A4AF3/A4BF2
PRELIMINARY INFORMATION

Since model year 2000 Hyundai has been using a new transaxle in the Accent, Elantra, and Tiburon. It is the A4AF3 for use with 1.5L engines, and the A4BF2 for use with 2.0L engines. These transaxles are almost identical to the A4AF1 and A4AF2 with several major exceptions. The A4AF1 and A4AF2, as well as the new A4AF3 and A4BF2 are almost identical to the KM series except that they are "backwards."

The big change is the addition of two solenoids, Pressure Control Solenoid B (PCSVB) and Shift Control Solenoid Valve C (SCSVC) as seen in figure 4, a couple of valves (Figure 6), and an accumulator for the Forward (Rear) clutch (Figure 7). Pressure Control Solenoid Valve A (PCSVA) as in previous applications is the solenoid that controls main line pressure . PCSVB directly controls the application of the Forward (Rear Clutch) on a 4-3 downshift. When this solenoid fails you can expect to see harsh 4-3 downshifts. The other new solenoid is Shift Control Solenoid Valve C (SCSVC) controls the end clutch apply and reduces line pressure in 4th gear for less drag on the engine increasing fuel economy. The new valves in the valve body are only to support the new solenoid scheme. They are the Fail Safe Valve, the Control Switch Valve, and the High-Low Pressure Valve (Figure 6) . The check balls remain the same as other KM style units (Figure 7).

With the addition of the new solenoids comes changes to the Diagnostic Trouble Codes. Although not as generalized as a code P1750 (Solenoid Pack Fault), the new codes do not specify if a solenoid circuit is open or shorted. It does specify which solenoid though. P0760 indicates a fault in the SCSC solenoid circuit, and P0765 is for the PCSB. Both will cause the MIL to light and a failsafe condition. See Figure 3 for a complete code list. The pin on the diagnostic connector used to manually retrieve codes with an analog voltmeter has moved to pin 1 (see Figure 5).

In addition to the code changes, changes were also made to the pinouts to accommodate the two new wires. The case connector is now six pins (See Figure 1). The computer appears identical to a fourth generation KM computer, but the pin assignments have changed (see Figure 2).

One other note. The A4AF3 and A4BF2 do still have creep mode, but there is no longer a separate switch to control it. Creep mode is now controlled by the computer using the TPS and VSS inputs. Further, the TPS signal is now routed THROUGH the ECM rather than being split to both the TCM and the ECM.
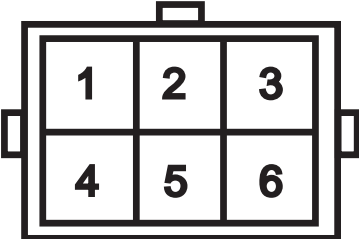
PIN #	Wire Color	Solenoid ID	Solenoid Type	Voltage	Resistance
1	White	SCSV-C	On/Off	System	20-24
2	Black	PCSV-A	Duty Cycle	3	2.5-3.5
3	Blue	PCSV-B	Duty Cycle	3	2.5-3.5
4	Yellow	SCSV-B	On/Off	System	20-24
5	Brown	SCSV-A	On/Off	System	20-24
6	Red	DCCSV	Duty Cycle	3	2.5-3.5

Figure 1

A4AF3/A4BF2
PRELIMINARY INFORMATION

***EPC-A (PCSVA)	14	1	Lockup Solenoid (DCCSV)	
***EPC-B (PCSVB)	15	2	Shift Sol B (SCSVB)***	
***Shift Sol A (SCSVA)	16	3	Shift Sol C (SCSVC)***	
***NC	17	4	MIL Request Line	
***Torque Red Req	18	5	ROM Pack Ctrl ***	
NC	19	6	NC	
***NC	20	7	Kickdown Servo Switch	
TPS (via ECM)	21	8	A/C Switch	
NC	22	9	K-Line (Diagnostic)	
TFT Ground	23	10	NC	
TFT Signal	24	11	L-Line (Diagnostic)	
On with Ign	25	12	On with Ign	
Ground	26	13	Ground	

Battery	9	1	Park	
VSS	10	2	Reverse	
Pulse Generator B	11	3	Neutral	
Pulse Generator B	12	4	Drive	
Pulse Generator A	13	5	Second	
Pulse Generator A	14	6	Low	
Ground	15	7	O/D Enable	
Tach (RPM)	16	8	NC	

*** Indicates pins which have changed function from KM computer
COMPUTER PINOUT

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Figure 2

ERROR CODES	
P1703	TPS OPEN OR SHORTED
P0712	TFT OPEN CIRCUIT
P0713	TFT SHORT CIRCUIT
P1709	KICKDOWN SERVO SWITCH (SERVO COVER) OPEN OR SHORTED
P0707	LOSS OF ENGINE RPM SIGNAL
P0717	LOSS OF SIGNAL FROM PULSE GENERATOR A (END CLUTCH)
P0722	LOSS OF SIGNAL FROM PULSE GENERATOR B (DIFFERENTIAL)
P0750	SCSV-A OPEN OR SHORTED
P0755	SCSV-B OPEN OR SHORTED
P0760	SCSV-C OPEN OR SHORTED
P0707	PRNDL SWITCH OPEN CIRCUIT
P0708	PRNDL SWITCH SHORT CIRCUIT
P0745	PCSV-A OPEN OR SHORTED
P0765	PCSV-B OPEN OR SHORTED
P0743	DCCSV OPEN OR SHORTED
P0740	LOCKUP STUCK ON
P1744	SLIPPING OR ABNORMAL VIBRATION IN LOCKUP
P0731	SLIPPING OR INCORRECT RATIO WHEN COMMANDING FIRST GEAR
P0732	SLIPPING OR INCORRECT RATIO WHEN COMMANDING SECOND GEAR
P0733	SLIPPING OR INCORRECT RATIO WHEN COMMANDING THIRD GEAR
P0734	SLIPPING OR INCORRECT RATIO WHEN COMMANDING FOURTH GEAR
P1765	TORQUE REDUCTION REQUEST SIGNAL LINES (FROM TCM TO ECM)
P1766	TORQUE REDUCTION EXECUTION SIGNAL LINES (FROM ECM TO TCM)

Figure 3

A4AF3/A4BF2
PRELIMINARY INFORMATION

Basic Solenoid Shift Pattern			
GEAR	SCSV-A	SCSV-B	SCSV-C
1st	On	On	Off
2nd	Off	On	Off
3rd	Off	Off	On
4th	On	Off	On-Off

Due to the added valves in the valve body, Shift Solenoid C can turn off in 4th and the transmission will remain in 4th. When it does turn off, line pressure will be 130 psi. If the solenoid remains On in 4th, line pressure will be 95psi.

SCSVB
(Yellow Wire)

SCSVA
(Brown Wire)

DCCSV
(Red Wire)

PCSVA
(Black Wire)

SCSVC
(White Wire)

PCSVB
(Blue Wire)

SOLENOID LOCATIONS

Figure 4

SIGNAL   **GROUND**

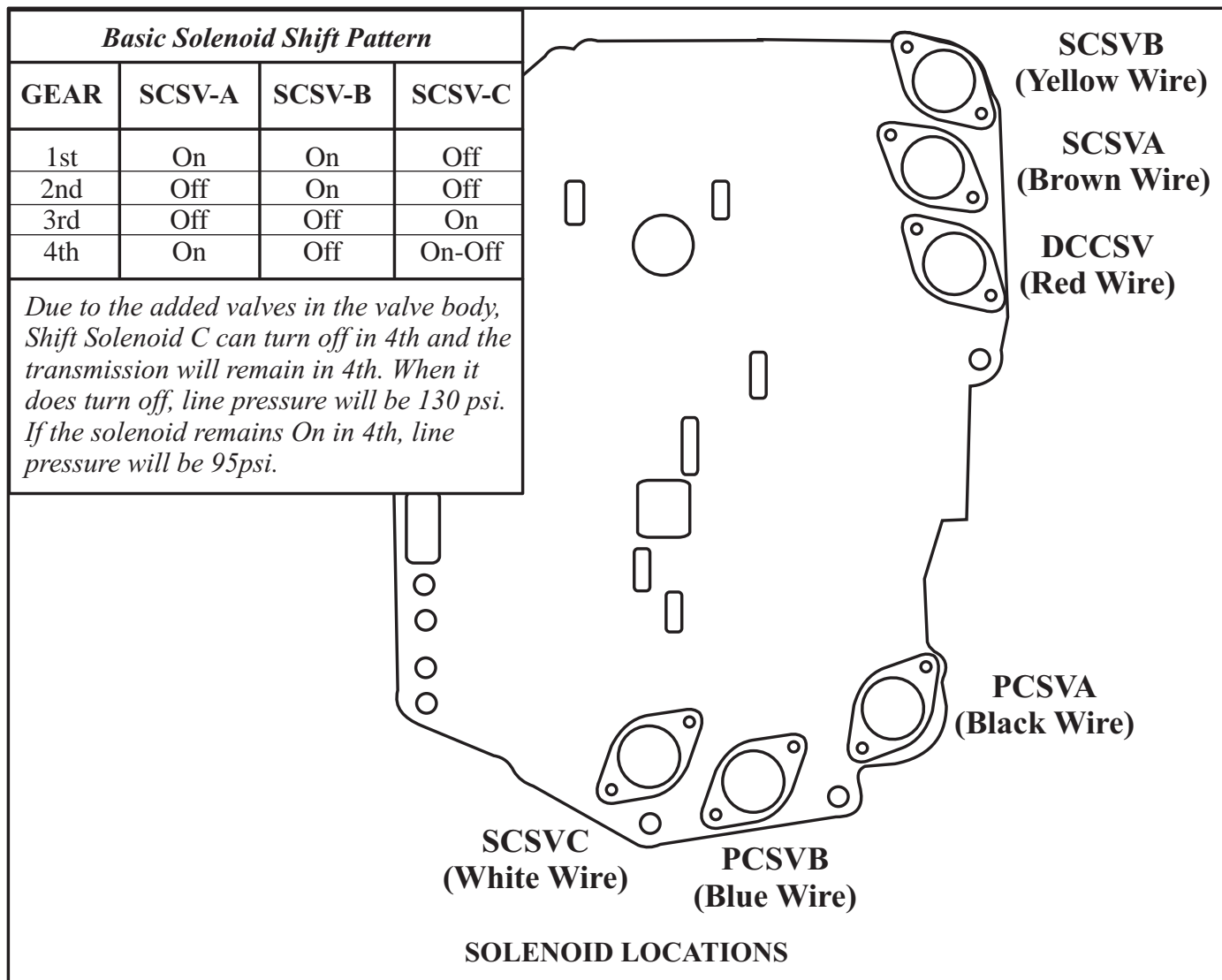| 1 | | | | | | 8 |
| 9 | | | | | | 16 |

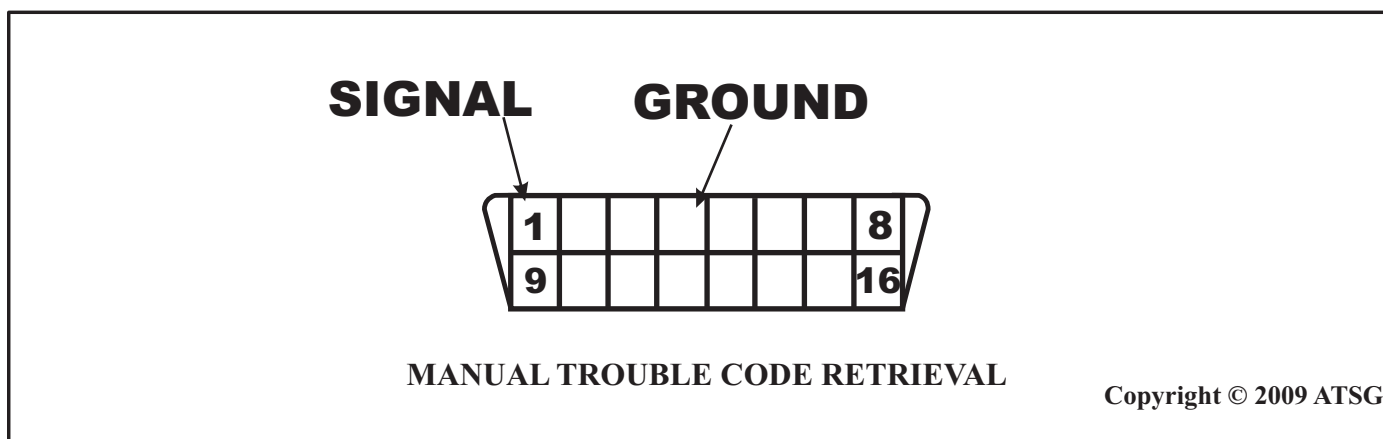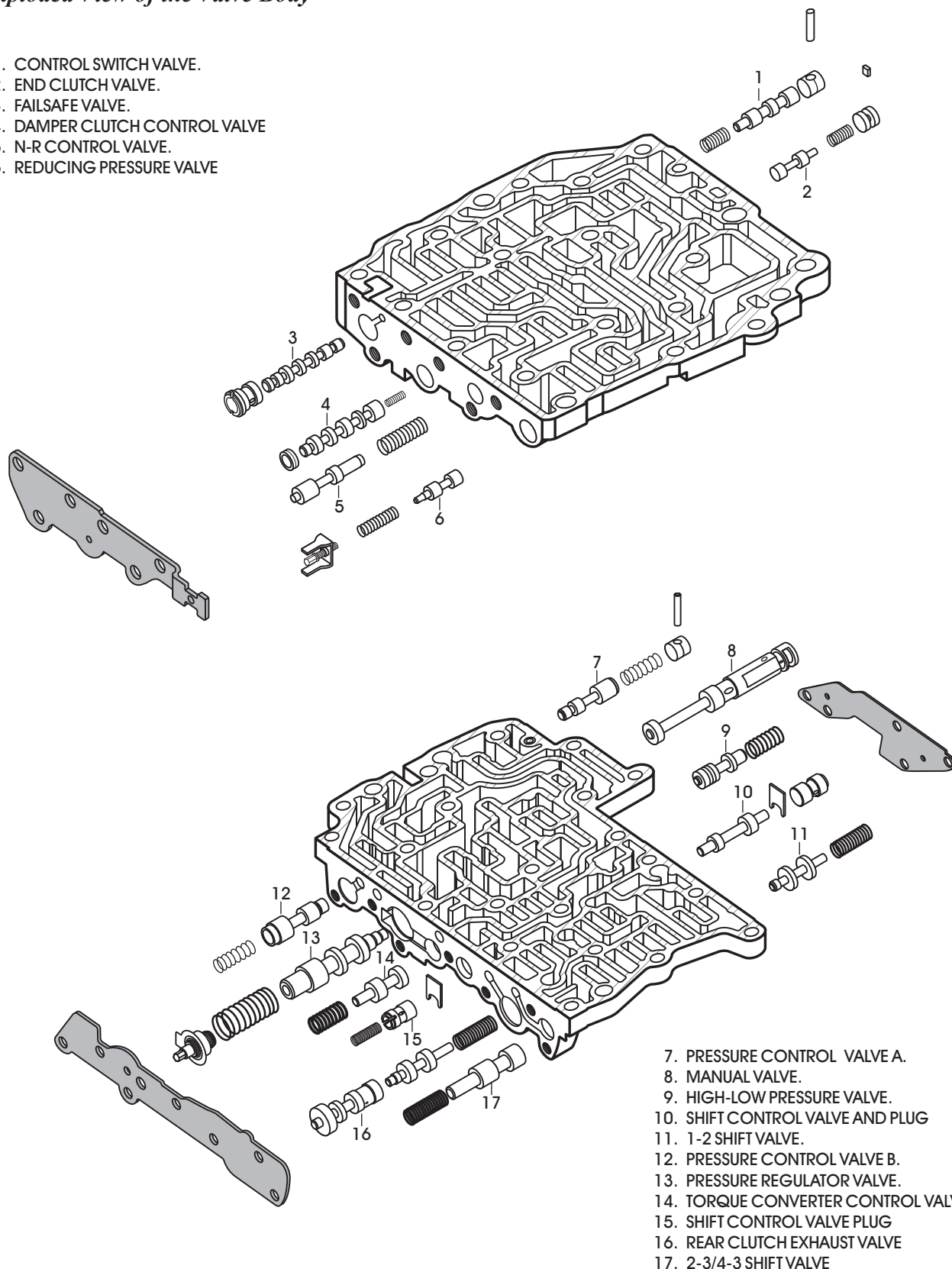**MANUAL TROUBLE CODE RETRIEVAL**

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Figure 5

Exploded View of the Valve Body

1. CONTROL SWITCH VALVE.
2. END CLUTCH VALVE.
3. FAILSAFE VALVE.
4. DAMPER CLUTCH CONTROL VALVE
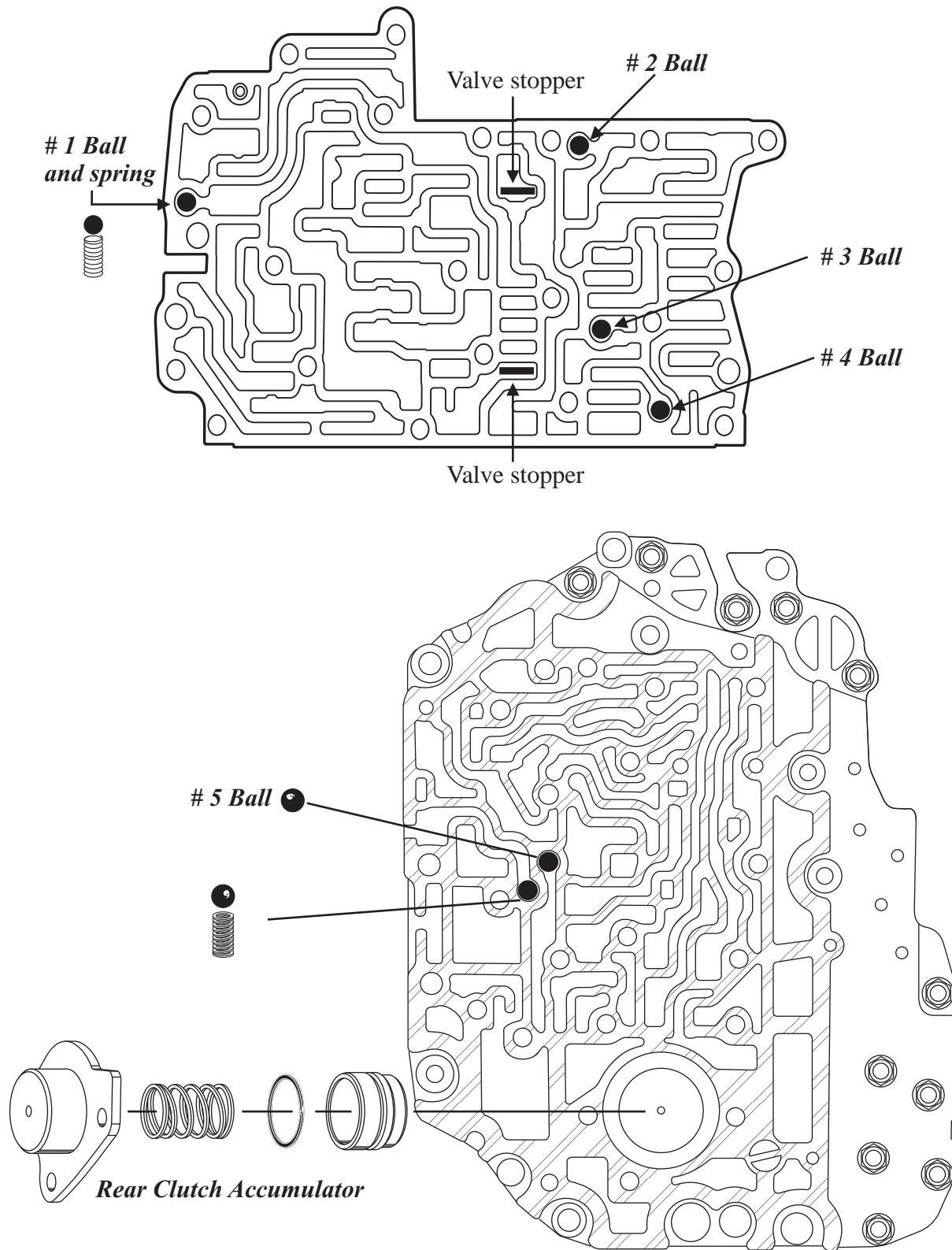5. N-R CONTROL VALVE.
6. REDUCING PRESSURE VALVE

7. PRESSURE CONTROL VALVE A.
8. MANUAL VALVE.
9. HIGH-LOW PRESSURE VALVE.
10. SHIFT CONTROL VALVE AND PLUG
11. 1-2 SHIFT VALVE.
12. PRESSURE CONTROL VALVE B.
13. PRESSURE REGULATOR VALVE.
14. TORQUE CONVERTER CONTROL VALVE.
15. SHIFT CONTROL VALVE PLUG
16. REAR CLUTCH EXHAUST VALVE
17. 2-3/4-3 SHIFT VALVE

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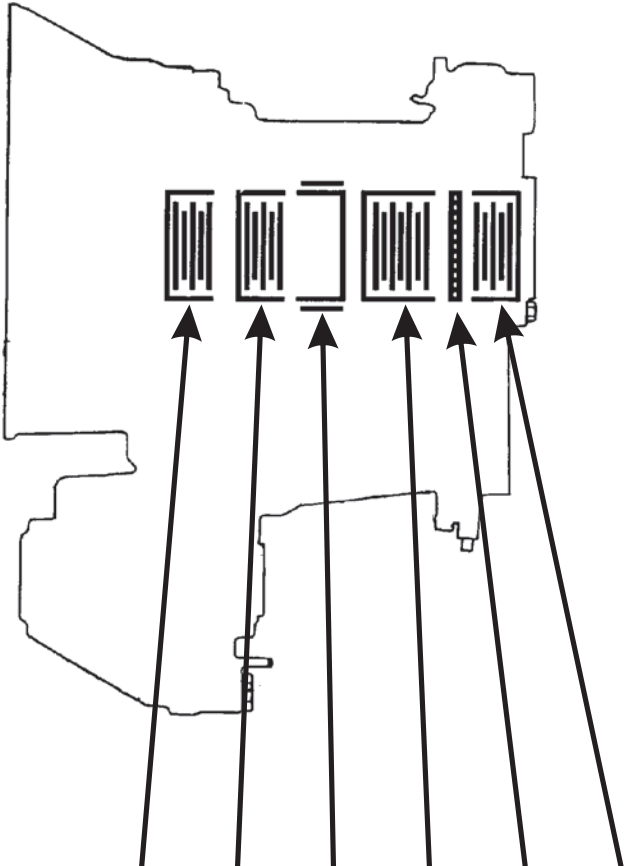Figure 6

Small parts and check ball location

#1 Ball and spring

#2 Ball

Valve stopper

#3 Ball

#4 Ball

Valve stopper

#5 Ball

Rear Clutch Accumulator

Figure 7

09-18
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Application Chart

A4AF3/A4BF2

RANGE	GEAR	DIRECT CLUTCH (Front)	FWD CLUTCH (Rear)	2-4 BAND	LOW REV CLUTCH	ONEWAY CLUTCH	3-4 CLUTCH (End)
R	REV	ON			ON		
D	1st		ON			ON	
	2nd		ON	ON			
	3rd Begins	ON	ON				
	3rd Completed	ON	ON				ON
	4th Begins	ON					ON
	4th Completed			ON			ON
2	1st		ON			ON	
	2nd		ON	ON			
1	1st		ON		ON		

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Figure 8