KIA SOUL A6MF1 TRANSMISSION

P0753 SHIFT SOLENOID "A"

COMPLAINT: A 2012 Kia Soul 2.0L with an A6MF1 transmission comes into the shop in failsafe. The scan tool pulls up Pressure Control Solenoid Valve "A" Electrical code P0748 along with Shift Control Solenoid Valve "A" Electrical P0753 and P2709 for Shift Control Solenoid Valve "F" Electrical.

The tech begins to diagnose the vehicle and discovers there is no shift solenoid F and is not clear on which solenoid would be Pressure Control Solenoid Valve "A" (figure 1). The only code that makes sense is P0753 for Shift Solenoid A. By looking at a wire diagram (figure 2), it is also learned that there are two separate solenoid power supplies going into the transmission. One at terminal 5 and the other at terminal 10.

A decision is made to make a quick resistance check of Shift Solenoid Valve "A" across terminals 10 and 18 to see if there is 10 ohms (figures 1, 2 and 3). When this check verified that nothing appeared to be wrong with the circuit, all the other circuits were then checked. In doing so, it was discovered that there was an open circuit when checking the solenoids that use terminal 5 as their power source. The solenoids on this circuit are the LP Solenoid, The UD and 2/6 Brake Solenoid and Shift Solenoid "B". Not one of these solenoids seem to match the codes being set so a further look into these codes were then made.

CAUSE: When looking into code definitions for this vehicle, it was found that there are two different sets of codes that can be displayed for each solenoid. A P0748 for Pressure Control Solenoid Valve "A" is also the Line Pressure Solenoid. P0753 Shift Control Solenoid Valve "A" is also the UD Brake Solenoid while the P2709 code for Shift Control Solenoid Valve "F" is also the code for Shift Solenoid "B". All three of these solenoids are supplied with power from terminal 5 as figure 2 reveals. This circuit was broken in the internal ribbon type wiring harness causing the problem.

But learning of the two sets of codes eliminated the confusion which could cause a tech to be mislead by the scanner codes displayed and spend unnecessary time trying to resolve a problem. Especially if the only code stored was a Shift Control Solenoid "A" electrical fault.

CORRECTION: Replace the internal wiring harness and use figure 4 for a list of diagnostic codes to be used when diagnosing these transmissions.

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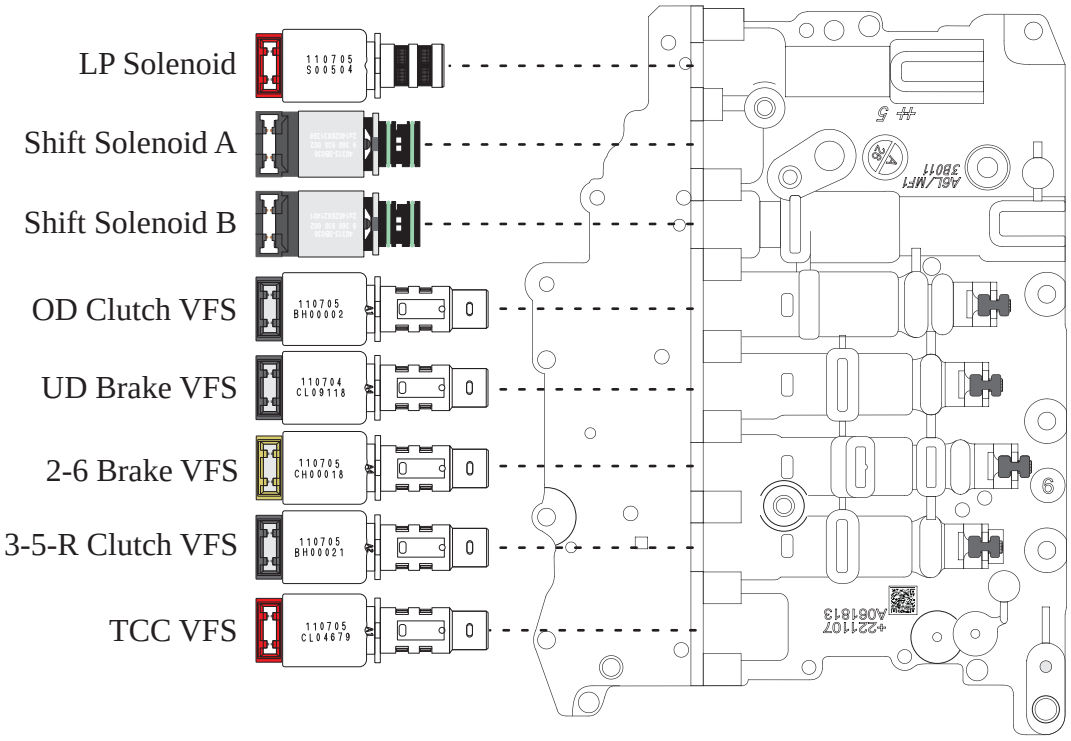

O.E. Solenoid Specifications

Normally High (N/H) Variable Force Solenoids (VFS)

Line Pressure OD VFS UD VFS 3-5-R VFS	Control Pressure kpa (kgf/cm^2, psi)	500.14~9.81 (5.1~0.1, 72.54~1.42)
	Current (mA)	50~850
	Internal Resistance (Ù)	5.1

Normally Low (N/L) Variable Force Solenoids (VFS)

TCC 2/6	Control Pressure kpa (kgf/cm^2, psi)	9.81~500.14 (0.1~5.1, 1.42~72.54)
	Current (mA)	850~50
	Internal Resistance (Ù)	5.1

On/Off Shift Solenoids

SSA SSB	Control Pressure kpa (kgf/cm^2, psi)	490.33 (5.0, 71.12)
	Internal Resistance (Ù)	10~11

Figure 1

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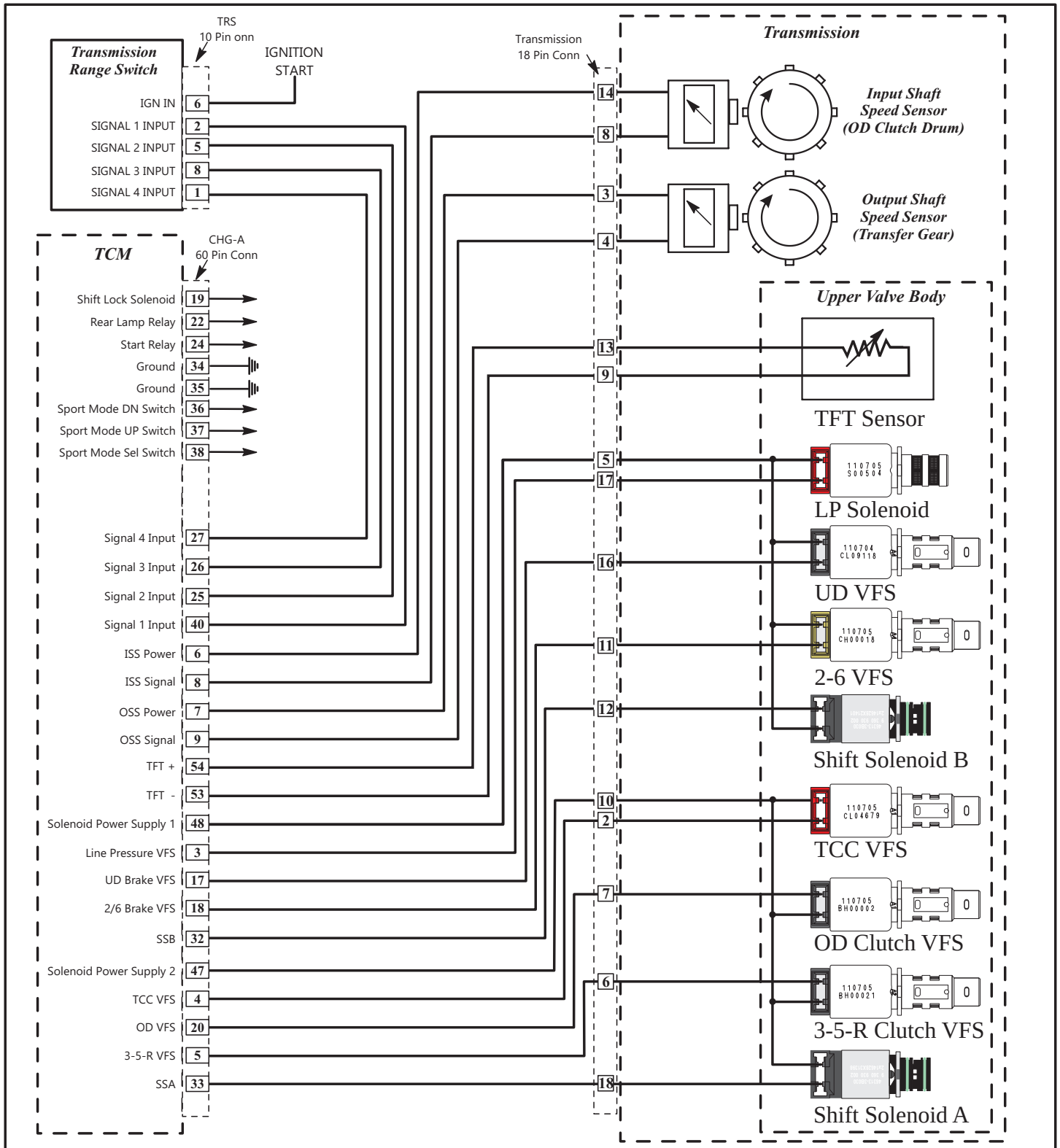
P0753 SHIFT SOLENOID "A"



PCM/TCM Pinout will vary depending upon year, make and model making it necessary to pull specific wiring for testing from the computer to the transmission. TCM/PCM makes can be Kefico (TCM), Delphi (PCM), or Continental/Siemens (PCM).

Figure 2

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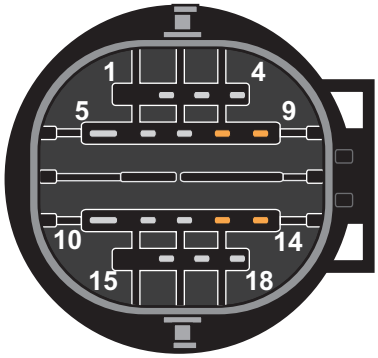
P0753 SHIFT SOLENOID "A"



Pin Assignments

1. Not used	10. Power Supply (TCC, OD, 35R, SSA)
2. TCC Control Solenoid	11. 2/6 Variable Force Solenoid
3. OSS Power	12. Shift Solenoid B
4.OSS Signal	13. TFT +
5. Power Supply (LP, U/D, 2/6, SSB)	14. ISS Power
6. 3-5-R Variable Force Solenoid	15. Empty
7. OD Variable Force Solenoid	16. UD Variable Force Solenoid
8. ISS Signal	17. Line Pressure Solenoid
9. TFT -	18. Shift Solenoid A

Figure 3

2012 KIA SOUL A6MF1 TRANSMISSION

P0753 SHIFT SOLENOID "A"

DTC	DESCRIPTON
DTC P0601	Internal Control Module Memory Check Sum Error
DTC P0705	Transmission Range Sensor Circuit Malfunction
DTC P0706	Transmission Range Sensor Circuit Range/Performance
DTC P0712	TFT Sensor 'A' Circuit Low Input
DTC P0713	TFT Sensor 'A' Circuit High Input
DTC P0717	Input-Turbine Speed Sensor 'A' Circuit No Signal
DTC P0729	Gear 6 Incorrect Ratio
DTC P0722	Output Speed Sensor Circuit No Signal
DTC P0733	Gear 3 Incorrect Ratio
DTC P0734	Gear 4 Incorrect Ratio
DTC P0735	Gear 5 Incorrect Ratio
DTC P0731	Gear 1 Incorrect Ratio
DTC P0732	Gear 2 Incorrect Ratio
DTC P0741	TCC Circuit Performance or Stuck Off
DTC P0743	TCC Clutch Circuit Electrical
DTC P0748	Pressure Control Solenoid Valve (VFS) 'A' Electrical
DTC P0753	Shift Control Solenoid Valve 'A' Electrical (UD/B)
DTC P0758	Shift Control Solenoid Valve 'B' Electrical (2-6/B)
DTC P0763	Shift Control Solenoid Valve 'C' Electrical (35R/C)
DTC P0768	Shift Control Solenoid Valve 'D' Electrical (OD/C)
DTC P0773	Shift Control Solenoid Valve 'E' Electrical (SS-A)
DTC P0880	TCM Power Signal Error Open - Short (GND)
DTC P0955	Auto Shift Manual Mode Circuit
DTC P2709	Shift Control Solenoid Valve 'F' Electrical (SS-B)
DTC U0001	High Speed CAN Communication Bus off
DTC U0100	Lost Communication With ECM-PCM 'A'

Figure 4