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"Shiftin' Great in 2008" Seminar Information

ATSG Seminars

Thank you for attending ATSG's "Shiftin' Great in 2008" technical training seminar. As you can see, the ATSG Technical staff put together a quality seminar to help professionals like your self to stay on top of the trade with information that can be used to fix problems and repair transmissions for years to come. These seminars are presented across the US and Canada with a wide spectrum of technicians attending them so we encourage any suggestions that you may have. It is our interest to see the transmission industry prosper and that begins with getting the right price for a job done once. Getting the right price but doing the job 3 or 4 times hurts both the employee and the employer. Without question, training and information make for great companions in transmission repair. You can submit your suggestions by either e-mail or snail-mail. To send by e-mail, please use atsgsem@atsg.biz or atsgsem@atsgmiami.com. By snail-mail please use the address located at the bottom of the page. Thank you.

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BMW/ISUZU
4L30E INADEQUATE LINE RISE

COMPLAINT: Before or after overhaul, a BMW/ISUZU with the 4L30E transmission exhibits a complaint of soft or flared up-shifts, complaints of slipping, or gear ratio codes stored. A line pressure check indicates pressure is not increasing properly with throttle opening and an electrical check shows proper amp drop in EPC Solenoid circuit.

CAUSE: One cause may be a worn Feed Limit Valve bore in the Adapter Case Valve Body.

The responsibility of the Feed Limit Valve is to regulate line pressure before it is fed to the Force Motor/Pressure Control Solenoid. As the valve bore wears, the valve and spring will lose it's ability to regulate properly, as bore wear becomes more severe, excessive exhaust of line pressure occurs creating the soft or flared shifts, slipping and other complaints.

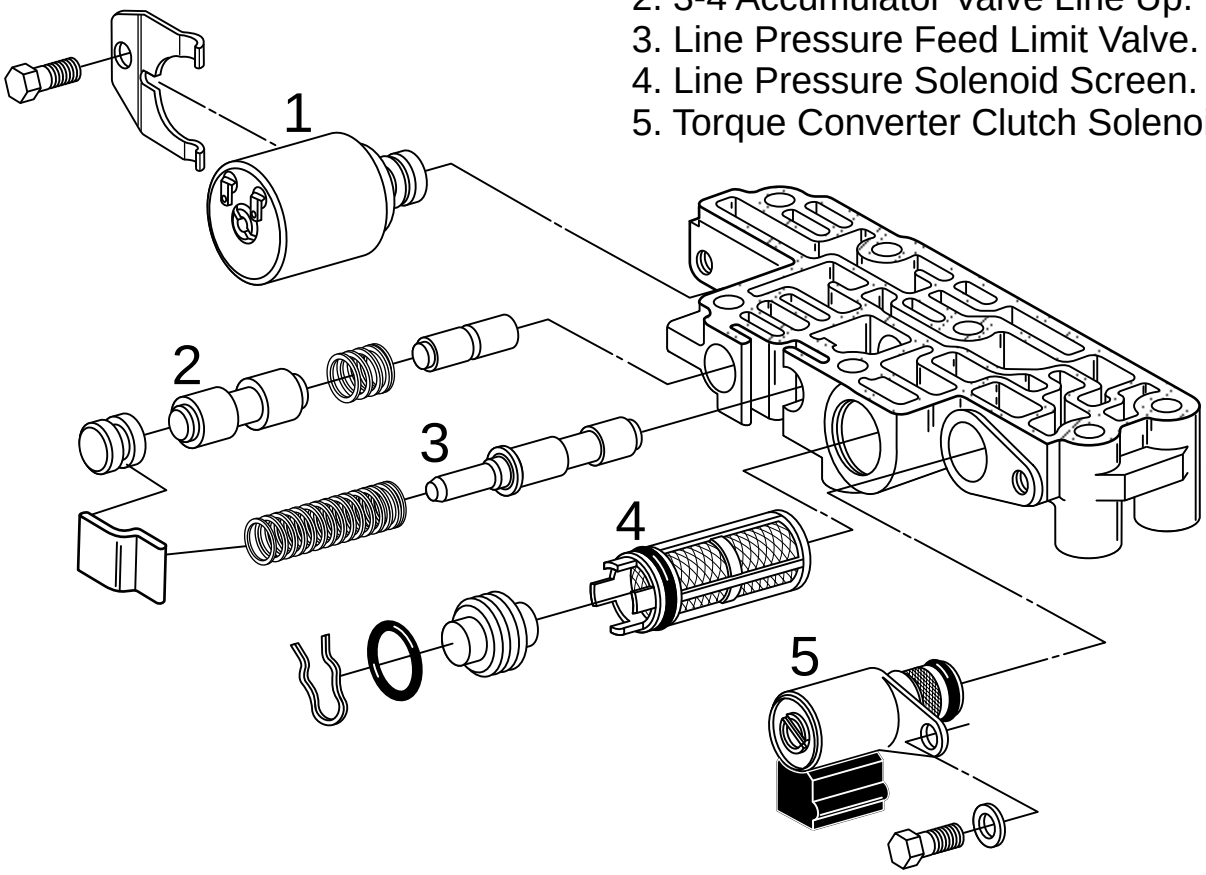
Refer to Figure 1 for diagram of Adapter Case Valve Body, and a partial cross-sectional view of the Feed Limit Valve, showing bore wear location.

CORRECTION: Replace the Adapter Case Valve Body.

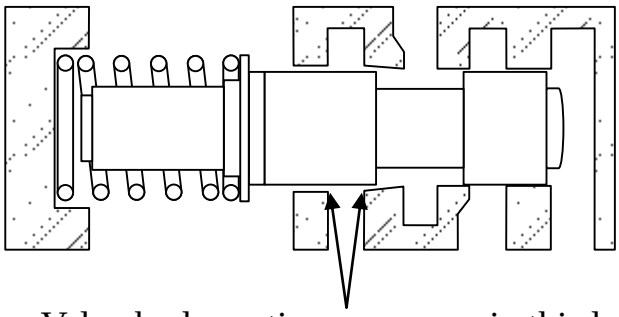
Many thanks to Dano at Dano's Transmissions for supplying us with the valve body.

ADAPTER CASE
VALVE BODY

1. Line Pressure Solenoid.
2. 3-4 Accumulator Valve Line Up.
3. Line Pressure Feed Limit Valve.
4. Line Pressure Solenoid Screen.
5. Torque Converter Clutch Solenoid.



PARTIAL CUTAWAY OF
FEED LIMIT VALVE BORE



Valve body casting may wear in this location
allowing line pressure to exhaust excessively.

Figure 1

BMW/2000 AND LATER ISUZU
4L30E NO REVERSE, BINDS IN 2ND

COMPLAINT: After overhaul, a BMW or 2000 - Later ISUZU with the 4L30E transmission exhibits a complaint of No Reverse, and Binds in 2nd Gear.

CAUSE: One cause may be a missing check ball in the adapter case housing.

BMW and 2000 - Later ISUZU vehicles utilize a ***"Reverse Inhibit"*** feature to prohibit application of the reverse clutch and prevent the possibility of damage to transmission components while driving in forward ranges. If the computer detects that reverse gear has been selected while driving forward with vehicle speed above 7 miles per hour, the TCM will energize and activate the Torque Converter Clutch Solenoid allowing the ***"Reverse Inhibit"*** valve located in the center support to move into a position which will block reverse clutch oil from applying the reverse clutch.

Refer to Figure 1 for location of the check ball in the adapter case housing, and the spacer plate identification. Refer to Figure 2 for a diagram of the BMW and 2000 and later ISUZU center support housing assembly which utilizes the "Reverse Inhibit" valve.

If during overhaul the check ball that is located in the adapter housing is omitted, two things will occur. The transmission will have no engagement in reverse, and it will bind up on the shift into 2nd gear. To see how this occurs, refer to the partial hydraulic diagrams in Figures 3, 4, 5 and 6.

Figure 3 shows the ball properly installed in the adapter housing. Note the ball seats against the separator plate and forces oil into the reverse clutch circuit, through the reverse inhibit valve then applying the reverse clutch, while at the same time blocking oil from entering the 2nd clutch circuit.

Figure 4 shows a missing check ball in the housing. With no check ball to seat against the plate, reverse oil pressure passes into the 2nd clutch circuit. Oil pressure flows through the 1-2/3-4 shift valve and exhausts at the 2-3 shift valve giving the neutral condition.

Figure 5 shows the ball properly installed in 2nd gear. Note the ball seats against the plate, and blocks oil from entering the reverse clutch circuit.

Figure 6 shows the ball missing. Oil pressure is allowed to enter the reverse clutch circuit causing the reverse clutch and 2nd clutch to apply together which causes the bind up condition on the shift.

CORRECTION: Install the check ball in the adapter housing.

ADAPTER HOUSING CHECK BALL LOCATION AND SEPARATOR PLATE ID.

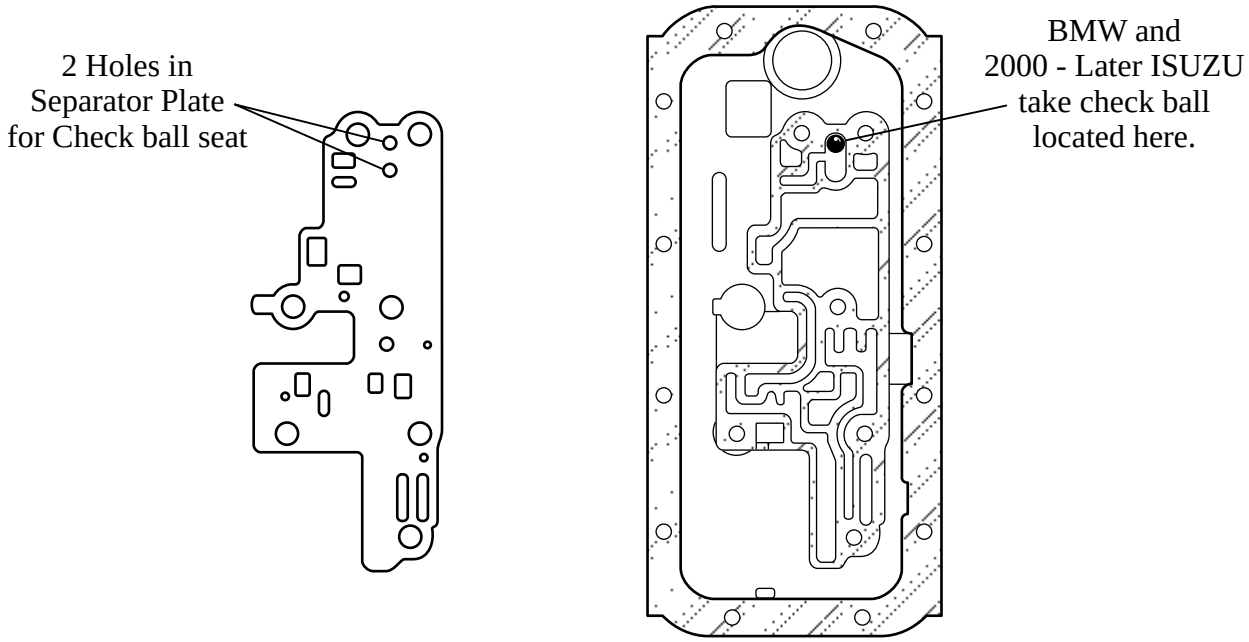
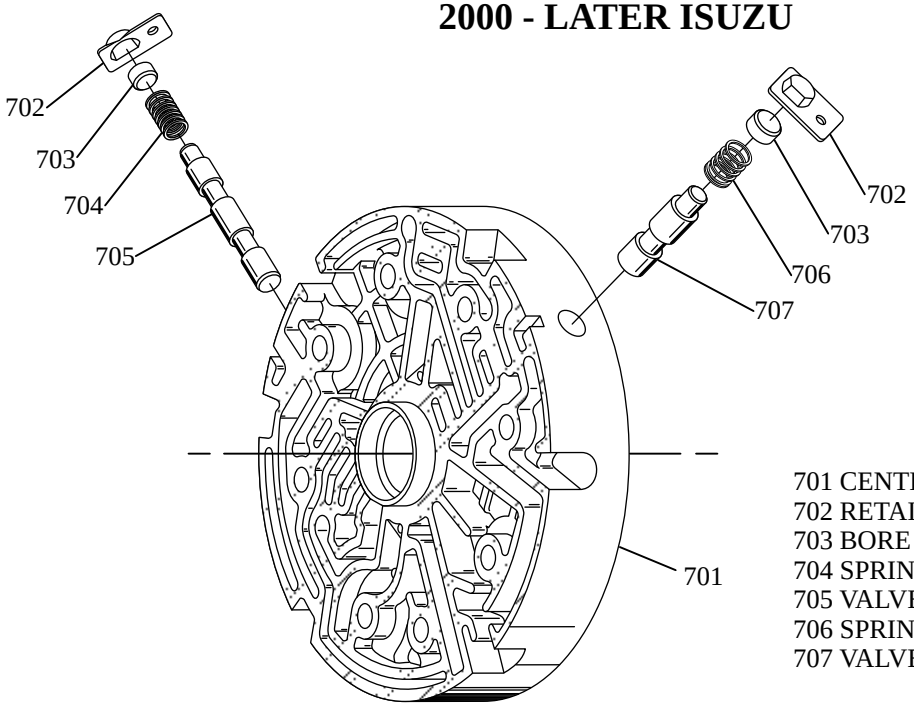


Figure 1

CENTER SUPPORT ASSEMBLY BMW AND 2000 - LATER ISUZU



701 CENTER SUPPORT
702 RETAINER PLATE
703 BORE PLUG
704 SPRING OVERRUN INHIBIT
705 VALVE OVERRUN INHIBIT
706 SPRING REVERSE INHIBIT CONTROL
707 VALVE REVERSE INHIBIT CONTROL

Figure 2

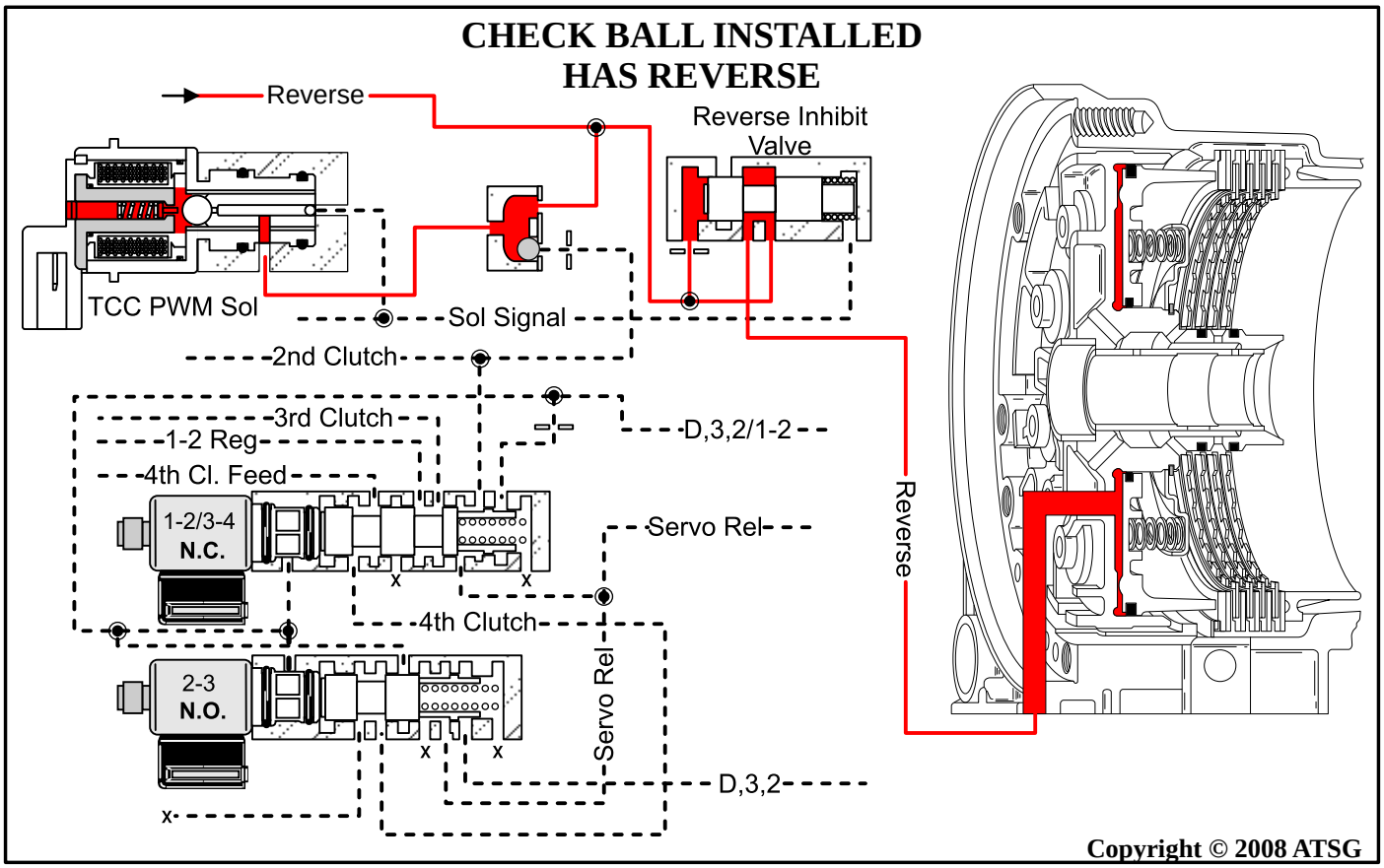


Figure 3

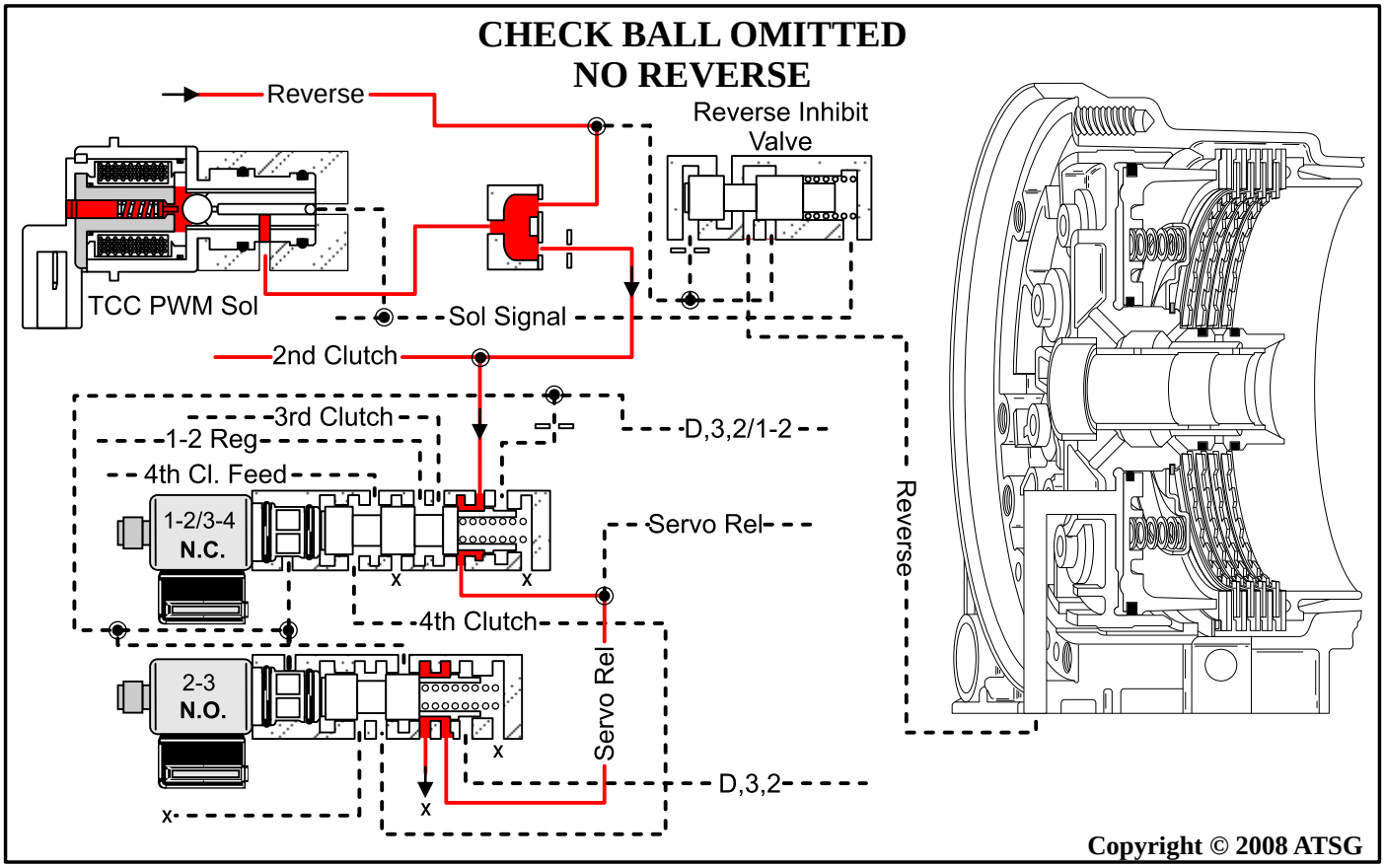


Figure 4

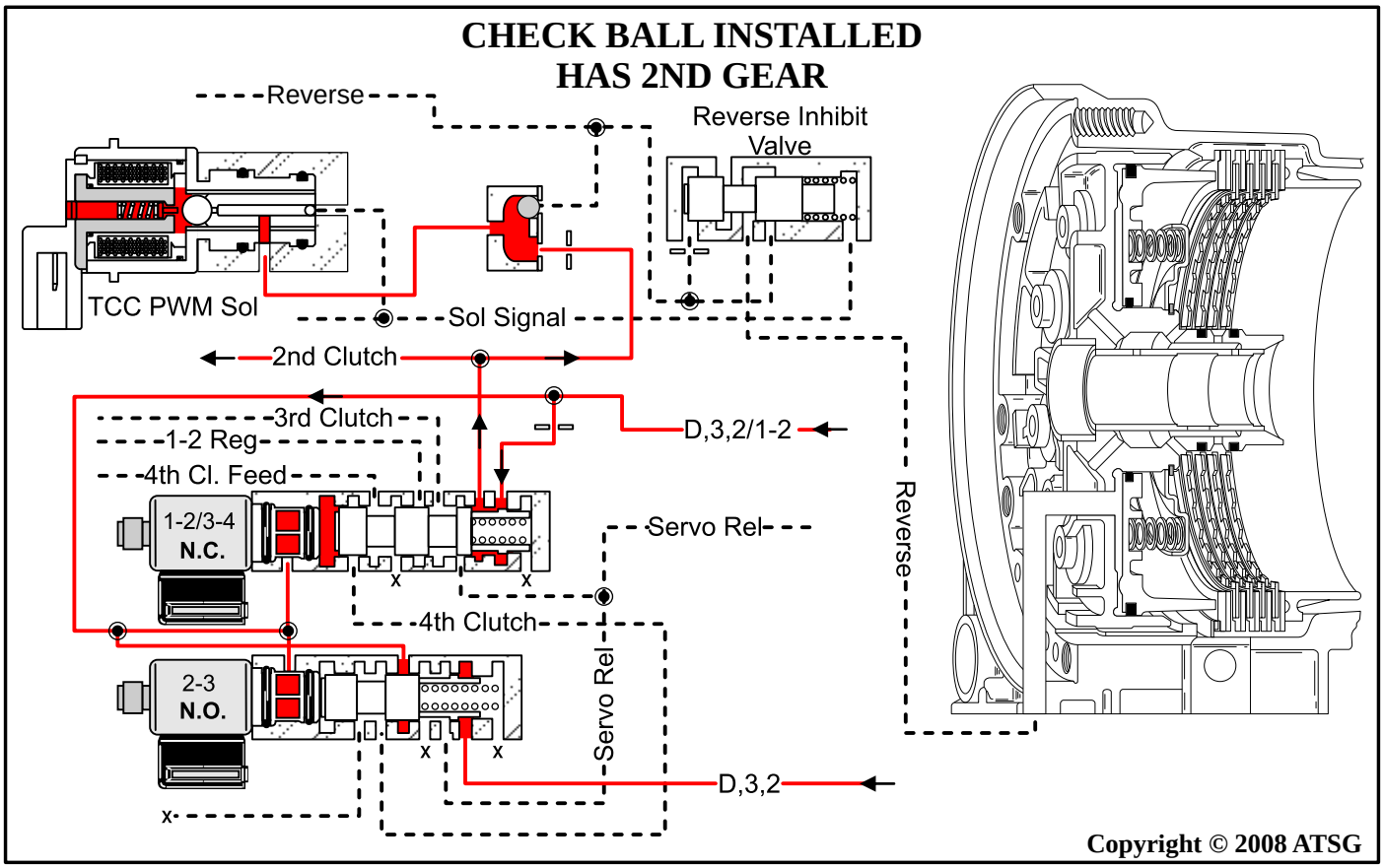


Figure 5

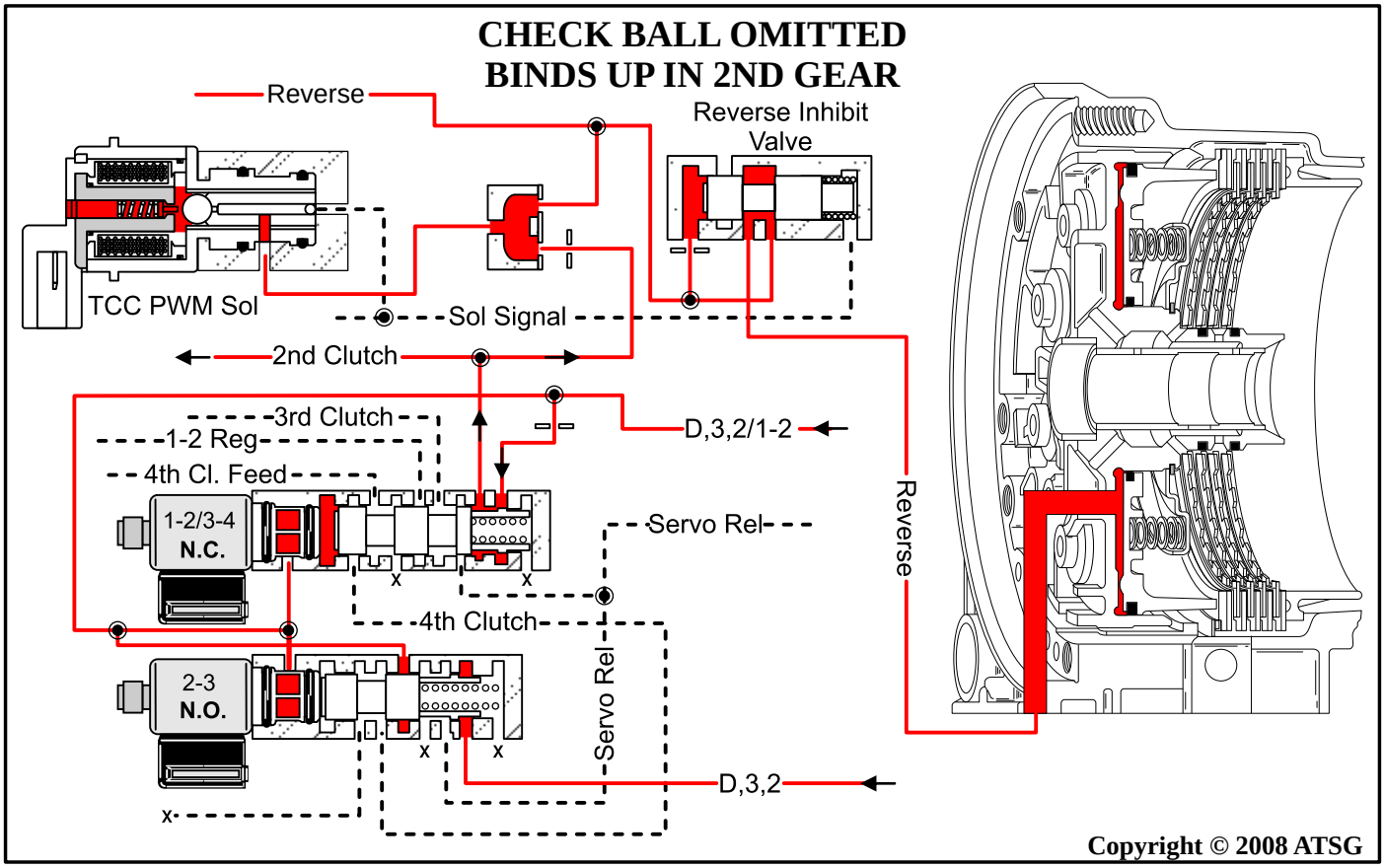


Figure 6

4L30E

VARIOUS INTERNAL COMPONENT CODES STORED

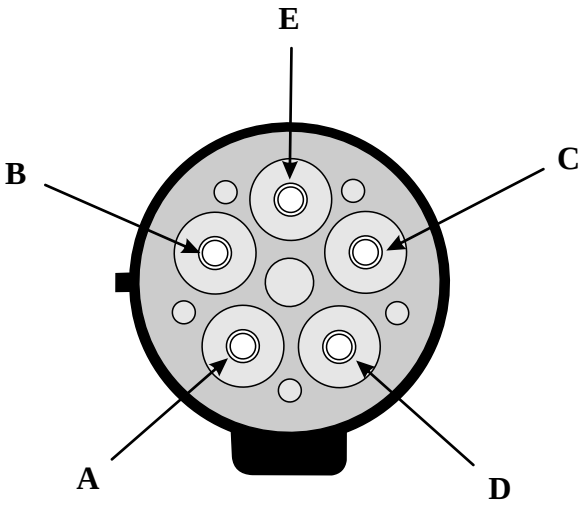
COMPLAINT: After overhaul, Pressure Control and/or TCC Solenoid and/or TFT codes are stored and a no reverse condition could exist.

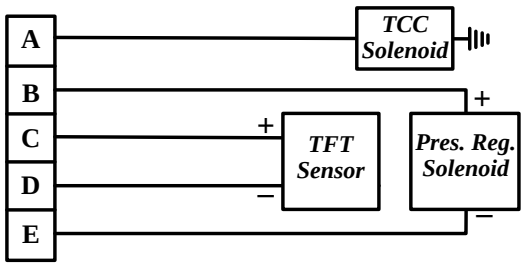
CAUSE: Case configurations changed depending on year of manufacture and make of vehicle.1990 to 1999 Isuzu vehicles equipped with the 4L30E used the round case connector in the overdrive housing in the front and the square case connector in the main case in the rear. The same locations were used for the Honda Passport starting with the 1994 model year.
In 1997 when the Cadillac Catera was introduced, these case connectors reversed positions. Now, the square case connector was up front in the overdrive housing and the round case connector was located in the main case in the rear of the unit. Isuzu and Honda adopted this same arrangement beginning with the 2000 model year. This can lead to cross connect situations which will result in the setting of the solenoid codes, (Refer to Figures 1 and 2).
Another problem area that can cause the above mentioned complaints has to do with the case connector locating tabs. These tabs become brittle over a period of time and break off. When this happens the case connectors can be plugged into the vehicle wire harness plug incorrectly, (Refer to Figure 3).

When the reverse lockout valve was added to the center support, (See Figure 4), another problem was produced. If the TCC and Pressure Control Solenoids are cross connected, the Pressure Control Solenoid signal will activate the TCC solenoid which in turn will stroke the reverse lockout valve, and a no reverse condition will exist. Refer to the hydraulic schematics in Figure 5 for TCC and reverse lockout valve operation.

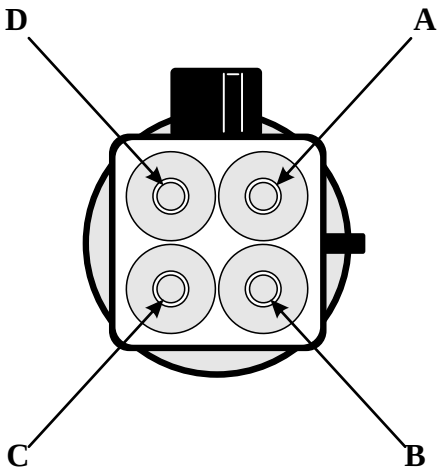
CORRECTION: Replace the internal wire harness if the locating tabs are broken and insure that the correct case connector/internal harness assembly is in the correct location.

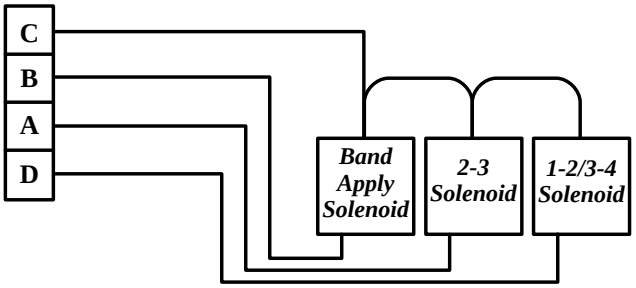
The Original Round Front Case Connector Terminal I.D.

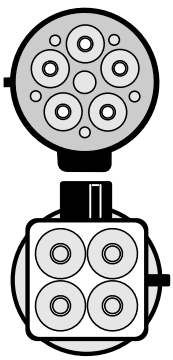




The Original Square Rear Case Connector Terminal I.D.



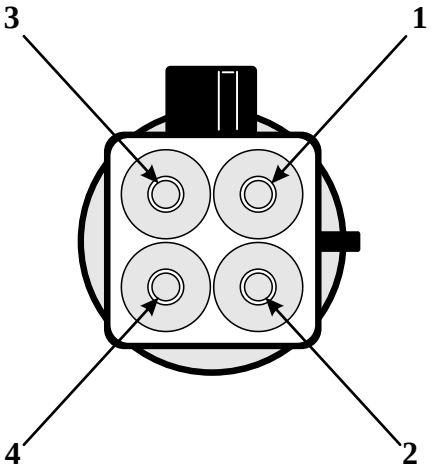


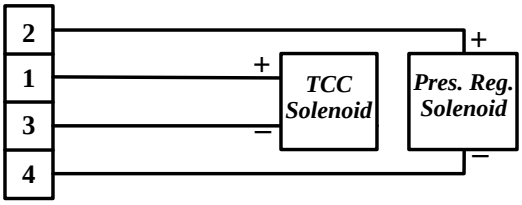


Solenoid	*Case Connector Terminal I.D.*	*Resistance In Ohms*
TCC	*A and case gnd*	*17.5 - 18.5*
Press. Sol.	*B and E*	*3.7 - 4.7*
TOT	*C and D*	*20K @ 70ºF*
Band Apply	*C and B*	*9.5 - 10.5*
2-3 Sol.	*C and A*	*17.5 - 18.5*
1-2/3-4 Sol.	*C and D*	*17.5 - 18.5*

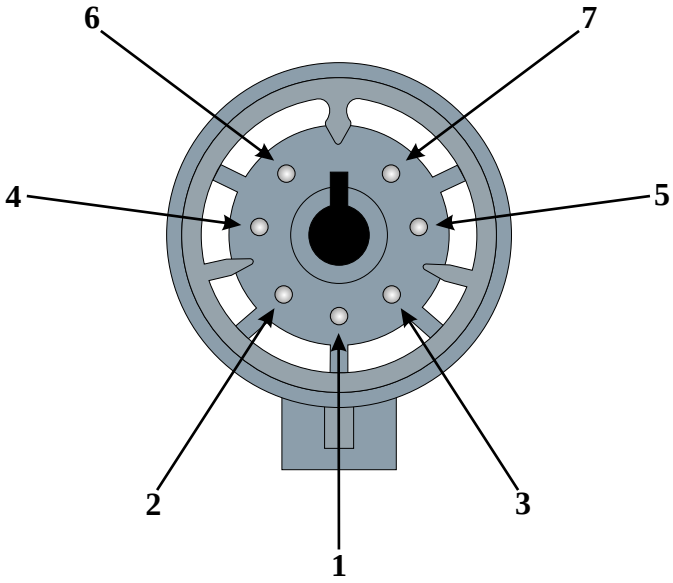
Figure 1

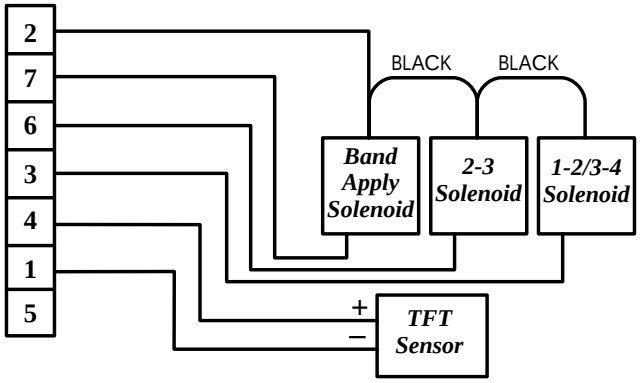
The Square Front Case Connector Terminal I.D.

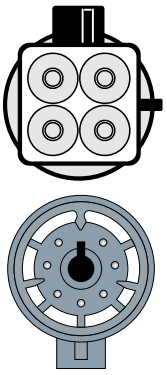




The Round Rear Case Connector Terminal I.D.







Solenoid	*Case Connector Terminal I.D.*	*Resistance In Ohms*
Press. Sol.	***2 and 4***	***3.7 - 4.7***
TCC	***1 and 3***	***17.5 - 18.5***
TOT	***1 and 4***	***20K @ 70ºF***
1-2/3-4 Sol.	***2 and 3***	***17.5 - 18.5***
2-3 Sol.	***2 and 6***	***17.5 - 18.5***
Band Apply	***2 and 7***	***9.5 - 10.5***

Figure 2

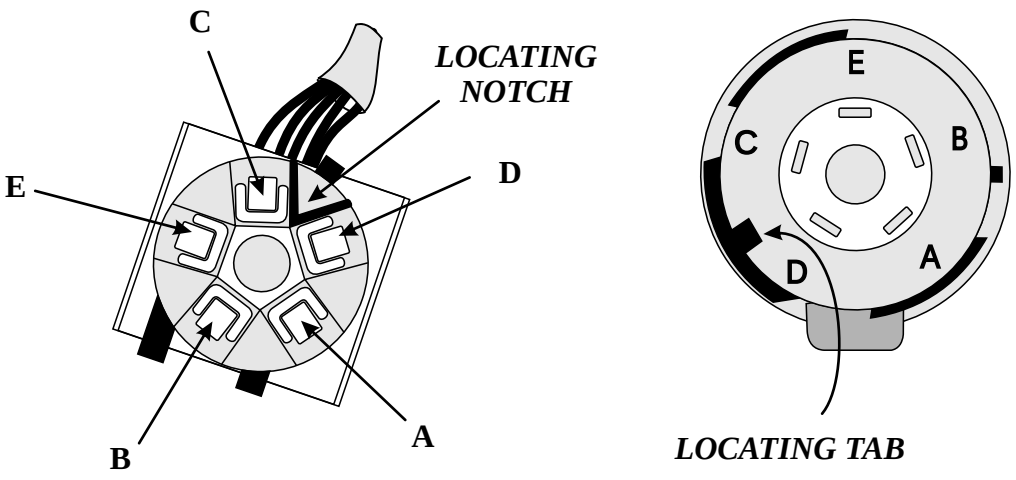


Figure 3

4L30E CENTER SUPPORT WITH REVERSE LOCKOUT VALVE

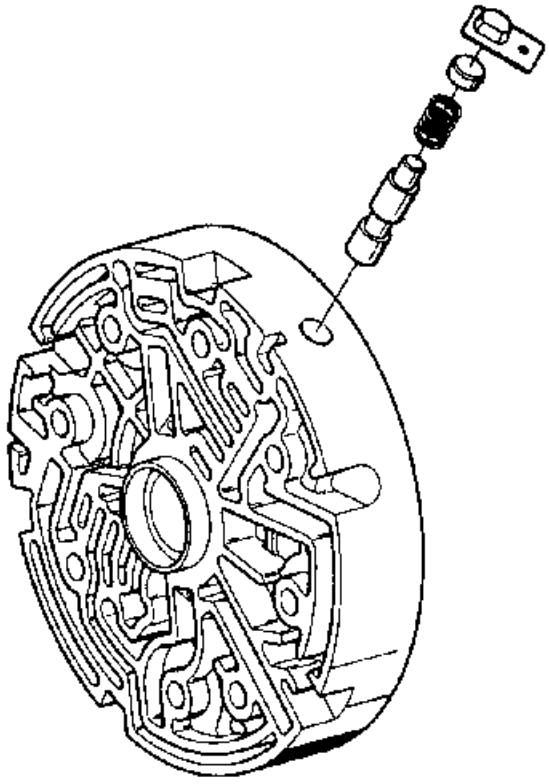


Figure 4

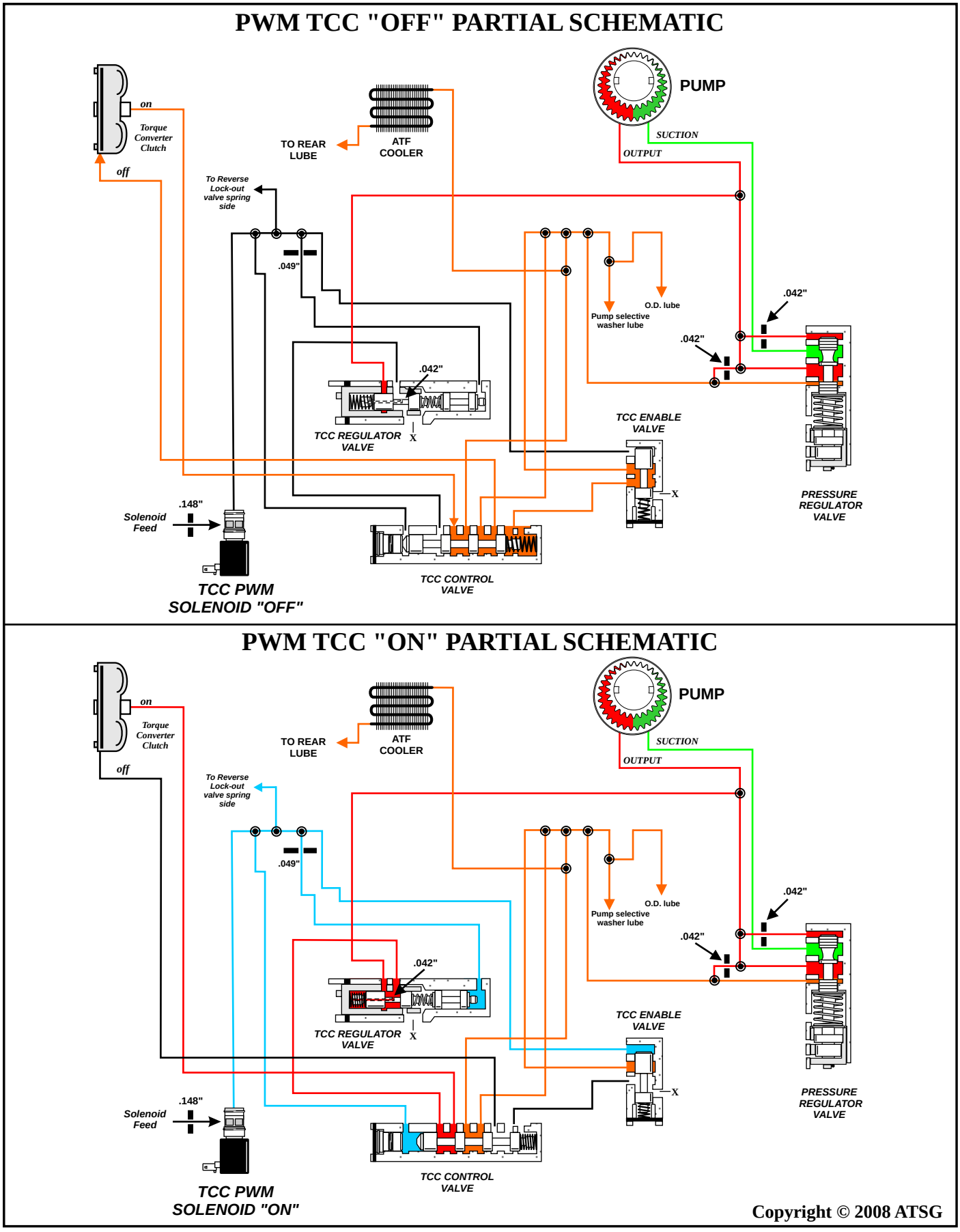

PWM TCC "OFF" PARTIAL SCHEMATIC
on
Torque Converter Clutch
off
TO REAR LUBE
ATF COOLER
PUMP
SUCTION
OUTPUT
To Reverse Lock-out valve spring side
.049"
.042"
O.D. lube
Pump selective washer lube
.042"
.042"
TCC REGULATOR VALVE
X
TCC ENABLE VALVE
X
PRESSURE REGULATOR VALVE
.148"
Solenoid Feed
TCC PWM SOLENOID "OFF"
TCC CONTROL VALVE
PWM TCC "ON" PARTIAL SCHEMATIC
on
Torque Converter Clutch
off
TO REAR LUBE
ATF COOLER
PUMP
SUCTION
OUTPUT
To Reverse Lock-out valve spring side
.049"
.042"
O.D. lube
Pump selective washer lube
.042"
.042"
TCC REGULATOR VALVE
X
TCC ENABLE VALVE
X
PRESSURE REGULATOR VALVE
.148"
Solenoid Feed
TCC PWM SOLENOID "ON"
TCC CONTROL VALVE
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Figure 5

BMW ZF6HP26

STUCK IN PARK

COMPLAINT: A 2002 BMW 745Li arrives at the shop on a tow truck. When the vehicle was started, the steering wheel paddle shift controls were operated to select drive. The technician observed the gear shift position indicator lamps go from park to neutral to drive and then it immediately returned to park.

CAUSE: The rubber "bridge seal" that goes between the Mechatronic (valve body) Assembly and the pump had blown out, (Refer to Figure 1).
With the "Bridge Seal" being damaged, a significant loss of system pressure occurred, this caused a lack of sufficient clutch pressure resulting in slippage. The TCM recognized this as the Input Speed Sensor maintained a reading when it should have been zero rpm while in gear with the brakes applied.
At this time the TCM commanded the transmission back into park in an effort to prevent any further transmission damage from occurring.

CORRECTION: Replace the bridge seal. BMW vehicles equipped with "shift by wire" are controlled by an "E" type valve body referred to as a "Mechatronic Module". The alternative is an "M" type valve body which has a conventional manual valve and gear selector lever. The "E" type does not have a manual valve, it has a rod that is actuated by solenoids which moves the internal linkage to engage and disengage park as well as other gear selection. There is a pre-loaded barrel spring mounted on a rotating lever that operates the park rod with the tension of the spring pushing the lever and rod into the park position. To release park, the MV3 and MV2 solenoids are energized. (Refer to Figure 2).
The park rod, as well as the location of the MV2 and MV3 solenoids can be seen in Figure 3. The MV3 Solenoid is mounted on the back side of the park lock cylinder which is on the valve body. Inside the cylinder there is a piston which connects to the rotating lever. When the MV3 Solenoid is OFF, a shaft extends out from the solenoid, pushing the rear of the piston and lever into the park position. When a command is requested to release park, the MV3 Solenoid is energized and the shaft retracts. At this time the MV2 Solenoid is also energized and it supplies fluid pressure to a chamber inside the front area of the cylinder which pushes the piston, rotating lever and park rod into the released position.
One example of the garage shift by wire controls is seen in Figure 4, this is the shift lever that signals the computer for gear selection. The selector lever operates as follows:

Position R: To select reverse the foot brake must be applied and the selector lever must be pushed up to the end of its travel.

Position N: If the neutral position is desired while in reverse, a downward tap on the selector lever is all that is needed. From the drive position, an upward tap on the selector lever is all that is required. From the park position, a tap on the lever in either direction will place the vehicle in neutral. Neutral will automatically be selected when the ignition is turned off but the key remains in the cylinder. Park will automatically be selected after 30 minutes unless N is selected before 30 minutes has elapsed at which time an additional 30 minutes is added to the time in neutral.

Superior

Lory's

BMW ZF6HP26 STUCK IN PARK

CORRECTION continued:

Position D: Depress the foot brake and pull the selector lever to its fullest travel in a downward direction.

Position P: Park engages by a push of a button built into the selector lever. Park automatically disengages when R, N or D is selected when the engine is running. Park will automatically engage when the ignition key is removed from the cylinder.

The results of selector lever operation is displayed on the instrument cluster as shown in Figure 5.
Some vehicles will have the selector lever as well as steering wheel mounted paddles as seen in Figure 6.

There are many safety features related to this system such as a message display center in the instrument cluster informing the driver of a problem.
Should the vehicle get stuck in park, and the vehicle needs to be moved, there is an emergency park release lever under the dash. The handle is located behind a locked access panel. The ignition key will unlock this access panel revealing the handle which is connected to a cable which when pulled or pushed, will mechanically release or engage park.

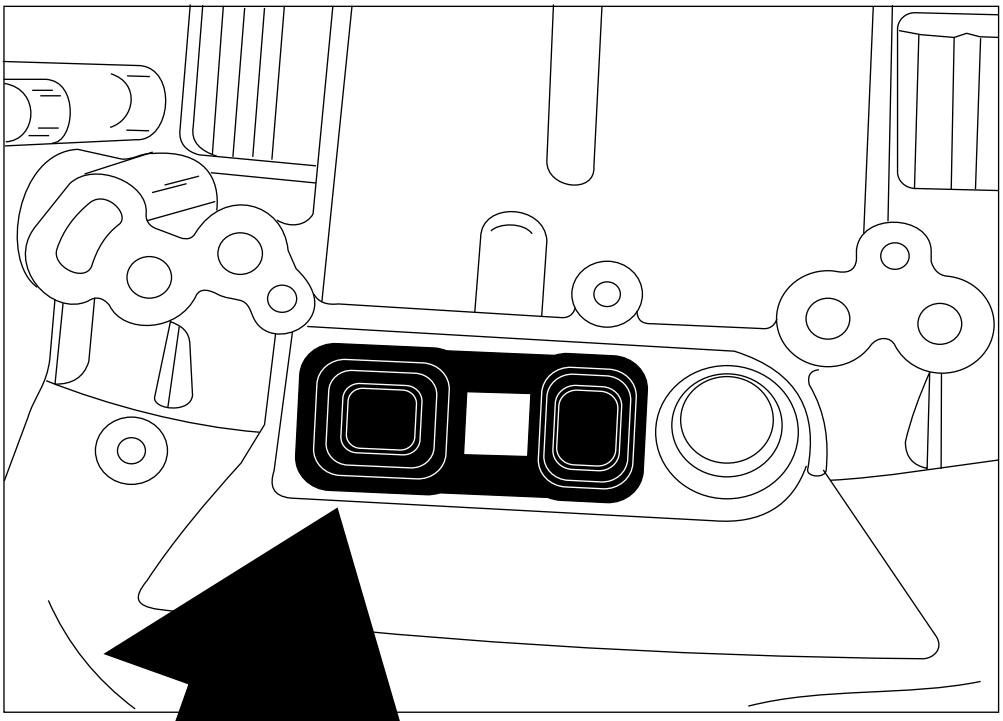
SERVICE INFORMATION:

Bridge Seal.....ZF Part Number 0501215718

Many thanks to Reno Partipilo, Sal Scardina and Joe Russo from Continental Transmission in Bridgeview, IL, for sharing their experience with us and for providing some of the photos that made this bulletin possible.

Sonnax

BRIDGE SEAL



ENOUGH LINE PRESSURE IS LOST FROM THE DAMAGED BRIDGE SEAL TO CAUSE THE TCM TO PUT THE TRANSMISSION BACK INTO PARK

DAMAGED BRIDGE SEAL

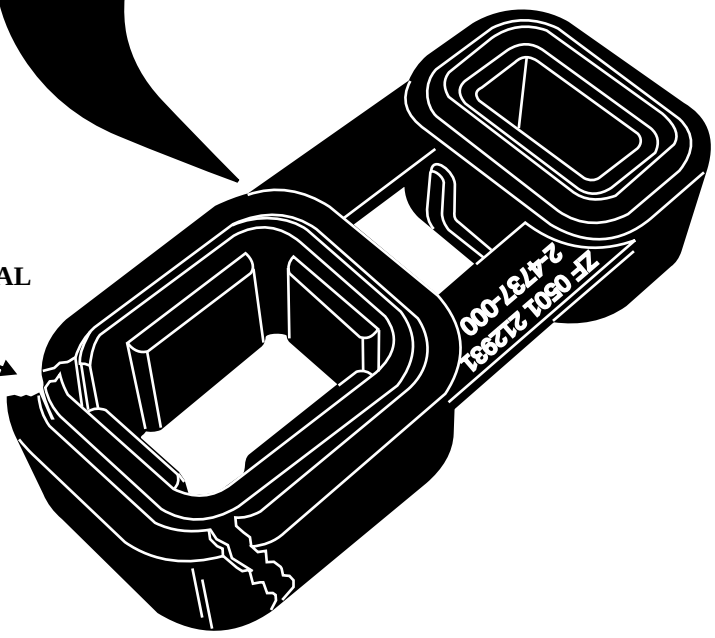


Figure 1

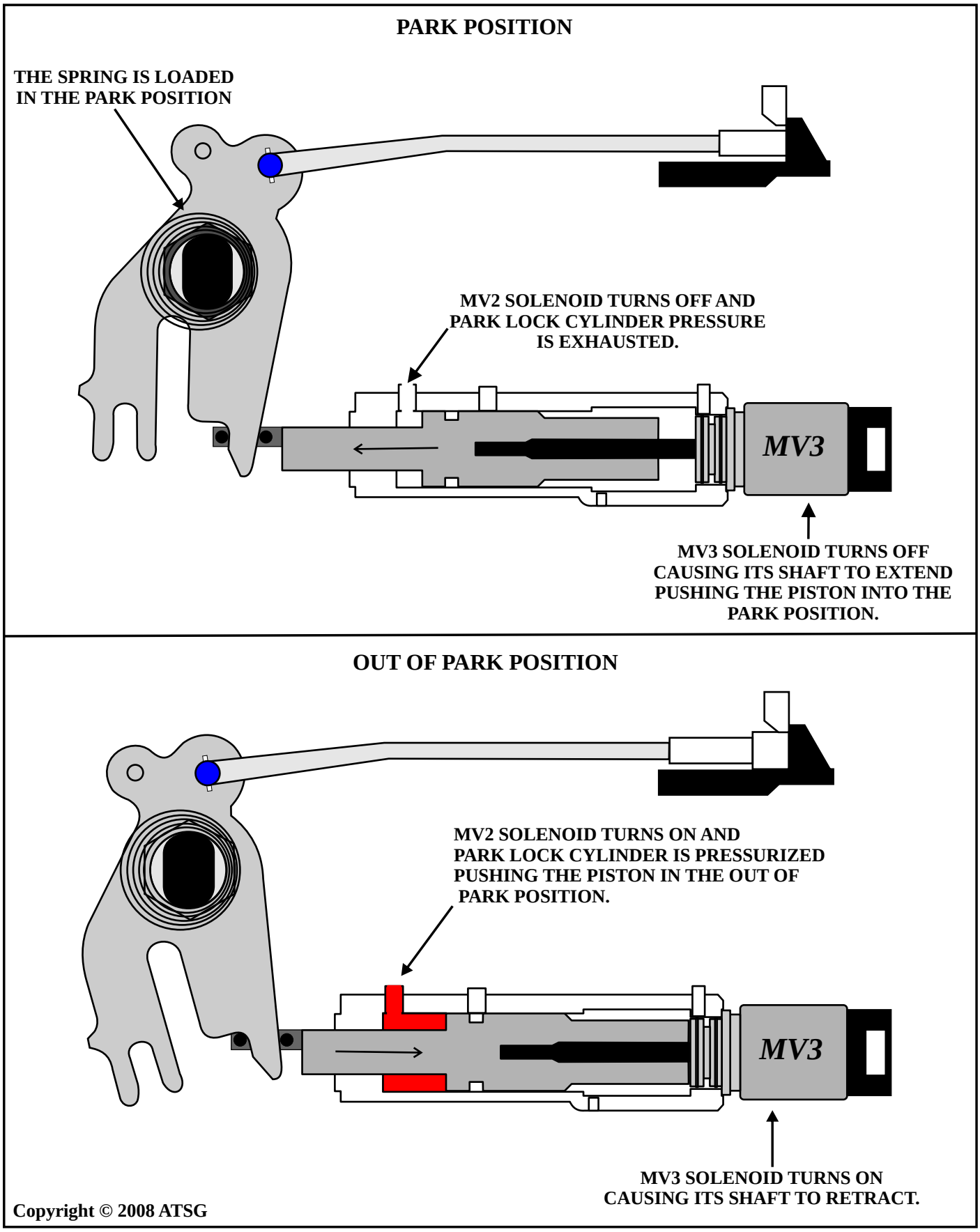

PARK POSITION
THE SPRING IS LOADED IN THE PARK POSITION
MV2 SOLENOID TURNS OFF AND PARK LOCK CYLINDER PRESSURE IS EXHAUSTED.
MV3
MV3 SOLENOID TURNS OFF CAUSING ITS SHAFT TO EXTEND PUSHING THE PISTON INTO THE PARK POSITION.
OUT OF PARK POSITION
MV2 SOLENOID TURNS ON AND PARK LOCK CYLINDER IS PRESSURIZED PUSHING THE PISTON IN THE OUT OF PARK POSITION.
MV3
MV3 SOLENOID TURNS ON CAUSING ITS SHAFT TO RETRACT.
Copyright © 2008 ATSG

Figure 2

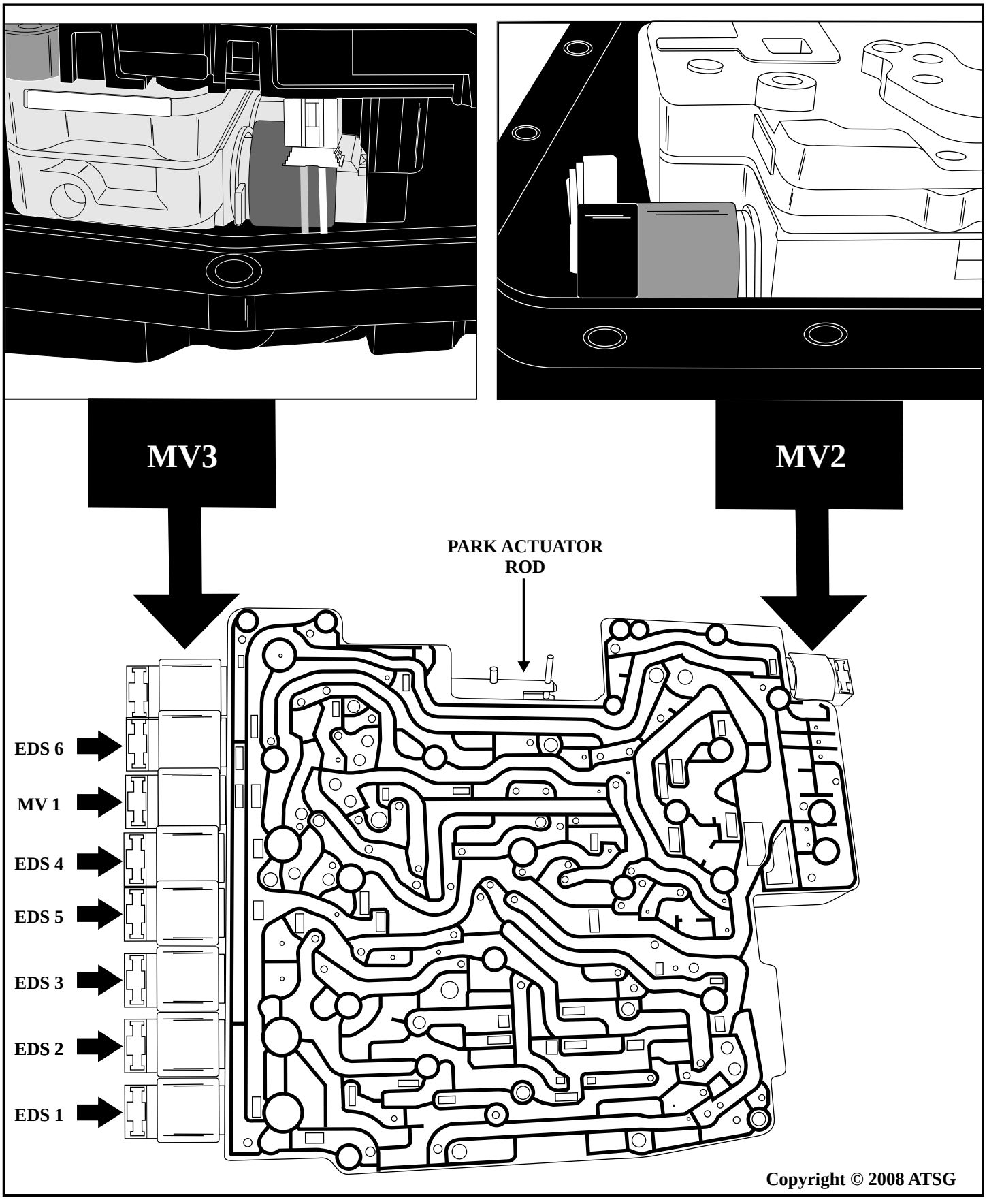

MV3
MV2
PARK ACTUATOR ROD
EDS 6
MV 1
EDS 4
EDS 5
EDS 3
EDS 2
EDS 1
Copyright © 2008 ATSG

Figure 3

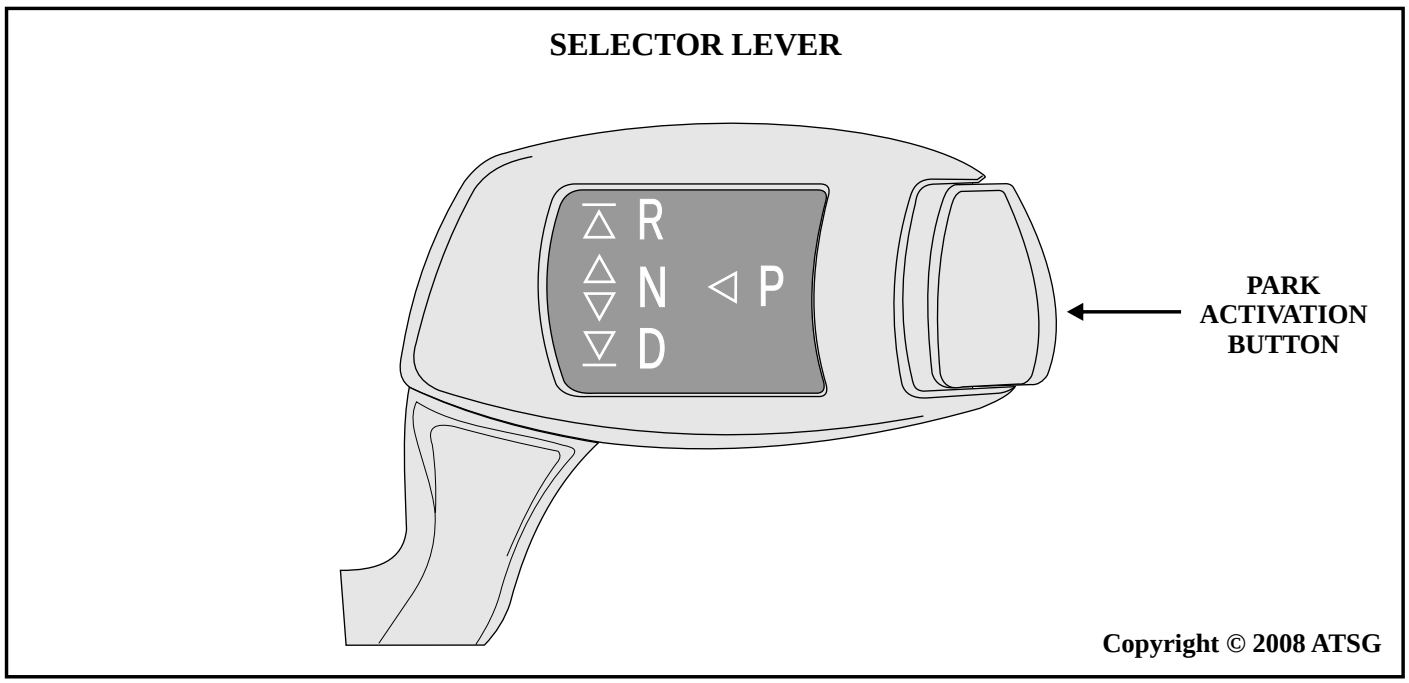


Figure 4

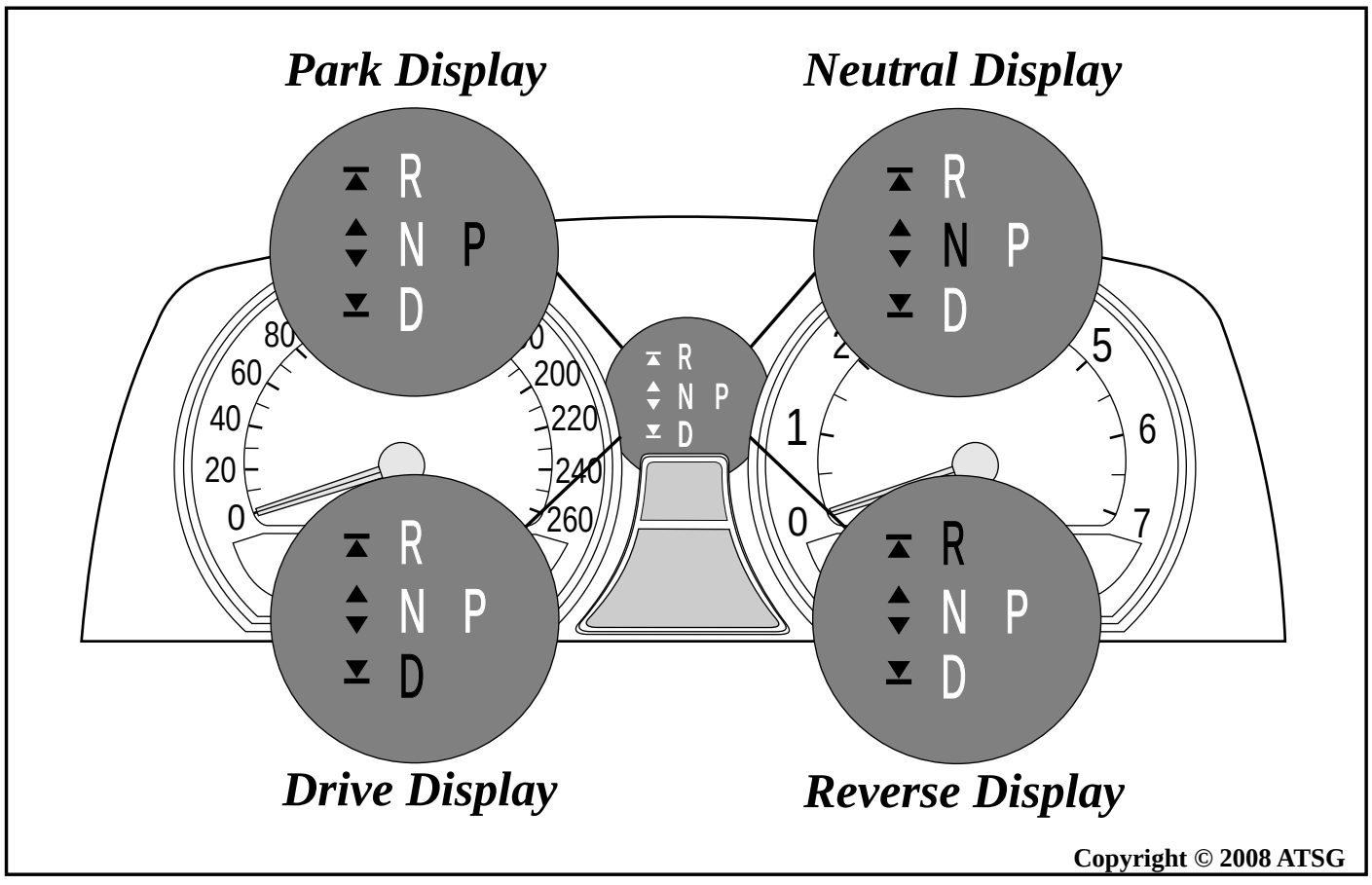


Figure 5

STEERING WHEEL MOUNTED PADDLES

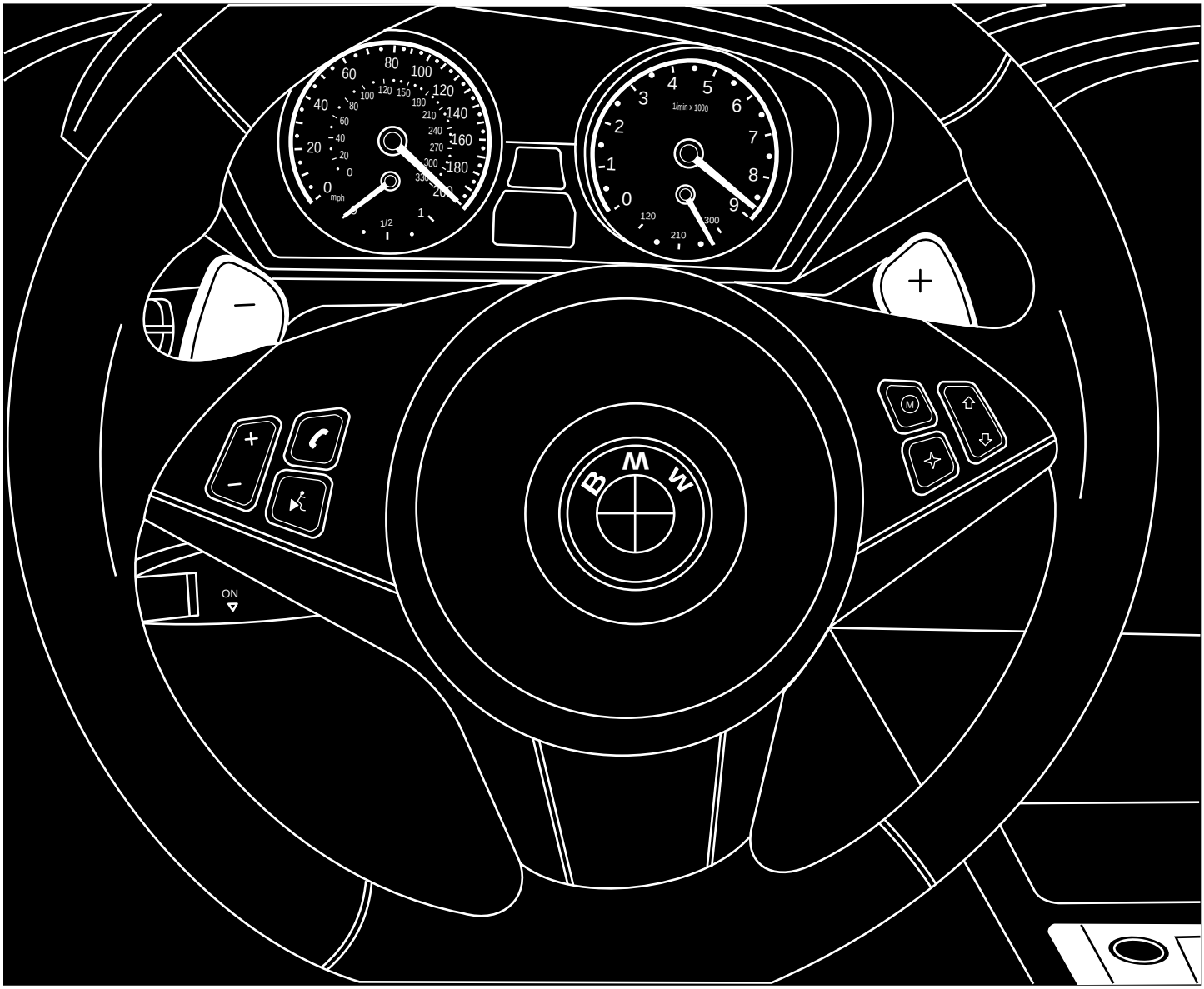


Figure 6

ZF6HP26

TRANSMISSION FLUID LEAK

COMPLAINT: The transmission appears to be leaking from the pan gasket, (Refer to Figure 1).

CAUSE: The Mechatronic Sealing Sleeve o-rings (Refer to Figure 2) is leaking and running down along the pan rail giving the appearance that the pan gasket is leaking.

CORRECTION: Replace the Mechatronic Sealing Sleeve.

SERVICE INFORMATION:

Mechatronic Sealing Sleeve.....ZF Part Number 0501212190
Oil Pan/Filter Assembly For Manual Valve Body.....ZF Part Number 0501215789

ZF6HP26 TRANSMISSION FLUID LEAK

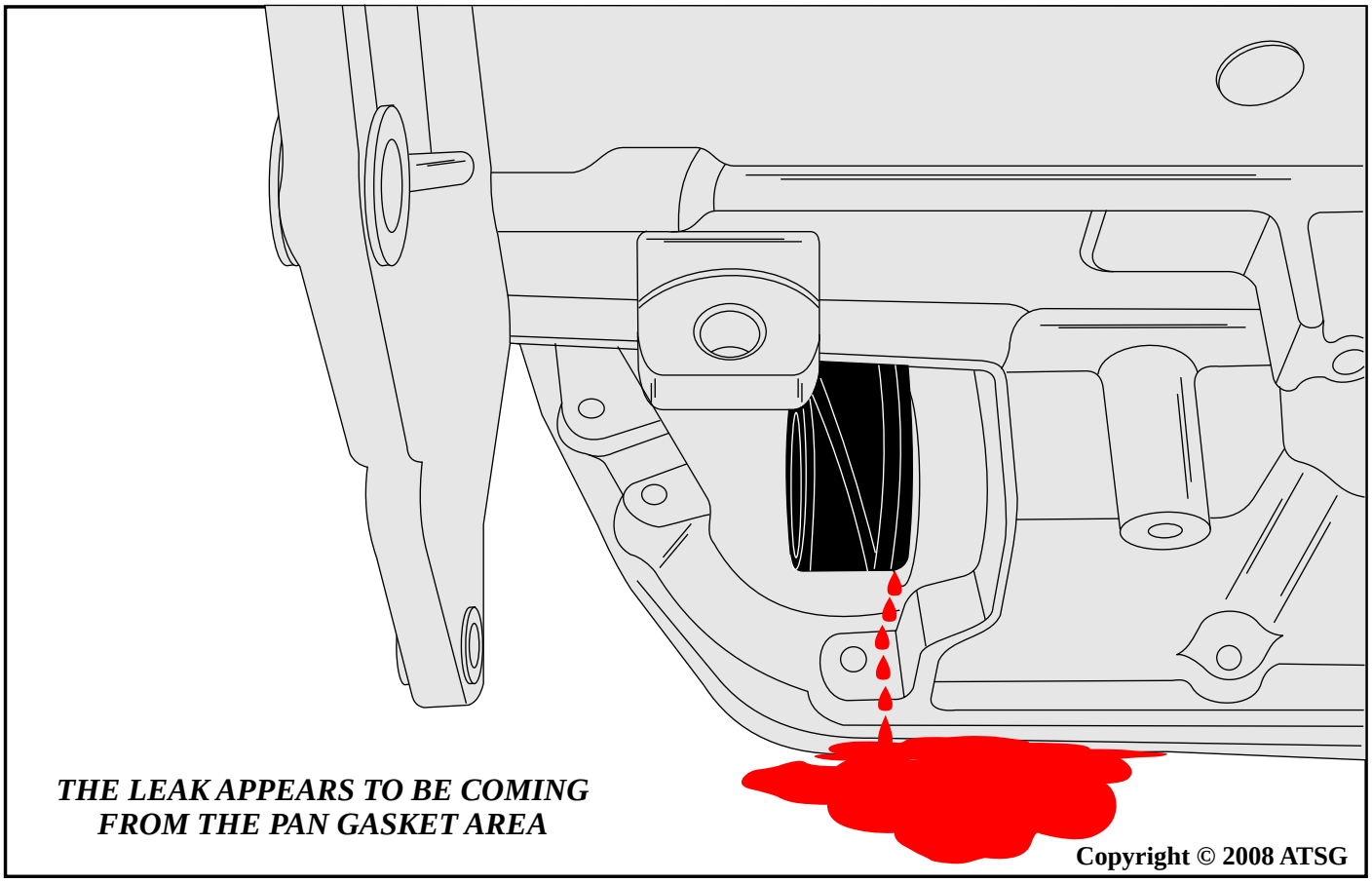


Figure 1

MECHATRONIC SEALING SLEEVE

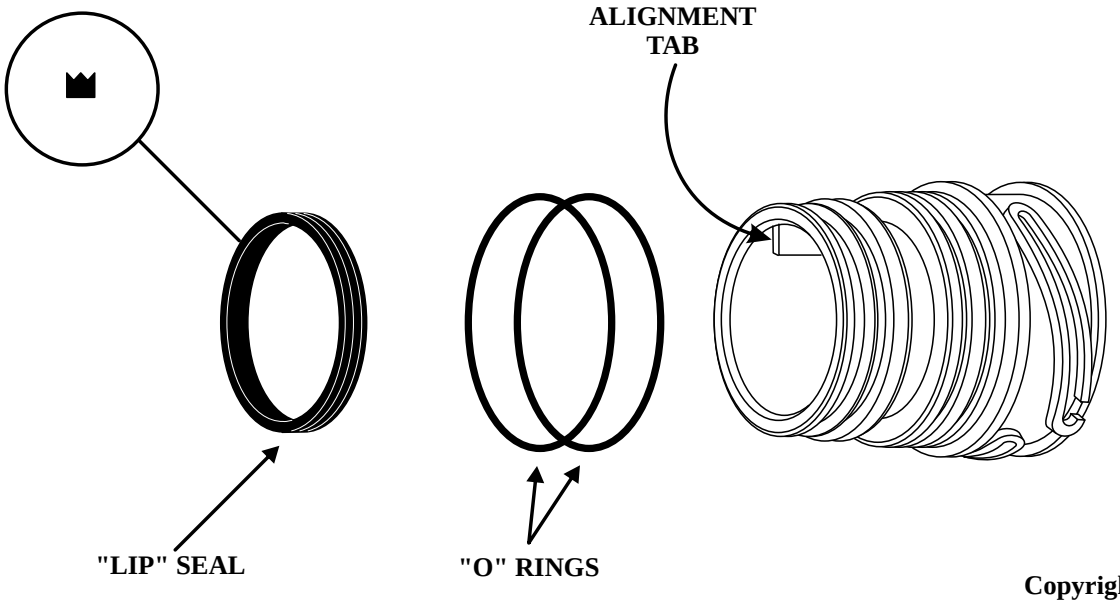


Figure 2

SLIDE

HONDA/ACURA MGHA FAMILY

WRONG GEAR STARTS, SETS VARIOUS SOLENOID DTC'S

COMPLAINT: After overhaul, a Honda vehicle equipped with a MGHA Family transmission exhibits a complaint of wrong gear starts. When checking for codes with a scanner, various solenoid DTC's may be stored.

CAUSE: One cause may be solenoid connectors cross connected. Cross connecting the brown or black connectors between Shift Solenoid A, B, C or the TCC Solenoid may cause wrong gear starts, but would not set DTC's. Cross connecting Shift Solenoid A, B, C or TCC Solenoid black or brown connectors with CPC Solenoids A, B, or C may also cause wrong gear starts and will most likely store a DTC for the affected solenoids.

CORRECTION: Use the diagram in Figure 1 to identify the proper solenoid locations. There are a few different brown and black connectors. Use the chart in Figure 2 to identify the correct solenoid connector color as well as corresponding wire color to assist the technician in correct assembly.

Note: Wire colors provided are based on 2001 model Acura MDX vehicle. Use care when connecting the solenoids. Wire colors may vary between models, however connector colors remain the same.

MGHA FAMILY
SOLENOID AND PRESSURE SWITCH LOCATIONS

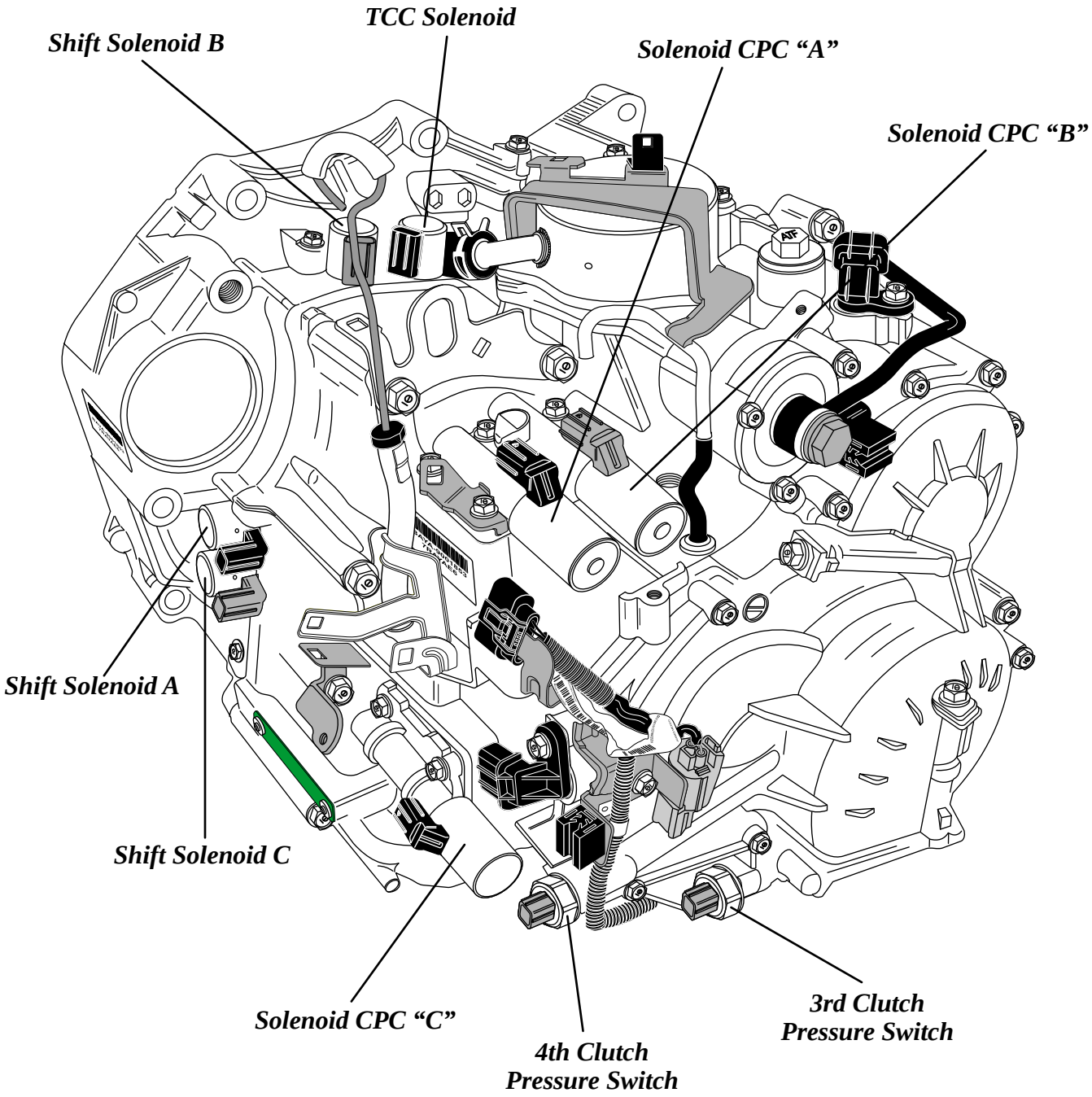


Figure 1

MGHA FAMILY
SOLENOID AND PRESSURE SWITCH
CONNECTOR AND WIRE COLORS

SOLENOID/ PRESSURE SWITCH	CONNECTOR COLOR	WIRE COLOR
Shift Solenoid A	Black	Blue/Yellow Black
Shift Solenoid B	Brown	Lt Green/White Black
Shift Solenoid C	Brown	Lt Green Black
Torque Converter Clutch Solenoid	Black	Yellow Black
Clutch Pressure Control Solenoid A	Black	White Red
Clutch Pressure Control Solenoid B	Brown	Lt. Green Brown/White
Clutch Pressure Control Solenoid C	Black	Red/Blue Lt Green/Red
3RD Clutch Pressure Switch	Grey	Blue/White
4TH Clutch Pressure Switch	Beige/Natural	Blue/Yellow

Figure 2

HONDA BAXA/B7XA FAMILY
FLARES OR SLIPS ON UP SHIFTS

COMPLAINT: Before or after overhaul, a Honda vehicle equipped with a BAXA/B7XA Family transmission exhibits a complaint of flared or slipping up shifts. This could be a *"Cold Only"* condition, or the problem may continue even after warm up.

CAUSE: One cause may be a loss of clutch apply pressure at the Clutch Pressure Control (CPC) valves in the accumulator valve body. Clutch apply pressure loss can be caused by faulty Clutch Pressure Control Solenoids, a faulty Clutch Pressure Switch, or a problem with the CPC valves in the valve body. The CPC valves are used to regulate clutch apply oil during each gear shift transition. The CPC valves are regulated by pressure from the Clutch Pressure Control Solenoids. The Solenoids are activated and modulated by the ECM and use the Clutch Pressure Switches as an input for clutch apply control. The valves may stick in the bore during cold operation. If this happens, they cannot regulate clutch control pressure adequately, causing a flared or sliding shift. The bore plugs that retain the CPC valves may become loose in the bore or the bore where the CPC valves travel may become worn causing a loss of clutch control pressure. This also can cause a flared or sliding shift.

Refer to Figure 1 for a partial hydraulic diagram of the Clutch Pressure Control System showing the transition between 2nd and 3rd gear. Refer to Figure 2 for partial hydraulic diagram showing 3rd gear fully applied

CORRECTION: When overhauling the transmission, it is necessary to pay close attention to the CPC valves, the bore plugs, and the CPC valve bores in the accumulator body. There are several things that need to be done during the overhaul procedure to reduce the potential of having a repeat failure, or continued problem.

The bores in the accumulator valve body where the CPC valves travel must be closely inspected for wear. If the bores are worn the accumulator valve body will need to be replaced.

Remove the CPC valve springs from the body *(leave the valves in and replace the bore plugs)*. Place the accumulator body in a freezer for at least two hours. After the body has had a chance to get good and cold, turn the body from side to side and check if the valves drag. The valves should float freely back and forth, if there is any drag, clean the bores with some very slightly abrasive cloth, *(be careful not to scratch the bore)* or replace the accumulator body as necessary.

Make certain the bore plugs fit snugly in the bore. Use a tubing cutter around the outside of each plug to raise a ridge that will help the bore plugs fit much tighter and help reduce the possibility of leaking.

Refer to figure 3 for accumulator valve bodydiagram and CPC valve locations.

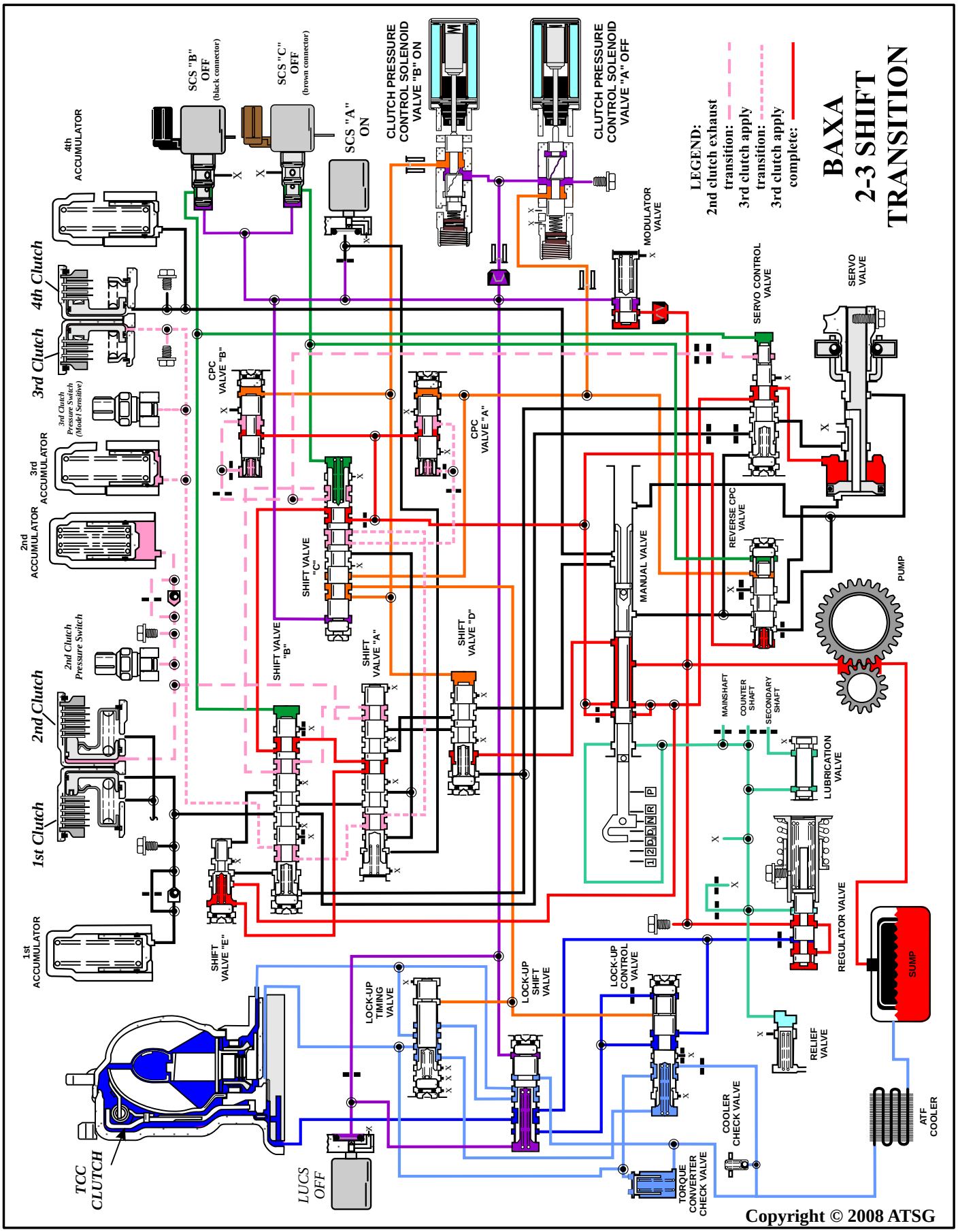

BAXA
2-3 SHIFT
TRANSITION
LEGEND:
2nd clutch exhaust transition:
3rd clutch apply transition:
3rd clutch apply complete:
SCS "B" OFF (black connector)
SCS "C" OFF (brown connector)
SCS "A" ON
CLUTCH PRESSURE CONTROL SOLENOID VALVE "B" ON
CLUTCH PRESSURE CONTROL SOLENOID VALVE "A" OFF
MODULATOR VALVE
SERVO CONTROL VALVE
SERVO VALVE
4th ACCUMULATOR
4th Clutch
3rd Clutch
3rd Clutch Pressure Switch (Model Sensitive)
3rd ACCUMULATOR
2nd ACCUMULATOR
2nd Clutch Pressure Switch
2nd Clutch
1st Clutch
1st ACCUMULATOR
CPC VALVE "B"
CPC VALVE "A"
SHIFT VALVE "C"
SHIFT VALVE "B"
SHIFT VALVE "A"
SHIFT VALVE "D"
SHIFT VALVE "E"
MANUAL VALVE
REVERSE CPC VALVE
PUMP
MAINSHAFT
COUNTER SHAFT
SECONDARY SHAFT
LUBRICATION VALVE
REGULATOR VALVE
SUMP
LOCK-UP TIMING VALVE
LOCK-UP SHIFT VALVE
LOCK-UP CONTROL VALVE
RELIEF VALVE
COOLER CHECK VALVE
ATF COOLER
TORQUE CONVERTER CHECK VALVE
TCC CLUTCH
LUCS OFF
P R N D 2 1
Copyright © 2008 ATSG

Figure 1

SLIDE

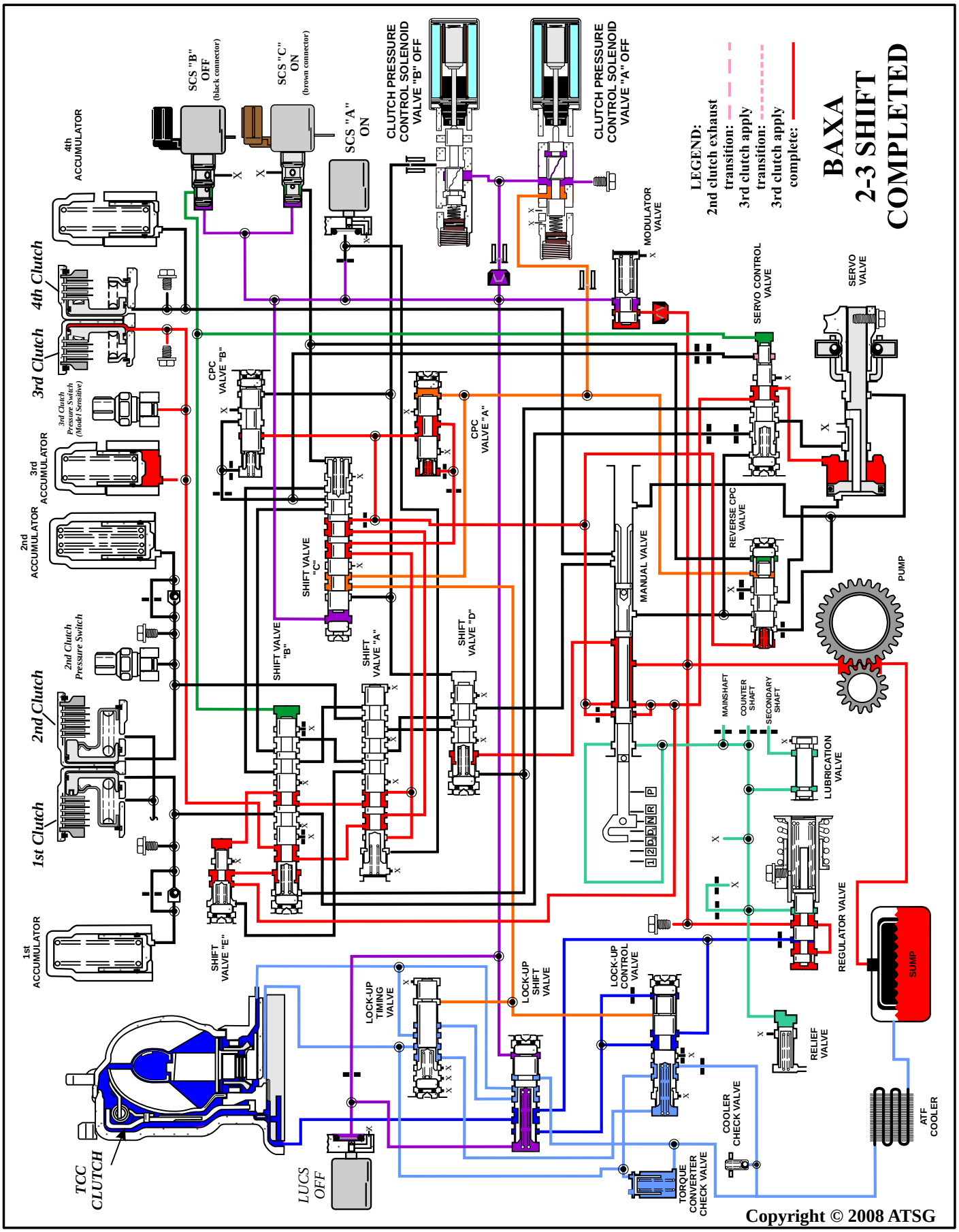
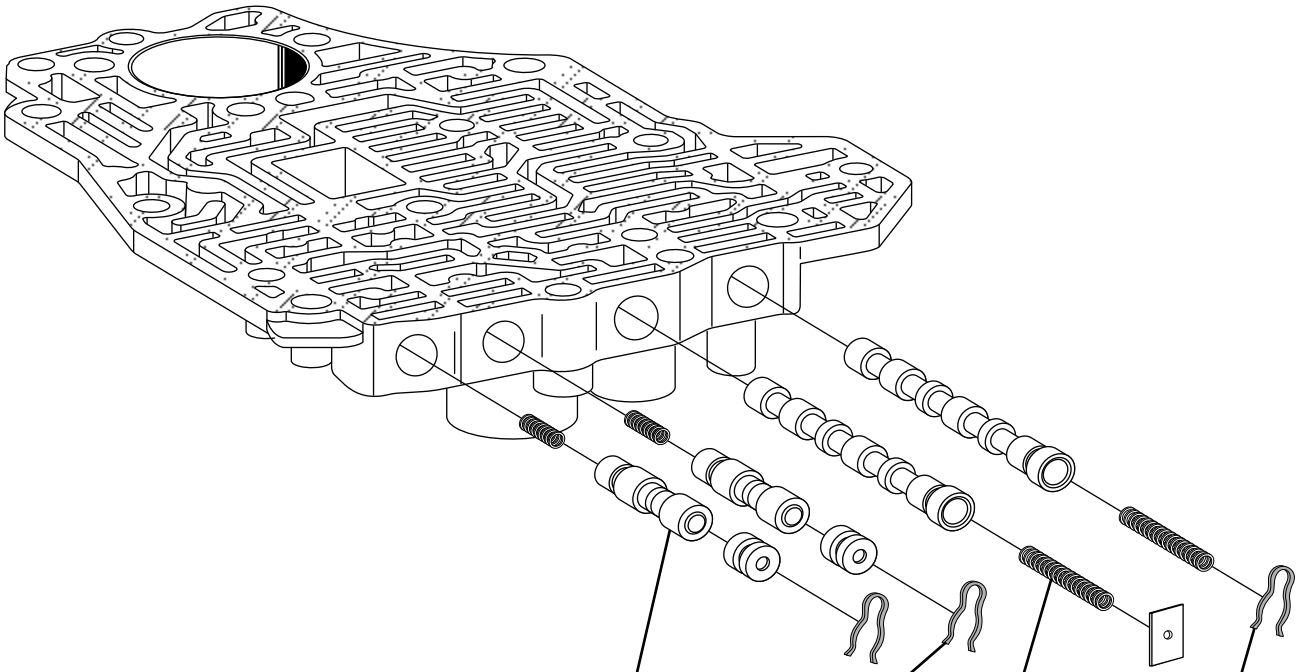
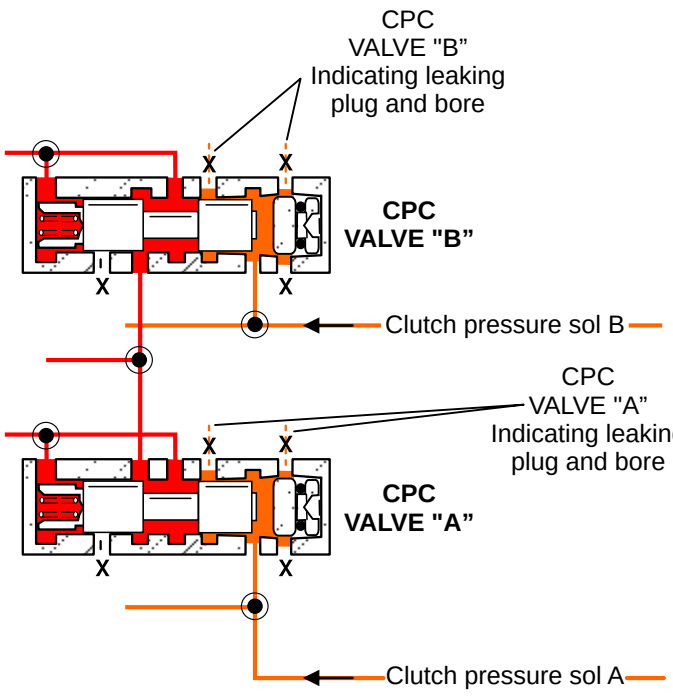


Figure 2

Automatic Transmission Service Group

ACCUMULATOR VALVE BODY





Check CPC Valve A and B to make sure there is no side to side wobble in the bore

Figure 3

SLIDE

HONDA BAXA/B7XA FAMILY

MIL ILLUMINATED SETTING DTC P1705

COMPLAINT: Before or after overhaul, a Honda vehicle equipped with a BAXA/B7XA Family transmission exhibits a complaint of the Malfunction Indicator Lamp (MIL) illuminated. When checking for codes, DTC P1705 is detected.

CAUSE: One cause may be a problem with the Powertrain Control Module (PGM-FI) main relay stuck closed.

To check for the PGM-FI main relay being stuck closed, have a suitable scan tool connected to the OBDII connector located under the driver side of the dash. Turn the ignition switch to the OFF position. If the scan tool does not lose communication, the PGM-FI main relay is stuck closed, proceed to **CORRECTION 1**. If scan tool does lose communication, the problem may be intermittent. Cycle ignition several times with scan tool still connected and see if code can be reproduced. If scan tool loses communication and code returns, proceed to **CORRECTION 2**.

CORRECTION 1: Replace the PGM-FI main relay.

CORRECTION 2: To diagnose and check the A/T Gear Position Switch, go to A/T Gear Position Switch Test.

SERVICE INFORMATION:

PGM-FI Main Relay (Two Door Models).....Honda Part # 39400-582-A01
PGM-FI Main Relay (Four Door Models).....Honda Part # 39400-584-003
A/T Gear Position Switch.....Honda Part # 28900-P6H-013

A/T GEAR POSITION SWITCH TEST:

Turn the ignition switch to the ON position. Move the gear selector from the Park position down each detent to the D1 position. Check to see if the gear position indicator light illuminates for each position. If any indicators stay illuminated in a position that is not indicated by the gear selector, proceed with Gear Position Switch Test. If indicators illuminate correctly, problem may be intermittent, wiggle harness and repeat test.

Pull the carpet back from both passenger and driver side of vehicle and locate the PCM behind the center console. There will be four connectors at the PCM. Connector A (32 pin), Connector B (25 pin), Connector C (31 pin) and Connector D (16 pin). Refer to Figure 1 for PCM Connector Pin ID and A/T Gear Position Switch Pin ID. Refer to Figure 2 for partial wiring diagram of A/T Gear Position Switch.

NOTE: Pin locations and wire colors are specifically for 98-99 Honda Accord 4 CYL vehicles. Other models may vary.

Special thanks to Bill at AAA-1 Transmissions in New York.

Cont'd on next page.

A/T GEAR POSITION SWITCH TEST: CONT'D

PRELIMINARY: ***Preliminary checks for integrity of ground wire B20 at PCM Harness connector.***

Using a DVOM set to read DC volts, back-probe terminal B20 *(brn/blk wire)* with the red lead of the meter. Place the black lead of the meter to the battery negative terminal. The meter should indicate a reading of .1 volts or less with the ignition on. If ok, proceed. If not ok, repair ground circuit B20.

STEP ONE: ***Step One checks the integrity of the P/N input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D13 *(blu/wht wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in P/N. All other gear ranges should indicate approximately 5 volts. If ok, proceed to Step Two. If voltage is seen in P/N, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D13 at the PCM and Terminal 1 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D13 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

STEP TWO: ***Step Two checks integrity of Reverse input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D6 *(white wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in Reverse. All other gear ranges should indicate approximately 12 volts. If ok, proceed to Step Three. If voltage is seen in Reverse, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D6 at the PCM and Terminal 9 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D6 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

Cont'd on next page.

A/T GEAR POSITION SWITCH TEST: CONT'D

STEP THREE: ***Step Three checks the integrity of the D4 input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D9 *(yellow wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in D4. All other gear ranges should indicate approximately 5 volts. If ok, proceed to Step Four. If voltage is seen in D4, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D9 at the PCM and Terminal 7 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D9 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

STEP FOUR: ***Step Four checks the integrity of the D3 input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D8 *(pink wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in D3. All other gear ranges should indicate approximately 12 volts. If ok, proceed to Step Five. If voltage is seen in D3, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D8 at the PCM and Terminal 6 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D8 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

STEP FIVE: ***Step Five checks the integrity of the D2 input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D14 *(blue wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in D2. All other gear ranges should indicate approximately 12 volts. If ok, proceed to Step Six. If voltage is seen in D2, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D14 at the PCM and Terminal 5 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D14 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

Cont'd on next page.

A/T GEAR POSITION SWITCH TEST: CONT'D

STEP SIX: ***Step Six checks the integrity of the D1 input.***

Using a DVOM, set to read DC volts. Back-probe terminal B20 *(brn/blk wire)* with the black lead of the meter, probe terminal D15 *(brown wire)* with the red lead. Turn the ignition switch to ON, and check for voltage. Move the gear selector slowly through each range. The meter should indicate a voltage reading of .1 volts or less in D1. All other gear ranges should indicate approximately 12 volts. If ok, refer back to PGM-FI relay test with scan tool. If voltage is seen in D1, disconnect the connector at the Gear Select Switch on the transmission and check for continuity between Terminal D15 at the PCM and Terminal 4 at the Gear Position Switch. If no continuity exists, repair open in circuit. If continuity is good, replace the Gear Position Switch. If less than .1 volts is observed in all positions, disconnect both connectors and check for continuity between terminal D15 at the PCM and ground. If continuity exists, repair short to ground in circuit. If no continuity exists, PCM is at fault.

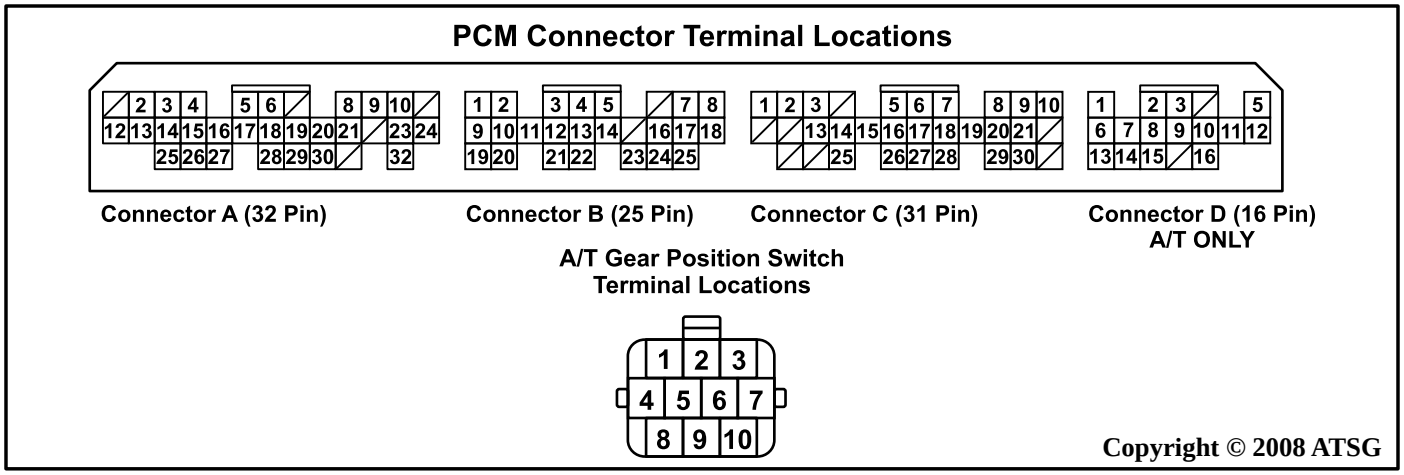


Figure 1

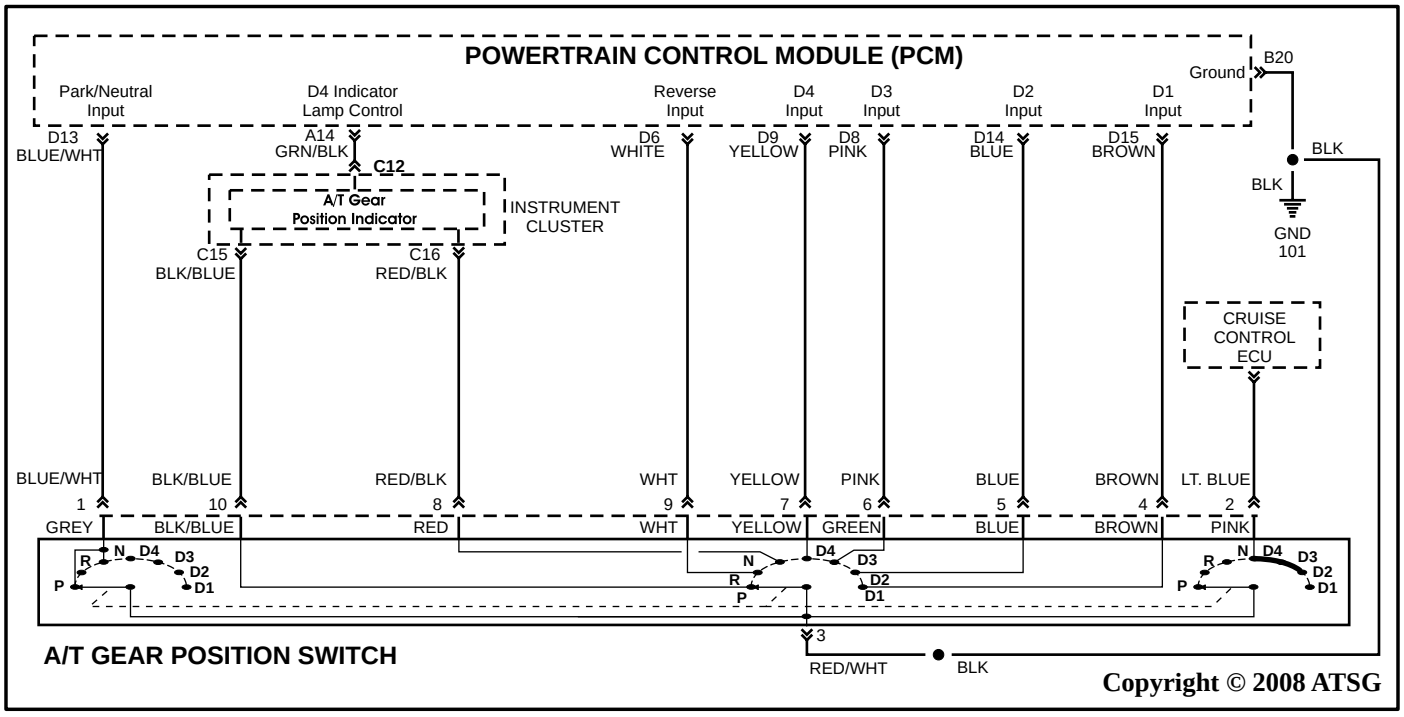


Figure 2

HONDA CIVIC HYBRID

HIGH ENGINE RPM ON DECEL

COMPLAINT: When a 2006 Honda Civic Hybrid with CVT transmission is decelerating from highway speeds while driving straight ahead, the engine speed occasionally stays at around 4,000 rpm.

CAUSE: The 2006 Honda Civic Hybrid is equipped with a "Corner G Control System. While decelerating through a corner, this system changes the transmission pulley ratios to obtain the best engine speed.
If there is even a minor difference in size between the rear tires, the PCM may "think" the vehicle is turning into a corner when it is not. This causes higher than normal engine speed during deceleration while driving straight.

NOTE: Same sized tires from different manufactures can vary the tire revolutions per mile resulting in the above complaint.

CORRECTION: Reprogram the PCM with HDS Software Version 2.010.003 or later to give the PCM more tolerance to small size variations between tires.

SERVICE INFORMATION:

Updated Program ID*.....*MXA550
Revision Part Number*.....*37806-RMX-A55

MAZDA MPV JF506E, 2002 ONLY
HARSH SHIFTS. MIL ON/OD LIGHT FLASHING. NO DTC'S STORED

COMPLAINT: Some 2002 Mazda MPV vehicles may exhibit a complaint of harsh shifts with the MIL illuminated and/or OD light flashing. Code retrieval with a scan tool indicates no DTC's stored.

CAUSE: One cause may be a problem with the Transmission Control Module (TCM). When checking for DTC's on these model vehicles, the scan tool will indicate no codes. Mazda produced a Technical Service Bulletin *(TSB 05-011/02)* concerning this problem that states the TCM needs to be re-flashed in order to be able to retrieve DTC's. After the re-flash has been performed, the problem remains. The next step to take is to replace the TCM.

CORRECTION: Replace the TCM.

The TCM on 2002 Mazda MPV vehicles is located on the passenger side flooring of the vehicle just below the glove compartment and is bolted to the PCM bracket.

MERCEDES BENZ 722.6

TCM FLUID CONTAMINATION

COMPLAINT: The vehicle may experience intermittent speed sensor or solenoid codes with reoccurring limp mode. When the technician locates the TCM, (Refer to Figure 1), to do some electrical checks, the TCM is found to be full of transmission fluid.

CAUSE: Transmission Fluid has worked its way up the wiring between the transmission case connector and the TCM through capillary action. As a result of this action, the TCM has been filled with fluid, (Refer to Figure 2).
This has nothing to do with the with seal condition on the conductor plate or the vehicle harness connector, even with good seals this will occur, (Refer to Figure 3).

CORRECTION: Remove some insulation to bare the wires just above the vehicle harness connector in a staggered fashion. Then melt a drop of solder on each wire, (Refer to Figure 4), this will act as a dam, then shrink wrap each wire and tape the harness to dress it up. This will prevent the fluid from traveling up the wire harness to the TCM, especially after TCM replacement.

Many thanks to Wayne Duvall from Crownsville Transmission for the photos that made this bulletin possible.

TCM FLUID CONTAMINATION

TCM LOCATIONS

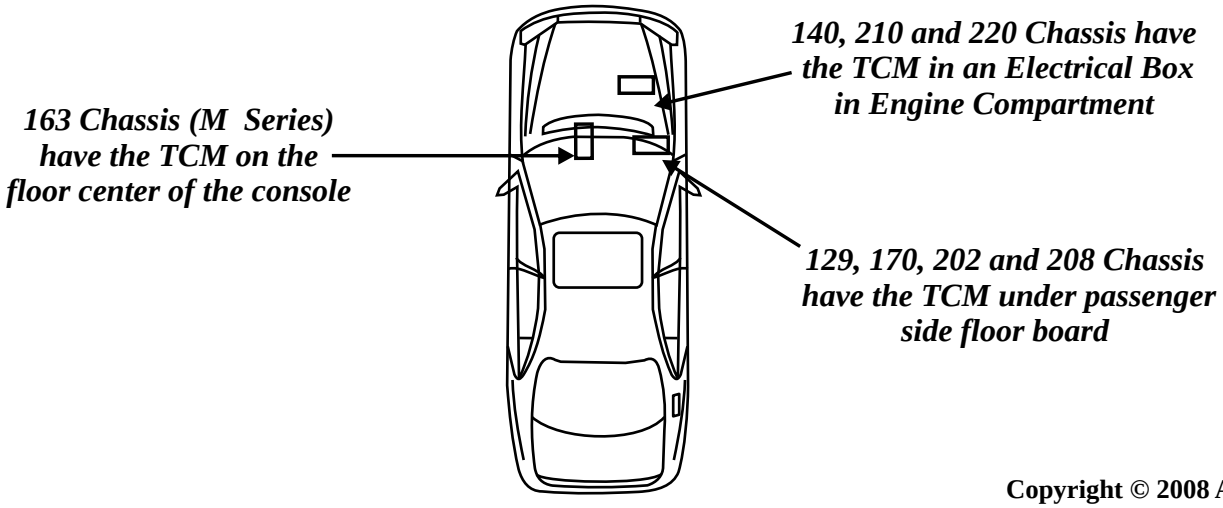


Figure 1

TCM LOCATION & TERMINAL IDENTIFICATION

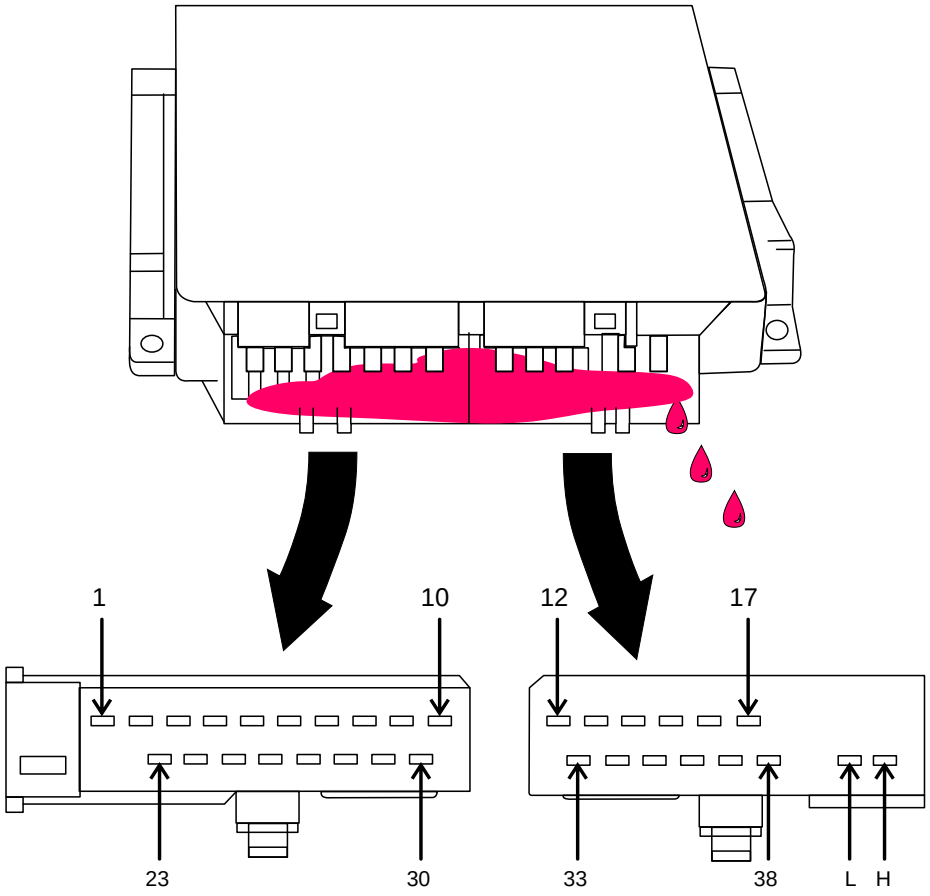


Figure 2

TCM FLUID CONTAMINATION

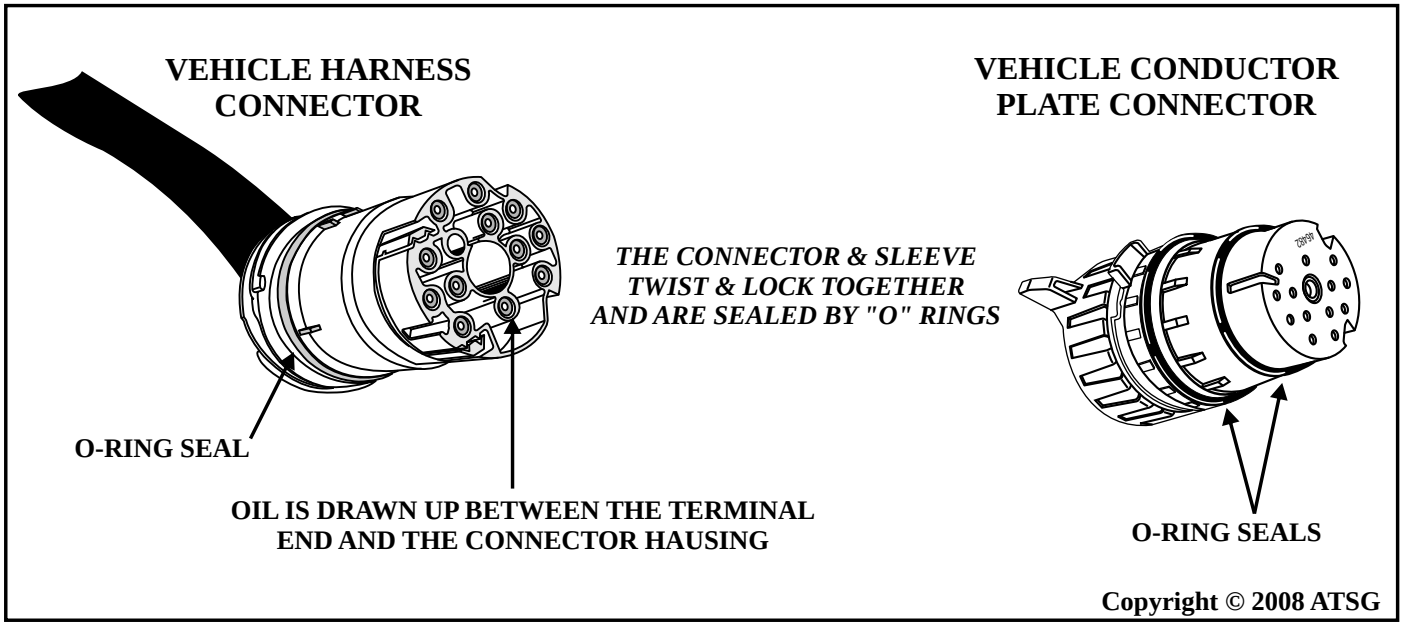


Figure 3

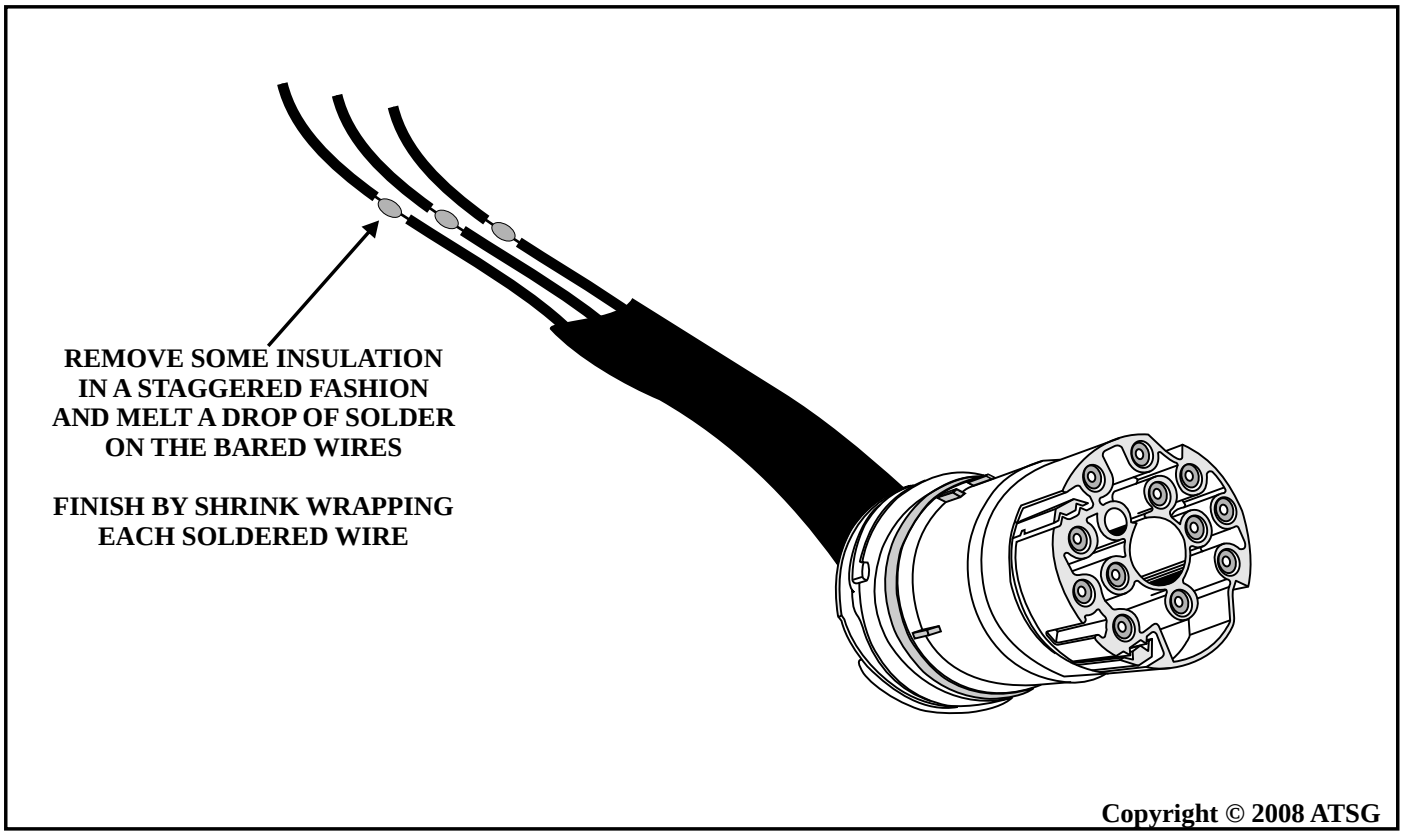


Figure 4

F4A40/50 SERIES

SECOND CLUTCH FAILURE

COMPLAINT: The vehicle comes back after overhaul with the second clutch plates burnt. Overall line rise is good and the only code stored is a P0732 for a second gear ratio error.

CAUSE: The use of a second clutch housing seal that is the incorrect length or the second clutch housing seal has failed and is leaking.

CORRECTION: The Tan seal has a flat rubber end that sits against the second clutch housing. The Black seal has a lip that sits against the second clutch housing, (Refer to Figure 1). This lip seal has been known to fail prematurely, use a quality seal.
The second clutch housing comes in two different diameters, depending on the transmission being a F4A42 or an F4A51.
The F4A42 has a second clutch housing outside diameter of 6.813" (173.05mm)and a piston diameter of 6.625"(168.28mm). This requires a second clutch housing seal length of 1.438" (37mm), it is Tan in color, See Figure 2.
The F4A51 has a second clutch housing outside diameter of 7.625" (193.68mm) and a piston diameter of 7.500" (190.50mm). This requires a second clutch housing seal length of 1.313" (34mm) and is Black in color, See Figure 2.

To insure that the correct length seal is used, perform the measurement shown in Figure 3. The measurement is taken from the valve body surface of the case to the surface of the second clutch housing.
The F4A42 measurement will be 1.426" (36.22mm). The F4A51 measurement will be 1.305" (33.15mm).

NOTE: Be careful when replacing the second clutch piston, they come in three thicknesses.

F4A40/50 SERIES SECOND CLUTCH FAILURE

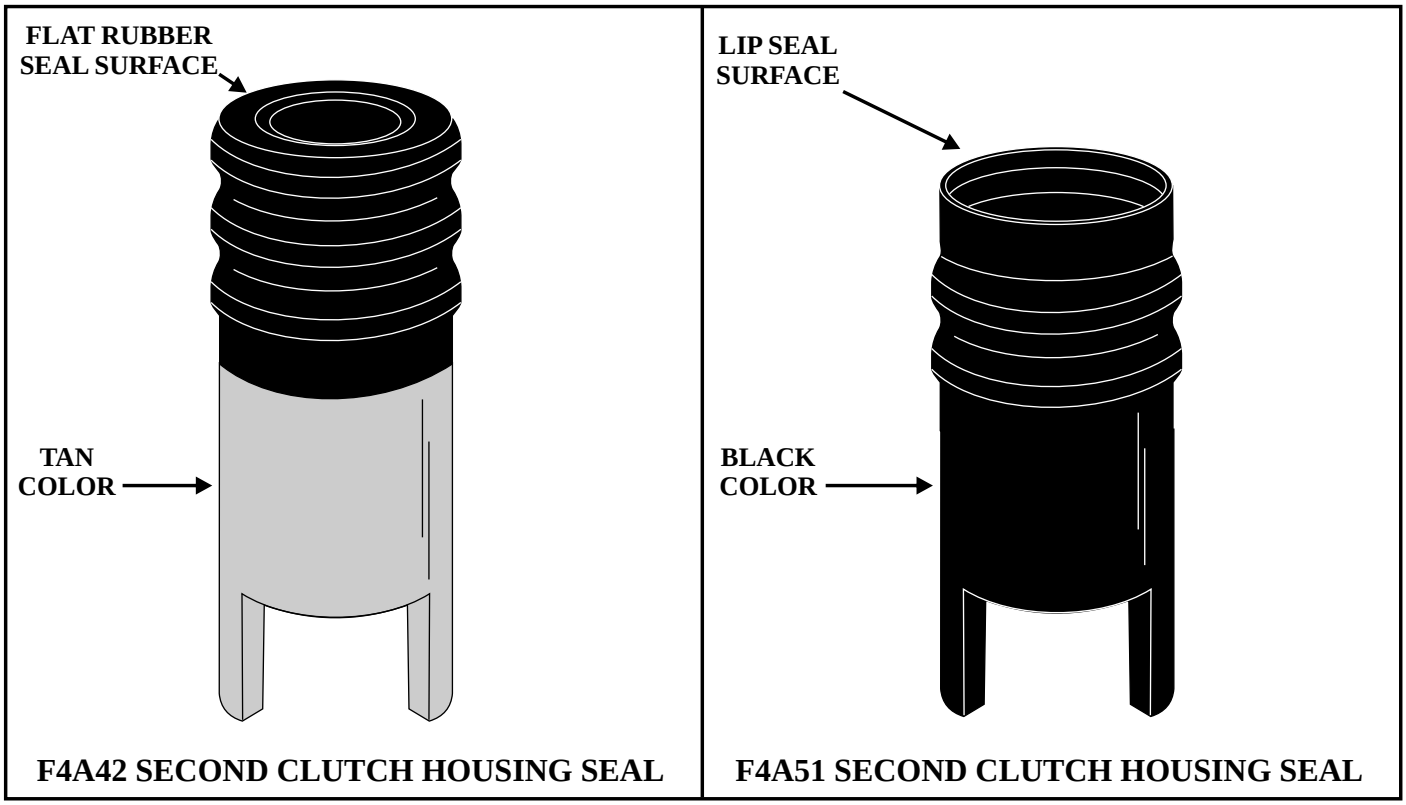


Figure 1

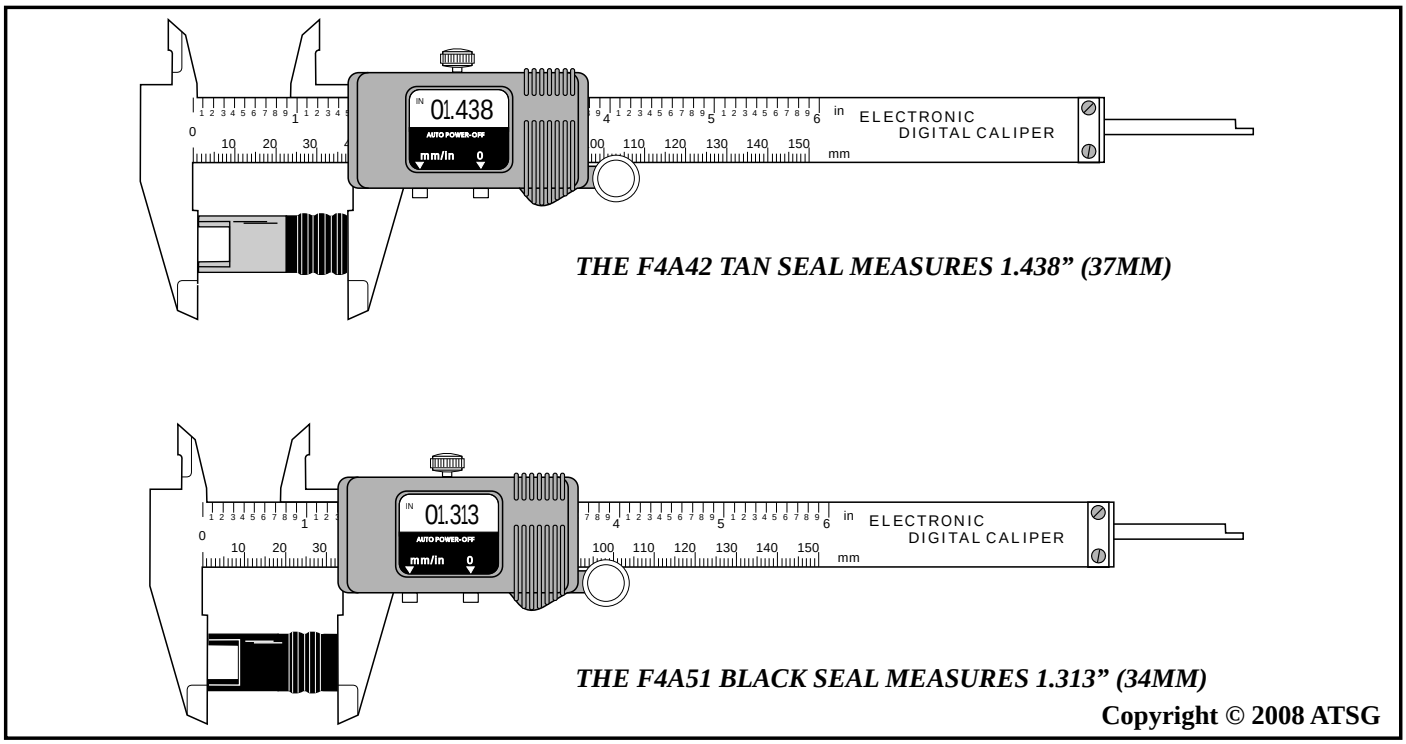


Figure 2

F4A40/50 SERIES SECOND CLUTCH FAILURE

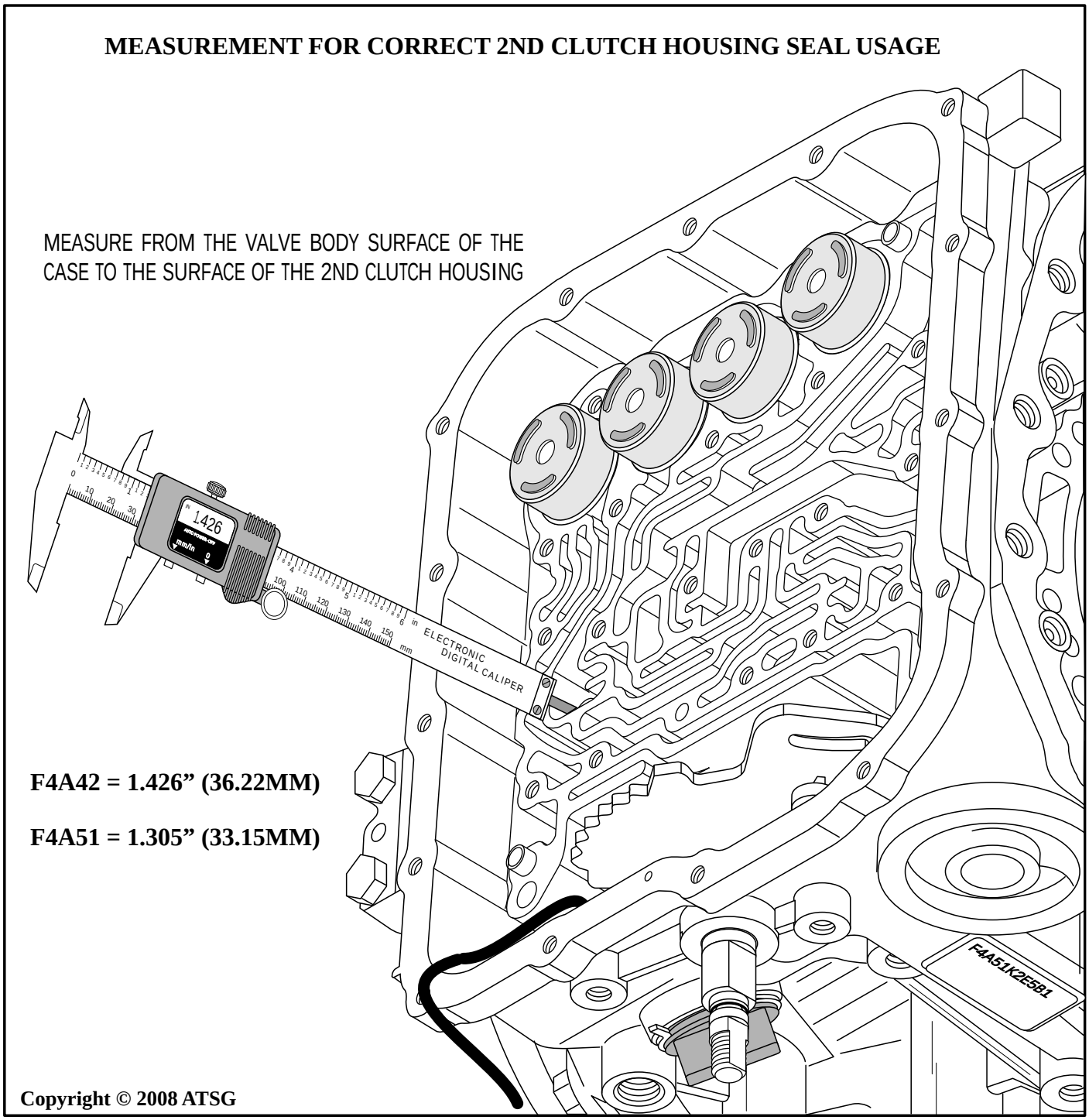


Figure 3

MITSUBISHI F4A51

NO FORWARD MOVEMENT

COMPLAINT: The vehicle has no forward movement only when the headlamps are turned on. The vehicle will move forward if the transmission is left in drive and the headlamps are turned off.

CAUSE: One of the tail lamps had a compromised ground. When the headlamps were turned on, a ground path was sought through the reverse lamp circuit. Looking at the wire schematic in Figure 1, you can see that when the selector lever is placed into the Drive position, voltage will be supplied to terminal 102 (Refer to Figure 2) at the TCM from the Park/Neutral Switch. When the headlamps were turned on, voltage seeking a ground path through the reverse lamp circuit would supply a signal to the TCM at terminal 108 as well. Now the TCM believes that the transmission is in both Drive and Reverse and as a safety feature, the TCM energizes the Underdrive Solenoid which prevents the Underdrive Clutch from applying causing the transmission to obtain a neutral condition. This would explain why reverse was no problem since that is the only signal the TCM received.

CORRECTION: Repair the tail lamp ground inside the trunk.

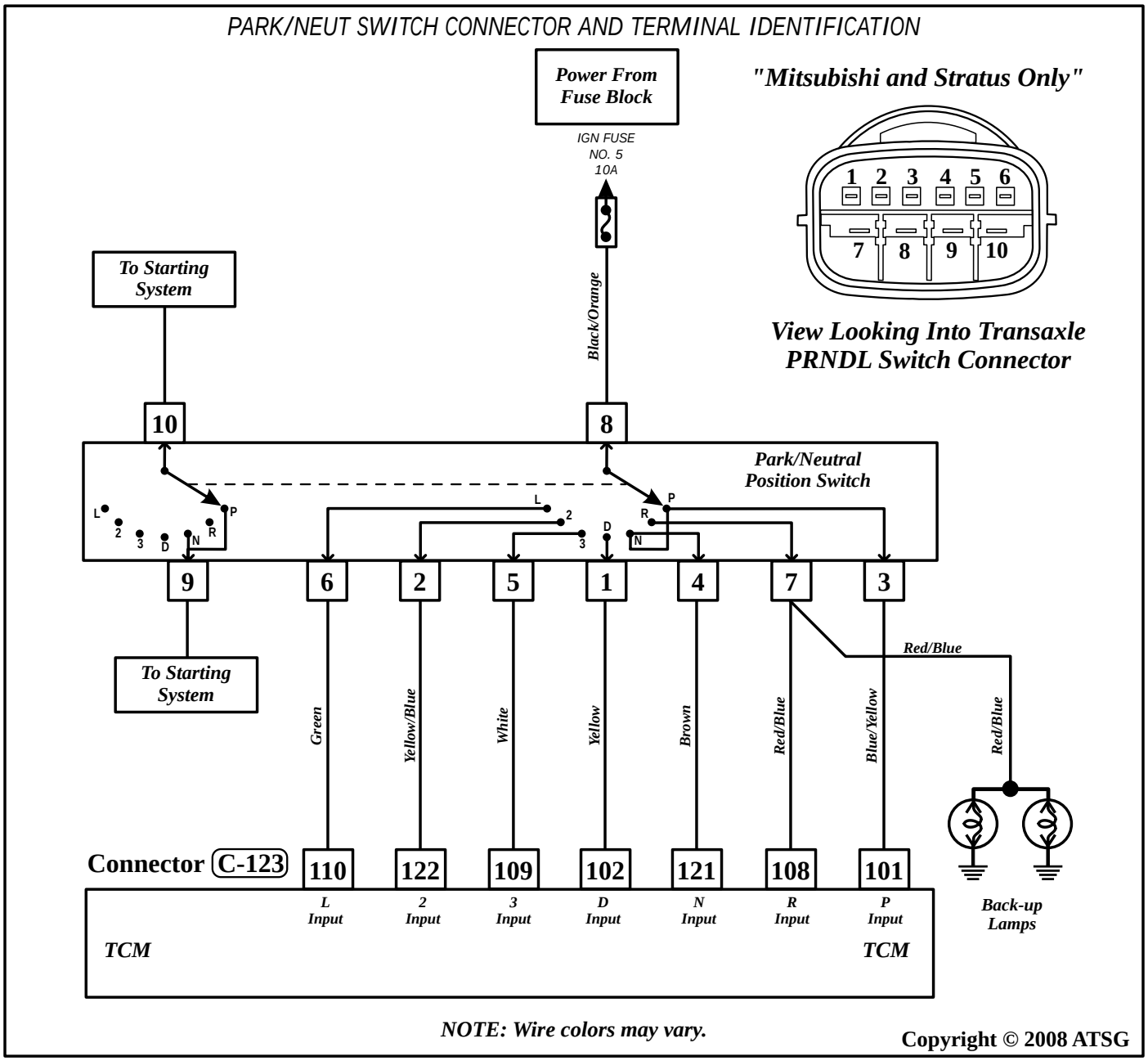


Figure 1

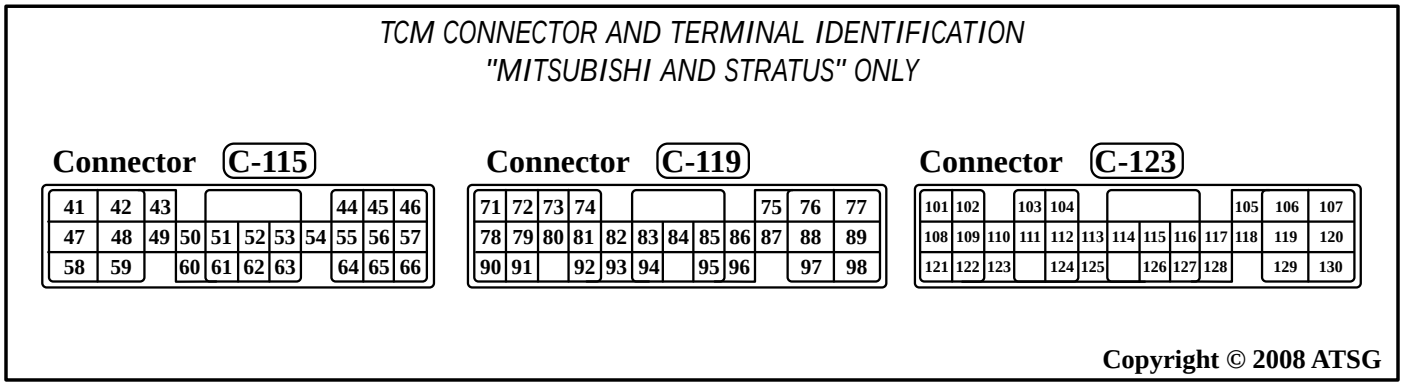


Figure 2

2000 - UP NISSAN RE4FO4A/RE4RO1A
SLIGHTLY DELAYED 1-2 UP-SHIFT AND QUICK OVER-SPEED DURING 2-3 SHIFT

COMPLAINT: A Nissan vehicle equipped with either the RE4RO1A or RE4FO4A transmission enters the shop with a complaint of a slightly delayed 1-2 up-shift, and a quick over-speed or cut-loose on the 2-3 shift. This condition may be confused with a high clutch failure. Upon disassembly, there are no apparent problems in the high clutch circuit.

CAUSE: One cause may be a stuck closed WOT (Wide Open Throttle) switch. On 2000 and later models, a stuck closed WOT switch not only causes the slightly delayed up-shifts *(approximately 4 - 5 mph.)* into all gears; 1-2, 2-3, 3-4, and TCC apply, it also causes shift solenoid A to be energized briefly immediately before the 2-3 up-shift command. When this takes place, the transmission instantly makes a shift from 2nd gear, back to 1st *(which feels like a cut-loose, or over-speed)*, then completes the rest of the up-shifts.

NOTE: *Nissan models previous to model year 2000 do not exhibit the same condition. A stuck closed WOT switch, would cause high line pressure, and excessively late up-shifts in all ranges.*

CORRECTION: Check the WOT/IDLE Switch input, repair, or replace as necessary. The WOT/IDLE Switch on these vehicles is incorporated with the Throttle Position Sensor. Refer to Figure 1 for WOT/IDLE and TPS connector identification and pin layout.

Idle/Full Throttle Switch Check:

Step 1:
This step checks for battery reference voltage to the WOT/IDLE Switch. Turn the ignition "ON". Probe the wire side of the WOT/IDLE harness with the connector plugged in, and check for voltage at Pin 2 of the WOT/IDLE Throttle Switch Connector. Place the red lead of your voltmeter to Pin 2, and the black lead of your meter to a good ground such as the battery negative terminal. You should see a reading of approx. 8-12 volts DC with the ignition on. For reference, refer to Figure 2.

Step 2:
This step checks the Idle side of the WOT/IDLE Switch. Move the red lead of your meter to Pin 3 of the connector. Leave the black lead of your meter on the battery negative terminal. You should see a reading of approx. 8 to12 volts DC with the ignition on and accelerator pedal at a closed throttle. As the accelerator pedal is depressed, the voltage should drop to about 0.0 volts DC. For reference, refer to Figure 3.

CORRECTION CONT'D:

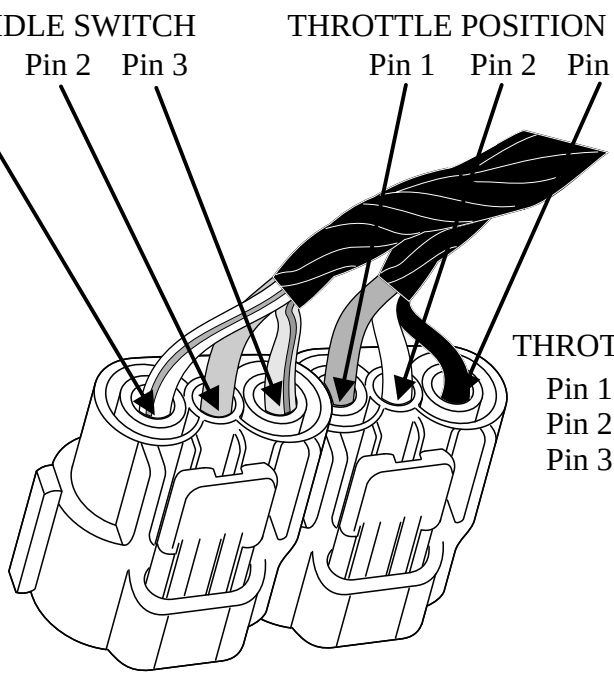
Step 3:

This step checks the WOT side of the WOT/IDLE Switch. Move the red lead of your meter to Pin 1 of the connector. Leave the black lead of your meter on the battery negative terminal. Depress the accelerator pedal fully to the floor. You should see a reading of approx. 0.0 volts DC at a closed throttle. As the accelerator pedal is depressed, the voltage should jump to approx. 8 to 12 volts DC, once the accelerator pedal has been depressed to between 5/8 and 3/4 throttle and should remain at the same voltage through Wide Open Throttle. For reference, refer to Figure 4.

Step 4:

This step checks for a short to power on the WOT Switch wire. Disconnect the connector from the WOT/IDLE Switch. Leave the red lead of your meter connected to Pin 1 of the connector. Leave the black lead of your meter on the battery negative terminal. You should see a reading of 0 volts. Any voltage on this wire would be an indication that the wire is shorted to a power. If the wire is shorted to a power, either locate the short in the harness, or cut the wire at the computer and the WOT/IDLE switch and run a new wire. For reference, refer to Figure 5.

WOT/IDLE AND TPS CONNECTOR IDENTIFICATION AND LAYOUT



WOT/IDLE SWITCH

Pin 1 = WOT signal.
Pin 2 = 12 volt power.
Pin 3 = IDLE signal.

THROTTLE POSITION SENSOR

Pin 1 = 5 volt reference signal.
Pin 2 = TP signal to computer.
Pin 3 = Sensor ground.

Figure 1

CHECKING REFERENCE VOLTAGE

Check voltage between Pin 2 and ground. You should see approx. 12 volts DC.

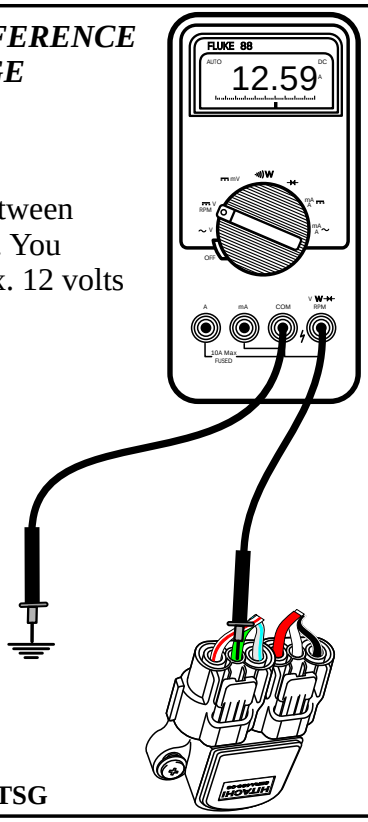


Figure 2

CHECKING IDLE SW VOLTAGE

OFF IDLE SHOWN

Check voltage between Pin 3 and ground. You should see approx. 12 volts DC at idle, and 0 volts off idle.

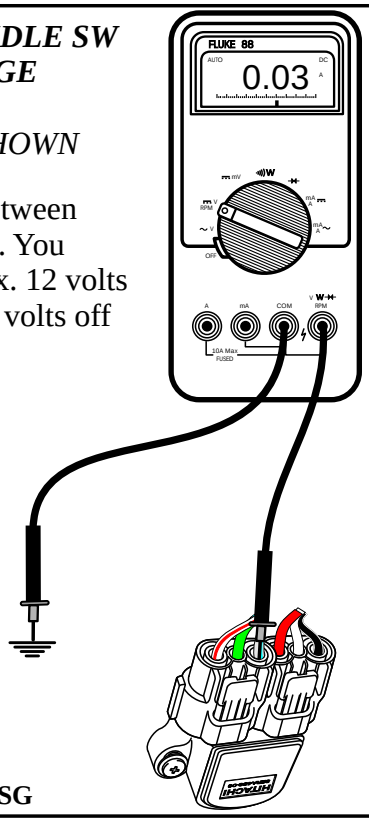


Figure 3

CHECKING WOT SW VOLTAGE

WOT SHOWN

Check voltage between Pin 1 and ground. You should see approx. 0 volts DC. Below 3/4 throttle, and approx. 12 volts at WOT.

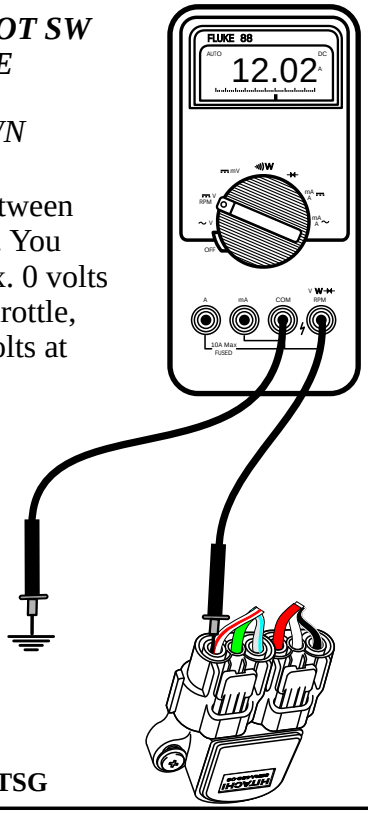


Figure 4

CHECKING WOT SW SHORT TO VOLTAGE

NO SHORT TO VOLTAGE INDICATED

Unplug connector, check voltage between pin 1 and ground, there should be 0 volts DC.

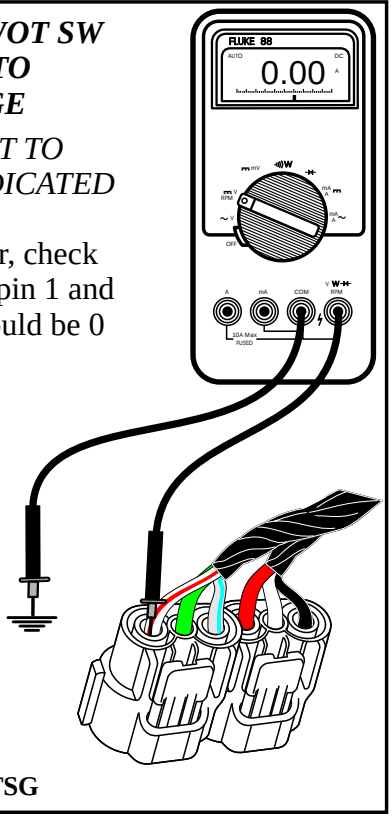


Figure 5

NISSAN RE5R05A

VALVE BODY IDENTIFICATION

The RE5R05A is the Nissan/Infiniti five speed rear drive transmission used in the InfinitiCX35, FX35, FX45, G35, M35, M35x, M45, Q45, and QX56. It is also used in Nissan 350Z, Frontier, Pathfinder, Armada, Titan and Xterra XE models. This transmission has been on the road in North America since the 2002 model year.

As a result this transmission is a common sight in many shops, however the information that is available from the O.E.M. is mostly incomplete, especially when it comes to valve body information such as small parts and checkball locations as well as valve nomenclature.

There is also confusion in checkball location and valve lineup because there is a difference between the Infiniti and Nissan valve bodies.

The following information will illustrate both the late and early valve body information so badly needed in our industry.

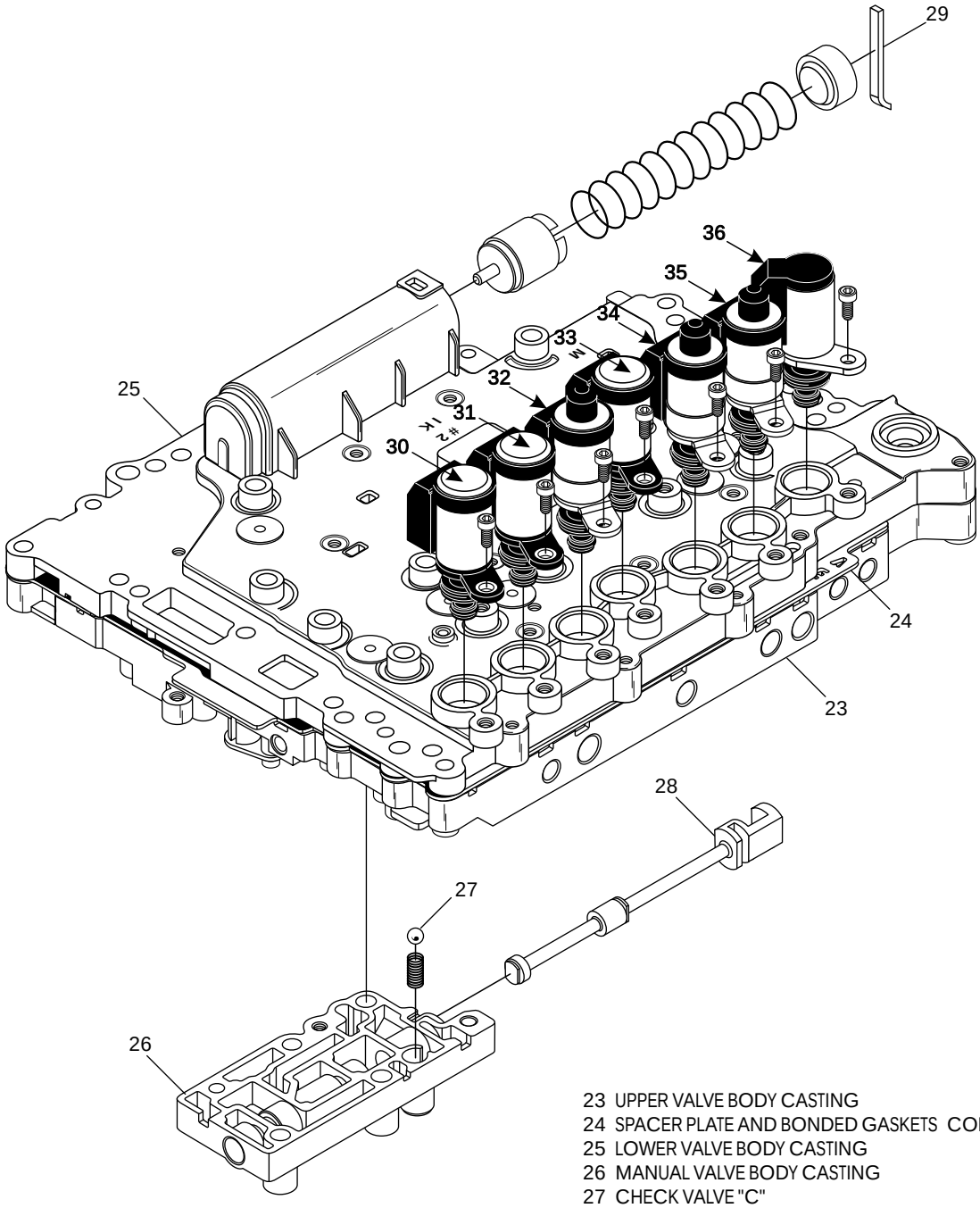
We would also like to take this opportunity to thank Lance Wiggins, ATRA Technical Supervisor for allowing ATSG to use the valve nomenclature in this bulletin that Lance so pain stakingly discovered along with Steve Younger.

Refer to Figure 1 for Infiniti Upper Valve Body and Solenoid Identification.
Refer to Figure 2 for Infiniti Upper Valve Body Valve Identification.
Refer to Figure 3 for Infiniti Upper Valve Body Small Parts Locations.
Refer to Figure 4 for Infiniti Lower Valve Body Checkball Locations.
Refer to Figure 5 for Infiniti Manual Valve Body Identification.

Refer to Figure 6 for Nissan Upper Valve Body and Solenoid Identification.
Refer to Figure 7 for Nissan Upper Valve Body Valve Identification.
Refer to Figure 8 for Nissan Upper Valve Body Small Parts Locations.
Refer to Figure 9 for Nissan Lower Valve Body Checkball Locations.
Refer to Figure 10 for Nissan Manual Valve Body Identification.

Refer to Figure 11 for "Normally Applied" Solenoid Operation.
Refer to Figure 12 for "Normally Vented" Solenoid Operation.
Refer to Figure 13 for "Normally Closed" Solenoid Operation.

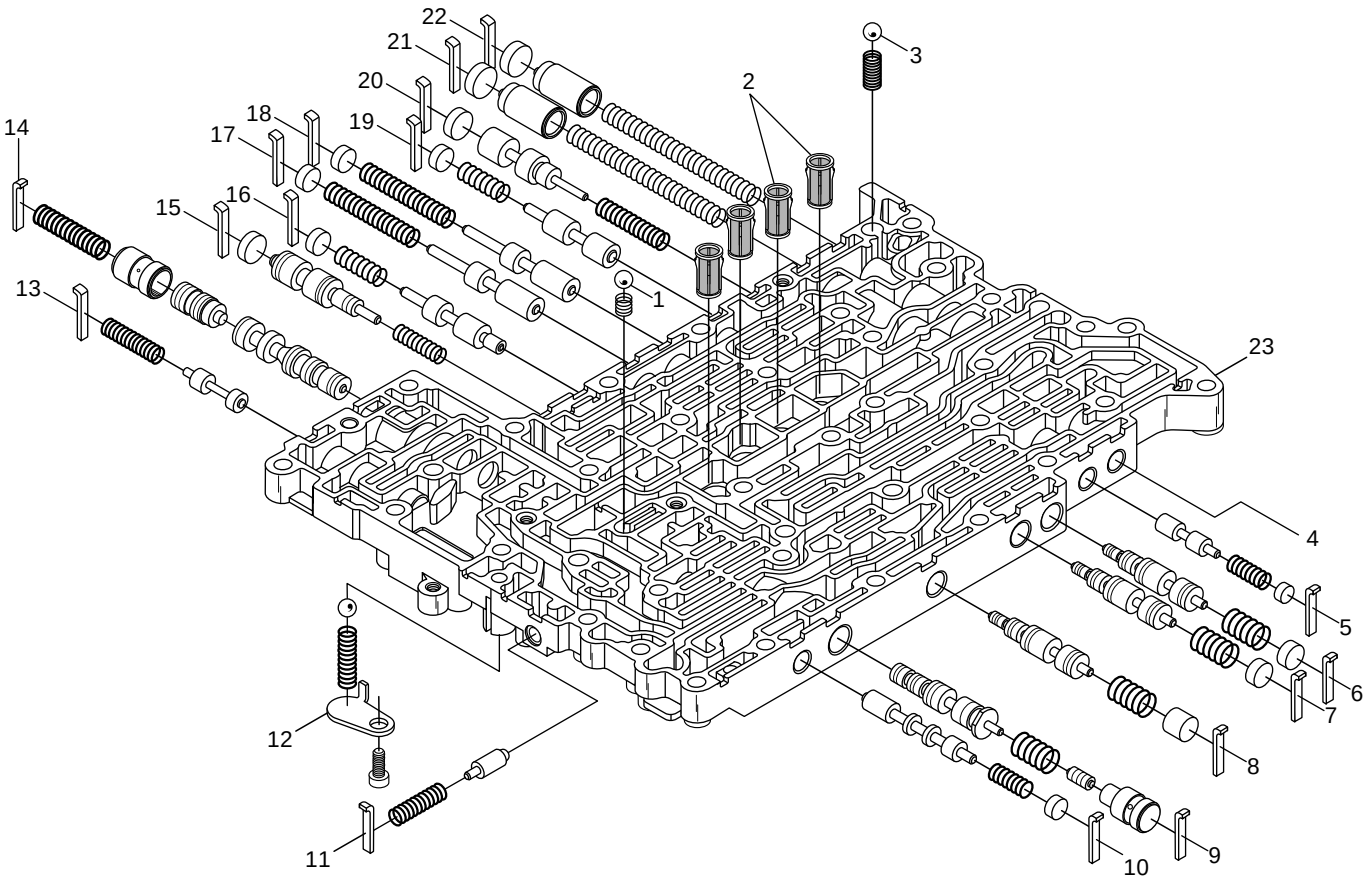
RE5RO5A "INFINITY" VALVE BODY EXPLODED VIEW



23 UPPER VALVE BODY CASTING
24 SPACER PLATE AND BONDED GASKETS CODE "AE"
25 LOWER VALVE BODY CASTING
26 MANUAL VALVE BODY CASTING
27 CHECK VALVE "C"
28 MANUAL VALVE
29 FORWARD AND REVERSE ENGAGEMENT ACCUMULATOR
30 LINE PRESSURE SOLENOID
31 LOW COAST BRAKE CLUTCH SOLENOID
32 HIGH AND LOW CLUTCH SOLENOID
33 FRONT BRAKE CONTROL SOLENOID
34 INPUT CLUTCH SOLENOID
35 DIRECT CLUTCH SOLENOID
36 TORQUE CONVERTER CLUTCH SOLENOID

Figure 1

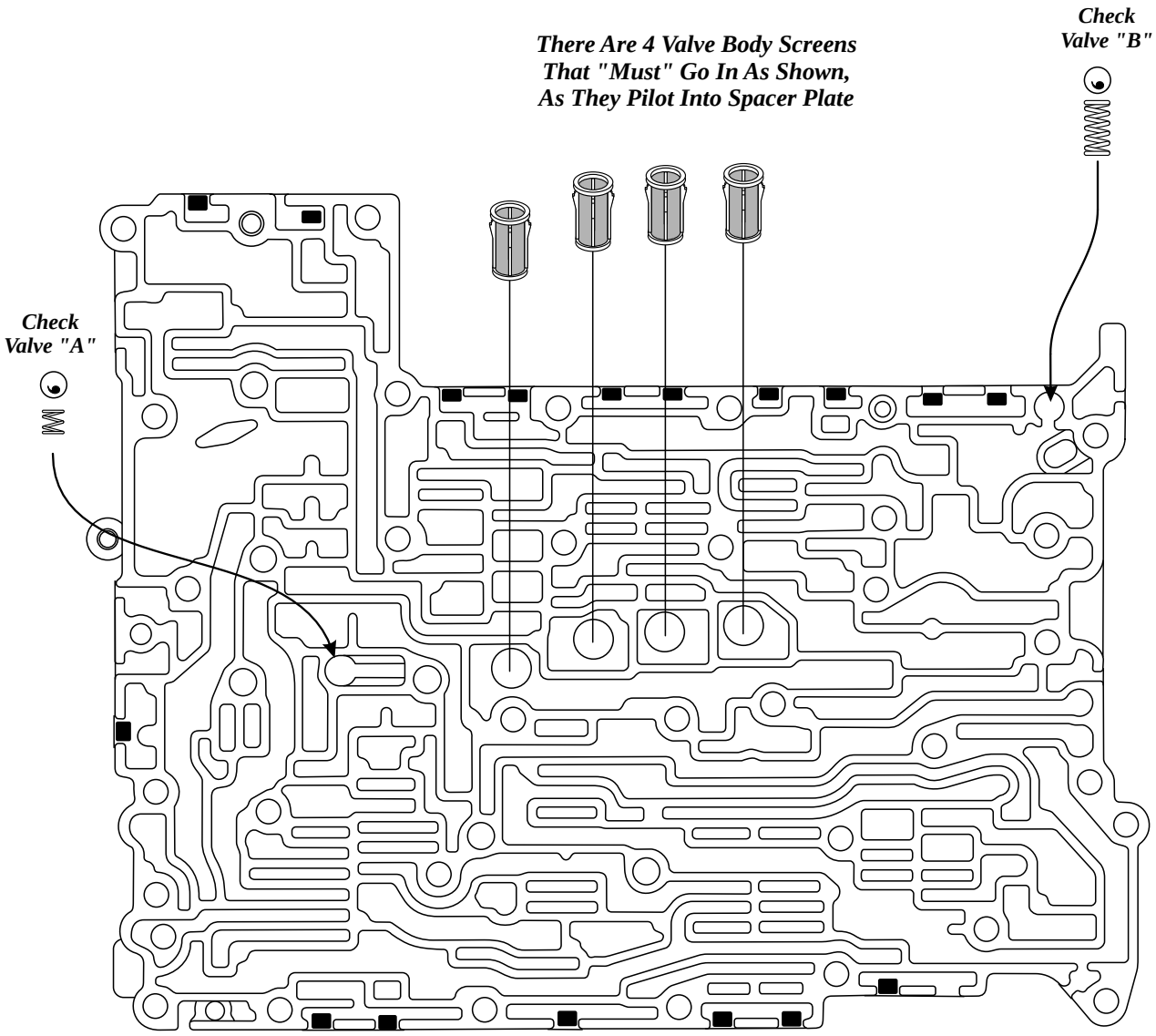
RE5RO5A "INFINITY" UPPER VALVE BODY EXPLODED VIEW



1 CHECK VALVE "A"
2 VALVE BODY SCREENS (4 REQUIRED)
3 CHECK VALVE "B"
4 BLANK HOLE BORED WITH NO VALVE TRAIN
5 DIRECT CLUTCH PISTON SWITCHING VALVE
6 HIGH/LOW REVERSE CLUTCH CONTROL VALVE
7 INPUT CLUTCH CONTROL VALVE
8 DIRECT CLUTCH CONTROL VALVE
9 TORQUE CONVERTER CLUTCH CONTROL VALVE
10 TORQUE CONVERTER LUBRICATION VALVE
11 COOLER BYPASS VALVE
12 LINE PRESSURE RELIEF VALVE
13 TCC REGULATOR VALVE
14 LINE PRESSURE REGULATOR VALVE
15 FRONT BRAKE CONTROL VALVE
16 ACCUMULATOR CONTROL VALVE
17 PILOT VALVE "A"
18 PILOT VALVE "B"
19 LOW COAST BRAKE SWITCHING VALVE
20 LOW COAST BRAKE REDUCING VALVE
21 NEUTRAL TO REVERSE ACCUMULATOR
22 NEUTRAL TO DRIVE ACCUMULATOR
23 UPPER VALVE BODY CASTING

Figure 2

RE5R05A "INFINITY" UPPER VALVE BODY



Check Valve "A"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.350"
SPRING DIAMETER	.285"
WIRE DIAMETER	.016"
APPROX COILS	5

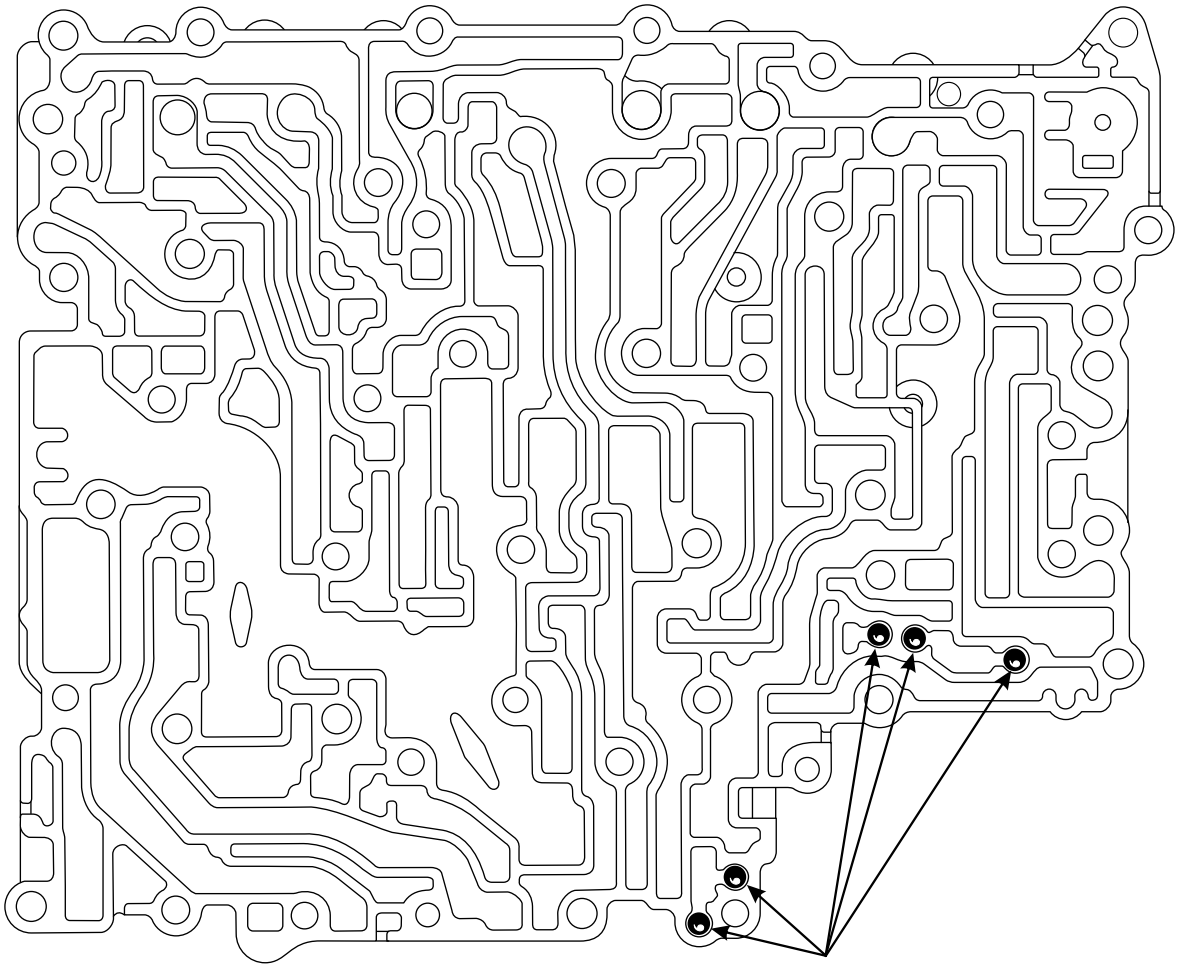
Check Valve "B"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.705"
SPRING DIAMETER	.316"
WIRE DIAMETER	.039"
APPROX COILS	11

Figure 3

European Exchange (Use 07 Ad)

European Exchange (Use 07 Ad)

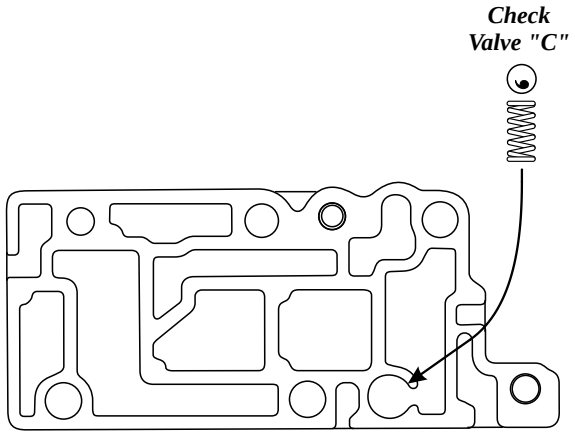
RE5R05A "INFINITY" LOWER VALVE BODY



5 Steel Check Balls Required
5.5mm (.218") Diameter

Figure 4

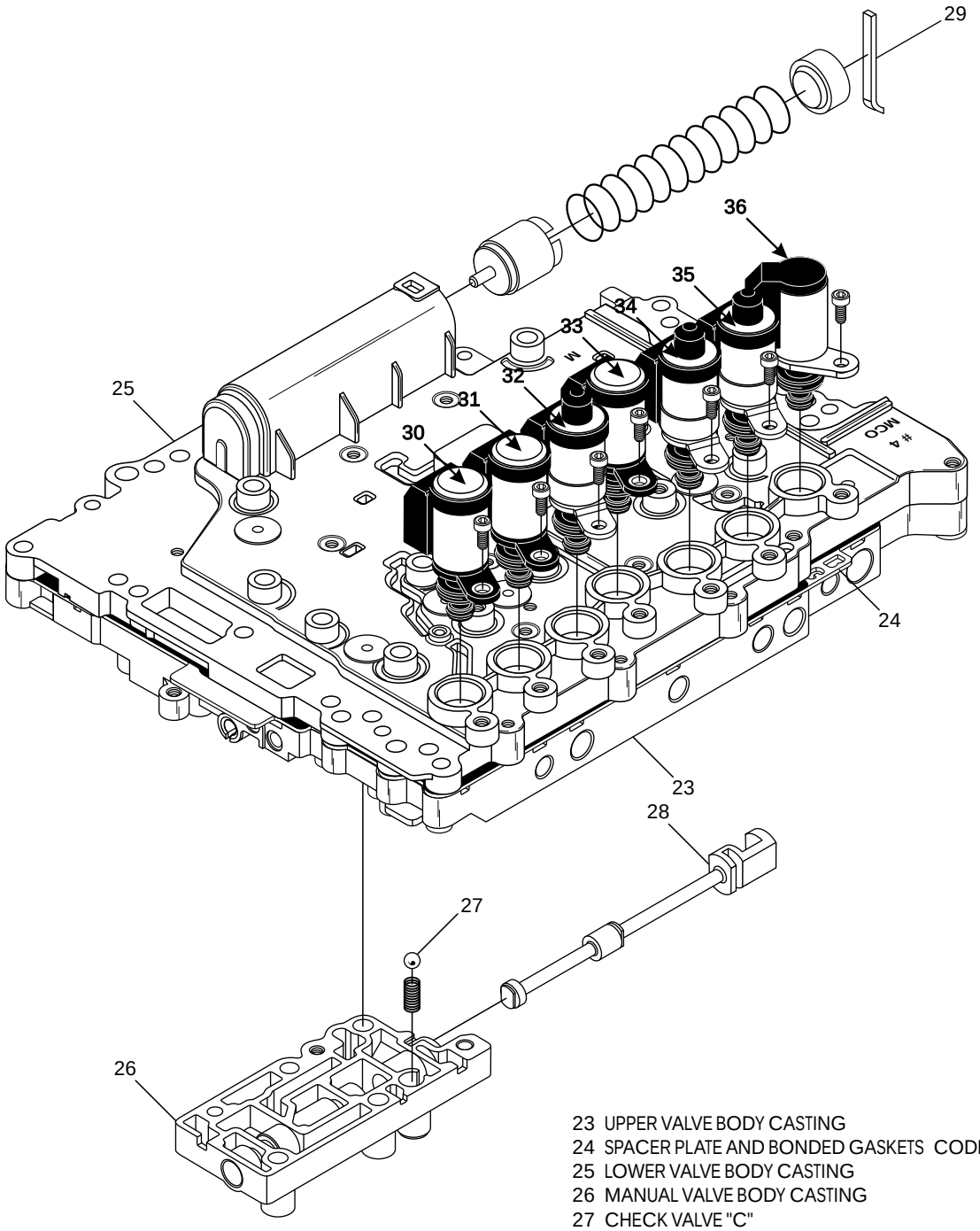
RE5R05A "INFINITY" MANUAL VALVE BODY



Check Valve "C"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.705"
SPRING DIAMETER	.316"
WIRE DIAMETER	.039"
APPROX COILS	11

Figure 5

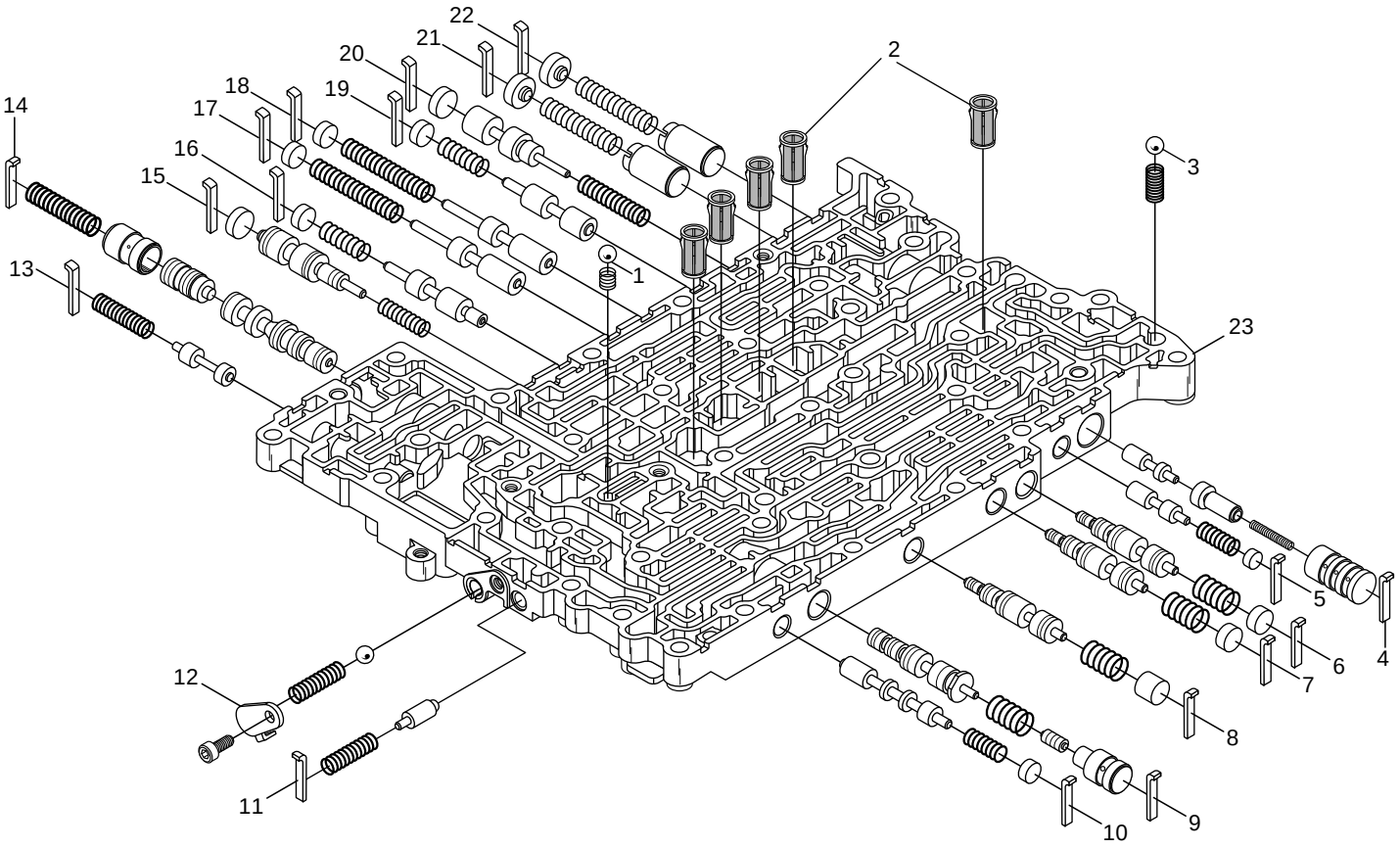
RE5R05A "NISSAN" VALVE BODY EXPLODED VIEW



23 UPPER VALVE BODY CASTING
24 SPACER PLATE AND BONDED GASKETS CODE "BC"
25 LOWER VALVE BODY CASTING
26 MANUAL VALVE BODY CASTING
27 CHECK VALVE "C"
28 MANUAL VALVE
29 FORWARD AND REVERSE ENGAGEMENT ACCUMULATOR
30 LINE PRESSURE SOLENOID
31 LOW COAST BRAKE CLUTCH SOLENOID
32 HIGH AND LOW CLUTCH SOLENOID
33 FRONT BRAKE CONTROL SOLENOID
34 INPUT CLUTCH SOLENOID
35 DIRECT CLUTCH SOLENOID
36 TORQUE CONVERTER CLUTCH SOLENOID

Figure 6

RE5R05A "NISSAN" UPPER VALVE BODY EXPLODED VIEW

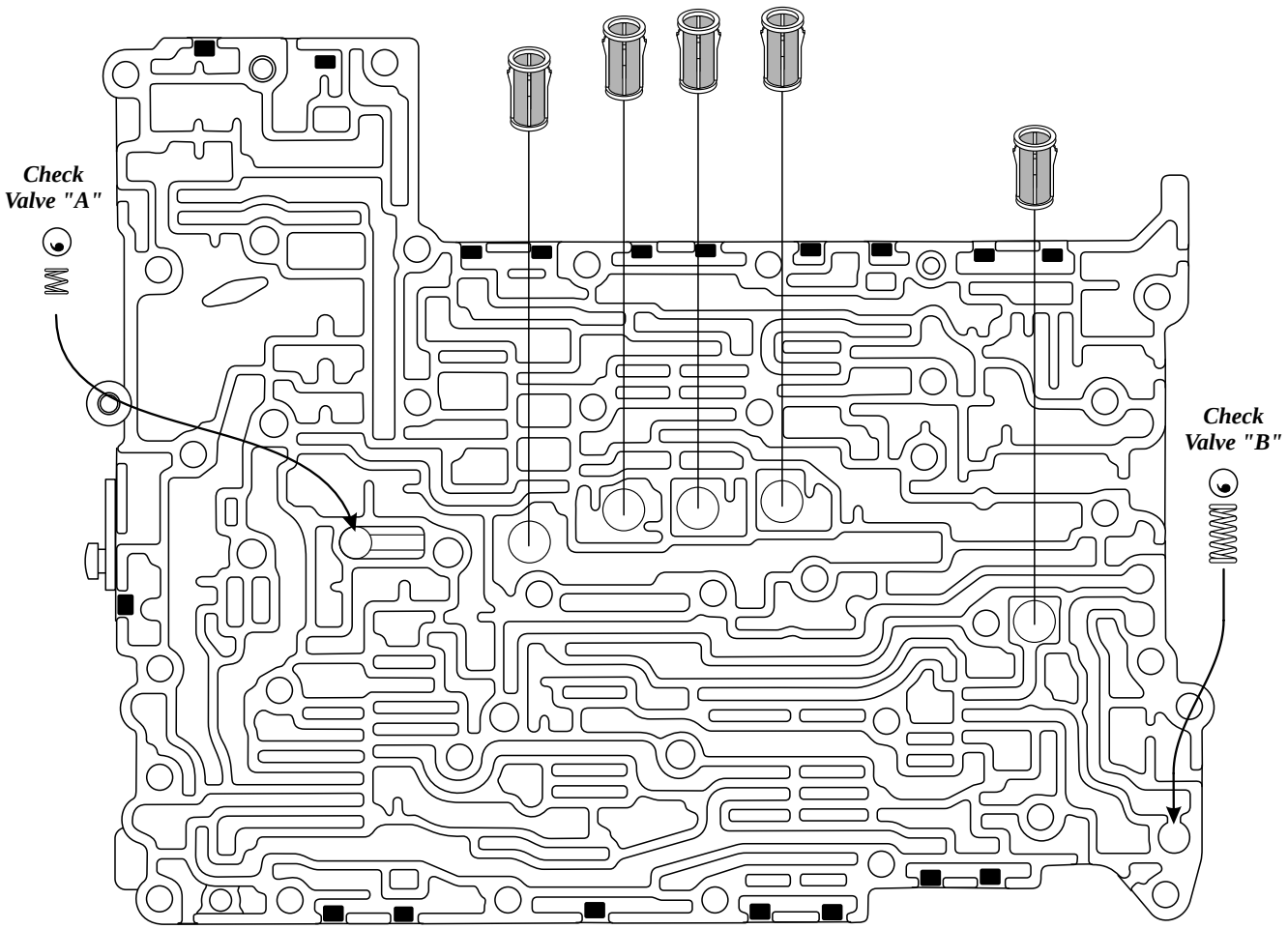


1 CHECK VALVE "A"
2 VALVE BODY SCREENS (5 REQUIRED)
3 CHECK VALVE "B"
4 DIRECT CLUTCH REGULATING VALVE
5 DIRECT CLUTCH PISTON SWITCHING VALVE
6 HIGH/LOW REVERSE CLUTCH CONTROL VALVE
7 INPUT CLUTCH CONTROL VALVE
8 DIRECT CLUTCH CONTROL VALVE
9 TORQUE CONVERTER CLUTCH REGULATOR VALVE
10 TORQUE CONVERTER LUBRICATION VALVE
11 COOLER BYPASS VALVE
12 LINE PRESSURE RELIEF VALVE
13 TORQUE CONVERTER OPERATING PRESSURE VALVE
14 LINE PRESSURE REGULATOR VALVE
15 FRONT BRAKE CONTROL VALVE
16 ACCUMULATOR CONTROL VALVE
17 PILOT VALVE "A"
18 PILOT VALVE "B"
19 LOW COAST BRAKE SWITCHING VALVE
20 LOW COAST BRAKE REDUCING VALVE
21 NEUTRAL TO REVERSE ACCUMULATOR
22 NEUTRAL TO DRIVE ACCUMULATOR
23 UPPER VALVE BODY CASTING

Figure 7

RE5R05A "NISSAN" UPPER VALVE BODY

There Are 5 Valve Body Screens That "Must" Go In As Shown, As They Pilot Into Spacer Plate



Check Valve "A"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.350"
SPRING DIAMETER	.285"
WIRE DIAMETER	.016"
APPROX COILS	5

Check Valve "B"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.705"
SPRING DIAMETER	.316"
WIRE DIAMETER	.039"
APPROX COILS	11

Figure 8

SLIDE

RE5R05A "NISSAN" LOWER VALVE BODY

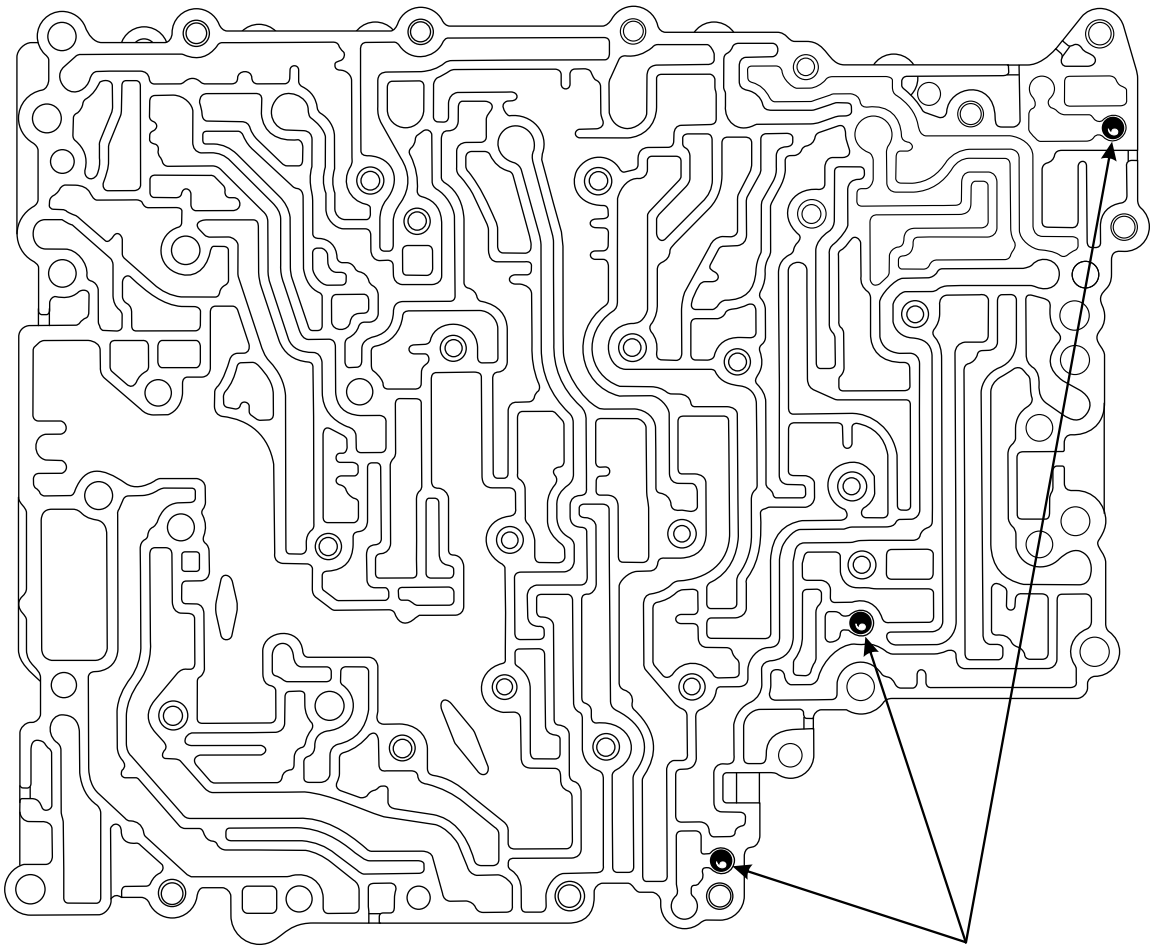
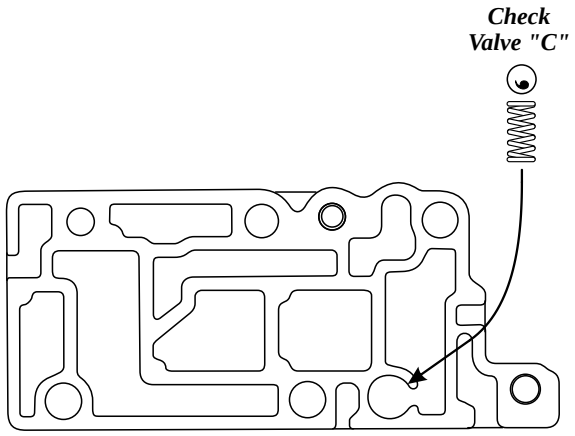


Figure 9

RE5R05A "NISSAN" MANUAL VALVE BODY



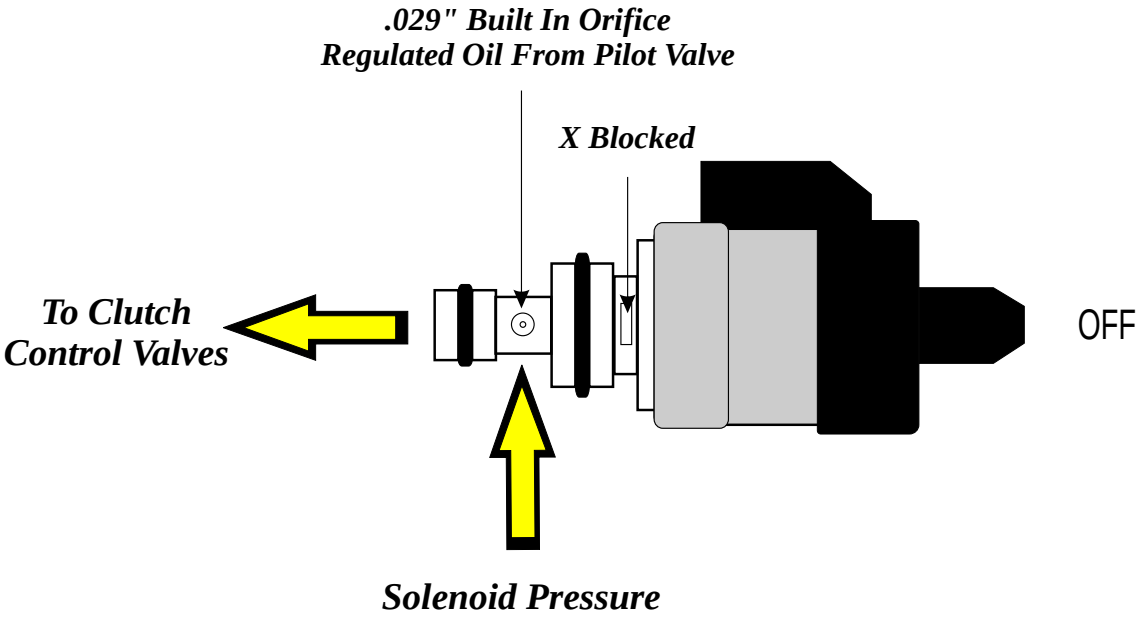
Check Valve "C"	
BALL DIAMETER	.312"
SPRING FREE LENGTH	.705"
SPRING DIAMETER	.316"
WIRE DIAMETER	.039"
APPROX COILS	11

Figure 10

3 Normally Applied Solenoids

HIGH/LOW, INPUT & DIRECT CLUTCH SOLENOIDS

Solenoid Resistance is approximately 6-7 ohms across the 2 solenoid terminals



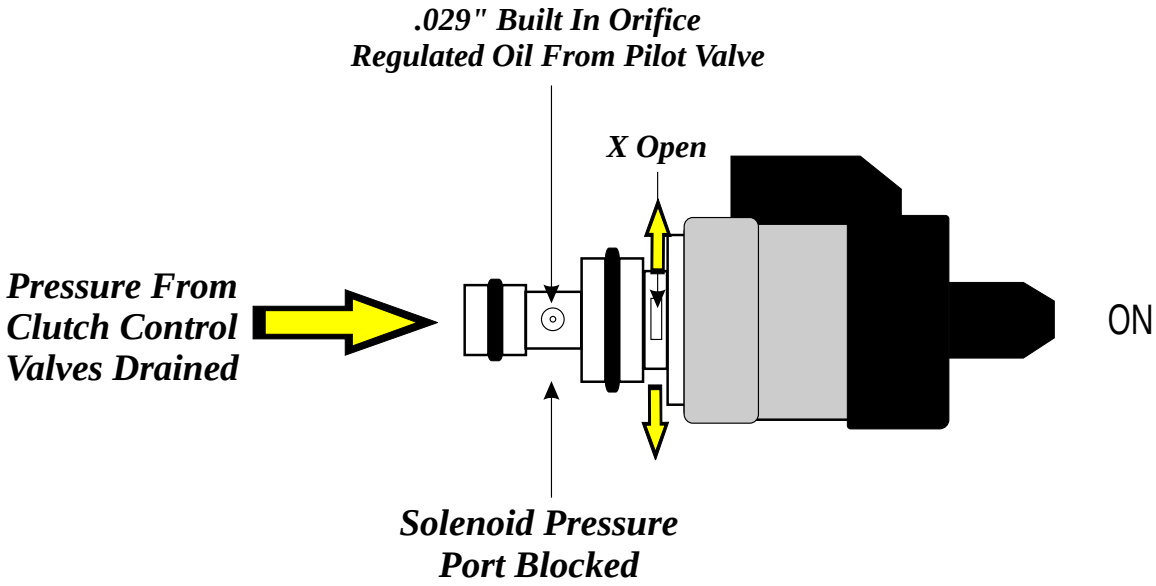
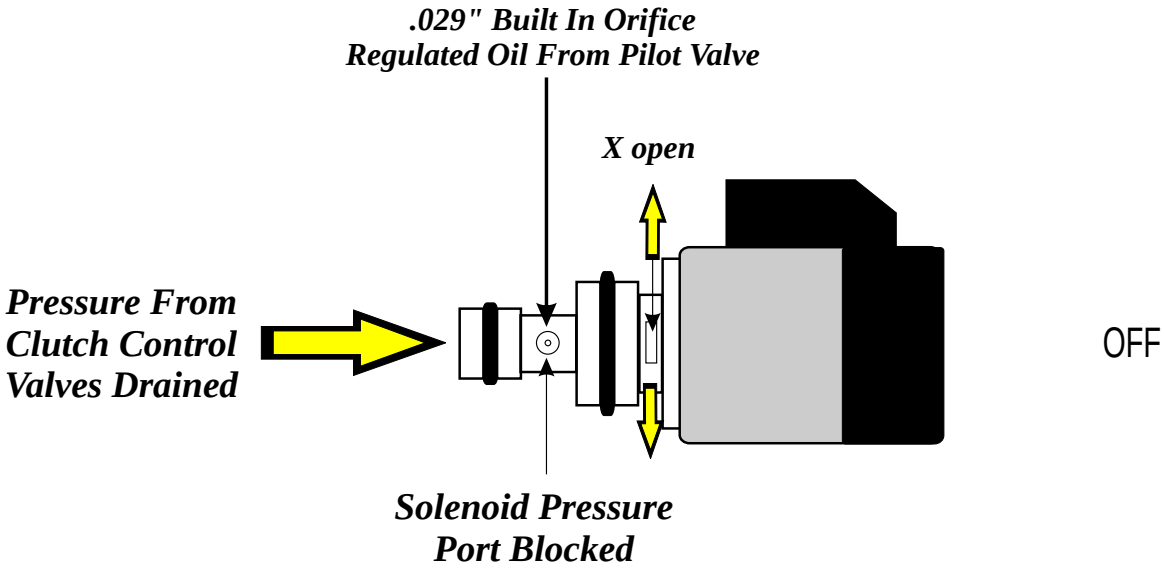


Figure 11

3 Normally Vented Solenoids

LINE PRESSURE, LOW COAST BRAKE & FRONT BRAKE CONTROL SOLENOIDS

Solenoid Resistance is approximately 6-7 ohms across the 2 solenoid terminals



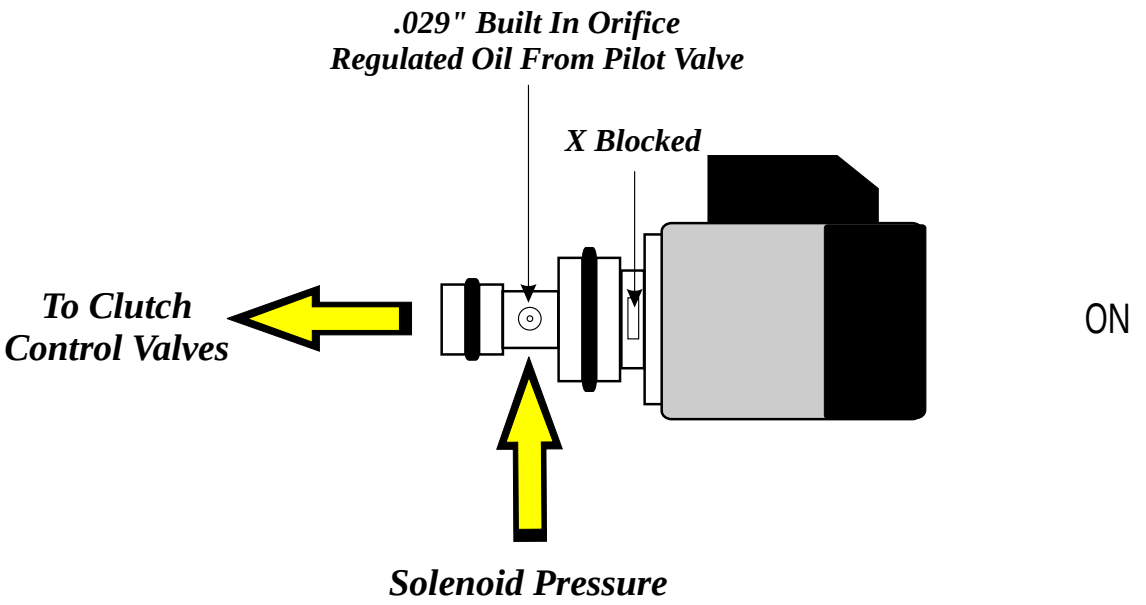
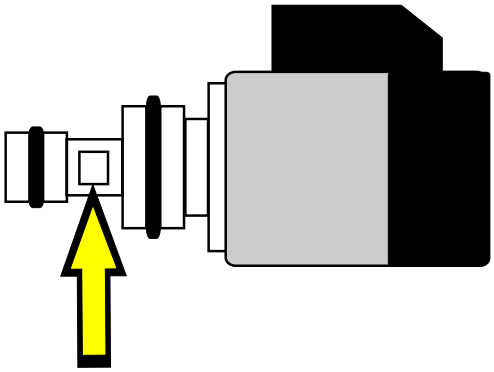


Figure 12

1 Normally Closed Solenoid

TORQUE CONVERTER CLUTCH SOLENOID

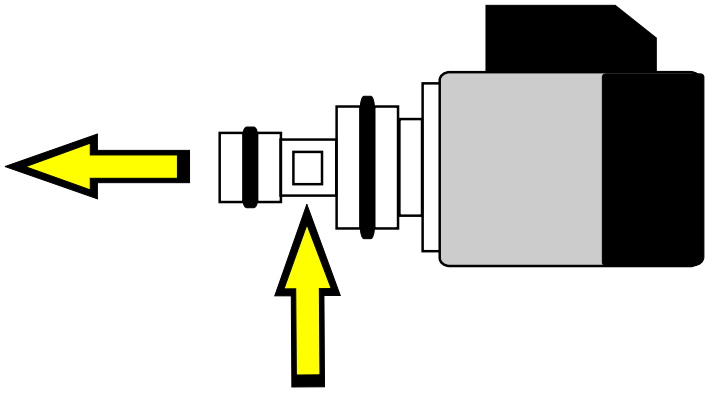
Solenoid Resistance is approximately 25-30 ohms across the 2 solenoid terminals



OFF

Solenoid Pressure Port Blocked

To TCC Valves



ON

Solenoid Pressure

Figure 13

NISSAN/INFINITI RE5R05A
VARIOUS UP-SHIFT COMPLAINTS, DTC P0720 STORED

COMPLAINT: Before or after overhaul, a NISSAN/INFINITI with the RE5R05A may exhibit various up-shift compaints. When checking the vehicle with a scan tool, DTC P0720 Vehicle Speed Sensor A/T ***(Revolution/Output Sensor)*** is indicated.

CAUSE: One cause may be a faulty Vehicle Speed Sensor A/T ***(Revolution/Output Sensor)***. The Revolution/Output Sensor is a Hall Effect Sensor type located in the rear housing of the transmission and obtains its reading off the park gear. The Revolution/Output Sensor is used by the Transmission Control Module (TCM) to assist in determining shift scheduling.

DTC P0720 is set when the TCM doesn't receive a proper voltage signal from the sensor while driving. This code can also be set when the ignition switch is turned "ON", and an improper signal is received from the Vehicle Speed Sensor MTR before the vehicle begins moving.

The Vehicle Speed Sensor MTR signal is sent from the instrument cluster/combination meter to the TCM by way of CAN bus signal through the CAN communication line. The instrument cluster receives its vehicle speed information through the CAN communication line via the ABS system from the Wheel Speed Sensors.

In the event of a Revolution/Outpur Sensor malfunction, the TCM will utilize the MTR signal for Vehicle Speed Input.

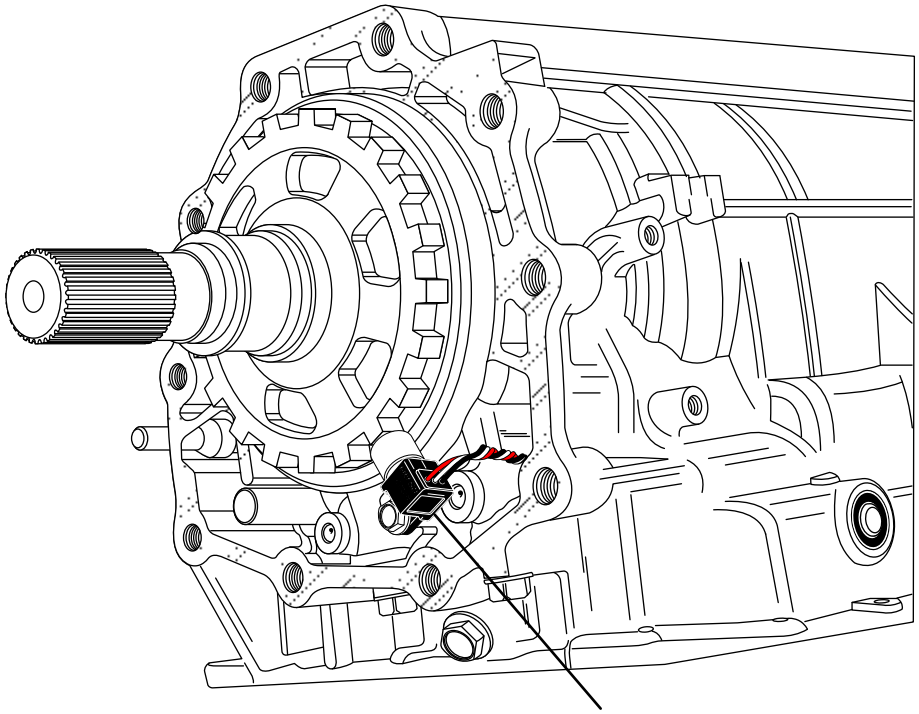
CORRECTION: Check and/or replace the Revolution/Output Sensor as necessary.

Refer to Figure 1 for Revolution/Output Sensor location in the transmission and the harness connector location on the Park Neutral Position Switch. Refer to Figure 2 for a partial wiring diagram of the Revolution/Output Sensor Circuit and instructions for bench testing the Hall Effect Sensor.

SERVICE INFORMATION:

VSS A/T *(Revolution/Output Sensor)* Nissan Part #..... 3193590-X02

VEHICLE SPEED SENSOR A/T *(REVOLUTION/OUTPUT)* SENSOR LOCATION



Revolution/Output Sensor

HARNESS CONNECTOR PLUG IN LOCATION IN THE RANGE SENSOR

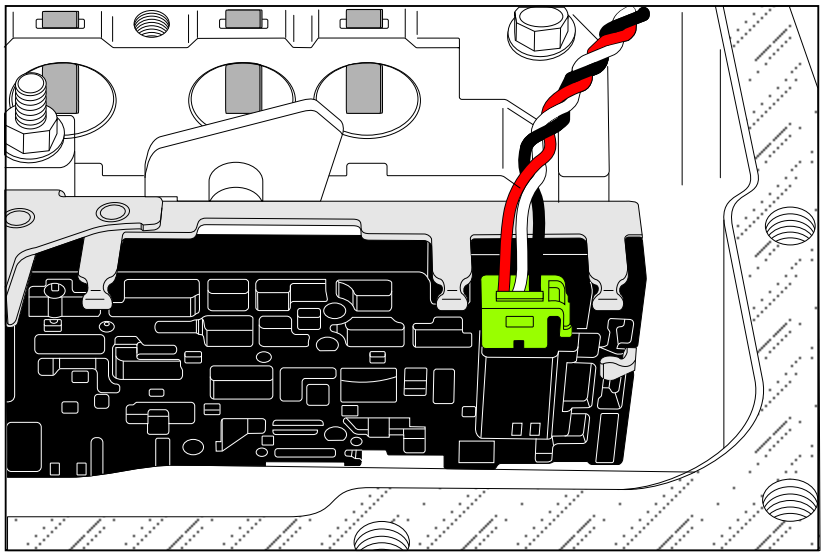
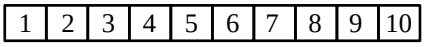


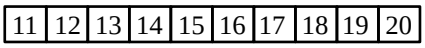
Figure 1

PARTIAL WIRING DIAGRAM

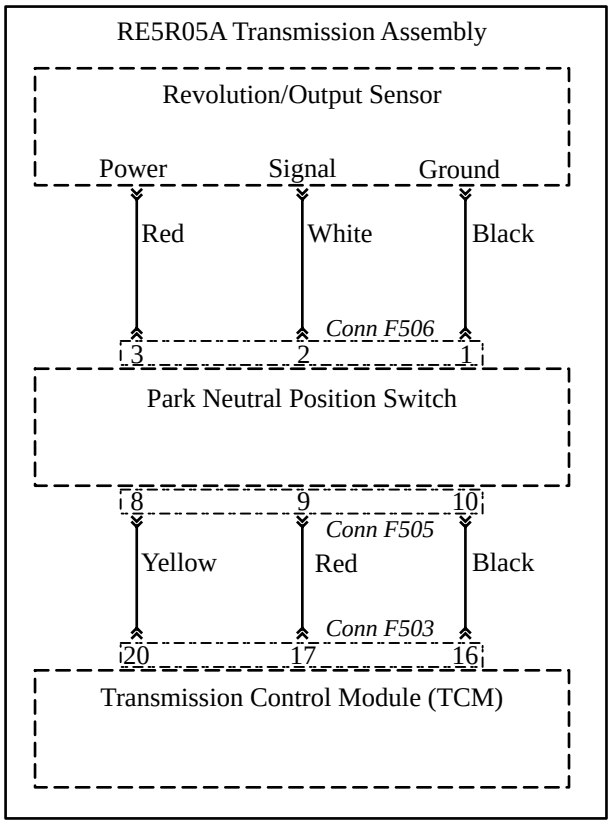
Connector F506 Rev/Output Sensor



Connector F505 P/N Position Switch



Connector F503 TCM



REVOLUTION/OUTPUT SENSOR CHECK

Remove the tail housing or transfer case from the transmission, and the transmission oil pan. Unplug the F506 Green Connector from the P/N Position Switch.

Run 12 volts from a battery to the Red Wire *(Pin 3)* of the F506 Green Connector.

Run a jumper lead from the Black Wire *(Pin 1)* of the F506 Green Connector to battery ground.

Using a DVOM or Graphing Meter, place the Red lead of the meter to the White Wire *(Pin 2)* of the F506 Green Connector, place the Black lead of the meter to the Black Wire *(Pin 1)* of the F506 Green Connector.

Turn output shaft slowly and you should see the meter toggle from voltage to infinite as the lugs on the park gear pass in front of the Revolution/Output Sensor Pick-up.

Figure 2

SUBARU 4-ATAXLE - PHASE II

NO REVERSE

COMPLAINT: The transmission may exhibit a slight delayed forward engagement and will also have a no reverse condition. When the engine is shut off the vehicle lurches backward.

CAUSE: The Low Clutch Timing and Pressure Control Solenoid connectors have been switched.

CORRECTION: Because the Pressure Control and Low Clutch Timing Solenoids are in close proximity of each other, it is easy to switch their connectors. The connector ends are all the same color and are interchangeable, however, **the wire color should match the solenoid connector,** Refer to Figure 1 for solenoid identification.

The no reverse condition is a result of the Low Clutch Timing Solenoid running all the time due to the Pressure control Solenoid connector that is plugged into it. This causes oil to stroke the Reverse Inhibit Valve as seen in the hydraulic schematic in Figure 2. When the shift lever is in the reverse position and the engine is turned off, The Low Clutch Timing Solenoid is also turned off thereby draining the reverse inhibit circuit at which time the valve spring strokes the reverse inhibit valve in the opposite direction which will now momentarily charge the Low/Reverse clutch circuit causing momentary reverse engagement.

SERVICE INFORMATION:

The combination of the Low Clutch Timing Solenoid and the Reverse Inhibit Valve is what constitutes the Reverse Inhibit System in these vehicles.
In order to prevent an accidental shift into reverse at a speed above 6 MPH (10km/h), the Low Clutch Timing Solenoid is turned on to stroke the reverse inhibit valve. When the reverse inhibit valve strokes the Low/Reverse Clutch passage is blocked.

NO REVERSE & DELAYED FORWARD ENGAGMENT

SOLENOID & TCM GROUND LOCATION

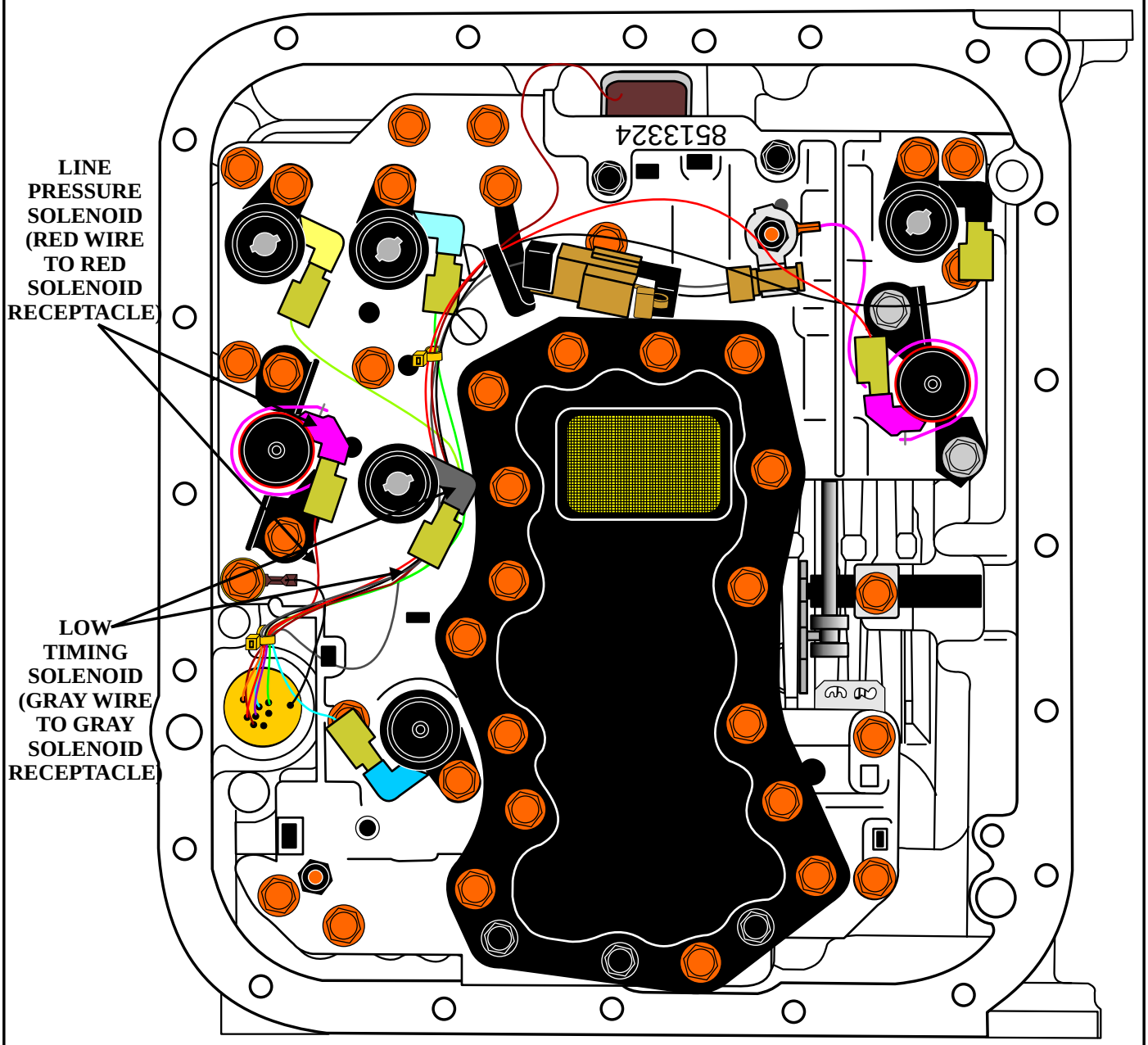


Figure 1

NO REVERSE & DELAYED FORWARD ENGAGMENT

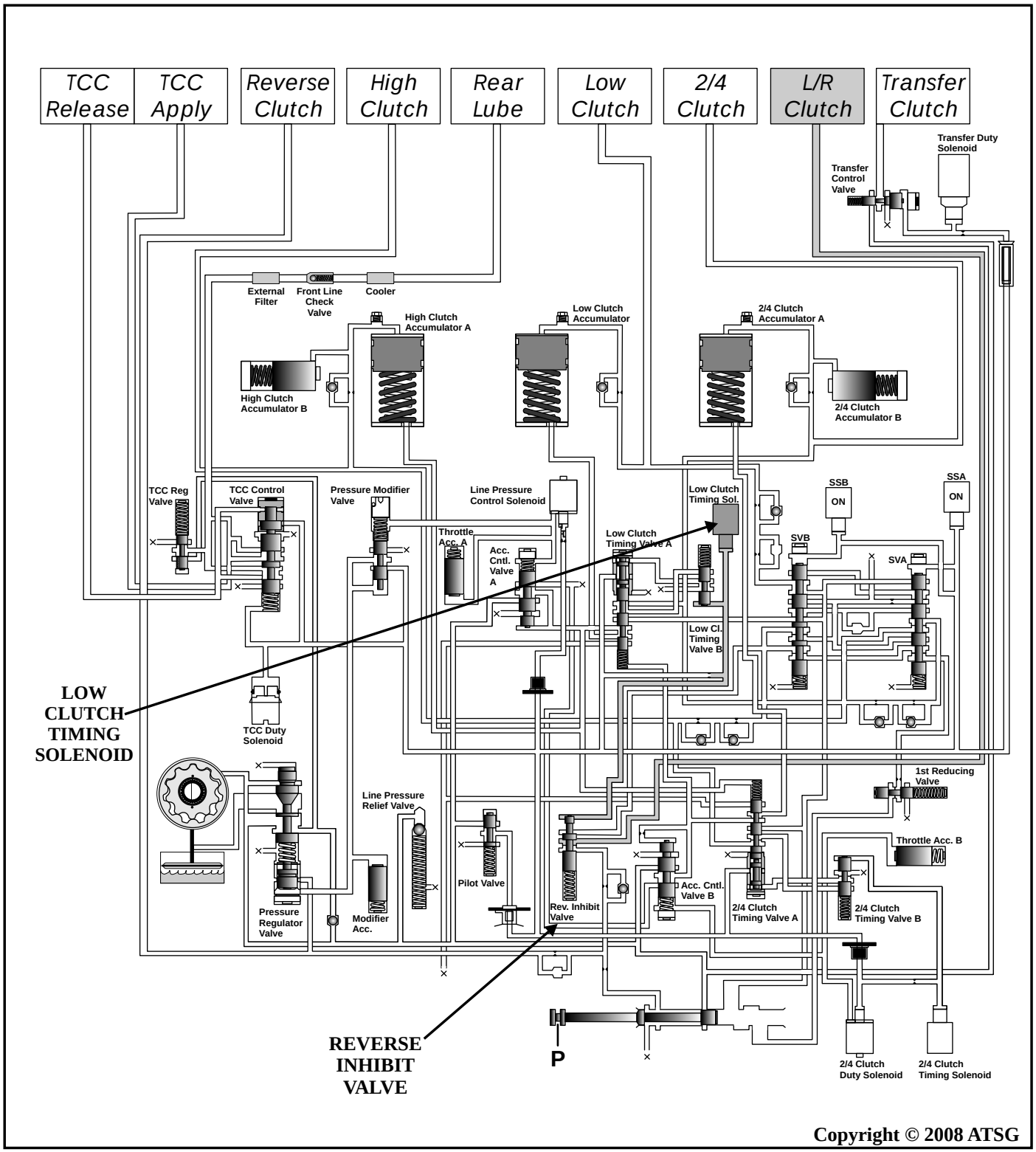


Figure 2

TOYOTA U150 SERIES
SLIPPING UPSHIFTS / PREMATURE FAILURE

COMPLAINT: Toyota vehicles equipped with the U150 series five speed Transaxles may exhibit, slipping upshifts and or premature transmission failure.

CAUSE: The cause may be, a faulty Pressure Control Solenoid which is referred to as the SLT (Figure 1), or a worn out Solenoid Modulating Valve Bore in the upper valvebody (Figure 2). Reason: The SLT solenoid controls line pressure, if it is faulty slipping shifts will occur. The Solenoid Modulating Valve Controls solenoid feed to all of the solenoids except the SR and S4 solenoids, which are fed line pressure thru a .046" orifice. Low solenoid feed will cause low feed to the linear solenoids which are controlling shift overlap, which means premature trans failure.

CORRECTION: To correct this condition, attach a line pressure gage on the Line pressure port located on the front of the case where the accumulator outline is. Line pressure is approximately 60 psi. in Drive and 150 at stall. Evaluate line rise as the vehicle is driven, an erratic or bouncy needle can indicate SLT failure, replace as necessary. If Pressure is good, disassemble the Upper Valvebody as shown in Figure 2 and check the solenoid modulating valve bore for wear. Note: at the time of this printing there are no repairs for this valve, a good used or new valvebody will have to be purchased.

SERVICE INFORMATION:

TOYOTA U150 SERIES VALVEBODY (04 SIENNA model dependant).....35410-08011
SLT SOLENOID.....35290-45010

Special thanks to:
Mike Fontana at Lee Myles NJ
David at Transmission Exchange MO

U150 SERIES SOLENOID I.D.

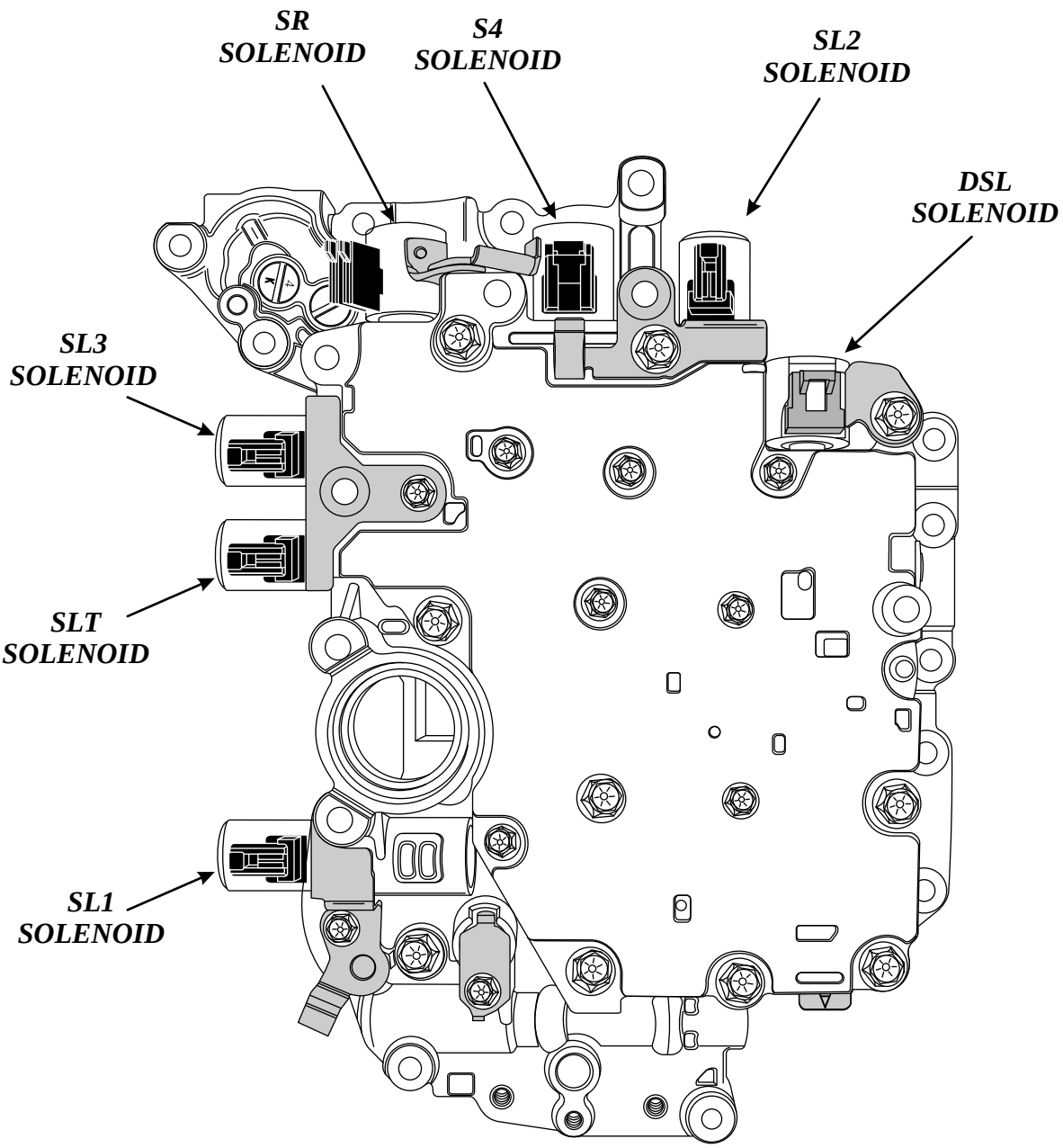
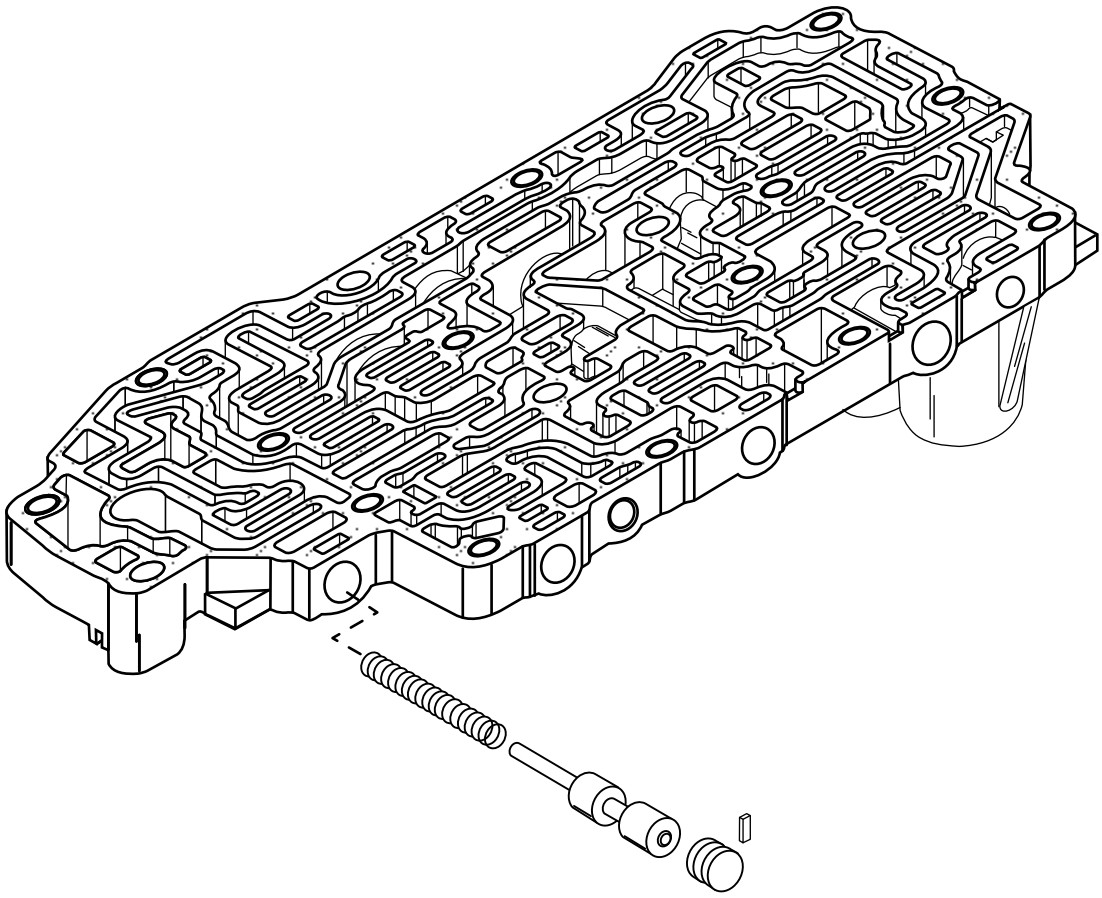
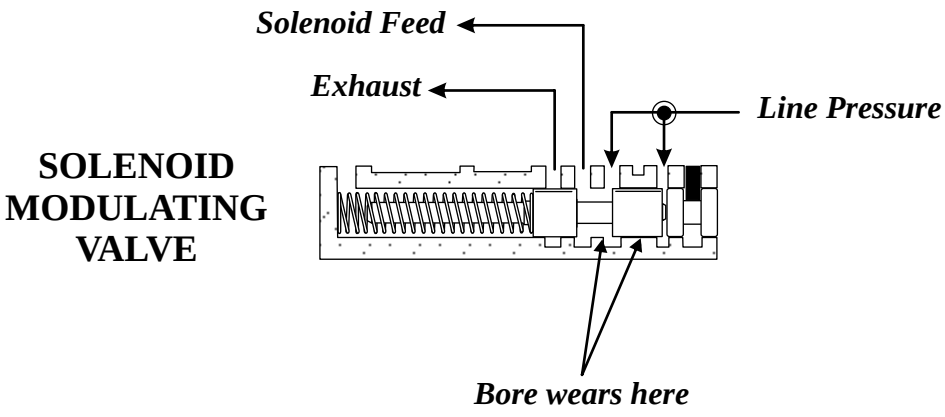


Figure 1

UPPER VALVE BODY





SOLENOID MODULATING VALVE

Note: Bore wear in the Solenoid Modulating Valve may cause low Solenoid Feed Pressure causing poor shift quality and premature Transmission Failure.

Figure 2

TOYOTA U240-E
VALVE BODY REPAIR INFORMATION

The Toyota U240-E has numerous sleeves that are prone to wear. The information listed below will show how the sleeve wear can create premature Transmission failure if these sleeves are not replaced. There is also information showing valve and spring locations as well as checkballs and retainers.

Refer to Figure 1 for a cross-sectional view of the Primary Regulator Valve and a brief description of it's operation and potential failures.

Refer to Figure 2 for a cross-sectional view of the Clutch Apply Control Valve and a brief description of it's operation and the potential failures that may be caused by a worn sleeve.

Refer to Figures 3 and 4 for a cross-sectional view of the Lock-up Control Valve and a partial hydraulic schematic of it's operation with the TCC Off and TCC On , and the potential failures that may be caused by a worn sleeve.

Refer to Figure 5 For the location of the Main Regulator Valve and Sleeve.

Refer to Figure 6 For the Lower Valve body retainer and Checkball locations

Refer to Figure 7 For the location of the Clutch Apply Control Valve and Sleeve, and the Lock-up Control Valve and Sleeve.

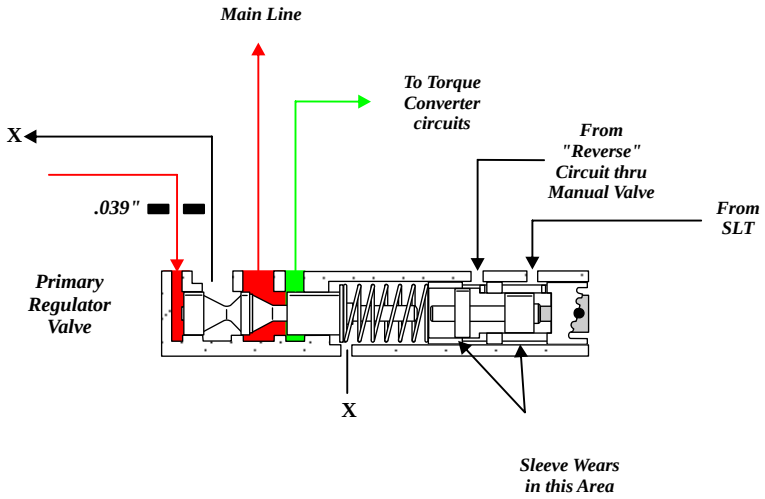
Refer to Figure 8 For the Upper Valve body retainer and Checkball locations

Refer to Figure 9 for the location of the B1 and C2 Accumulators. Check the pistons and the bores in the Upper Valve Body for wear, repair as necessary.

SERVICE INFORMATION:

MAIN REGULATOR BOOST SLEEVE RAV4 (Toyota part number).....35417-28030
MAIN REGULATOR BOOST SLEEVE CAMRY (Toyota part number).....35417-21010
MAIN REGULATOR BOOST VALVE AND SLEEVE SONNNAX 57917E-01K
CLUTCH APPLY CONTROL VALVE SLEEVE (Toyota part number).....35492-21010
TORQUE CONVERTER CONTROL VALVE SLEEVE (Toyota part number).....35211-21010

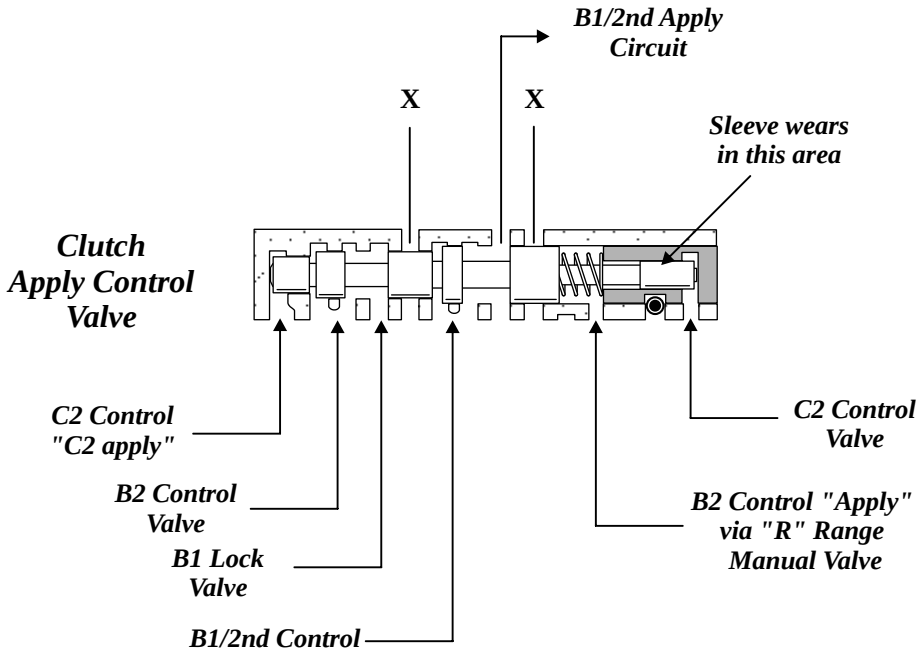
PRIMARY REGULATOR BOOST SLEEVE



Wear in the Boost Sleeve may cause pressure loss in Reverse and or insufficient line pressure rise

Figure 1

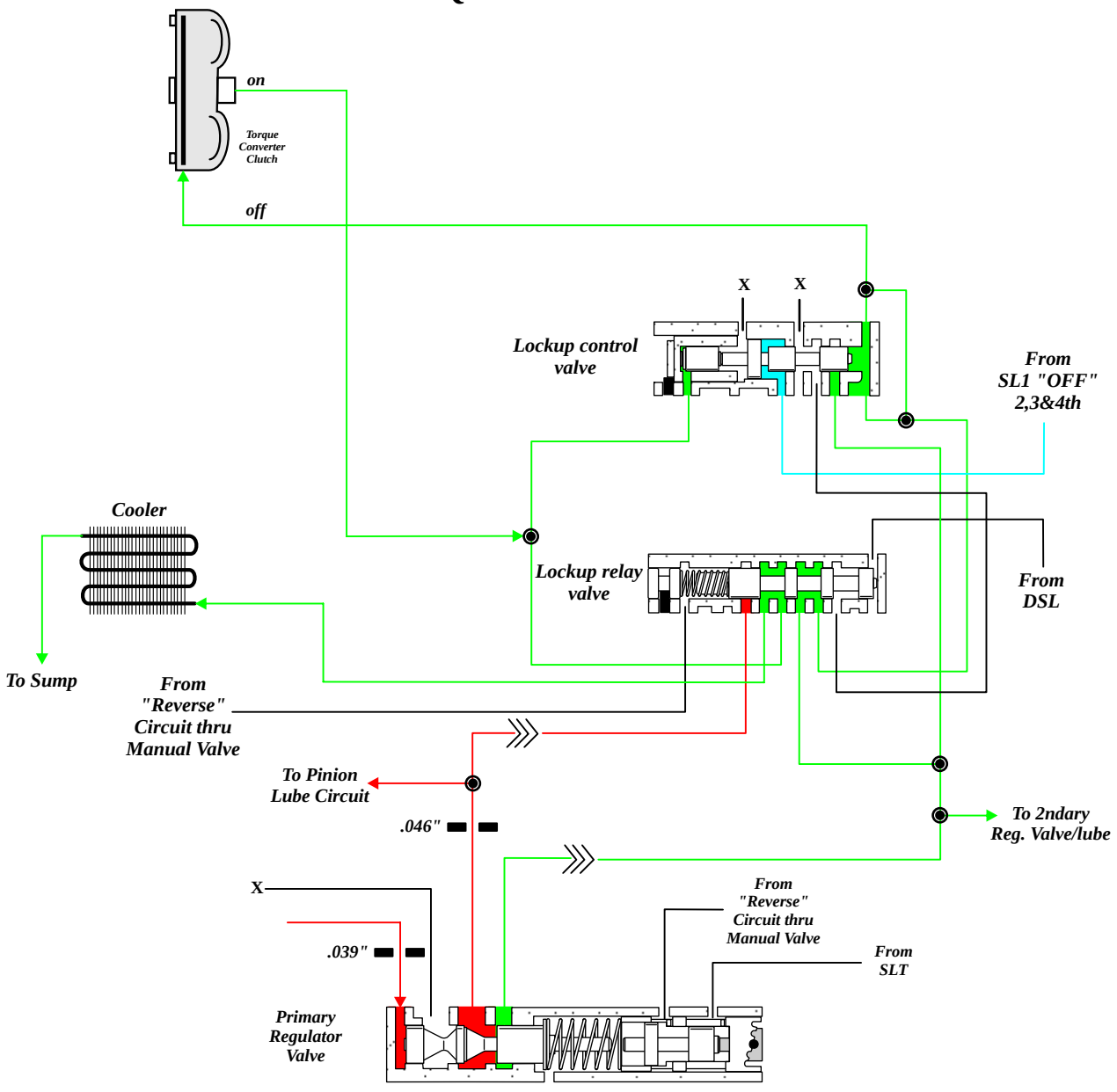
CLUTCH APPLY CONTROL VALVE SLEEVE



Wear in the Clutch Apply Control Valve Sleeve may cause problems with the sequencing of Clutch apply and Clutch release, which may lead to a flared or bind on a up or downshift.

Figure 2

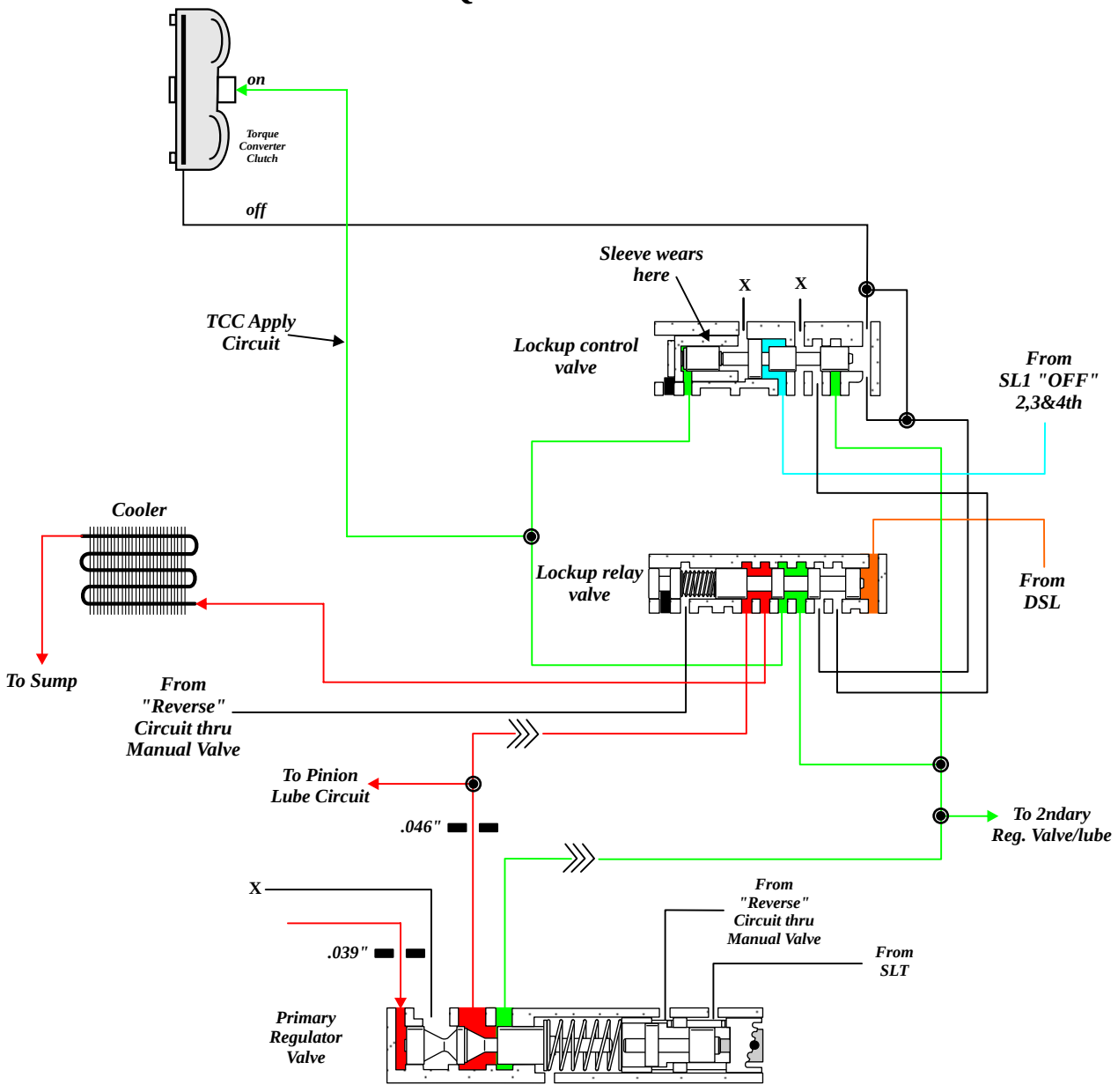
TORQUE CONVERTER OFF



Summary: When the Torque Converter is OFF, the Lockup relay valve is to the right and Torque Converter Off pressure feeds the cooler circuit.

Figure 3

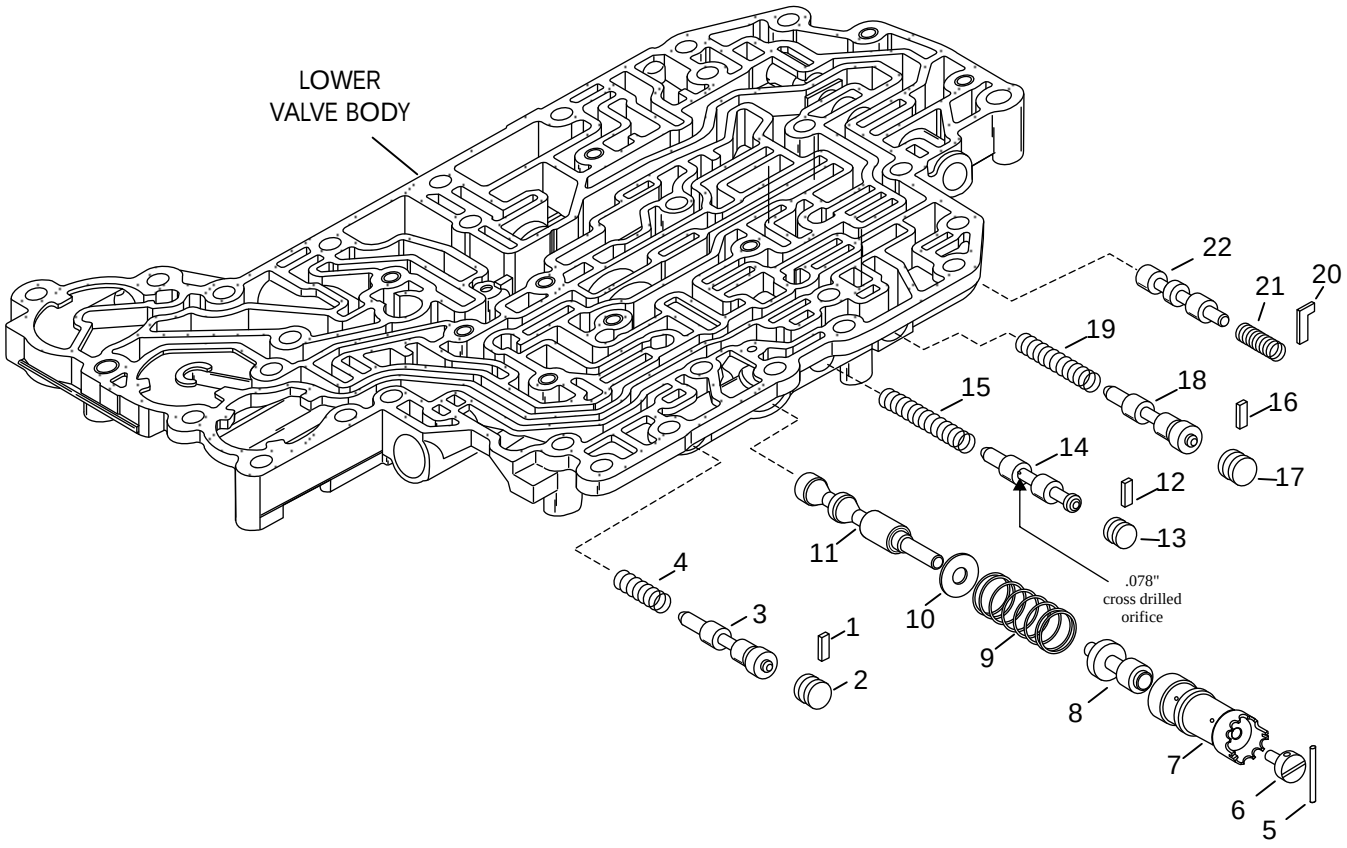
TORQUE CONVERTER ON



Summary: When the Torque Converter is ON, the Lockup relay valve is stroked to the left and orificed line pressure is fed to the cooler circuit. Note: when the Lockup control valve sleeve wears, the TCC Apply circuit can leak past the valve and sleeve, to an exhaust, and cause a pressure loss in the TCC Apply Circuit.

Figure 4

LOWER VALVE BODY

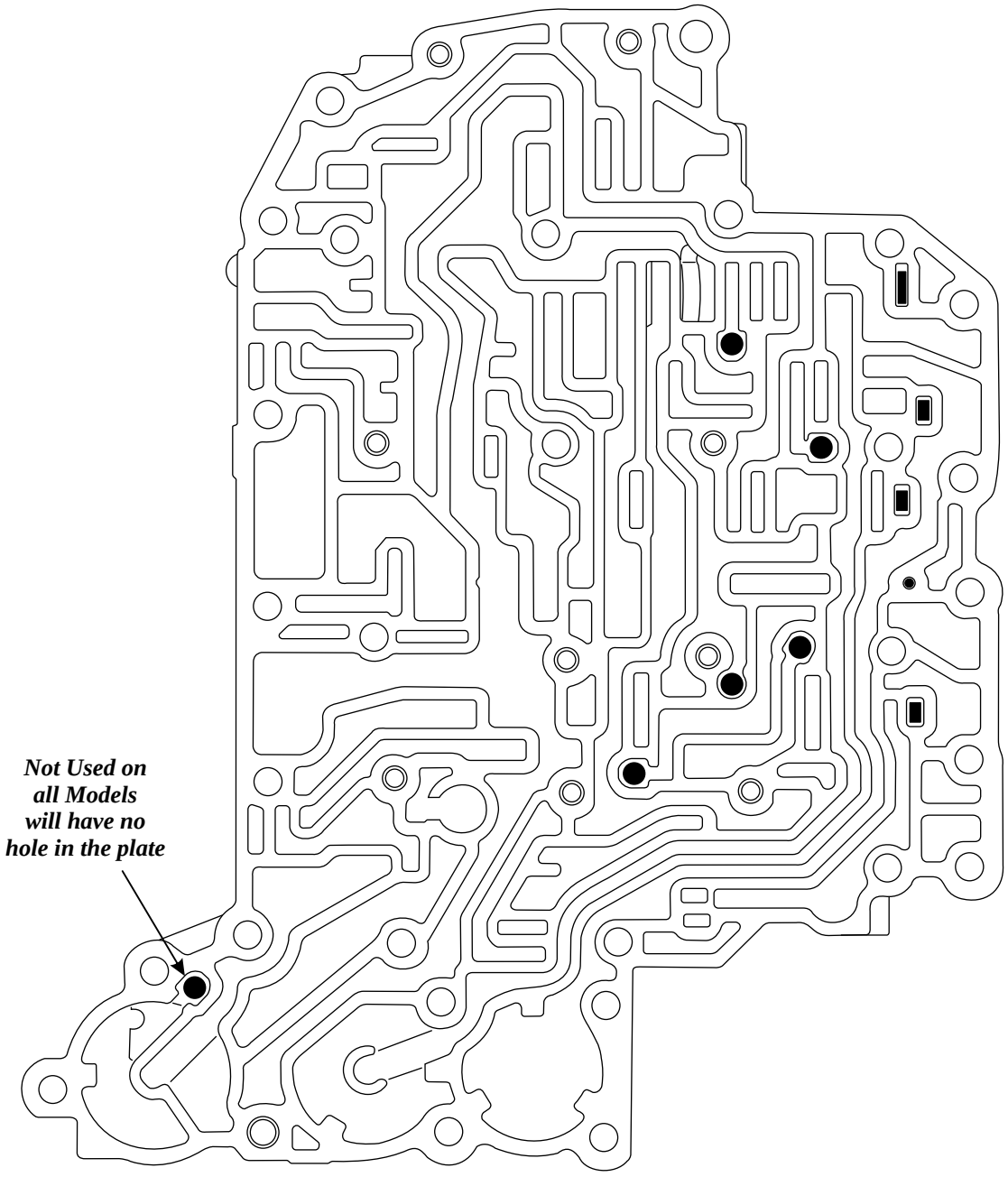


LOWER VALVEBODY LEGEND

1. C2 Control Valve retainer
2. C2 Control Valve bore plug
3. C2 Control Valve
4. C2 Control Valve spring
5. Main Regulator Valve retainer
6. Main Regulator Valve Plug
7. Main Regulator Valve Boost Sleeve
8. Main Regulator Valve Boost Valve
9. Main Regulator Valve Spring
10. Main Regulator Valve Spring Seat
11. Main Regulator Valve
12. B-2 Control Valve retainer
13. B-2 Control Valve bore plug
14. B-2 Control Valve
15. B-2 Control Valve Spring
16. B-1 Control Valve retainer
17. B-1 Control Valve bore plug
18. B-1 Control Valve
19. B-1 Control Valve spring
20. 3-4 Shift Valve retainer
21. 3-4 Shift Valve spring
22. 3-4 Shift Valve

Figure 5

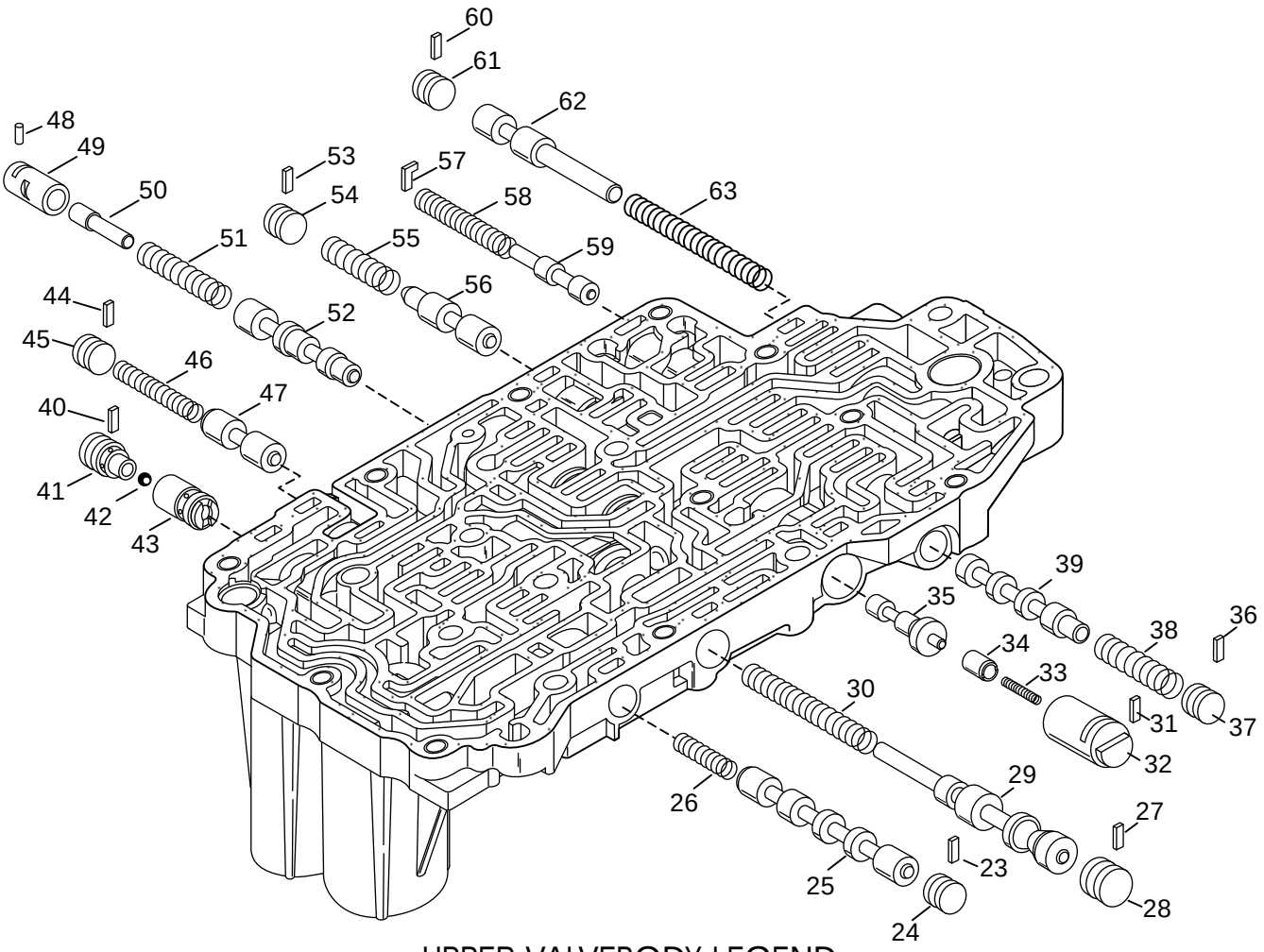
LOWER VALVE BODY RETAINER AND CHECKBALL LOCATIONS



Note: All Checkballs are 5.5 mm / .217"

Figure 6

UPPER VALVE BODY

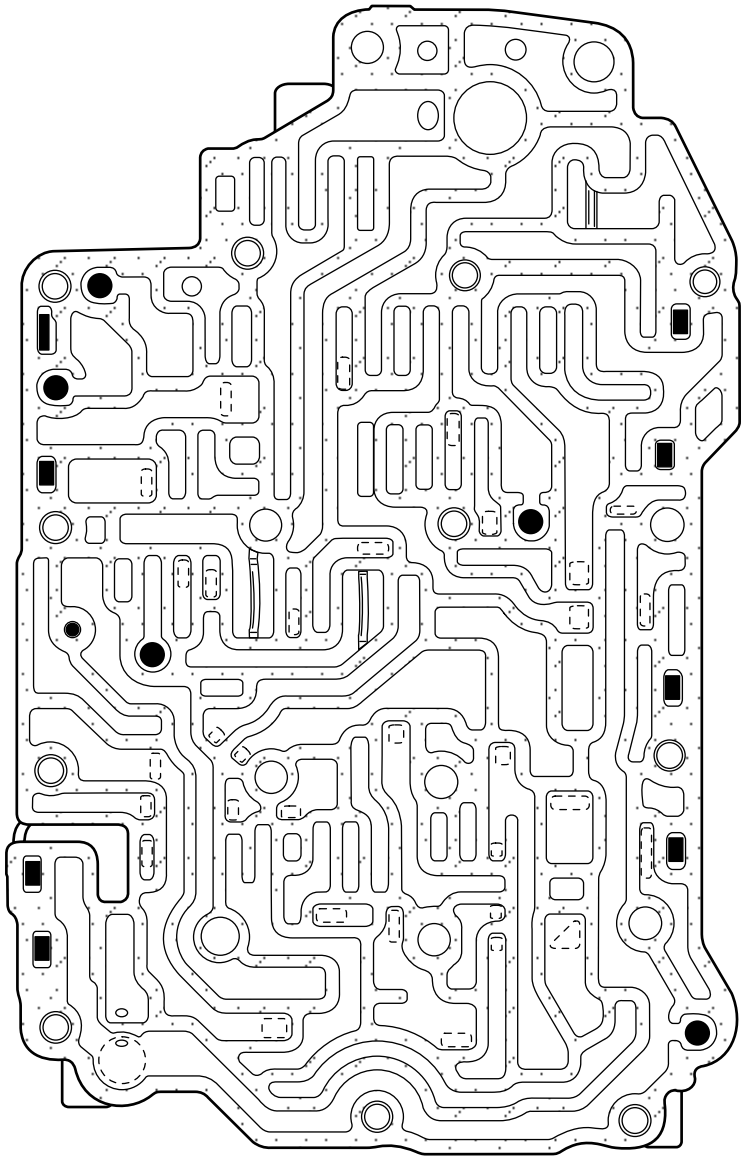


UPPER VALVEBODY LEGEND

23. C2 Lock Valve retainer
24. C2 Lock Valve bore plug
25. C2 Lock Valve
26. C2 Lock Valve Spring
27. Secondary Regulator Valve retainer
28. Secondary Regulator Valve bore plug
29. Secondary Regulator Valve
30. Secondary Spring
31. Lock-up Control Valve retainer
32. Lock-up Control Valve Sleeve
33. Lock-up Control Valve Spring
34. Lock-up Control Valve Plunger
35. Lock-up Control Valve
36. Lock-up Relay Valve retainer
37. Lock-up Relay Valve bore plug
38. Lock-up Relay Valve Spring
39. Lock-up Relay Valve
40. 3 Way Check Valve
41. 3 Way Check Valve outer ball seat
42. 3 Way Check Valve .250" steel ball
43. 3 Way Check Valve inner ball seat
44. C2 Exhaust Valve retainer
45. C2 Exhaust Valve bore plug
46. C2 Exhaust Valve Spring
47. C2 Exhaust Valve
48. Clutch Apply Control Valve retainer
49. Clutch Apply Control Valve Sleeve
50. Clutch Apply Control Valve plunger
51. Clutch Apply Control Valve Spring
52. Clutch Apply Control Valve
53. B-1 Control Valve retainer
54. B-1 Control Valve bore plug
55. B-1 Control Valve Spring
56. B-1 Control Valve
57. B-3 Orifice Control Valve retainer
58. B-3 Orifice Control Valve Spring
59. B-3 Orifice Control Valve
60. Solenoid Modulator Valve retainer
61. Solenoid Modulator Valve bore plug
62. Solenoid Modulator Valve
63. Solenoid Modulator Spring

Figure 7

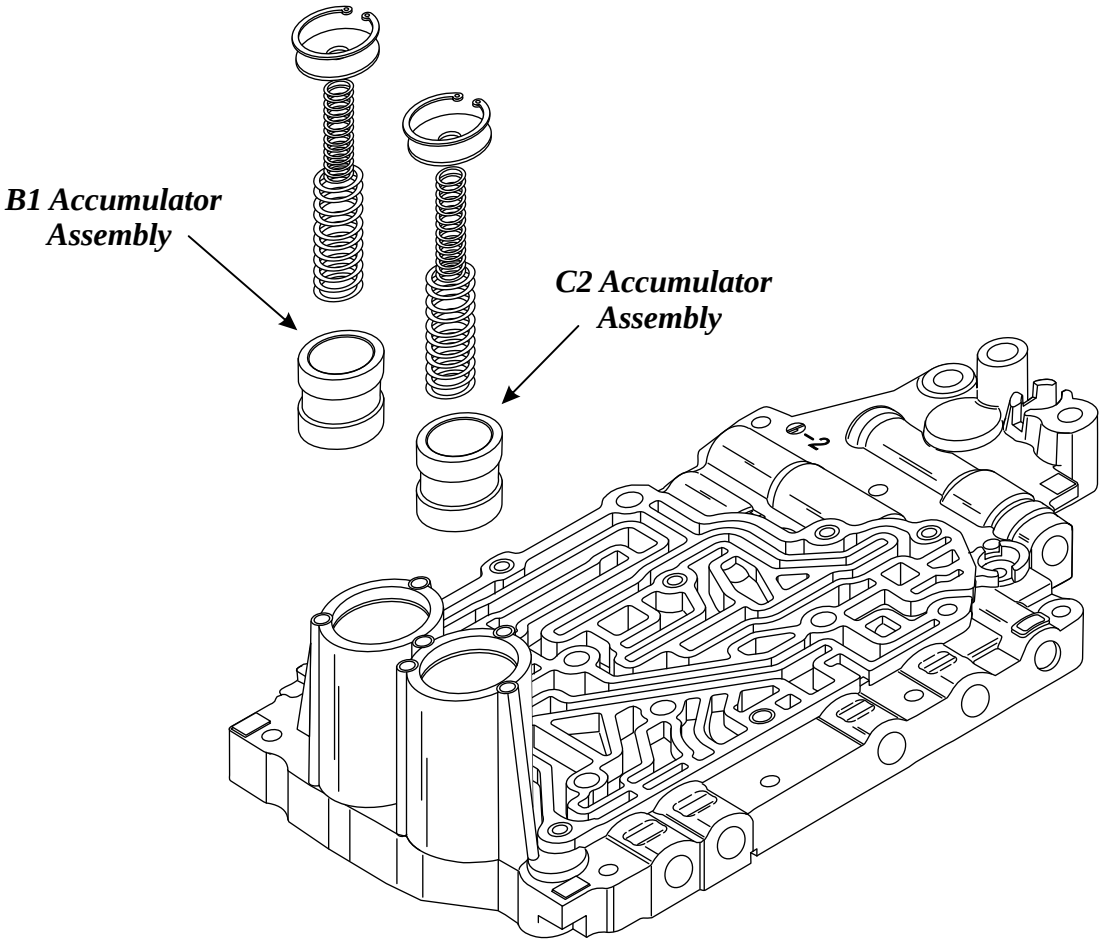
UPPER VALVE BODY
RETAINER AND CHECKBALL LOCATION



Note: All Checkballs are 5.5 mm / .217"

Figure 8

UPPER VALVE BODY
ACCUMULATOR PISTONS



NOTE: Inspect the Accumulator Pistons and bores in the Upper Valve Body for wear, replace as necessary.

Figure 9

TOYOTA U341E/F

NO REVERSE

COMPLAINT: After overhaul, the vehicle shifted on the lift from first through fourth gears. But, on the road, it would only shift from first to second and then neutral. It had no reverse both on the lift and on the road. When the rear cover was removed, it was discovered that the direct and reverse clutch plates were burned.
Pressure was checked at the rear cover and strangely enough no pressure was present at the direct clutch service port, (Refer to Figure 1).

CAUSE: The next step was to check the valve body, at first nothing looked out of place. But when the oil passages were followed from the direct and reverse clutch circuit, they led to the filter screen in the upper valve body shown in Figure 2.
Inspecting the valve body in Figure 3, the filter screen is upside down, when it is in this position it traps oil from traveling through that channel preventing the oil from exiting the hole in the spacer plate shown in Figure 4 which ultimately lead to the direct and reverse clutches via the manual valve.

CORRECTION: Figures 5 and 6 show the correct position of the filter screen which now allows the oil to travel to the direct and reverse clutch packs which resulted in vehicle movement in reverse.

SERVICE INFORMATION:
The U341E is a front wheel drive only transaxle used in the 2000 to 2005 Celica GT, 2000 - 2005 Echo, 2006 to 2007 Yaris and the 2004 to 2006 Scion xA/xB.
The U341F is an all wheel drive transaxle used in the 2003 to 2007 Toyota Matrix and the 2003 to 2007 Pontiac Vibe.

TOYOTA U341E/F - NO REVERSE

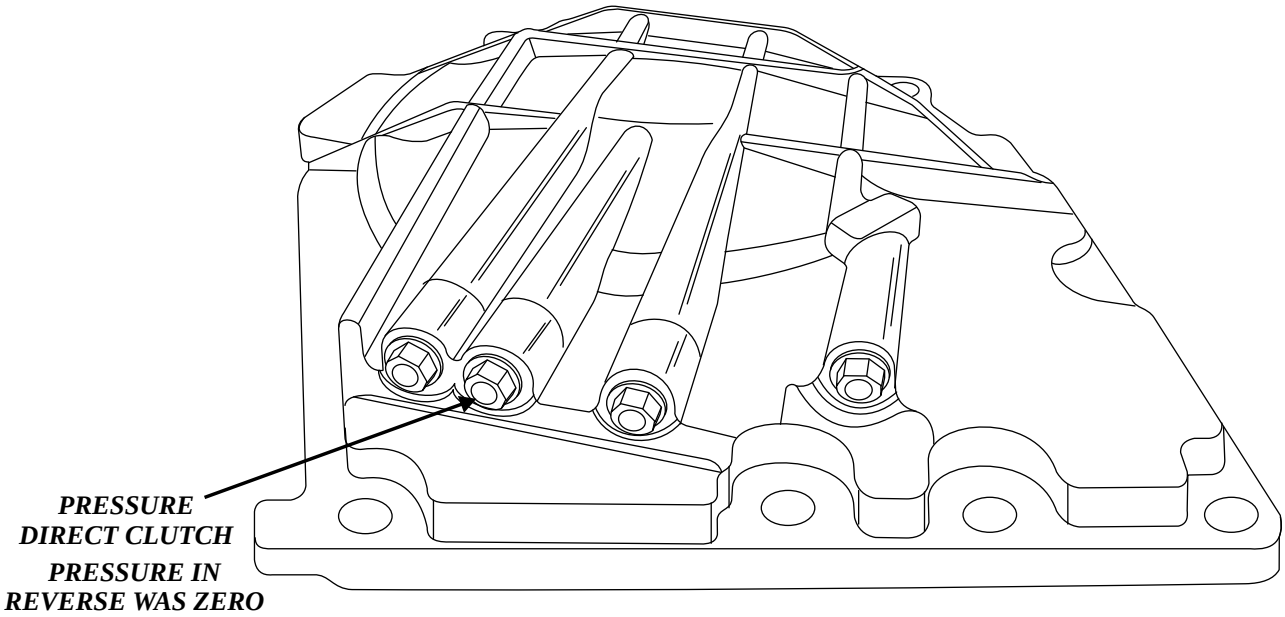


Figure 1

UPPER VALVE BODY

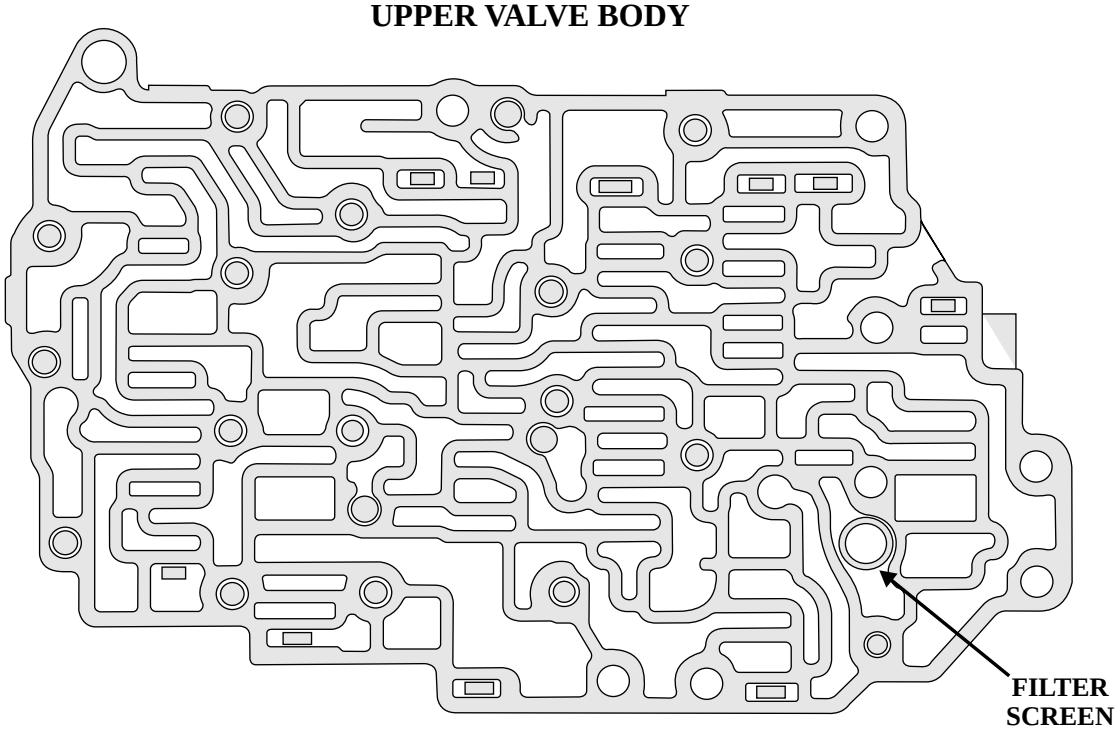


Figure 2

TOYOTA U341E/F - NO REVERSE

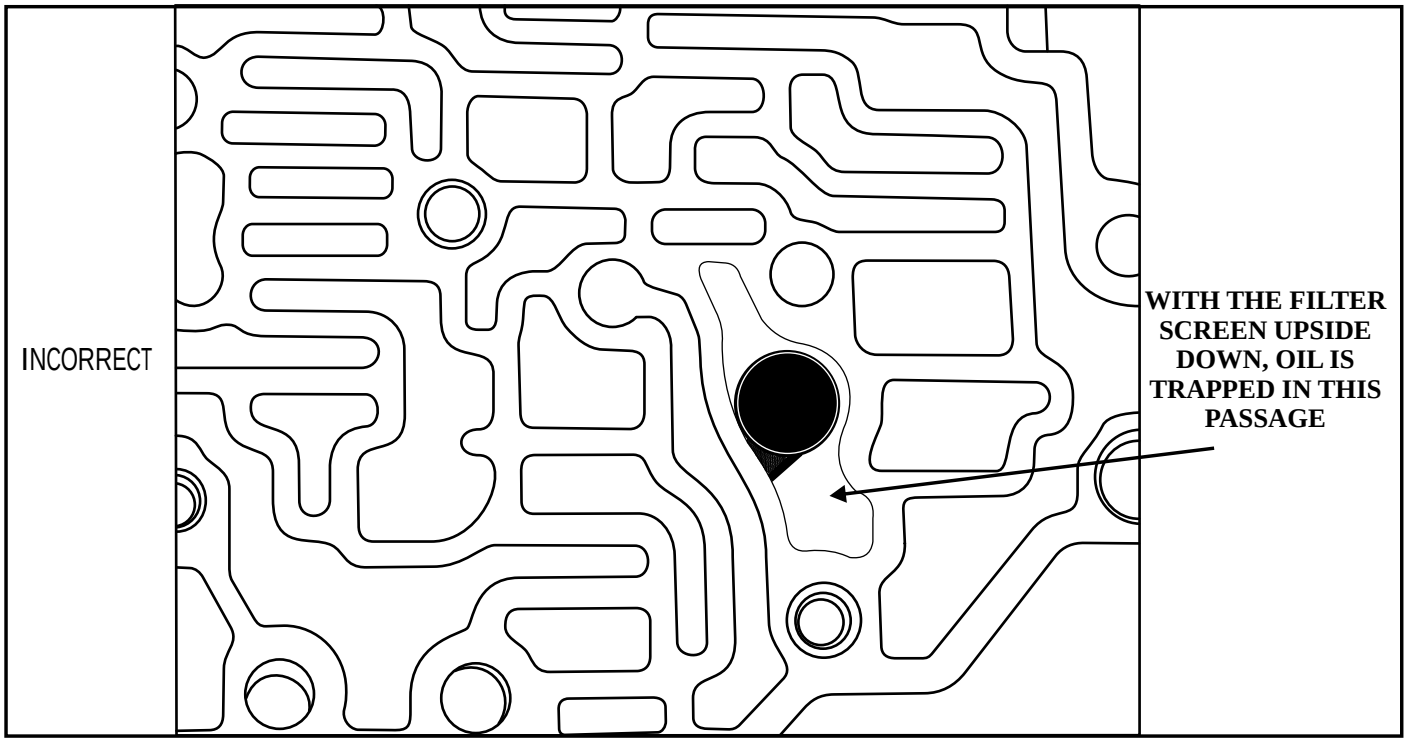


Figure 3

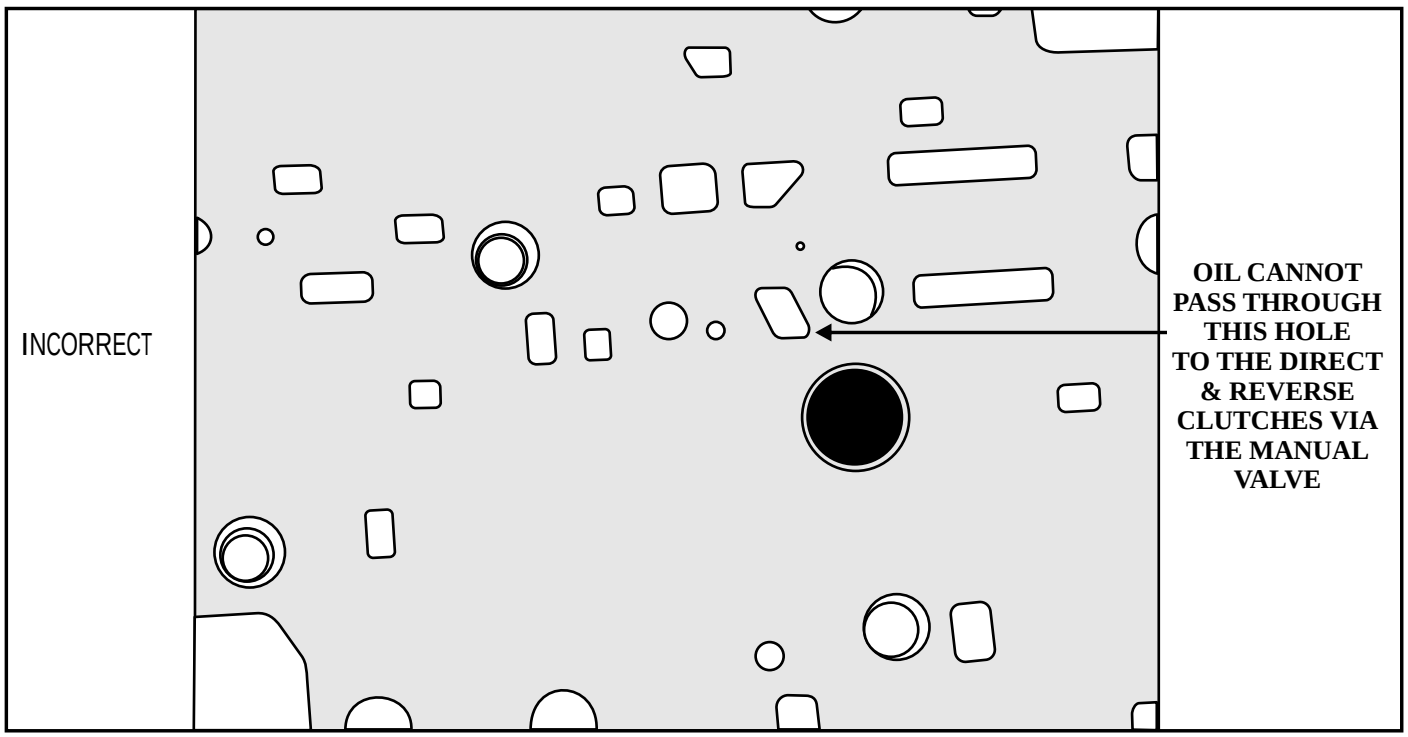


Figure 4

TOYOTA U341E/F - NO REVERSE

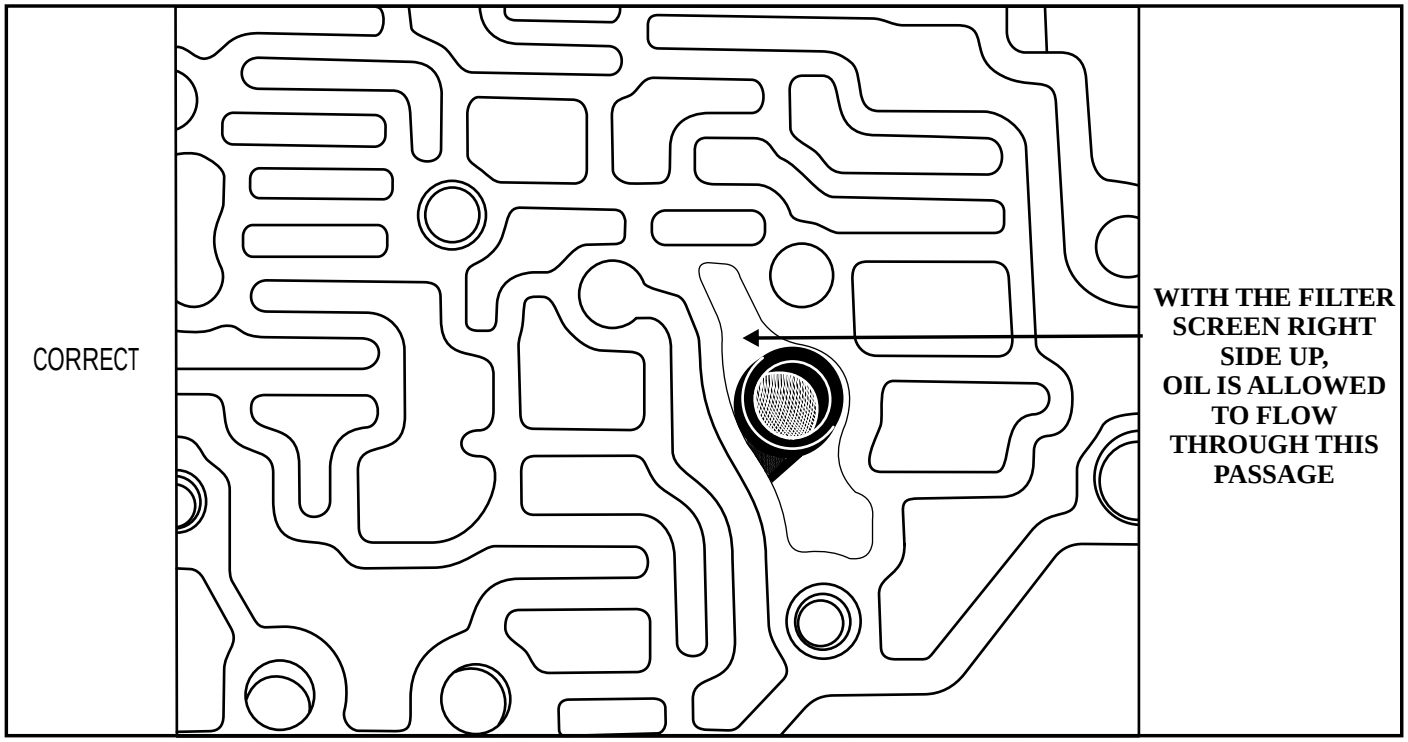


Figure 5

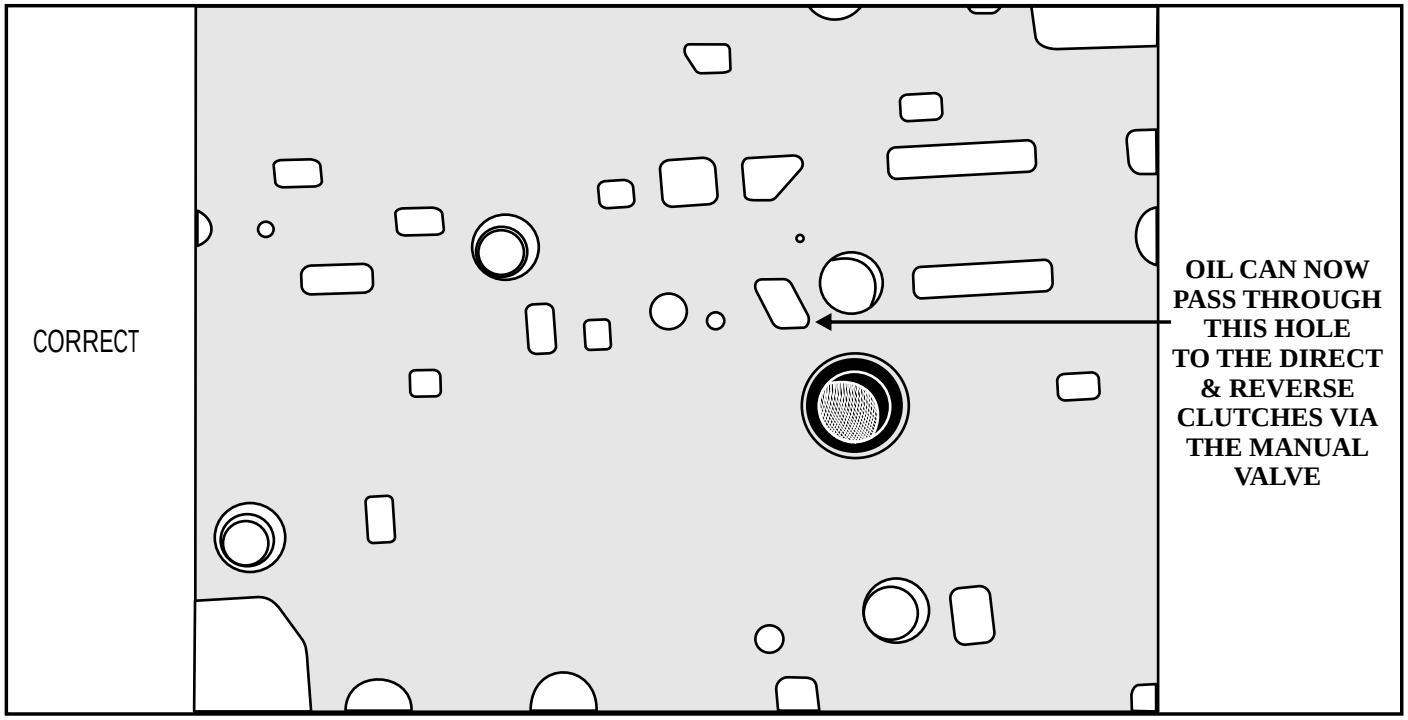


Figure 6

TOYOTA U341E/F

TCC OPERATION

COMPLAINT: The vehicle comes into the shop with P0770 stored, the generic code definition says "Solenoid E". The technician cannot find which is Shift Solenoid "E" and cannot determine if that means there is an electrical problem or a mechanical one. Information in general on these transmissions are inadequate or just not available.

CAUSE: Code P0770 is mechanically generated, it means that the converter clutch is slipping. Solenoid "E" is the "SL" or "Lockup Control Solenoid". If this was an electrical problem with the lockup solenoid circuit, Code P0773 would be set.
If the lockup solenoid was the cause of the converter clutch slipping, it would be mechanically faulty, not electrically. Other causes could be valve wear.

CORRECTION: The "SL" Solenoid location is shown in Figure 1. In some repair manuals, including the factory manual, a Lockup Control Valve is shown in the location illustrated in Figure 2.
In all "E" and "F" valve bodies that were inspected, ***none*** had this valve.

The location of the Lockup Relay and Solenoid Relay Valves are shown in Figure 3, check these for wear. The checkball indicated in Figure 3 is only used in the U341F, the U341E does not use it.

Figure 4 illustrates the operation of the lockup system when converter clutch is off.

Figure 5 illustrates the operation of the lockup system when converter clutch is on.

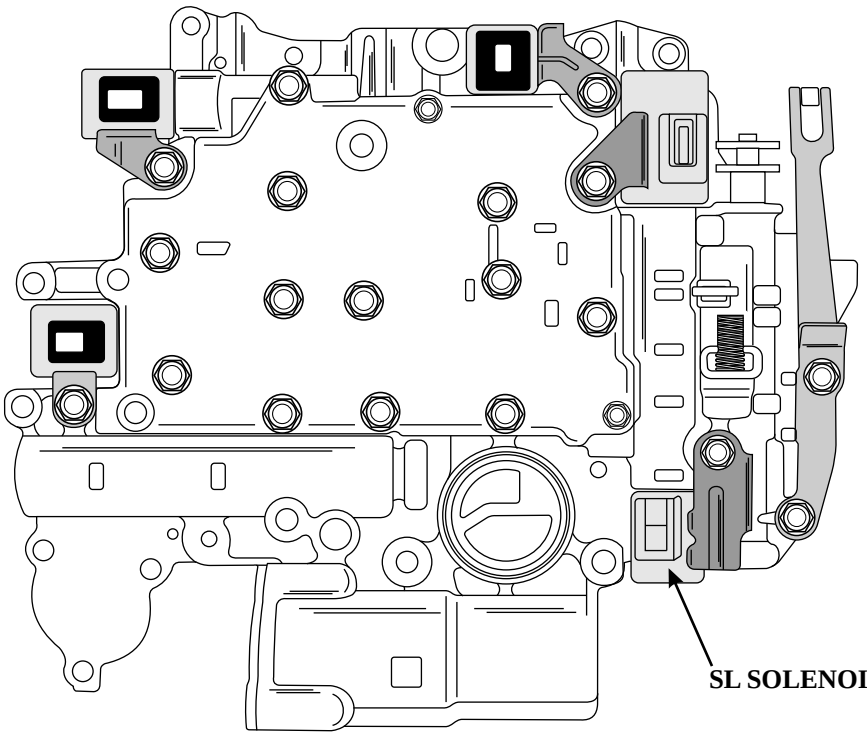
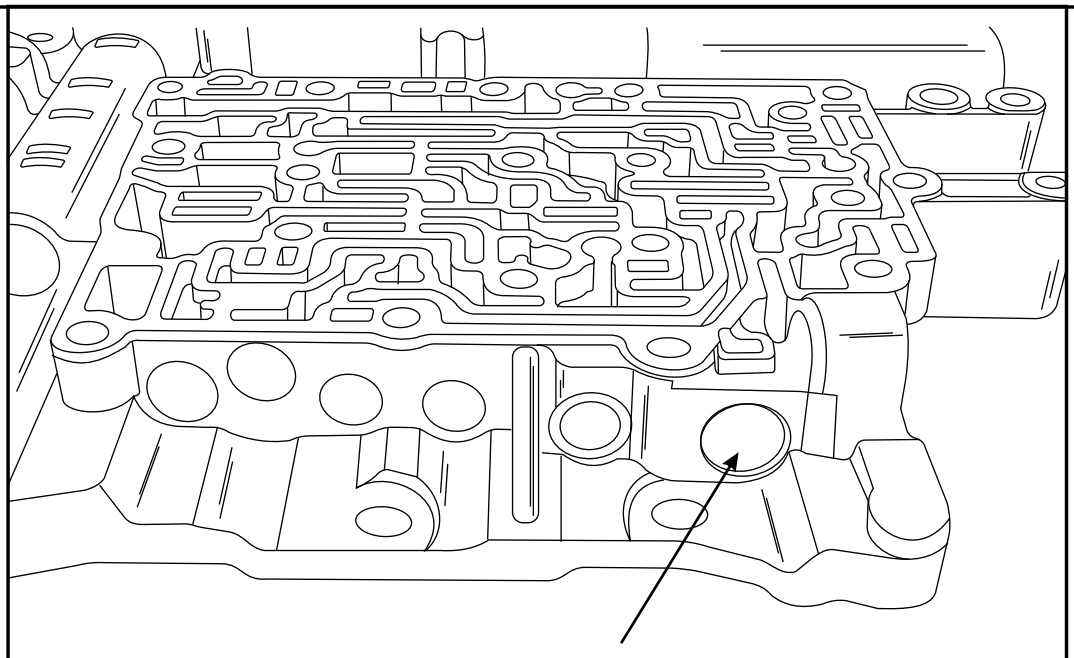


Figure 1



NOTE: Manuals may show a Lock-up Control Valve line-up in this location

Figure 2

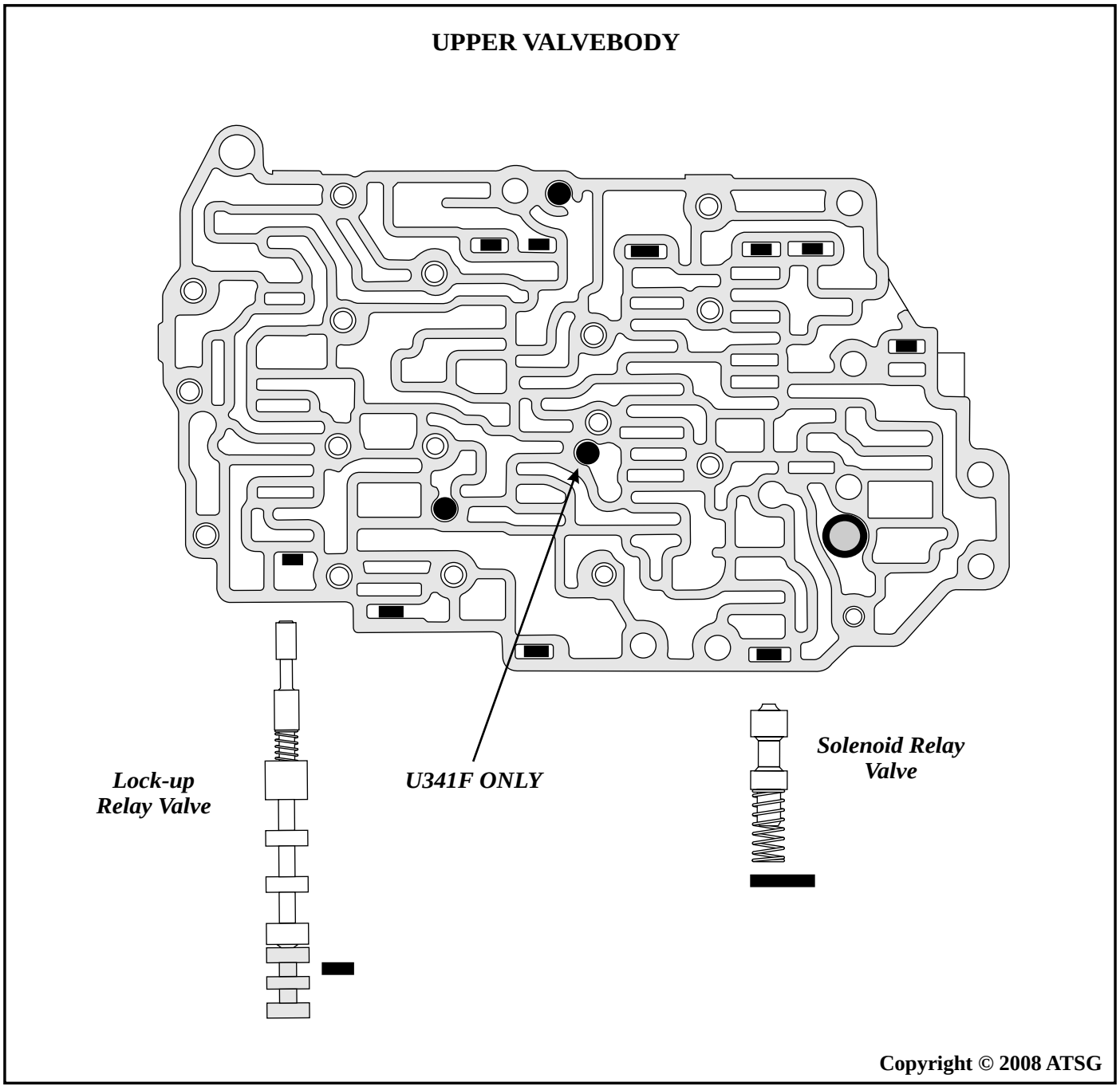

UPPER VALVEBODY
Lock-up
Relay Valve
U341F ONLY
Solenoid Relay
Valve
Copyright © 2008 ATSG

Figure 3

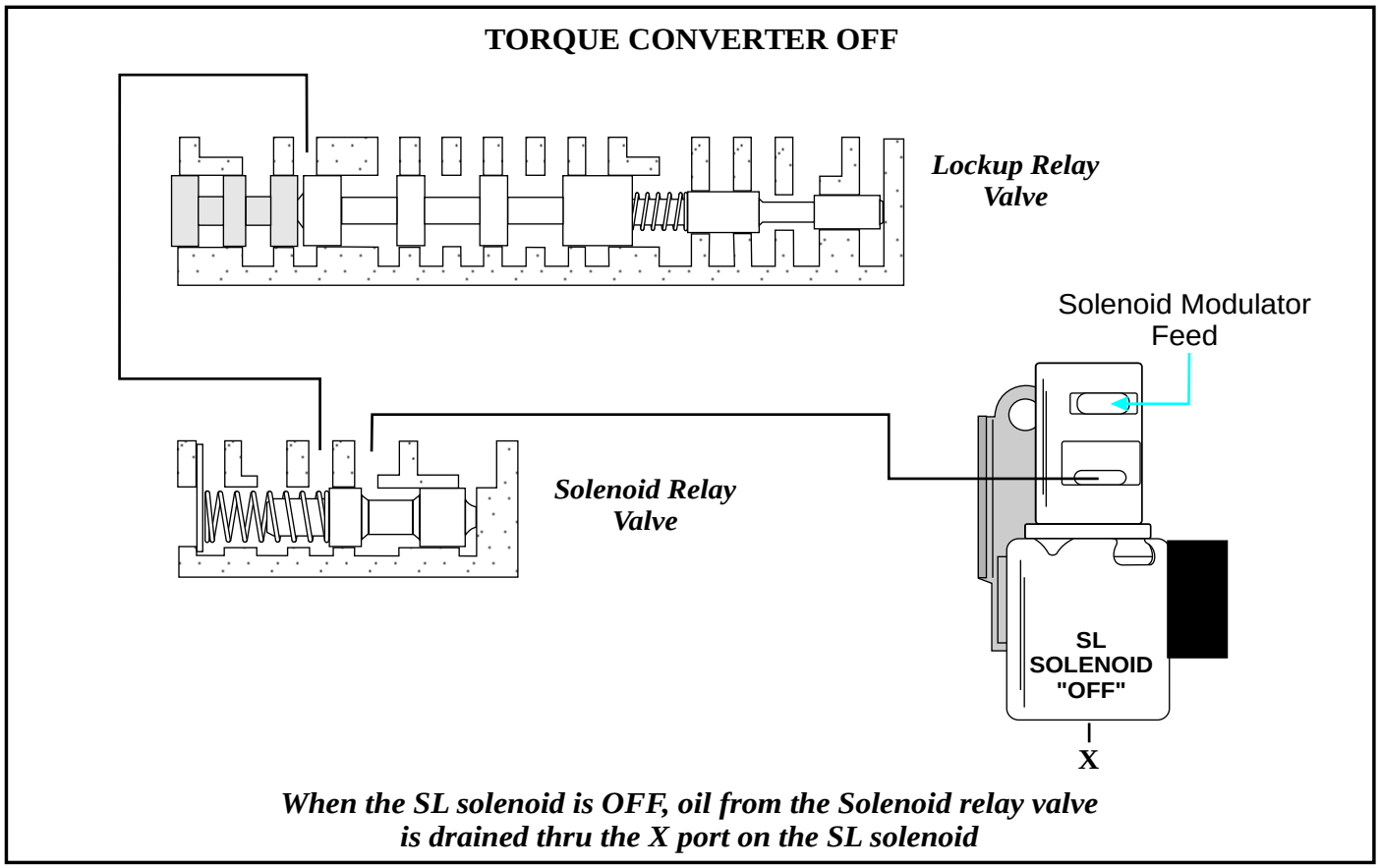


Figure 4

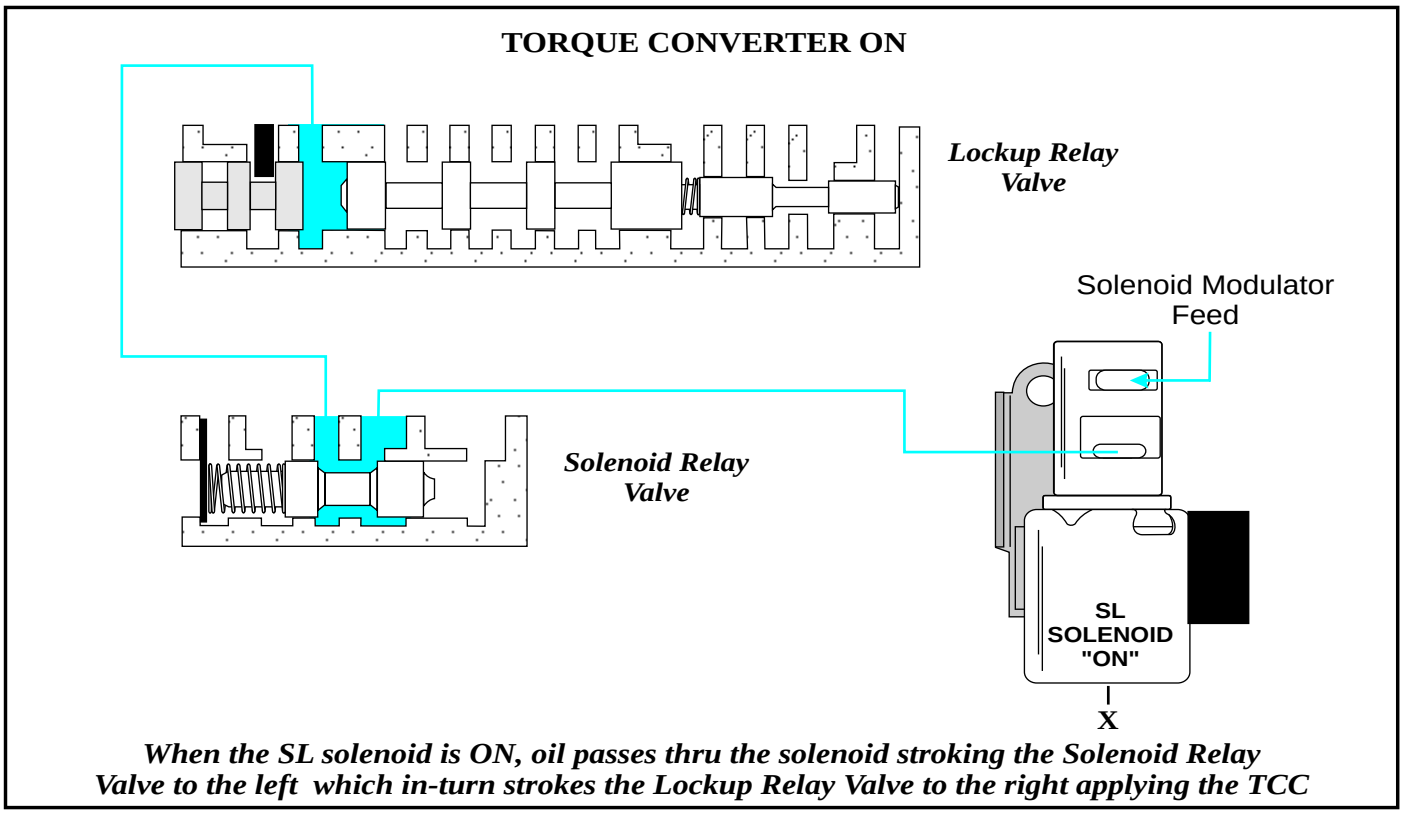


Figure 5

VOLKSWAGEN JF506E
REPEATED LUBE FAILURE

COMPLAINT: Repeated planetary failure, from lack of lubrication, on any Volkswagen equipped with the JF506E transaxle. Has normally been occurring after rebuild.

CAUSE: The cause may be, ***not*** installing the "beaded" gasket between the case and the converter housing, or installing the ***wrong*** "beaded" gasket, as shown in Figure 1. Jatco changed this gasket during the 2003 model year because of a change in the case pocket depth. This gasket is in the Volkswagen aftermarket kits only, as Volkswagen is the only manufacturer that uses the cooler mounted externally on the transaxle case, as shown in Figure 3. There are tubes that run from the back side of the converter housing, internally over to the cooler.

CORRECTION: Now there will be two different thickness gaskets included in your kits, and this will require you to measure the thickness of the original gasket metal core, before discarding, as shown in Figure 2. The 1st design gasket (1999-Some 2003) has a metal core thickness of .203mm (.008"). The 2nd design gasket (Some 2003-Up) has a metal core thickness of .610mm (.024"). Install the correct "beaded" gasket between the case and the converter housing, as shown in Figure 1.

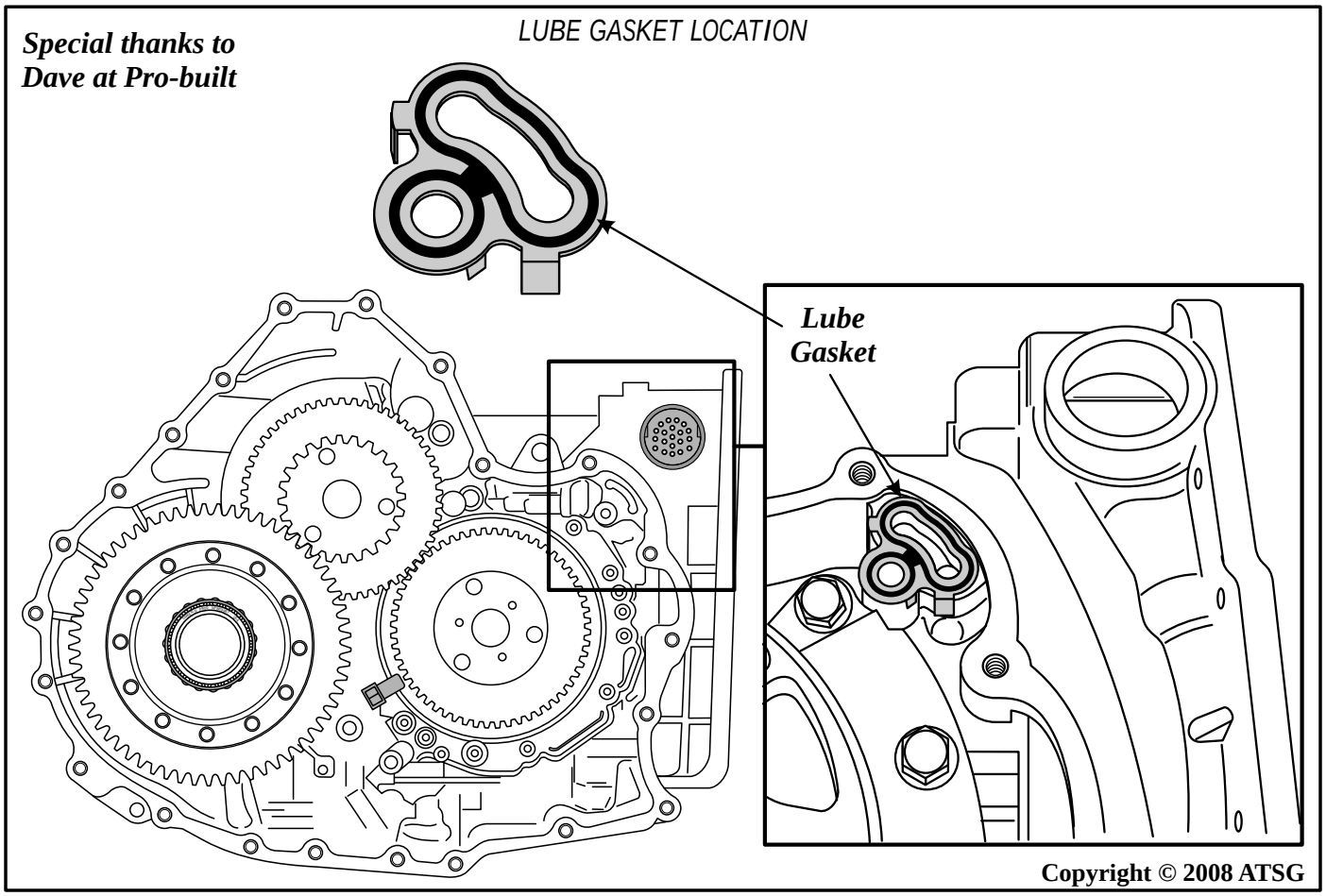
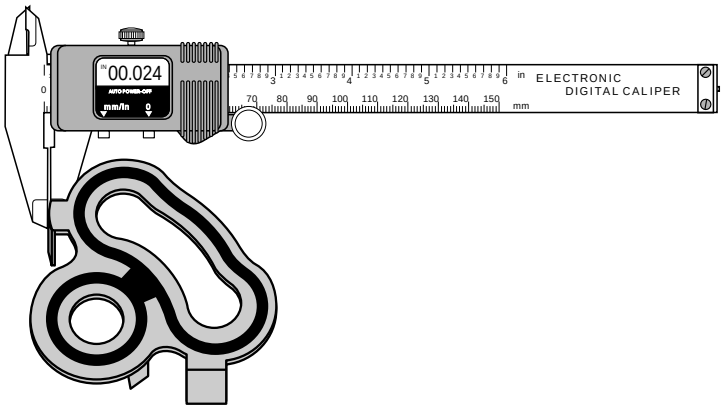


Figure 1

SLIDE

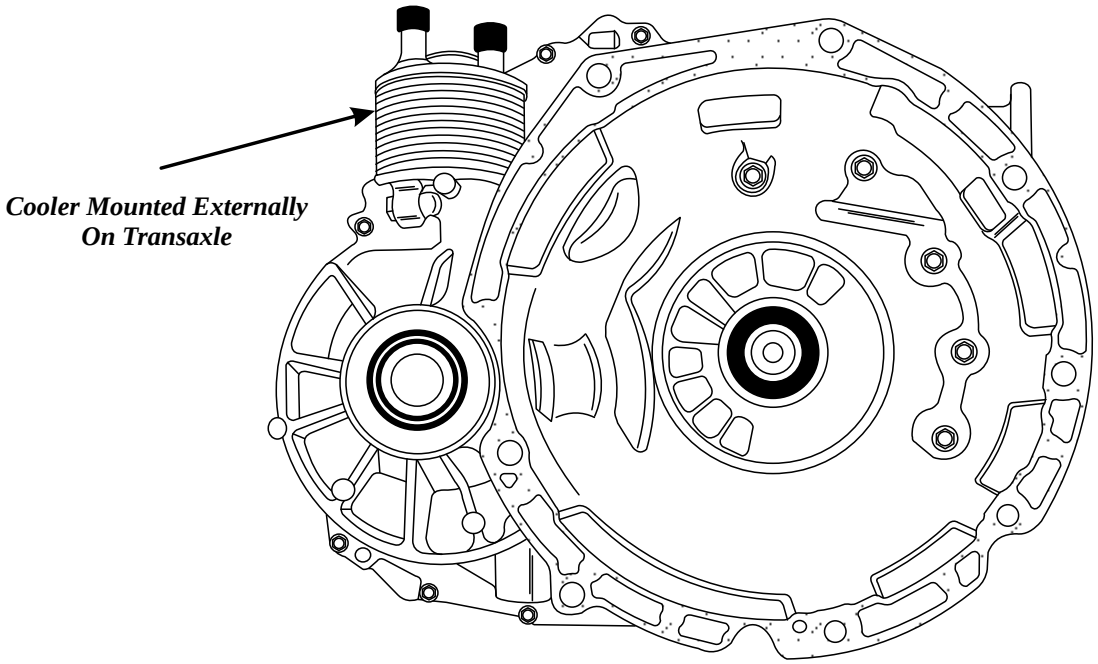
measuring gasket metal core thickness



1999 Models Through Some 2003 = .203mm (.008") Thickness

Some 2003 Through Current Models = .610mm (.024") Thickness

Figure 2



Volkswagen
Golf, GTI And Jetta

Figure 3

JF506E "ALL MODELS"
VALVE BUZZ AFTER REBUILD

COMPLAINT: Any make or model vehicle equipped with the JF506E transaxle, after rebuild, may exhibit a "Buzzing" noise that sounds like it is low on fluid. After many fluid checks, the technician has to add 2 to 3 quarts (overfill) to make the noise disappear.

CAUSE: The cause may be, a less than desirable oil pump to case gasket. The oil pump to case gasket is a stamped steel gasket, with a dark rubber coating that at a close look is actually machined. This type of gasket would normally be "Ribbed" around all oil passage holes, however the gasket is "Ribbed" only around the pump suction port, as shown in Figure 1.

CORRECTION: The sure way to fix it is to install an OEM oil pump gasket. If you happen to be doing an all wheel drive Jaguar, I am sure you don't want to ***try*** something. The only car company that services the oil pump gasket is Mazda, and the pump gasket is available under OEM part number FP01-19-221. Install the OEM pump gasket to insure you do not see this vehicle again. Torque the pump bolts starting closest to the ribbed area first.

SERVICE INFORMATION:

Oil Pump to Case Gasket (Mazda Number) FP01-19-221

Special Note:
We have also provided you with some oil pump bushing information and some oil pump specifications in Figure 2 and 3.

OIL PUMP GASKET CONCERNS

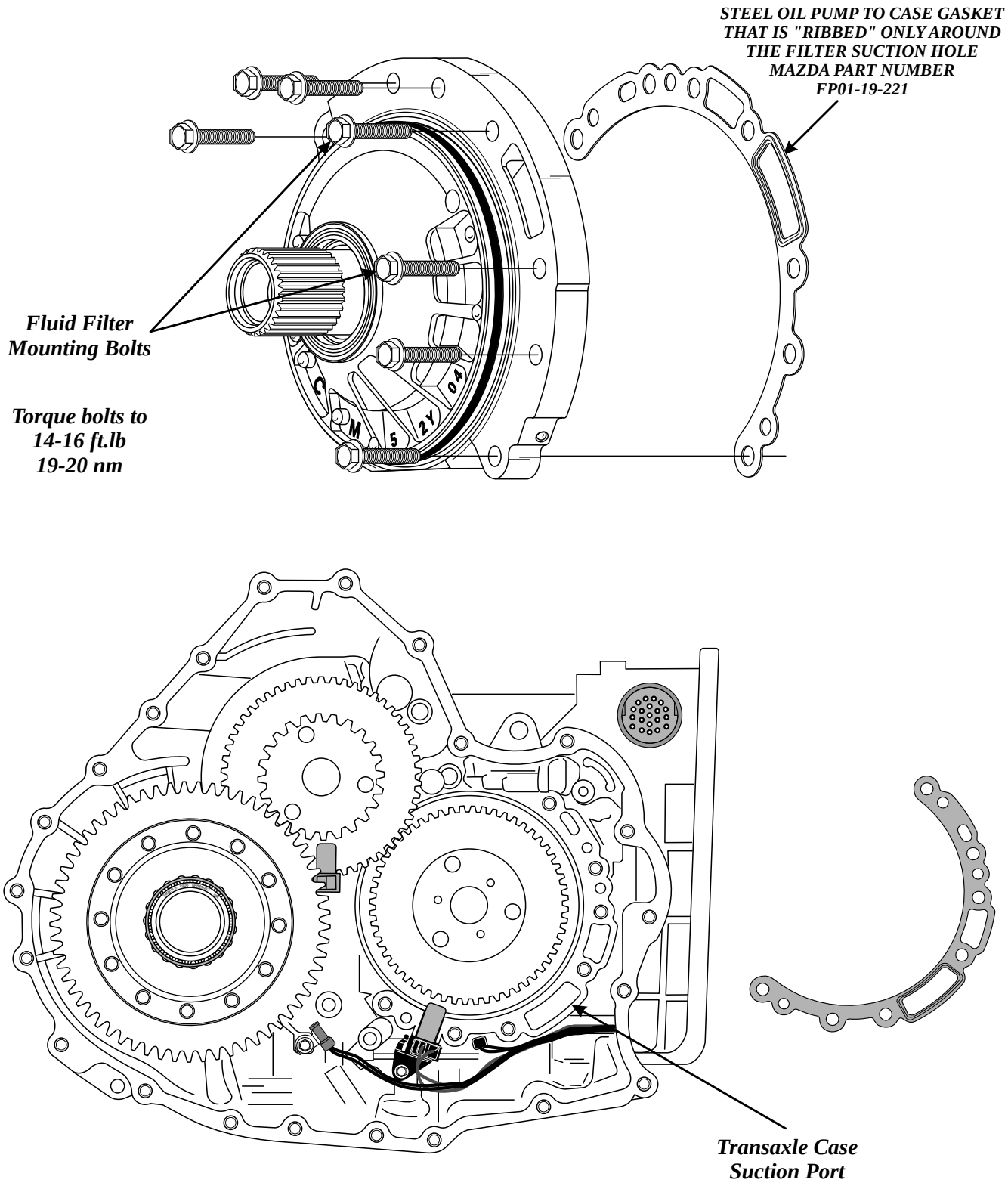


Figure 1

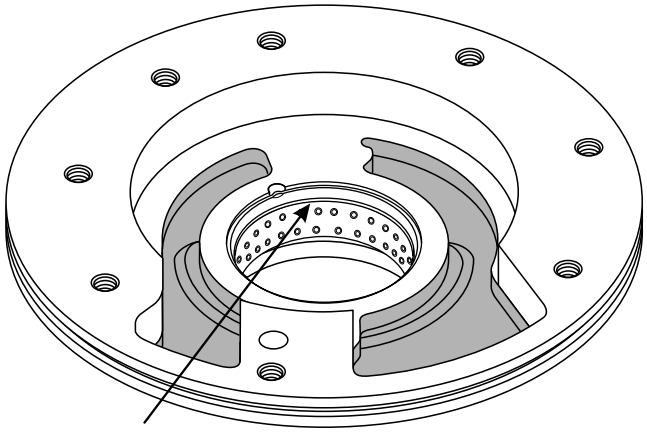
OIL PUMP ASSEMBLY

The Oil Pump Assembly has the Gerotor style pump gears, without a pump cresent, as shown in Figure 3. The converter hub bushing in the oil pump also has a step in it, that gets installed facing the pump gears, as shown in Figure 2. Oil Pump specifications are also shown in Figure 2.

Torque cover to body bolts to 62-70 in.lb (7-8 nm)

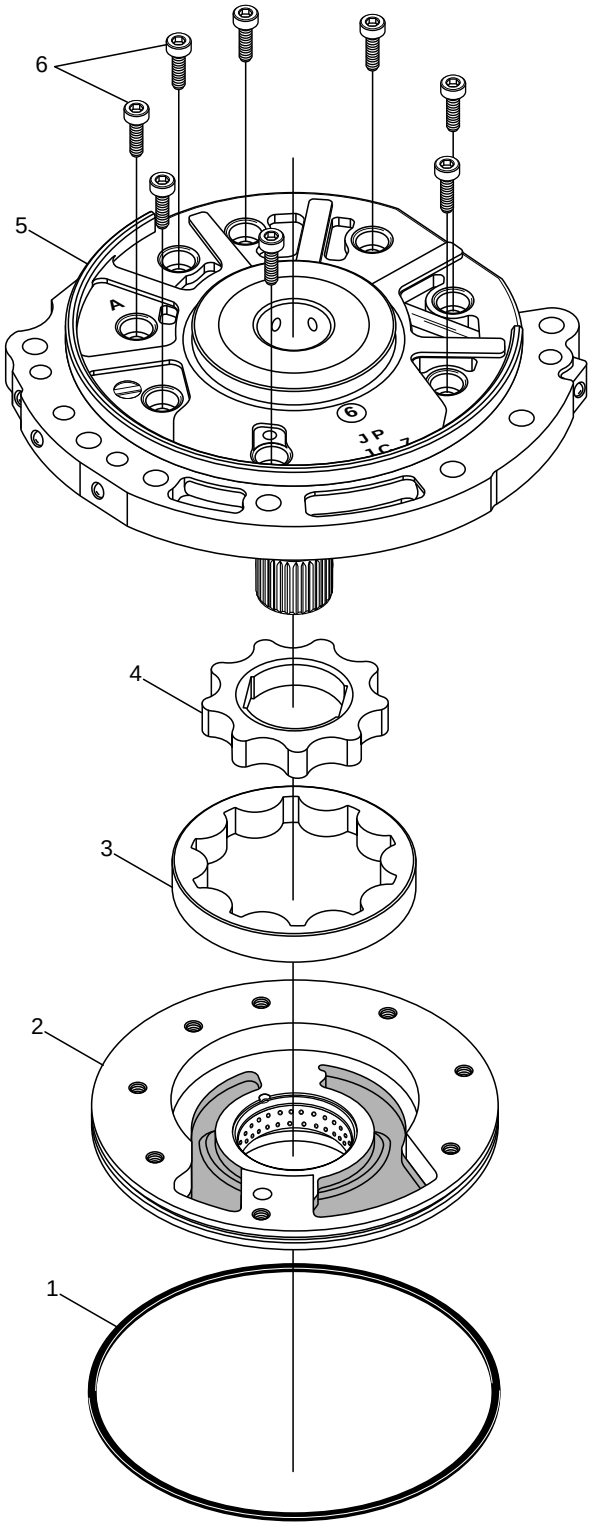
Oil Pump Specifications	
COMPONENT	***SPECIFICATION***
INNER GEAR TO FACE	.0008" - .0015"
OUTER GEAR TO FACE	.0008" - .002"
OUTER GEAR TO BODY	.004" - .006"

OIL PUMP BUSHING INSTALLATION



INSTALLED WITH THE "STEP" FACING THE INNER GEROTOR

Figure 2



1 PUMP TO CONVERTER HOUSING "D" RING
2 OIL PUMP HOUSING
3 OUTER GEROTOR
4 INNER GEROTOR
5 OIL PUMP COVER
6 PUMP COVER TO OIL PUMP BOLTS (8 REQUIRED)

Figure 3

V.W. / AUDI 01M/01N/01P

PARTIAL ENGINE STALL IN DRIVE OR REVERSE

COMPLAINT: V.W. and Audi vehicles equipped with the 01M, 01N or 01P transaxles may exhibit a partial engine stall or full engine stall during an engagement into Drive or Reverse. ***NOTE: This condition has many times been confused with an engine performance problems***.

CAUSE: One cause may be, a mechanically stuck closed EV4 solenoid. This solenoid is Normally Open and must drain the regulated solenoid pressure thru the exhaust port located on the side of the solenoid as shown in Figure 1. Another cause may be, the Converter Clutch Control Valve and Sleeve as well as the Converter Clutch Apply Valve, as shown in Figures 3 and 4, may also cause the same complaint, because of bore wear in the valvebody casting, or the valve and sleeve below EV4 may be worn out. . Refer to Figure 2 for a partial hydraulic schematic of EV4 and how when it is partially stuck closed it will stroke the TCC Control Valve and cause the Converter Clutch to be partially or fully applied.

CORRECTION: Replace EV4 solenoid, and check the TCC Control valve as well as the small valve and sleeve for wear, repair or replace as necessary. ***Note: Valve bore repair and replacements are available from Sonnax***.

EV4 (N91) SOLENOID CHECK AND OPERATION

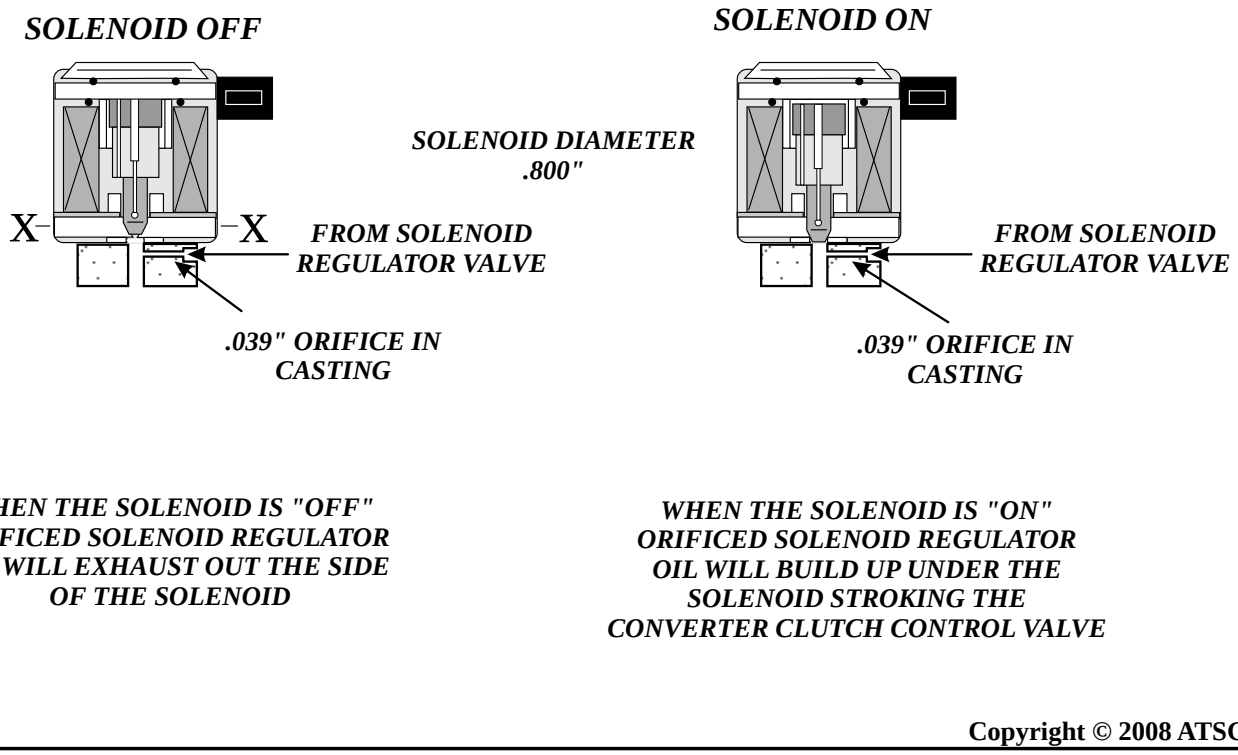


Figure 1

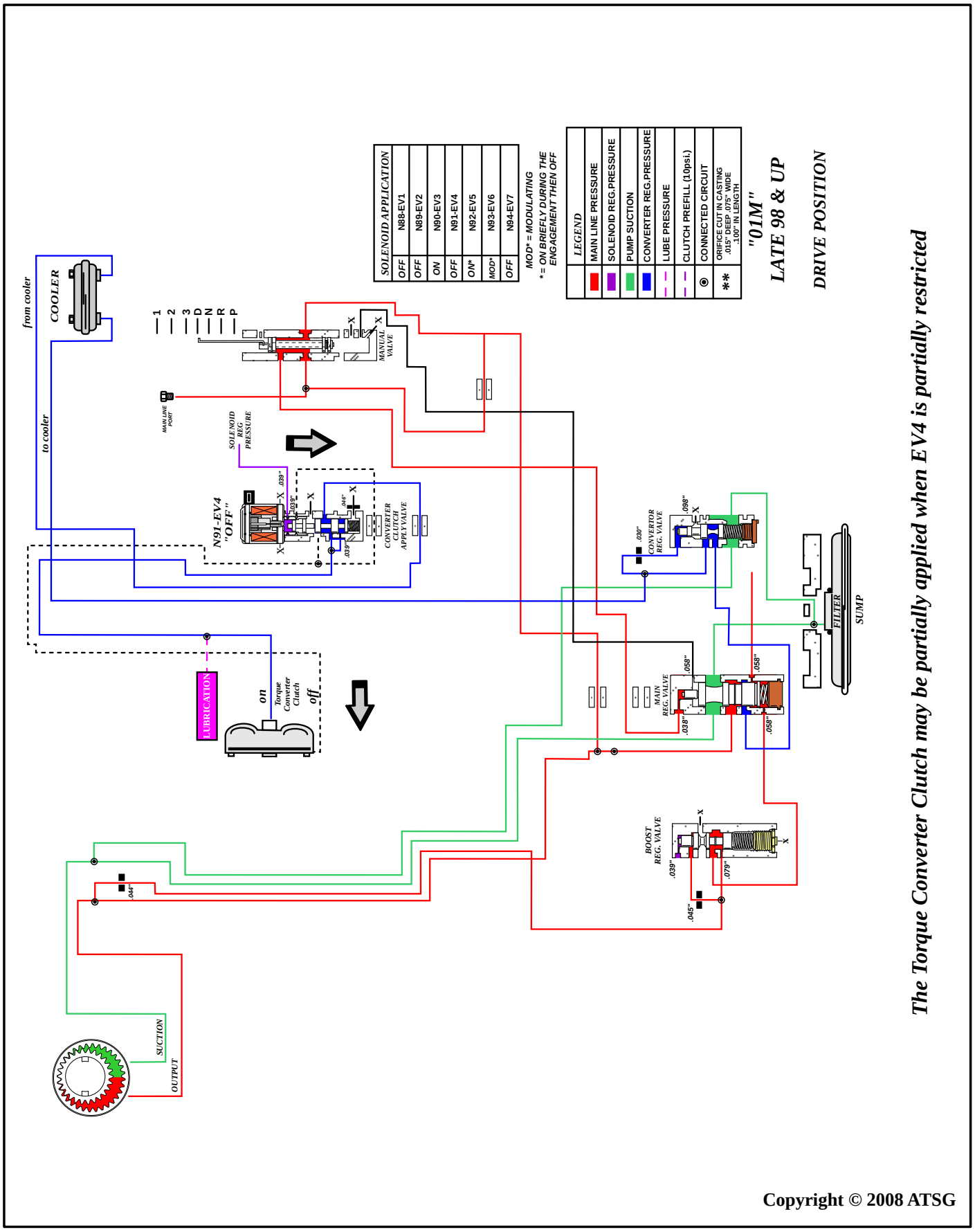


Figure 2

AUDI AND VOLKSWAGEN 98&UP 01M VALVE BODY
EXPLODED VIEW

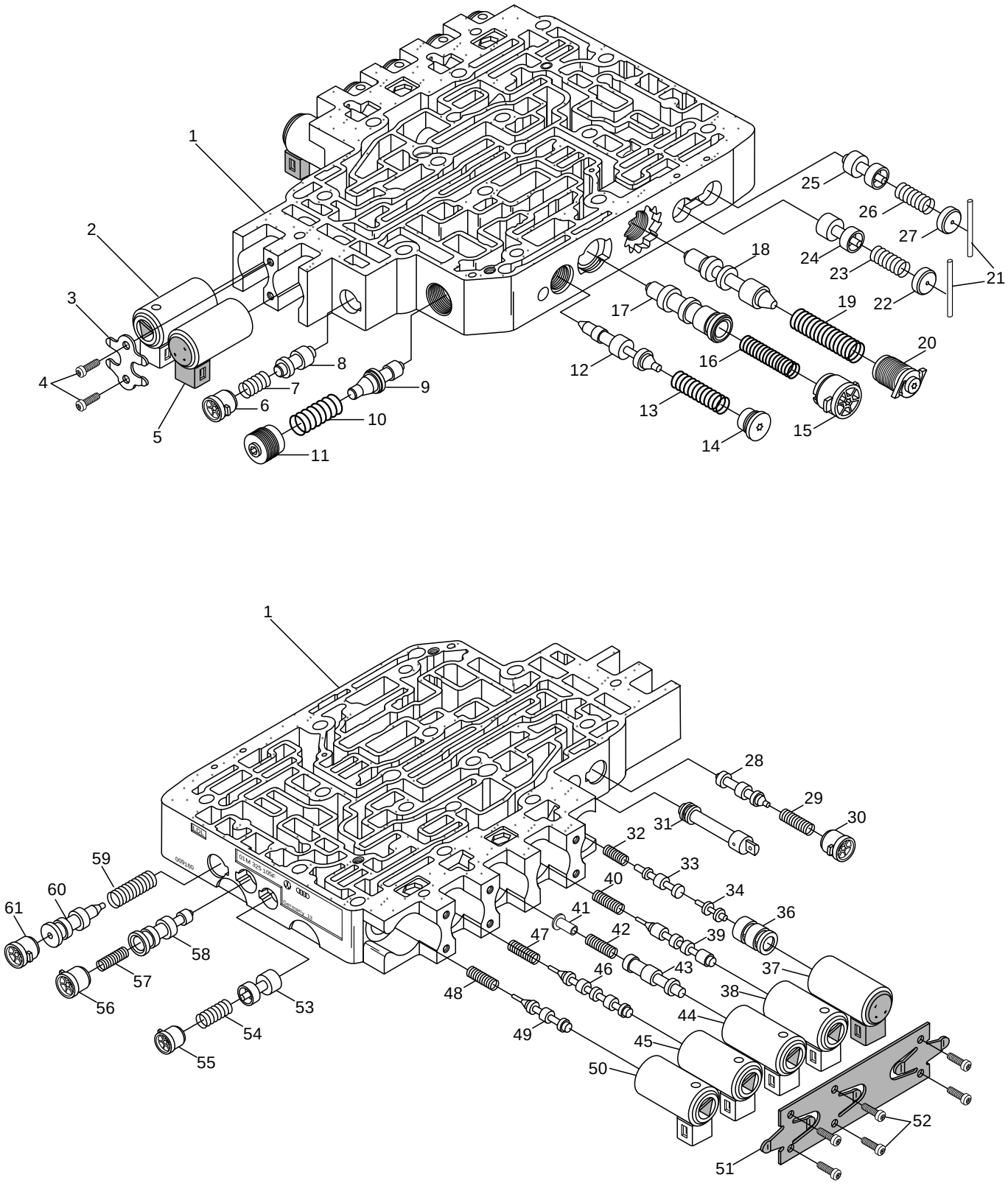


Figure 3

LEGEND

1. MAIN VALVE BODY CASTING
2. EV-7 SOLENOID (N94)
3. SOLENOID RETAINING BRACKET
4. SOLENOID RETAINING BRACKET BOLTS
5. EV-6 SOLENOID (N93)
6. MANUAL 1ST LOCKING VALVE RETAINER (YELLOW)
7. MANUAL 1ST LOCKING VALVE SPRING
8. MANUAL 1ST LOCKING VALVE
9. SOLENOID REGULATOR VALVE
10. SOLENOID REGULATOR VALVE SPRING
11. SOLENOID REGULATOR VALVE RETAINER
12. CONVERTER REGULATOR VALVE
13. CONVERTER REGULATOR VALVE SPRING
14. CONVERTER REGULATOR VALVE RETAINER
15. MAIN PRESSURE REGULATOR VALVE RETAINER (BROWN)
16. MAIN PRESSURE REG. VALVE SPRING
17. MAIN PRESSURE REGULATOR VALVE
18. BOOST PRESSURE REGULATOR VALVE
19. BOOST PRESSURE REG. VALVE SPRING
20. BOOST PRESSURE REGULATOR RETAINER (ADJUSTABLE)
21. K-3 & K1 REGULATOR VALVE RETAINING PINS
22. K-3 REGULATOR VALVE BORE PLUG
23. K-3 REGULATOR VALVE SPRING
24. K-3 REGULATOR VALVE
25. K-1 REGULATOR VALVE
26. K-1 REGULATOR VALVE SPRING
27. K-1 REGULATOR VALVE BORE PLUG
28. MANUAL 1ST/K-3 LOCKOUT VALVE
29. MANUAL 1ST/K-3 LOCKOUT VALVE SPRING
30. MANUAL 1ST/K-3 LOCKOUT RETAINER (YELLOW)
31. MANUAL VALVE
32. CONVERTER CLUTCH APPLY VALVE SPRING
33. CONVERTER CLUTCH APPLY VALVE
34. CONVERTER CLUTCH CONTROL VALVE
36. CONVERTER CLUTCH CONTROL VALVE SLEEVE
37. EV-4 SOLENOID, CONVERTER CLUTCH (N91)
38. EV-3 SOLENOID (N90)
39. K-3 SHIFT VALVE
40. K-3 SHIFT VALVE SPRING
41. B-1 APPLY VALVE SPRING SEAT
42. B-1 APPLY VALVE SPRING
43. B-1 APPLY VALVE
44. EV-5 SOLENOID (N92)
45. EV-1 SOLENOID (N88)
46. K-1/B-1 SHIFT VALVE
47. K-1/B-1 SHIFT VALVE SPRING
48. B-2 SHIFT VALVE SPRING
49. B-2 SHIFT VALVE
50. EV-2 SOLENOID (N89)
51. SOLENOID RETAINING BRACKET
52. SOLENOID RETAINING BRACKET BOLTS (6)
53. B-2 REGULATOR VALVE
54. B-2 REGULATOR VALVE SPRING
55. B-2 REGULATOR VALVE RETAINER (YELLOW)
56. K-1 CONTROL VALVE RETAINER (TAN)
57. K-1 CONTROL VALVE SPRING
58. K-1 CONTROL VALVE
59. 2-3 TIMING VALVE SPRING
60. 2-3 TIMING VALVE
61. 2-3 TIMING VALVE RETAINER (TAN)

Figure 4

V.W. / AUDI 01M/01N/01P

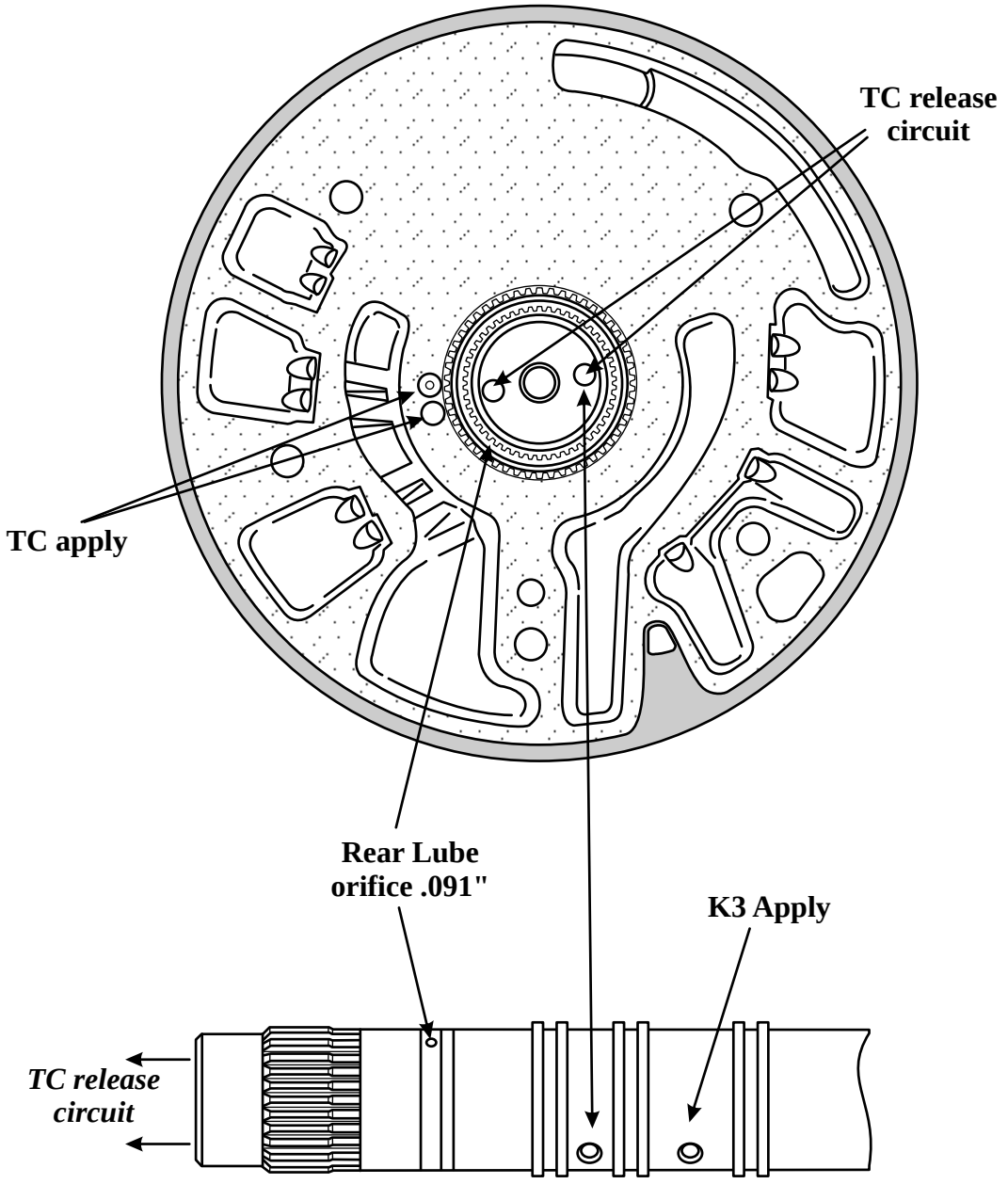
INTERMITTENT P0740 OR VAG 01192

COMPLAINT: V.W. Audi vehicles equipped with the 01M/01N/01P transaxle may exhibit an intermittent P0740 or VAG 01192 Torque Converter Slip diagnostic trouble code, after overhaul. This condition may only set under certain throttle conditions which may be very difficult to diagnose.

CAUSE: The cause may be, during pump assembly, the inner pump gear was installed backwards causing a restriction in the TCC apply circuit, which may cause the Torque Converter Clutch apply to be delayed for a split second, producing the slip code. Refer to Figure 1 for the identification of the TCC release circuits and the TCC apply circuit. Refer to Figure 2 for a view of the inner pump gear installed on the stator and how TCC apply pressure is fed to the two open lugs that the Torque Converter drive lugs are not possessing. Refer to Figure 3 for a cross-sectional view of the stator and the inner pump gear showing it's correct installation.

CORRECTION: To correct this condition, refer to Figure 3 and install the inner pump gear with the deeper cut towards the pump stator.

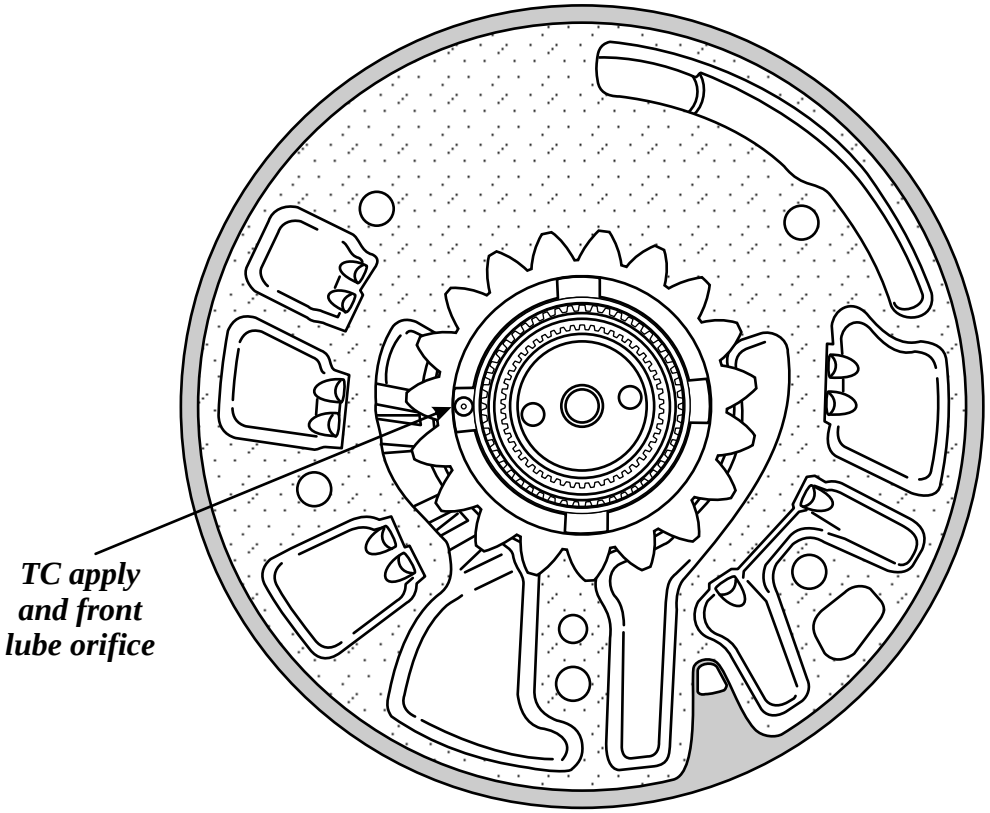
PUMP PASSAGE I.D.



The rear lube orifice is fed from the area in-between the Stator and the Turbine shaft.

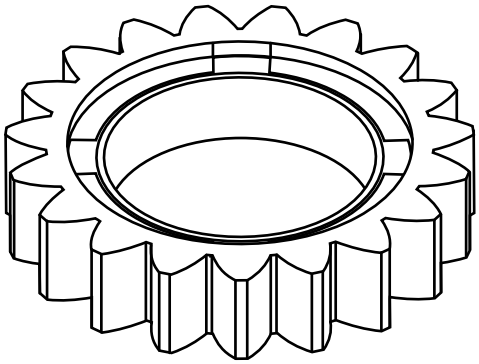
Figure 1

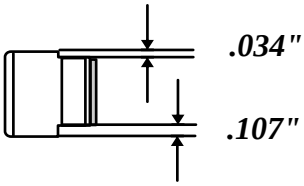
PUMP PASSAGE I.D.

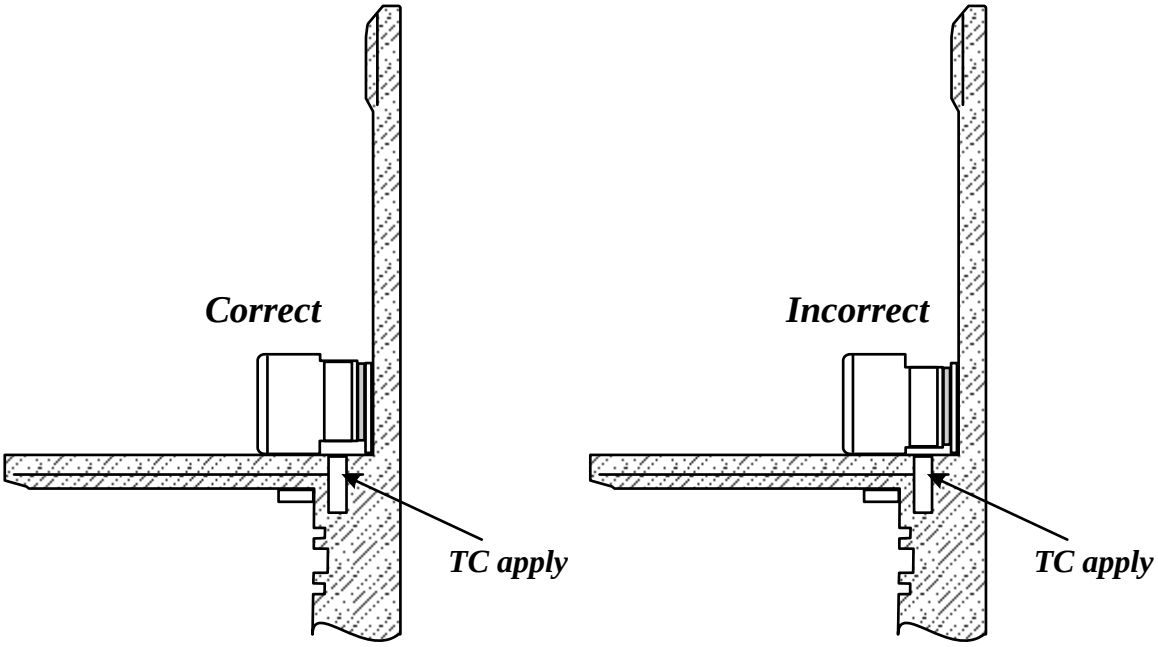


The Torque Converter Apply Circuit is fed thru the two open holes in the pump gear that the drive lugs of the Torque Converter hub are not possessing.

INNER PUMP GEAR







The Pump drive gear is cut deeper on the stator side to allow a larger volume of Apply Pressure to enter the Torque Converter.

Figure 3

V.W. / AUDI 01M/01N/01P

3-4 UPSHIFT FLAIR

COMPLAINT: V.W. and Audi vehicles equipped with the 01M, 01N or 01P transaxles may exhibit a 3-4 upshift flair, or a quick spin up during th e shift.

CAUSE: The cause may be, low solenoid feed pressure, a worn Solenoid Regulator Valve bore, or a missing spring for checkball number 4. This can cause a flair on the 3-4 upshift because of the lack of pre-fill on the K1 clutch. This pre-fill pressure ranges from 3-10 psi. and begins at the solenoid regulator valve, is fed thru two .040" orifices and is finally regulated by the number 4 checkball and spring. The lack of pre-fill can cause the K1 clutch to release too quick during the 3-4 upshift transition. See the partial circuit diagram shown in Figure 1.

CORRECTION: To correct this condition, ensure that the solenoid casings are sealed against the valve body casting, by using gaskets, as shown in Figure 3 and 4. Check the bore of the solenoid regulator valve and repair bore if necessary. See Figure 2 for a cross-sectional view and Figure 4 for the valve location. Verify that the spring under checkball number 4 , as shown in Figure 6, is in the correct location.

SERVICE INFORMATION:

Solenoid gaskets are available in some aftermarket overhaul kits. Valve repair and a replacement spring , for the number 4 checkball are available from Sonnax.

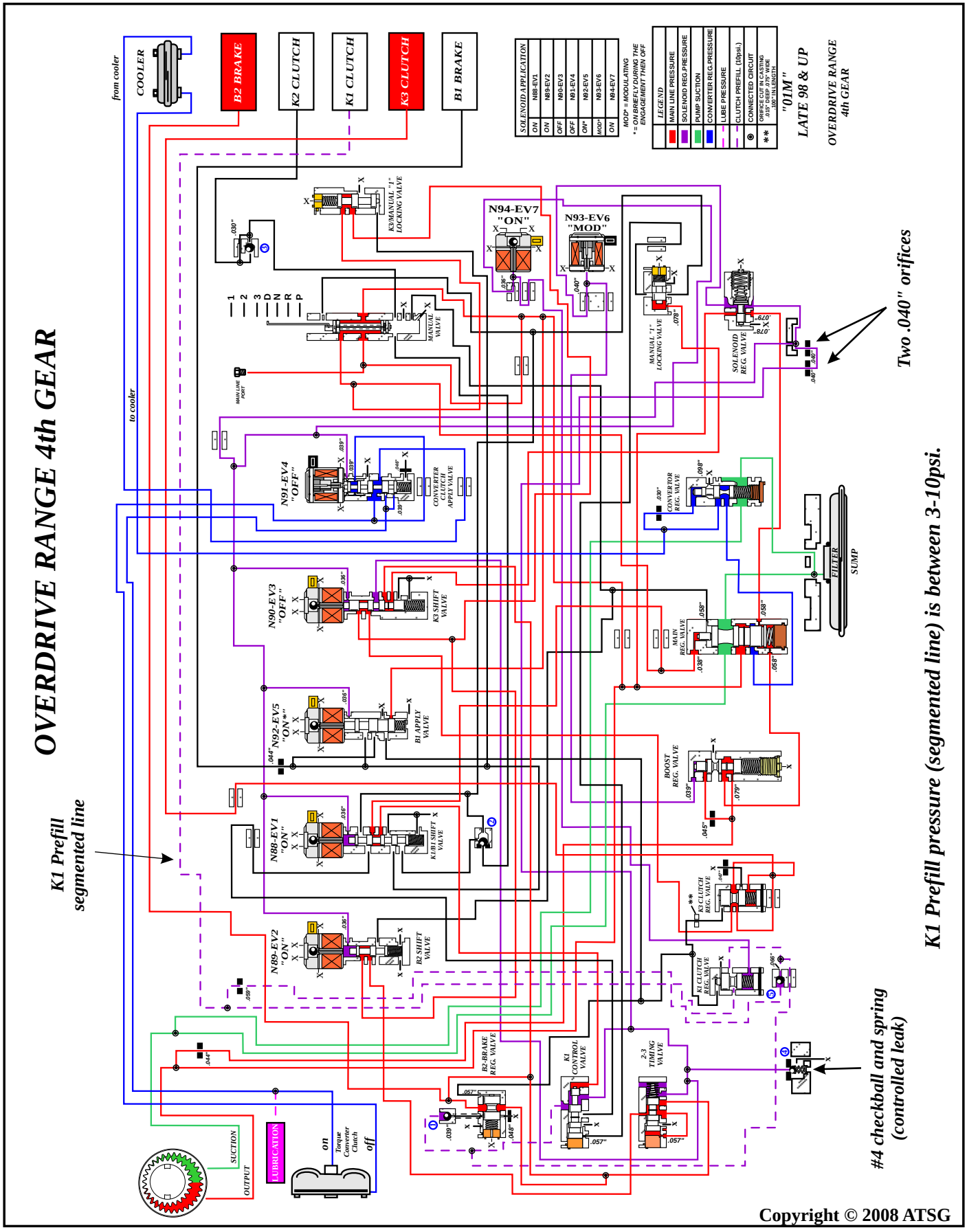

OVERDRIVE RANGE 4th GEAR
OVERDRIVE RANGE
4th GEAR
"01M"
LATE 98 & UP
from cooler
COOLER
to cooler
B2 BRAKE
K2 CLUTCH
K1 CLUTCH
K3 CLUTCH
B1 BRAKE
SOLENOID APPLICATION
N88-EV1
N89-EV2
N90-EV3
N91-EV4
N92-EV5
N93-EV6
N94-EV7
MOD* = MODULATING
* = CLOSED DURING THE ENGAGEMENT THEN OFF
LEGEND
MAIN LINE PRESSURE
SOLENOID REG.PRESSURE
PUMP SUCTION
CONVERTER REG.PRESSURE
LUBE PRESSURE
CLUTCH PREFILL (10psi.)
CONNECTED CIRCUIT
ORIFICE CUT IN CASTING
.040" DIA. UNLESS OTHER WISE
.100" IN LENGTH
**
N94-EV7 "ON"
N93-EV6 "MOD"
K3/MANUAL "1" LOCKING VALVE
MANUAL VALVE
MAIN LINE PORT
N91-EV4 "OFF"
CONVERTER CLUTCH APPLY VALVE
N90-EV3 "OFF"
K3 SHIFT VALVE
N92-EV5 "ON"*
B1 APPLY VALVE
N88-EV1 "ON"
K1/B1 SHIFT VALVE
N89-EV2 "ON"
B2 SHIFT VALVE
MANUAL "1" LOCKING VALVE
SOLENOID REG. VALVE
Two .040" orifices
CONVERTOR REG. VALVE
MAIN REG. VALVE
FILTER
SUMP
BOOST REG. VALVE
K3 CLUTCH REG. VALVE
K1 CLUTCH REG. VALVE
B2-BRAKE REG. VALVE
K1 CONTROL VALVE
2-3 TIMING VALVE
K1 Prefill pressure (segmented line) is between 3-10psi.
K1 Prefill segmented line
#4 checkball and spring (controlled leak)
SUCTION
OUTPUT
LUBRICATION
on
Torque Converter Clutch
off
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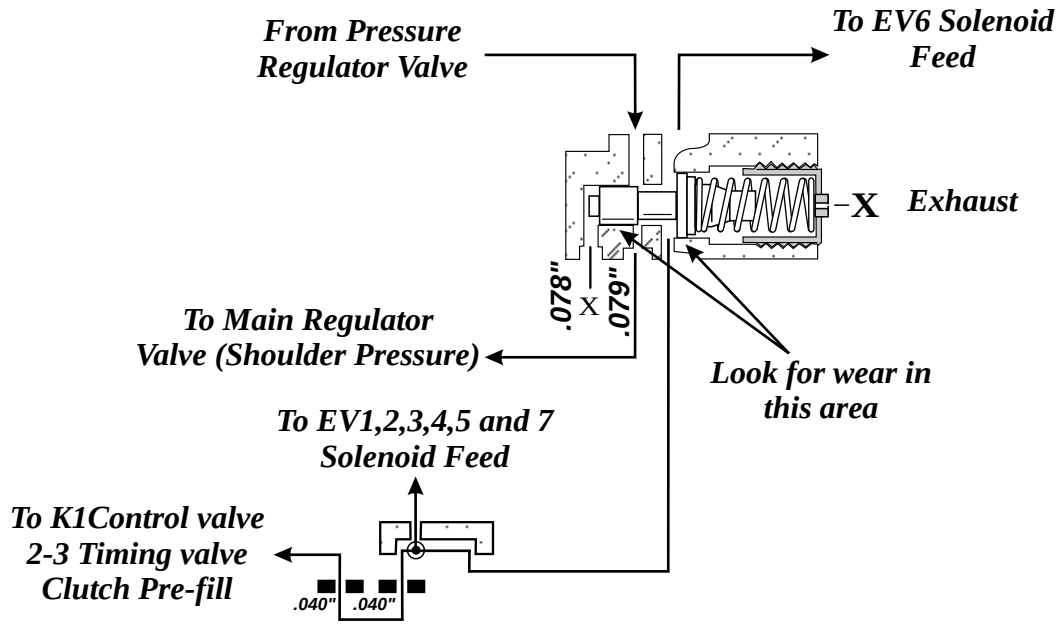
Figure 1

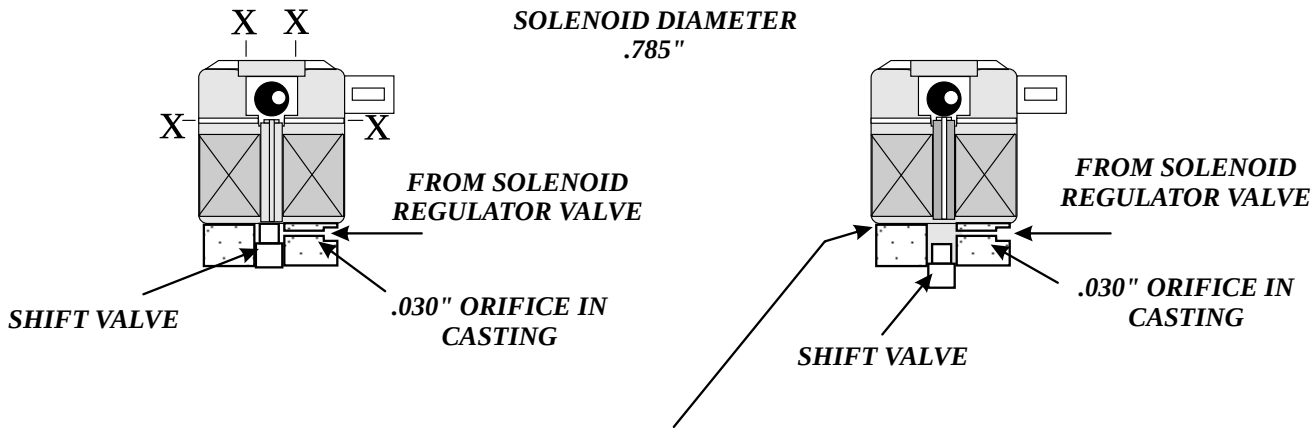
SOLENOID REGULATOR VALVE



Check the bore of the Solenoid Regulator Valve for wear. Pressure bleeding past the valve lands will be exhausted at the plug shown above

Figure 2

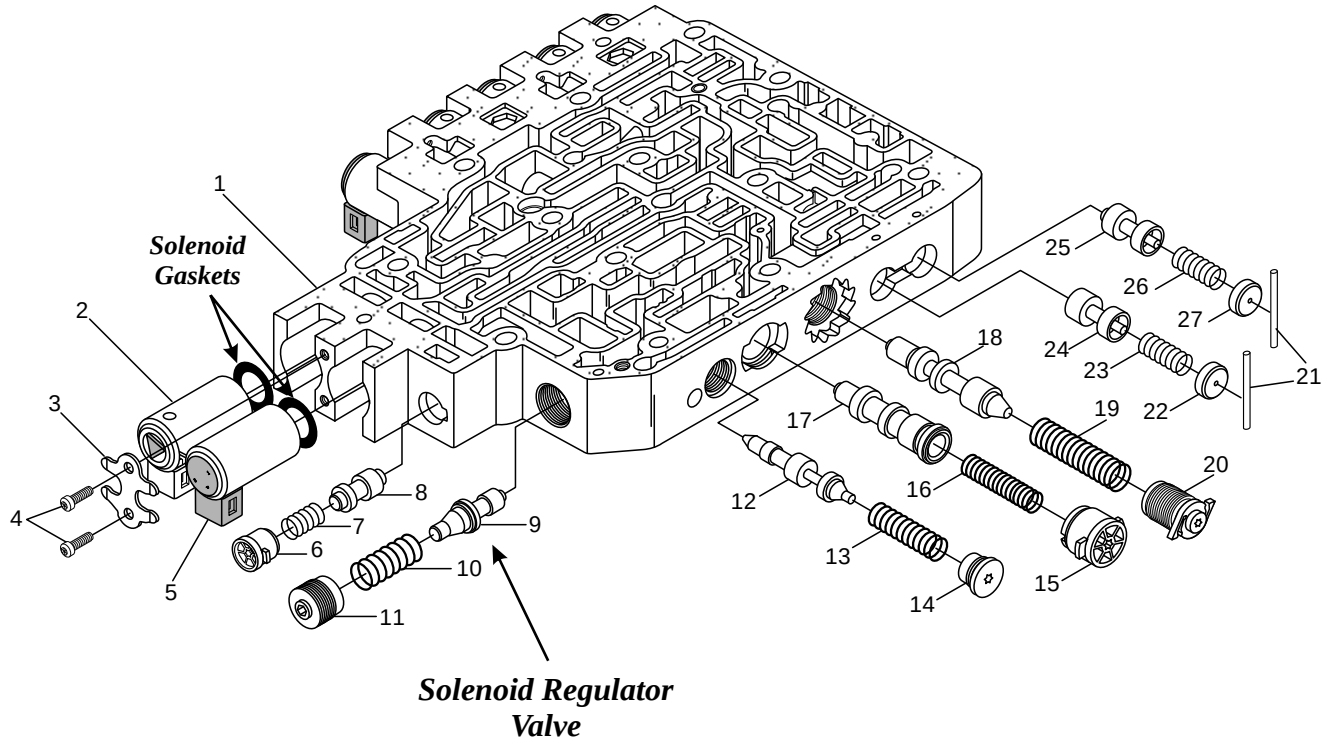
EV1 (N88), EV2 (N89), EV3 (N90), EV5 (N92) AND EV7 (N94) SOLENOID CHECK AND OPERATION

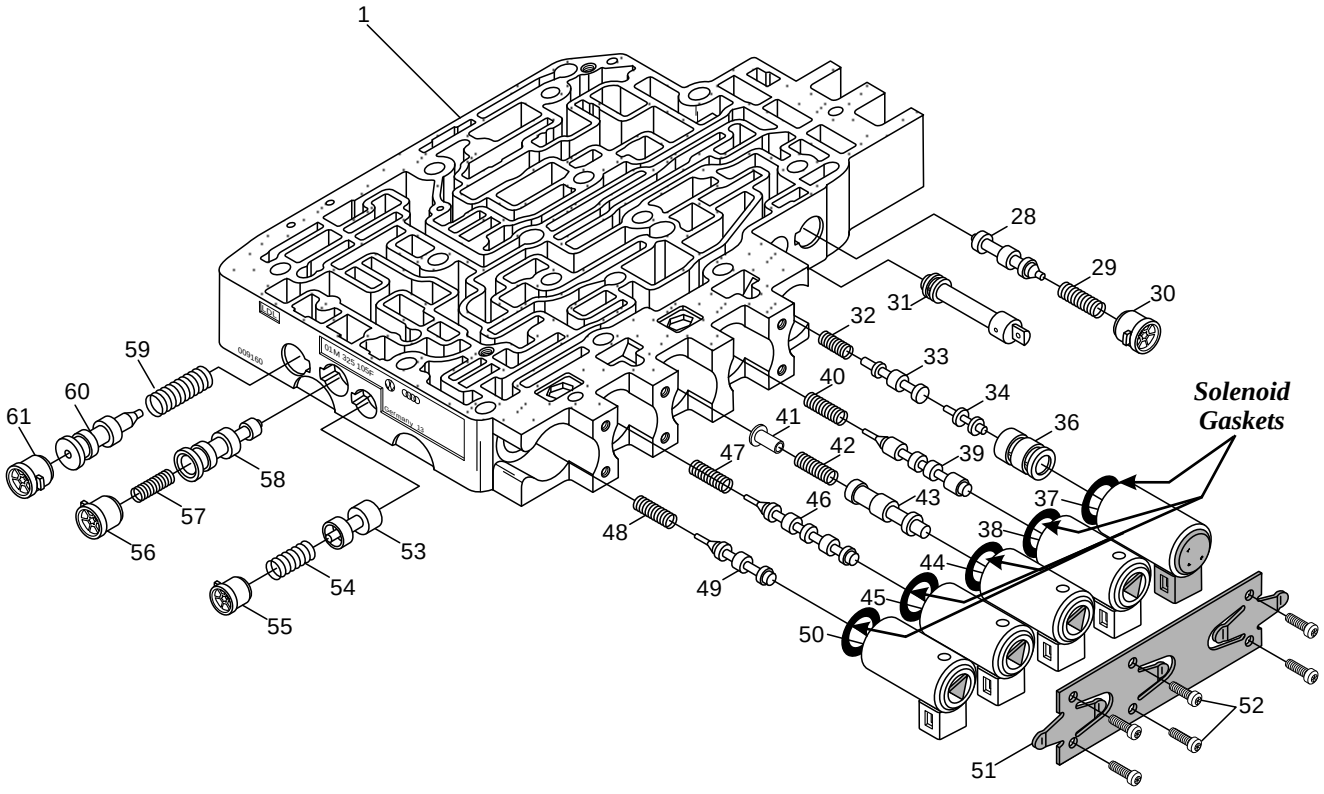


Use a gasket in-between the Solenoid casing and the Valvebody Casting

Figure 3

AUDI AND VOLKSWAGEN 98&UP 01M VALVE BODY
EXPLODED VIEW





NOTE: Refer to Figure 5 for the Valve Legend

Figure 4

SLIDE

LEGEND

1. MAIN VALVE BODY CASTING
2. EV-7 SOLENOID (N94)
3. SOLENOID RETAINING BRACKET
4. SOLENOID RETAINING BRACKET BOLTS
5. EV-6 SOLENOID (N93)
6. MANUAL 1ST LOCKING VALVE RETAINER (YELLOW)
7. MANUAL 1ST LOCKING VALVE SPRING
8. MANUAL 1ST LOCKING VALVE
9. SOLENOID REGULATOR VALVE
10. SOLENOID REGULATOR VALVE SPRING
11. SOLENOID REGULATOR VALVE RETAINER
12. CONVERTER REGULATOR VALVE
13. CONVERTER REGULATOR VALVE SPRING
14. CONVERTER REGULATOR VALVE RETAINER
15. MAIN PRESSURE REGULATOR VALVE RETAINER (BROWN)
16. MAIN PRESSURE REG. VALVE SPRING
17. MAIN PRESSURE REGULATOR VALVE
18. BOOST PRESSURE REGULATOR VALVE
19. BOOST PRESSURE REG. VALVE SPRING
20. BOOST PRESSURE REGULATOR RETAINER (ADJUSTABLE)
21. K-3 & K1 REGULATOR VALVE RETAINING PINS
22. K-3 REGULATOR VALVE BORE PLUG
23. K-3 REGULATOR VALVE SPRING
24. K-3 REGULATOR VALVE
25. K-1 REGULATOR VALVE
26. K-1 REGULATOR VALVE SPRING
27. K-1 REGULATOR VALVE BORE PLUG
28. MANUAL 1ST/K-3 LOCKOUT VALVE
29. MANUAL 1ST/K-3 LOCKOUT VALVE SPRING
30. MANUAL 1ST/K-3 LOCKOUT RETAINER (YELLOW)
31. MANUAL VALVE
32. CONVERTER CLUTCH APPLY VALVE SPRING
33. CONVERTER CLUTCH APPLY VALVE
34. CONVERTER CLUTCH CONTROL VALVE
36. CONVERTER CLUTCH CONTROL VALVE SLEEVE
37. EV-4 SOLENOID, CONVERTER CLUTCH (N91)
38. EV-3 SOLENOID (N90)
39. K-3 SHIFT VALVE
40. K-3 SHIFT VALVE SPRING
41. B-1 APPLY VALVE SPRING SEAT
42. B-1 APPLY VALVE SPRING
43. B-1 APPLY VALVE
44. EV-5 SOLENOID (N92)
45. EV-1 SOLENOID (N88)
46. K-1/B-1 SHIFT VALVE
47. K-1/B-1 SHIFT VALVE SPRING
48. B-2 SHIFT VALVE SPRING
49. B-2 SHIFT VALVE
50. EV-2 SOLENOID (N89)
51. SOLENOID RETAINING BRACKET
52. SOLENOID RETAINING BRACKET BOLTS (6)
53. B-2 REGULATOR VALVE
54. B-2 REGULATOR VALVE SPRING
55. B-2 REGULATOR VALVE RETAINER (YELLOW)
56. K-1 CONTROL VALVE RETAINER (TAN)
57. K-1 CONTROL VALVE SPRING
58. K-1 CONTROL VALVE
59. 2-3 TIMING VALVE SPRING
60. 2-3 TIMING VALVE
61. 2-3 TIMING VALVE RETAINER (TAN)

Figure 5

CHANNEL PLATE
CHECKBALL AND SPRING LOCATION

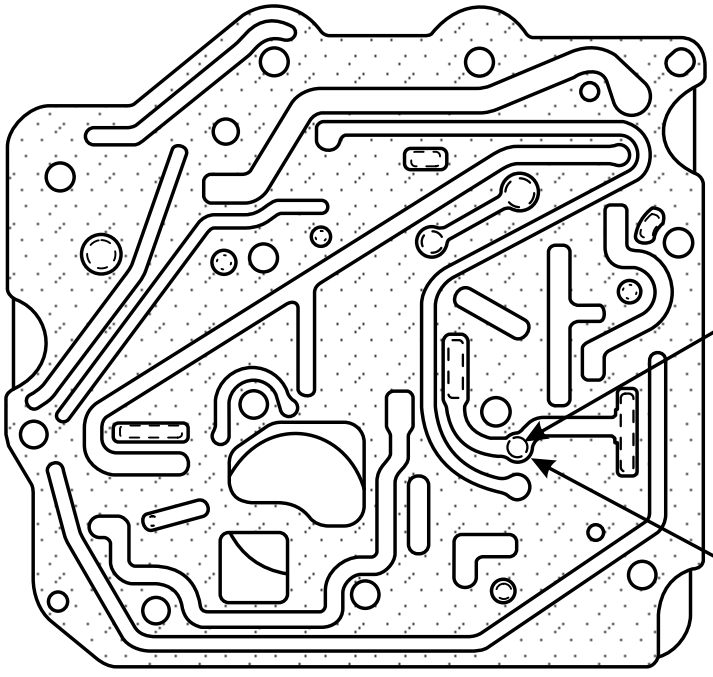


Figure 6

O.E.M. SERVICE WEBSITE ACCESS

VEHICLE MANUFACTURER SERVICE INFORMATION MATRIX			
MANUFACTURER & WEB ADDRESS	**SHORT TERM SUBSCRIPTION RATE**	**MONTHLY SUB-SCRIPTION RATE**	**LONG TERM SUBSCRIPTION RATE**
ACURA/HONDA www.serviceexpress.honda.com	$20.00 72 Hours	$50.00	$500.00 1 Year
AUDI/VOLKSWAGEN www.ebahn.com	Single Platform $29.95-72 Hours All Platforms $49.95-72 Hours	Single Platform $49.95 All Platforms $79.95	Single Platform $79.95-1 Year All Platforms $999.95-1 Year
BENTLEY [1] www.bentleytechinfo.com	FREE ACCESS	FREE ACCESS	FREE ACCESS
BMW www.bmwtechinfo.com	$30.00 24 Hours	$250.00	$2500.00 1 Year
CHRYSLER/DODGE/EAGLE/ JEEP/PLYMOUTH www.techauthority.com	$20.00 24 Hours	$200.00	$1500.00 1 Year
FORD/LINCOLN/MERCURY [2] www.motorcraft.com	$19.95 72 Hours	$299.95	2499.95 1 Year
GENERAL MOTORS www.gmtechinfo.com	$20.00 72 Hours	$150.00	$1200.00 1 Year
HYUNDAI www.hmaservice.com	FREE ACCESS	FREE ACCESS	FREE ACCESS
INFINITI [3] www.infinititechinfo.com	$19.99 24 Hours	$299.98	$2499.98 1 Year
ISUZU www.isuzutechinfo.com	$20.00 24 Hours	$150.00	$1650.00 1 Year
JAGUAR [4] www.juguartechinfo.com	$44.00 24 Hour	$262.00	$1377.00 1 Year
KIA www.kiatechinfo.com	FREE ACCESS	FREE ACCESS	FREE ACCESS
LAND ROVER [4] www.landrovertechinfo.com	$44.00 24 Hour	$262.00	$1528.00 1 Year
LEXUS [5] www.techinfo.lexus.com	$10.00 24 Hours	$50.00	$350.00 1 Year
MAZDA www.mazdatechinfo.com	$19.95 24 Hour	$199.95	$900.00 - 6 Months $1500.00 - 1 Year

NOTE: Subscription rates change without notice, the prices shown are of October 2007.

O.E.M. SERVICE WEBSITE ACCESS

VEHICLE MANUFACTURER SERVICE INFORMATION MATRIX			
MANUFACTURER & WEB ADDRESS	**SHORT TERM SUBSCRIPTION RATE**	**MONTHLY SUB-SCRIPTION RATE**	**LONG TERM SUBSCRIPTION RATE**
MERCEDES BENZ [6] www.startekinfo.com	$18.00 - 24 Hours $95.00 - Weekly	$275.00	$2950.00 1 Year
MINI www.minitechinfo.com	$30.00 24 Hour	$250.00	$2500.00 1 Year
MITSUBISHI www.mitsubishitechinfo.com	$19.95 - 24 Hour $99.95 - Weekly	$249.99	$999.99 - 6 Months $1499.95 - 1 Year
NISSAN [7] www.nissantechinfo.com	$19.99 24 Hour	299.98	2499.98 1 Year
PORSCHE www.techinfo.porsche.com	$110.00 Per Document	Not Available	$5200.00 1 Year
ROLLS ROYCE [8] www.rrtis.com	Free Access	Free Access	Free Access
SAAB www.saabtechinfo.com	$10.00 24 Hour	$75.00	$180.00 - 3 Months $500.00 - 1 Year
SUBARU [9] www.techinfo.subaru.com	$34.95 72 Hour	$299.95	$2499.95 1 Year
SUZUKI [10] www.suzukitechinfo.com	$19.99 24 Hour	$99.99	$299.99 - 6 Months $499.99 - 1 Year
TOYOTA/SCION [5] www.techinfo.toyota.com	$10.00 24 Hour	$50.00	$350.00 1 Year
VOLVO www.volvotechinfo.com	$39.50 72 Hour	$260.00	$2600.00 1 Year

[1] The coverage for Bentley vehicles is for 1994 and later models, plus Rolls Royce vehicles built before 12/31/02.
[2] The Ford website offers other access options at lower prices for single model and year, or single vehicle, multiple years, diagnostics only, reprogramming only, etc.
[3] The Infiniti website offers free viewing of Owners Manuals and Navigation System Manuals for 1996 and later vehicles. It also offers TSBs for 1990 and later vehicles.
[4] The Jaguar and Land Rover websites offer lower pricing for single venues.
[5] Toyota, Scion and Lexus information can be accessed for one charge.
[6] Mercedes Benz access always expires at midnight of the last day of the subscription.
[7] The Nissan website offers free viewing of Owners Manuals and Navigation System Manuals for 1996 and later vehicles. It also offers TSBs for 1987 and later vehicles.
[8] The Rolls Royce website has very limited information, and only for vehicles built after 12/31/02.
[9] Subaru Pre 2003 reprogramming revisions are difficult to locate. Use http//techinfo.subaru.com/html/reprogramming_pre-j2534_files.pdf
[10] The Suzuki website offers other access options for single model service manual, single TSB or unlimited service manuals and TSBs.

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