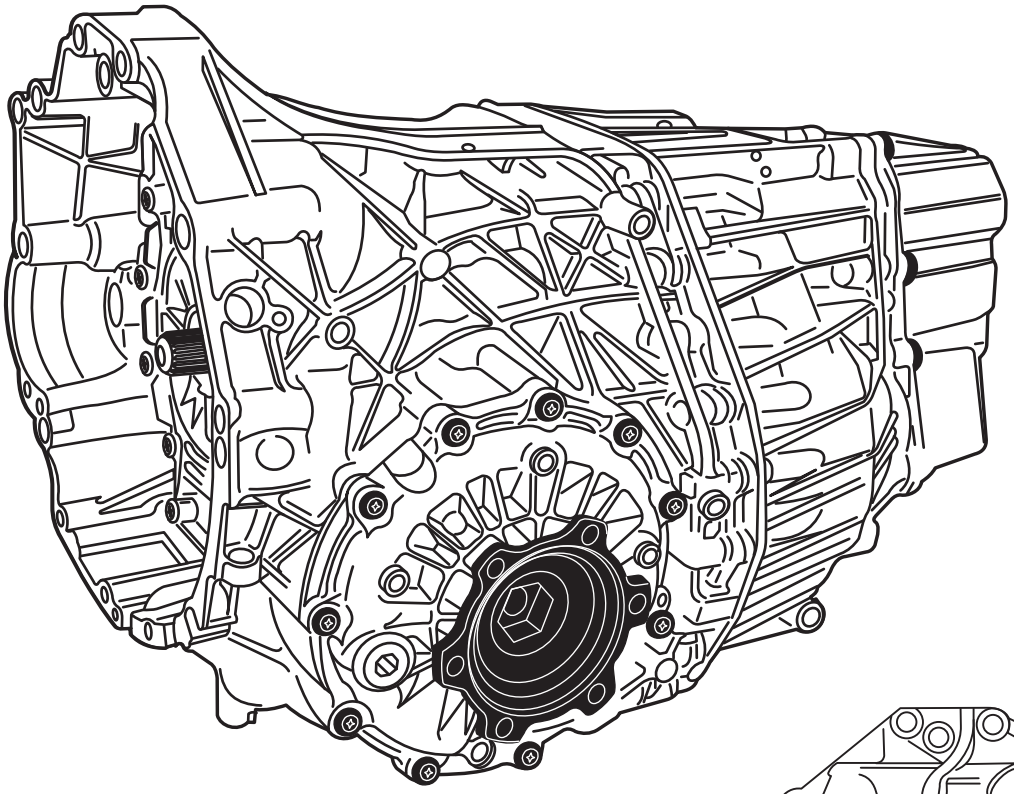
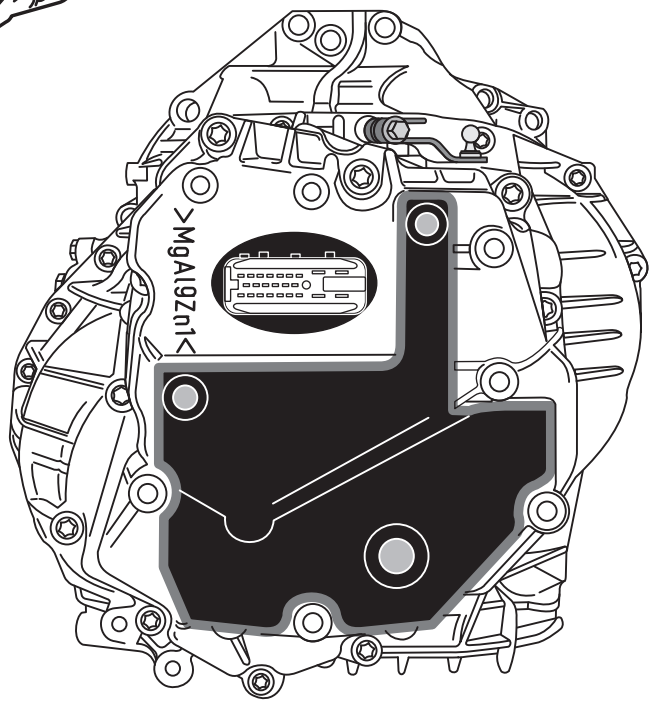
THE 01J MULTITRONIC®

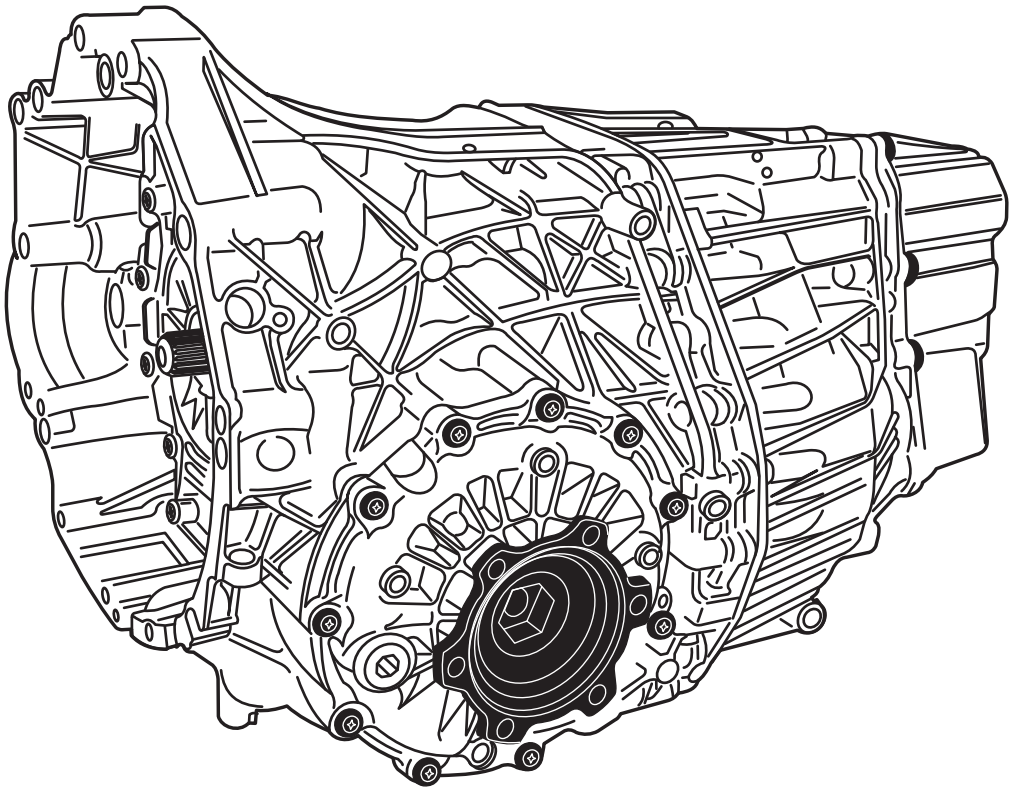
2004 Audi A4 and A6
1.8L and 3.0L





THE AUDI MULTITRONIC 01J CVT
PRELIMINARY INFORMATION

THE 01J MULTITRONIC®
Audi A4 and A6



Some Audi A4 and A6 vehicles are equipped with the Multitronic® 01J (VL300) Continuously Variable Transmission. One of the more unique features about this transmission is the fact that the Transmission Control Module (TCM) is located ***INSIDE*** the transmission with the 25 pin TCM connector for early units and a round 20 pin TCM for later units protruding out the rear of the unit.. This transmission does not use a torque converter, it uses a dual mass flywheel or a flywheel/damper plate assembly depending on engine size. Another of the unique components of the 01J is the use of a drive chain instead of a belt. This is the first time a drive chain has been used in a CVT application. The TCM operates several external relays through the same harness as the one that connects to the back of the transmission case. The TCM also communicates with other modules over the CAN Network. The Tiptronic gear selection feature provides six (6) or seven (7) manually selected speeds.

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

01J Basic Disassembly

1.Using a #45 torx, remove 12 bolts from the TCM cover and remove the cover and gasket (See Figures 1 and 2). ***Note oil sealing washer bolt location.***

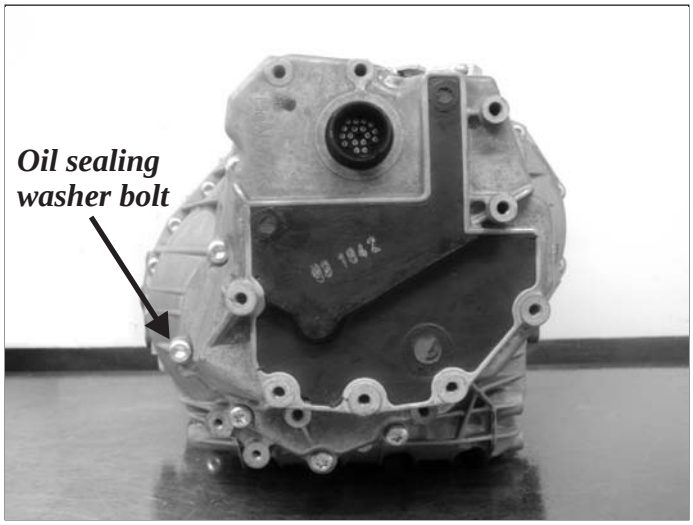


Figure 1

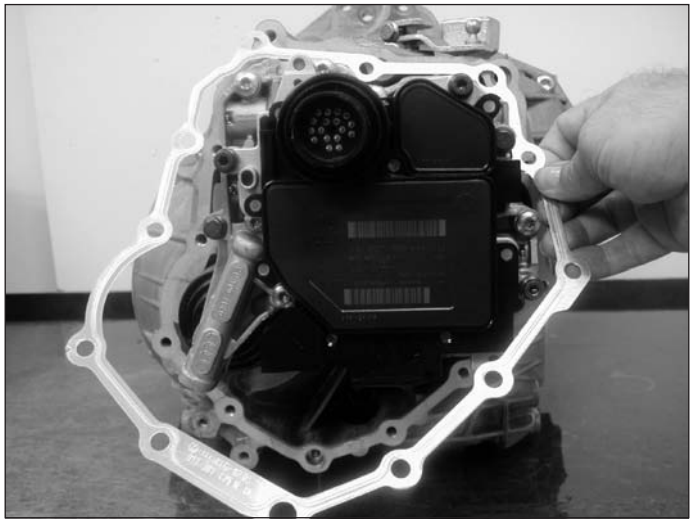


Figure 2

2.Using a #30 torx, remove 3 TCM retaining bolts as seen in figures 3 and 4 and remove the TCM (Figure 5).

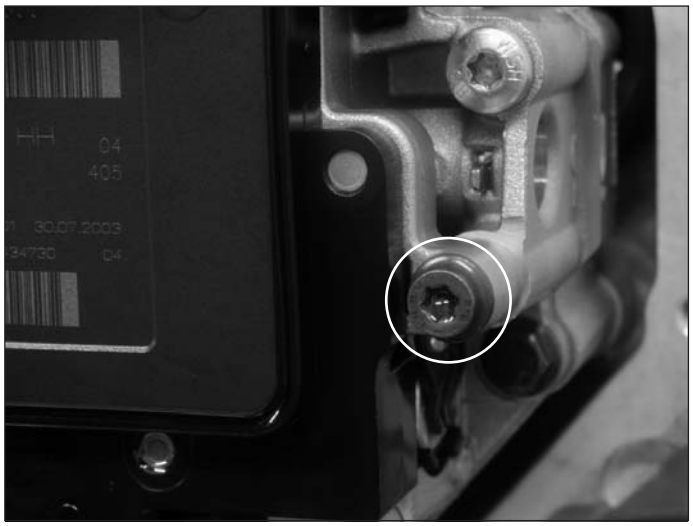


Figure 3

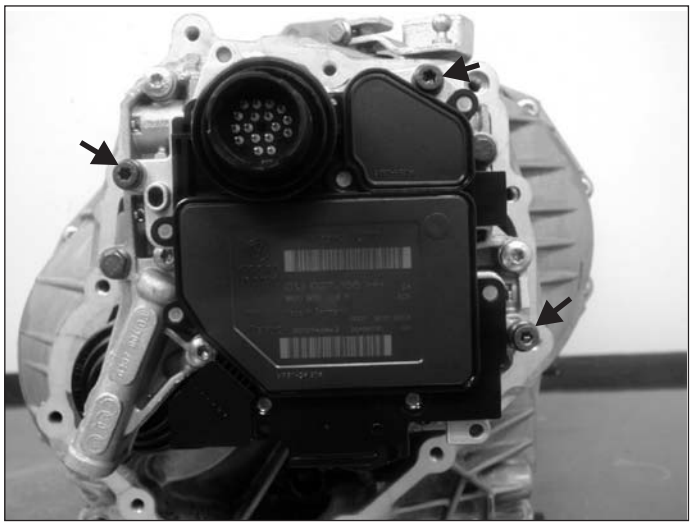


Figure 4

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

3.Disconnect the spring from the detent roller and lever as seen in figure 6.

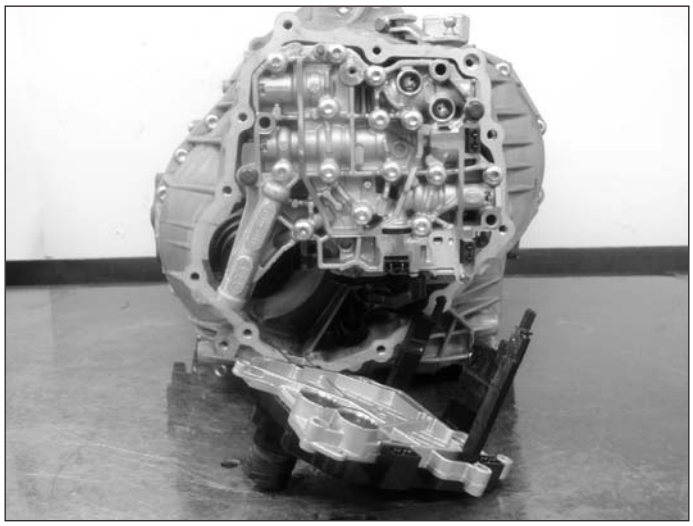


Figure 5

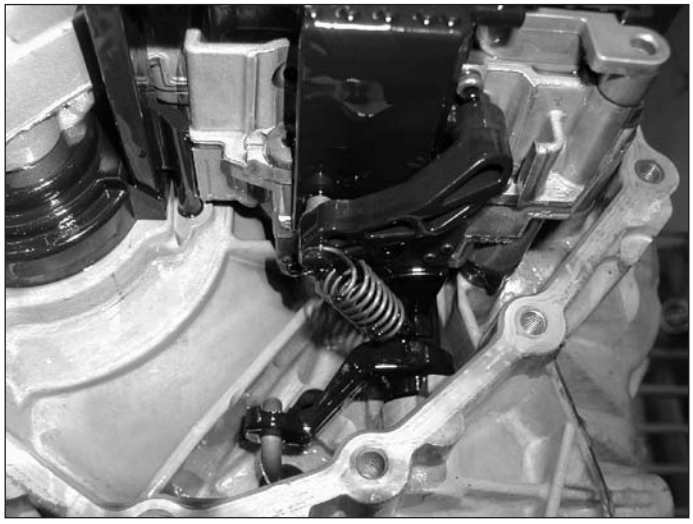


Figure 6

4.Remove the detent roller being careful not to loose the little roller from the lever (Figures 7 and 8).

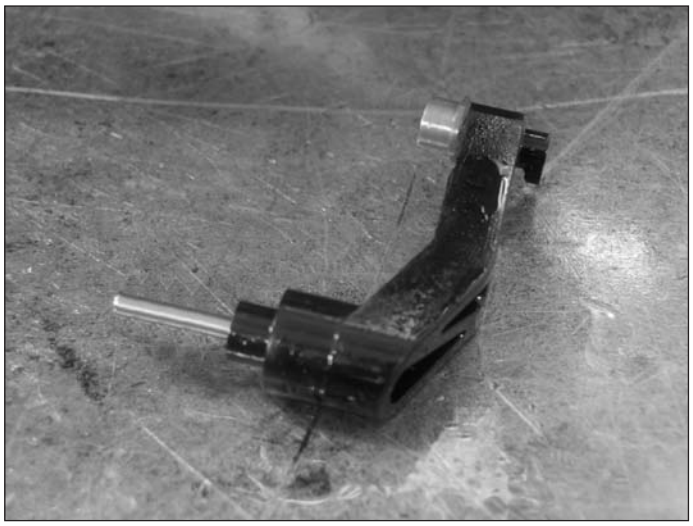


Figure 7

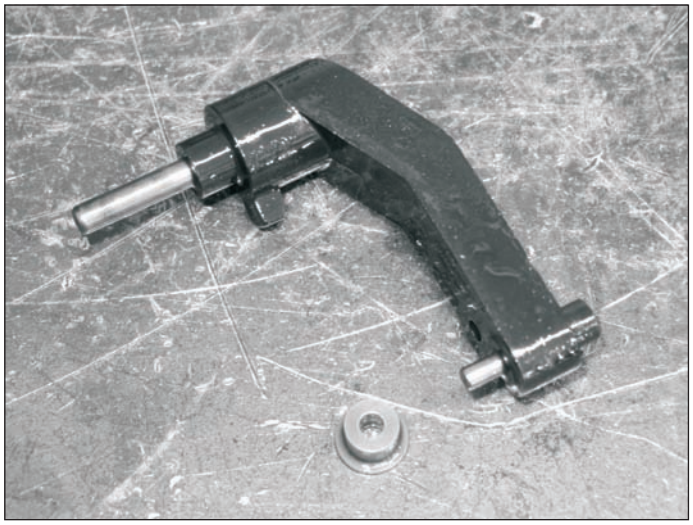


Figure 8

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

5.Remove the 2 pressure switch O'rings from the valve body (Figure 9).

6. Using a 10 mm socket, remove the 3 valve body attaching bolts and remove the valve body (Figure 10).

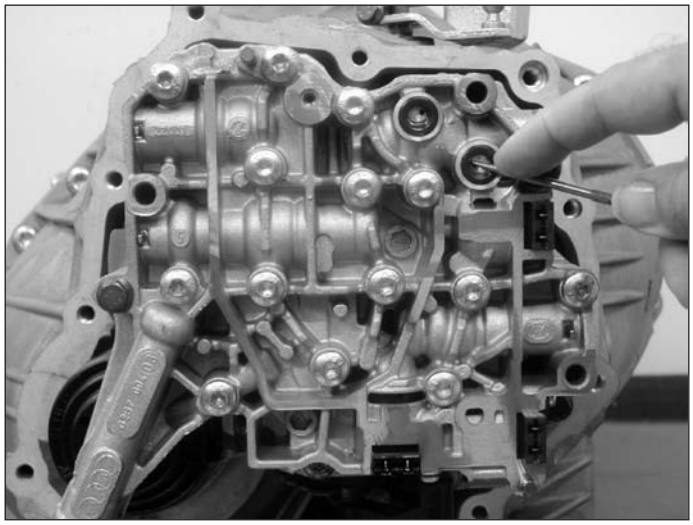


Figure 9

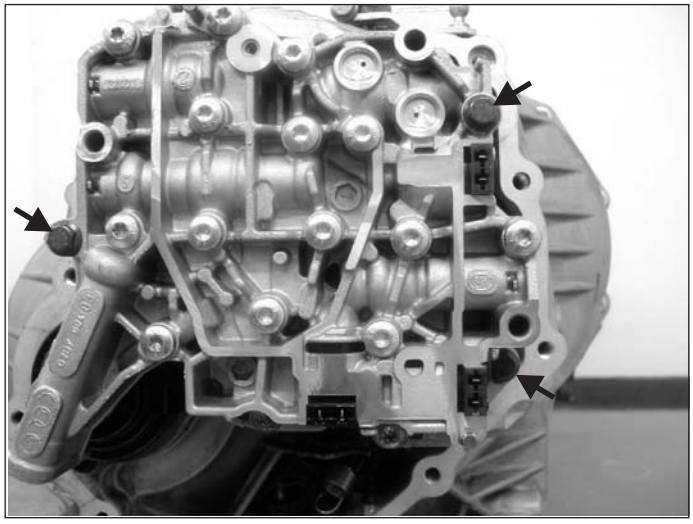


Figure 10

7.With the valve body removed, tube seals become accessible for removal (Figure 11). Care must be taken when removing the Input Sender Wheel (Figure 12) and the Output Sender Wheel (Figure 13) as they are not shaft seals. They each have magnets in them which

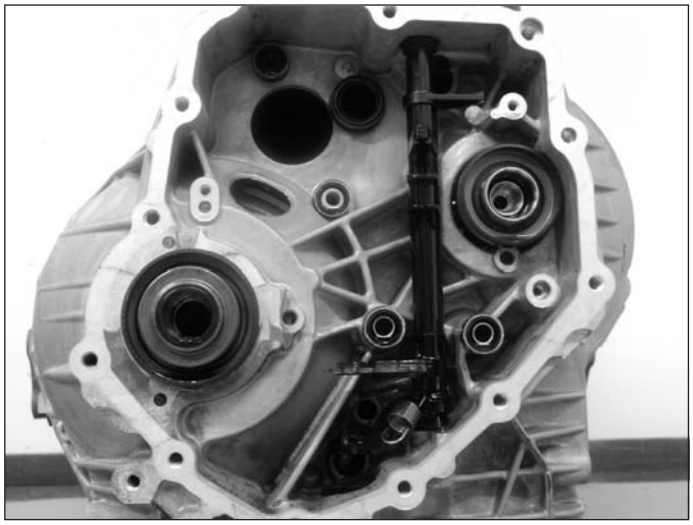


Figure 11

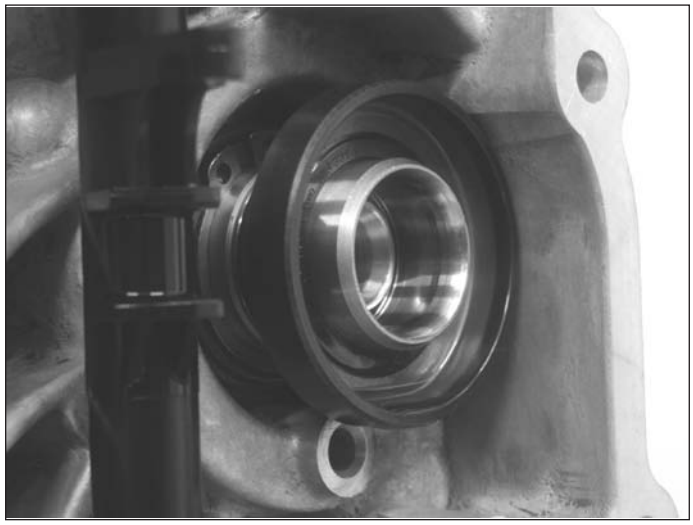


Figure 12

are used to excite Hall Affect Sensor built into the TCM. The Input Sensor Wheel has 40 equally spaced magnets in it while the Output Sensor Wheel uses 32 equally spaced magnets.

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

8. After removing all tube seals and sensor wheels the snap ring and shim can be removed from the primary pulley shaft as seen in figures 14 through 16.

Figure 13

Figure 15

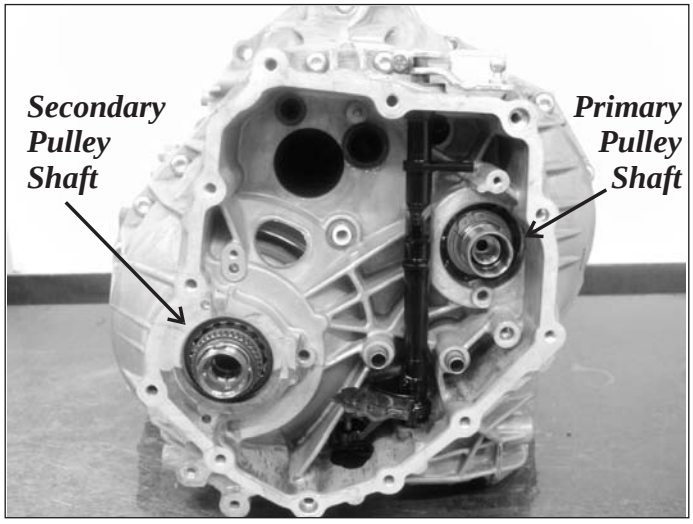


Figure 14

Figure 16

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

9. With the snap ring and shim removed from the primary pulley shaft, use a 45 mm torx to remove 21 bolts from the pulley case cover (Figure 17).

Figure 17

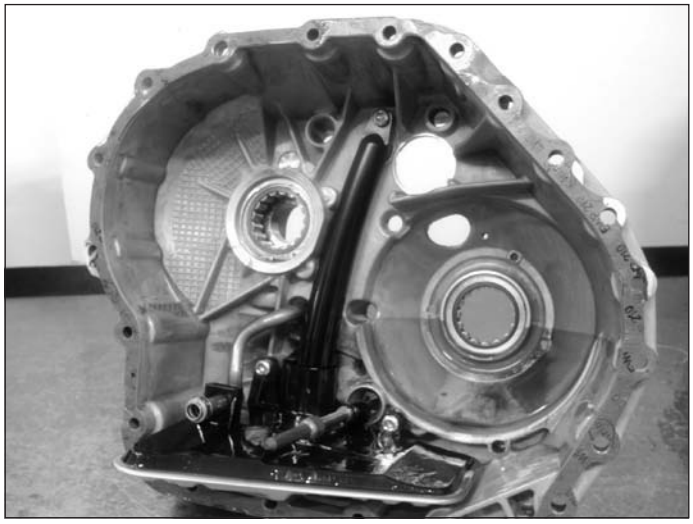


Figure 18

10. When all the bolts are removed, carefully work the pulley case cover off of the primary and secondary pulley shafts (Figures 18 through 20).

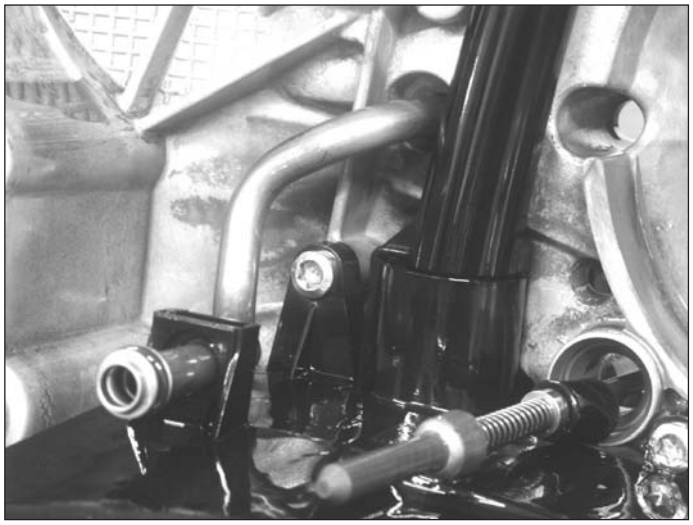


Figure 19

Figure 20

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

11. Next, remove the inner shim from the primary pulley shaft (Figure 21).

12. A quick observation should be made to see that the chain is at its smallest wrap in the primary pulley while

Figure 21

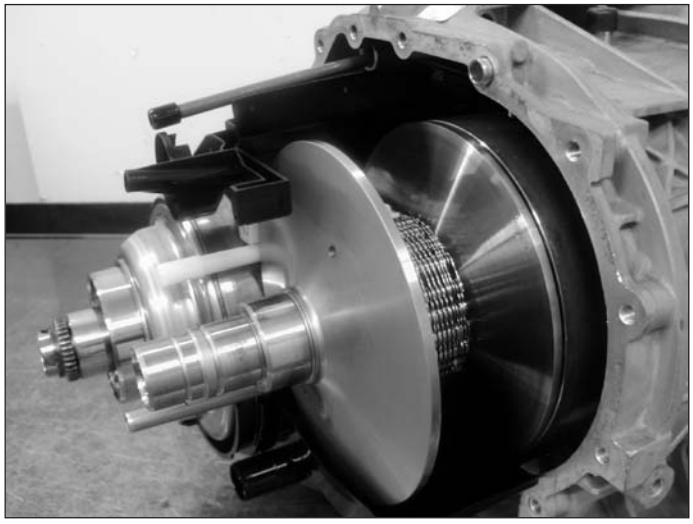


Figure 22

at its largest wrap in the secondary pulley as seen in figures 22 and 23. This is the low gear chain wrap position which is where the pulleys should be without hydraulic pressure. If the wrap angle is not as shown, there is a problem with the pulley and chain assembly.

13. Inspect the chain and sheave faces on both pulleys for wear or damage.

14. Remove Reverse Clutch Pressure Tube and baffling (Figure 24).

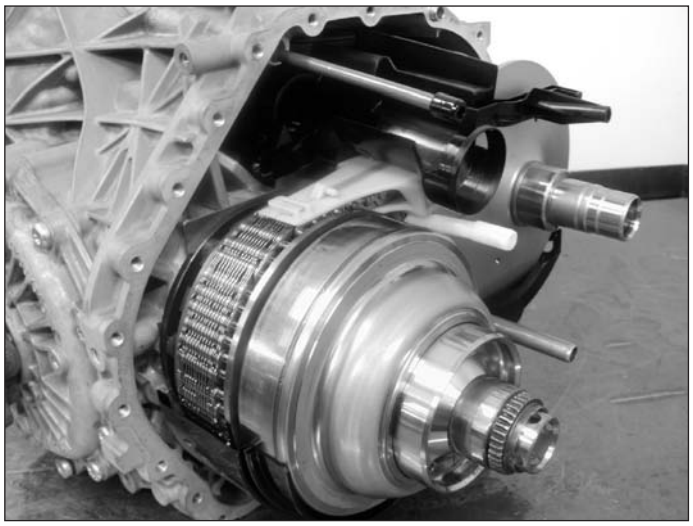


Figure 23

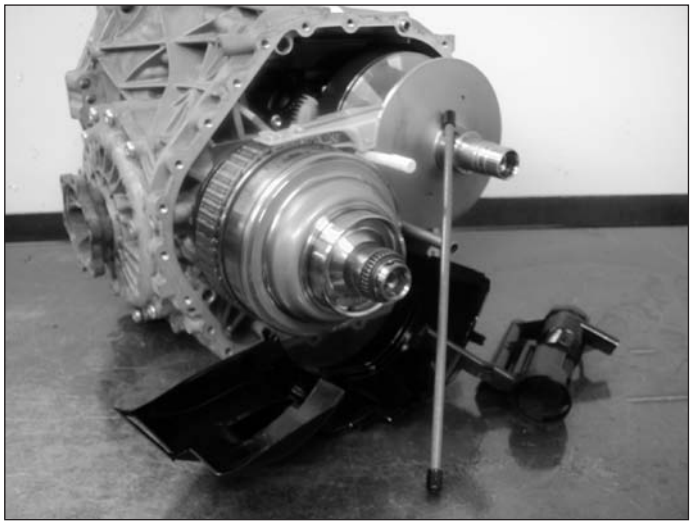


Figure 24

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

15. Remove 14 front cover retaining bolts using a # 45 torx and carefully remove the cover, forward clutch and planetary assembly from the case as seen in figures 25 and 26.

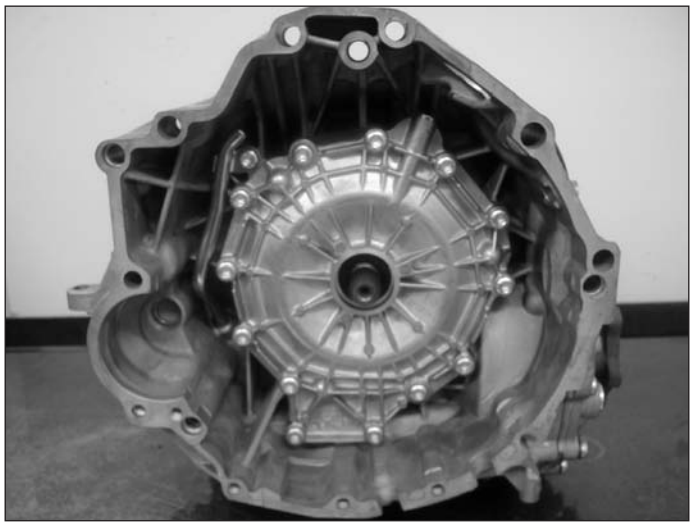


Figure 25

Figure 26

16. Remove the Forward Clutch Pressure Tube from the assembly and set aside (figures 27 and 28).

Figure 27

Figure 28

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

17. Remove the Reverse Clutch frictions, steels and seal from the converter case housing (figures 29 and 30).

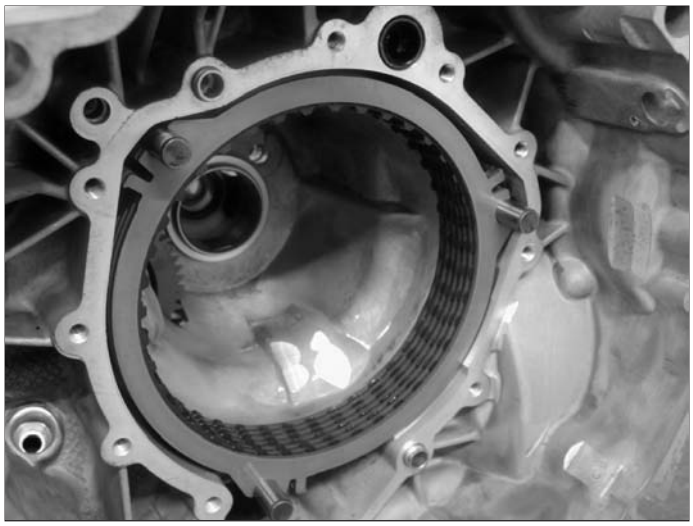


Figure 29

Figure 30

18. Remove the front seal to gains access to the Input Shaft retaining snap ring (figure 31).

19. With a suitable pair of Snap Ring plyers, carefully remove the Turbine Shaft snap ring (figure 32).

Figure 31

Figure 32

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

20. Using a press, carefully remove the forward clutch drum and planetary assembly from the Reverse Piston Front Cover assembly as seen in figures 33 and 34.

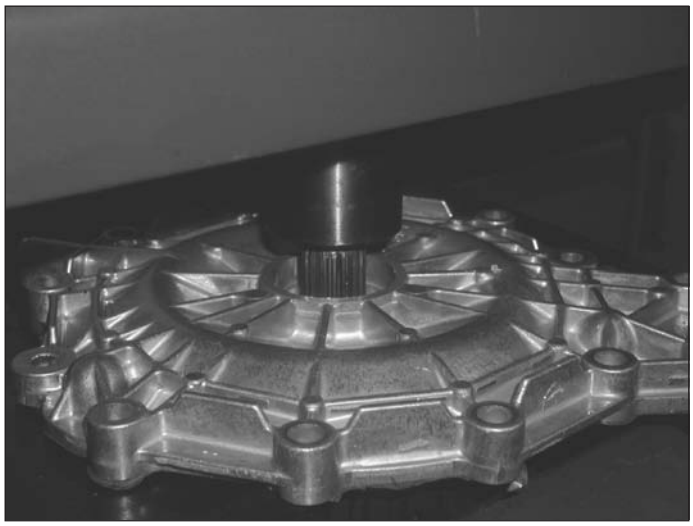


Figure 33

Figure 34

21. With a # 45 torx remove the front differential cover and assembly (figure 35).

22. Note the locations of the 3 bolts shown in figure 36 with sealing washers for proper reassembly.

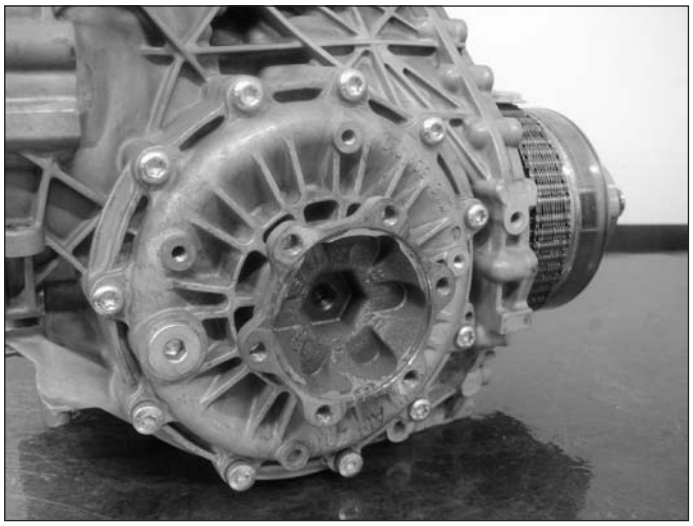


Figure 35

Figure 36

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

23. With the bolts removed carefully pry the assembly away from the case (figure 37).

24. Remove the spring loaded pivot pin from the cross shaft as seen in figure 38.

25. If the entrainment pump or the drive and driven pulley assembly needs to be removed for service, remove the pinion seal to expose the locking ring as seen in figures 39 and 40.

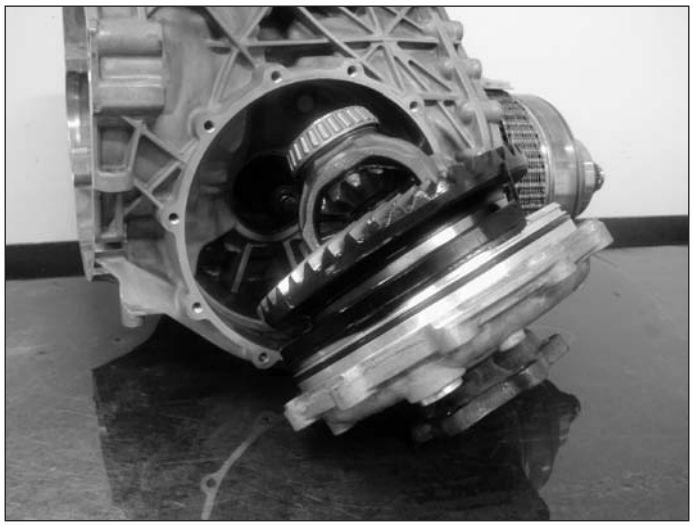


Figure 37

Figure 38

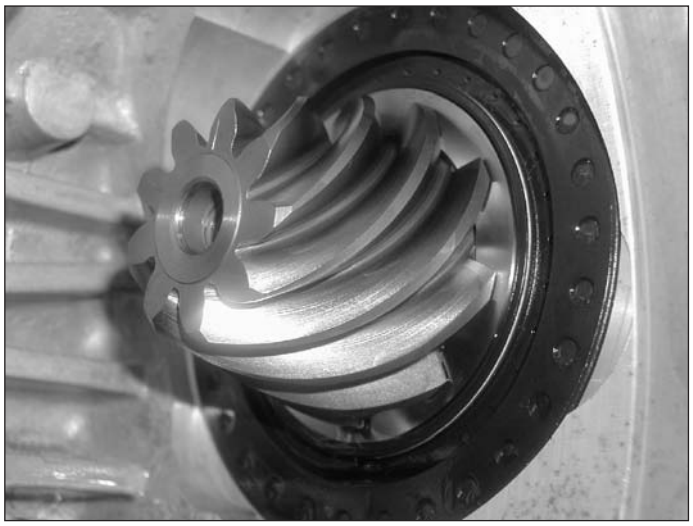


Figure 39

Figure 40

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

26. Carefully remove the outer retainer ring as seen in figure 41 exposing the main snap ring as seen in figure 42.

Figure 41

Figure 42

27. Carefully remove the main snap ring with a pair of suitable snap ring plyers (figure 43).

Figure 43

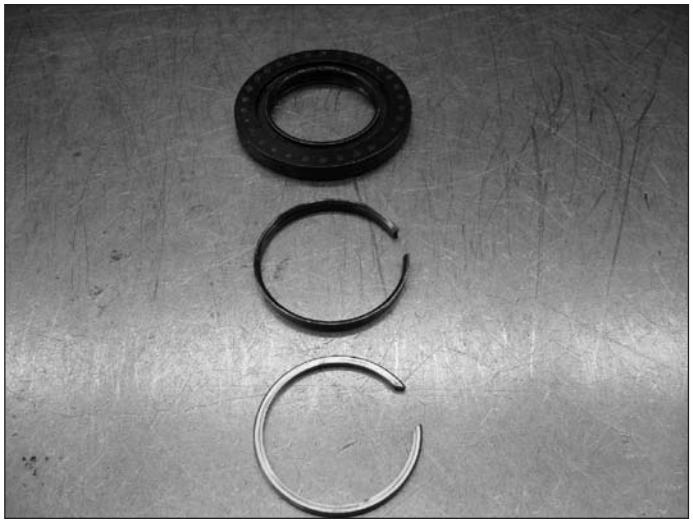


Figure 44

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

28. Install the brace into the differential and carefully introduce air into the push piston to remove the drive and driven pulley set from the case as seen in figures 45 to 47.

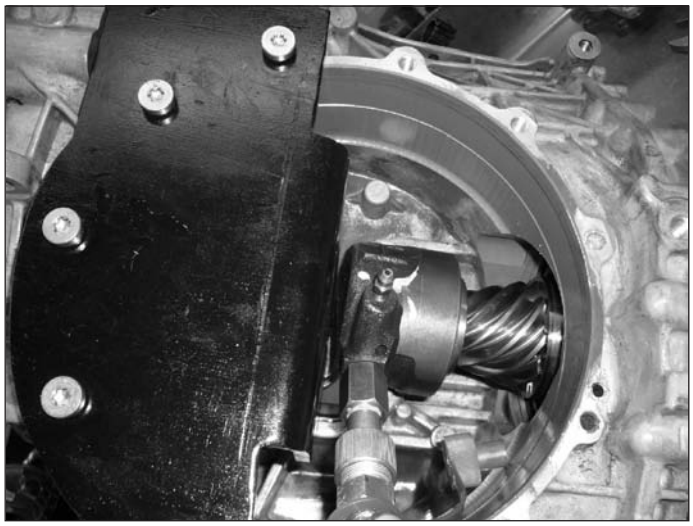


Figure 45

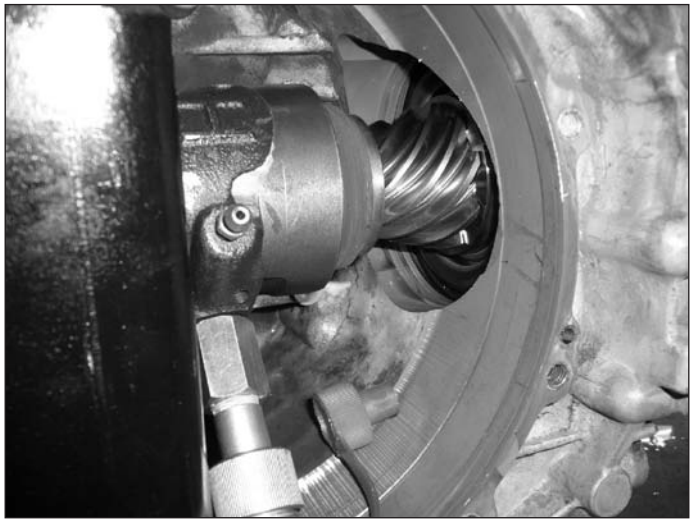


Figure 46

29. To install the pulley set, slide it into place and install the threaded rod into the pinon gear as seen in figure 48.

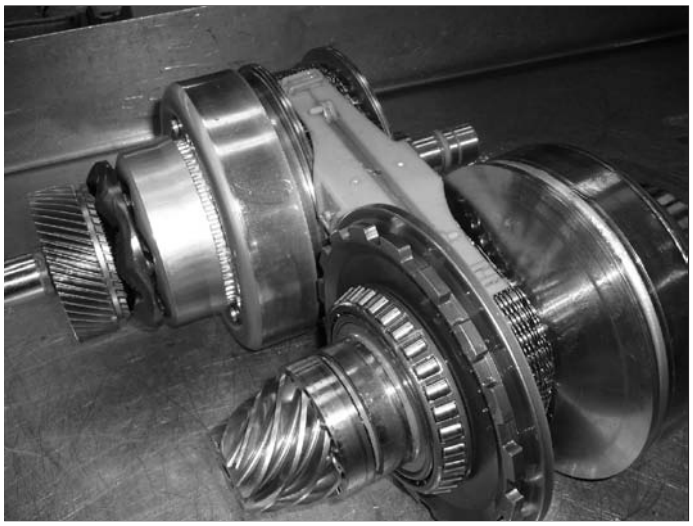


Figure 47

Figure 48

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

30. Install the sleeve over the threaded shaft (figure 49).

31. With a nut and wrench, carefully draw the shaft into place and install the snap ring and retainer (figure 50).

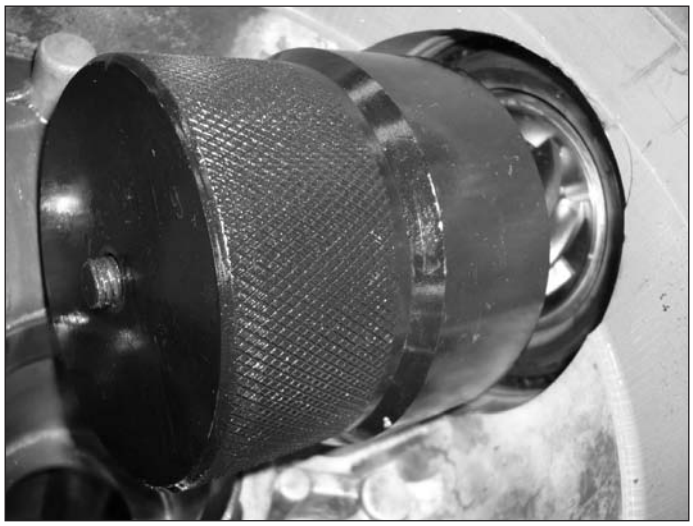


Figure 49

Figure 50

51. Install a new pinion seal (figure 51).

52. The special tool kit through AC will also allow for you to disassemble the drive and driven pulleys (figure 52).

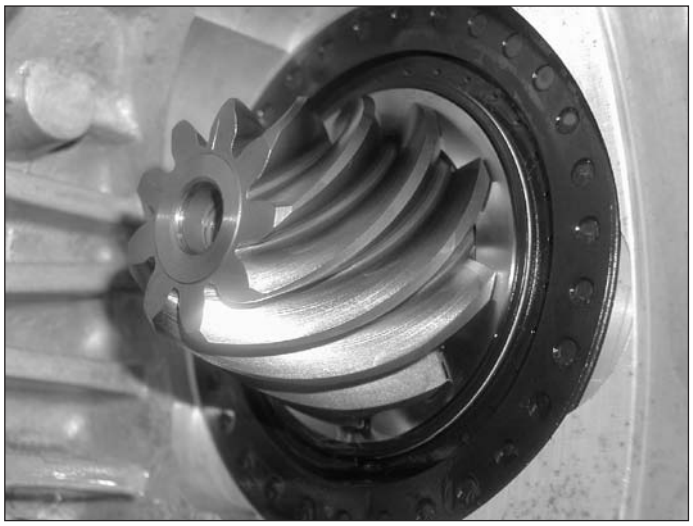


Figure 51

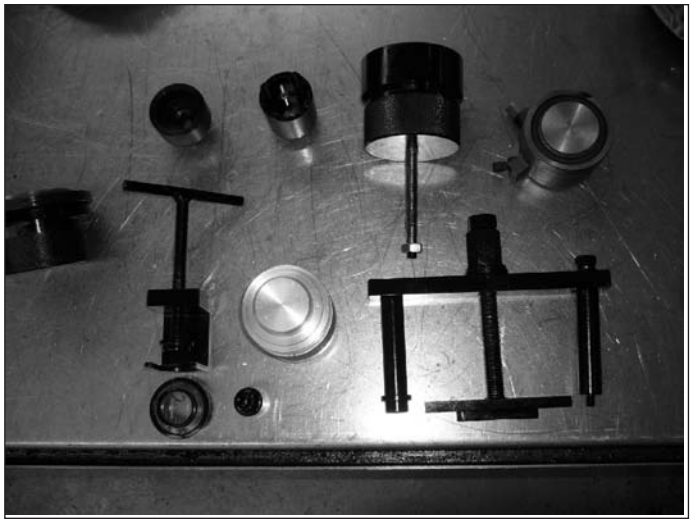


Figure 52

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

Forward Clutch

1. Using 2 screwdrivers, carefully lift the pressure plate with piston from the input shaft as seen in figures 1 and 2.

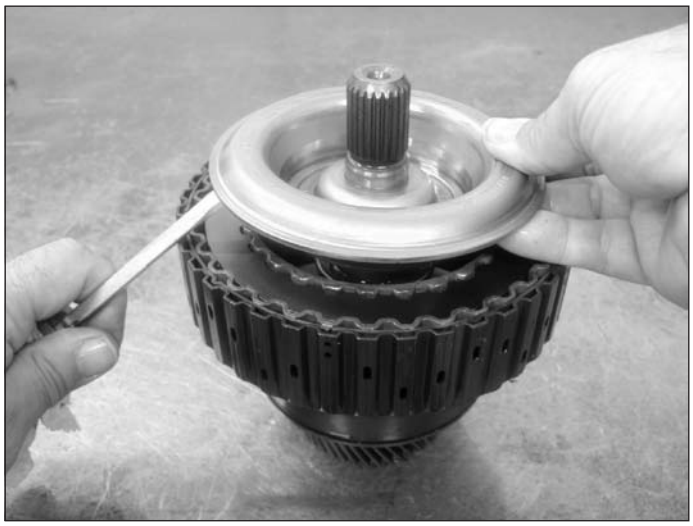


Figure 1

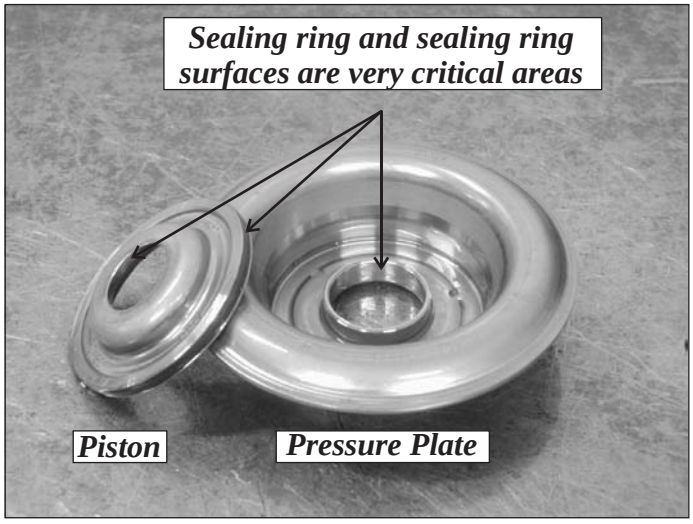


Figure 2

Special note:

Sealing ring and sealing ring surfaces shown in figure 2 are very critical areas. The slightest sign of damage such as scratching or scoring will require part replacement.

2. Remove the corrugated washer as seen in figure 3.

3. Remove the upper selective shim as seen in figure 4.

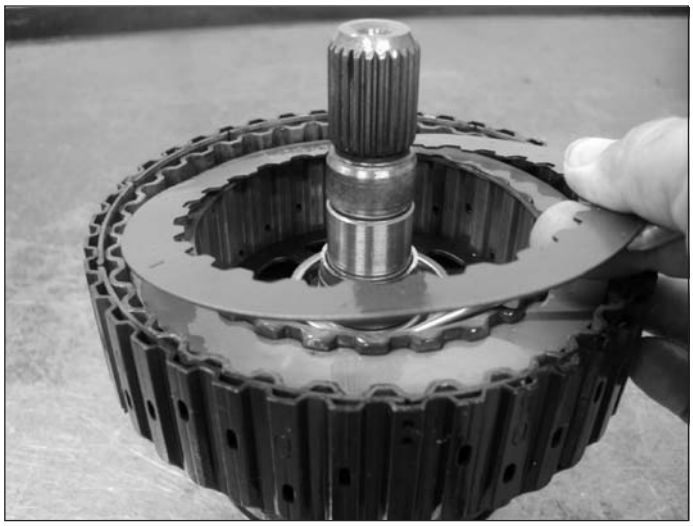


Figure 3

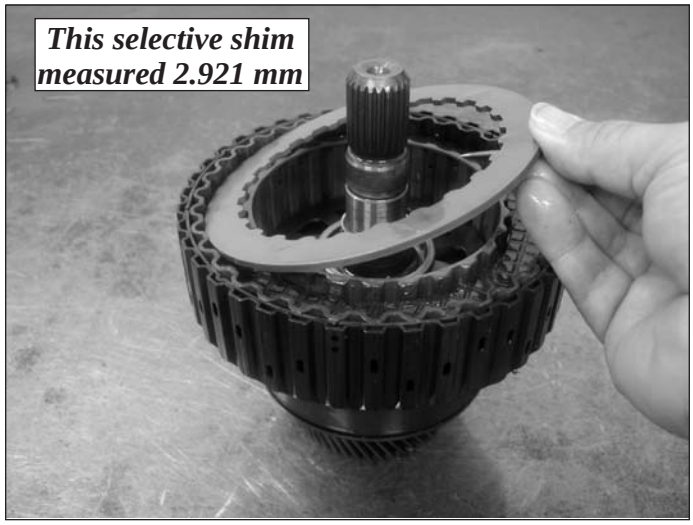


Figure 4

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

4. Remove the forward frictions and steels (figure 5).

5. Remove the lower selective shim (figure 6).

6. Inspect the inner forward clutch piston sealing ring for damage or wear. If replacement is required, it must be replaced with the inside o'ring located under the sealing ring (see figures 7 and 8).

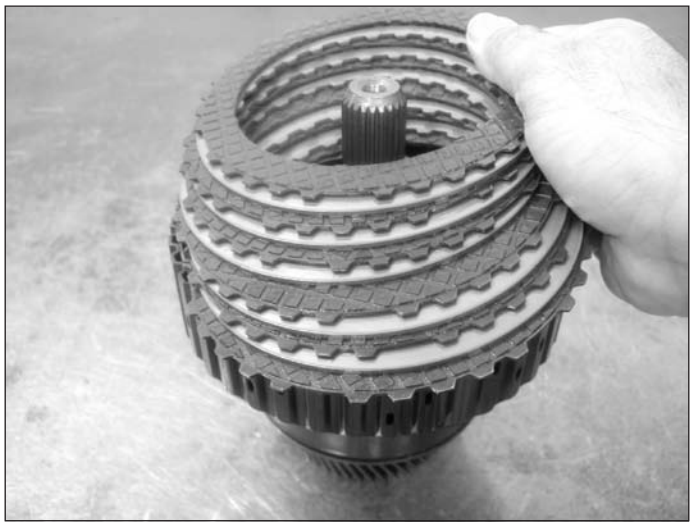


Figure 5

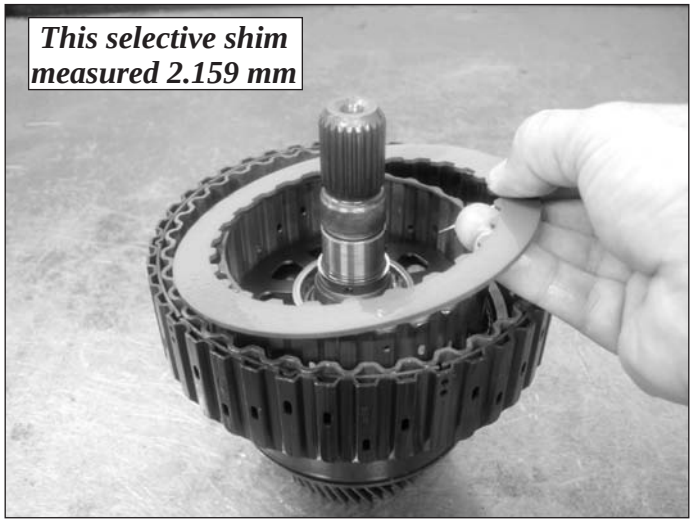


Figure 6

Figure 7

Figure 8

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

7. Using a suitable spring compression tool, compress the diaphragm return spring and remove the snap ring, retainers and the diaphragm return spring as seen in figures 9 and 10.

Figure 9

Figure 10

8. Remove round retainer ring and tin plate as seen in figures 11 and 12. There is nothing serviceable under the tin plate. The removal of this plate will accommodate proper cleaning of the planetary assembly.

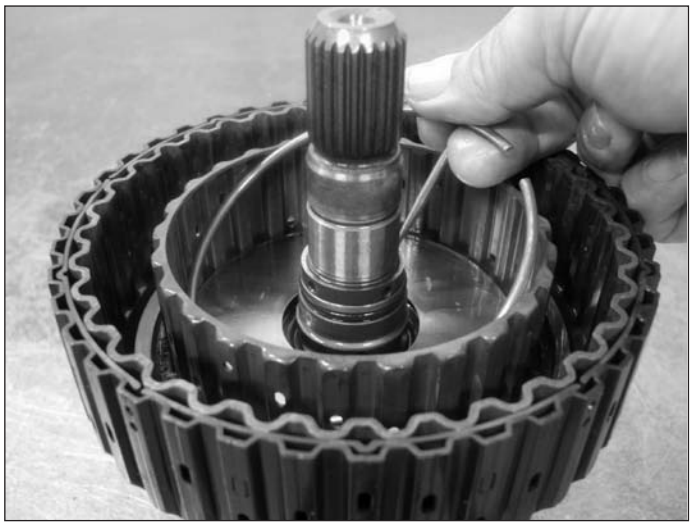


Figure 11

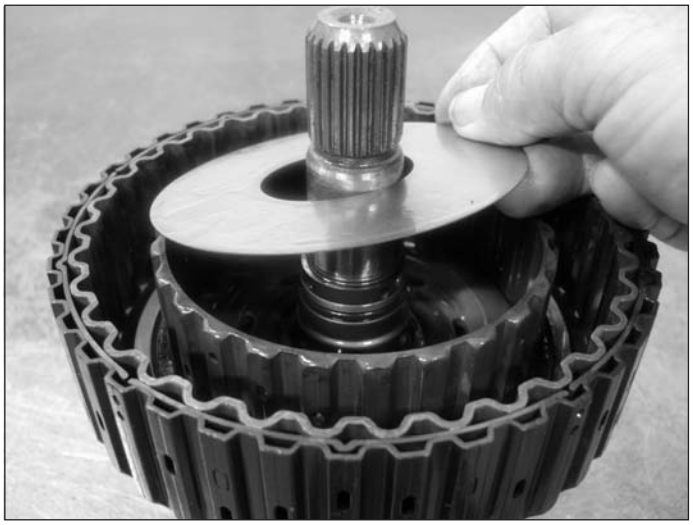


Figure 12

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

NOTE: The following disassembly is not required unless the plastic support rings and washer need to be replaced or intense cleaning is required.

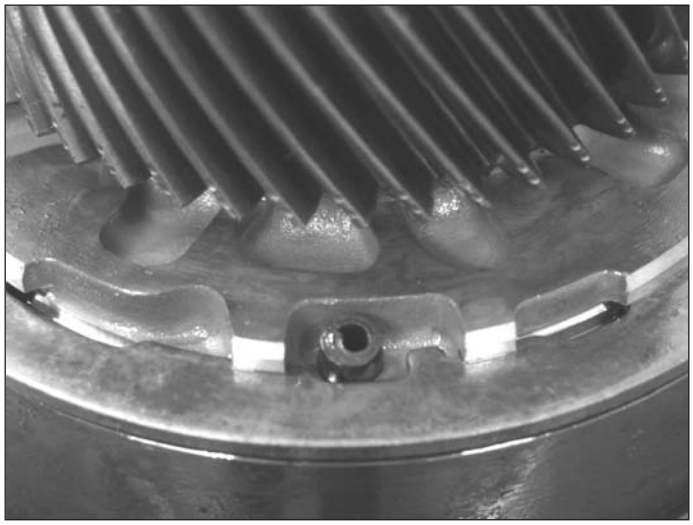


Figure 13

Figure 14

9. Drive the roll pin flush and rotate the bronze washer so tabs are clear from carrier and lift the washer off (see figures 13 and 14). Once removed, there will be sufficient room to use an extractor tool for roll pin removal.

10. Carefully lift the internal ring gear shell from the planetary assembly and remove the washer as seen in figures 15 and 16. The pinion gears can also be inspected looking for washer wear and roughness on their rotating pins.

Figure 15

Figure 16

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

11. Replace the plastic support rings as necessary and reassemble the forward drum in the reverse sequence (figure 17) noting the following critical points.

12. Once the forward clutch is re-assembled, a suitable tool or part number VW 416b must be used to pushdown on the pressure plate by a second technician as seen in figure 18.

13. Using part number T40102 or equivalent .058" feeler gauges, move the two feeler gauges back and forth in a circle beneath the pressure as the arrows in figure 18 illustrates.

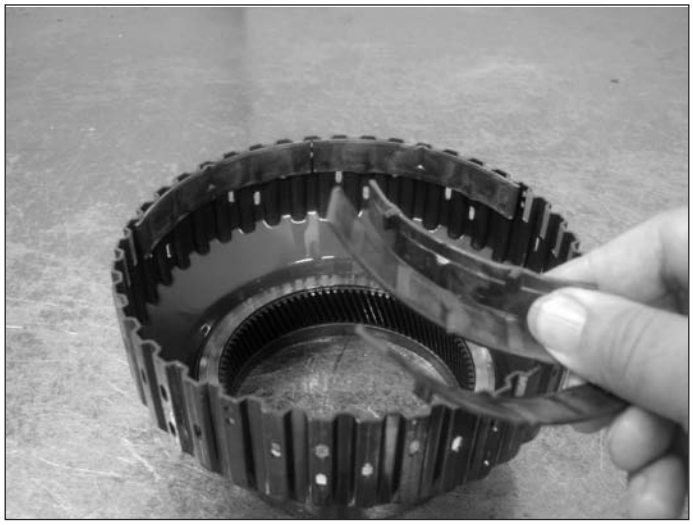


Figure 17

The entire circular area needs to be inspected. The two feeler gauges MUST always move freely without any resistance whatsoever. If the gauges can not freely move around the pressure plate the forward clutch stack up will need to be adjusted by changing the selected shims shown in figures 4 and 6.

It is essential to obtain a successful 0.058" even clearance all the way around the pressure plate otherwise problems will be encountered when driving off from a standstill.

Originally there was an update that changed the forward clutch stack up from 6 friction plates to 7 friction trapezoid design plates. The part number for this repair kit was ZAW 398 001 which was to be accompanied with a TCM re-flash using CD ROM part number 8E0 906 961J.

At the time of this printing, these parts are no longer made available. What is available is the entire front cover, planetary and drum assembly already to go. This can only be purchased with the use of a Vehicle Identification Number.

When the unit is assembled, a factory re-flash procedure must be performed.

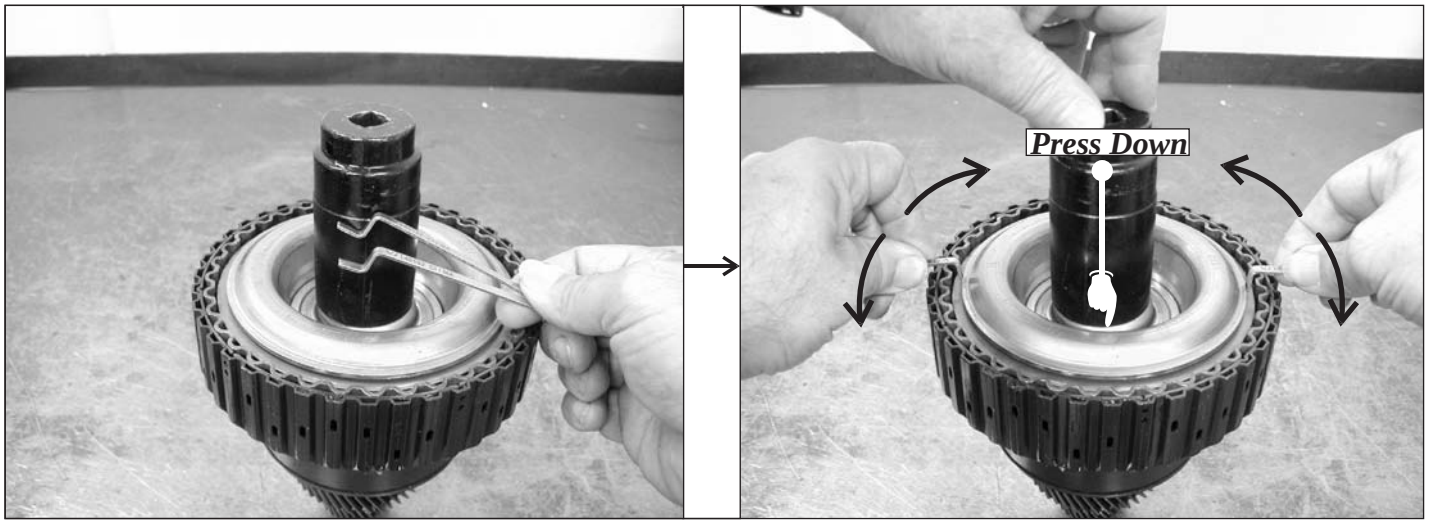


Figure 18

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

14. Inspect the seals at both ends of the Forward Clutch pressure tube (figure 19). These are critical points in the forward clutch circuit making it essential that they seal properly. The o ring end of the tube sits into the forward drum planetary assembly as seen in figure 20.

Figure 19

Figure 20

15. The split sealing ring end of the pressure tube seals inside the plastic entrainment pump plumbing. The clad seal in the case seals against a shoulder on the forward drum planetary assembly (figures 20 and 21). Both are critical sealing points for the forward clutch.

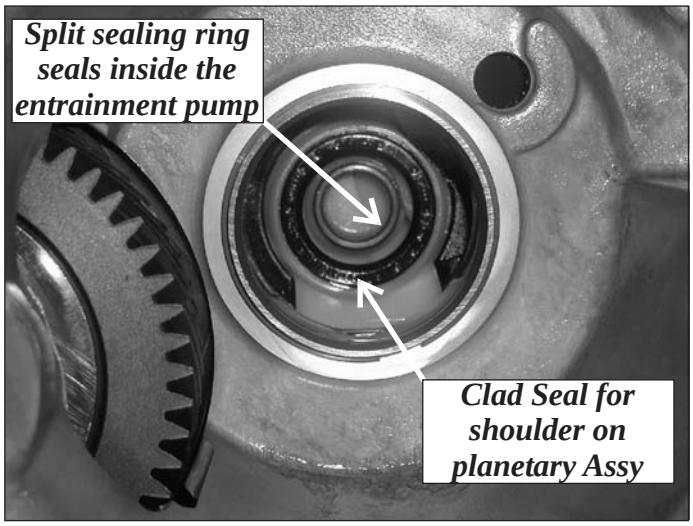


Figure 21

Figure 22

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

16. Inspect the molded reverse clutch piston and replace as necessary and reassemble (figures 22-24).

Figure 23

Figure 24

17. Install the reverse pressure seal with the lip of the seal facing the cover (see figure 25). Install the reverse clutch pack assembly into the case starting with the wavy plate first, then steel, friction steel, friction ending with the thick apply plate as seen in figure 25.

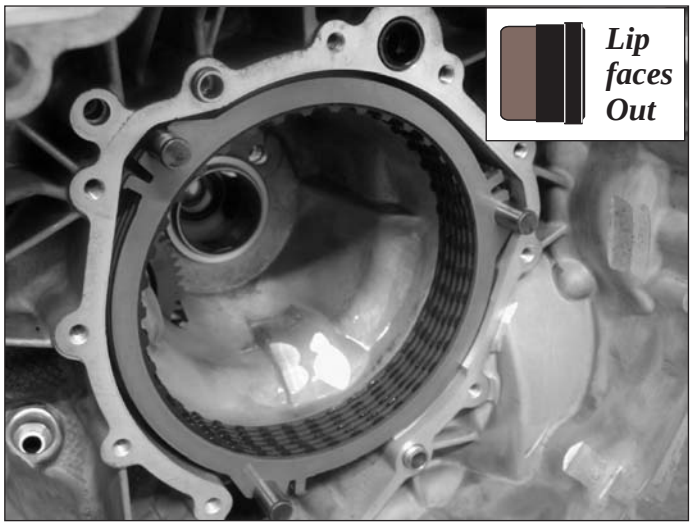


Figure 25

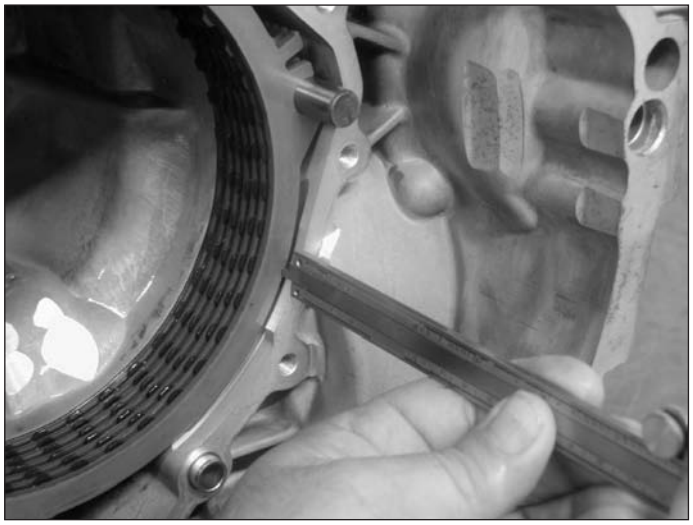


Figure 26

18. While compressing the clutch pack by hand measure the distance to the edge of the case as seen in figure 26. This transmission measured 5.969mm (0.235”).

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

19. The distance from the cover face to the apply plate fingers measure approximately 4.699mm (0.185”). When this figure is subtracted from 5.969 (0.235”) the reverse clutch clearance with this transmission is determined to be at 1.27mm (0.050”).

Figure 27

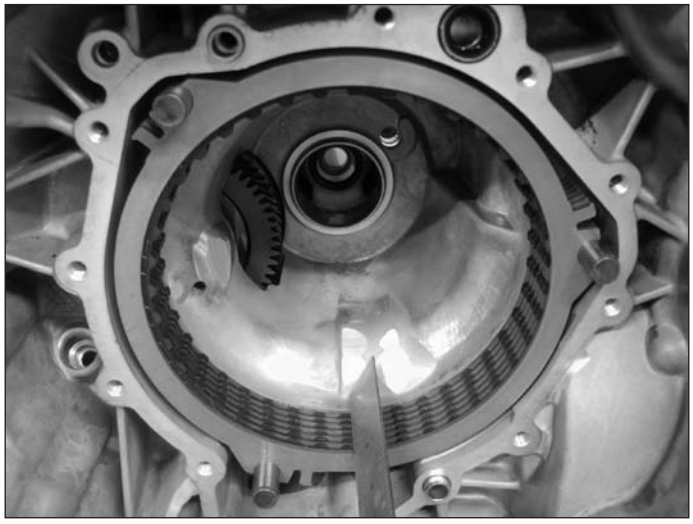


Figure 28

20.Align all the reverse clutch frictions with a straight edge so that all the teeth are exactly aligned (figure 28).

21.With factory tool T40050 or equivalent install the forward clutch assembly into the reverse clutches. Rotate the input shaft slightly in both directions until all the clutch plates have been engaged. Once the reverse frictions are all indexed, with a slight lift on the input shaft rotate the shaft counterclockwise so that it engages in the teeth of the helical intermediate gear.

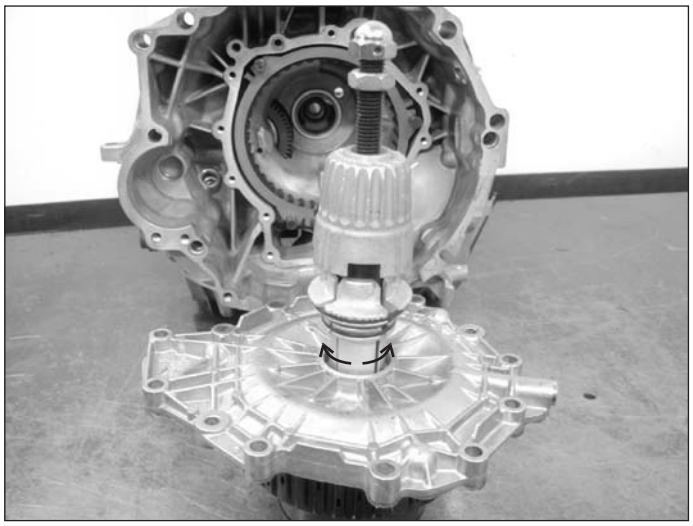


Figure 29

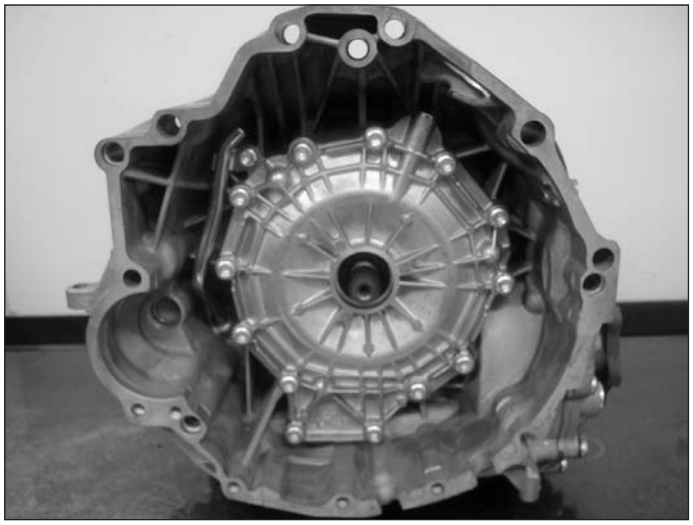


Figure 30

Once the assembly is fully installed and the cover is seated on the dowels, tighten the cover bolts to 23 Nm (see figures 29 and 30).

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

22. Using figures 31 through 34, install the reverse pressure tube and baffling.

Note: Do not install the Park Rod at this time as it will not pass through the access hole in the case cover.

Figure 31

Figure 33

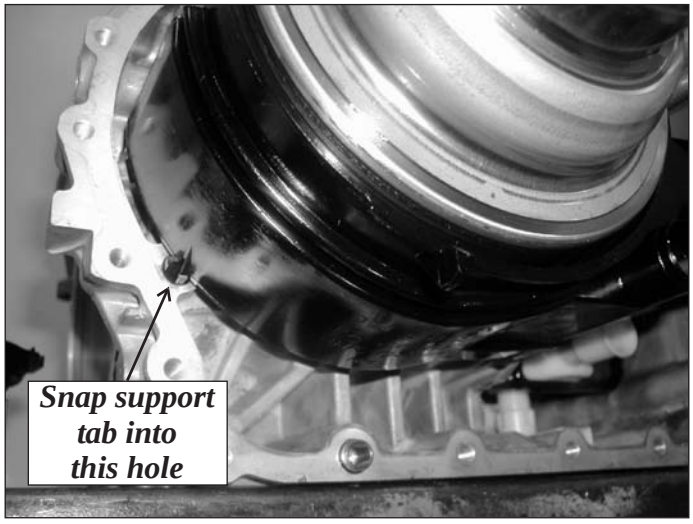


Figure 32

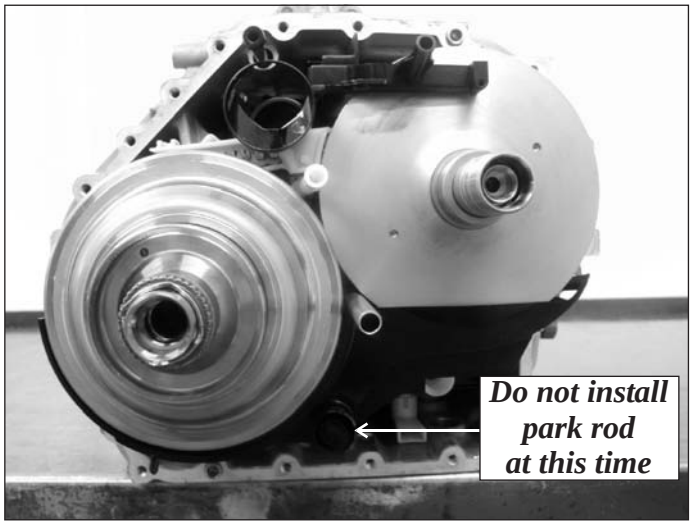


Figure 34

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

23. Place the inner shim on the primary pulley shaft (figure 35), ***connect the park rod*** into the manual arm shaft and install the case cover.

Figure 35

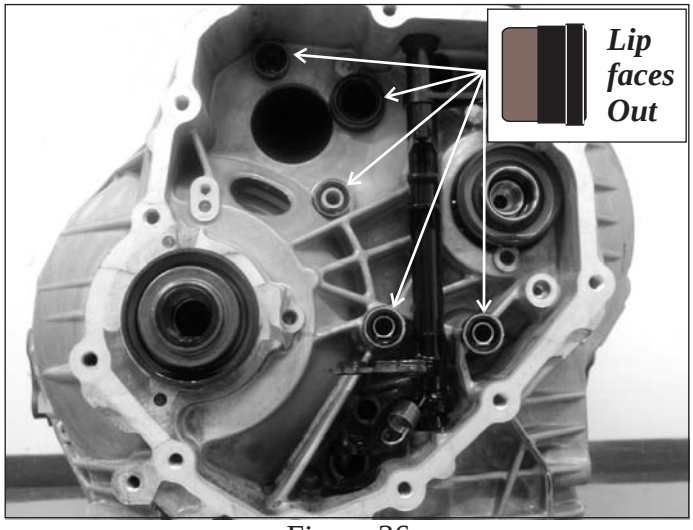


Figure 36

24. Install the outer shim and snap ring on the primary pulley shaft (refer back to figures 16 and 15 on page 4).

25. Carefully install the sensor rings and all seals with the lip end facing out as seen if figure 36.

26. Clip the manual valve into the securing spring on the valve body as seen in figure 3

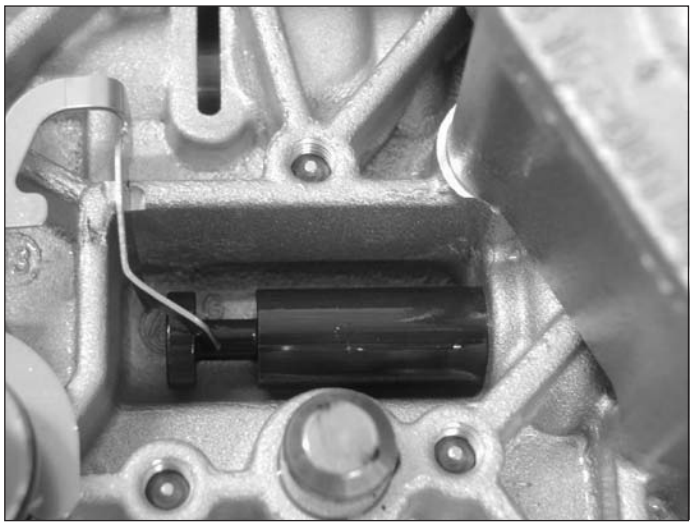


Figure 37

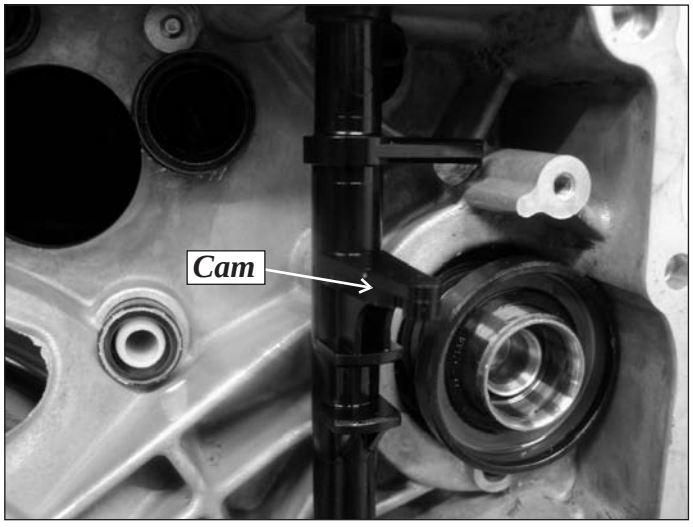


Figure 38

27. Rotate manual arm shaft so that the shift cam which indexes with the manual valve is almost vertical with a slight inclination to the right (figure 38)

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

28. Both the secondary pulley shaft oil collar (figure 39) and the manual valve must be aligned when installing the valve body. Once installed verify that the manual valve is moving by repeatedly rotating the linkage shaft and watching the back end of the manual

Figure 39

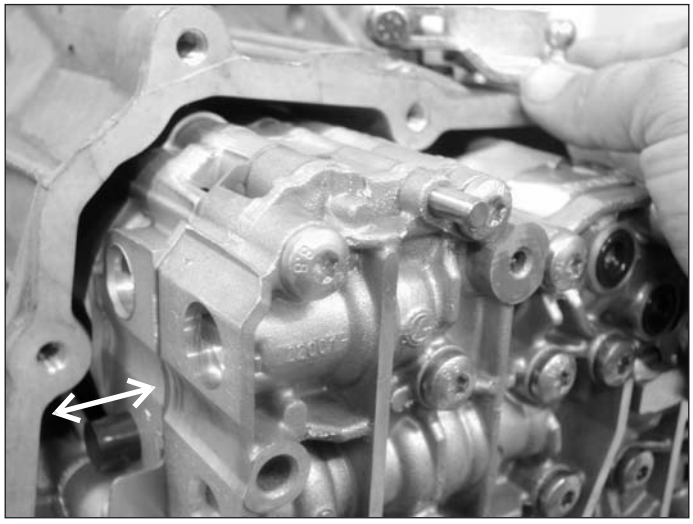


Figure 40

to see if the manual valve is moving in and out of the bore (see figure 40).

29. Attach the spring around the base of the manual arm shaft and install the detent lever and roller into the valve body (figure 41).

30. Attach the spring to the bottom of lever (figure 42).

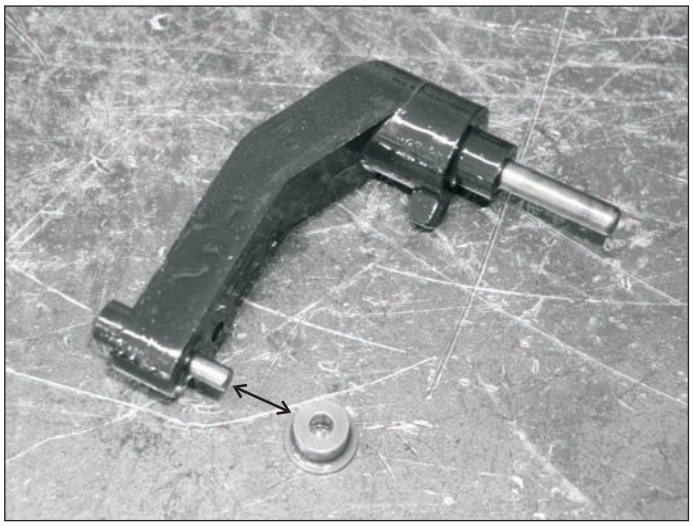


Figure 41

Figure 42

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

31. Ensure both pressure switch o-rings are in place and tighten the three 10 mm valve body bolts to 10 Nm (figure 43).

32. Install the TCM tightening the three # 30 torx attaching bolts to 10 Nm also (figure 44).

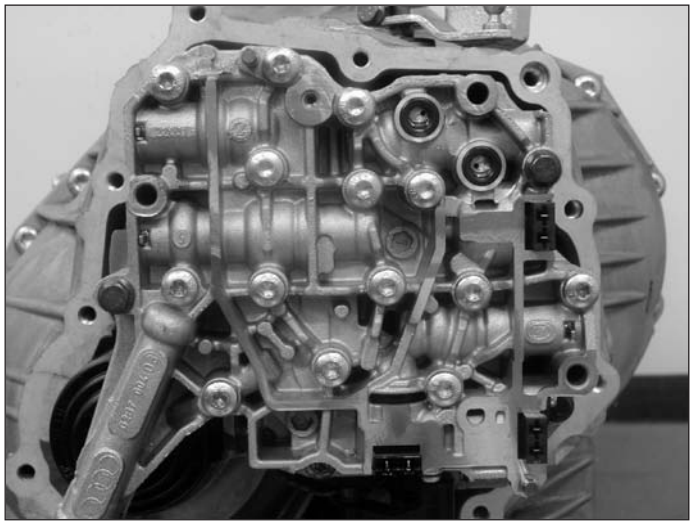


Figure 43

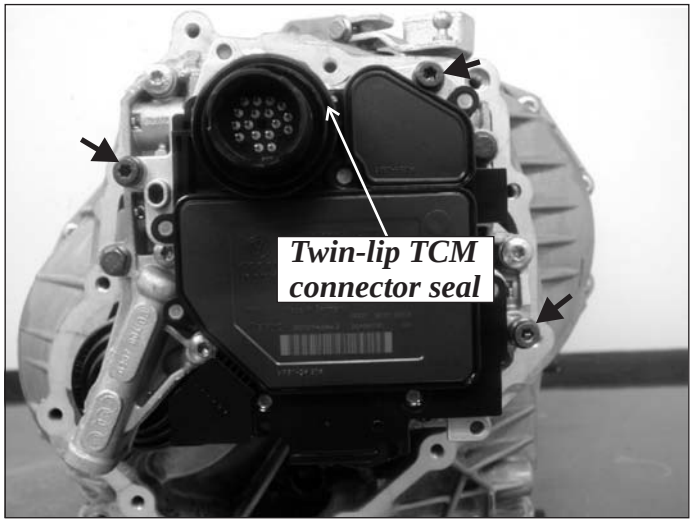


Figure 44

33. Install a new twin-lip TCM connector seal with the twin-lips facing the cover (figure 44). Care must be taken that these lips do not fold down when the cover is fitted onto the case (figure 46).

34. Install new gasket (figure 45).

35. Install new cover bolts and tighten to 15 Nm plus an additional 90° turn more (figure 46). ***Note the location of the one bolt with an oil sealing washer.***

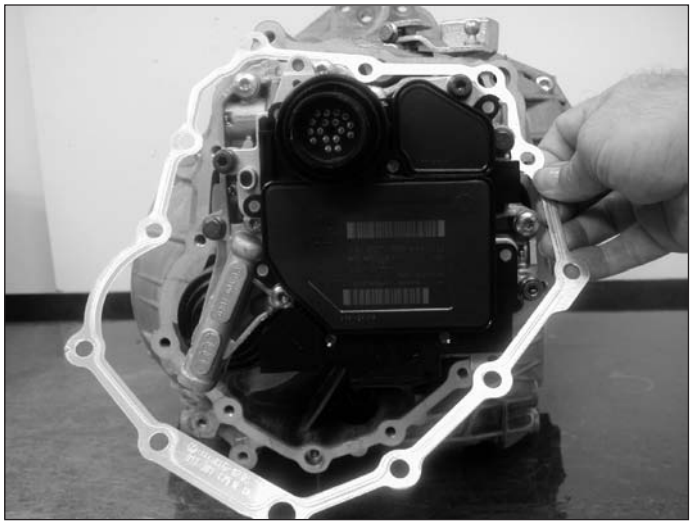


Figure 45

Figure 46

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

Adapt TCM and Fluid Fill Adapt

Using a suitable fill pump device, fill the transmission with VAS 5162 Audi CVT fluid (part # G 052 180 A2 for 1 liter) through the fill hole shown in figure 1 until fluid begins to overflow (approximately 7.5 to 8 liters). Engage the transmission with the wheels off the ground and top off the fluid before placing the vehicle on the ground for a road test.

Once the vehicle is prepared to be driven, an Adapt the TCM procedure must be performed. This should always be done anytime transmission work is performed or if the battery has been disconnected for any great length of time. If a 6 to 7 forward clutch friction update was performed, the TCM must receive a factory re-flash. All other work, the Adapt procedure is as follows:

1. The transmission fluid must be at 145° F (65°C) or warmer before the procedure can be properly performed.

2. Find a suitable road clear of traffic where the vehicle can be driven and stopped several times.

3. Place the selector lever into drive and drive forward at part load for approximately 70 feet (20 meters), then apply the brake coming to a complete stop. Continue to depress the brake pedal for approximately 10 more seconds with the selector lever still in Drive.

4. Shift the selector lever into reverse with the brake pedal depressed.

5. Release the brake and drive backwards at part load for approximately 70 feet (20 meters), then apply the brake coming to a complete stop. Continue to depress the brake pedal for approximately 10 more seconds with the selector lever still in Reverse.

6. Repeat this procedure (alternating between "D" and "R") five times.

Once these steps have been performed, the vehicle is prepared for a typical road test.

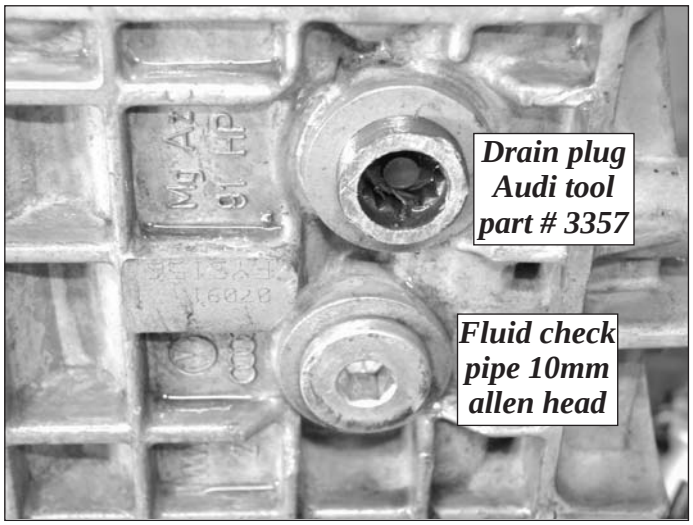


Figure 1

If the transmission does not operate at 100% efficiency check for bulletins regarding TCM re-flashing as there are several related to different engagements and shift complaints. Such as a bulletin Group 01 Number 03-10 issued 10/2/03 for a jerk in reverse when idling or bucking when accelerating from a standstill Group 01 Number 06-10 issued 1/27/06 (includes update from a 6 friction forward pack to a seven friction forward pack).

Fluid Change Only

Should a vehicle come in for a fluid service only, the following procedures must be performed:

1. Inspect the transmission fluid level though the check pipe located at the bottom of the transmission. It has a 10 mm allen head plug (figure1). If the transmission is full, some fluid should spill out. Fill with CVT fluid VAS 5162 as needed.

2. Have all 4 wheels off the ground (a minimum of at least 8 inches) and check to see that each wheel rotates freely by hand.

3. Observe the Tiptronic indicator and shift from 1st to top gear accelerating moderately after each shift never exceeding 35 mph.

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

4. Shift the transmission back down to first gear.

5. Carefully apply the brake until the wheels come to a stop.

6. With the brake applied, place the transmission into reverse.

7. Release the brake and moderately depress the accelerator to a reverse gear speed of 12 mph.

8. Carefully apply the brake until the wheels come to a stop.

9. Return the selector lever to Drive and repeat steps 2 through 8 five more times.

10. When completed place the selector lever into park and turn off the vehicle.

11. Change the transmission fluid. The drain plug is along side the check plug and can be removed with Audi key number 3357. Fill the transmission through the check plug using a suitable fill device with CVT fluid VAS 5162 (4.5 to 5 liters).

12. Repeat steps 2 through 9. Once completed, place the vehicle on the ground and road test.

Differential

The front differential in the transmission receives approximately 1.3 liters of SAE75 W90 synthetic fluid and is filled through the check plug as seen in figure 2.

The vehicle must be driven to heat the gear oil to approximately 60°C.

Allow the vehicle to sit for 5 minutes giving the gear oil time to settle.

Remove the plug and using a piece of wire, the fluid level must be approximately 8.5mm below the fill hole. Top off as necessary and tighten plug to 20 Nm.

It is recommended that a new plug replace the old.

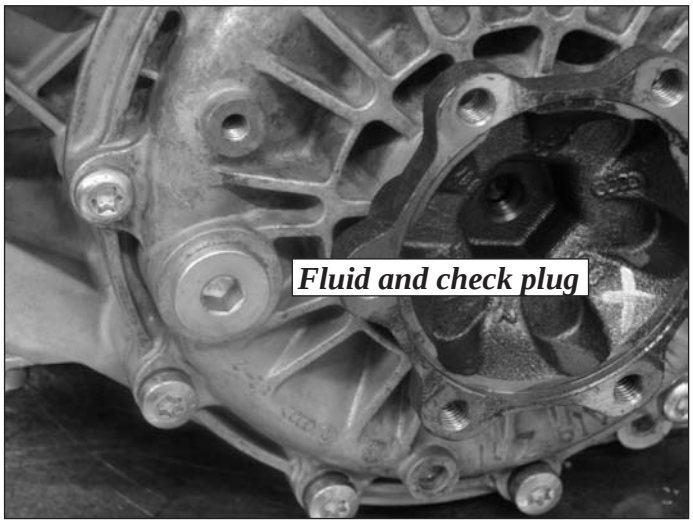


Figure 2

It is very common to find differentials overheated and destroyed as a result of low levels. It seems that the baffling around the differential (figure 3) makes it difficult to get an accurate reading. Of course Audi's awkward procedure for checking the gear oil level doesn't help any either.

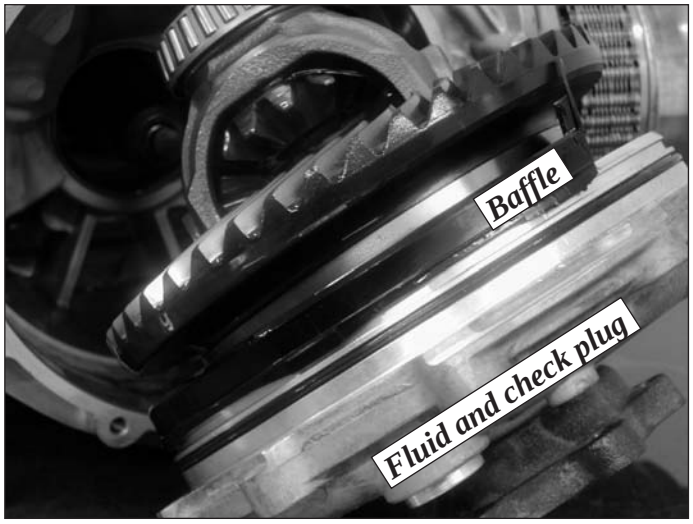


Figure 3

This particular transmission being used for this handout had beginning signs of failure. The ring gear was slightly overheated, the baffle in the cover was deteriorating and the differential side gears would not spin by hand at all.

01J BASIC DISASSEMBLY AND REASSEMBLY
PRELIMINARY INFORMATION

A close look at figures 4 and 5 reveal how the plastic washers under the gears have split and are walking out of place jamming gear rotation. This differential will need to be repaired or replaced.

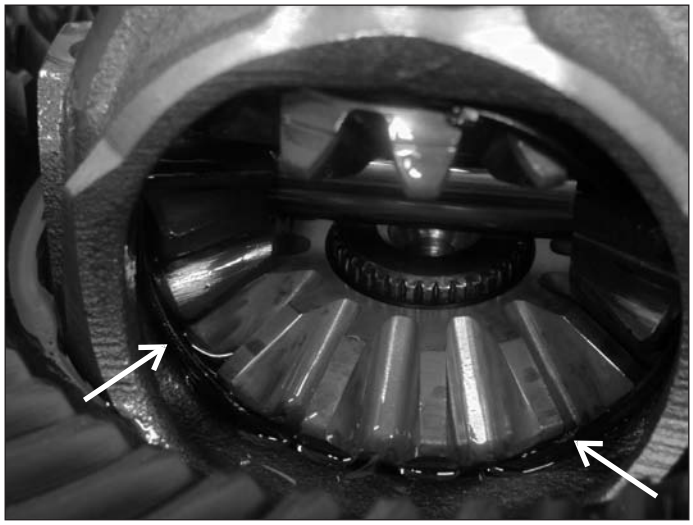


Figure 4

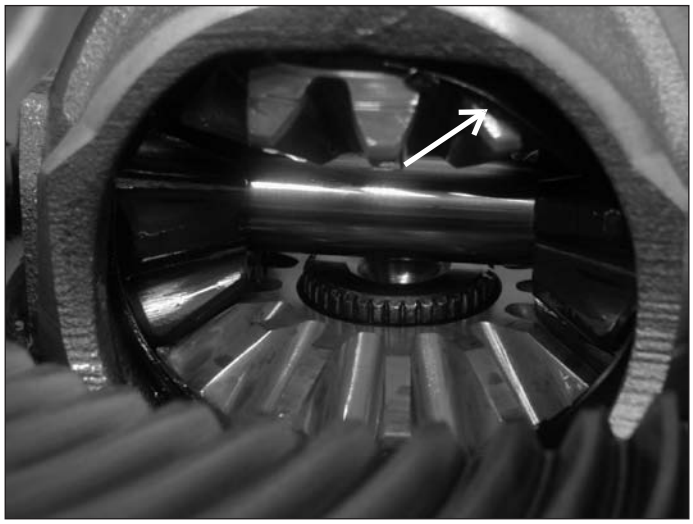
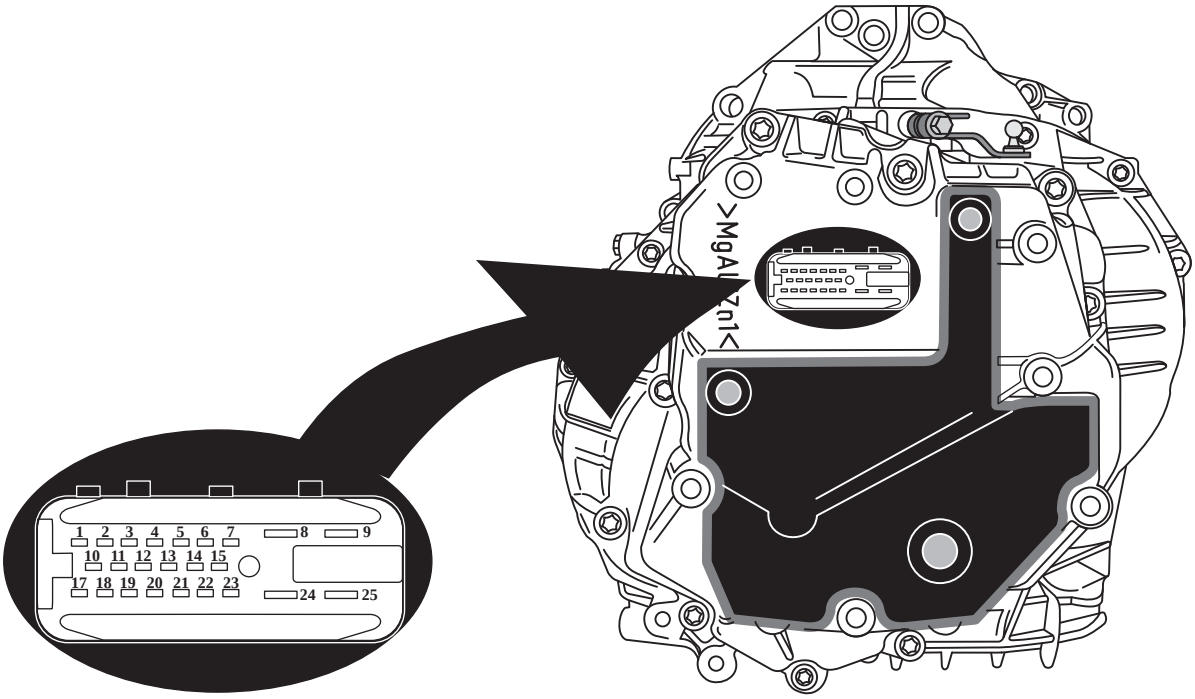


Figure 5

EARLY TCM CONNECTOR LOCATION & TERMINAL FUNCTIONS



The Transmission Control Module J217
25 pin compact connector

Two terminals are used in the TCM's 25 pin compact connector to connect to the CAN bus network system known as the Drivetrain CAN Bus Low and Drivetrain CAN Bus High. Hard wired directly into the 25 pin connector is an Engine Speed Signal on terminal 15. The hard input is the priority line for engine RPM data. It is a key parameter for the slip control feature of the forward and reverse clutch. The Engine RPM data that the TCM receives over the CAN bus is a redundancy (back-up) signal.

Terminals 12 (upshift), 13(recognition) and 14 (downshift) are inputs to the TCM from the Tiptronic Console Shifter.

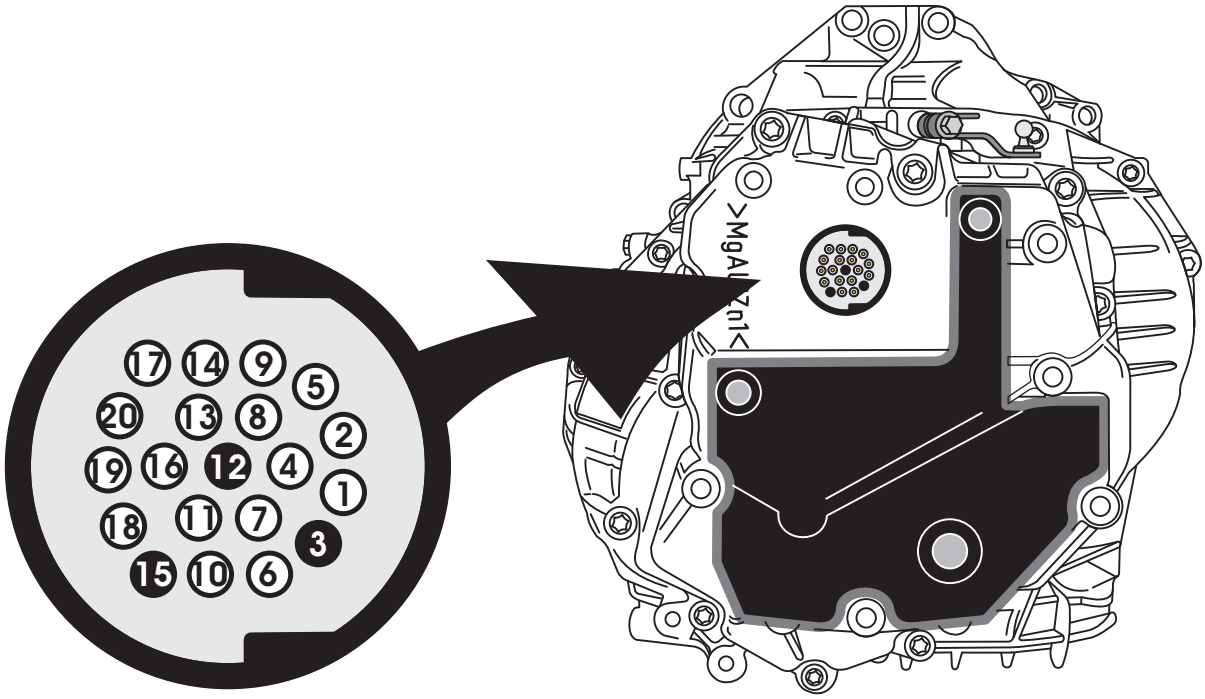
Pin 6 is a shift indicator signal sent out by the TCM
Pin 5 is a vehicle speed signal sent out by the TCM
Pin 2 is the diagnosis and programing interface wire

These specific data signals are also sent into the CAN bus network system from the TCM.

Other connections to the TCM's 25 pin compact connector are power and grounds, the Park/Neutral Position Relay, the Shift Lock Solenoid

Figure 1

LATE TCM CONNECTOR LOCATION & TERMINAL FUNCTIONS



The Transmission Control Module J217
20 pin compact connector

Two terminals are used in the TCM's 20 pin compact connector to connect to the CAN bus network system known as the Drivetrain CAN Bus Low (T17) and Drivetrain CAN Bus High (T14).

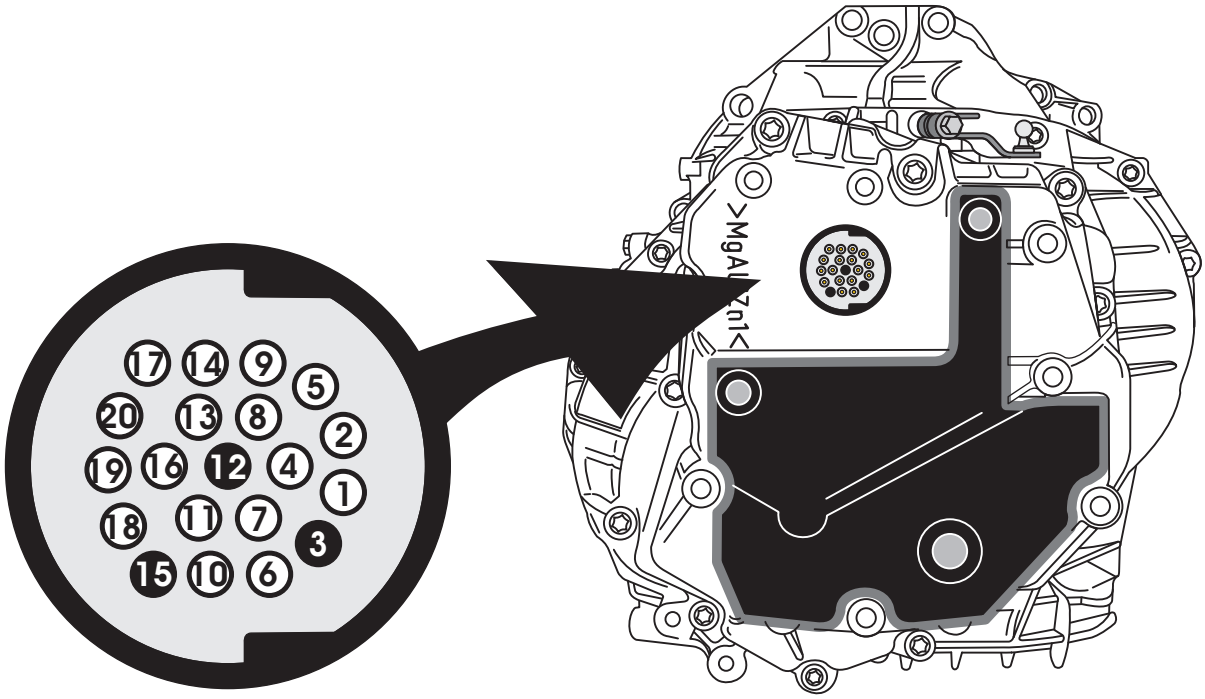
Hard wired directly into the 20 pin connector is an Engine Speed Signal on terminal 18 (varies - check wiring diagram). The hard input is the priority line for engine RPM data. It is a key parameter for the slip control feature of the forward and reverse clutch. The Engine RPM data that the TCM receives over the CAN bus is a redundancy (back-up) signal. Terminal 6 is the K line to the DLC.

Terminals 13, 19 and 20 are inputs to the TCM from the Tiptronic Console Shifter.

Terminal 5 is connected to the Shift Lock Solenoid
Terminals 4 and 7 connect to the PNP Relay
Terminals 9 and 10 are power
Terminal 8 is ground

Figure 2

LATE TCM TYPICAL WIRING DIAGRAM



The Transmission Control Module J217
20 pin compact connector

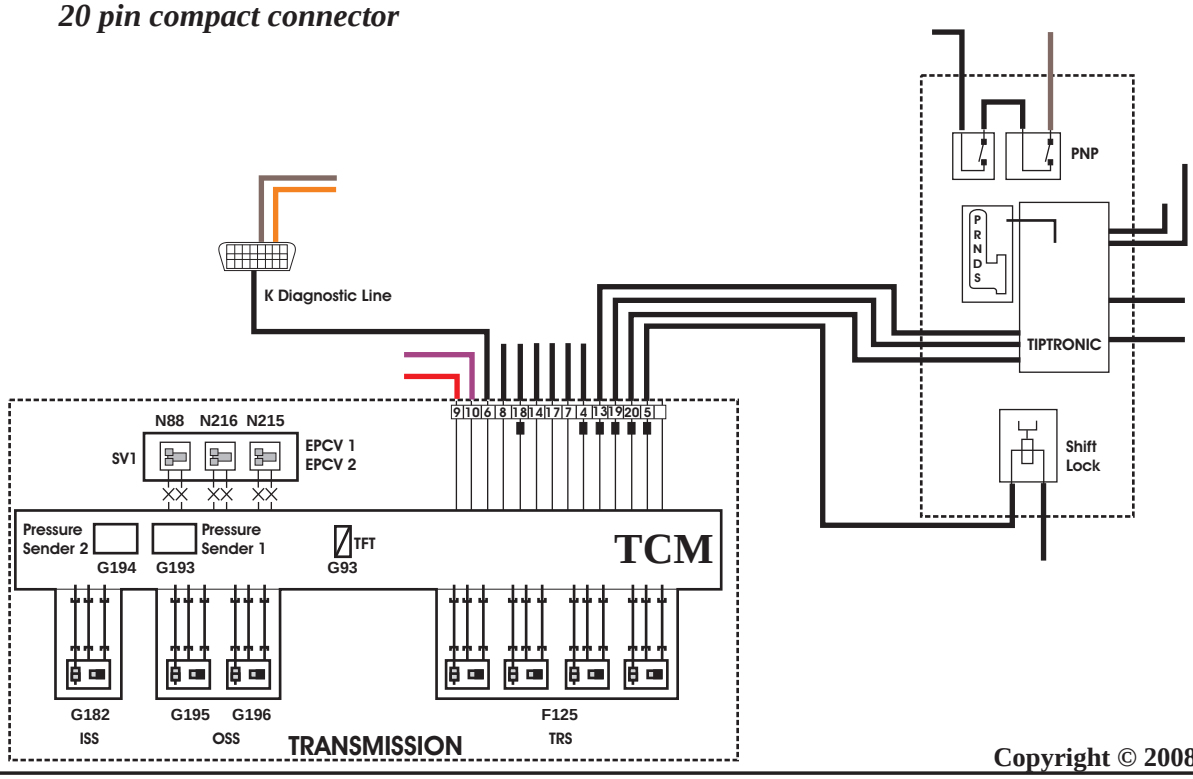
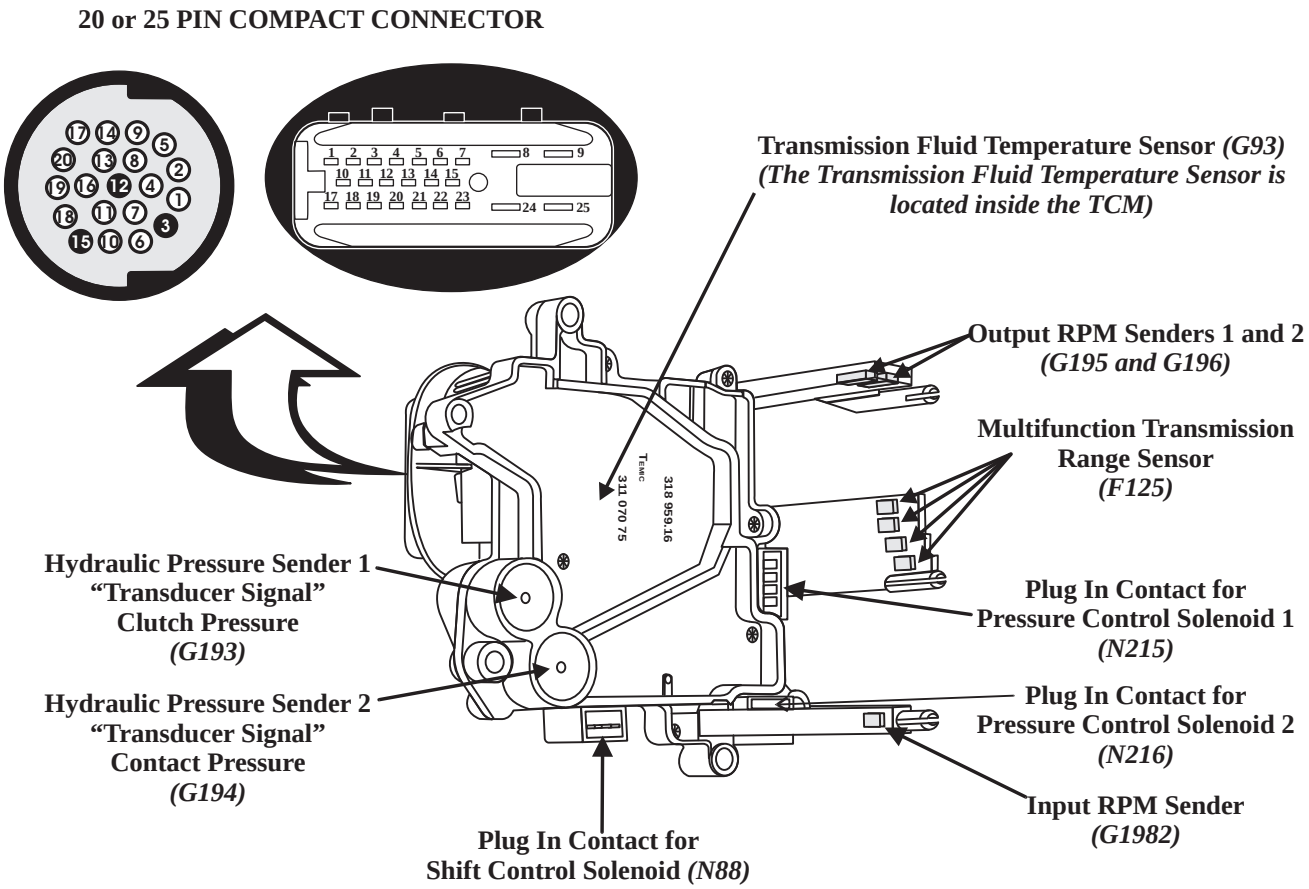


Figure 3

MULTITRONIC ® TCM COMPONENT IDENTIFICATION



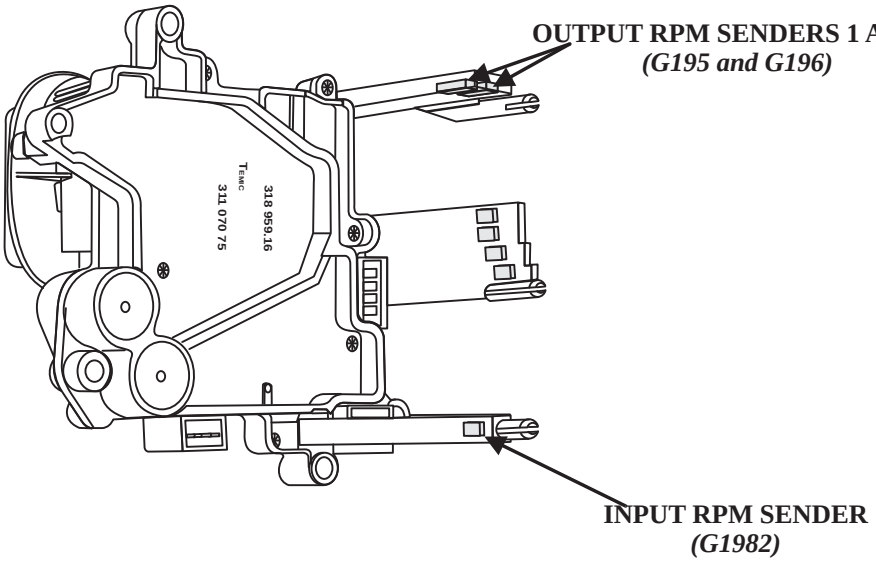
Located inside the Multitronic® unit is the ***Transmission Control Module (TCM)***. Incorporated into the TCM are two hydraulic pressure transducers. Also incorporated into the unit are Hall Effect Sensors used for RPM readings and manual valve selection. The TCM uses robust plug-in gooseneck connectors to snap into the three solenoids that are fitted into the valve body housing. This special electrical feature of the TCM being integrated into the transmission eliminates the need for wiring. This allows the unit to be impervious to electromagnetic interference and with the Hall Effect sensors being free of mechanical wear, the durability and reliability of the TCM's system increases significantly.

As a result of this integrated system, testing of the solenoids and RPM signals can not be accomplished with the use of a scope or DVOM. A scan tool will need to be used to observe its data stream.

The TCM is connected to a CAN bus system through its 20/25 pin compact connector where information is exchanged over the network between the ECM and ABS control module. The TCM receives data rom the ECM such as, but not limited to; the Engine speed signal, cruise control, coolant temperature, accelerator pedal position, kickdown information, brake switch information, intake air temp, altitude information and AC compressor status. The TCM also receives data from the ABS control module such as but not limited to; individual wheel speed signals and ABS activity.

Figure 4

THE TRANSMISSION CONTROL MODULE J217
HALL EFFECT SENSORS



The ***RPM Hall Effect Sensors*** are mounted in the TCM and reach past the valve body. The Input RPM sensor reads a signal off of a sender wheel containing 40 equally spaced magnets. This registers the rotation speed of pulley set 1 (the drive pulley) which represents actual transmission input speed. It is used together with engine speed data for clutch control.

Output RPM Sender 1 and Sender 2 reads a signal off of a sender wheel containing 32 equally spaced magnets. Output RPM Sender 1 registers the rotation speed of pulley set 2 (the driven pulley) to be used as output speed. Transmission output speed is used for transmission control, slip control and for a hill-hold function.

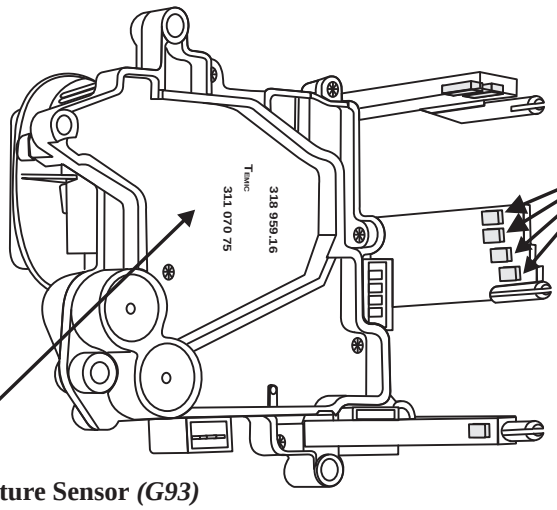
The positions of Sender 1 and 2 is offset so that the phase angles of the senders are 25% out of phase with one another. This allows Sender 2 to be used to recognize forward or reverse rotation. If the signal from the Output Sender 1 is lost, the output speed will be determined by sender 2.

If both fail, a substitute value is generated from the information available from the wheel speeds across the CAN bus.

With any combination of output speed data failure, the hill-hold feature is eliminated.

Figure 5

THE TRANSMISSION CONTROL MODULE J217
RANGE SENSOR/HALL EFFECT SENSORS &
TRANSMISSION FLUID TEMPERATURE SENSOR



MULTIFUNCTION TRANSMISSION RANGE SENSOR (F125)

Transmission Fluid Temperature Sensor ***(G93)***
(The Transmission Fluid Temperature Sensor is located inside the TCM)

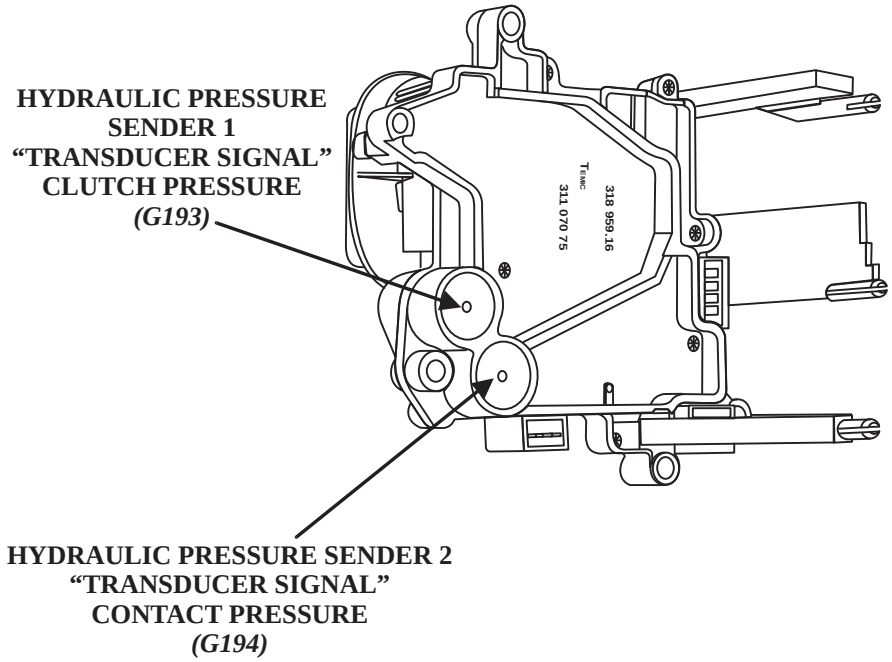
The ***Multifunction Transmission Range Sensor*** has four Hall Effect Sensors which are controlled by a magnetic gate located in the rooster comb area of the selector shaft. The signals from the sensors are interpreted in the same way as the positions of mechanical switches either open or closed. With 4 sensors, 16 total open and closed combinations can be obtained. 6 combinations are used to inform the TCM of a Park, Reverse, Neutral and Drive manual valve selection as well as intermediate movement positions from Park to Reverse and a Reverse to Neutral to Drive movement. The other 10 possible combinations are reserved as being faulty.

The ***Transmission Fluid Temperature Sensor*** is integrated into the circuit board ***inside*** the TCM. It records the temperature of the TCM aluminum mounting frame which is in close proximity to the actual fluid temperature.
Transmission oil temperature influences clutch control and transmission input speed control and adaptation functions. If the fluid temperature sensor fails, engine temperature is used to calculate a substitute value.To protect the transmission, engine performance will be reduced gradually until the engine is at idle.

Figure 6

THE TRANSMISSION CONTROL MODULE J217
PRESSURE SENDERS

Pressure Sender 1 registers clutch pressure of the forward and reverse clutches and is used to monitor clutch function. This clutch pressure monitoring has a high priority so malfunction of this sender usually causes the failsafe valve to be activated. The safety valve is activated by Shift Control Solenoid N88.



Pressure Sender 2 registers contact pressure which is regulated by a torque sensor. It is used to control clutch slip based on torque input. Therefore, contact pressure will be proportional to input torque. If this sender fails, the slip control adaptation is deactivated. Slip torque is then controlled by means of stored values.

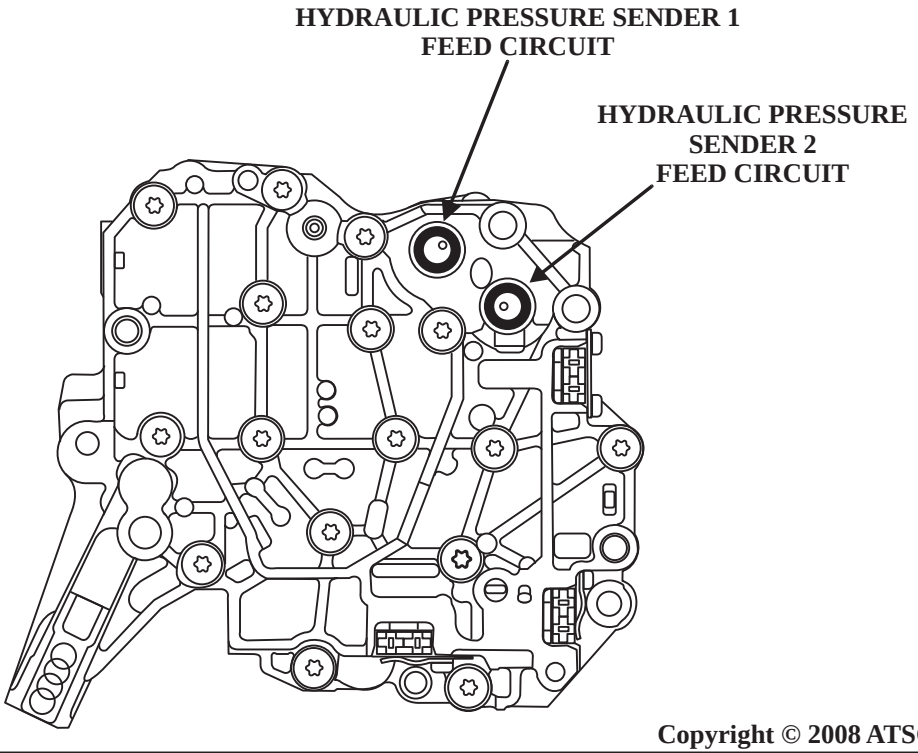


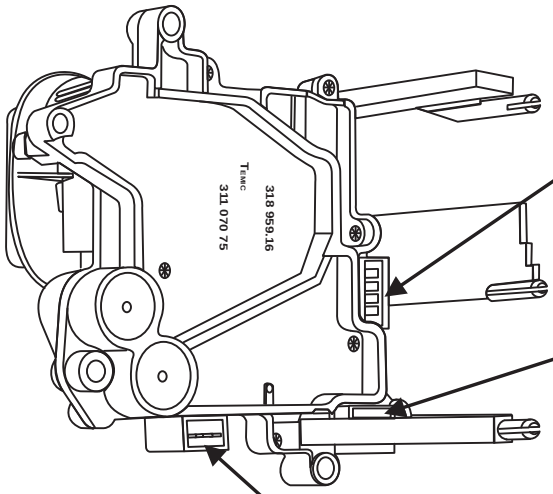
Figure 7

THE TRANSMISSION CONTROL MODULE J217
SOLENOIDS

The TCM calculates nominal clutch pressure from inputs such as Engine RPM, Transmission Input Speed, Accelerator Pedal Position, Engine Torque, Brake Signal and Transmission Fluid Temp. From these parameters the TCM controls the current to ***Pressure Control Solenoid 1***.

Pressure Control Solenoid 2 influences the position of the Hydraulic Reduction Valve which controls the Variator (Pulley Pressure) for ratio changes.

The Shift Control Solenoid is used to control the cooling valve and the safety valve.



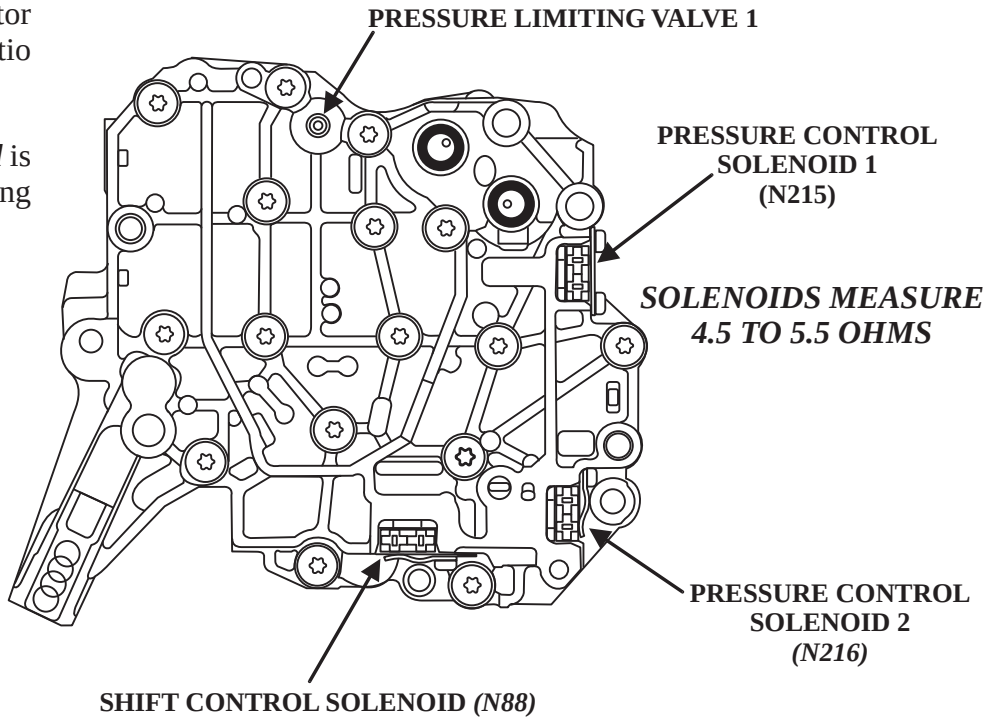


Figure 8

VALVE BODY VALVE IDENTIFICATION AND LOCATION

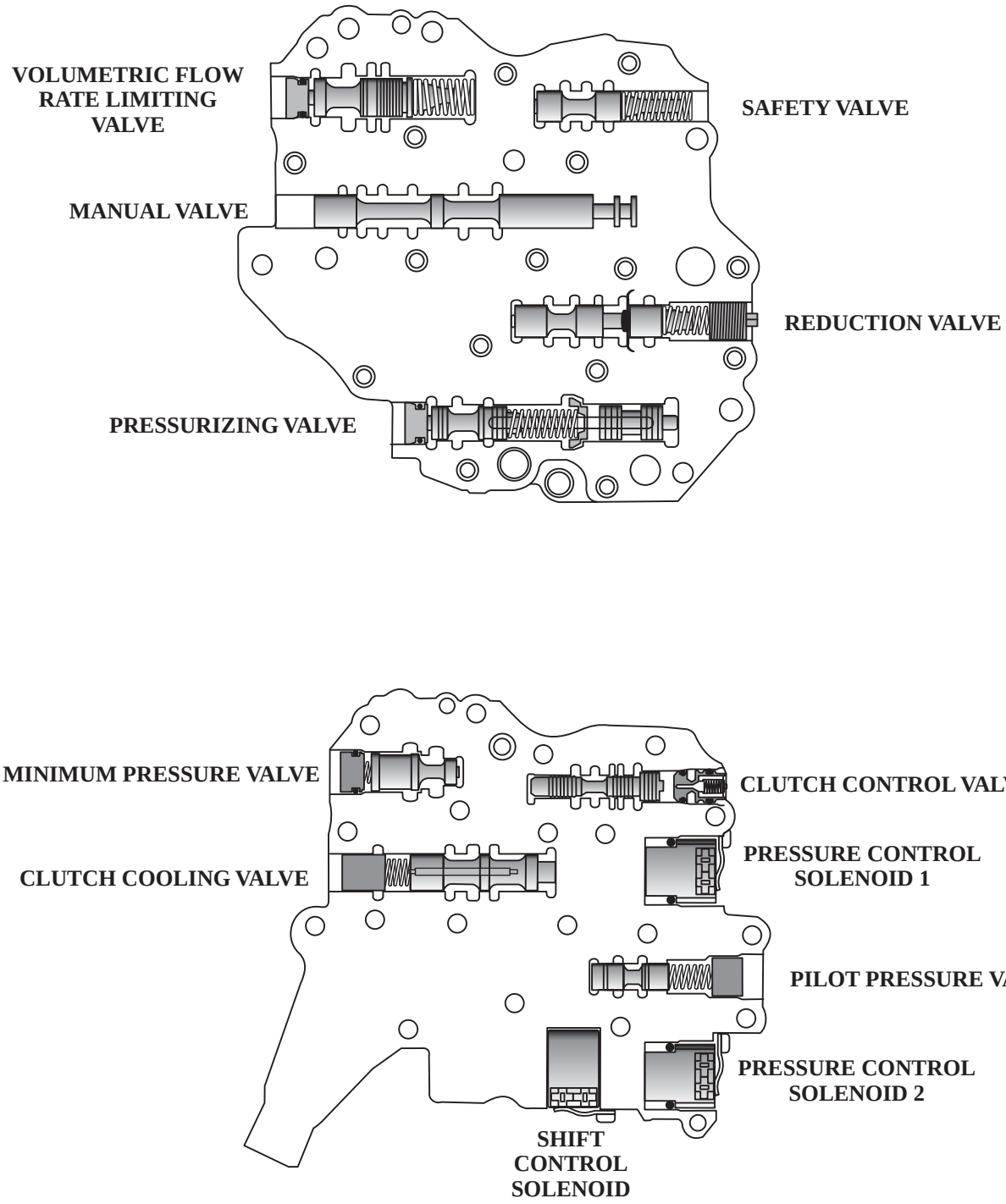
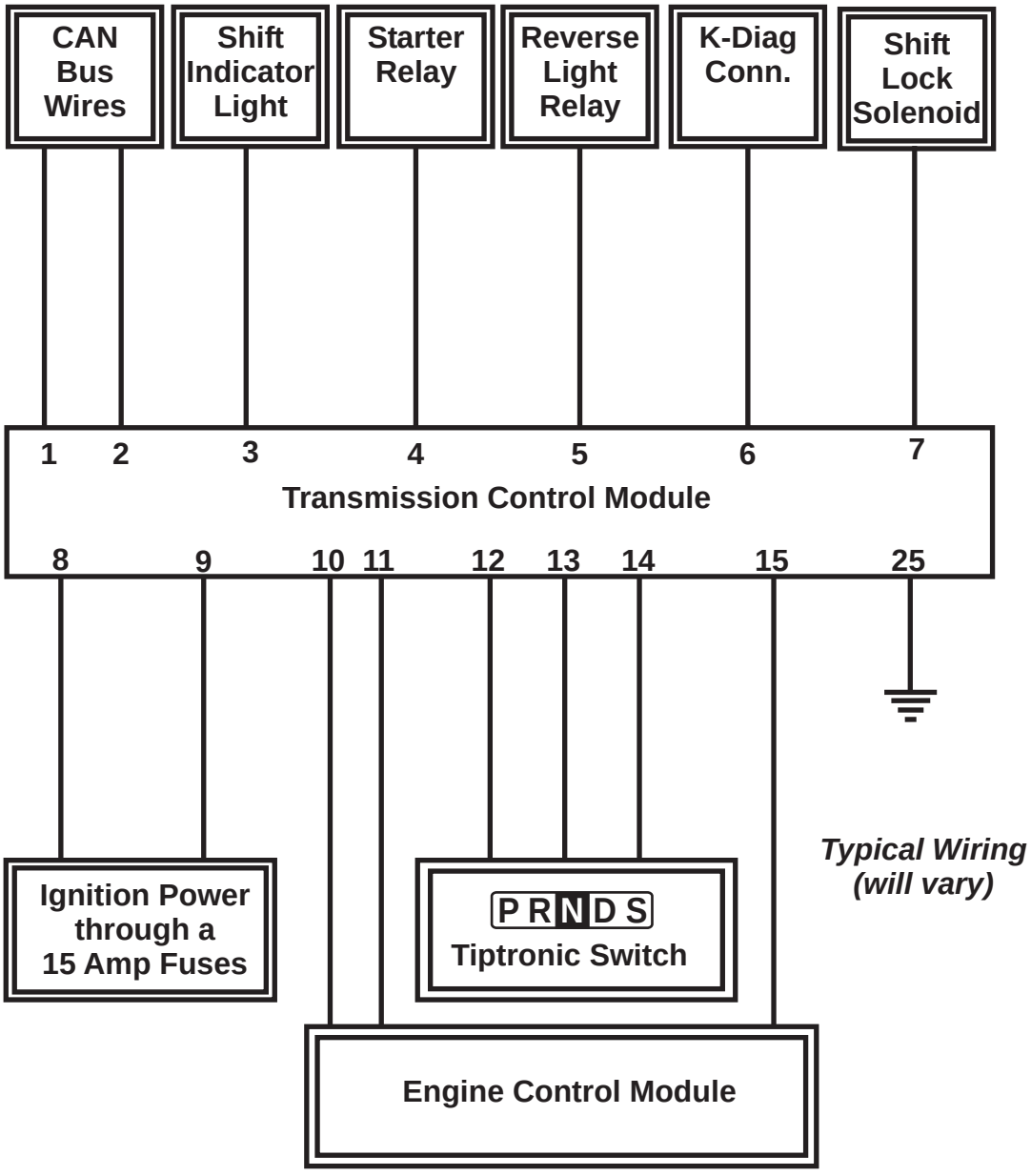


Figure 9

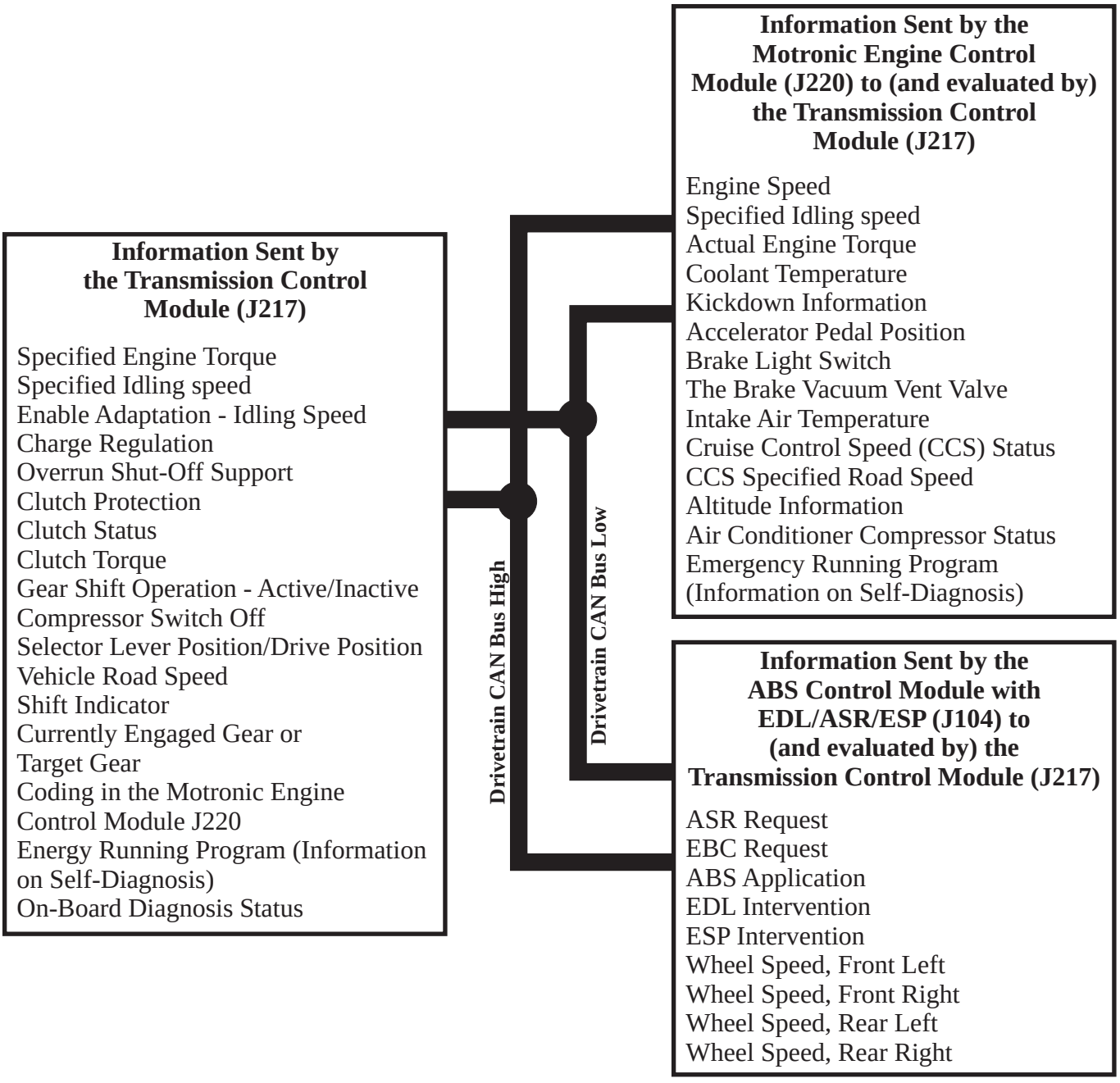
THE TRANSMISSION CONTROL MODULE J217
EXTERNAL CIRCUITS & COMPONENTS



Power and ground are supplied through the vehicle harness that plugs into its 25 pin connector. The TCM operates several external relays through this harness as well as the Shift Lock Solenoid. It has dedicated lines to send a road speed signal and receive an engine speed signal. It also interfaces with other computers on the CAN network.

Figure 10

CONTROLLER AREA NETWORK (CAN) INTERFACE



The Transmission Control Module (J217), sends information over the Controller Area Network (CAN), to the Motronic® Engine Control Module (J220) and to the ABS Control Module (J104) for evaluation.
The ECM and ABS modules are the only modules the TCM interfaces with over the network. Signals that travel between these three (3) modules are Engine Speed Signal, Shift Indicator Signal, Road Speed Signal, Diagnosis and programming interface, Tiptronic Recognition Signal, Tiptronic Downshift Signal and Tiptronic Upshift Signal.

Figure 11

FAULT INDICATION

The fault is stored and a substitute program enables continued operation of the vehicle with some restrictions. The fault is not indicated to the driver, since it is not critical with regard to safe operation of the vehicle. However, the vehicle will not operate properly.

CATEGORY 1 - CODES STORED NO DISPLAY CHANGE

The fault is stored and a substitute program enables continued operation of the vehicle with some restrictions. The Selector Lever Position Indicator also indicates the presence of a fault by ***inverting the display.*** The situation is not critical for the safe operation of the vehicle, however, the vehicle will not operate properly.

CATEGORY 2 - CODES STORED DISPLAY INVERTED

The fault is stored and a substitute program enables continued operation of the vehicles with some restrictions, at least until it stops. The Selector Lever Indicator Lever indicates the presence of a fault by ***flashing***. This state is critical with regard to safe vehicle operation. Therefore, driving the vehicle is not recommended.

CATEGORY 3 - CODES STORED DISPLAY INVERTED AND FLASHING

When the Multitronic® system detects a fault, the selector lever position indicator in the instrument cluster will inform the driver in one of three ways, depending on the type of fault. In some cases when the display is flashing, vehicle operation will only be maintained until the next time the vehicle stops. The vehicle can no longer be driven. In other cases, vehicle operation can be resumed by restarting the vehicle.

Figure 12

QUICK VAG TO OBDII CODE REFERENCE CHART

VAG CODE	OBDII CODE	BRIEF DESCRIPTION
16889	P0505	Idle speed control
16987	P0603	Control module faulty
16988	P0604	Control module faulty
P1689	P0605	Control module faulty
17086	P0702	Control module faulty
17087	P0703	Brake light switch circuit malfunction
17090	P0706	TRS implausible signal
17094	P0710	TFT sensor circuit malfunction
17095	P0711	TFT sensor implausible signal
17096	P0712	TFT signal too low
17097	P0713	TFT signal too high
17100	P0716	G182 RPM sensor implausible signal
17101	P0717	G182 RPM sensor no signal
17105	P0721	G195 RPM sensor implausible signal
17106	P0722	G195 RPM sensor no signal
17110	P0726	RPM signal from ECM implausible
17111	P0727	No RPM signal from ECM
17114	P0730	Wrong transmission ratio
17134	P0750	Solenoid N88 performance error
17137	P0753	Solenoid N88 circuit error
18031	P1623	No CAN communication
18112	P1704	Kickdown switch circuit error
18113	P1705	Gear ratio adaptation limit reached
18132	P1724	PN Position Switch shorted to ground
18137	P1729	PN Position Switch shorted to power
18141	P1733	Tiptronic switch shorted to ground
18147	P1739	Tiptronic switch shorted to ground
18148	P1740	Monitoring clutch temperature
18149	P1741	Clutch pressure adaptation limit reached
18150	P1742	Clutch torque adaptation limit reached
18151	P1743	Clutch slip too high
18152	P1744	Tiptronic switch shorted to ground
18156	P1748	Control module faulty

Figure 13

QUICK VAG TO OBDII CODE REFERENCE CHART

VAG CODE	OBDII CODE	BRIEF DESCRIPTION
18158	P1750	Power supply too low
18159	P1751	Power supply too high
18161	P1753	Tiptronic switch implausible signal
18162	P1754	Tiptronic switch open or shorted to power
18163	P1755	Tiptronic switch open or shorted to power
18164	P1756	Tiptronic switch open or shorted to power
18165	P1757	Power supply open circuit
18172	P1764	Monitoring clutch temperature
18173	P1765	G194 Sender 2 pressure adaptation limit reached
18181	P1773	G193 Sender 1 pressure signal too high
18183	P1775	G193 Sender 1 pressure adaptation limit reached
18169	P1761	Shift Lock Solenoid N110 shorted to ground
18185	P1777	G194 Sender 2 implausible signal
18194	P1786	Signal for back up light open circuit
18195	P1787	Signal for back up light shorted to ground
18196	P1788	Signal for back up light shorted to power
18198	P1790	TRS open circuit
18199	P1791	TRS shorted to ground
18200	P1792	TRS shorted to power
18201	P1793	G196 RPM sensor no signal
18203	P1795	Signal for road speed open circuit
18204	P1796	Signal for road speed shorted to ground
18205	P1797	Signal for road speed shorted to power
18206	P1798	G196 RPM sensor implausible signal
18221	P1813	Pressure control solenoid 1 N215 circuit malfunction
18226	P1818	Pressure control solenoid 2 N216 circuit malfunction
18249	P1841	ECM/TCM Mismatch
18258	P1850	No CAN Bus from ECM
18259	P1851	No CAN Bus from BCM
18262	P1854	TCM Data Bus Drive Faulty
18263	P1855	TCM CAN Bus open circuit
18265	P1857	Load signal error message from ECM
18269	P1861	TPS signal error message from ECM
18270	P1862	Missing message from Instrument Cluster

Figure 14

EXAMPLE OF MULTITRONIC® 01J SCANNER DISPLAY SCREENS

Measured Value Block	Display group number	Display fields	Description
Measured Value Block ⟶ **Bls.OFF.Bts.OFF PN active 0 km/h**	001	1 2 3 4	Brake light switch Brake test switch Shift lock solenoid-N110- Speed
Measured Value Block ⟶ **D 1 0 1 0 M switch 3**	002	1 2 3 4	Selector lever position Hall sensor status of the multi-function switch Tiptronic recognition Gear selected
Measured Value Block ⟶ **D M switch not actuated Reverse switch**	003	1 2 3 4	Selector lever position Tiptronic recognition Upshift switch for Tiptronic Reverse switch for Tiptronic
Measured Value Block ⟶ **D Forward 70 RPM 70 RPM**	004	1 2 3 4	Selector lever position Directional display Output speed 1 Output speed 2
Measured Value Block ⟶ **D Terminal 50 OFF 13.6V**	005	1 2 3 4	Selector lever position Park/Neutral position ON/OFF Back-ip light ON/OFF Supply terminal voltage
Measured Value Block ⟶ **P 0.470 A 0.265 A 0.000 A**	006	1 2 3 4	Can be ignored
Measured Value Block ⟶ **760 RPM 0 RPM 0 RPM AS**	007	1 2 3 4	Engine RPM Transmission input RPM Transmission output RPM Synchronous flag
Measured Value Block ⟶ **62% 310 RPM 2480 RPM 3240 RPM**	008	1 2 3 4	Accelerator pedal value Actual transmission output RPM Specified transmission input RPM Actual transmission input RPM
Measured Value Block ⟶ **100% Kickdown 234 Nm 6500 RPM**	009	1 2 3 4	Accelerator pedal value Kick-down switch Actual engine torque Engine RPM

Figure 15

EXAMPLE OF MULTITRONIC® 01J SCANNER DISPLAY SCREENS

Measured Value Block	Display group number	Display fields	Description
Measured Value Block ⟶ **0.25 A ADP. O.K. 72°C 387 Nm**	010	1 2 3 4	Adaptation of clutch curve driving forward Adaptation of starting from stop characteristics driving forward Transmission fluid temperature Specified clutch value
Measured Value Block ⟶ **0.25 A ADP. O.K. 72°C 387 Nm**	011	1 2 3 4	Adaptation of clutch curve backing up Adaptation of starting from stop characteristics backing up Transmission fluid temperature Specified clutch value
Measured Value Block ⟶ **0.5 A 0.81 A 0.28 A**	012	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **8.1 bar 3.2 bar 72°C 89°C**	013	1 2 3 4	Clutch pressure MF pressure Transmission fluid temperature Coolant temperature
Measured Value Block ⟶ **0.28 A 0.81 A 0.28 A 0.75 A**	014	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **0.91 A 0.813 A 3 bar 3 bar**	015	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **12.22 2.6 83 2.77**	016	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **0 % 800 RPM 20 Nm 12 Nm**	017	1 2 3 4	Accelerator Pedal Value Engine RPM Engine Torque Specified clutch torque (clutch 1)

Figure 16

EXAMPLE OF MULTITRONIC® 01J SCANNER DISPLAY SCREENS

Measured Value Block	Display group number	Display fields	Description
Measured Value Block ⟶ **8.1 bar 129 Nm 3.2 bar 0.098 A**	018	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **8.1 bar 0.12 A A/C compressor ON**	019	1 2 3 4	Can be ignored at this time
Measured Value Block ⟶ **800 RPM 800 RPM 800 RPM**	020	1 2 3 4	Engine RPM Specified Engine RPM at idle Specified transmission RPM at idle
Measured Value Block ⟶ **90 Nm 79 Nm 90 Nm 1399 Nm/sec**	021	1 2 3 4	Can be ignored at this time

Figure 17

MULTITRONIC® 01J SPECIFICATIONS

Designation:	multitronic® 01J
Factory designation:	VL 30
Code:	DZN
Maximum Transferable Torque:	Maximum 229 lbs-ft (310 Nm)
Range of Ratios of the Variator:	2:40:1 to 0.40:1
Spread:	6
Ratio of Auxiliary Reduction Gear Step:	51/46 = 1.109:1
Final Drive Ratio:	43/9 = 4.778:1
Operating Pressure of Oil Pump:	MAXIMUM approximately 870 PSI (6000kPa)
ATF for multitronic®:	G 052 180 A2
Axle Oil for multitronic®:	G 052 190 A2
Fluid Quantities:	
ATF new filling:	7.9 quarts (7.5 liters)
ATF change:	4.8 quarts (4.5 liters)
Axle Oil:	1.4 quarts (1.3 liters)
Gross Weight (without flywheel):	194 lbs (88 kg)
Overall Length:	24” (610mm)
Seal and gasket kit:	01J.OHK01
Forward frictions and steel:	01J.CK01
Reverse frictions and steels:	01J.FRK51 - 01J.STK51
Internal filter:	01J.FIL01
Tool kit:	01J.TOOL01

Figure 18

AUDI 01J

DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

COMPLAINT: Some Audi A4 or A6 vehicles equipped with an 01J continuously variable transmission may exhibit a delayed engagement into drive and/or a shudder on take off.

CAUSE: This type of CVT does not use a torque converter. Therefore it must rely on the computer's ability to slip the forward or reverse clutch on and off during engagements, take off and coming to a stop driving conditions. As a result, clutch clearance and the related hydraulic circuits are critical for proper clutch apply and release slip control operation. If the clearance is excessive or the hydraulic circuit develops a marginal leak, clutch control becomes compromised causing a delay and/or shudder on take off. Another feature that may be lost if the clutch system has been compromised is the "hill holder function." If the vehicle rolls back when standing on a slope with only light pressure applied to the brake, the clutch pressure is increased to immobilize the vehicle. If the clutch clearance is to excessive or there is a leak in the circuit, this feature will be lost which is a clue to a system malfunction.

A clutch relearn procedure or a computer reflash will need to be performed after all work has been completed in order to restore proper clutch control operation.

CORRECTION: Once the transmission is removed, the forward clutch assembly can be inspected by removing the front cover (Figure 1).

There are (14) # 45 torx cover retaining bolts. The input shaft, forward clutch and planetary assembly will come out as an assembly as the input shaft is pressed into a bearing in the cover and held into place with a snap ring behind the front seal.

Remove the front seal (1), retaining snap ring (2) and forward clutch feed pipe (27) then carefully press the input shaft, forward clutch and planetary assembly (25) from the cover (3) as seen in Figure 2. Be sure to fully support the cover during this pressing operation as it is very easy to snap the cover.

Once the assembly has been removed from the cover, the forward clutch assembly can be inspected (13 & 14). The planetary assembly is integral to the forward drum and can not be disassembled.

Inspect the forward clutch piston seals and sealing surfaces. The outer seal (10) on the forward clutch piston (9) seals inside the pressure plate (11). The inner seal is located on the input shaft which consists of an inner o'ring (18) and outer Teflon ring (17) and seals against the inside of the pressure plate (11). Both the seals and sealing surfaces are critical for proper operation. Some kits contain a new forward clutch piston with the outer seal installed.

There are two sealing rings on the forward clutch feed pipe (27), an o'ring (26) and a split ring (28). These too are critical sealing areas for the forward clutch hydraulic circuit. The sealing area for the split ring is located in the entrainment pump inside the transmission and should not be grooved. If it is, the entrainment pump will need to be replaced (See Figure 3).

AUDI 01J

DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

CORRECTION: To gain access to the entrainment pump, the drive and driven pulley set called the variator will need to be removed. This will require removing the differential (Figure 1), back cover (Figures 1 and 4), the valve body and the variator case cover.

When the valve body is removed, there will be 5 small pipe seals, 1 larger pipe seal and 2 speed sender wheels (See Figure 4). These speed sender wheels are not to be mistaken for oil seals which are then popped off with a hammer and screw driver. If you distort these speed sender wheels they will need to be replaced. These speed senders have magnetic strips in them that provide a rotation signal to hall affect sensors built into the TCM. Any distortion of the sender wheel will cause various transmission complaints including delayed engagements, shudder on take off and a loss of the hill holding feature. Some kits have mistakenly thought these were just oil seals and had aftermarket sources make them without magnets and when used there is a complete loss of a speed signal. Some kits that have the right sender wheels will usually have them in their own separate bag for protection along with installation instructions.

Once the pipe seals and the speed sender wheels are removed the variator case cover can be unbolted and removed from the main case.

With the differential out of the main case, remove the pinion shaft oil seal as seen in Figure 5. After the seal has been removed, there is a retainer spacer that must be carefully lifted out of place Figure 5). This retainer is not serviced separately so you must be careful not to distort it during removal as it must be reused during assembly. Once the retainer is removed, the retaining snap ring can be removed (Figure 5).

The variator is now ready to be removed. To do so will require a metal brace and hand pump press. With the metal brace acting as a support, place the press between the support brace and pinion gear. Slowly press the shaft out of the case while another person carefully guides the variator assembly from the main case (See Figure 6).

With the variator assembly removed, the entrainment pump becomes accessible for removal and replacement (See Figure 7).

There is another very critical seal in the forward clutch circuit that will need to be replaced. It is located on the forward clutch feed pipe that runs from the valve body and fits into the entrainment as seen in Figure 8.

To reassemble the variator assembly into the main case, carefully slide it into position as far as possible. With a treaded rod, screw it into the tip of the pinion shaft from the differential cavity. Slide a sleeve over the threaded rod and screw a nut onto the threaded rod. With a wrench, slowly tighten the nut pulling the pinion shaft into place while an assistant us carefully guiding the variator assembly into the case as it is being pulled in (See Figure 9).

Before the assembly is all the way in, loosen the nut and pull back on the sleeve and place the snap ring and the retainer spacer into position. Then begin to tighten the nut allowing the sleeve to guide both the snap ring and retainer into position.

AUDI 01J

DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

CORRECTION: ***Setting up the forward clutch:***

As mentioned previously, clutch clearance is critical. Originally these units come with a six friction stack up. There was an update that increased the stack up to 7 friction trapezoid design plates. The part number for this repair kit was ZAW 398 001 which was to be accompanied with a TCM re-flash using CD ROM part number 8E0 906 961J.

This service was superceded with buying a package that consisted of the front cover, planetary and forward drum all assembled and ready for instillation and could only be purchased with the use of a Vehicle Identification Number. Once assembled, a factory re-flash procedure needed to be performed.

This has changed back again. Now the 7 friction stack up can be purchased separately as well as selective steel plates and backing plates to adjust clutch clearance. Part numbers are listed under "Service Information."

Assemble the drum completely. Once the forward clutch is re-assembled, a suitable tool or part number VW 416b must be used to push down on the pressure plate by a second technician as seen in Figure 10.

Using part number T40102 or equivalent .058" feeler gauges, move the two feeler gauges back and forth to complete a full 360º circle beneath the pressure as the arrows in figure 10 illustrates.

The entire circular area needs to be inspected. The two feeler gauges MUST always move freely without any resistance whatsoever. If the gauges can not freely move around the pressure plate the forward clutch stack up will need to be adjusted by changing the selected shims.

It is essential to obtain a successful 0.058" even clearance (or slightly tighter) all the way around the pressure plate otherwise problems will be encountered when driving off from a standstill.

After repairs, it is still recommended to update transmission control module software. A failure to do so could lead to transmission failure as the software update enhances pressure control and clutch control strategies. There is also a drive cycle shift adapt relearn procedure that has been know to work well when the clutch clearance has been made slightly tighter than original specifications.

Drive Cycle Shift Adapt Relearn Procedure (Per Audi):
Warning:
Observe all workplace and vehicle lift safety guidelines in order to reduce the risk of serious personal injury or death.

Note:
Never operate the vehicle without ATF. Do not exceed 35 mph while operating the vehicle on the lift.

AUDI 01J

DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

CORRECTION: If just the clutch plates are replaced (the nose pulled but trans not completely rebuilt), the ATF must be flushed by performing the following steps:

1. Drive the vehicle onto a lift and ensure that the vehicle is secure to the lift.
2. Raise the vehicle until all 4 wheels are approximately 8 Inches off the ground. Ensure that all 4 wheels rotate freely.
3. In Tiptronic mode, shift from first to top gear and accelerate moderately after each shift.
4. Shift the transmission back down into first gear.
5. Carefully apply the brake pedal in order to stop the wheels from rotating.
6. With the brake pedal firmly applied, shift the transmission into R.
7. Release the brake pedal and moderately accelerate to approximately 12 mph.
8. Carefully apply the brake pedal in order to stop the wheels from rotating.
9. Return the gear lever to D and repeat steps 3 through 8 five times.
10. Place the gearshift lever into P and turn the engine off.
11. Change the ATF by using a suitable fill pump device, fill the transmission with VAS 5162 Audi CVT fluid (part # G 052 180 A2 for 1 liter) through the fill hole located at the bottom of the main case until fluid begins to overflow (approximately 7.5 to 8 liters). Engage the transmission with the wheels off the ground and top off the fluid before placing the vehicle on the ground for a road test.
12. Repeat steps 3 through 11 a second time.

Now adapt the Transmission Control Module (TCM):

1. Confirm that the ATF is at a minimum 65ºC.
2. With the ATF at a minimum 65ºC, carefully operate the vehicle in an open space (clear of traffic and obstacles).
3. Shift vehicle into D.
4. Drive forward at part load approximately 10 meters (33 feet), then apply brake pedal to a stop and continue to apply brake pedal for approximately 10 seconds.
5. Shift vehicle into R.
6. Release brake pedal.
7. Drive backwards at part toad approximately 10 meters (33 feet), then apply brake pedal to a stop and continue to apply brake pedal for approximately 10 seconds.
8. Repeat steps 1- 7 (alternating between D and R) five times.
9. Compteted adaptions can be viewed in MVB 10 and 11, position 2 with factory scan tool or VAG-COM.

SERVICE INFORMATION:

Program the Transmission Control Module (TCM) with flash CD Part # 8E0-906-961 J

FWD Clutch 7 Friction Update Kit	01J-398-944
FWD Clutch Selective Plate Set	01J-398-941
Reverse Clutch Set	01J-398-241
Reverse Clutch Selective Plate Set	01J-398-139
Entrainment Pump	01J-301-515 K

AUDI 01J

DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

SERVICE INFORMATION:

Forward Clutch Feed Pipe (Inside FWD Drum)	01J-323- 530 G
Forward Clutch Piston with seal	01J-323-929 A
Forward Clutch Pressure Plate	01J-323-945
Large Tube Seal	01J -301-547 A
Small Tube Seal	01J- 301- 547 F
Input Speed Sender Wheel	01J -331- 291 F
Output Speed Sender Wheel	01J -331-191 B
Valve Body Cover Gasket (Metal)	01J-301- 475 A
Front Seal	012-311-113 B
Set of 4 Circlips (Behind front seal)	01J-398- 941 A
Front Cover	01J-323- 259 G
Front Cover Gasket	01J-301-461 B

Forward Clutch Feeler Gauge Set	T40102
Forward Clutch Press Tube	VW 416B

Press Kit..... ATSG-01J Tool Kit*

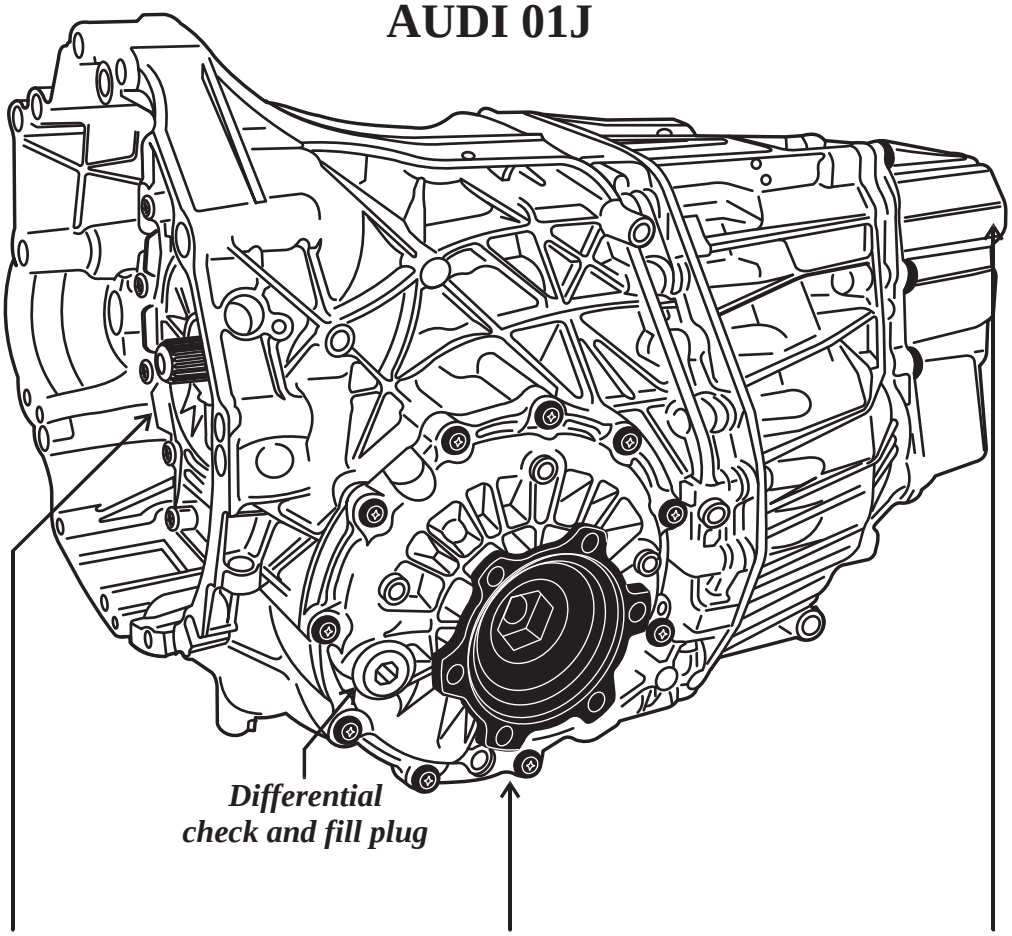
* ATSG is the exclusive North and South America Dealer for this aftermarket tool kit.

Tool Kit includes:

Hand Held Press
Pinion Shaft Nut Tool
Pinion Shaft Puller
Release Oil Screw
Differential Seal Assembly Tool
Seal Assembly Tool
Input Speed Sender Puller
Pinion Shaft Disassembly Tool
Input Shaft Nut Tool
Pinion Shaft Assembly Tool

Sometimes Dealers will sell special tools to the aftermarket. At the time of printing this information, you can call Audi's Equipment Solutions for the required CVT tool package at 1-800-892-9650. This is their tool package which is different than what ATSG offers.

AUDI 01J



When removed, the front cover gains access to the forward clutch and reverse clutch assemblies. The planetary assembly is integral to the forward drum and is pressed into the cover with a retaining snap ring located behind the front seal.

When removed, the differential cover gains access to the pinion shaft seal. Behind the seal is a retainer spacer ring around a snap ring which needs to be removed to press out the drive and driven pulley assembly should any service to the Entrainment pump or pulley assembly is needed.

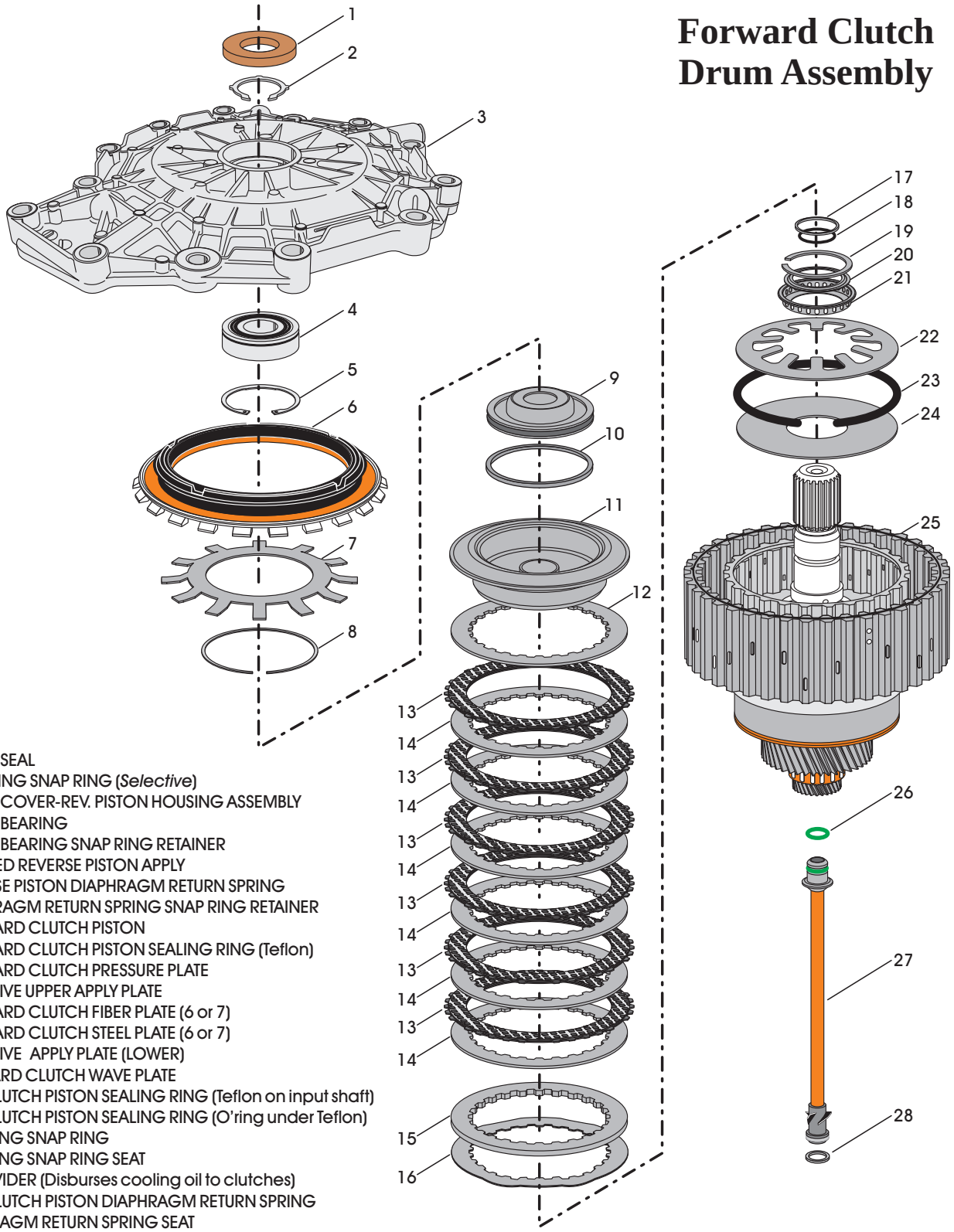
If the Entrainment pump needs to be serviced, the rear cover, TCM, valvebody and pulley case cover will need to be removed. Care must be taken to not mistaken the sender wheels as seals. These must be removed with care.

Differential

The front differential in the transmission receives approximately 1.3 liters of SAE75 W90 synthetic fluid and is filled through the check plug as seen above. The vehicle must be driven to heat the gear oil to approximately 60°C. Allow the vehicle to sit for 5 minutes giving the gear oil time to settle. Remove the plug and using a piece of wire, the fluid level must be approximately 8.5mm below the fill hole. Top off as necessary and tighten plug to 20 Nm. It is recommended that a new plug replace the old. It is very common to find differentials overheated and destroyed as a result of low levels. It seems that the baffling around the differential makes it difficult to get an accurate reading. Of course Audi's awkward procedure for checking the gear oil level doesn't help any either.

Figure 1

Forward Clutch Drum Assembly



1 FRONT SEAL
2 RETAINING SNAP RING (*Selective*)
3 FRONT COVER-REV. PISTON HOUSING ASSEMBLY
4 FRONT BEARING
5 FRONT BEARING SNAP RING RETAINER
6 MOLDED REVERSE PISTON APPLY
7 REVERSE PISTON DIAPHRAGM RETURN SPRING
8 DIAPHRAGM RETURN SPRING SNAP RING RETAINER
9 FORWARD CLUTCH PISTON
10 FORWARD CLUTCH PISTON SEALING RING (Teflon)
11 FORWARD CLUTCH PRESSURE PLATE
12 SELECTIVE UPPER APPLY PLATE
13 FORWARD CLUTCH FIBER PLATE (6 or 7)
14 FORWARD CLUTCH STEEL PLATE (6 or 7)
15 SELECTIVE APPLY PLATE (LOWER)
16 FORWARD CLUTCH WAVE PLATE
17 FWD CLUTCH PISTON SEALING RING (Teflon on input shaft)
18 FWD CLUTCH PISTON SEALING RING (O'ring under Teflon)
19 RETAINING SNAP RING
20 RETAINING SNAP RING SEAT
21 OIL DIVIDER (Disburses cooling oil to clutches)
22 FWD CLUTCH PISTON DIAPHRAGM RETURN SPRING
23 DIAPHRAGM RETURN SPRING SEAT
24 COVER PLATE
25 FORWARD CLUTCH DRUM AND PLANETARY ASSEMBLY
26 FORWARD CLUTCH PIPE O'RING
27 FORWARD CLUTCH PIPE
28 FORWARD CLUTCH PIPE SPLIT SEALING RING

Figure 2

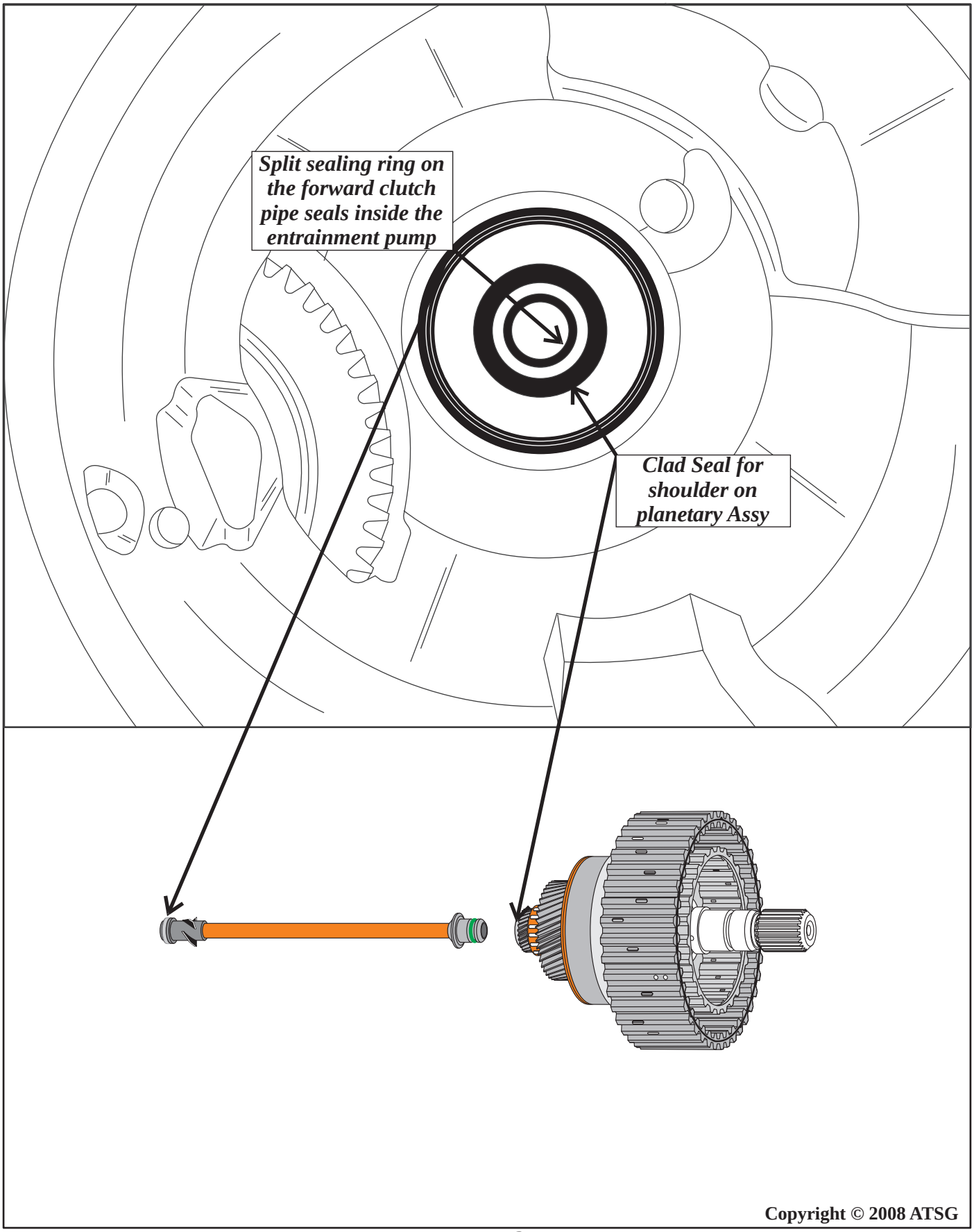
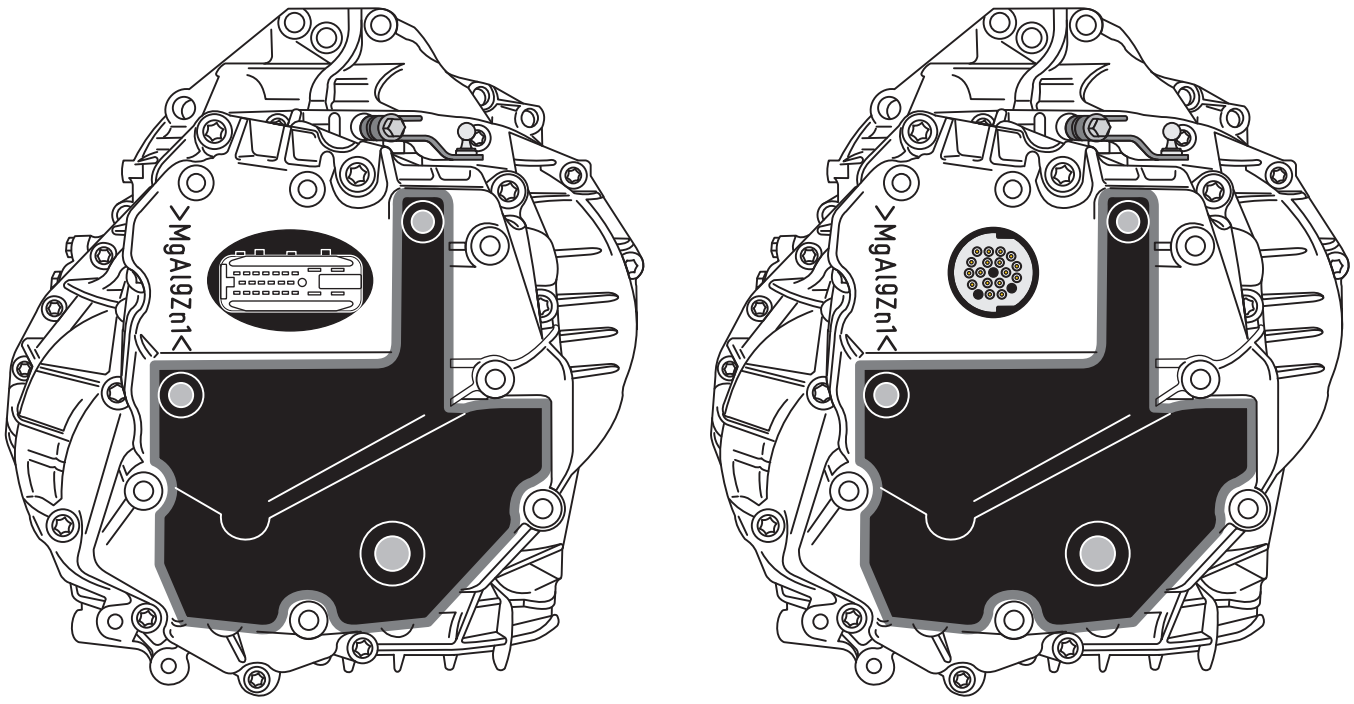


Figure 3



Early Cover View

Late Cover View

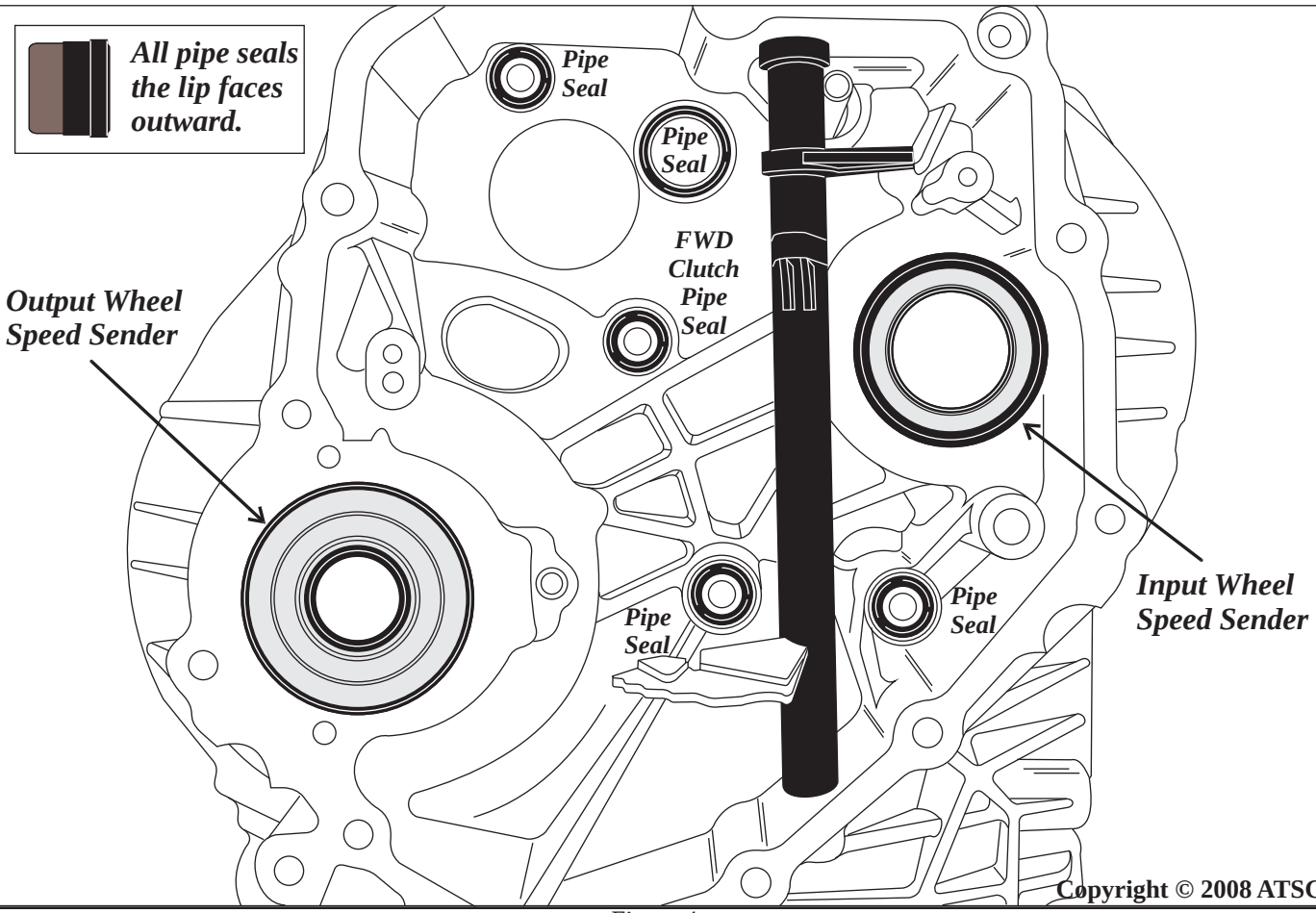
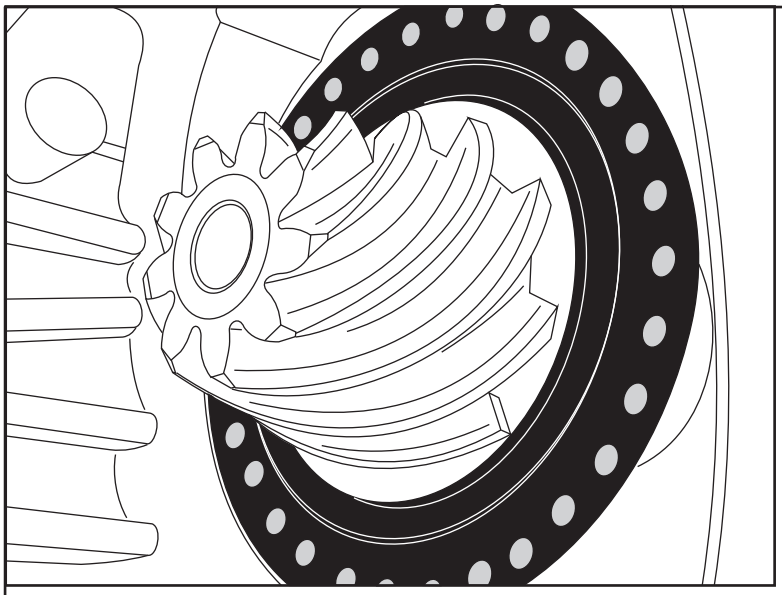
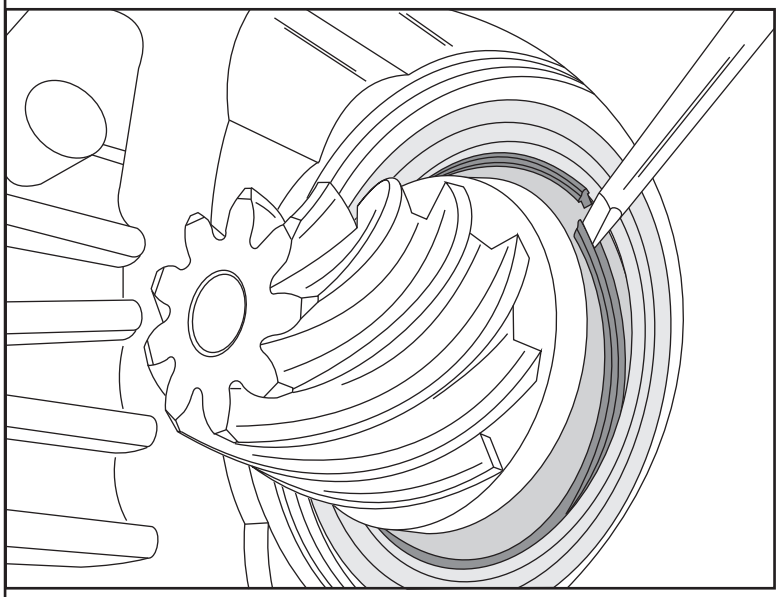


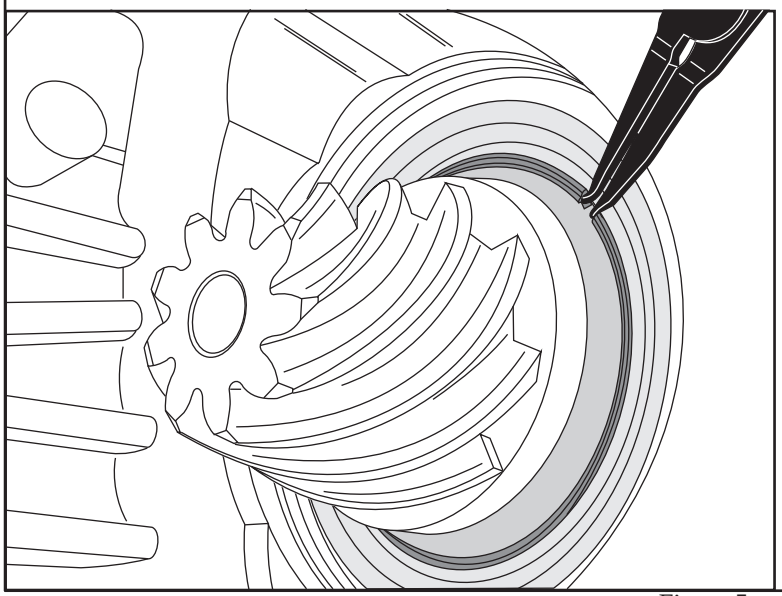
Figure 4



Remove Pinion Seal.



Remove the Retainer Spacer from around the inner snap ring being careful not to distort it as it will need to be reused. This part is not yet serviced separately.



Remove the inner snap ring.

Figure 5

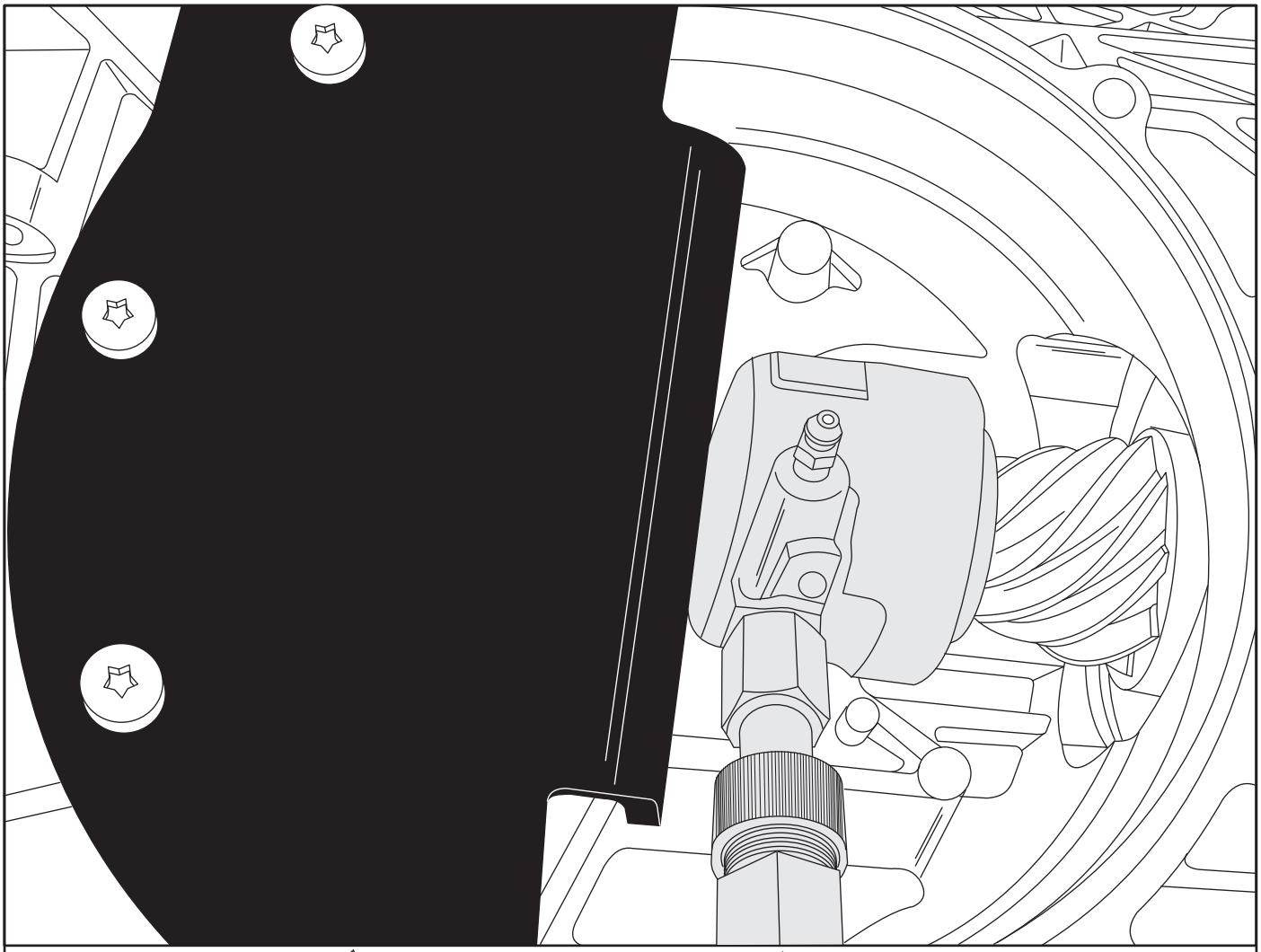
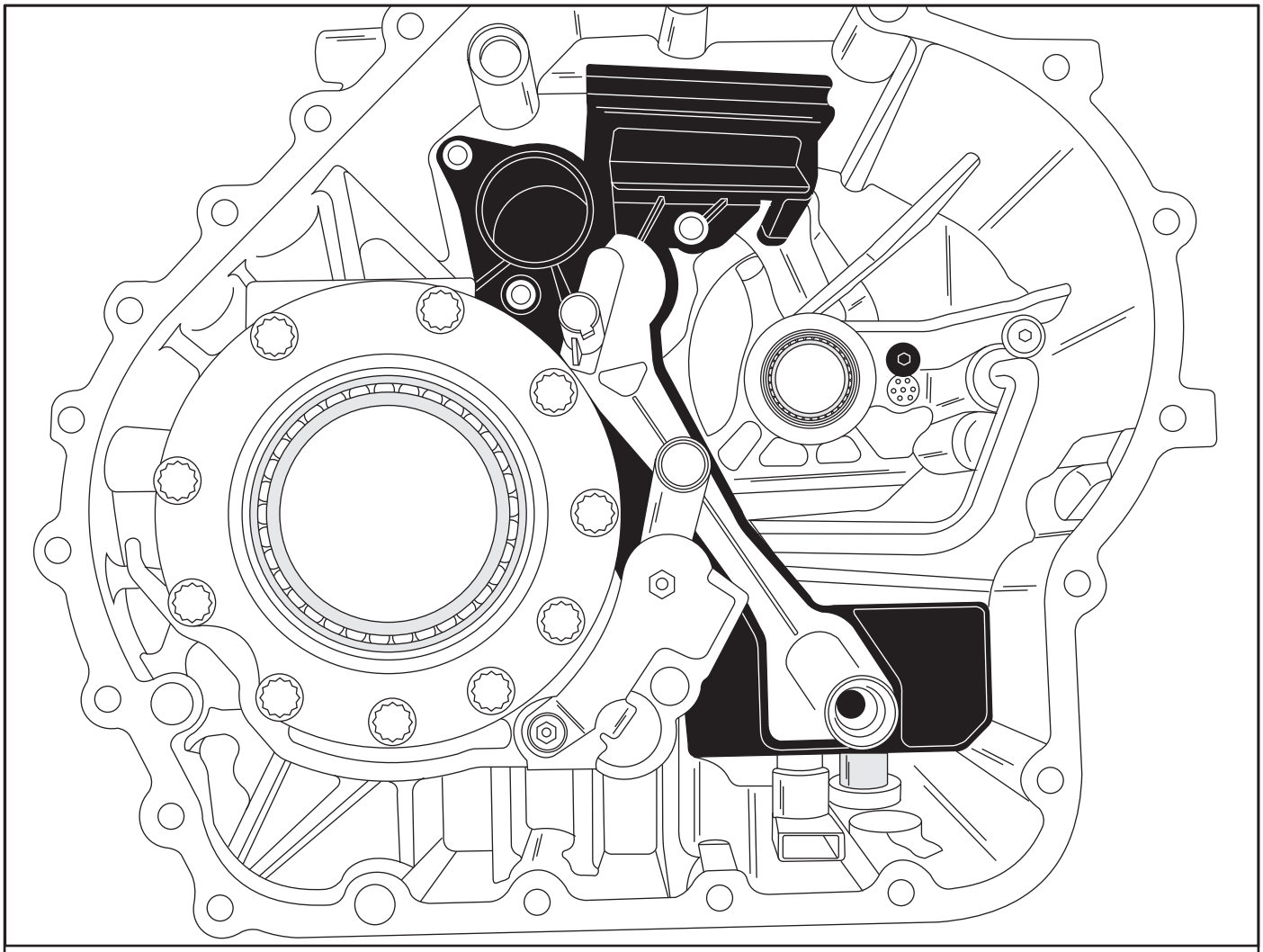
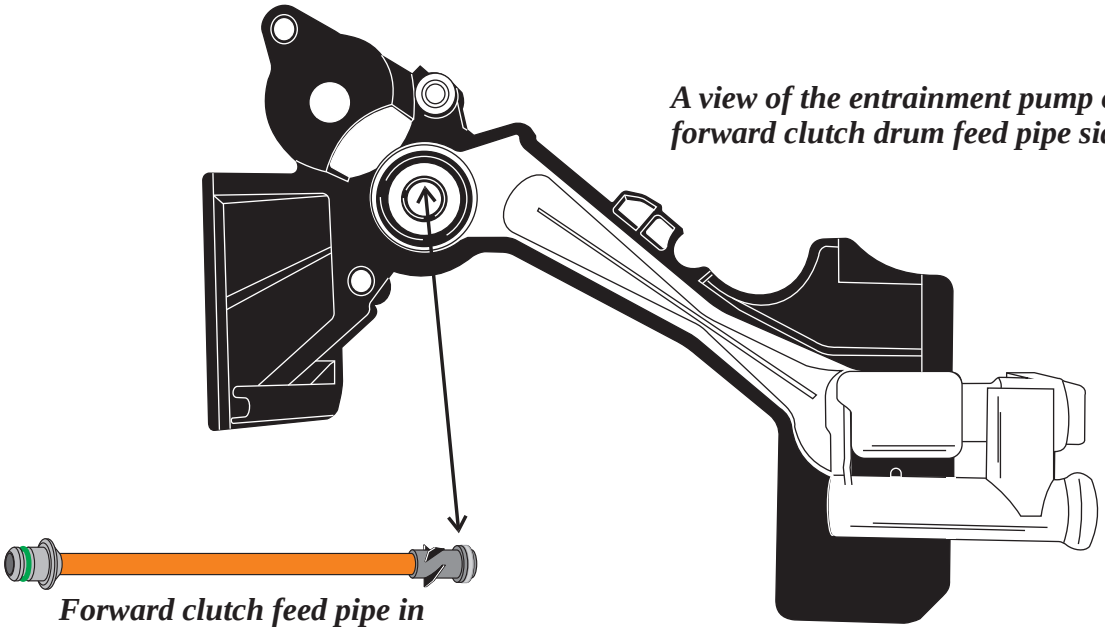


Figure 6





A view of the entrainment pump on the forward clutch drum feed pipe side.

Forward clutch feed pipe in Forward Clutch Drum

Figure 7

A view of the entrainment pump on the forward clutch feed pipe valve body side.

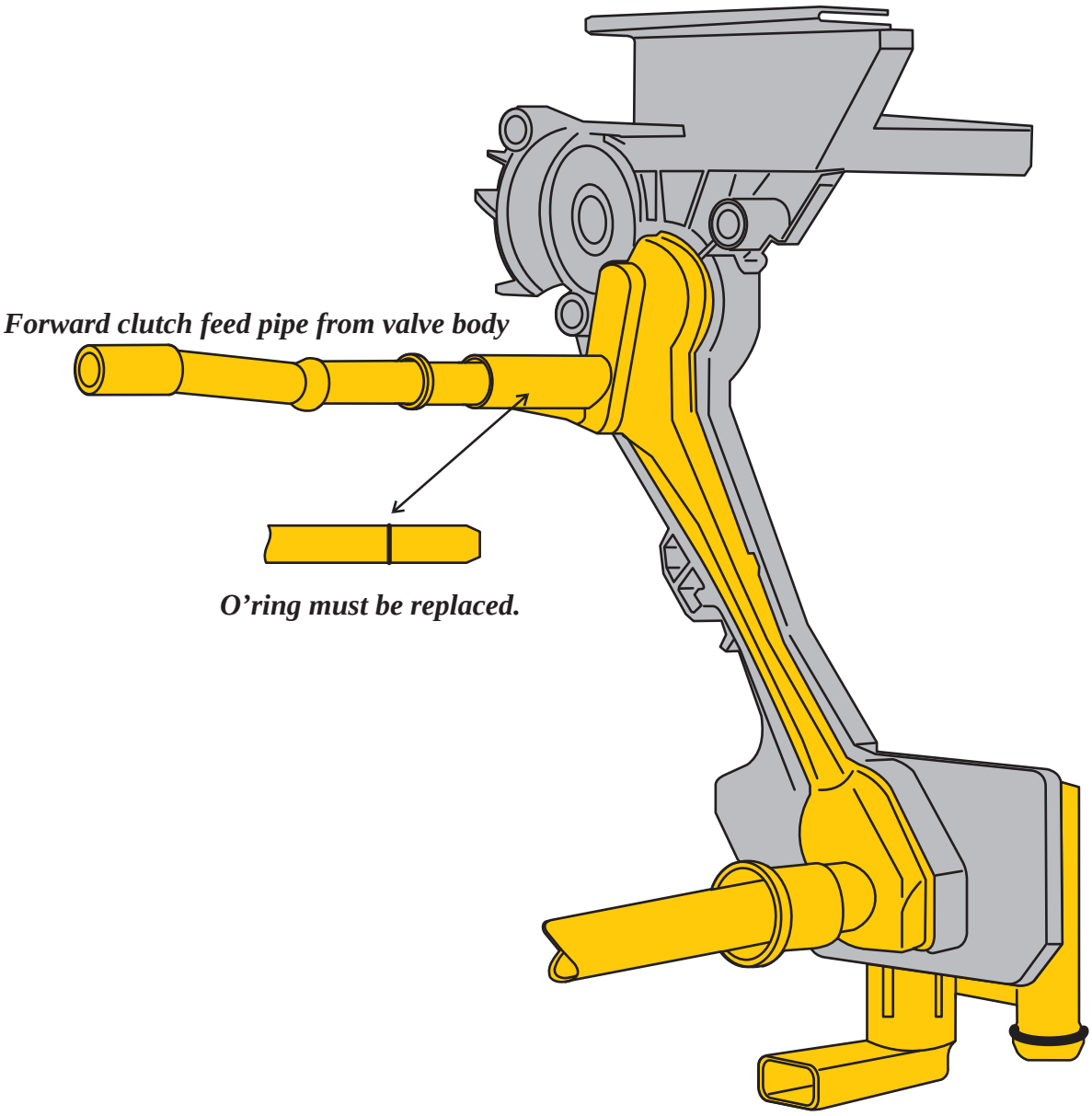


Figure 8

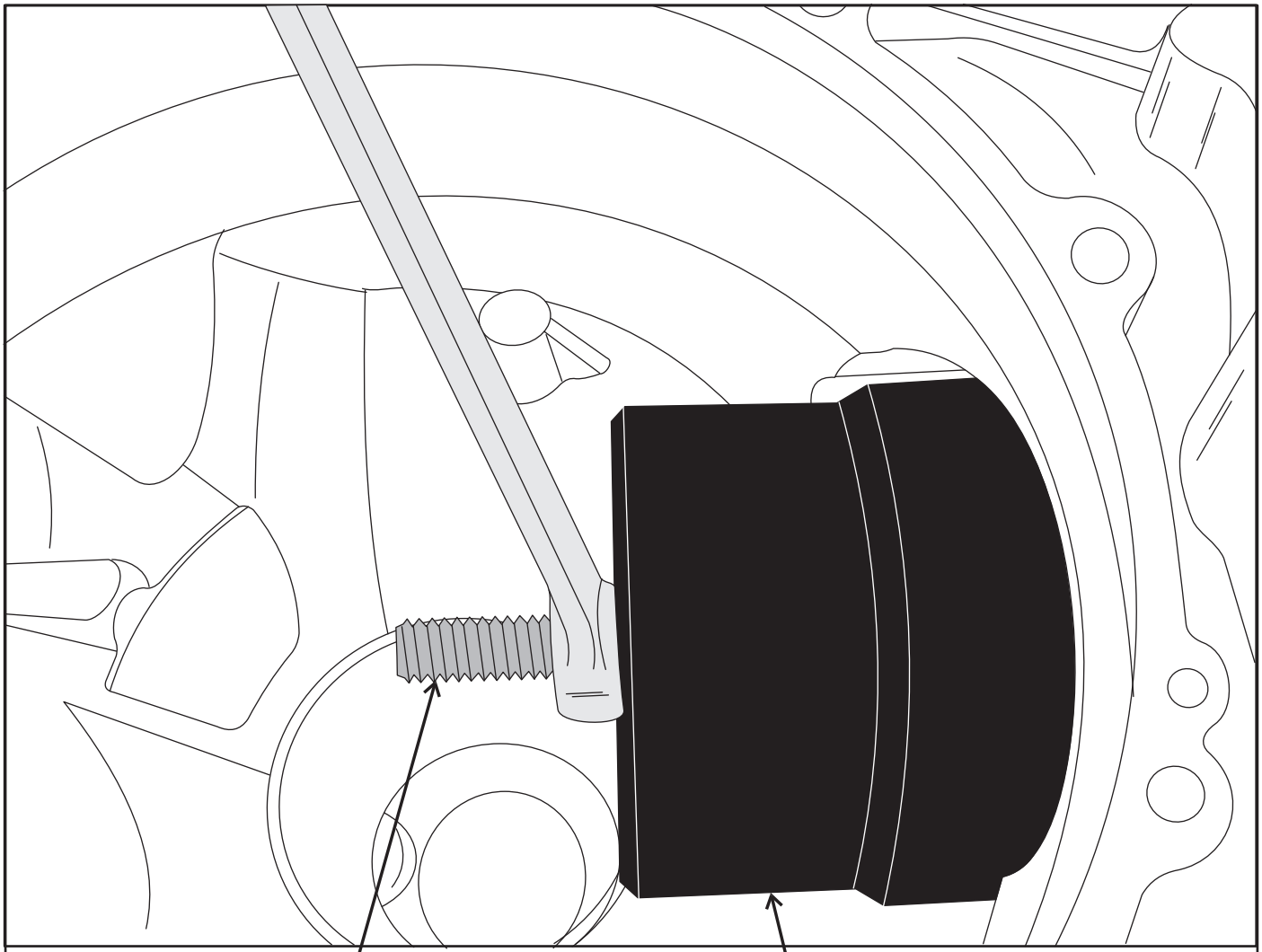
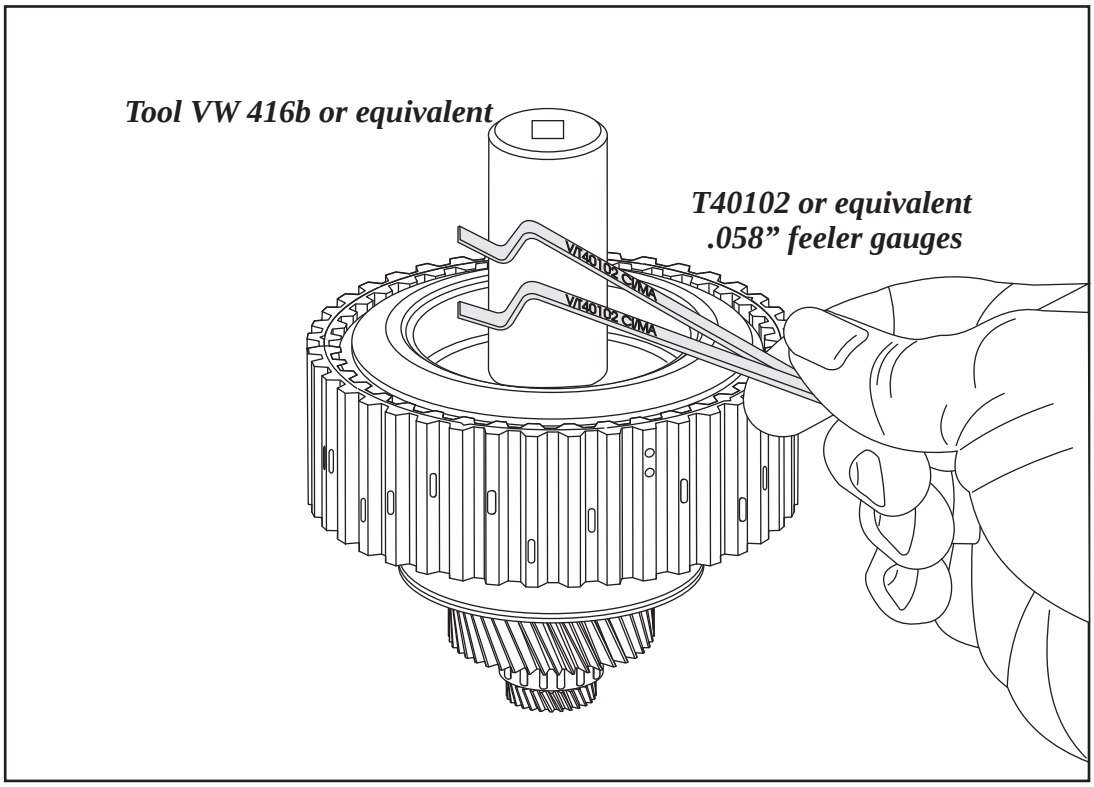
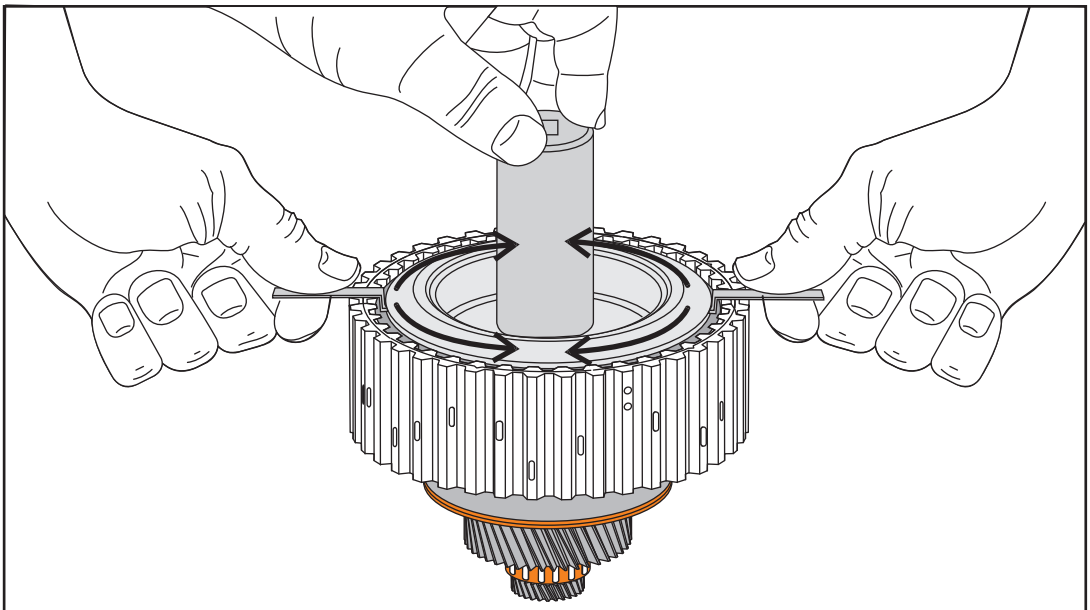


Figure 9





With an assistant providing pressure to center top tool, use the .058” feeler gauges in a half circular motion with each hand to ensure a full 360° even clearance.

Figure 10

Technical Service Information

Forward Clutch Drum Assembly Update

Forward clutch updated assembly setup:

As mentioned previously, clutch clearance is critical. Originally these units come with a six friction stack up. There was an update that increased the stack up to 7 friction trapezoid design plates. The 7 friction update is for 4 cylinder diesel or larger engines, the previous 6 friction assembly still applies to 4 cylinder 2.0 or smaller gas engines with trapezoid plates. The part numbers for the tools to set up the forward clutch are (seen in figure 1);

Assembly tool T10219/1
4 Calipers..... T40101
2 Rulers..... T40100
Digital depth gauge.....VAS 6087

Align all the clutch and steel plate notches evenly, with the wave plate on the bottom of the stack-up for measuring purposes only, assemble the drum completely. Once the forward clutch drum is re-assembled, a suitable tool or part number T10219/1 should be placed under the drum during end play measurements see figure 2.

Place all 4 Calipers spaced evenly, onto the Selective upper apply plate seen in figure 3. Place two of the Rulers one each onto two of the four Calipers. With the Digital depth gauge placed flat onto the two rulers, measure to the top or the Selective Upper Apply plate, measurements should be taken in four locations. Calculate the average of all four measurements, (total all 4 values and divide by 4) and this will be called measurement "A".

Next with the two rulers still in place measure to the top of the Thrust plate contact surface shown in figure 4. Measurements should be taken on both sides of the shaft. Move the two rulers 90 degrees and repeat measurements. Calculate the average of all four measurements, and this will be called measurement"B" (see figure 4). Subtract measurement "A" from "B" this will be calculation "K".

This same procedure must be performed with the forward clutch piton using only two calipers with one ruler taking measurements in 3 places (figure 5). Subtract measurement "A" from "B" this will be calculation "D".

Total Air Gap (endplay) measurement will be the difference between Calculated measurement "K" & "D". Using the chart below, determine the proper Selective disc to achieve the correct Air Gap measurement.

Air Gap specified value:1.4 ± 0.2 mm 6 Disc 1.8 ± 0.2 mm 7 Disc				
Available Upper & Lower adjustment discs (thickness in mm)				
1.90	**2.15**	**2.65**	**2.90**	**3.15**

The last step is to reassemble the forward clutch assembly with the Waved disc above the Selective Lower Apply disc seen in figure 6.

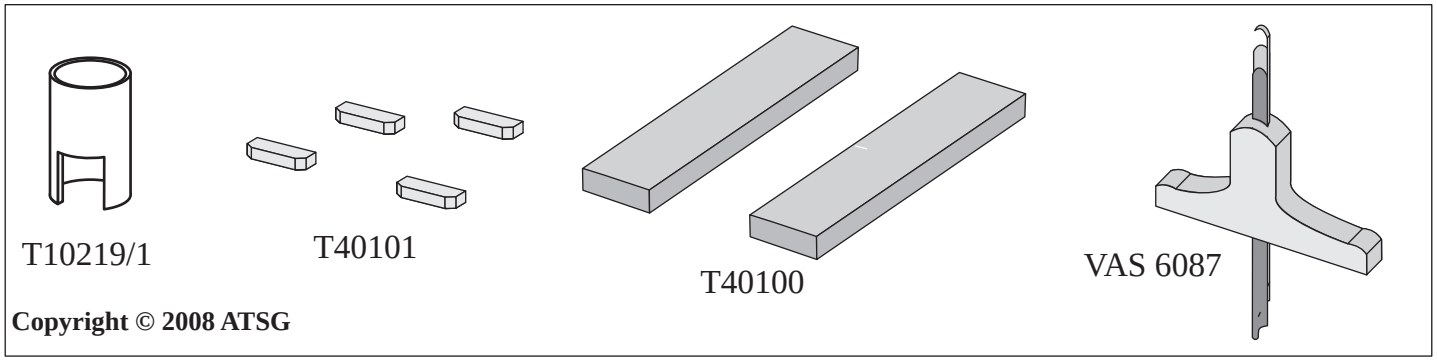


Figure 1

Forward Clutch Drum Assembly Update

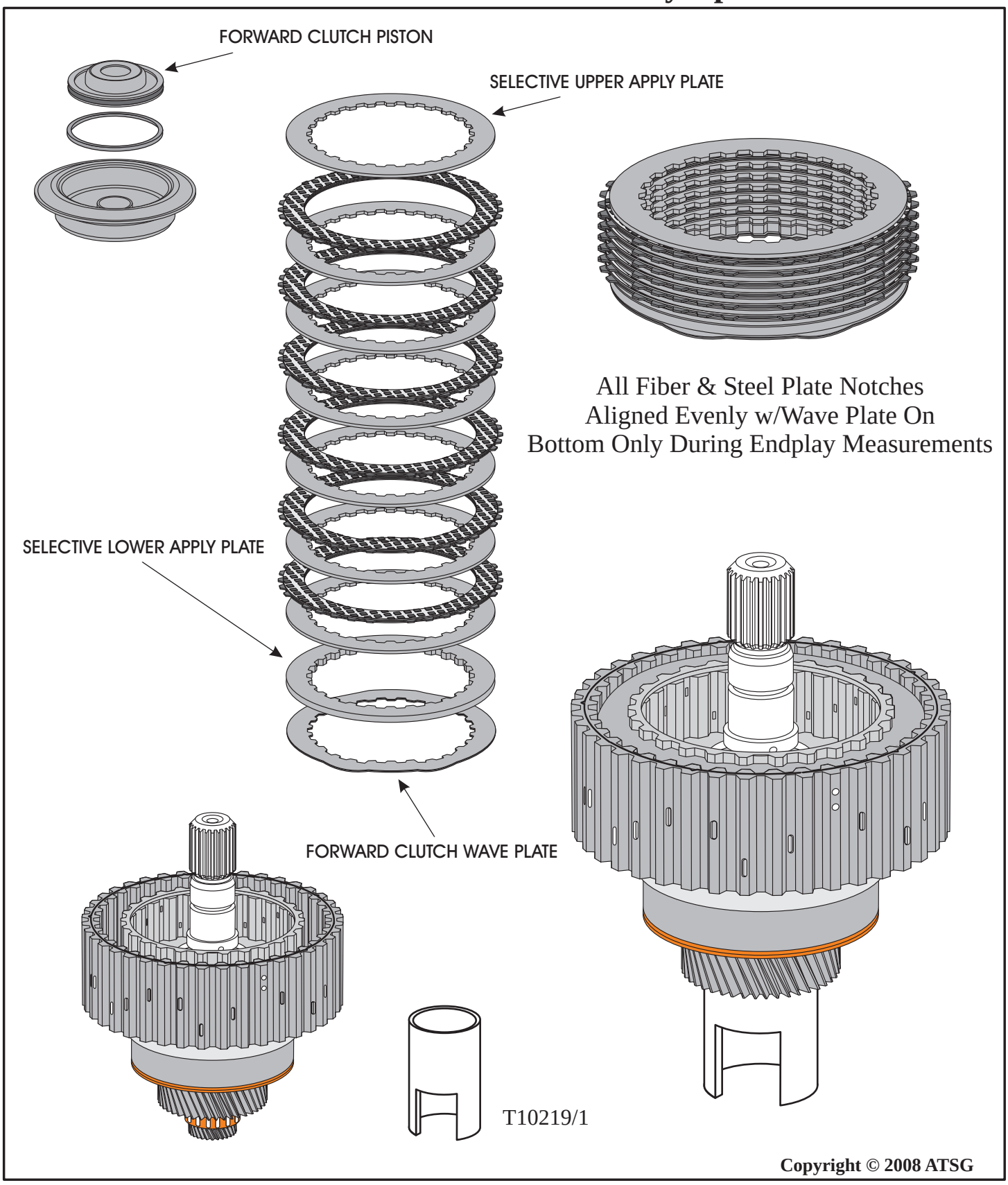
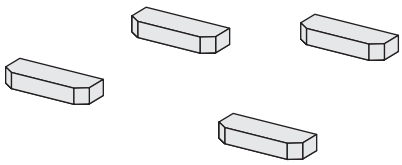
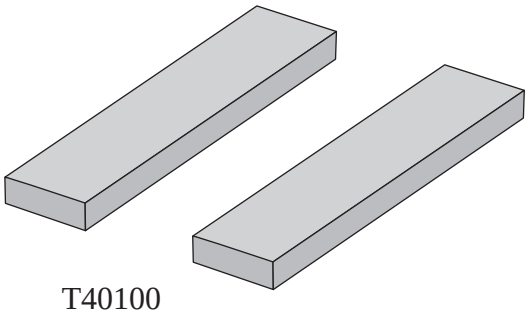


Figure 2

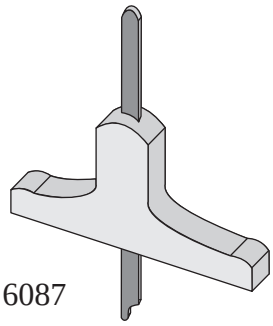
Forward Clutch Drum Assembly Update



T40101



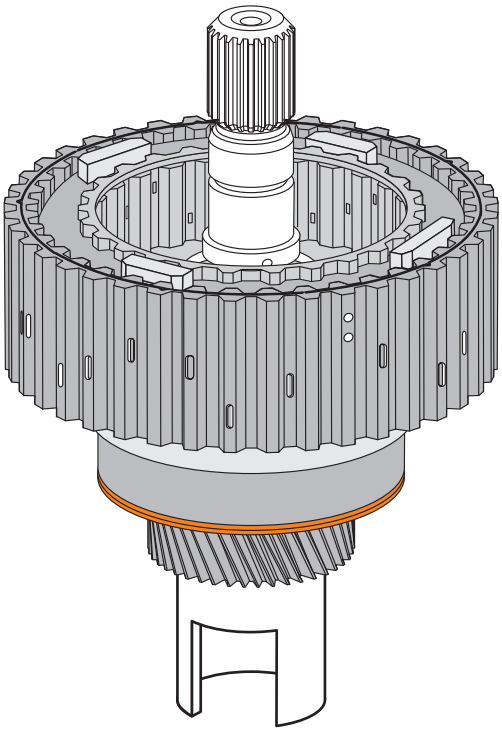
T40100

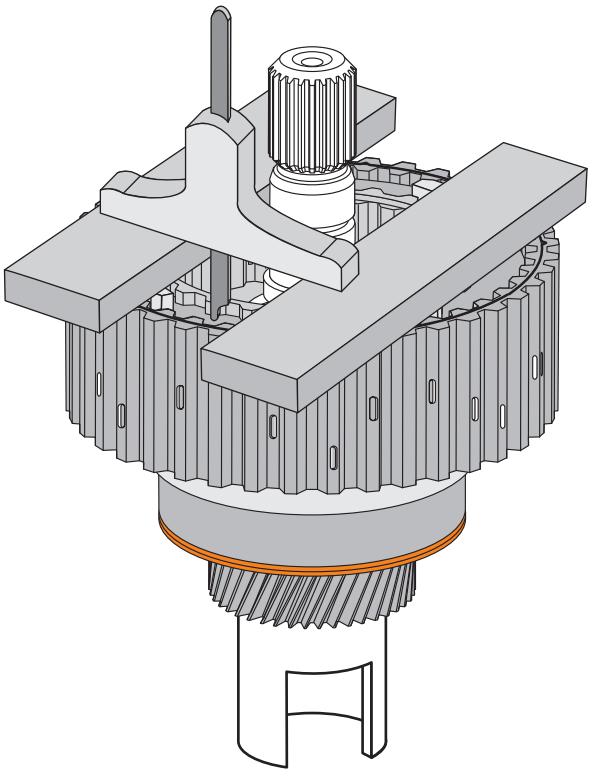


VAS 6087

Place 2 Rulers 1 Each Onto
2 Of The 4 Calipers
With A Digital Depth Gauge
Measure From Top Of Rulers
To Top Of Selective Upper Apply Plate
(measurements should be
taken in 4 locations then rulers should
be moved 90 degrees and repeat)

Place All 4 Calipers Onto
Selective Upper Apply Plate
(spaced evenly)



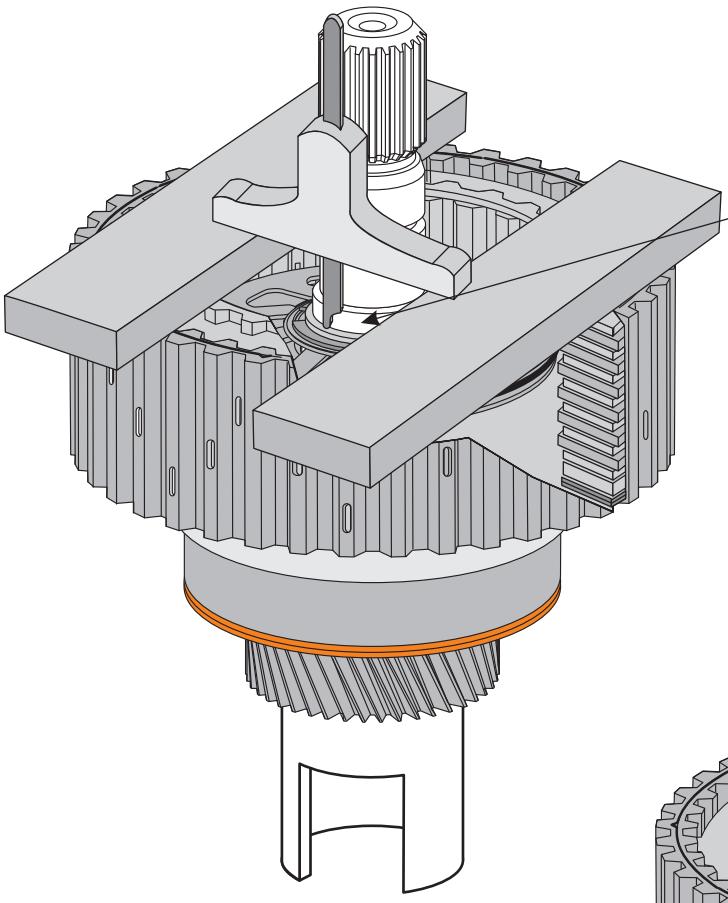


Measurement “A”
(calculate average of four measurements)

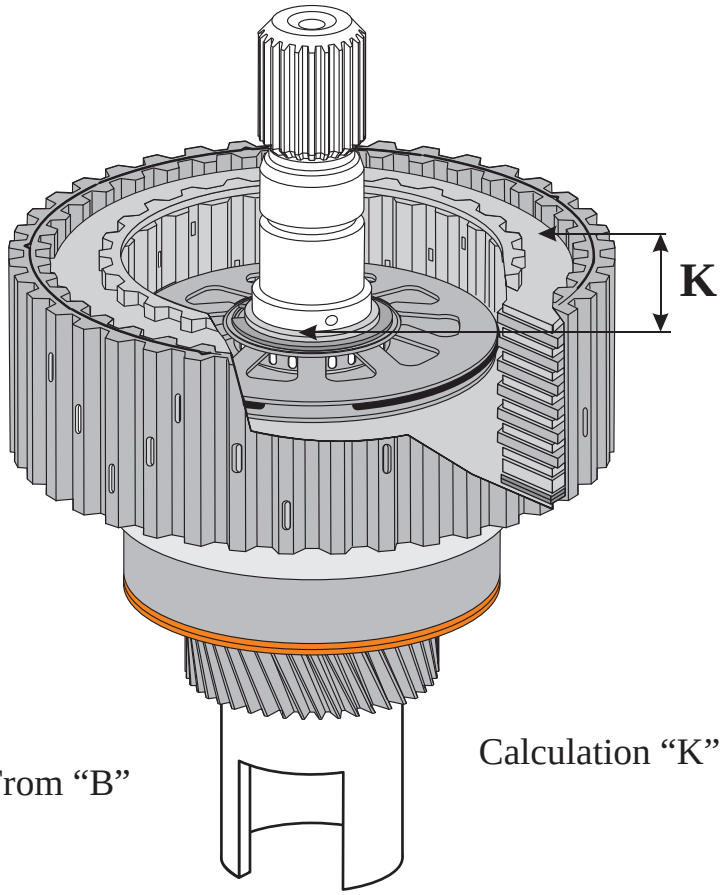
Figure 3

Forward Clutch Drum Assembly Update

Measurement “B”
(calculate average of four measurements)



Place 2 Rulers 1 Each Onto
2 Of The 4 Calipers
With Digital Depth Gauge
Measure From Top Of Rulers
To Top Of Thrust Plate Contact Surface
(measurements should be taken
on both side of shaft then rulers should
be moved 90 degrees and repeat)



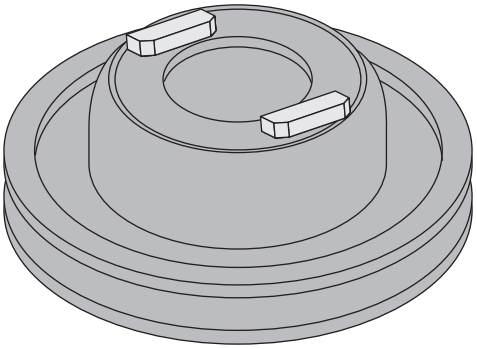
Calculation “K”

Subtract Calculated Measurement “A” From “B”
To Obtain Clutch Distance “K”

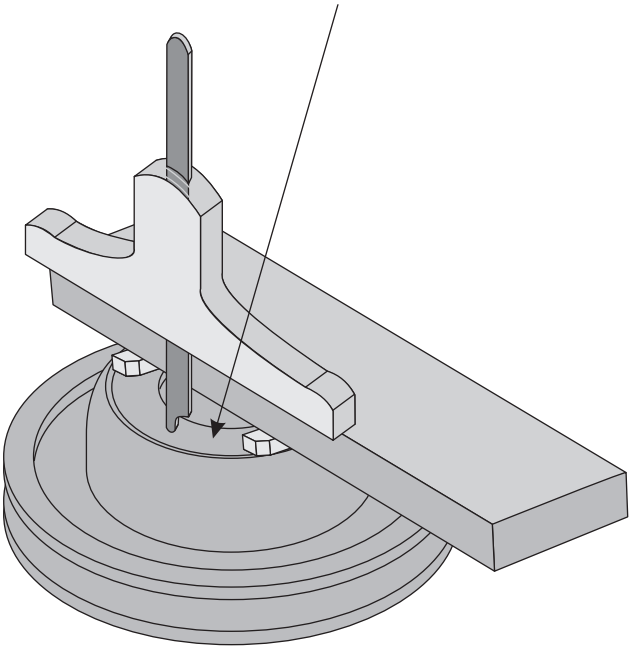
Figure 4

Forward Clutch Drum Assembly Update

(use 2 calipers)

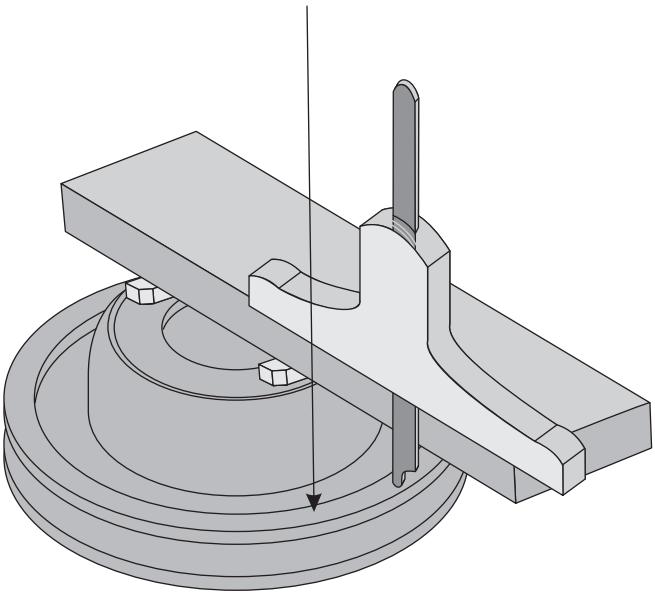


Place 1 Ruler Onto 2 Calipers
With Digital Depth Gauge
Measure From Top Of The Ruler
To Top Of The Forward
Piston Upper Running Surface
(move ruler120 degrees and repeat
for a total of 3 measurements)



Measurement “A”
(calculate average of three measurements)

Place 1 Ruler Onto 2 Calipers
With Digital Depth Gauge
Measure From Top Of The Ruler
To Top Of The Forward
Piston Lower Running Surface
(move ruler120 degrees and repeat
for a total of 3 measurements)



Measurement “B”
(calculate average of three measurements)

Subtract Calculated Measurement “A” From “B”
To Obtain Clutch Distance “D”

Figure 5

Forward Clutch Drum Assembly Update

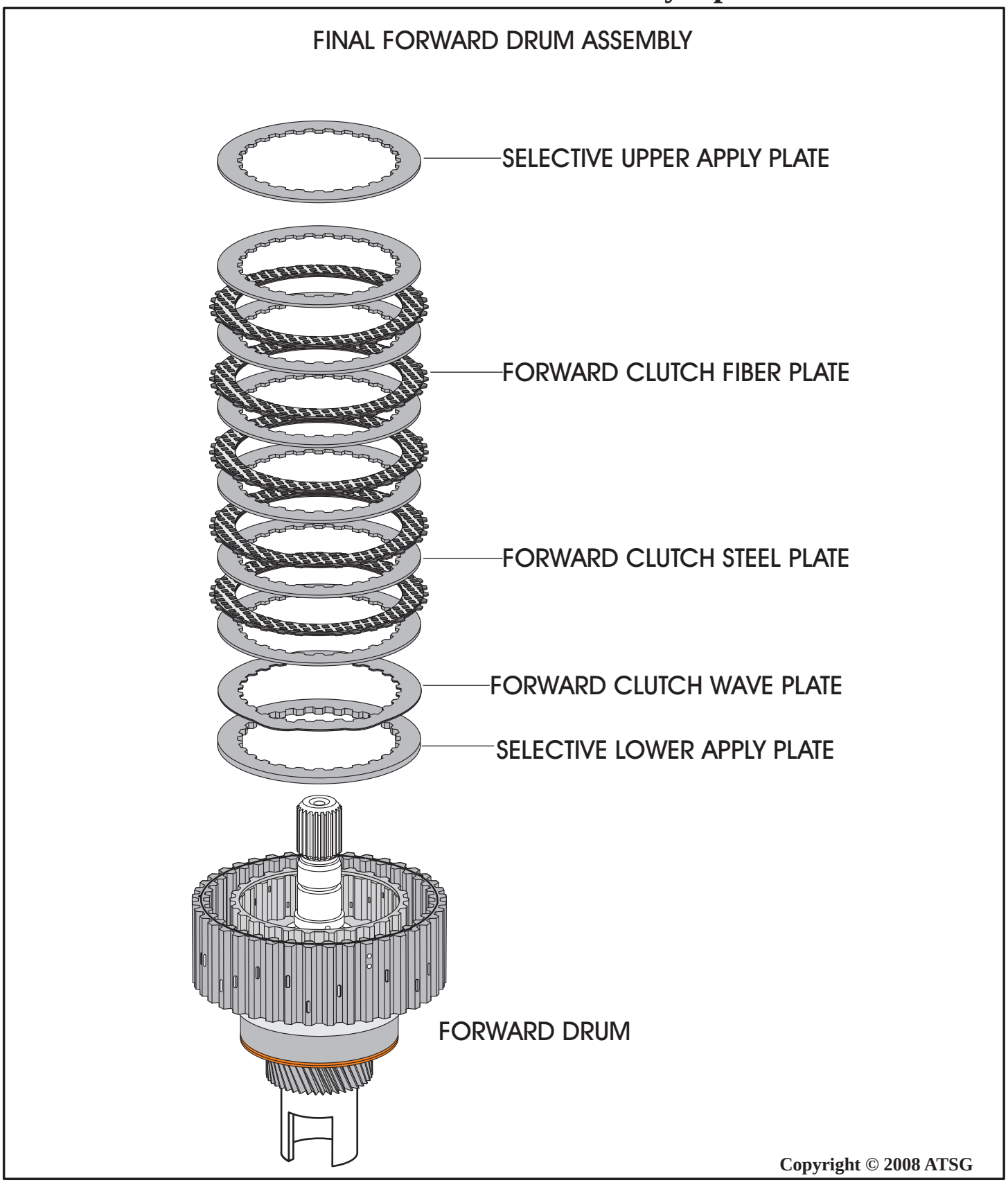


Figure 6

ATSG 01J TOOL KIT
INSTRUCTIONS

DESCRIPTION	01J PINION SHAFT NUT TOOL	PART No.	G-01J-01
			

DESCRIPTION	01J PINION SHAFT PULLER	PART No.	G-01J-02
			

DESCRIPTION	01J RELEASE OIL SCREW TOOL	PART No.	G-01J-03
		. 	

DESCRIPTION	01J DIFFERENTIAL SEAL ASSEMBLY TOOL	PART No.	G-01J-04
			

DESCRIPTION	01J SEAL ASSEMBLY TOOL	PART No.	G-01J-05
.. 			

DESCRIPTION	01J INPUT SPEED SENSOR PULLER	PART No.	G-01J-06
			

DESCRIPTION	01J PINION SHAFT DISASSEMBLY TOOL	PART No.	G-01J-07
 			

DESCRIPTION	01J INPUT SHAFT NUT TOOL	PART No.	G-01J-08
			

DESCRIPTION	01J PINION SHAFT ASSEMBLY TOOL	PART No.	G-01J-09