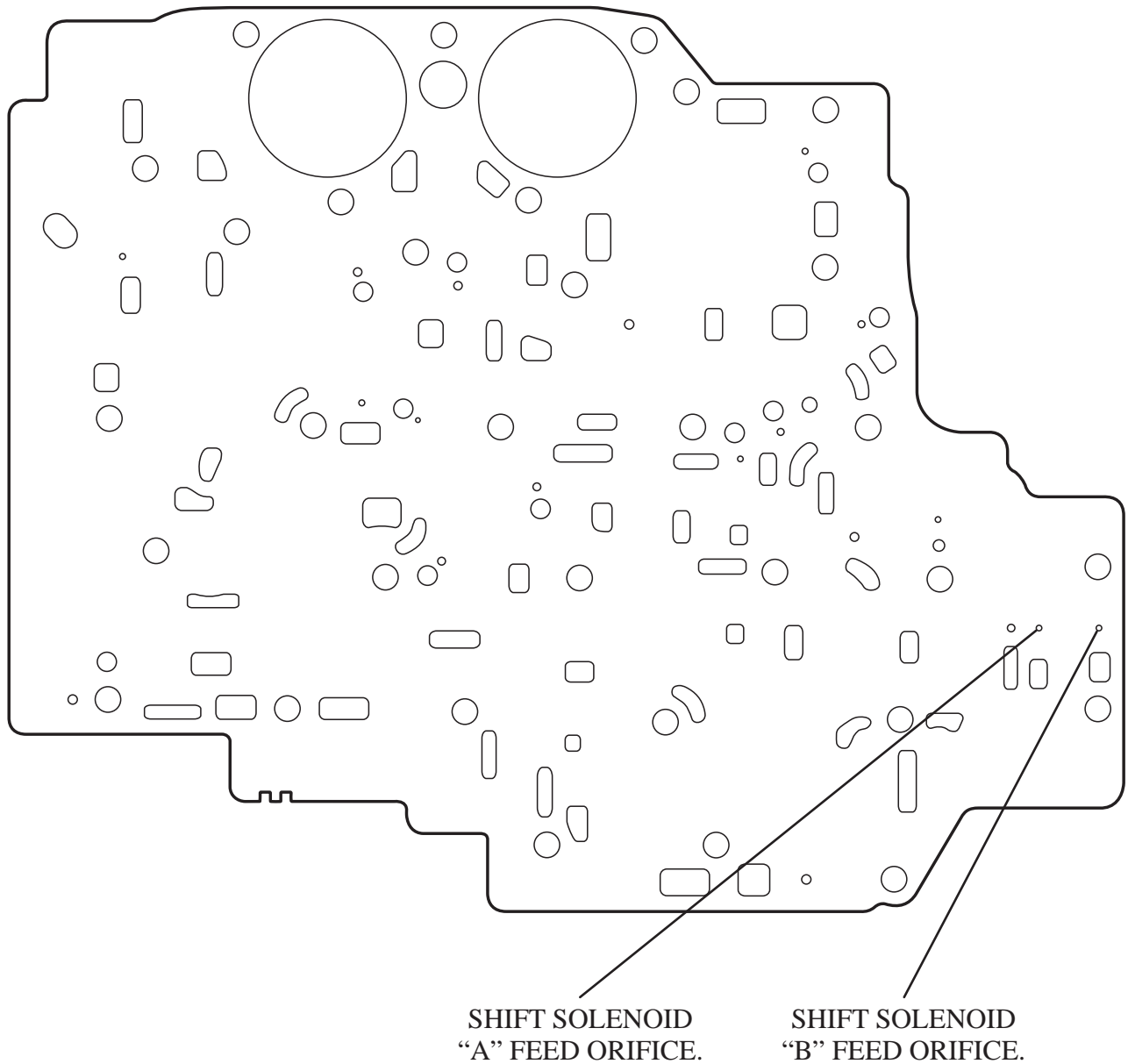
4L80E VALVE BODY BREAKDOWN



Copyright © 2009 ATSG

Figure 3

4L80E SPACER PLATE SOLENOID FEED ORIFICE LOCATIONS



***DO NOT ENLARGE EITHER FEED ORIFICE
DIAMETER GREATER THAN .035"***

Copyright © 2009 ATSG

Figure 4