



# Technical Service Information

## 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 too 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).



# Technical Service Information

## AUDI 01J

### DELAYED FORWARD ENGAGEMENT/SHUDDER ON TAKE OFF

#### **CORRECTION** *continued:*

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 threaded 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 carefully guides 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.



# Technical Service Information

## AUDI 01J

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#### **CORRECTION *continued:***

##### ***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 360° 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.



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## AUDI 01J

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#### **CORRECTION *continued*:**

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 65°C.
2. With the ATF at a minimum 65°C, 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 load 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. Completed adaptations 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



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##### 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*

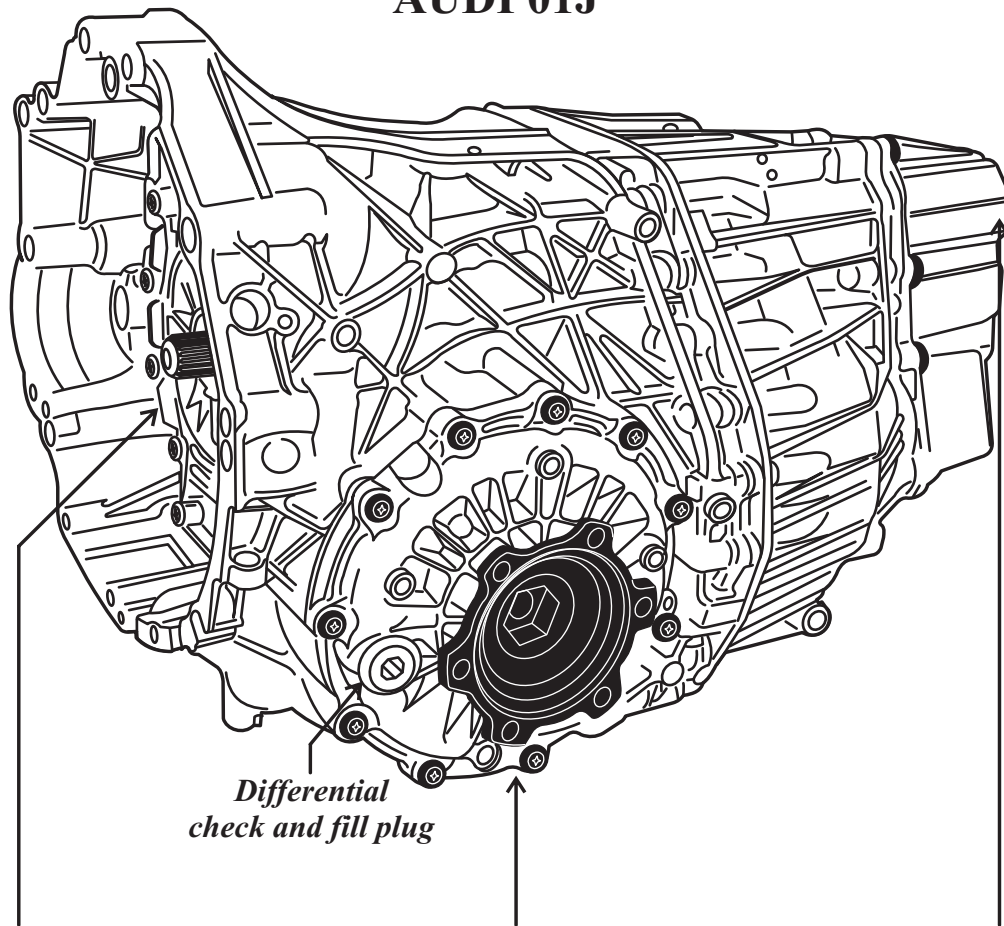
\* ATSG is the exclusive North and South America Dealer for this aftermarket tool kit.

##### 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***

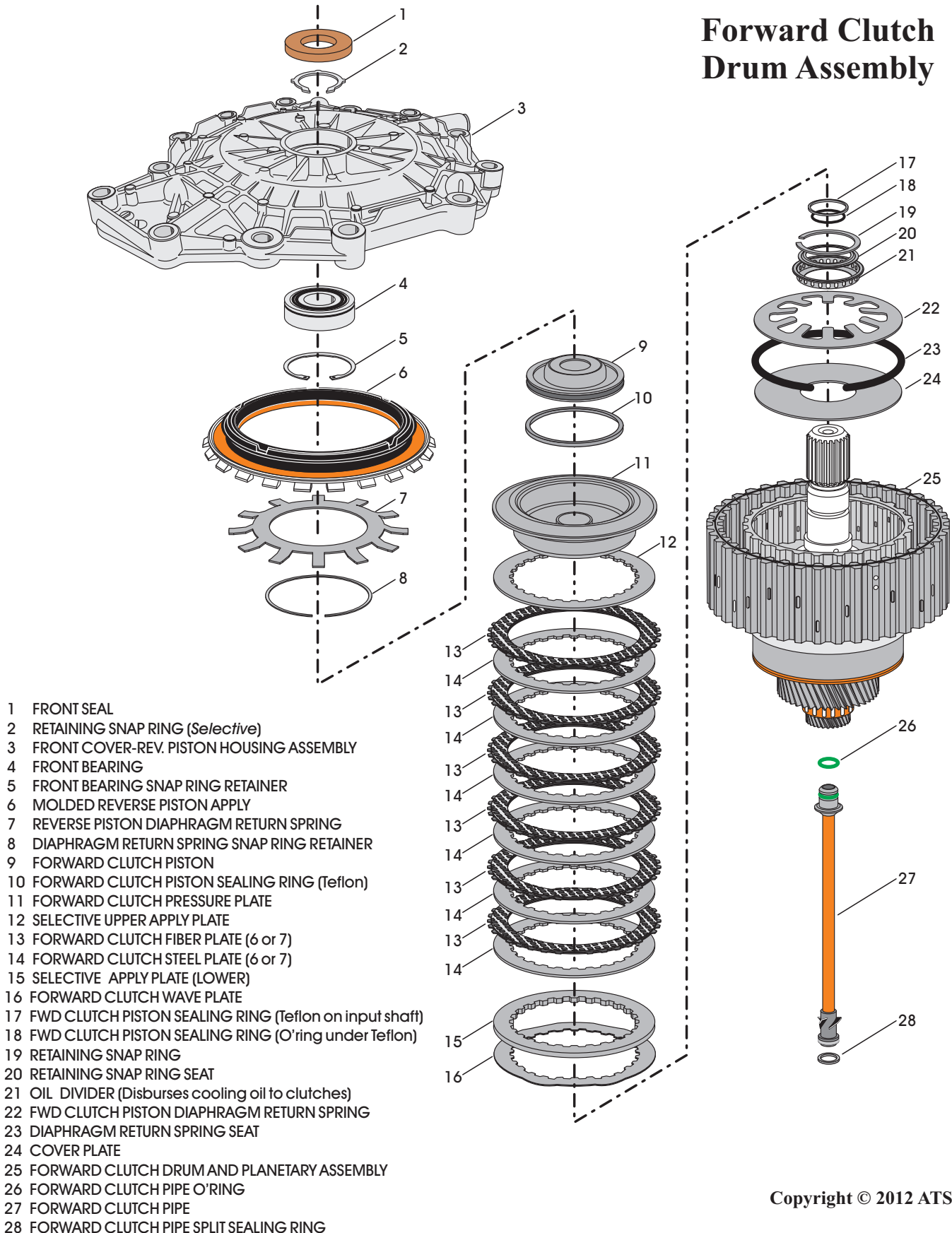
The front differential in the transmission receives approximately 1.3 liters of SAE75 W90 synthetic fluid and is filled through the check plug as seen above. The vehicle must be driven to heat the gear oil to approximately 60°C. Allow the vehicle to sit for 5 minutes giving the gear oil time to settle. 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.

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Figure 1

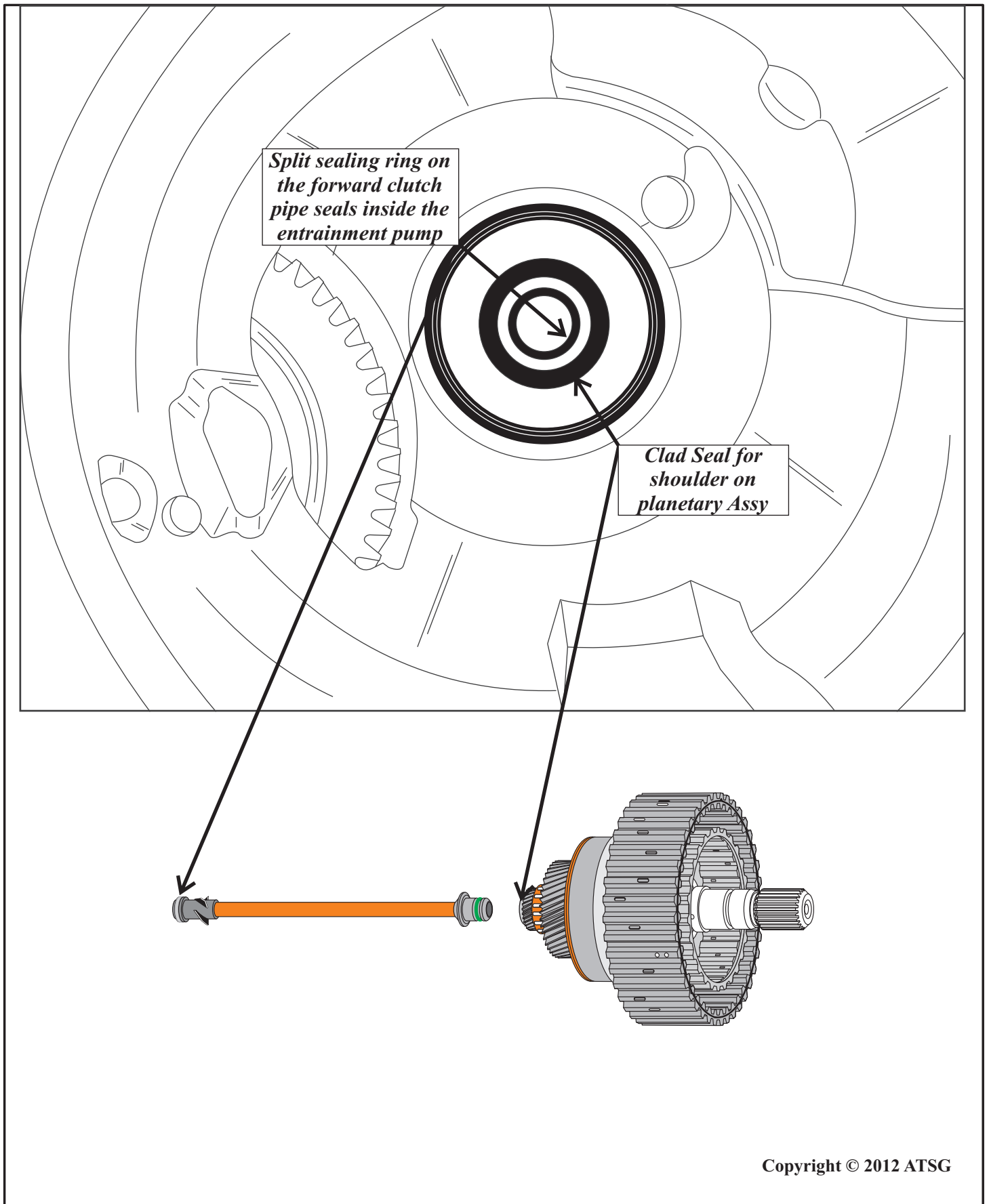


## Forward Clutch Drum Assembly



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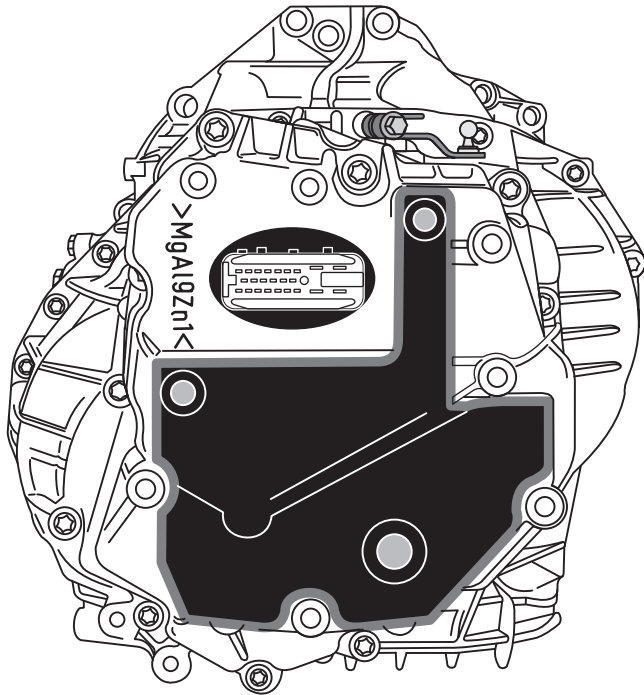
Figure 2



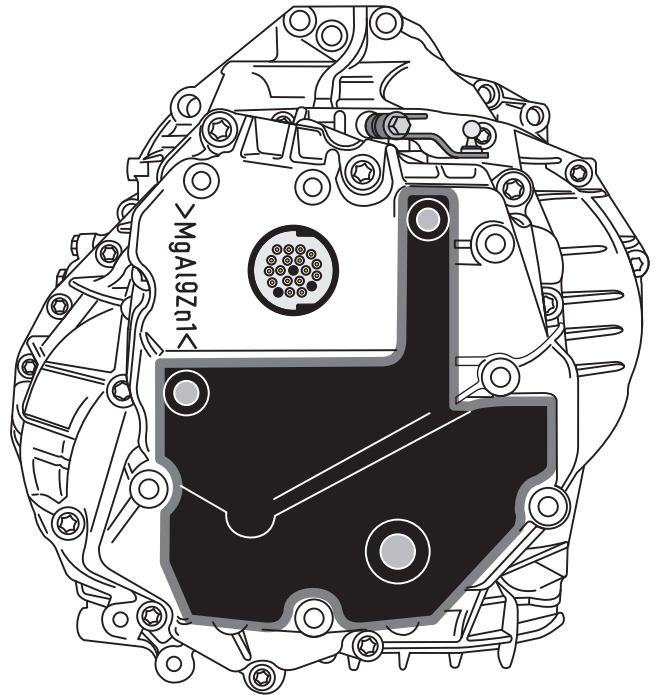
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Figure 3

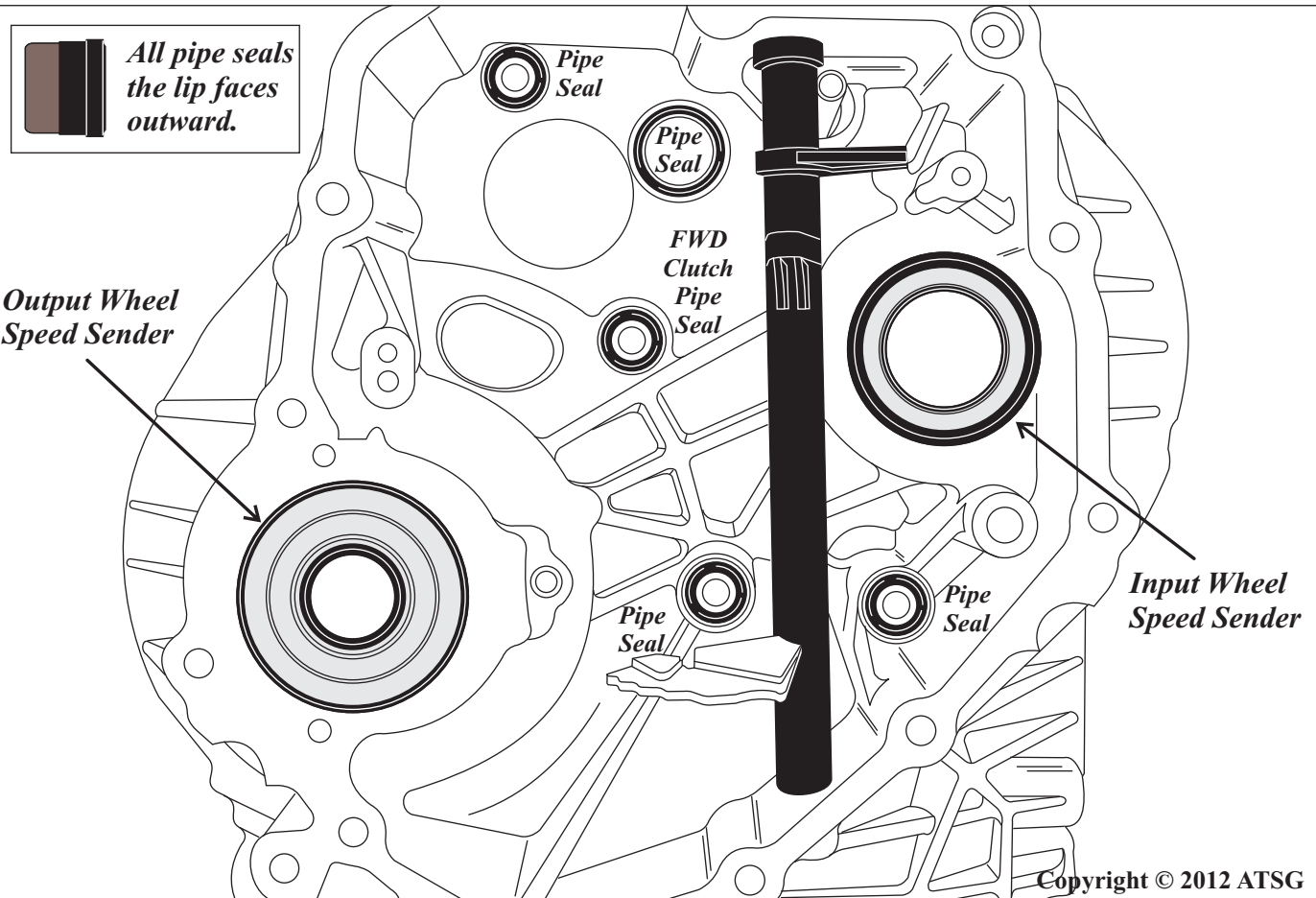




*Early Cover View*

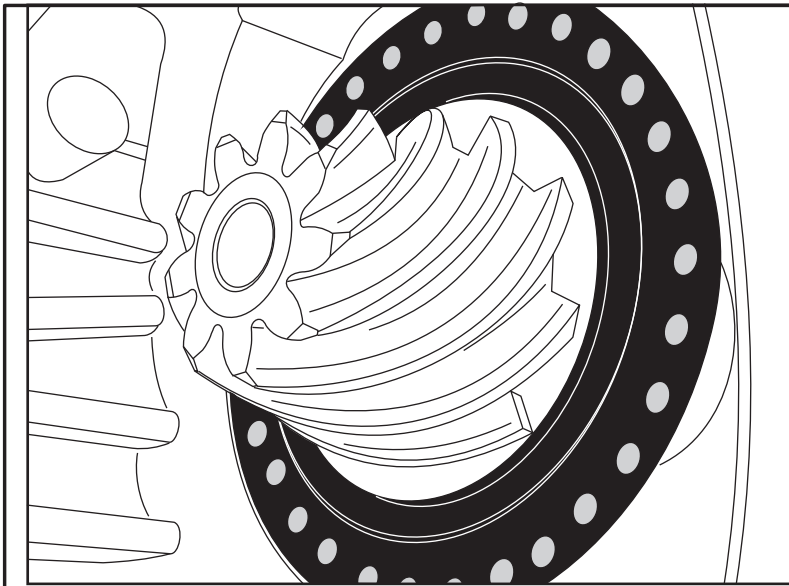


*Late Cover View*

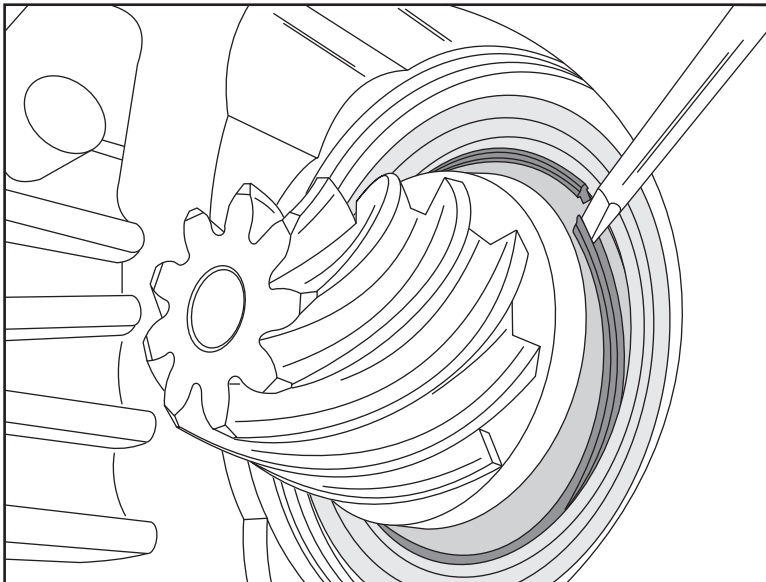


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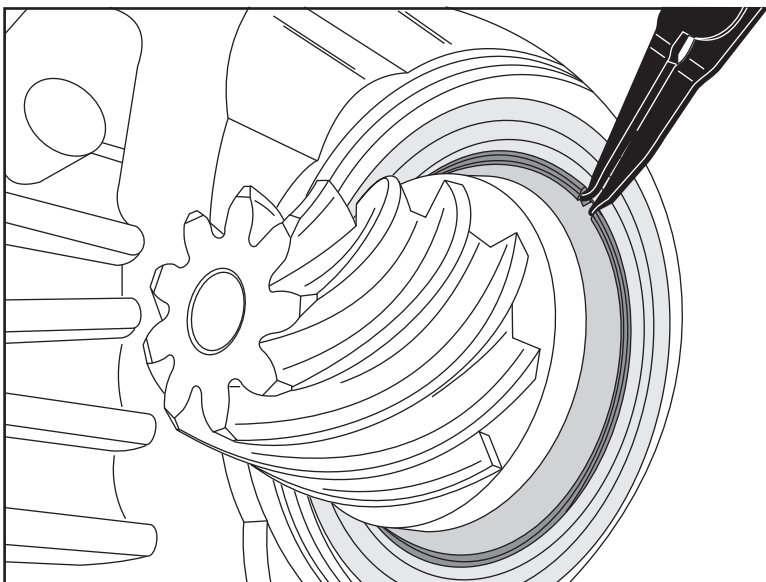
Figure 4



*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.*

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Figure 5

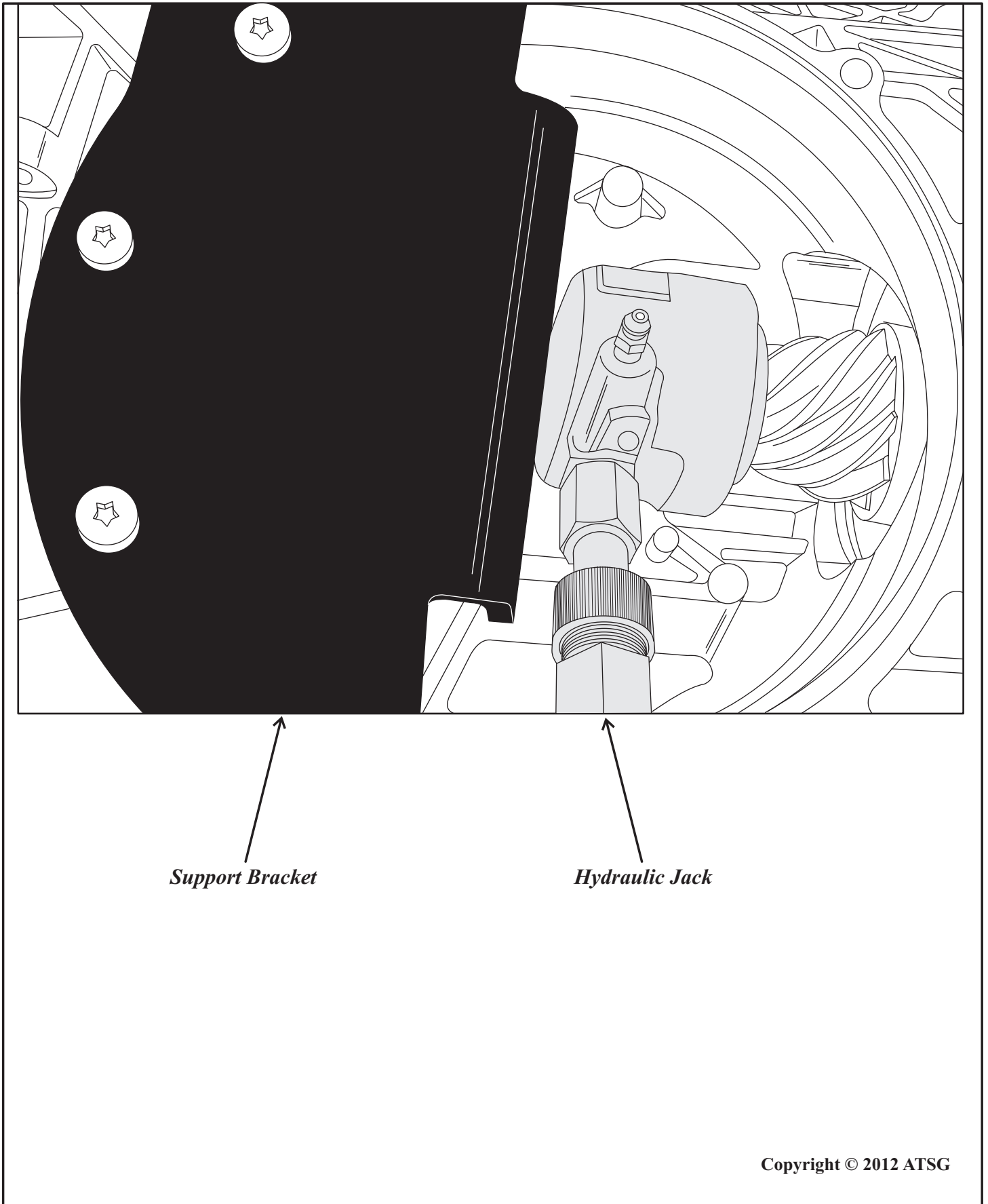


Figure 6

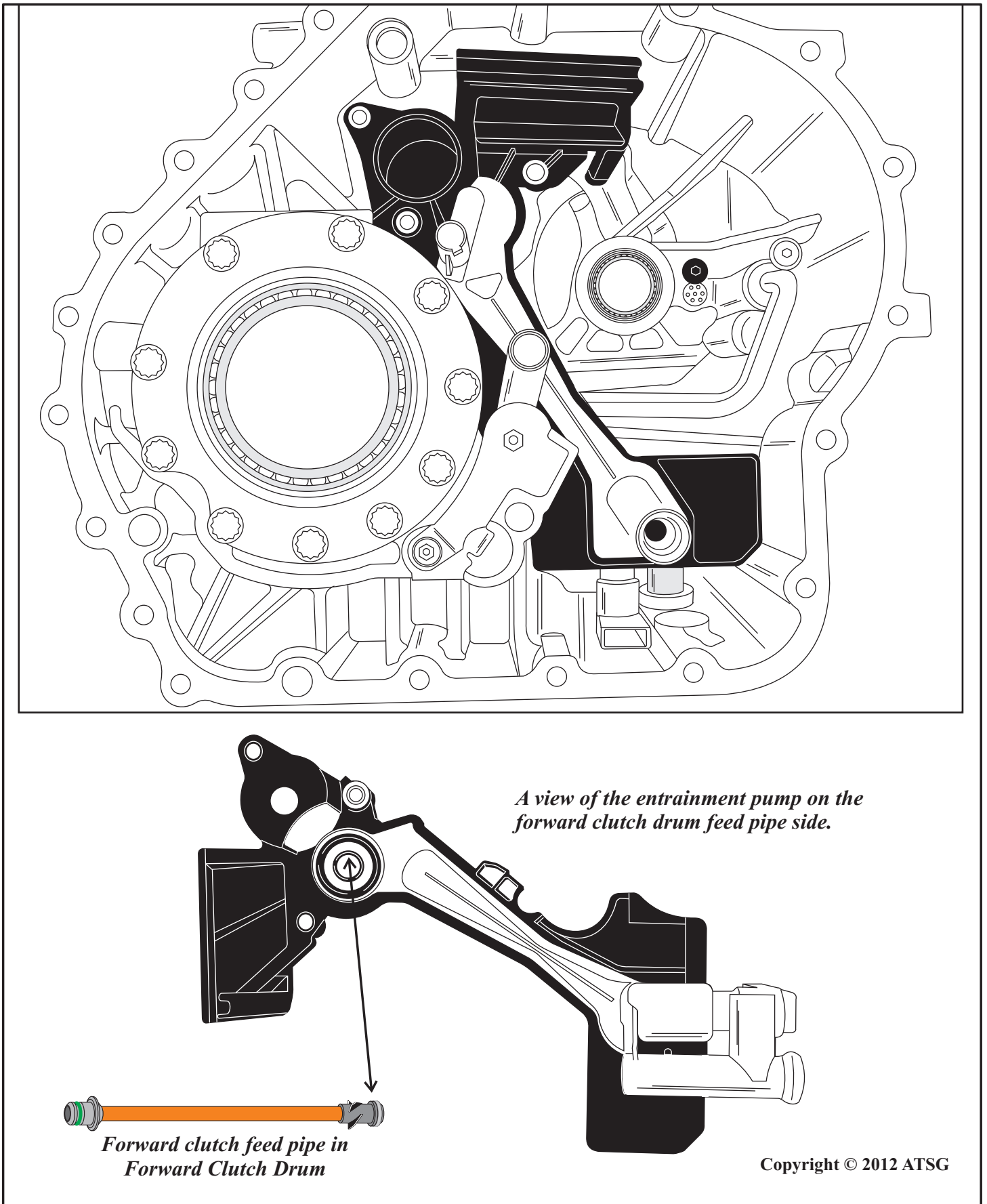
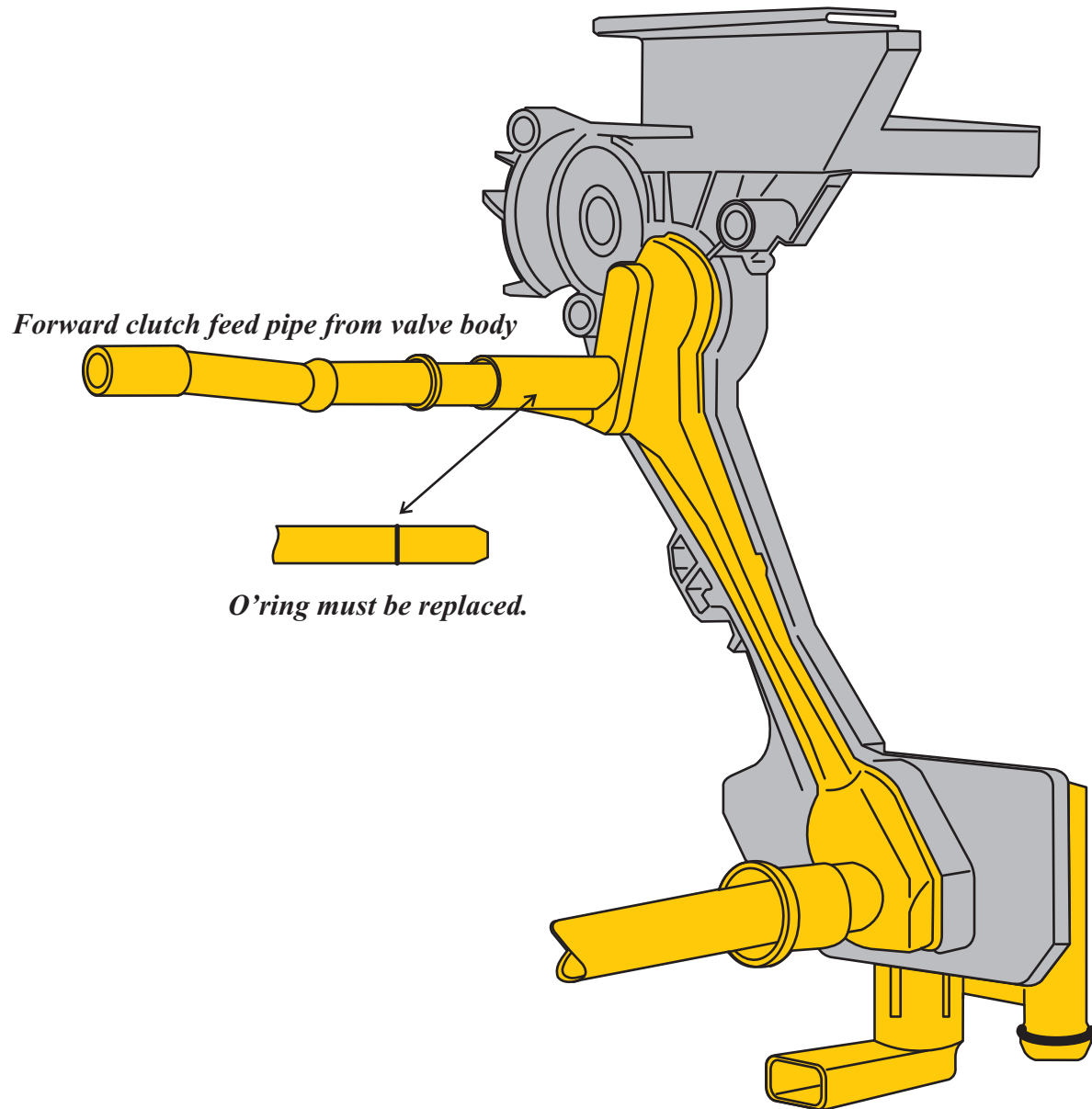


Figure 7

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



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Figure 8



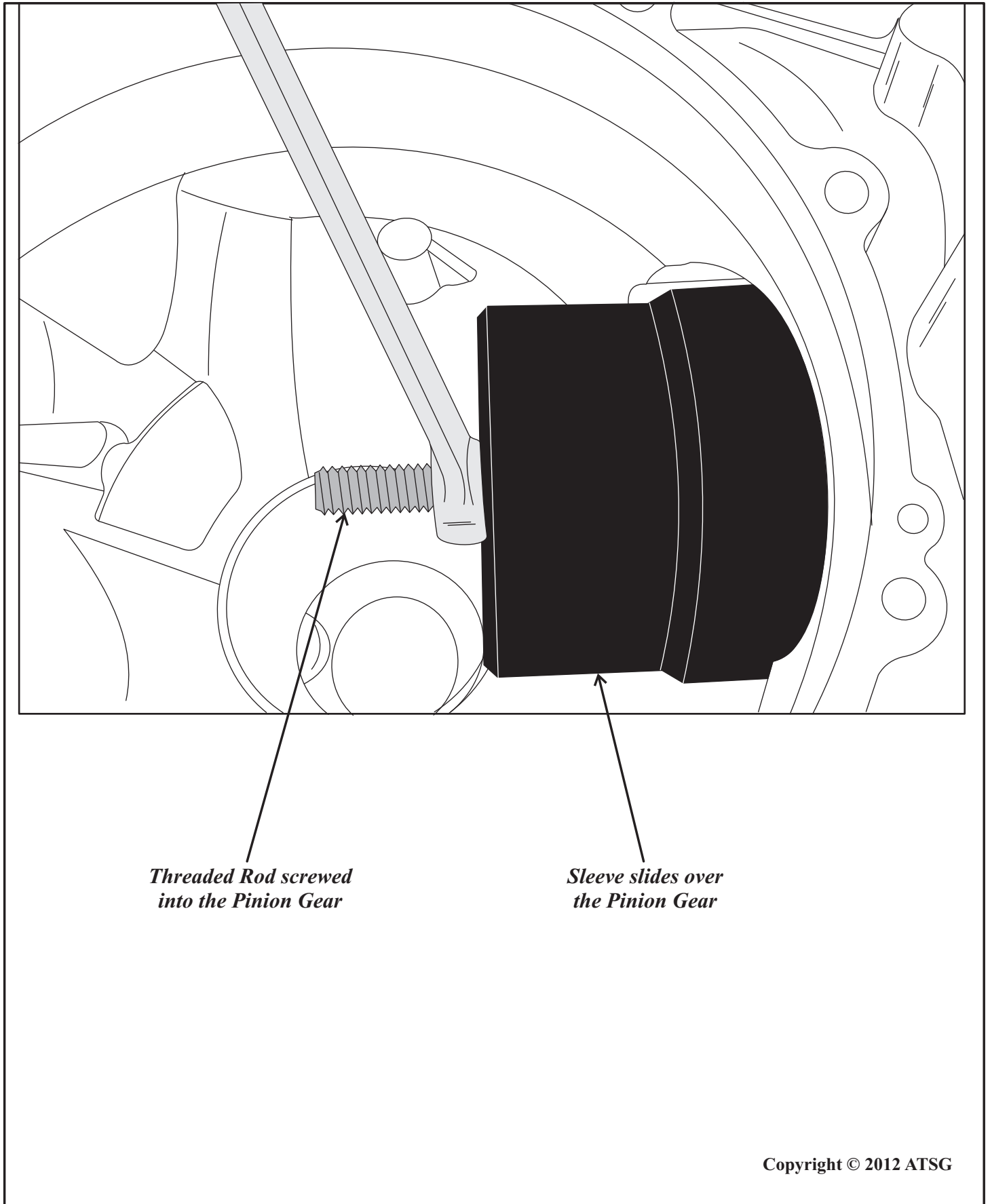
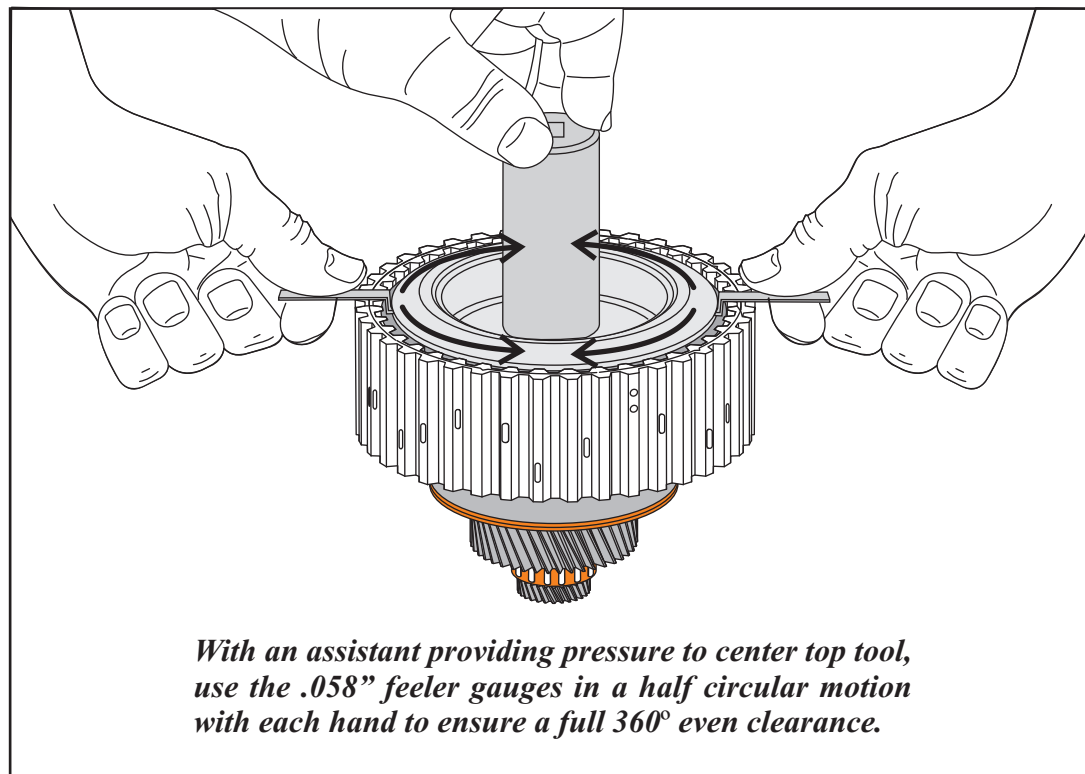
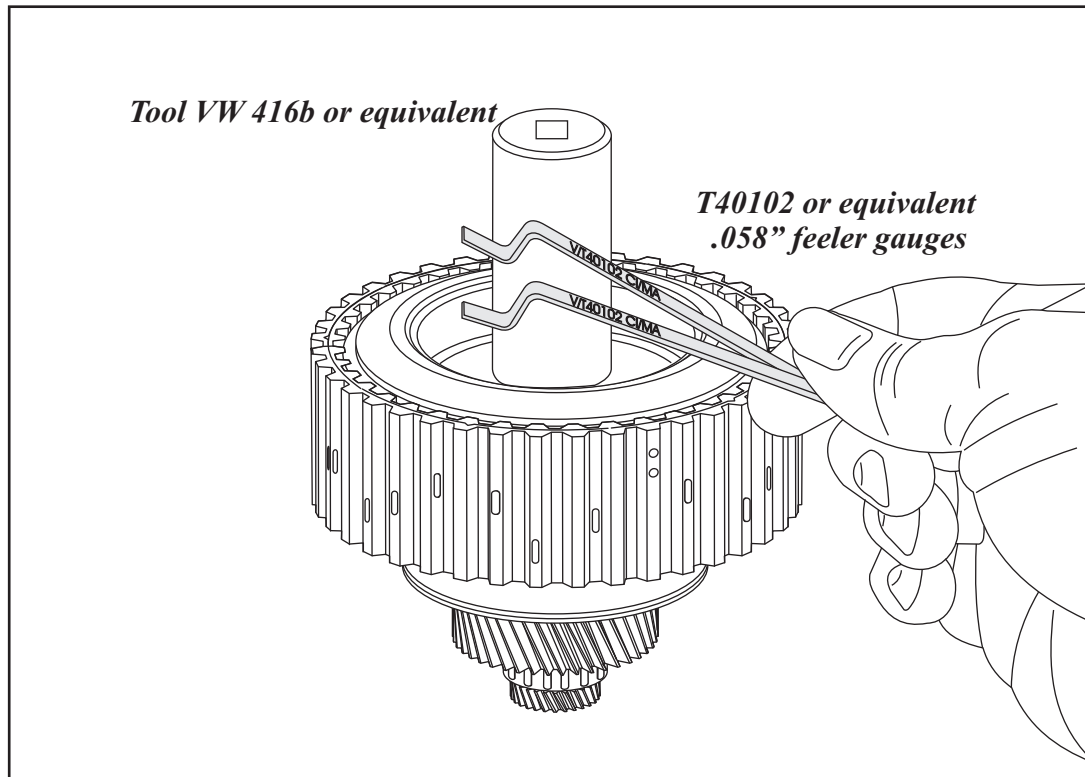


Figure 9



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Figure 10  
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