SINS
Simple is not Simple

Technical Information 09G/TF60-SN 09M/TF61-SN 09K/TF62-SN GA6F21WA Clearing & Relearning Shift Adapts

The 09G is an adaptive learn transmission. The TCM can adapt the upshift and downshift pressures for each shift as well as the initial engagement into drive and reverse. Whenever the transmission is rebuilt or the valve body is changed, the shift adapts should be cleared and the vehicle should be driven to relearn the new adapts.

Clearing the shift adapts:

The preferred way is to use a factory scan tool or equivalent to return the shift adapts to basic settings. Some Volkswagen vehicles, like the Beetle and Passat, will clear by turning the ignition to off, waiting 30 seconds and then disconnecting the harness connector from the TCM.

Relearning the new shift adapts:

After clearing, the vehicle must be brought to operating temperature and driven to relearn the shift adapts. Clear any trouble codes and check to see if they come back. Drive the vehicle at about 20% throttle angle up through the gears. Once in sixth gear release throttle and allow at least 20 seconds to come to a complete stop. Repeat this cycle 15–20 times. The car may require more driving to fine tune the shift feel.

IMPORTANT NOTES

1.) If the transmission has a delay or harsh reverse engagement, *hold your foot on the brake pedal until completely finished relearning reverse or drive engagement.** move shifter to reverse, wait 3 seconds then move back to neutral and wait 3 seconds. Repeat 10 times and the engagement feel should be about normal.

2.) VW warns that during the learning process, shift quality may deteriorate before it gets better.

3.) TCM will **not** relearn the shift adapts when codes are present or if the transmission is not at operating temperature.

** The TCM has a safety feature that requires the brake pedal to be depressed until the transmission gear that is selected has engaged. If brake pedal is released before the transmission engages, the TCM will command neutral and the PRNDL lights will flash until the brake pedal in depressed and the transmission engages. Once it engages the PRNDL lights will stop flashing.*

After performing this relearn procedure, it is still possible for the hydraulics to be so far from the system's norm that manual calibration of the valvebody is necessary to achieve the desired drivability. The first step in calibrating a valvebody is to identify which clutch or brake control needs to be adjusted. Figure below illustrates common drivability issues and the appropriate clutch and brake control to adjust in order to resolve the issue. For example, if a vehicle was experiencing a flare on the 3-4 shift, the resolution would be to turn the adjustment screw on the spring tensioner for the spool valve that shares the bore with the K2 control solenoid in the counter-clockwise direction. One complete turn of the screw can resolve a slight application issue while an obvious flare or bind-up may be resolved by two complete rotations of the screw.

Component	Turn Screw Clockwise (Decrease Pressure)	Turn Screw Counter-Clockwise (Increase Pressure)
B1	•1-2 Blind-up •5-6 Blind-up •3-2 Bump	•1-2 Flare •5-6 Flare •3-2 Flare
K1	•Quick Harsh Drive Engagement •5-4 Bump	•Delayed Harsh Drive Engagement •5-4 Flare
K2	•3-4 Blind-up	•3-4 Flare
K3	•Quick Harsh Reverse Engagement •2-3 Blind-up •4-5 Blind-up •4-3 Bump •6-5 Bump	•Delayed Harsh Reverse Engagement •2-3 Flare •4-5 Flare •4-3 Flare •6-5 Flare

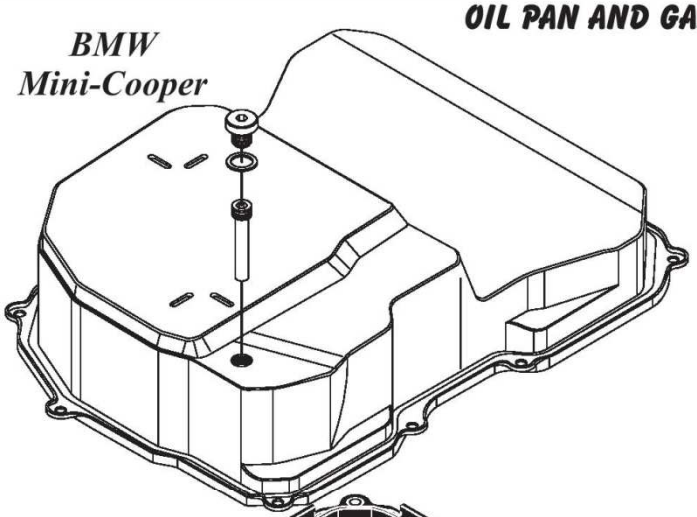
The engagement into Drive and Reverse can be particularly tricky to diagnose whether the pressure is too high or low. The effects of both and high and low K3 pressures can be seen on the engagement of reverse. In an ideal clutch application, the pressure gradually rises to 30 psi as seen in the Smooth Engagement. If the pressure rise is too sudden, the engagement will be harsh. Notice how the early engagement reaches the engagement pressure before the ramp sequence while the delayed engagement finishes the ramp sequence before it reaches the engagement pressure. The harshness of both the early and delayed engagement featured could be perceived to be of the same magnitude. When diagnosing the difference between high and low pressure, it is important to focus on the time between moving the gear selector and the bump that follows. The early engagement will happen almost instantaneously whereas the delayed engagement will take up to 2 seconds to feel the bump.

The line pressure circuit and EPC solenoid do not have adjustment screws and all of their corrections are relegated to the TCM. The TCC solenoid does have an adjustment screw that is typically staked and nonadjustable. Similarly, TCC corrections can only be made by the TCM. It should be noted that if the output pressure is lower than normal in the TCC solenoid, the initial torque converter lock-up engagement while in third gear could be firm and feel similar to a 3-4 shift. When diagnosing it is important to confirm which gear is engaged by using a scan tool or the Tiptronic system of the vehicle. Shift firmness should work itself out through the relearn procedure.

The improved design of the hydraulic control system in the 09G allows you to take the guess work out of resolving drivability issues. Direct control of the clutch and brake components through dedicated solenoids, along with the ability to adjust pressures of the hydraulic circuits, make diagnosis and resolution of drivability issues more of a science and less of an art.

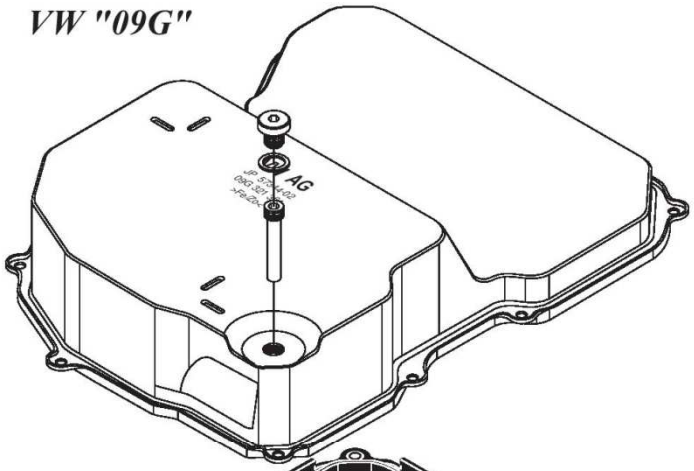
OIL PAN AND GASKET IDENTIFICATION

BMW
Mini-Cooper



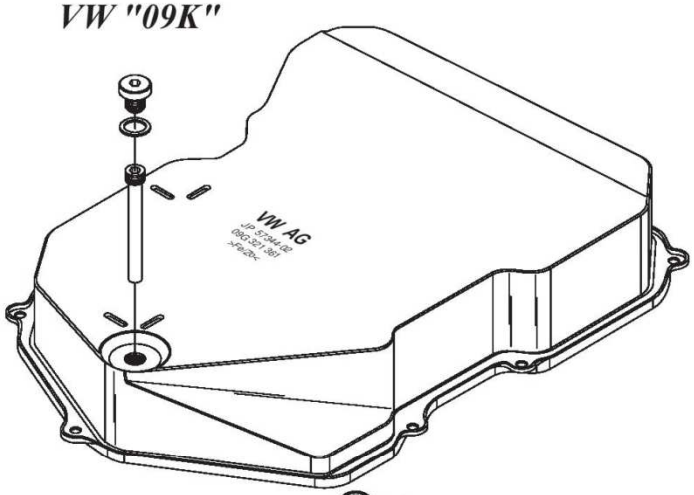
"09G" VW & Mini Cooper
Pan Gasket
8 Bolts

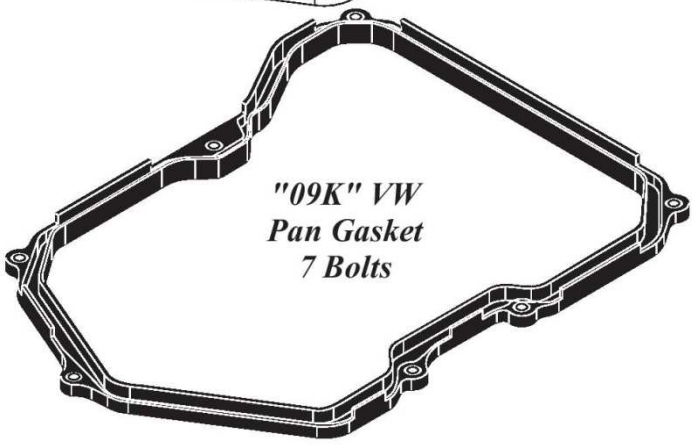
VW "09G"



"09G" VW & Mini Cooper
Pan Gasket
8 Bolts

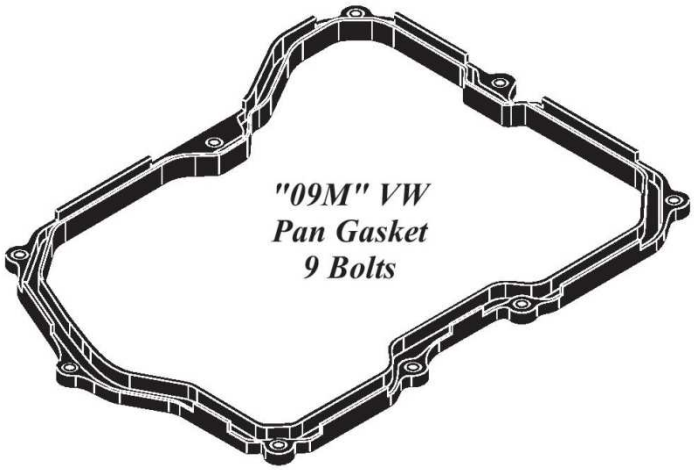
VW "09K"





"09K" VW
Pan Gasket
7 Bolts

VW "09M"



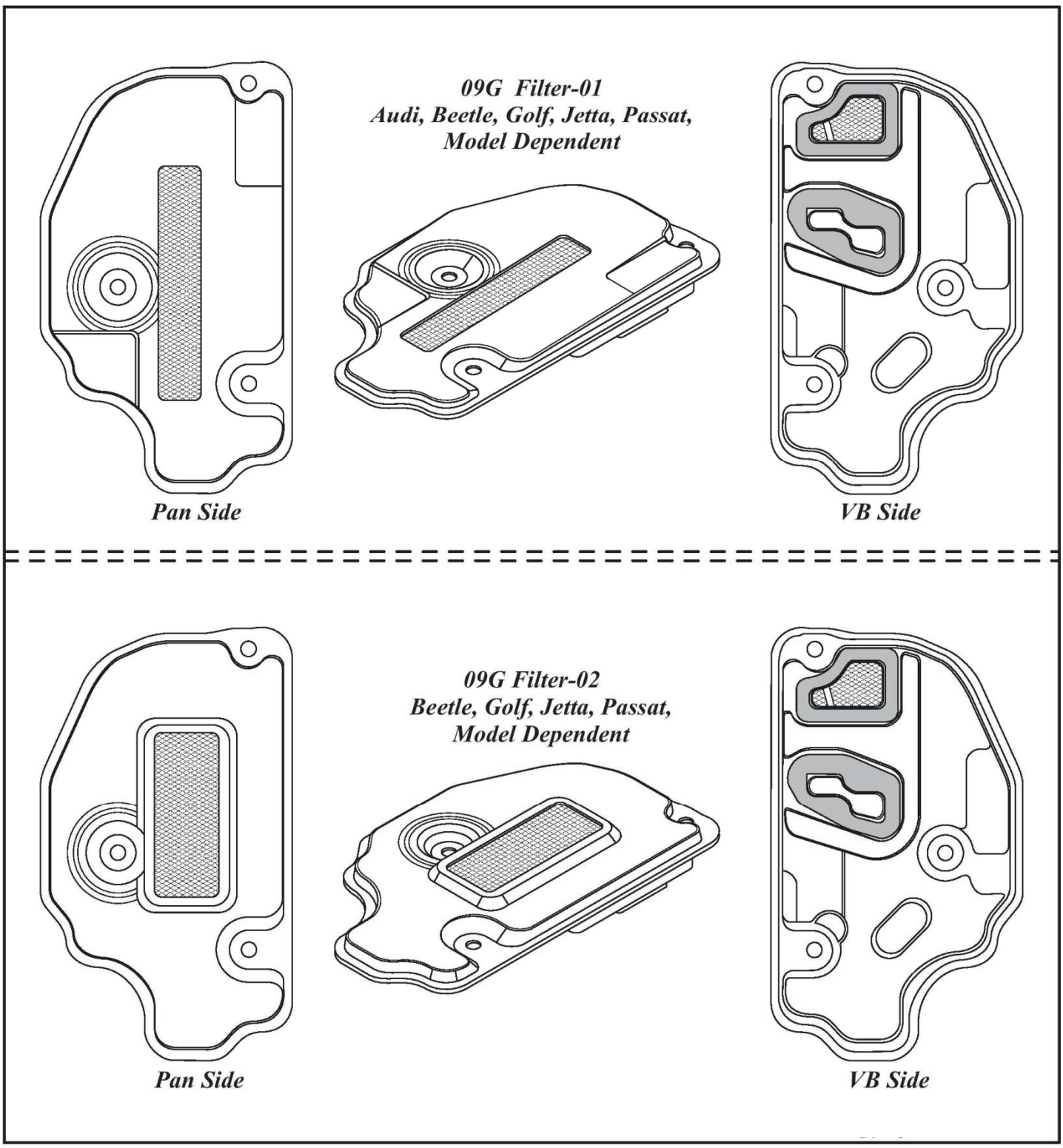
"09M" VW
Pan Gasket
9 Bolts

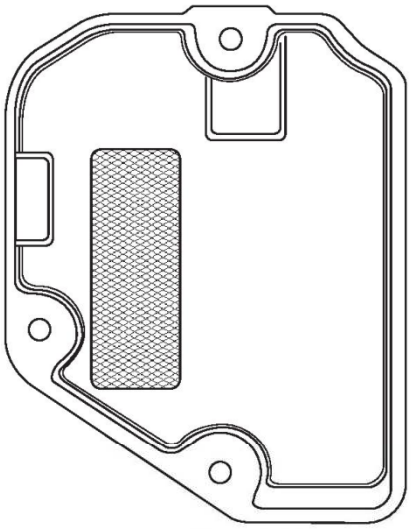
OIL PAN AND GASKET IDENTIFICATION

The various oil pans and oil pan gaskets are identified for you in Figure 47, on Page 39 and they ***will not*** interchange. Notice that the 8 bolt gasket is used on the 09G and the Mini-Cooper. Gaskets are the same but the pans, filters and stand-pipe are different.

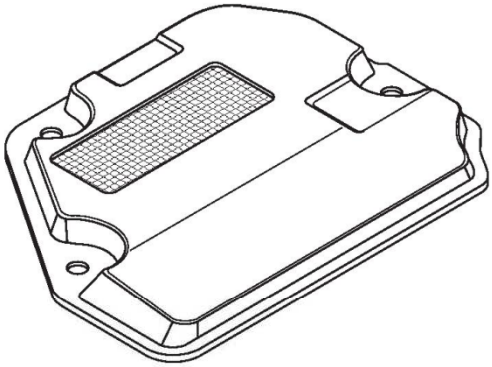
OIL FILTER IDENTIFICATION

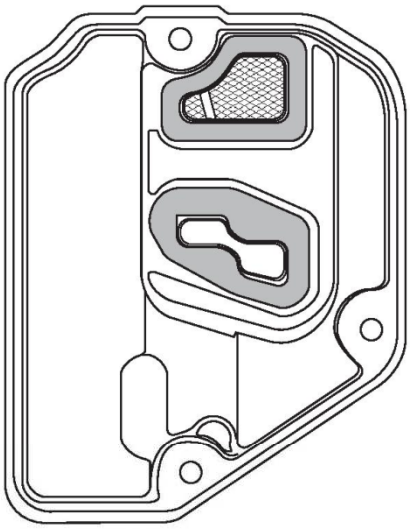
The various oil filters are identified for you in Figure 48 and 49 and again, the filters ***will not*** interchange from model to model. You must have the proper filter that matches pan depth.





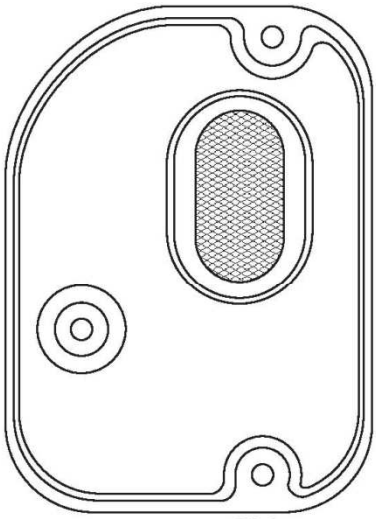
09K Filter-03
Transporter 05-ON



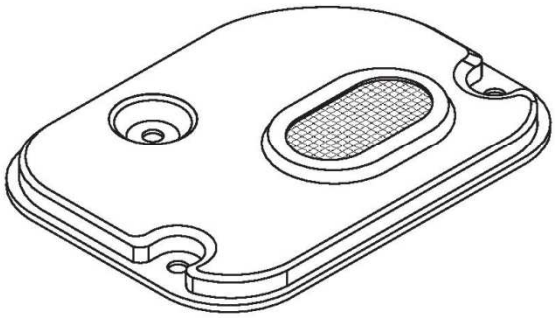


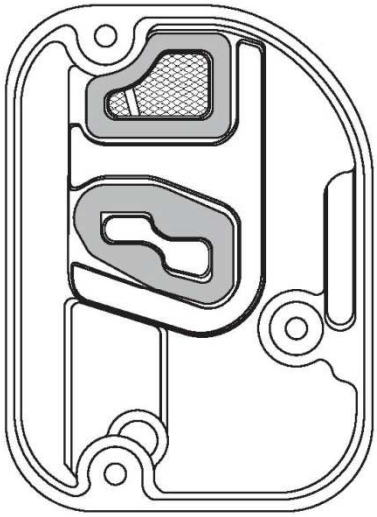
Pan Side

VB Side



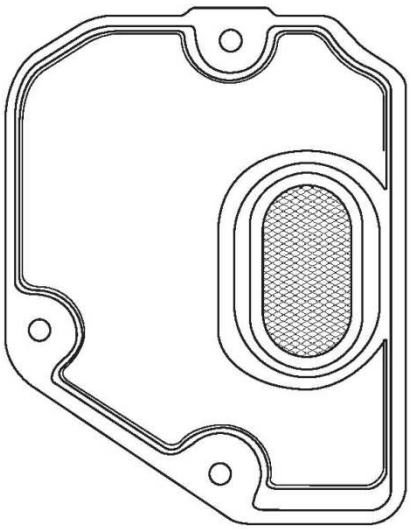
09M Filter-04
Passat 06-ON



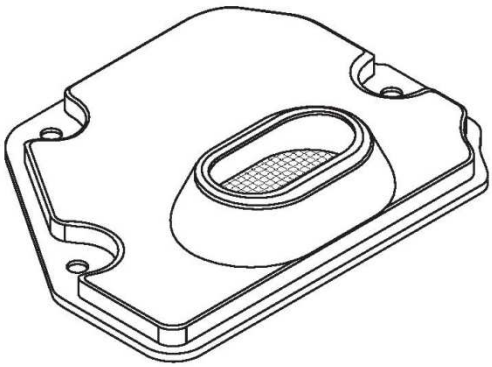


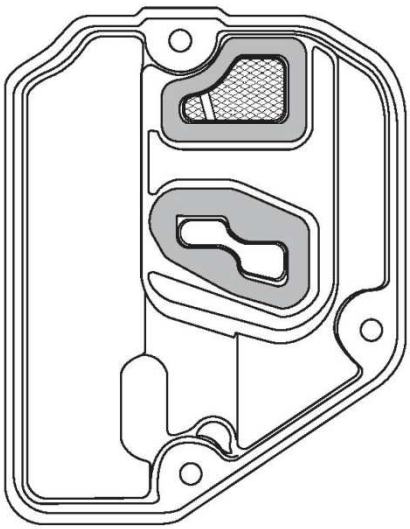
Pan Side

VB Side



09G Filter-05
Mini-Cooper 06-ON



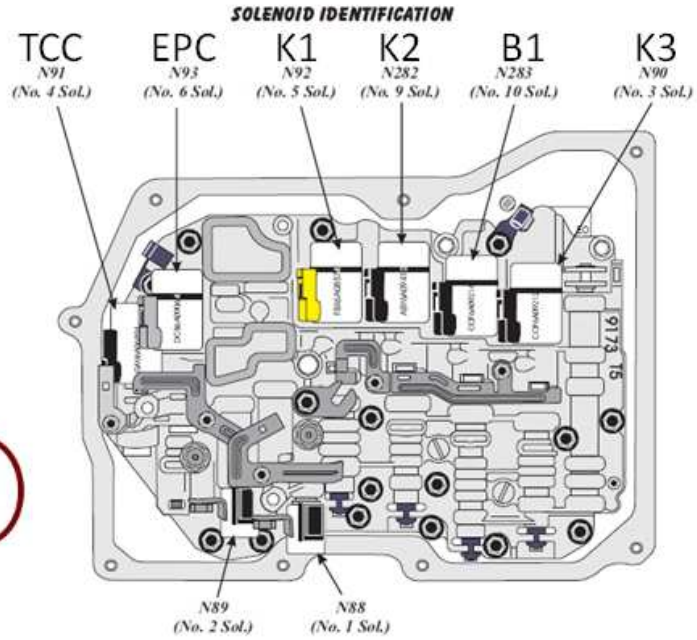


Pan Side

VB Side

Industrial No: 133952
Application: EPC, K1, K2, K3,B1
N93,N92,N282,N90,N283

Industrial No: 133951
Application TCC
N91



INDIVIDUAL SOLENOID FUNCTION AND RESULT OF FAILURE

N88 Solenoid (No. 1 Solenoid)
The N88 Solenoid is an ***On/Off*** solenoid and is On and Open in gears 4th through 6th. If this solenoid fails in the Closed (Off) position, 4th through 6th gear will not be available.

N89 Solenoid (No. 2 Solenoid)
The N89 Solenoid is also an ***On/Off*** solenoid and is On and Open, to allow the apply of the torque converter clutch. When both the N88 and N89 solenoids are energized at the same time, the B2 brake clutch is applied in Tiptronic 1st Gear (Manual Low). If the N89 Solenoid fails in the Closed (Off) position, there will be no torque converter clutch apply and no engine braking in Tiptronic 1st gear (Manual Low).

N90 Solenoid (No. 3 Solenoid)
The N90 Solenoid is a ***normally applied***, pulse width modulated solenoid controlling the apply and release of the K3 Clutch. When this solenoid is fully Off, the K3 clutch is fully applied. If this solenoid fails in the Off (Normally Applied) position, 3rd, 5th and Reverse shifts may be firm.

N91 Solenoid (No. 4 Solenoid)
The N91 Solenoid is a ***normally vented***, pulse width modulated solenoid controlling the apply and release of the converter clutch, with the ability to ramp the apply and release. When this solenoid is fully Off, the converter clutch is fully released. If this solenoid fails in the Off (Normally Vented) position, there will be no converter clutch application.

Solenoid N92 (No. 5 Solenoid)
The N92 Solenoid is a ***normally applied,*** pulse width modulated solenoid controlling the apply and release of the K1 Clutch. When this solenoid is fully Off, the K1 clutch is fully applied. If this solenoid fails in the Off (Normally Applied) position, 1st through 4th shifts may be firm.

Solenoid N93 (No. 6 Solenoid)
The N93 Solenoid is a ***normally applied***, pulse width modulated solenoid and controls the main line pressure. When this solenoid is fully Off, maximum line pressure is the result. If this solenoid fails in the Off (Normally Applied) position, all shifts will be harsh.

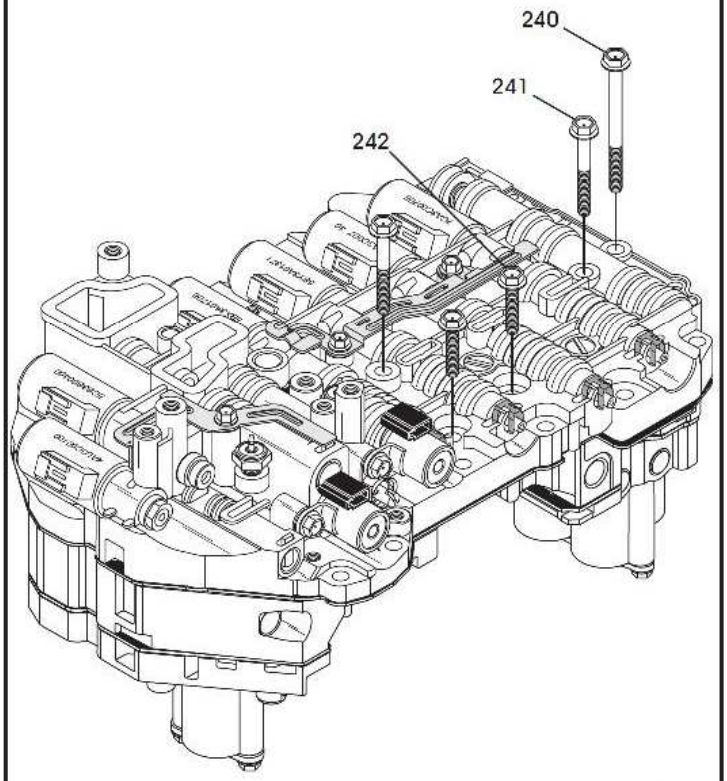
Solenoid N282 (No. 9 Solenoid)
The N282 Solenoid is a ***normally applied***, pulse width modulated solenoid controlling the apply and release of the K2 Clutch. When this solenoid is fully Off, the K2 clutch is fully applied. If this solenoid fails in the Off (Normally Applied) position, 4th, 5th and 6th shifts may be firm.

Solenoid N283 (No. 10 Solenoid)
The N283 Solenoid is a ***normally applied***, pulse width modulated solenoid controlling the apply and release of the B1 Clutch. When this solenoid is fully Off, the B1 clutch is fully applied. If this solenoid fails in the Off (Normally Applied) position, 2nd and 6th shifts may be firm.

COMPONENT REBUILD

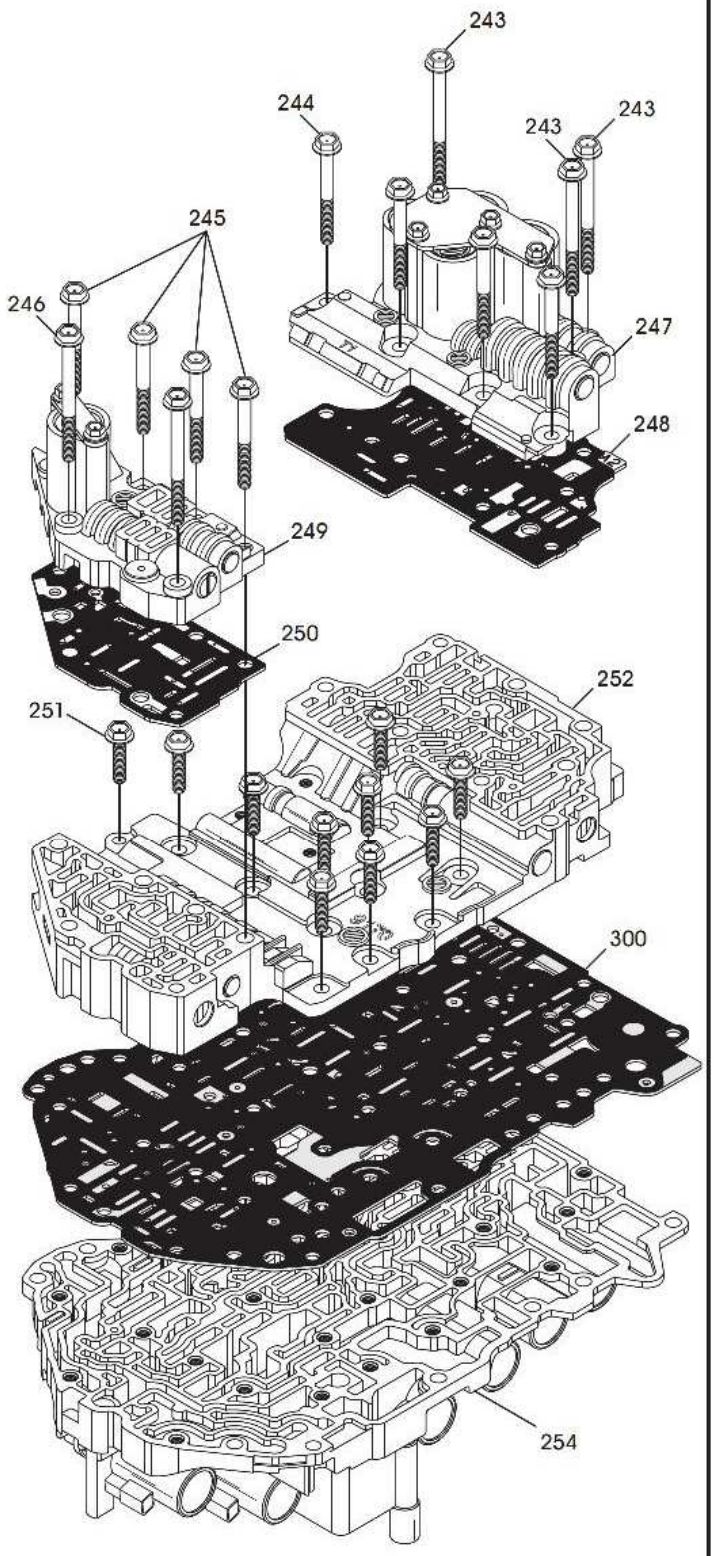
VALVE BODY ASSEMBLY

1. Disassemble the main valve body components using Figure 148 and 149 as a guide.
   Note: All valve body bolt lengths are found in the legend and must be positioned properly.
2. Clean all valve body components thoroughly and dry with compressed air.
   Note: Do not submerge solenoids in solvent.
3. Inspect all valve body components thoroughly for any damage.



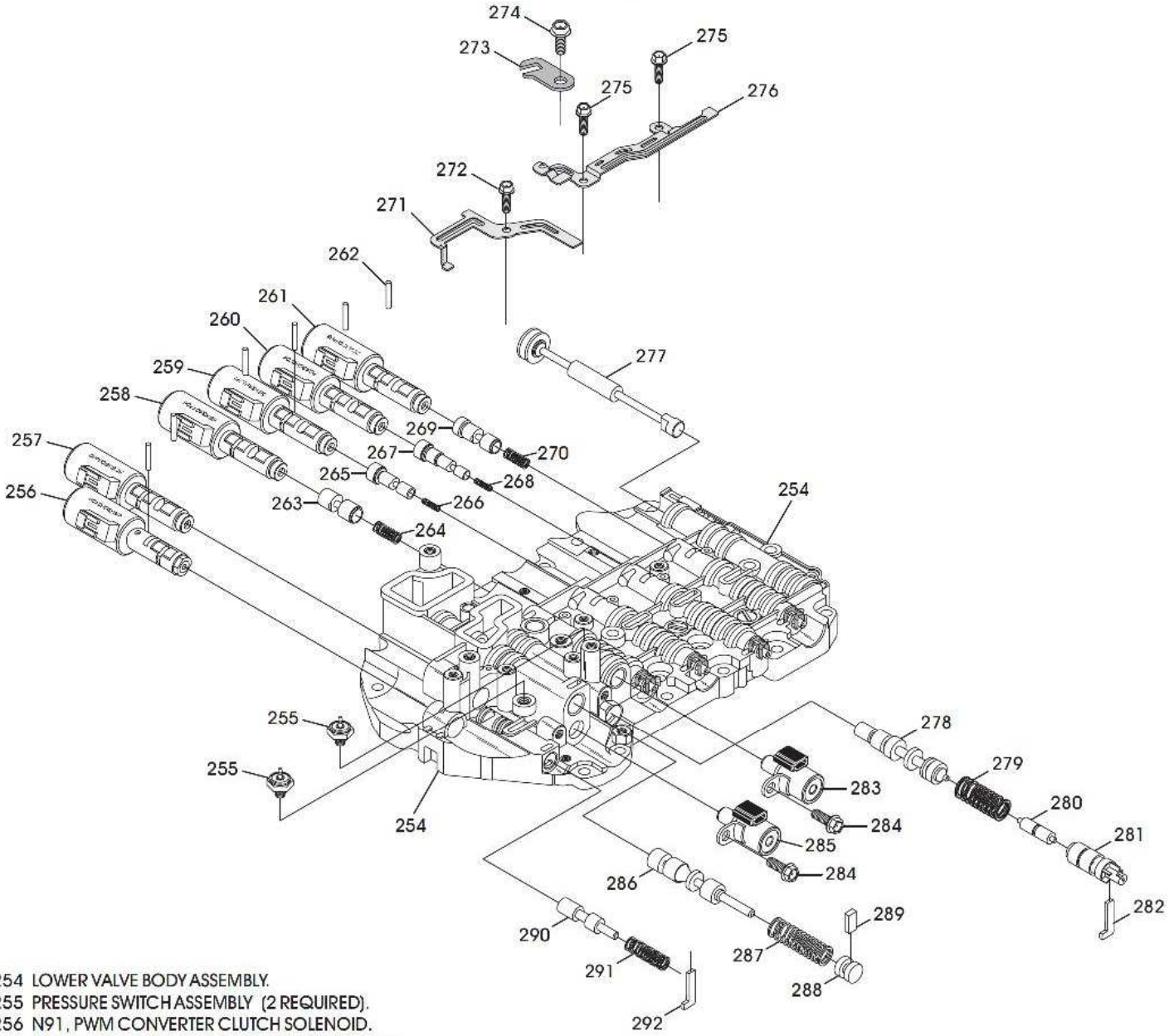
240 LOWER V.B. TO ACCUMULATOR HOUSING 2 BOLT (70 MM LENGTH).
241 LOWER V.B. TO UPPER V.B. BOLT (39.5 MM LENGTH).
242 LOWER V.B. TO UPPER V.B. BOLT (28 MM LENGTH).
243 ACCUMULATOR 2 HOUSING TO UPPER V.B. (64 MM LENGTH)(3 REQ).
244 ACCUMULATOR-2 HOUSING TO UPPER V.B. (52 MM LENGTH)(4 REQ).
245 ACCUMULATOR-1 HOUSING TO UPPER V.B. (52 MM LENGTH)(4 REQ).
246 ACCUMULATOR-1 HOUSING TO UPPER V.B. (64 MM LENGTH)(2 REQ).
247 ACCUMULATOR-2 HOUSING ASSEMBLY.
248 ACCUMULATOR-2 ASSEMBLY SPACER PLATE.
249 ACCUMULATOR-1 HOUSING ASSEMBLY.
250 ACCUMULATOR-1 ASSEMBLY SPACER PLATE.
251 UPPER V.B. TO LOWER V.B. BOLTS (21 MM LENGTH)(10 REQUIRED).
252 UPPER VALVE BODY ASSEMBLY.
254 LOWER VALVE BODY ASSEMBLY.
300 MAIN VALVE BODY SPACER PLATE.

"09G" VALVE BODY EXPLODED VIEW



See Legnd in Figure 148

"09G" LOWER VALVE BODY ASSEMBLY, EXPLODED VIEW



254 LOWER VALVE BODY ASSEMBLY.
255 PRESSURE SWITCH ASSEMBLY (2 REQUIRED).
256 N91, PWM CONVERTER CLUTCH SOLENOID.
257 N93, PWM LINE PRESSURE CONTROL SOLENOID.
258 N92, PWM K1 CLUTCH CONTROL SOLENOID.
259 N282, PWM K2 CLUTCH CONTROL SOLENOID.
260 N283, PWM B1 CLUTCH CONTROL SOLENOID.
261 N90, PWM K3 CLUTCH CONTROL SOLENOID.
262 PWM SOLENOID RETAINING PINS (6 REQUIRED)
263 K1 CLUTCH REGULATOR VALVE.
264 K1 CLUTCH REGULATOR VALVE SPRING.
265 K2 CLUTCH REGULATOR VALVE.
266 K2 CLUTCH REGULATOR VALVE SPRING.
267 B1 CLUTCH REGULATOR VALVE.
268 B1 CLUTCH REGULATOR VALVE SPRING.
269 K3 CLUTCH REGULATOR VALVE.
270 K3 CLUTCH REGULATOR VALVE SPRING.
271 N91 AND N93 SOLENOID PIN RETAINING BRACKET.
272 SOLENOID PIN RETAING BRACKET BOLT.
273 TRANSAXLE FLUID TEMPERATURE SENSOR RETAINING BRACKET.
274 TFT SENSOR RETAINING BRACKET BOLT.
275 SOLENOID PIN RETAINING BRACKET BOLTS (2 REQUIRED).
276 N92, N282, N283, N90 SOLENOID PIN RETAINING BRACKET.
277 MANUAL VALVE.
278 PRIMARY PRESSURE REGULATOR VALVE.
279 PRIMARY PRESSURE REGULATOR VALVE SPRING.
280 PRIMARY PRESSURE REGULATOR BOOST VALVE.
281 PRIMARY PRESSURE REGULATOR BOOST VALVE SLEEVE.
282 PRIMARY REGULATOR BOOST SLEEVE RETAINER.
283 N88, ON/OFF SOLENOID.
284 SOLENOID RETAINING BOLT (2 REQUIRED).
285 N89, ON/OFF SOLENOID.
286 SECONDARY PRESSURE REGULATOR VALVE.
287 SECONDARY PRESSURE REGULATOR SPRING.
288 SECONDARY PRESSURE REGULATOR BORE PLUG.
289 SECONDARY PRESSURE REGULATOR BORE PLUG RETAINER.
290 N88, N89, N90, N282, N283 SOLENOID REGULATOR VALVE.
291 SOLENOID REGULATOR VALVE SPRING.
292 SOLENOID REGULATOR VALVE SPRING RETAINER.

Transmission Solenoid - Harness Connectors Chart

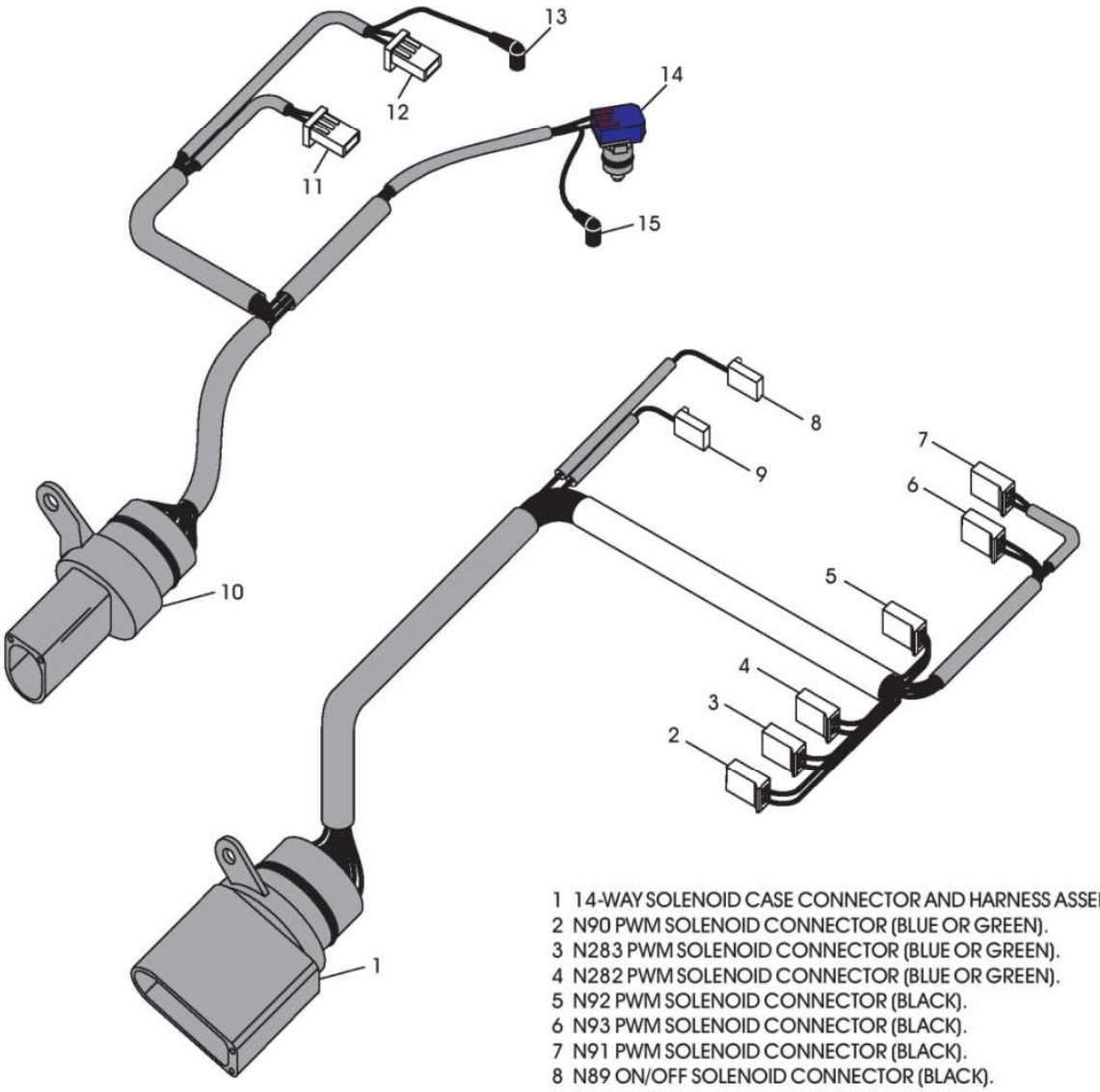
Pass-Thru Case Connectors

There are 2 pass-thru case connectors and internal wire harness assemblies used on these units. One is an 8-way connector that serves all of the internal sensors and one 14-way connector that serves all of the solenoids, as shown in Figure 15.

As stated previously, the transaxle temp sensor is an integral part of the 8-way connector and wire harness assembly, as shown in Figure 15.

Continued on Page 15

8-WAY AND 14-WAY PASS-THRU CASE CONNECTORS AND HARNESS ASSEMBLIES



Wire Harness' Vary Depending On Model And Year

1 14-WAY SOLENOID CASE CONNECTOR AND HARNESS ASSEMBLY.
2 N90 PWM SOLENOID CONNECTOR (BLUE OR GREEN).
3 N283 PWM SOLENOID CONNECTOR (BLUE OR GREEN).
4 N282 PWM SOLENOID CONNECTOR (BLUE OR GREEN).
5 N92 PWM SOLENOID CONNECTOR (BLACK).
6 N93 PWM SOLENOID CONNECTOR (BLACK).
7 N91 PWM SOLENOID CONNECTOR (BLACK).
8 N89 ON/OFF SOLENOID CONNECTOR (BLACK).
9 N88 ON/OFF SOLENOID CONNECTOR (BLACK).
10 8-WAY SENSOR CASE CONNECTOR AND HARNESS ASSEMBLY.
11 INPUT SPEED SENSOR CONNECTOR (WHITE).
12 OUTPUT SPEED SENSOR CONNECTOR (BLUE).
13 NUMBER 2 PRESSURE SWITCH CONNECTOR (SOME MODELS).
14 TRANSAXLE FLUID TEMPERATURE SENSOR.
15 NUMBER 1 PRESSURE SWITCH CONNECTOR (SOME MODELS).

Fig.15

Pass-Thru Case Connectors (Cont'd)

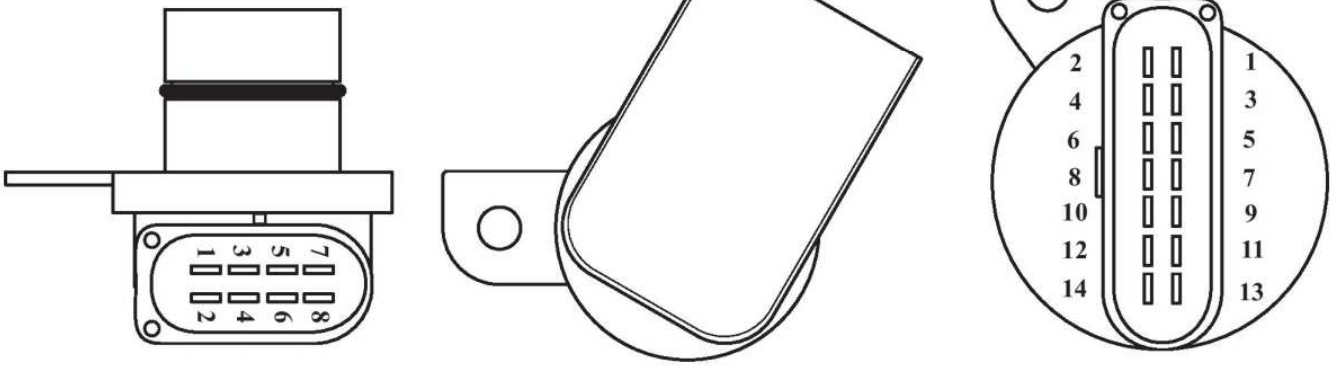
The Volkswagen 09G transaxles observed are shown in Figure 19. Notice on these models there are 2 different mountings for the 8-way connector to the case. "Some" cases are equipped with both mounting holes, so mark the location before you disassemble.

The 09M transaxle observed has the 8-way connector going straight out the rear, with the 14-way mounted in the left front location, as shown in Figure 20.

Note: Regardless of the direction that connector is rotated during the manufacturing process the terminal numbers will remain the same, as the numbers are rotated along with the connector on all models. Terminal number 1 will always be at the square end of the connector, as shown in the illustrations.

Refer to Figure 17, 18, 19, and 20 for case connector terminal identification of your model.

BMW MINI-COOPER



8-Way Connector Top View

8-Way Connector Face View

14-Way Connector Face View

Figure 17

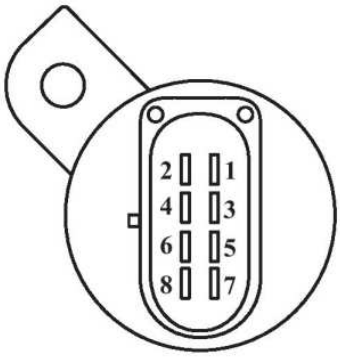
VOLKSWAGEN 09K

09K 300 038

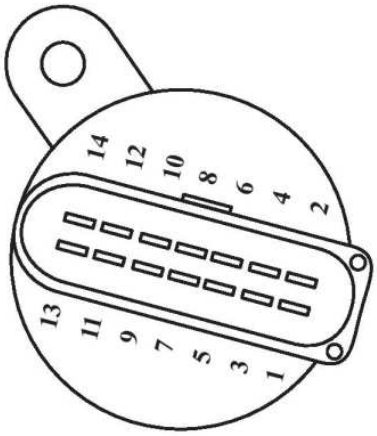
8-Way Connector Face View

14-Way Connector Face View

VOLKSWAGEN 09G
09G 300 035H

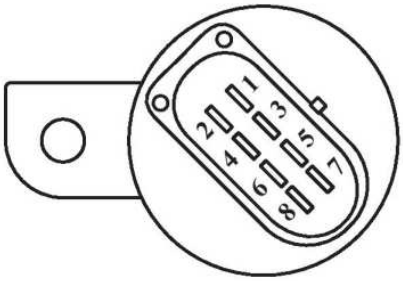


8-Way Connector
Face View

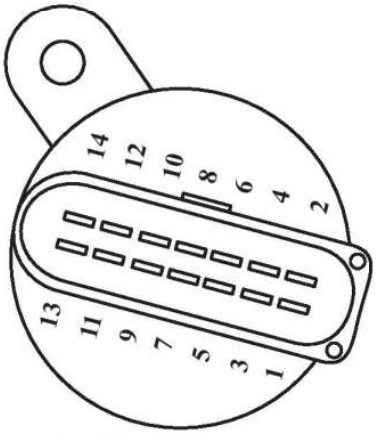


14-Way Connector
Face View

VOLKSWAGEN 09G
09G 300 035P



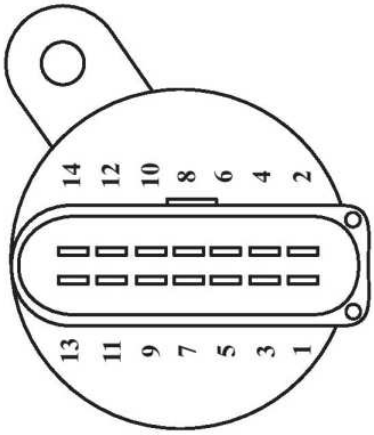
8-Way Connector
Face View



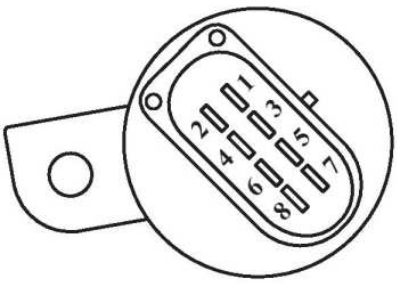
14-Way Connector
Face View

Figure 19

VOLKSWAGEN 09M
09M 320 035H



14-Way Connector
Face View



8-Way Connector
Face View

Figure 20

RESISTANCE CHART THROUGH 14-WAY CASE CONNECTOR

Solenoid Number (Name)	*Positive Meter Lead Terminal No. (Wire Color)*	*Negative Meter Lead Terminal No. (Wire Color)*	Ohms Resistance
Solenoid No. 1 (N88)	1 (White)	Case Ground	*10.0 - 16.0*
Solenoid No. 2 (N89)	2 (Black)	Case Ground	*10.0 - 16.0*
Solenoid No. 3 (N90) K3	7 (Lt. Blue)	8 (Lt. Green)	*4.0 - 8.0*
Solenoid No. 4 (N91) TCC	11 (Lt. Green)	12 (Brown)	*4.0 - 8.0*
Solenoid No. 5 (N92) K1	3 (Yellow)	4 (Purple)	*4.0 - 8.0*
Solenoid No. 6 (N93) EPC	13 (Green)	14 (Grey)	*4.0 - 8.0*
Solenoid No. 9 (N282) K2	5 (Red)	6 (Blue)	*4.0 - 8.0*
Solenoid No. 10 (N283) B1	9 (White)	10 (Black)	*4.0 - 8.0*

When comparing resistance readings of On/Off solenoids, the resistance should be within .5 Ohms of one another.
When comparing resistance readings of PWM solenoids, the resistance should be within .5 Ohms of one another.

RESISTANCE CHART THROUGH 8-WAY CASE CONNECTOR

Sensor ID (Name)	*Positive Lead Term. No. (Color)*	*Negative Lead Term. No. (Color)*	*Temperature F° (C°)*	*Ohms Resistance*
TFT (G93)	1 (Orange)	2 (Orange)	*-22°F (-30°C)*	*37K - 51K Ohms*
			50°F (10°C)	*5K - 8K Ohms*
			77°F (25°C)	*3K - 5K Ohms*
			230°F (110°C)	*230 - 265 Ohms*
			293°F (145°C)	*100 - 120 Ohms*
ISS (G182)	3 (White)	4 (Red)	*77°F (25°C)*	*5.0M Ohms**
OSS (G195)	5 (Tan)	6 (Blue)	*77°F (25°C)*	*5.0M Ohms**
PS1 (G193)	7 (N/A)**	Case Ground		*0 = Open*
PS2 (G194)	8 (N/A)**	Case Ground		*0 = Open*

** The ISS and OSS are Hall Affect Sensors and should be checked using a scope under operating conditions. The resistance values provided in the chart are from new sensors. Resistance checks on these type of sensors would, at best, inform you of either open or grounded circuits within the sensor itself.*

*** Both pressure switches were eliminated in all 09G transaxles from June 2004 on.*

Wire colors provided in these charts are "Internal" colors.

Figure 21

Complaint:

- Harsh up or downshifts
- TCC slip, fluid overheat
- RPM cycling at low speed or coast

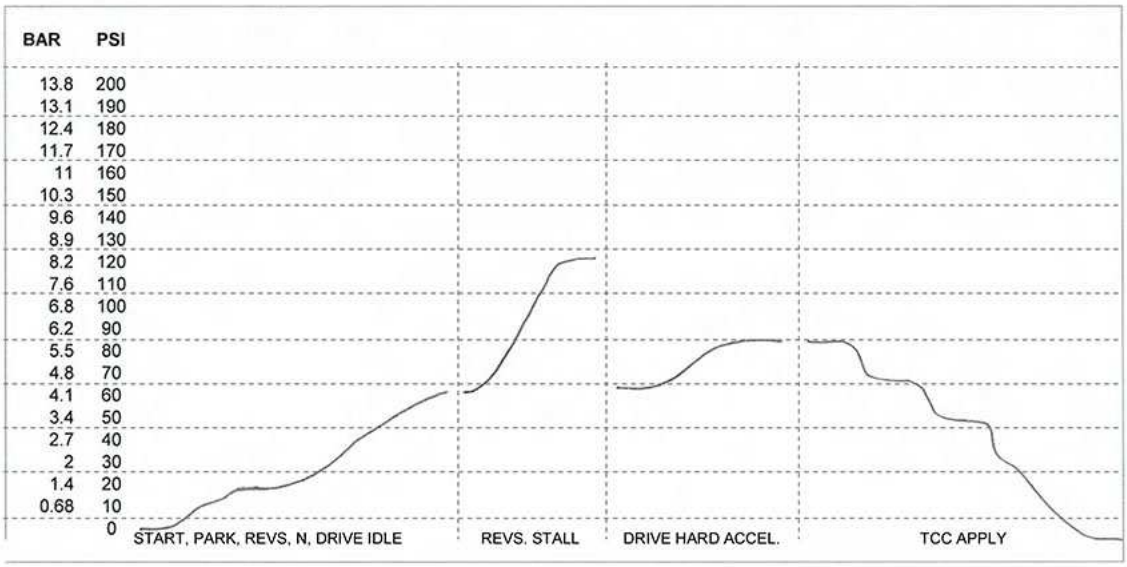
Cause:

- TCC clutch is not releasing or loss of TC modulation control
- Torque converter clutch control valve bore worn and/or secondary regulator valve bore worn

Diagnostic Procedure:

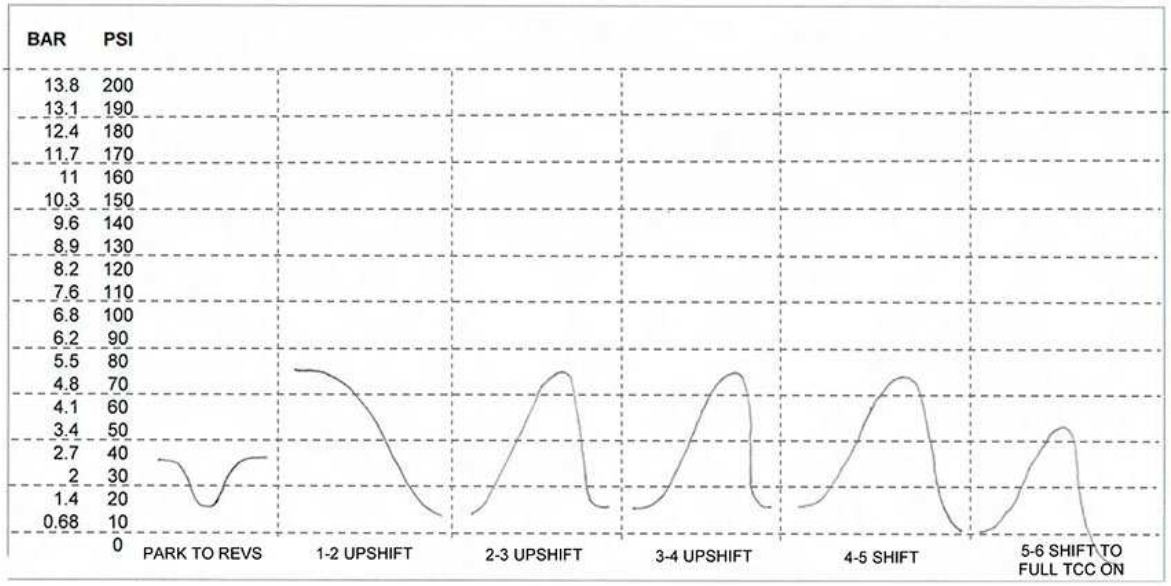
- Monitor converter release pressure to verify the clutch is being controlled. If release psi remains low (see chart) during up/down shift, the control valve is not stroking. Compare the release pressure to TCC solenoid amperage. For overheated conditions, also monitor cooler flow (see chart)

AW6 CONVERTER RELEASE PRESSURE (Typical)



Note: Tapping release pressure is a good method to verify operation of #4-N 91 solenoid.
TCC modulates off-on during 4-5-6 gear shifts. This tap is a method to verify TCC is affecting shift quality.
TCC modulates on after 1-2 shift.
TCC cut off during Tip-Tronic up & downshifts
TCC remains on during coast down.
If cooler release pressure is low, check fluid level!

AW6 CONVERTER RELEASE PRESSURE



TCC strategy of partial slip between upshifts.
TCC may remain applied on coast down for engine braking.
When converter is fully applied, release will be –0-
All Converter apply & release flow & pressure is controlled by lock-up control valve and fed by secondary regulator valve, limiting it to 125 psi.

Complaint:

- Flare on 2-3 shift
- Harsh engagement
- Delay forward or reverse

Cause:

- Clutch control valves (at solenoid bore) are out of adjustment. Primarily K3/C3 and or B1
- K3 valve is most active and bore wears quickly

Correction & Diagnosis:
Must repair K3/C3 clutch control valve body, then:

- Remove oil pan and adjust clutch control valves. Always measure & record the OE position
- To overcome a flare on 2-3, back out the K3 adjuster which increases apply psi. You may have to turn in the B1 adjuster to slow down its exhaust rate. Suggest 1/2 to 3/4 turn per test
- Suggest use of graphing scanner to monitor engine RPM vs. ISS RPM. Should not have spikes in engine RPM during down shift. Engine RPM and ISS #182, sensors should parallel each other. If the engine RPM has spikes at the beginning of shift, clutch pressure is not high/fast enough. If the engine RPM sensor appears to be a square form or dips down during shift, there is a bind up and the opposing clutch (probably B1) may have to be adjusted as well!

Note: On the TF-60SN (VW 09G/09K/09M), the Ross-Tech performs well for this diagnosis. (www.Ross-Tech.com).

Complaint:

- Slippage or loss of 3-4, K-2 clutch failure

Cause:

- TF-60 series commonly have a cross leak under the case sleeve which feeds the K-2 clutch

Correction:

- Replace the sleeve with an aftermarket with improved retention

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Complaint:

- Loss of lubrication
- Transmission temperature codes
- Enable of shift mode I or II

Cause:

- Incorrect valve body and separator plate for case lube design
- Remote heat exchanger and case mounted cooler use different separator plates

Correction:

- Install matching parts. To isolate this (prior to road test) check for cooler flow and release pressure on the lift. Refer to related charts

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Complaint:

- (09M, 09G) Harsh reverse, 3rd or 5th
- Bind up on 3-4 or 3-2

Cause:

- Damaged K-3 clutch balance piston. This piston acts as a return and accumulator counter acting upon the K-3 apply piston

Correction:

- Need to replace the K-3 drum assembly unless pistons are available
- Aftermarket pistons are now available with tabs to eliminate the radial piston movement

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Complaint:

- Post overhaul, flare upshifts or bumpy downshifts

Cause:

- Failure to reset adapts or relearn strategy has not been completed

Correction:

- Reset all control modules
- Perform a drive cycle relearn of 15 shift cycles

Complaint:

- Fluid discoloration
- TCC clutch failure

Cause:

- Improper fluid will not control TCC clutch slip rate and dissipate heat.

Correction: Suggested fluids

- T-IV or 1161540 for Volvo
- XT-8QAW-Ford
- JW53309-Mazda
- 9986195-GM
- Mobile 1, ESSO or Castrol full synthetic are aftermarket alternatives

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Complaint:

- No reverse, Loss of gear
- Low fluid level

Cause:

- Solenoid wiring may be incorrect

VW Fill adapter:
Some VW applications use a plastic fill elbow that enters above the pan and to the left of front. The number on the part is VW AG-JP57344-02. The case could be bored to accept this fill adapter. It would require drilling the case to .517" ID (13.1mm) to a depth of .487" (12.3mm). At the base of the first bore is a stepped transition to a final bore of .412" (10.4mm)

Complaint:

- Harsh coast downshifts, harsh upshifts

Cause:

- TCC control valve bore and sleeve wear. Bore wear reduces the hydraulic control of release pressure on the converter piston. The piston remains applied during the shift

Correction:

- Service TCC control bore and sleeve

Complaint:

- Flare/long upshifts, gear ratio codes, loss of gear

Cause:

- Bore wear at a specific clutch control valve
- Solenoid modulator valve bore worn
- Clutch circuit, relay valve sticking
- SL clutch control solenoid defective or contaminated
- Main pressure regulator bore and/or boost sleeve worn
- Incorrect fluid level

Correction:

- Inspect and service in order of above

Complaint:

- Delayed forward engagement

Cause:

- Valve body temperature sensor not registering properly. (Will also affect TCC apply)
- Fluid level incorrect'C-1/ K-1 clutch control valve bore worn or defective solenoid

Correction:

- Service C-1/K-1 valve and test thermal element