# SECTION TR

# Transmission

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**General Instructions**


**Detailed information on standard workshop and safety procedures, and general servicing operations is not included in this manual, which has been prepared to assist qualified service personnel. ODG assumes no responsibility or liability for PERSONAL INJURY or VEHICLE DAMAGE which results from any servicing procedure performed, including those instructions outlined in this manual. Before performing a servicing operation, an individual must have determined to his/her satisfaction that a personal injury or vehicle damage will not result from the servicing procedure or tools selected.**


**All transmission work should be performed by a qualified mechanic. Severe damage and/or reduced performance can result from an improperly serviced transmission.**


**Do not attempt to move the gearshift from the neutral starting position until the engine idles down completely. The Argo is equipped with an automatic clutch that is activated by engine speed. If the engine idle speed is too high, the transmission will grind during gear engagement.**

## Transmission Oil

### Maintenance Schedule

The transmission oil should be changed after the initial 25 hours of vehicle operation. After this, it should be changed every 150 operating hours.


**Proper transmission lubrication will reduce wear, and extend gearbox life. Please use the type, and quantity of transmission oil specified below.**


**Inspecting the condition and level of oil in the transmission must be done on a regular basis.**

**Do not operate the ARGO if the transmission oil level on the dipstick is above or below the grooved indicator. Damage to the transmission or a reduction in vehicle performance could occur.**

### Recommended Oil Type

**Oil Type**: 80W90 Gear Oil HYPOY-C or an EP Rated 80W90 Gear Oil for Extreme Pressure Gear applications.

Using any other than the recommended oil could cause serious damage to the transmission components. The approximate refill capacity of the ARGO transmission is 0.85 Liters (1.5 imperial pints, 1.8 U.S pints). However, be sure that it is filled to the full mark on the dipstick. DO NOT OVERFILL.

### Oil Level Inspection

Inspect the transmission oil on a daily basis.

**CAUTION**

**Do not run the ARGO if the oil level in the transmission shows above or below the mark on the dipstick. Damage to transmission components could occur.**

### Checking the Transmission Oil Level

### (34-100)

Check the transmission oil level every 50 operating hours. Some models of the ARGO are equipped with a transmission oil dipstick (Figure 6-4a). Clean the area around the dip-stick before removing. Remove the dipstick by pulling up.

The transmission oil level should be even with the mark on the dipstick as shown in Figure 6-4. Add 80 W 90 Gear Lube HYPOY-C through the transmission oil fill/dipstick hole until the transmission is filled to the correct level. DO NOT OVERFILL. Replace the dipstick securely.


Figure 6-4a. 34-100 Transmission showing dipstick and drain plug locations

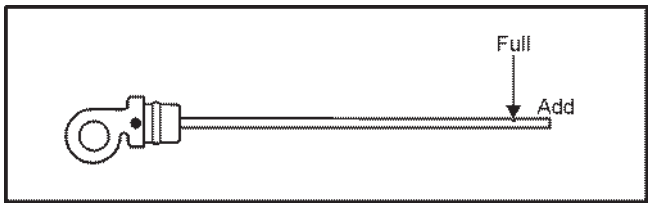



*Figure 6-4. Transmission dipstick.*

### Checking the Transmission Oil Level

### (34-200)

HDi (Admiral) transmission models do not have an oil dipstick. Check for correct oil level by viewing the site glass installed to the lower portion of the transmission housing (Figure 6-4b). To view this site glass, remove the quick release firewall. Oil filling half the site glass indicates correct oil level.

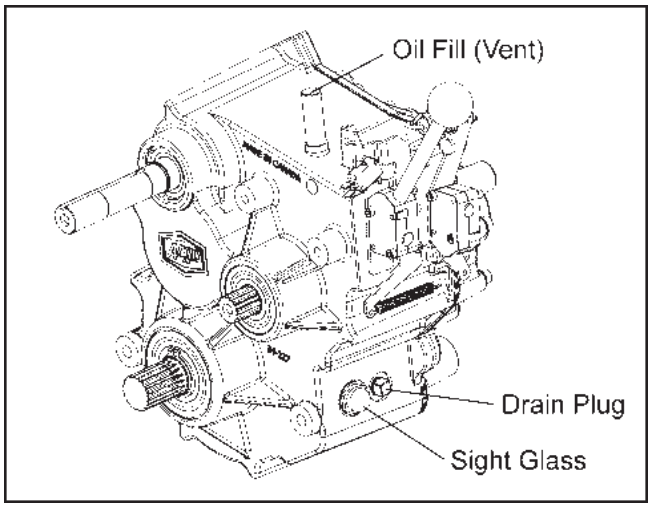



Figure 6-4b. 34-200 Transmission showing drain plug location

**Changing the Transmission Oil - 34-100**

Remove firewall to access the drain plug located at the bottom of the transmission. See figure 6-4a. Drain the transmission oil into a suitable container and dispose of the oil at a disposal site.

While draining the transmission oil, be sure to clean off any metal particles that are on the magnet of the drain plug. These fine metal particles are a result of the transmission gears meshing during the initial break-in period. Re-install the plug and tighten it securely.

**Refilling the Transmission - 34-100**

Refill the transmission through the oil fill/dipstick hole. Oil capacity for all transmissions is 38.7 oz.( 1.1 L) of 80 W 90 Gear Lube HYPOY-C. As you refill the transmission, check the oil level with the dipstick. Check that the oil level is even with the mark on the dipstick, after it has been seated fully in the dipstick hole. DO NOT OVERFILL.

Overfilling may result in oil being forced out the breather hole that could contaminate the brake pads and lead to brake failure.

**Changing the Transmission Oil - 34-200**

Removing the oil from the Admiral transmission requires the use of a vacuum style pump such as the 638-02 Big Boy, Top Sider (available from Ontario Drive and Gear). Due to the design of the Admiral transmission, the majority of the oil in the case will be below the drain plug.

Remove the drain plug (Figure 6-4b) and drain the oil until the flow stops. Insert the vacuum tube of the Big Boy Vacu-Pump into the drain plug hole and remove the remaining oil from the transmission sump.

**Refilling the Transmission - 34-200**

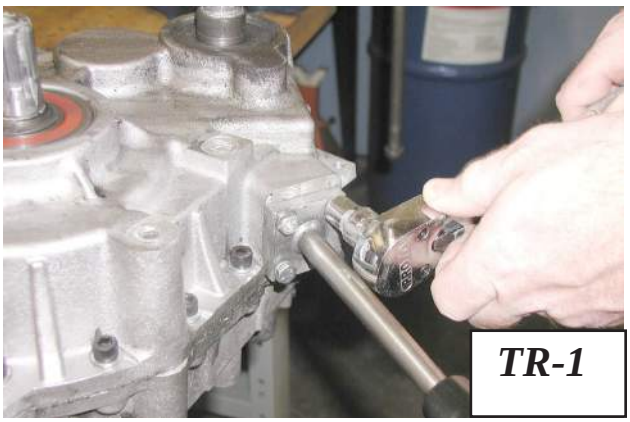
Install the drain plug. Remove the fill/vent plug located on the top of the transmission. Fill the transmission with 80W90 Gear Lube HYPO-C. Fill the transmission until the sight glass is half full. For Oil capacity see Oil Capacity Chart (Figure 6-5).

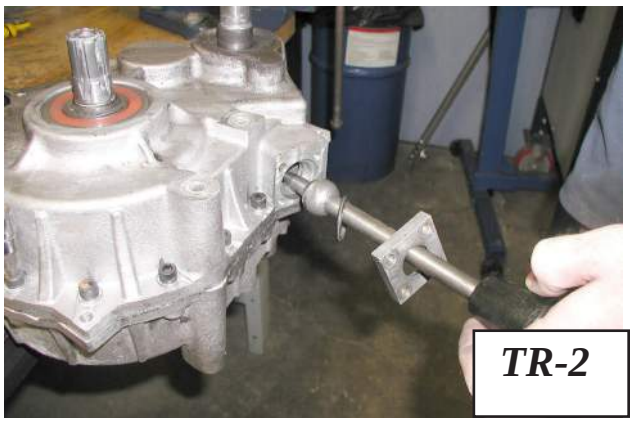
| Transmission Oil Capacity | |
|---|---|
| HDi (34-200) | 1.2 L |
| Avenger & Frontier (34-100) | 1.1 L |

Figure 6-5. Transmission Oil Capacity

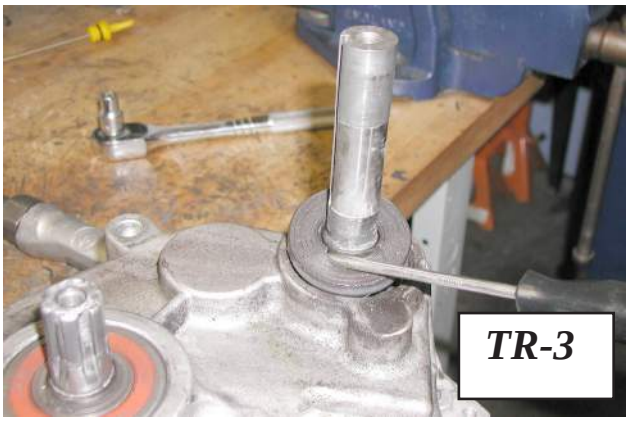
**Argo Transmission Disassembly - 34-100**

1. Drain oil and unthread the 4 fasteners securing the shifter lever assembly to top end of the transmission and remove the lever. ***Photo TR-1 & 2***


***TR-1***


***TR-2***

2. Remove all fasteners securing the housing halves together. There are 11 located on the input shaft side and 4 located on the opposite side. Ensure that all fasteners have been removed before proceeding to seperate the transmission housings.
3. Remove the oil seal from the input shaft. ***Photo TR-3***
4. Remove the retaining ring from the input shaft. ***Photo TR-4***


***TR-3***


***TR-4***

5. Remove the retaining rings from both output shafts. There may or may not be shims below the retaining rings. ***Photo TR-5***

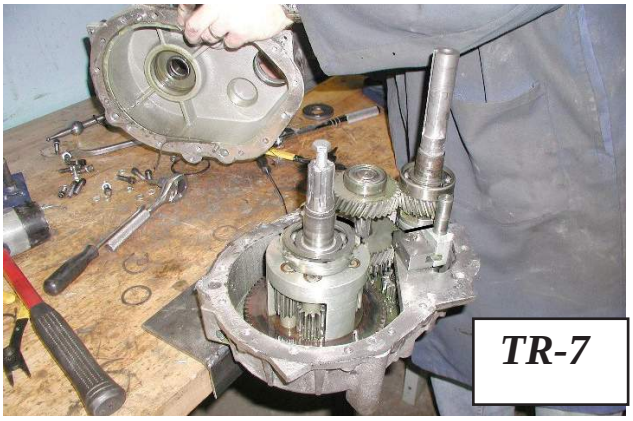
**Separating the Transmission**

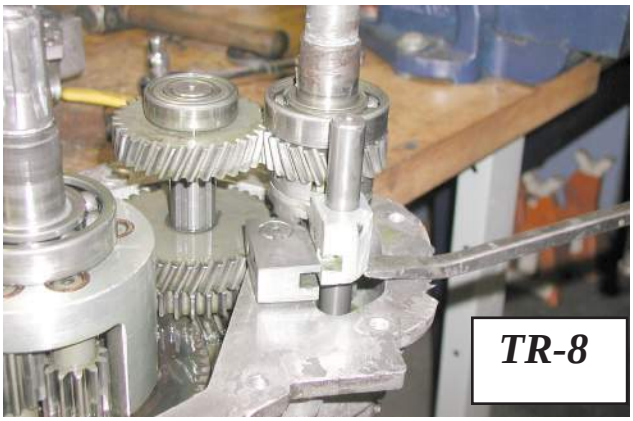
6. There are 3 threaded tab locations provided on the Avenger transmission housing (input shaft side). These locations are used to assist in separating the two halves of the transmission during disassembly. As 3 bolts are threaded into the housing, they come into contact with the opposite housing, pushing and separating the 2 halves. Thread each of these bolts a little at a time and in an uniform alternating pattern. **DO NOT** overtighten to avoid the risk of breaking the housing tab. Stop occasionally to tap the output shaft with a soft faced hammer. Repeat this until the cover has separated. ***Photo TR-6***

7. Pull the housing halve, up and off from the input shaft side. ***Photo TR-7***


***TR-5***


***TR-6***


***TR-7***

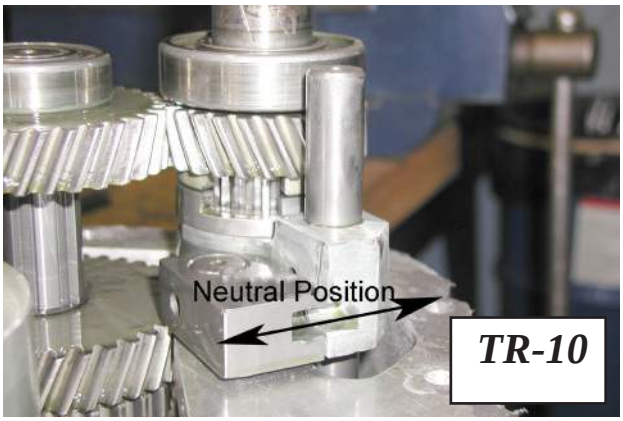

***TR-8***

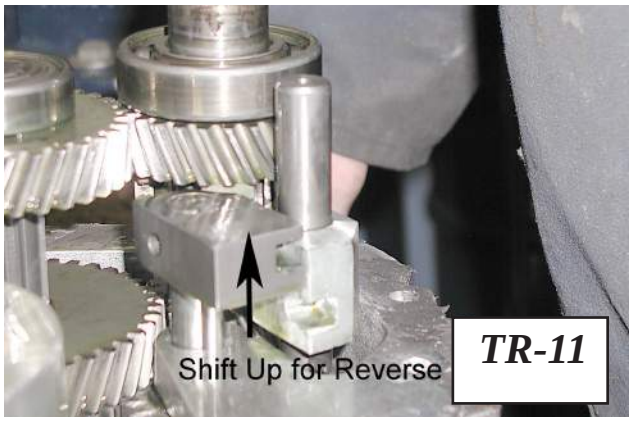
8. Shift to top position.(High Gear) and remove roll pin from the shift block on the high/ low shift shaft. ***Photos TR-8 & 9***


***TR-9***

9. Place shift shaft back into neutral. ***Photo TR-10***

10. Place reverse shift shaft into reverse. ***Photo TR-11***




11. Pull the input shaft from the transmission housing. ***Photo TR-12***

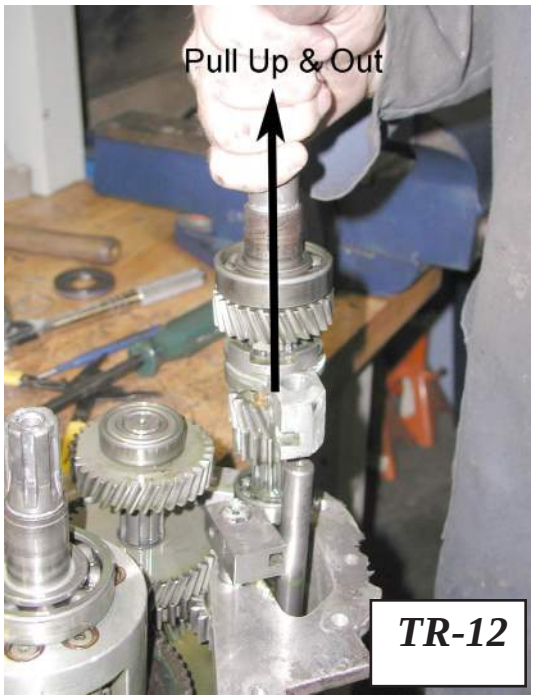
12. Remove the spline shaft drive gear assembly. ***Photo TR-13***

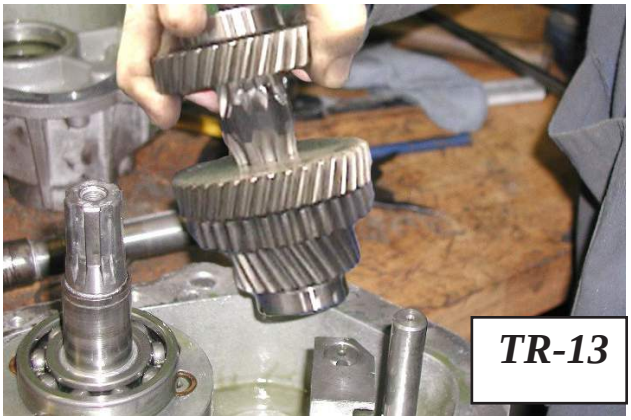
13. Remove the set screw securing the ball and spring within the housing at the hi/lo shift shaft assembly. ***Photo TR-14***

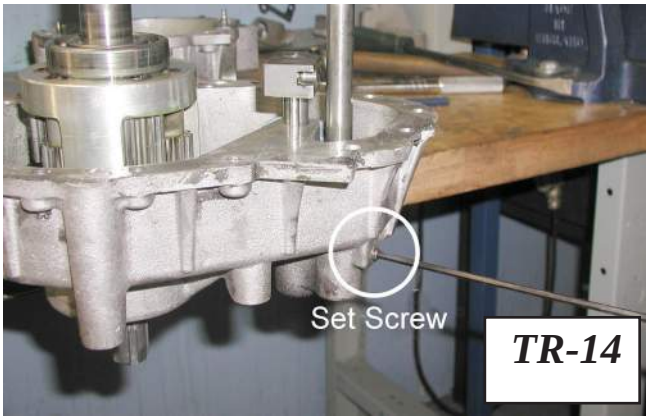
14. Remove the spring and steel ball.
    Photo ***TR-15 & 16***

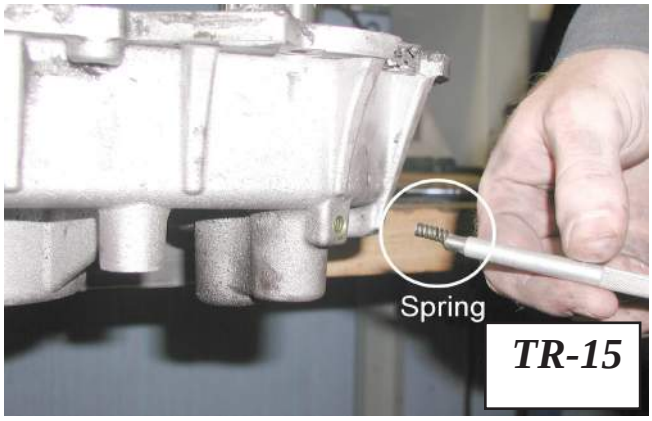
15. Place the reverse shift shaft block back down against the housing (out of reverse). ***Photo TR-17***

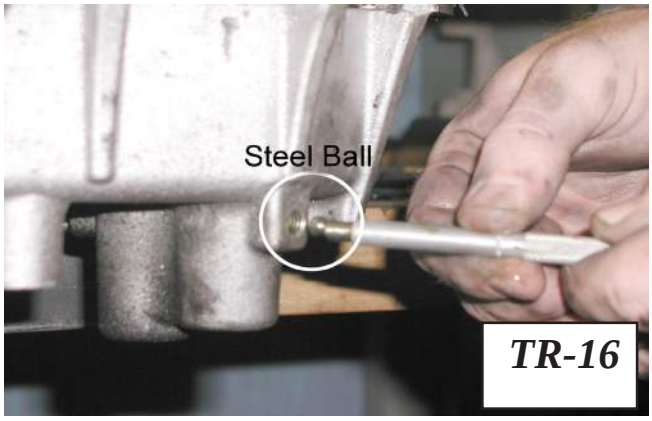
16. Remove the hi/lo shift shaft from the housing. ***Photo TR-18***

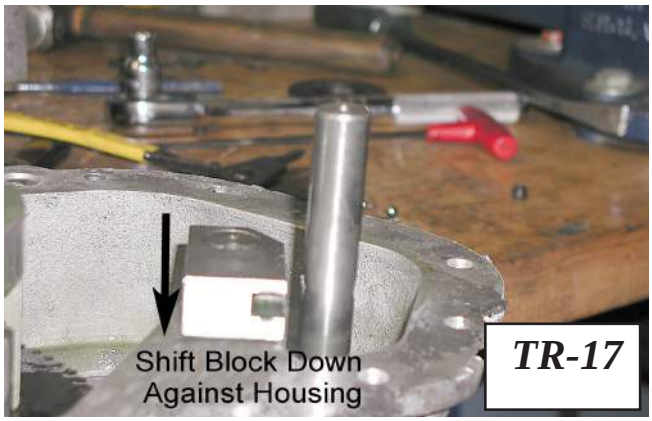


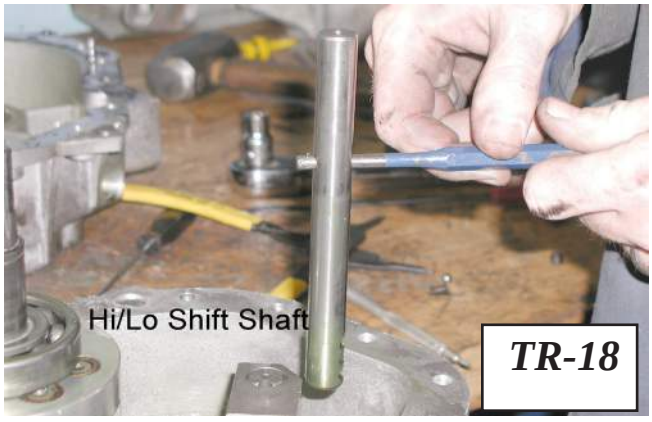



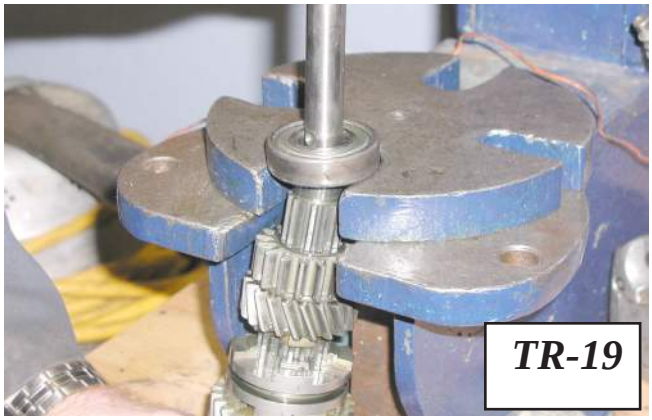


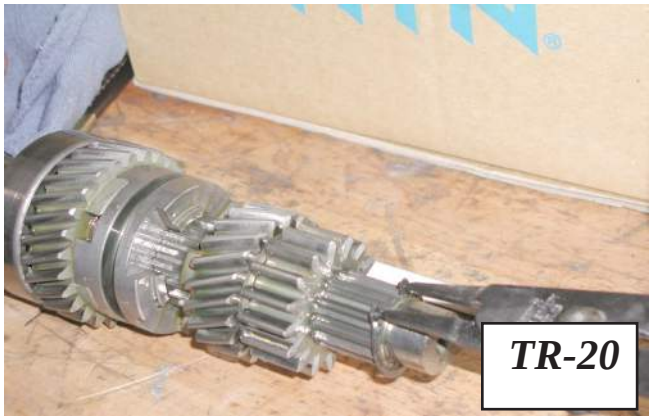




17. Using an arbor press, remove the smaller ball bearing from the end of the input shaft. ***Photo TR-19***
18. Remove the retaining ring at the reverse gear. ***Photo TR-20***



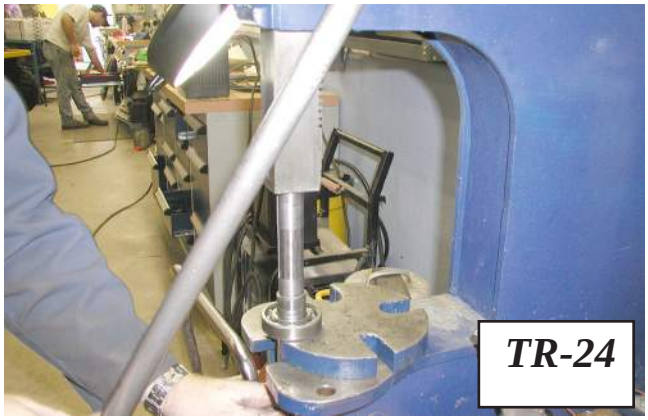




19. Remove the reverse and low gear from the input shaft at the arbor press. ***Photo TR-21***
20. Slip the dog clutch from the input shaft and remove the retaining ring & Thrust Washer found above the High Gear. ***Photo TR-22***
21. Slip the high gear from the input shaft, ***PhotoTR-22*** and remove the thrust washer and Retaining Ring found below it. ***Photo TR-23***


TR-21

TR-22

TR-23


TR-24

22. Remove the last ball bearing from the input shaft at the arbor press. ***Photo TR-24***

**Disassemble the Spline Shaft Drive Gear Assembly**

23. Remove the bearing and high gear from the spline shaft at the arbor press. ***Photo TR-25***

24. Remove low gear, reverse gear, drive gear and bearing from the spline shaft using the the arbor press. ***Photo TR-26***


TR-25

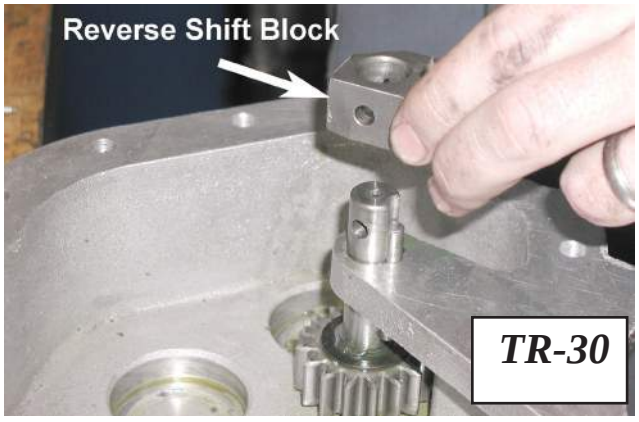

26. Press the differential from the housing at the arbor press. ***Photo TR-28***

**NOTE**

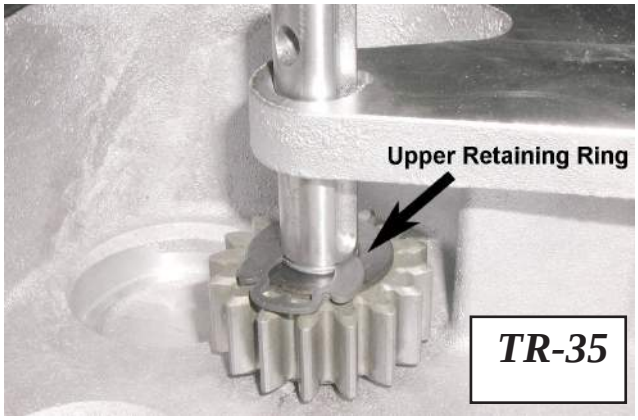
*The use of wood blocks beneath the housing prevents damage to the sealing edge of the casting as well as provides height for removing the differential.*



27. Disassemble the reverse shift shaft block by removing the roll pin securing it to the shaft. ***Photo TR-29 & 30***

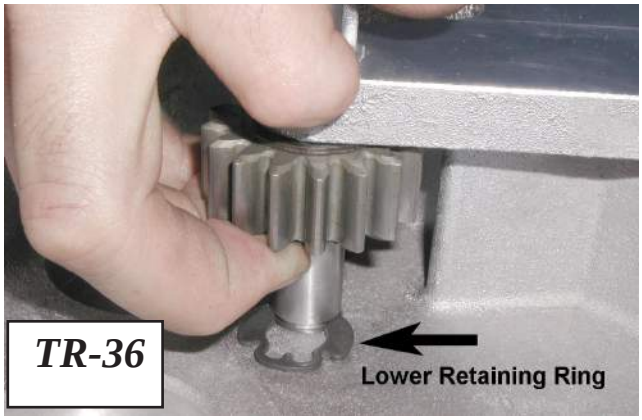


28. Remove the 3 steel balls located in the housing, between the hi/lo shift shaft and the reverse shift shaft. ***Photo TR-34***


29. To remove the reverse shift shaft and reverse idler gear from the housing, first remove the retaining ring located above the reverse idler. ***Photo TR-35***

30. Raise the reverse idler up and remove the retaining ring found below. ***Photo TR-36***





31. Pull the reverse shift shaft up and free from the housing. ***Photo TR-37***

32. Remove the Steel Dowel Pin from the reverse shift shaft.

**IMPORTANT**

**There is 1 Thrust Washer to the top side of the reverse idler gear and a Retaining Thrust Washer to the underside of the reverse idler gear**

33. Remove the reverse shift shaft from the housing. ***Photo TR-38***

34. Remove the last ball and spring from the housing. ***Photo TR-39***

*TR-38*


*TR-39*

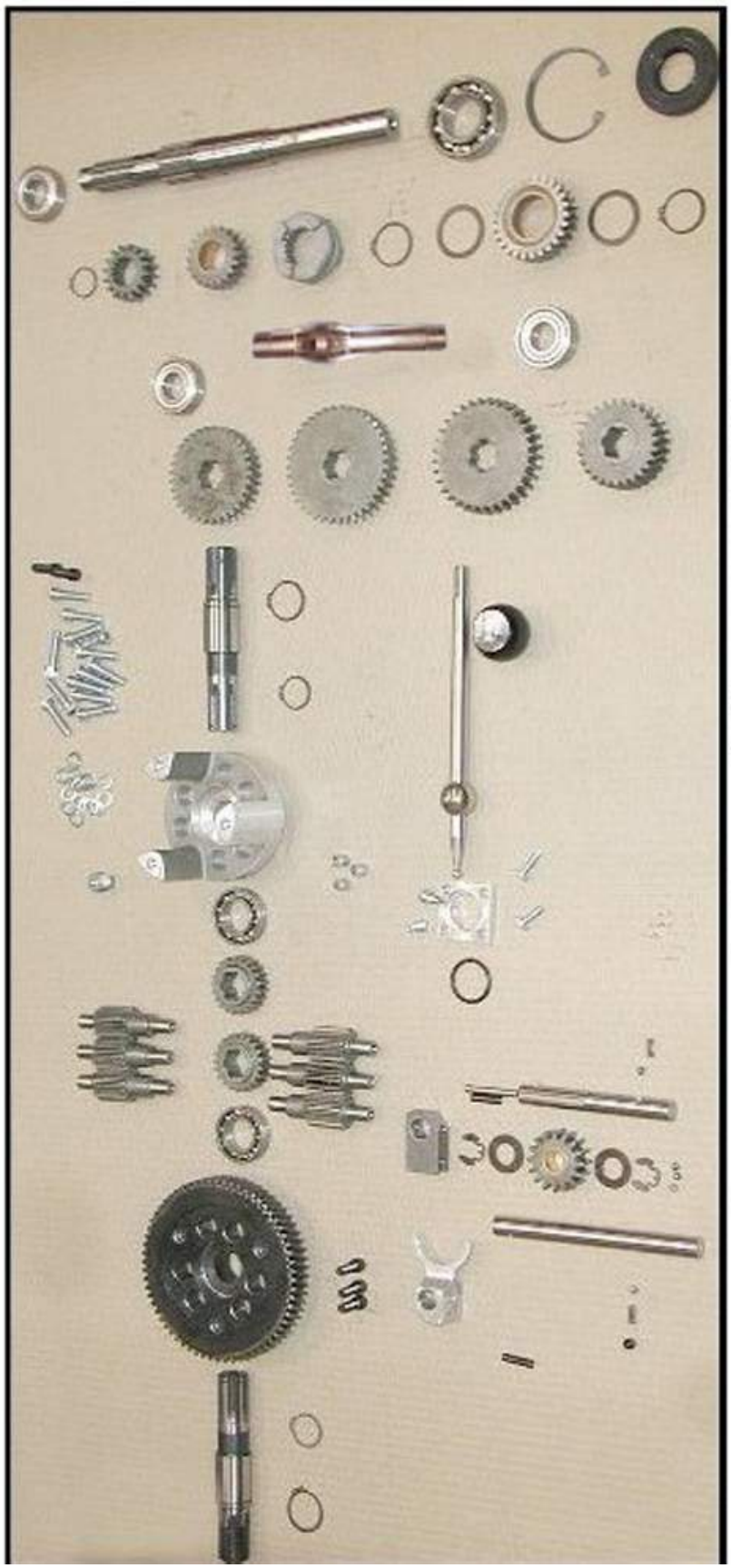
35. Remove all remaining Retaining Rings, Bearings and Seals from both the left and righthand side housings.

36. Wash and soak all components in a degreasing bath before inspection.

**Reassembling the Transmission**

1. Lay out all components of the AVENGER Transmission on a clean work surface. ***See Photo below and following page.***

Avenger Housing Assembly



Avenger Internal Components

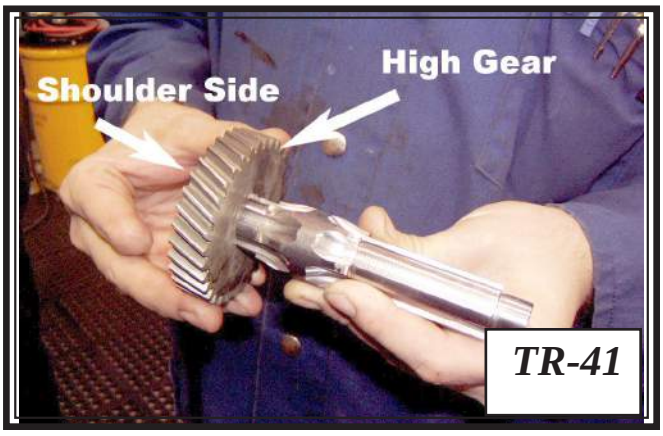
**Assembling the Idler Gear Bore Assembly**

1. Install the 34-109 High Gear to the short side of the 34-112 Splined Shaft. ***Photo TR-41***

**IMPORTANT**

**Install the High Gear with the machined shoulder up. See Photo TR-41**

2. Press the 101-01 Bearing to the High Gear end of the Splined Shaft with the shielded side facing out. ***Photo TR-42***



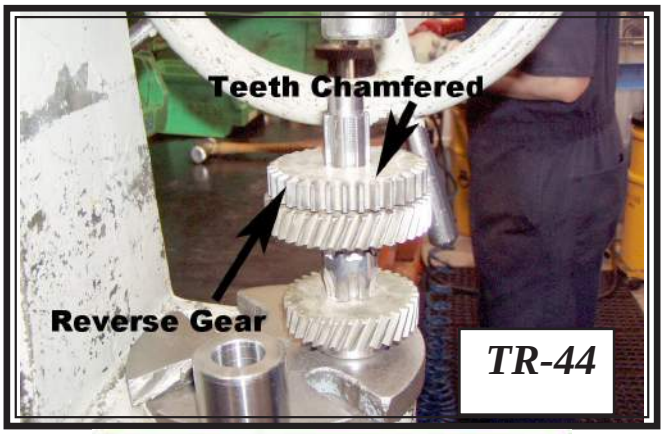



3. Install the 34-110 Low Gear to the opposite side of the Splined Shaft (long side). ***Photo TR-43***

**IMPORTANT**

**Install the Low Gear with the machined shoulder up.**

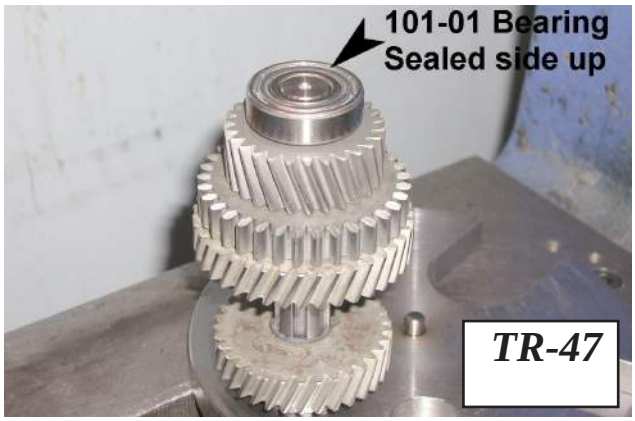
4. Slip on the 34-111 Reverse Gear up against the previously installed Low gear. ***Photo TR-44***




**IMPORTANT**

**The 34-111 Reverse gear must be assembled to the Splined Shaft with the chamfered teeth side facing up.** ***Photo TR-44***

5. Install the 34-123 Drive gear to the top of the previously installed Reverse Gear. ***Photo TR-46***


6. Press on the 101-01 bearing to the end of the shaft, shielded side up. ***Photo TR-47***

**IMPORTANT**

**See assembled component on the following page.**

**Do not install this 101-01 Bearing to the end of the shaft if the differential assembly has the high ratio 3.3 Gear Plate. This bearing should be installed to the housing at the same time as the 101-03 Bearing (step 16 of <u>Assembling Transmission Components to Housing</u> pg. TR-25). Interference between this Bearing and Gear Plate teeth will be apparent later on when installing along side the differential assembly if this is not observed.**

**Assembling the Input Shaft (Transmissions built prior to A5883)**

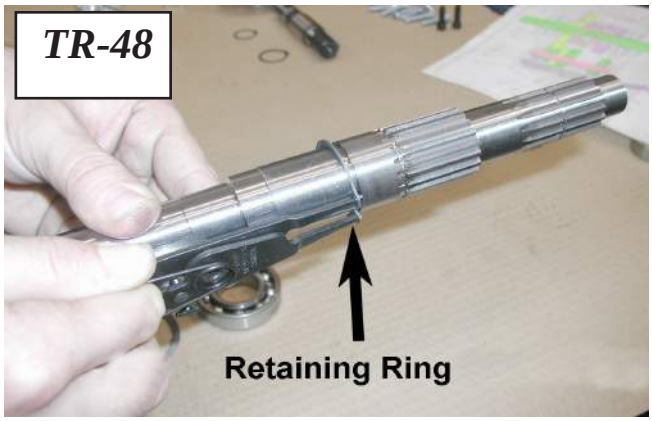
**For transmissions built <u>from</u> A5883 see Pages TR-35 for revised Input Shaft Assembly guidance.**

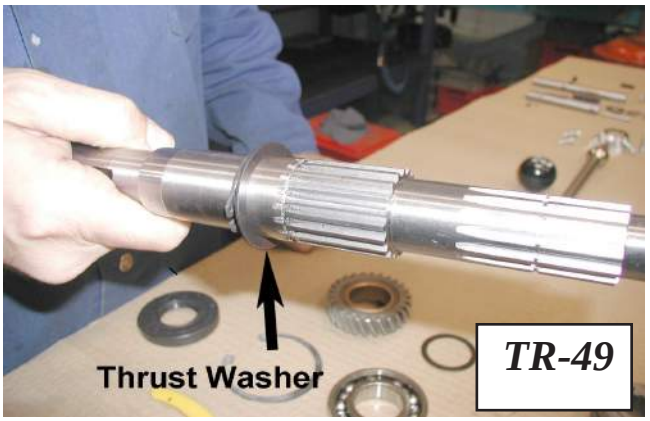
1. Install the 107-02 Retaining Ring to the 34-104 Input Shaft. ***Photo TR-48***

**IMPORTANT**

**Remember to do the comparison check of this retaining ring as described on page TR-9**

2. Slip a 108-79 Thrust Washer on to the Input Shaft and up against the previously installed retaining ring. ***Photo TR-49***



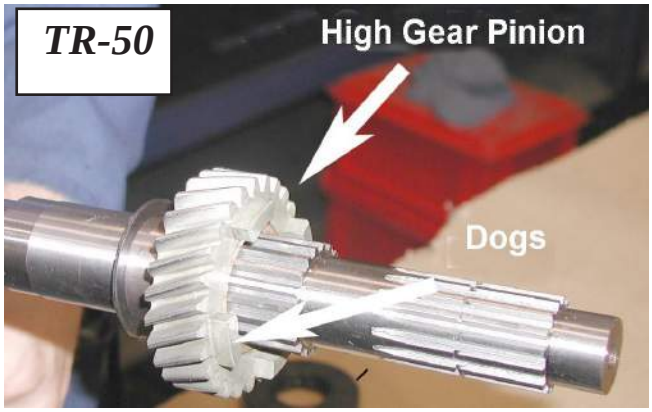

3. Slip the 34-105 High Gear Pinion (with 4 dog teeth), or 34-128 High Gear Pinion (with 3 dog teeth), up against the Thrust Washer. ***Photo TR-50***

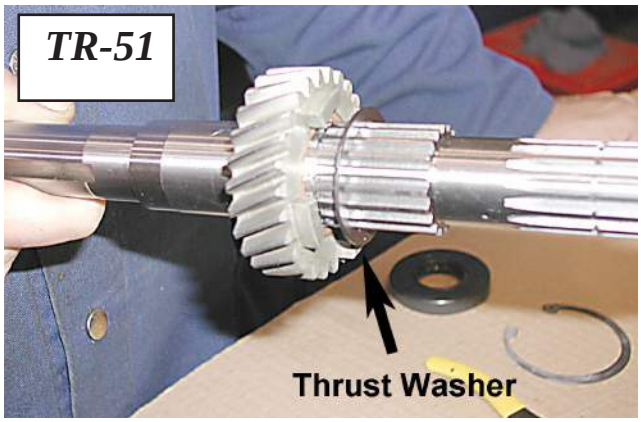
***See Note Regarding number of teeth on following page***

**NOTE**

*Transmissions manufactured prior to serial #A2856 utilize 4 dog teeth and from #A2856, 3 dog teeth.* ***Photo TR-50*** *Orient the the High Gear Pinion with the dog teeth facing up.*

4. Install the second Thrust Washer to the top of the High Gear Pinion. ***Photo TR-51***



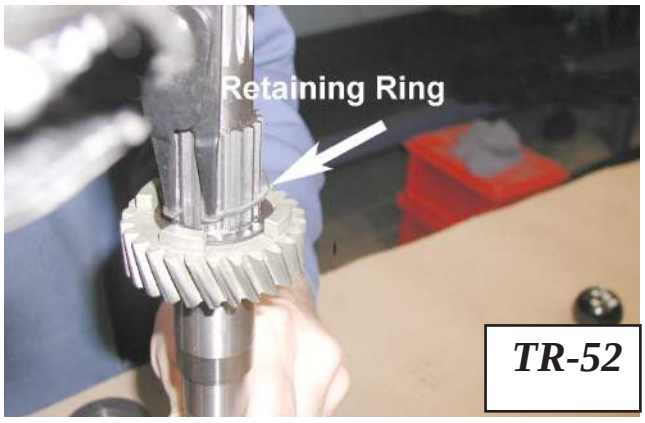



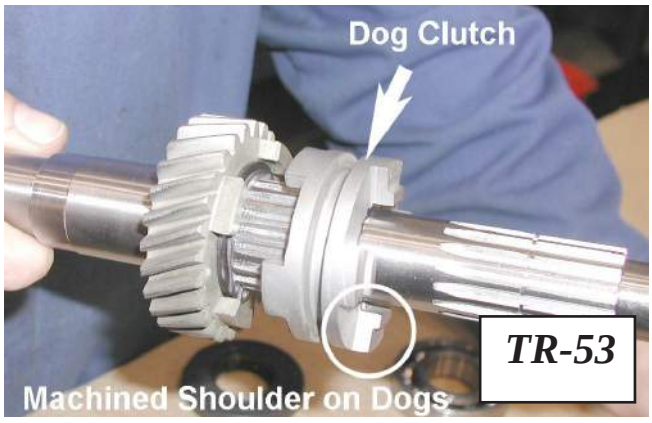

5. Install the 107-10 retaining ring to secure the second thrust washer. ***Photo TR-52***

6. Slip the 34-103 Dog Clutch (4 Tooth, prior to serial #A2856)or 34-127 Dog Clutch (3 tooth, from serial #A2856),to the Input Shaft. ***Photo TR-53***

**IMPORTANT**

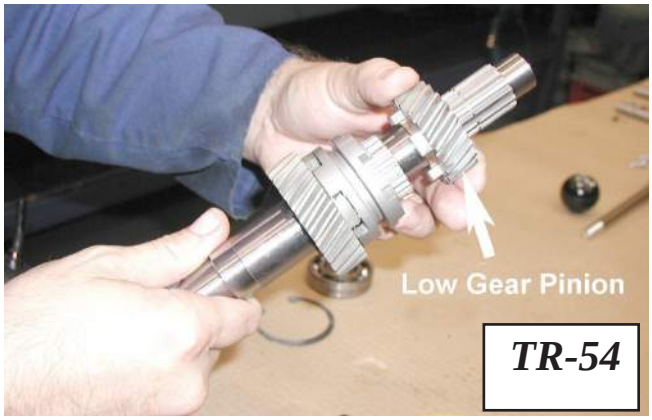
**The Dog Clutch needs to be oriented correctly when assembled to the Input Shaft. The dogs on one side of the clutch have a small machined shoulder. These dogs will engage with the Low Gear Pinion so they face away from the previously installed High Gear Pinion** ***Photo TR-53***

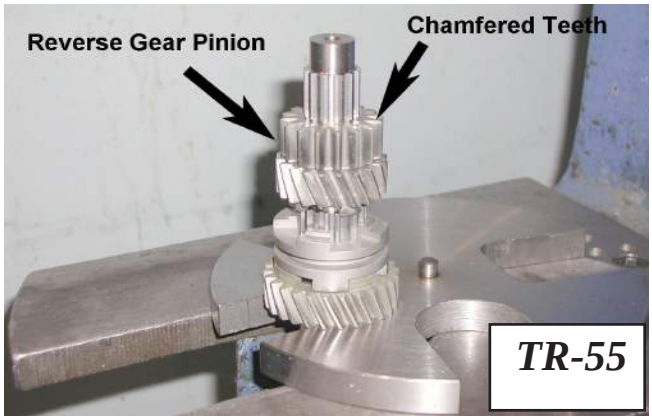



7. Install the 34-106 Low Gear Pinion (4 Tooth, prior to serial #A2856) or 34-129 (3 tooth, from serial #A2856)with the dogs facing towards the previously installed Dog Clutch. ***Photo TR-54***

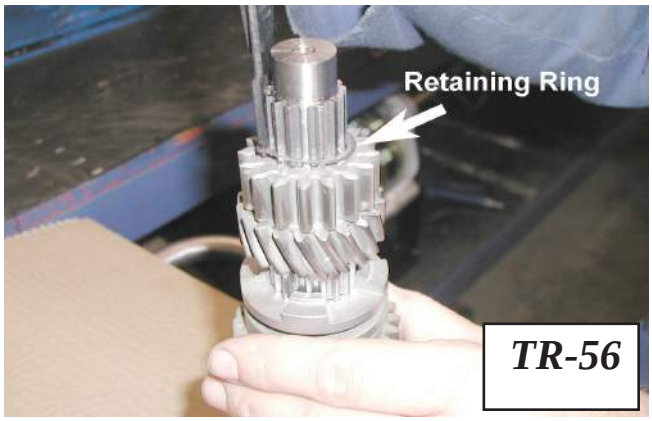
8. Press the 34-107 Reverse Gear Pinion on to the Input Shaft and up against the Low Gear Pinion. Orient the Reverse Gear Pinion with the chamfered teeth facing up. ***Photo TR-55***

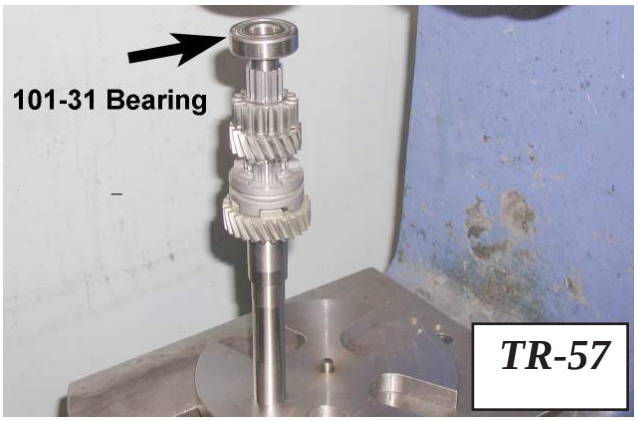


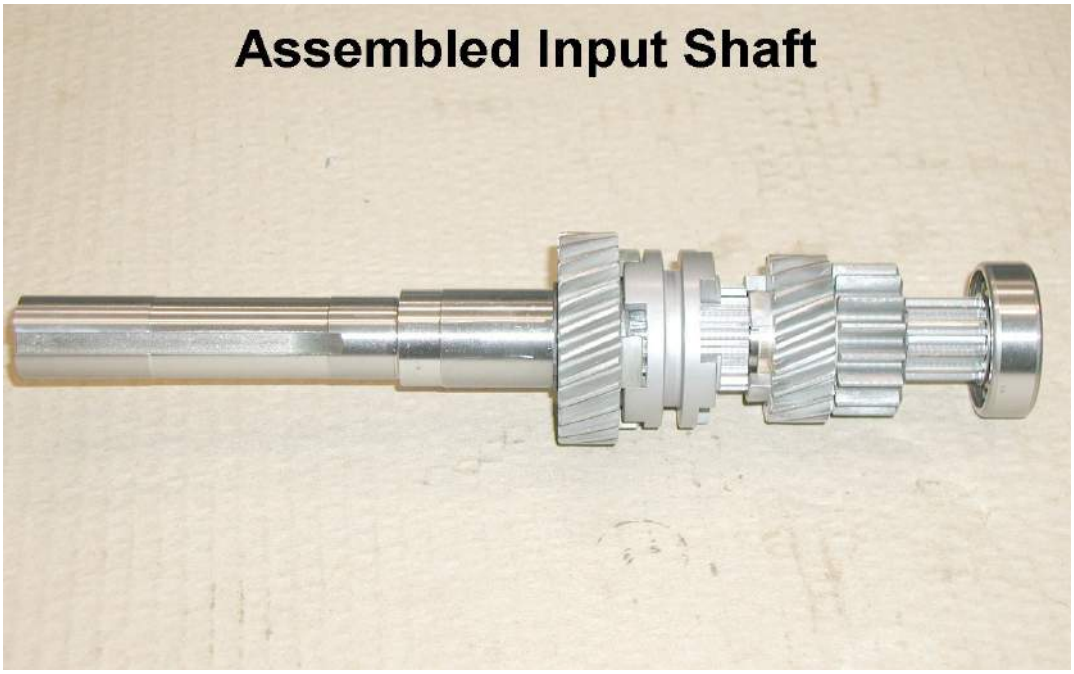




9. Secure the Reverse Gear Pinion with a 107-12 Retaining Ring. ***Photo TR-56***

10. Press a 101-01 bearing to the end of the Input Shaft with the shielded side up. ***Photo TR-57***



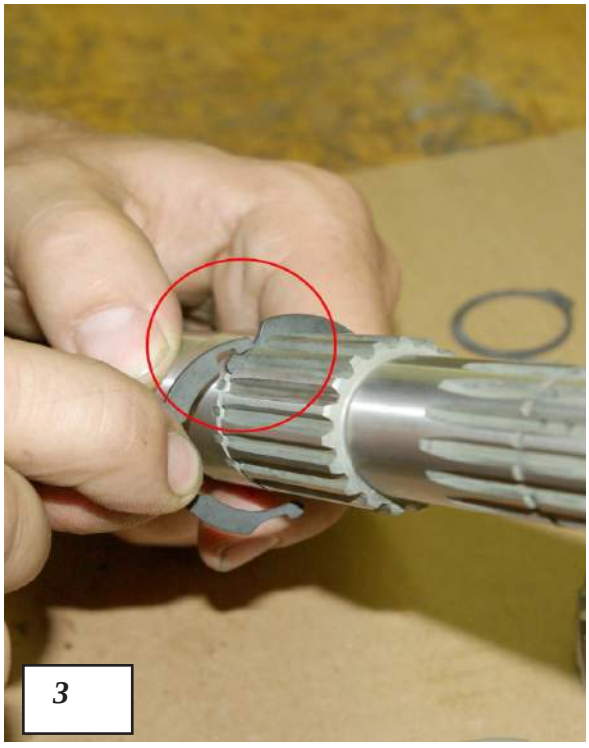



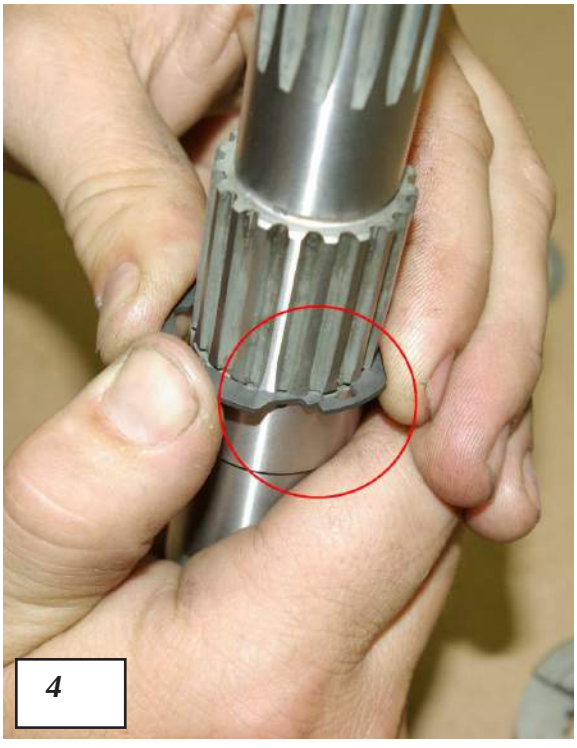



1. **Transmissions built from A5883:** Locate the **34-130 Input Shaft** and install the first half of the **107-14 Retaining Ring** to the machined groove at the High Gear Pinion location. ***Photo 1 & 2***



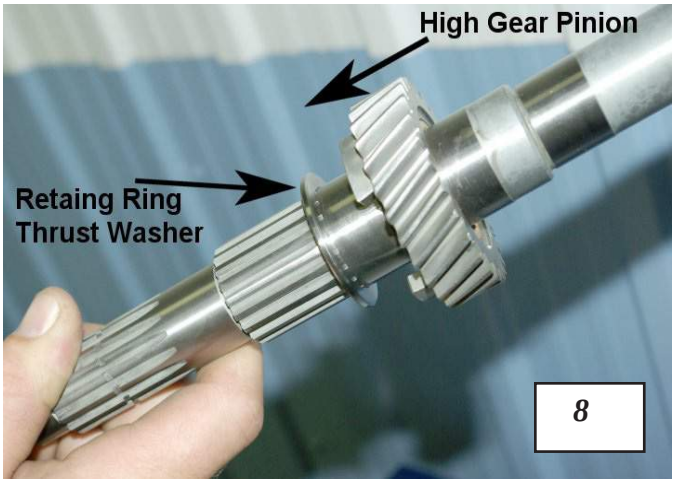
2. Interlock the second half of the **107-14 Retaining Ring** into the previously installed one. ***Photo 3*** At the opposite side, squeeze the retaining ring assembly together to lock and seat securely into the machined groove. ***Photo 4 & 5***



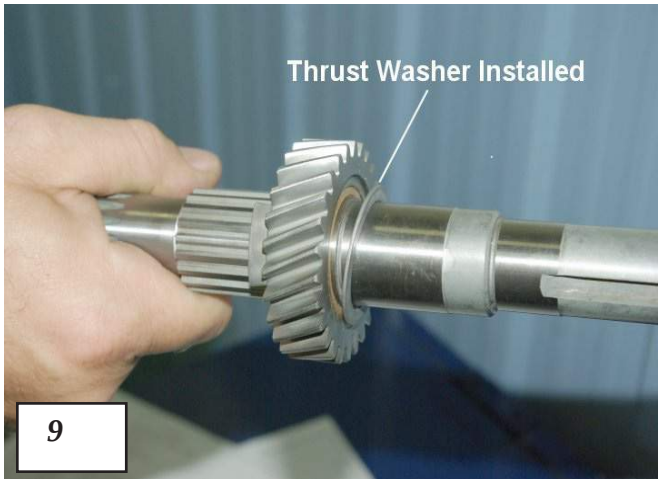
4. Locate the **108-85 Retaining Thrust Washer** and slip it over the input shaft (cupped side towards retaining ring) and up against the retaining ring assembly. ***Photo 6 & 7***

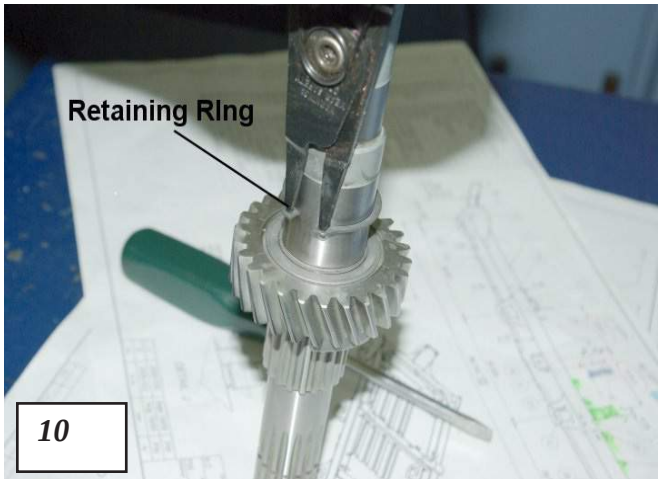


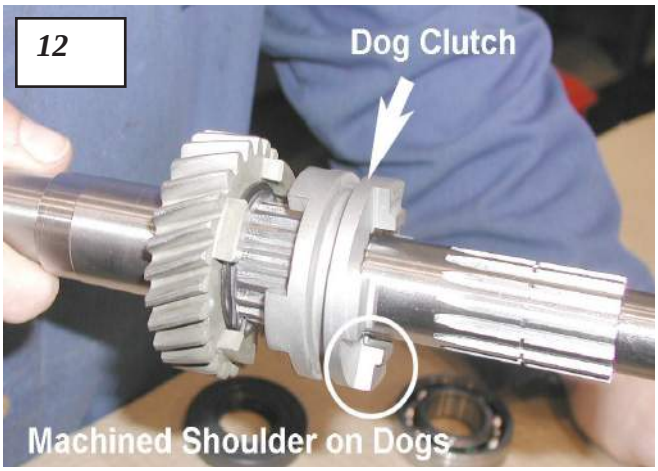

5. Install the **High Gear Pinion** on to the Input Shaft (dog teeth facing towards the Thrust Washer). Rest it against the Thrust Washer. ***Photo 8***

6. Slip a **108-79 Thrust Washer** to the other side of the High Gear Pinion and secure with a 107-02 Retaining Ring. ***Photos 9, 10 & 11***







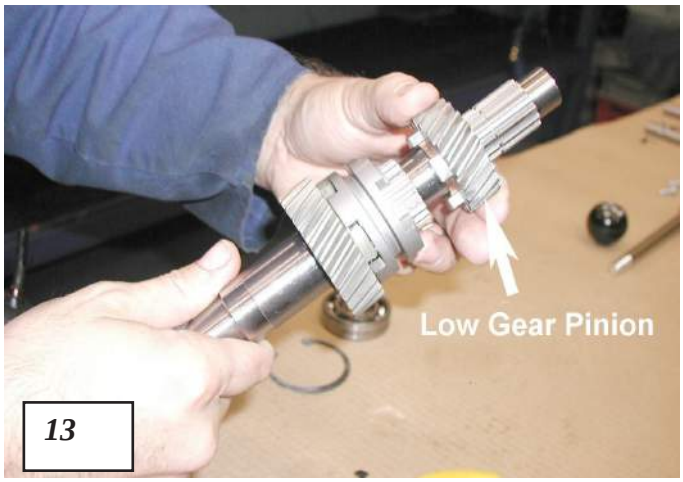

6. Slip the Dog Clutch to the Input Shaft. ***Photo 12***

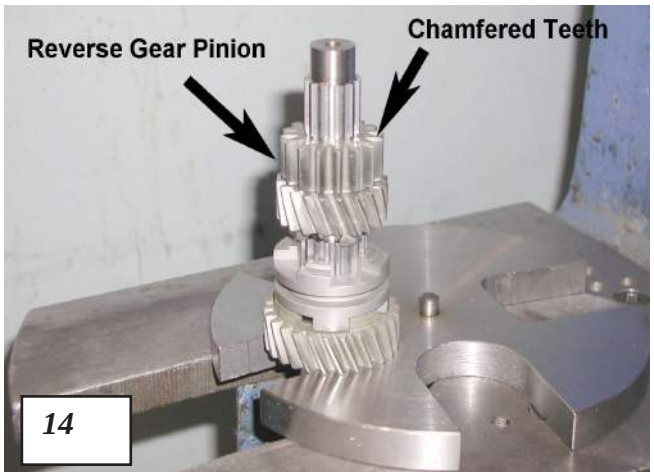
**IMPORTANT**

**The Dog Clutch needs to be oriented correctly when assembled to the Input Shaft. The dogs on one side of the clutch have a small machined shoulder. These dogs will engage with the Low Gear Pinion so they face away from the previously installed High Gear Pinion** ***Photo 12***

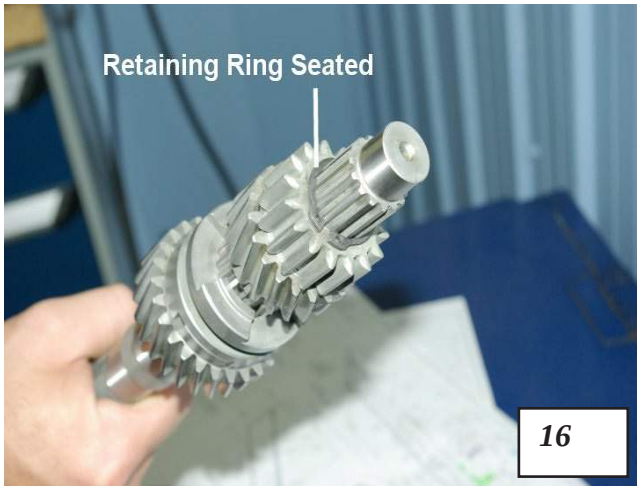
7. Install the Low Gear Pinion with the dogs facing towards the previously installed Dog Clutch. ***Photo 13***

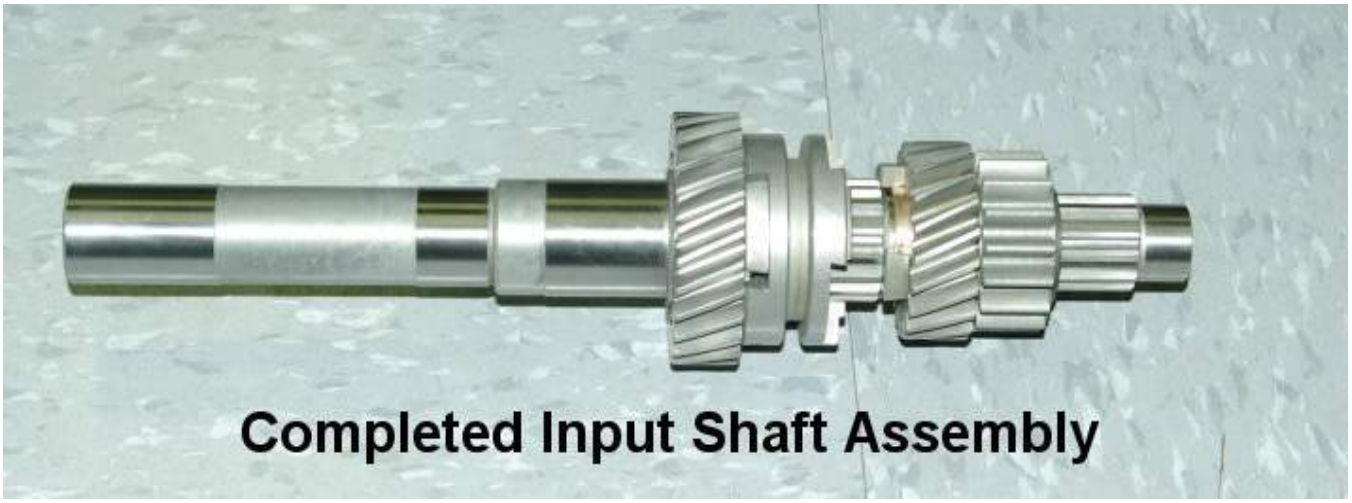
8. Slip the Reverse Gear Pinion on to the Input Shaft and up against the Low Gear Pinion. Orient the Reverse Gear Pinion with the chamfered teeth facing up. ***Photo 14***




9. Secure the Reverse Gear Pinion with a **107-15 Retaining Ring.** ***Photos 15 & 16***

**Assembling the Differential**

1. Install all 105-03 Oilite Bushings into both 34-122 cage and 34-124 Gear Plate. Photo TR-58 & 59

*TR-58*


*TR-59*

2. Blow all foreign debris from the Cage and Gear Plate.

5. Install the 101-15 Bearing into both Cage and Gear plate. Photo **TR-60 & 61**

6. Wipe the 34-98 Output Shaft free of debris with a lint free rag. Install this Output Shaft into the Aluminum Cage. Photo TR-62 & 63 ***See Note following page.***


*TR-60*

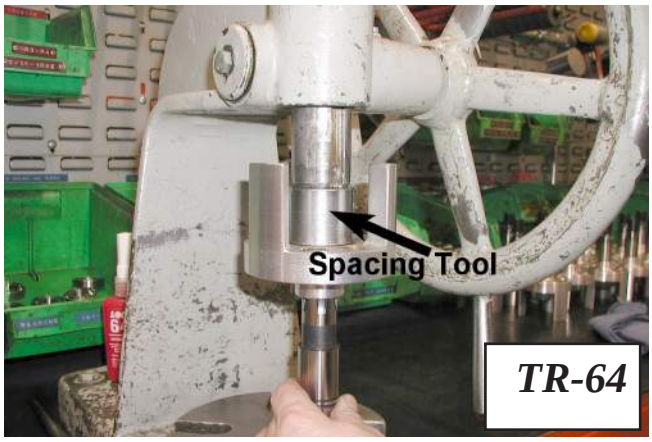

*TR-61*


*TR-62*


*TR-63*

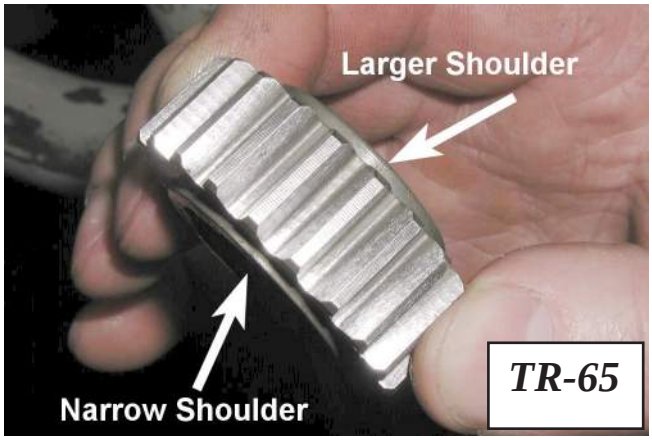
**NOTE**

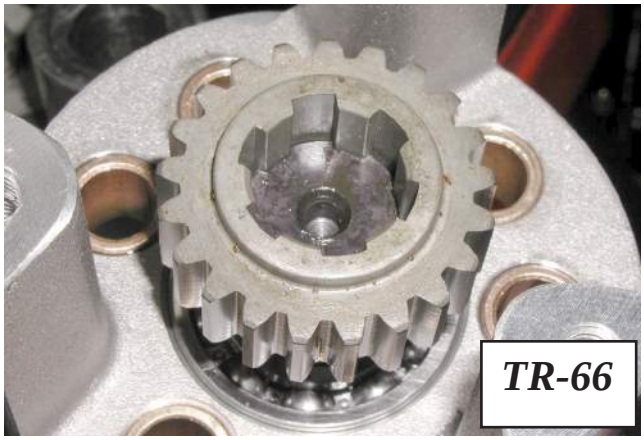
*Use a specialized spacing tool to secure the previously installed 101-15 Bearing inside the Aluminum Cage while the Output Shaft is press into place.* ***Photo TR-64***



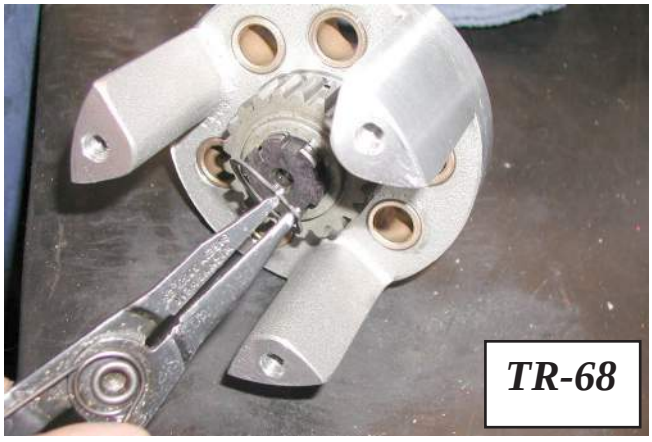

7. Orient the 34-14 Sun Gear as in ***Photo TR-65*** with the higher shoulder side facing up. Install it to the splined end of the Output Shaft. ***Photo TR-66 & 67***

8. Secure the Sun Gear with a 107-04 Snap Ring. ***Photo TR-68***

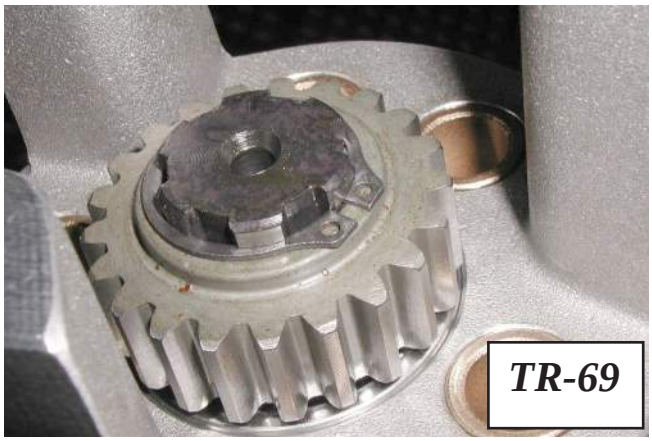


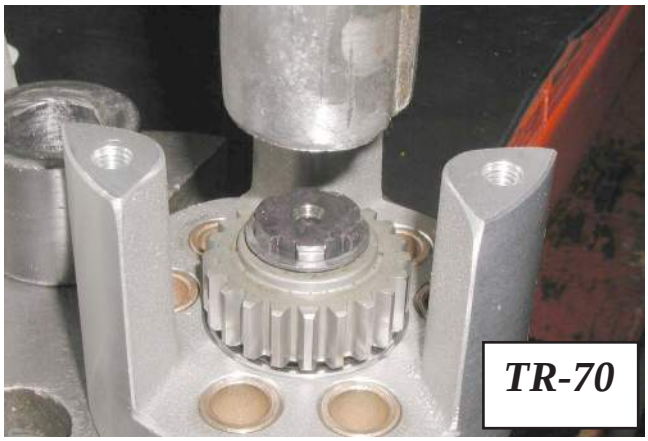





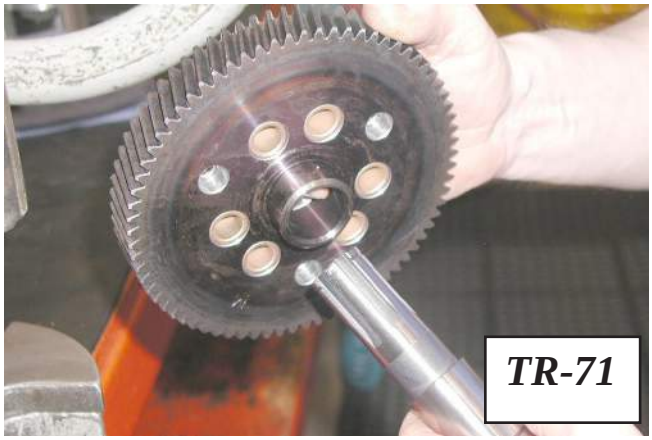



9. Be sure the Retaining Ring is properly seated to the machined groove of the Output Shaft. Photo TR-69 Press the Output Shaft from the inside of the cage to seat the Retaining Ring snuggly against the Sun Gear. ***Photo TR-70***


TR-69

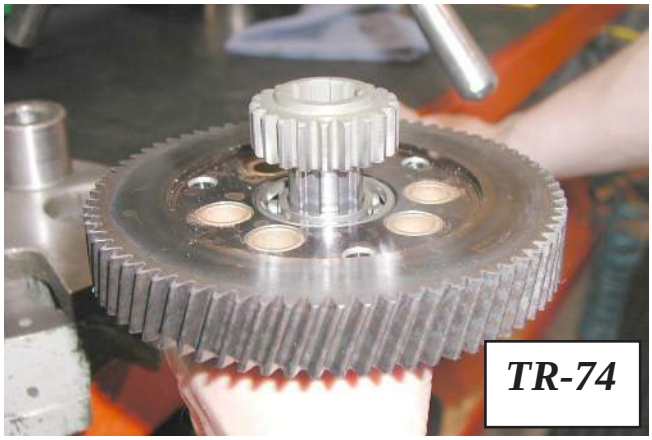

TR-70

10. Wipe down the 2nd 34-98 Output Shaft and assemble to the Gear Plate using the same method as described for the Aluminum Cage. ***Photo TR-71, 72 & 73***

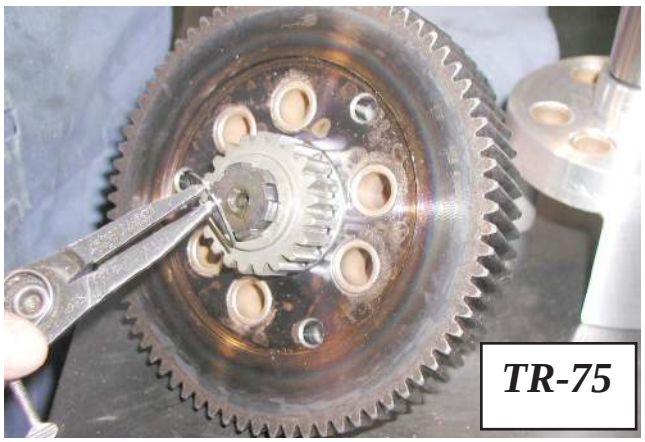

TR-71

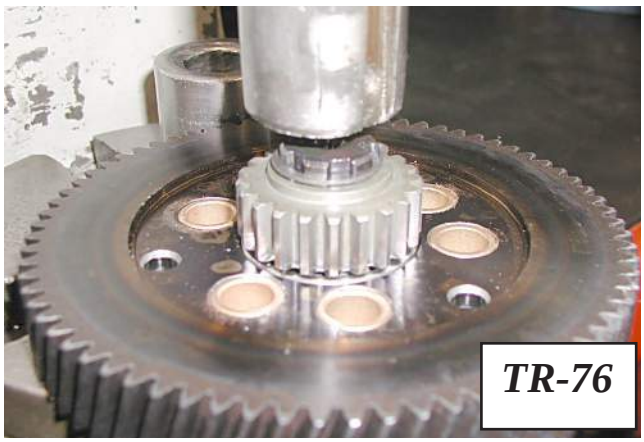

TR-72


TR-73

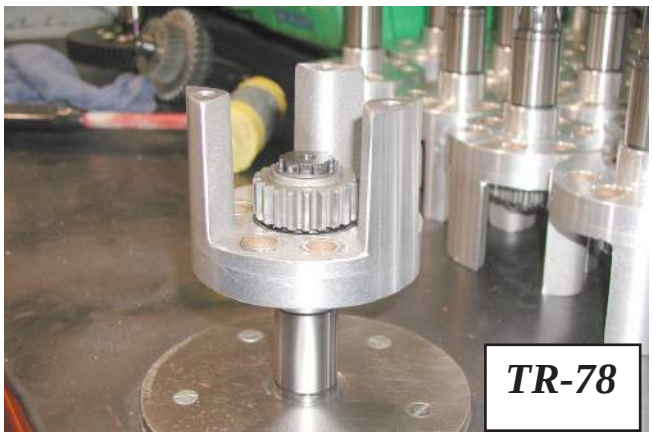

TR-74

11. Orient the 2nd 34-14 Sun Gear as in instruction 8 and install and secure it with a 107-04 Retaining Ring using the same method as described for the Aluminum Cage in instruction 10. ***Photo TR-74, 75, 76 & 77***


TR-75

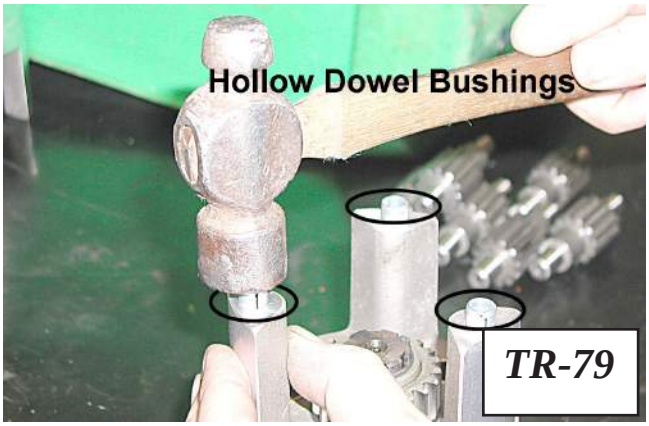

TR-76


TR-77

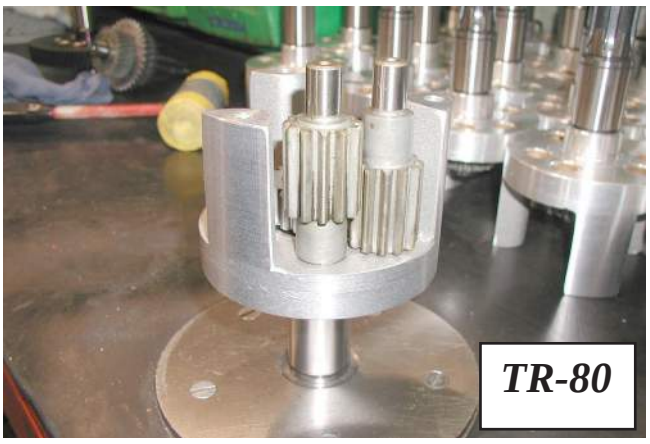

TR-78

12. Set the assembled 34-122 Aluminum Cage into an assembly stand. ***Photo TR-78***

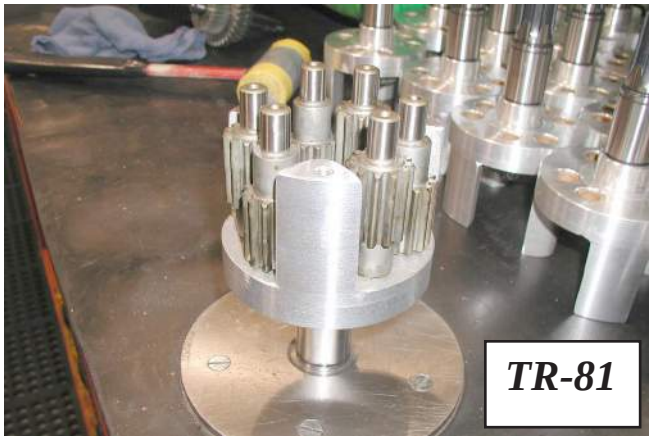
13. Install (3) 105-23 Hollow Dowl Pins into the mounting holes of the aluminum cage. ***Photo TR-79***



TR-79


TR-80

14. Install (6) 34-13 Pinions into the Oilite Bushings of the Aluminum Cage alternating the Pinions in an up and down manner as shown in ***Photo TR-80 & 81***


TR-81


TR-82


TR-83


TR-84

15. Assemble the Gear Plate to the Aluminum Cage. Align the top of the Pinions in the Cage, with the Oilite Bushings in the Gear Plate. ***Photo TR-82 & 83***

16. Seat the Gear Plate to the Aluminum Cage using a soft faced mallet. ***Photo TR-84***

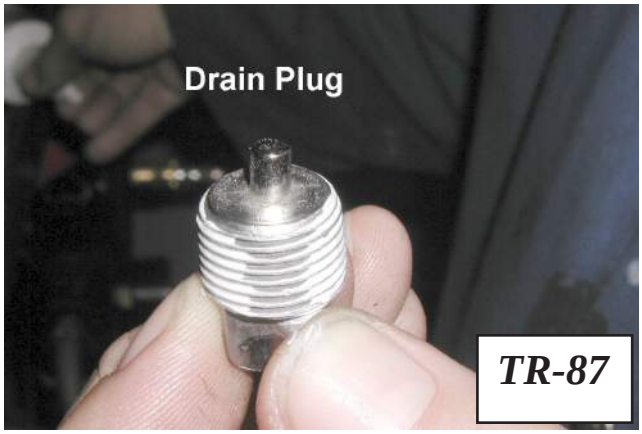
17 Apply Red 271 LOCTITE to each of the (3) 112-143 fasteners, ***Photo TR- 85***, and tighten down to 35 FT/LBS. ***Photo TR-86***

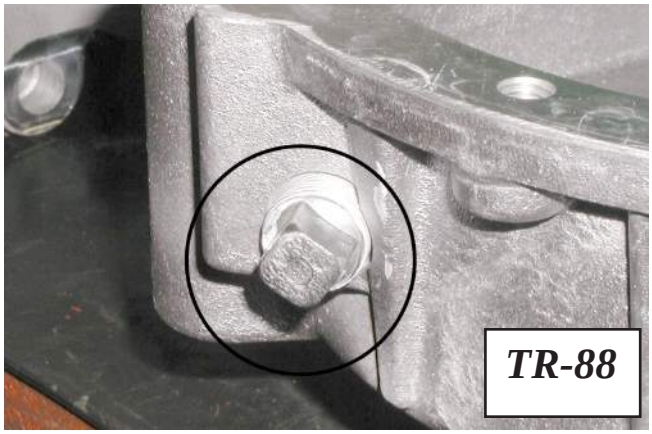

TR-85


TR-86

**Assembling Transmission Components to Housing**

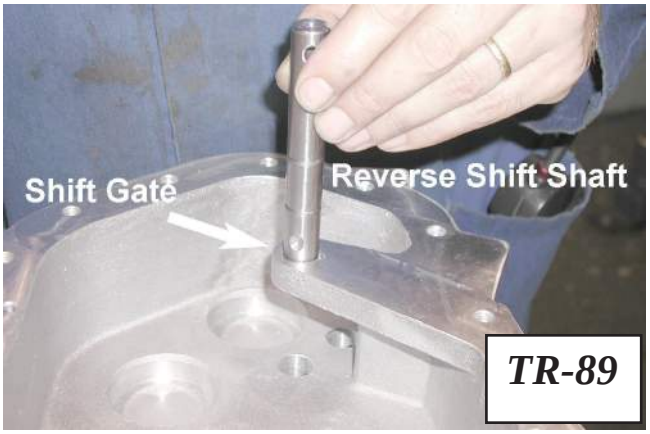
1. Apply some LOCTITE pipe sealant to the threads of the 103-02 drain plug and install into the housing. ***Photo TR-87 & 88***

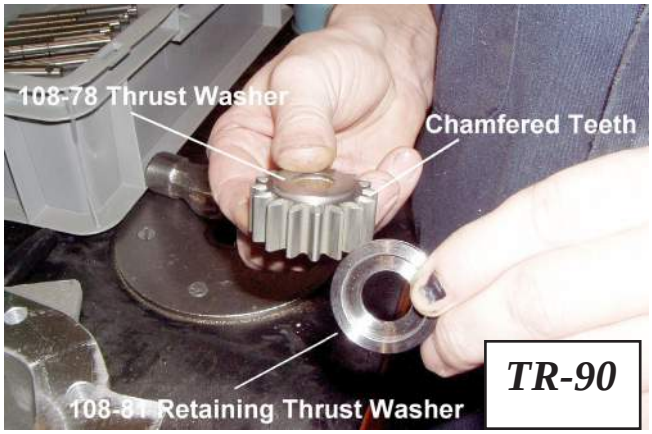



2. Start the 34-114 Reverse Shift Shaft into the housing boss as illustrated in ***Photo TR-89.***

3. Place a 108-78 Thrust washer above the 34-108 Reverse Idler, and a 108-81 Retaining Thrust Washer (machined side down), below the Reverse Idler. Push the 34-114 Reverse Shift Shaft completely through the Reverse Gear and washers and into the opposite side of the housing. Install the Reverse gear with the chamfered teeth facing up. ***Photo TR-90 & 91***

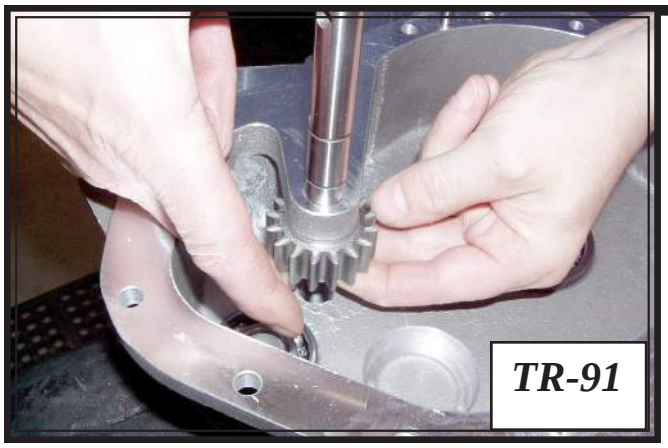


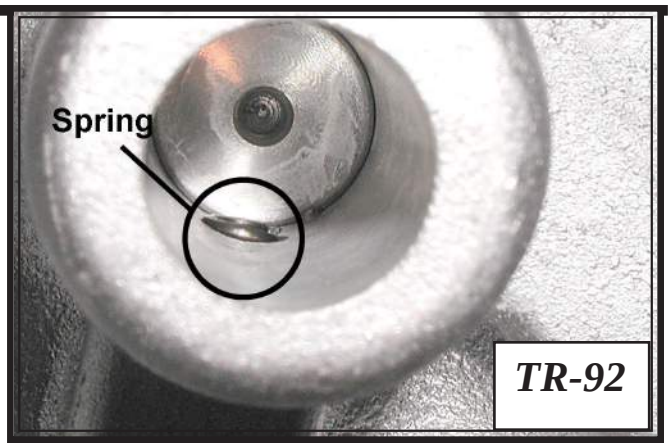




4. Install the 34-32 Spring into the machined hole of the 34-102 Right Hand Housing at the Reverse Shift Shaft location. ***Photo TR-92***

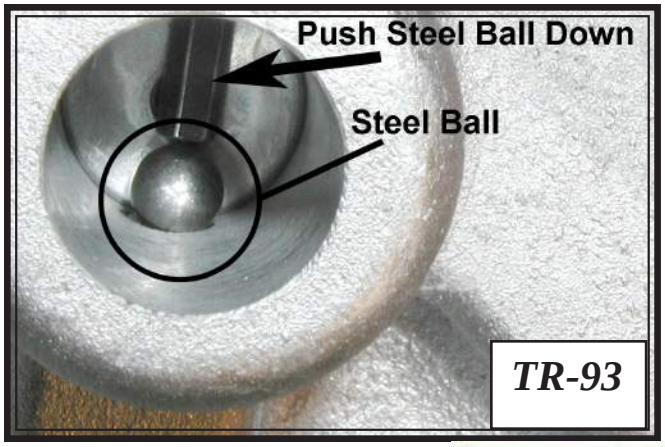
5. Install the 109-05 Steel Ball to the top of the Spring. ***Photo TR-93***

6. Push down on the Steel Ball using the access hole from the top of the Transmission Housing. While the ball is compressed, press the shaft over top of the ball. ***Photo TR-94***


TR-91



TR-92



TR-93

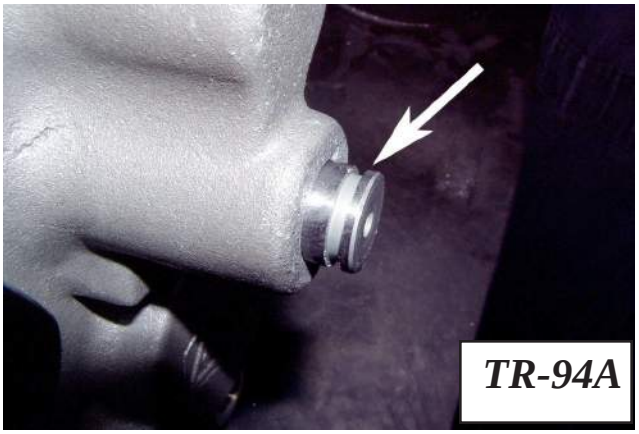
TR-94

**IMPORTANT**

**Transmissions Manufactured From Serial Number A3784, require a 113-16 O-Ring installed to the machined groove located near the end of the reverse shift shaft and require these extra steps to install it.**

i Continue to push the reverse shift shaft through the housing until the machined groove for the O-ring location is visible to the outside of the housing. ***Photo TR94A***

ii Install the 113-16 O-ring to the groove and apply some oil lubrication. ***Photo TR94B***

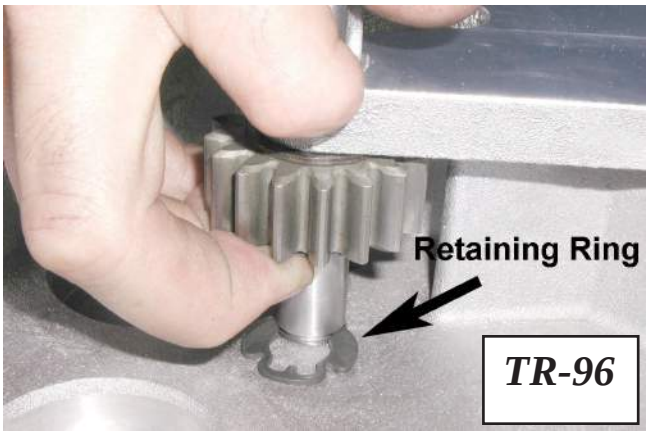

TR-94A


TR-94B

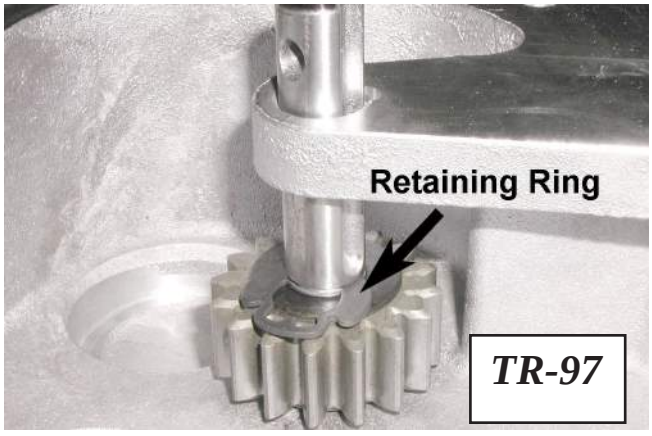
iii Push the reverse shift shaft back through the housing ensuring that you don't damage the O-ring as re-enters the housing.

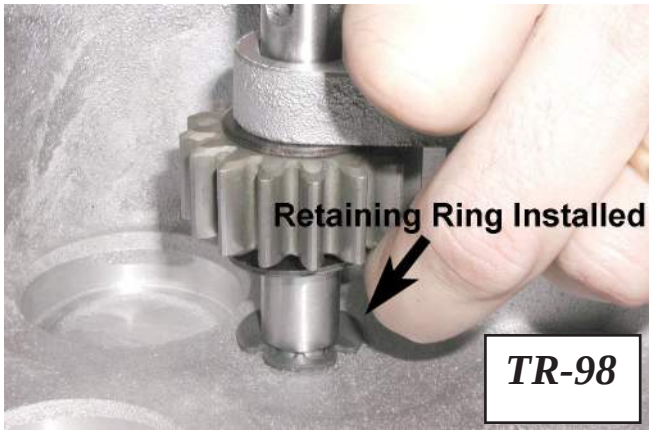
7. Pull the Reverse Shift Shaft up until the lower retaining ring groove location is visible. shaft is ***Photo TR-95***

8. Install the 107-11 Retaining Ring onto the Reverse Shift Shaft. ***Photo TR-96 & 97***

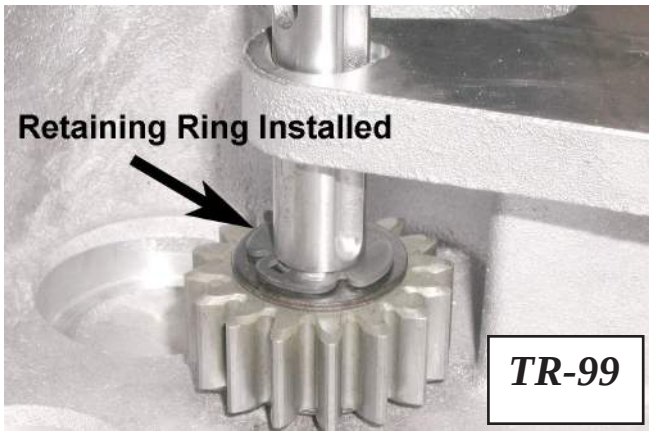



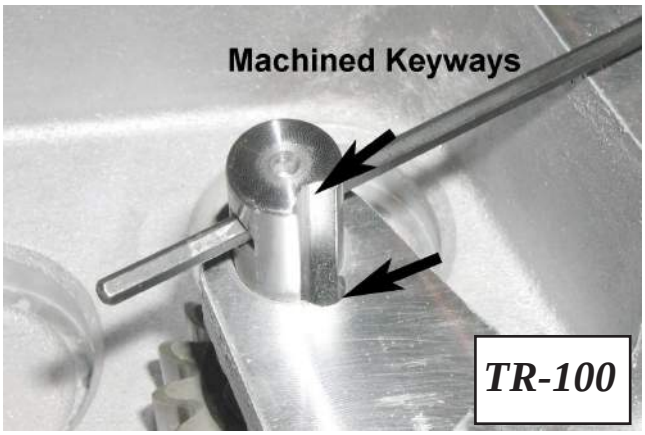

9. Lower the Reverse Idler Gear and install the second 107-11 Retaining Ring to the machined groove at the top of the Reverse Idler Gear. ***Photo TR-98 & 99***



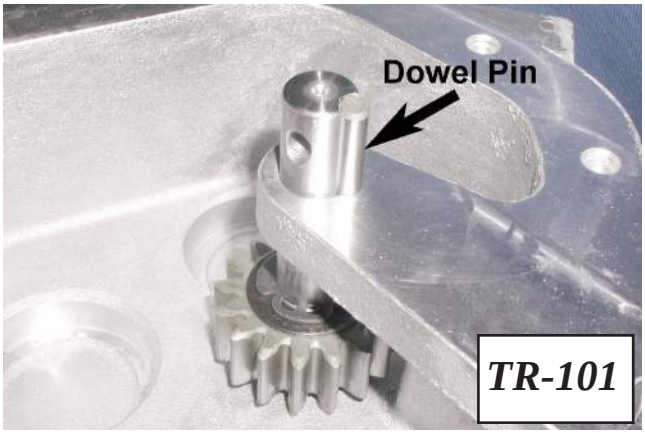

10. Insert a tool, eg. an allen wrench, into the machined hole of the Reverse Shift Shaft and turn the shaft until the keyways of both shaft and transmission boss are aligned. ***Photo TR-100***

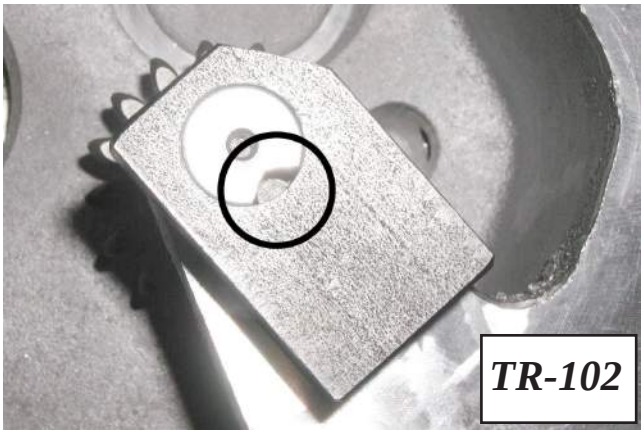



11. Install the 104-40 Dowel Pin to secure the Reverse Shift Shaft. ***Photo TR-101***

12. Assemble the 34-115 Reverse Shift Block to the Reverse Shift Shaft by aligning the keyway with the previously installed Dowel Pin. ***Photo TR-102***

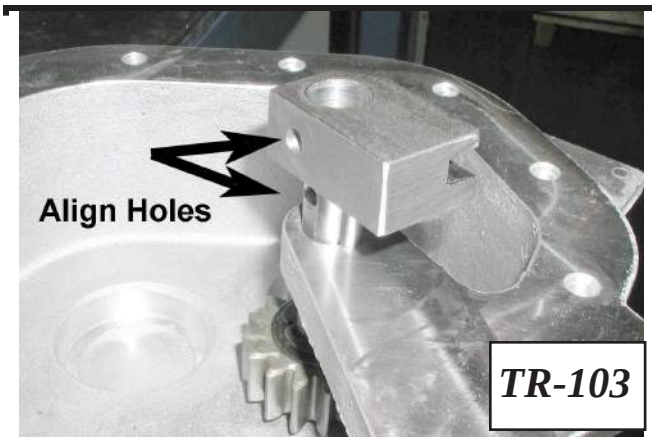


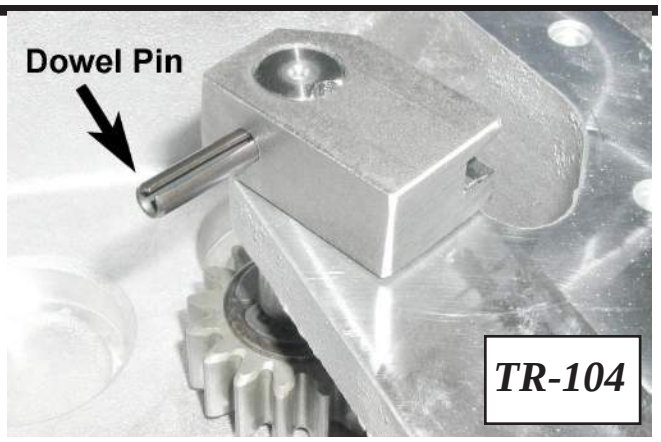



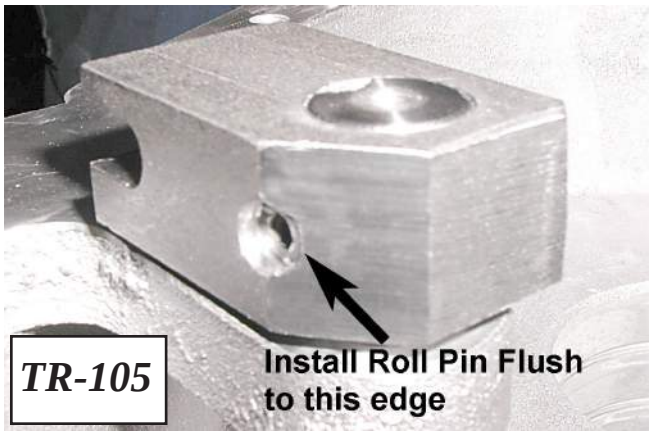

13. Tap the Shift Block on until the machined hole in both the Reverse Shift Shaft and the Shift Block are aligned, then install the 104-39 Spring Pin. ***Photo TR-103, 104 & 105***

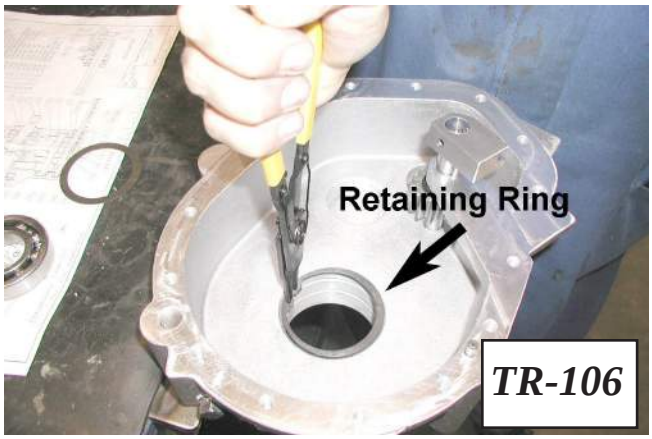
**NOTE**

*Install the Roll Pin flush to the machine corner of the shift block as shown in Photo TR-105*



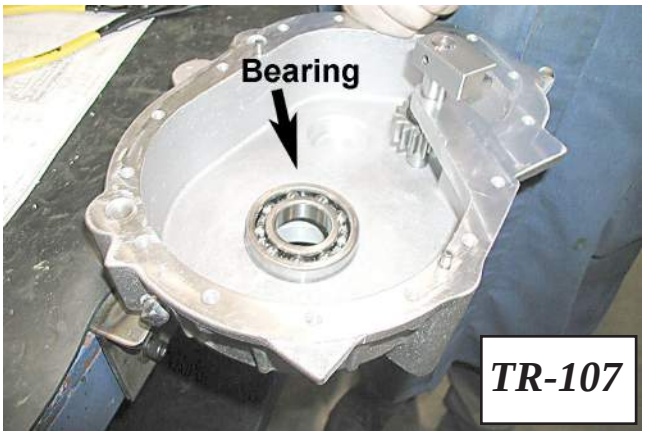




14. Install a 106-03 Retaining Ring to top groove of the Housing. ***Photo TR-106***

15. Press and install the 101-03 bearing into the Housing. ***Photo TR-107 & 108***





**NOTE**

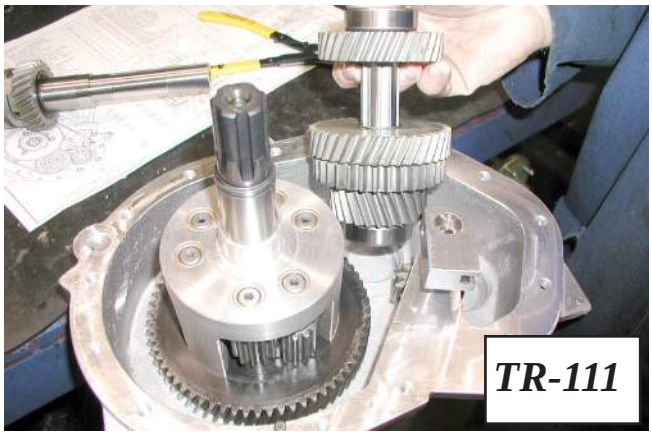
*If the differential consists of the high ratio 3.3 Gear Plate, it will be advantages to install the 101-01 Bearing into the cover as well at this point to avoid any interference later when installing the assembled Idler Gear Bore Assembly. See* **IMPORTANT** *on page* ***TR-13***

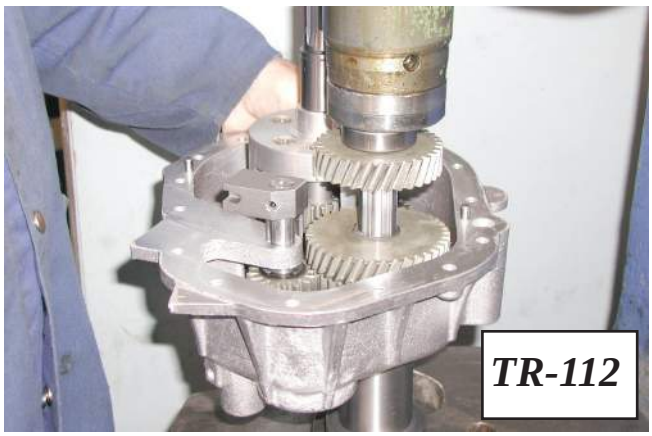
16. Press the assembled differential into the Housing. ***Photo TR-109 & 110***

17. Install the Idler Gear Bore Assembly at the arbor press. ***Photo TR-111 & 112***


TR-109

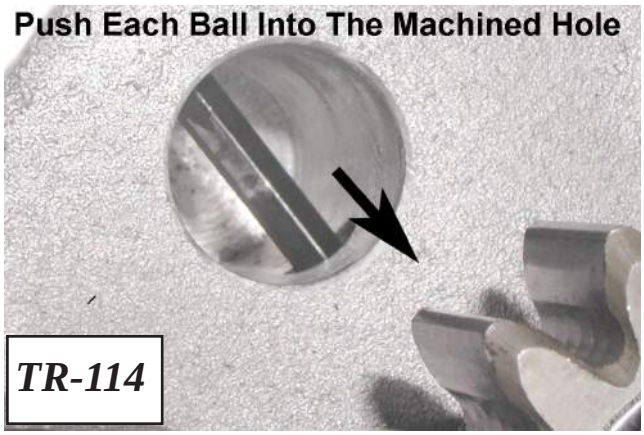

TR-110


TR-111


TR-112

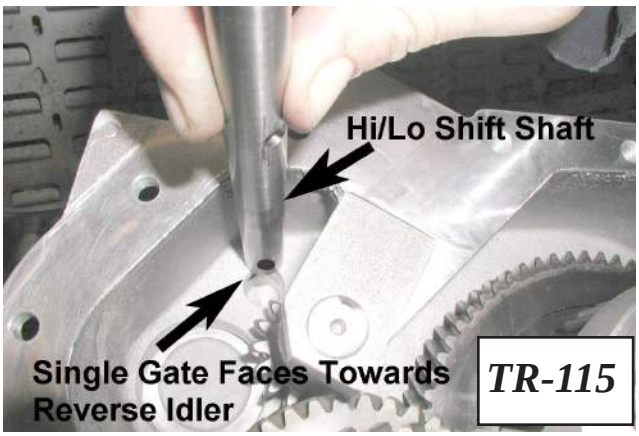
TR-113

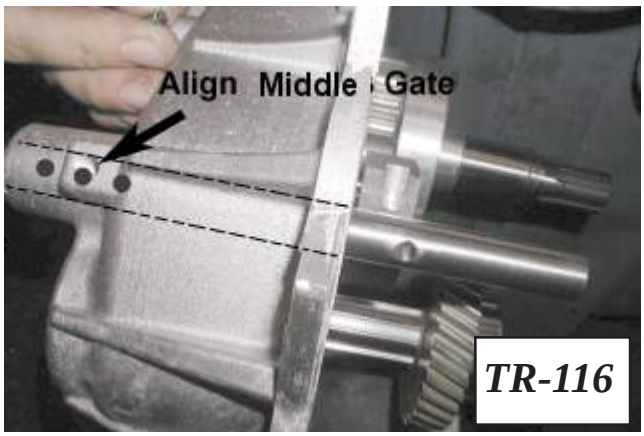
18. Next, push the Reverse Shift Shaft and Block down against the Housing boss (out of reverse). Install (3) 109-05 Steel Balls into the Hi/Low Shift Shaft cavity of the Housing, and push each one into the machined hole at the Reverse Shift Shaft. These (3) Steel balls will be located between the Reverse Shift Shaft and Hi/Low Shift Shaft. ***Photo TR-113 & 114***



TR-114

19. Install the 34-113 Hi/Low Shift Shaft into the Housing with the 3 machined gates facing to the outside of the housing and the 1 machined gate facing the Reverse Shift Shaft. ***Photo TR-115***



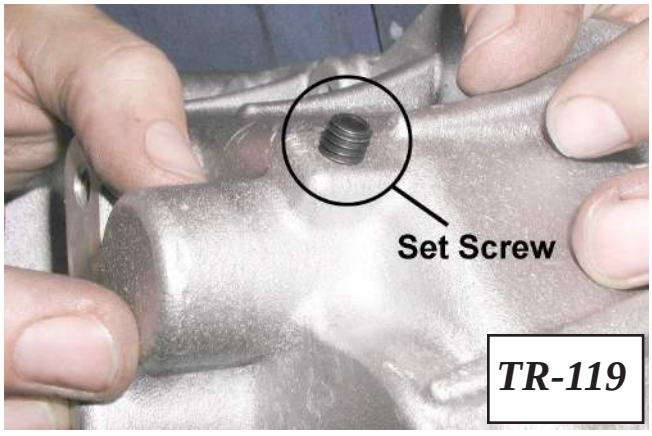




20. Align the middle gate in the Hi/Lo Shift Shaft with the access hole in the casting and install a 109-05 Steel Ball and 34-32 Spring. ***Photo TR-116, 117 & 118***

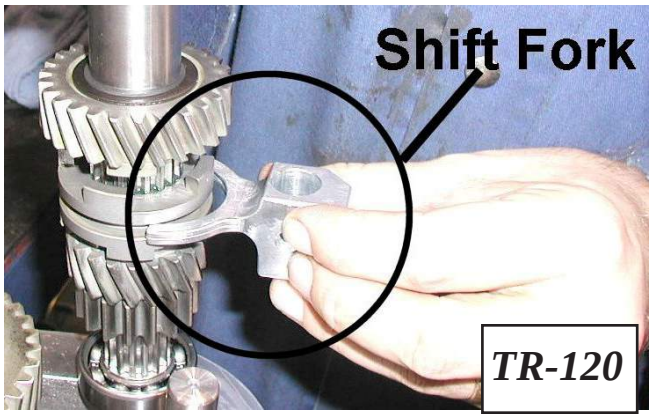


21. Apply Blue LOCTITE to the threads of the 112-145 Set Screw and tighten into the Housing approximately 2 1/2 turns. This may need to be adjusted later depending on how hard or easy the transmission shifts when tested. ***Photo TR-119***

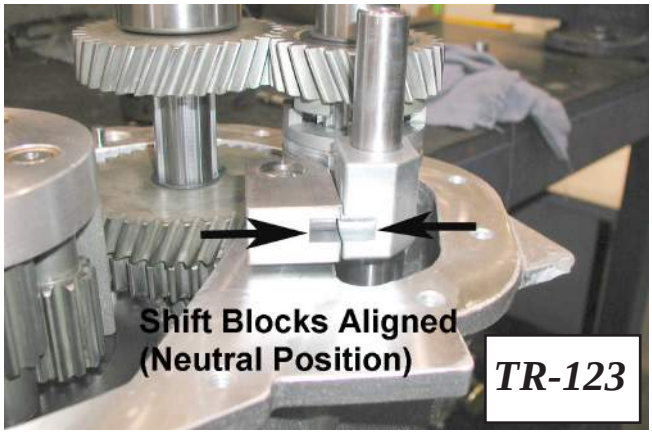
22. Assemble the 34-116 Shift Fork to the Dog Clutch on the Input Shaft Assembly. ***Photo TR-120***




23. Raise the Reverse Shift Block up (into reverse). Align the the machined hole of the Hi/Lo Shift Block Fork, with that of the Hi/Lo Shift Shaft, and install the complete Input Shaft assembly into the housing. ***Photo TR-121 & 122***

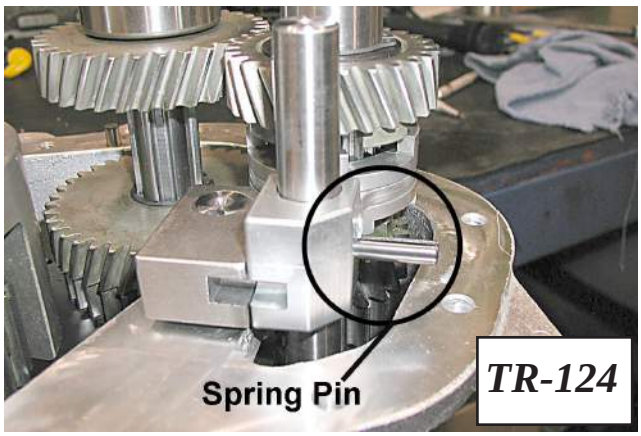


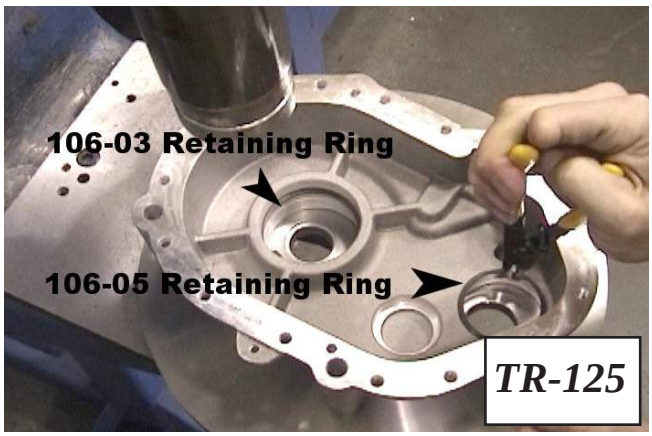



24. Place the transmission into the neutral position. ***Photo TR-123***

25. Secure the Hi/Lo Shift Fork to the Shift Shaft using a 104-39 Spring Pin. ***Photo TR-124***



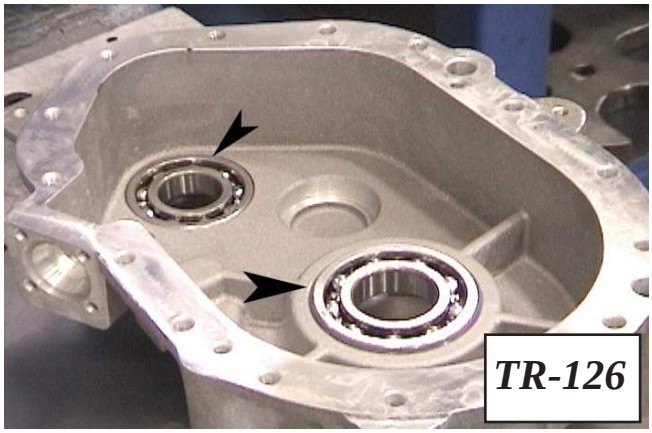

26. Install a 106-03 Retaining Ring to the top groove of the 34-101 Left Transmission Housing at the output shaft opening, and a 106-05 Retaining ring at the input shaft opening ***Photo TR-125***

27. Place a 114-01 shim to the top of the 106-03 Retaining Ring.

28. Press a 101-03 & 101-16 Bearing into the Left Transmission Housing. ***Photo TR-126***

29. Apply Black 598 LOCTITE RTV Silicon Gasket Maker around the perimeter of the Transmission Housing

30. Press the Left Hand Housing to the Right Hand Housing at the arbor press. Tap with a soft face mallet while pressing at the output shaft area. This will ensure that the housing is pressed on squarely and evenly to the lower half. ***Photo TR-127***


***TR-126***

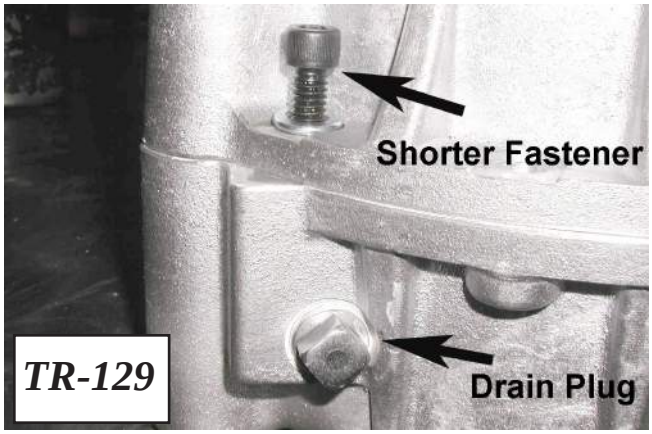

***TR-127***

31. Secure the halves of the transmission together using (10) 112-143, (1) 112-144 fasteners & (11) 108-05 lockwashers installed from the left side of the Housing. Three (3) 112-143, (1) 112-144 fasteners and (4) 108-05 lockwashers are installed from the right side of the Housing. ***Photo TR-128*** **Torque to 20FT-LBS**

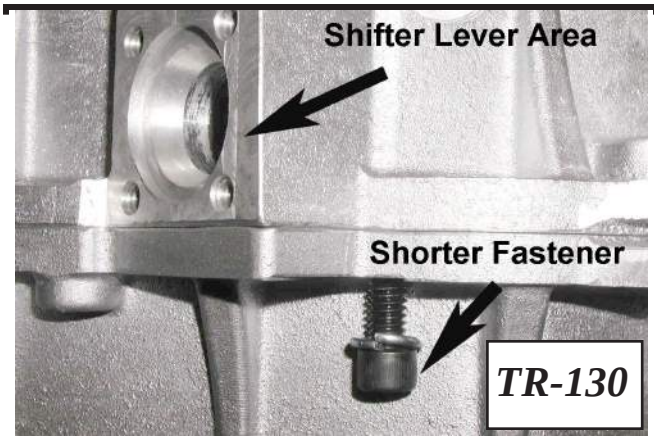
**NOTE**

*Two of these fasteners are shorter and are assembled into the transmission casting at blind holes. One is assembled at the drain plug area from the left side of the housing,* ***Photo TR-129****, and the other at the Shifter Lever area from the right side of the housing.* ***Photo TR-130***


***TR-128***

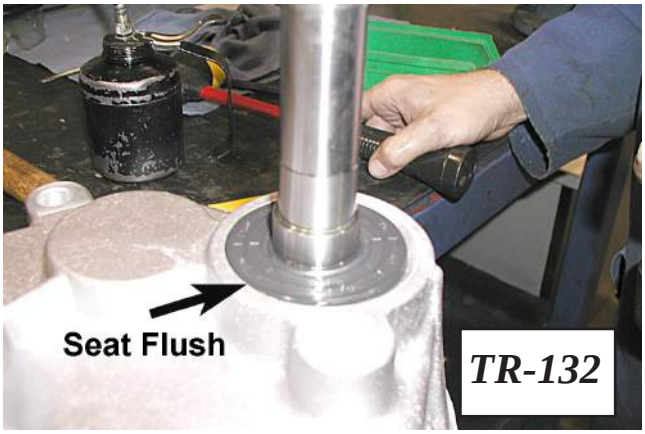


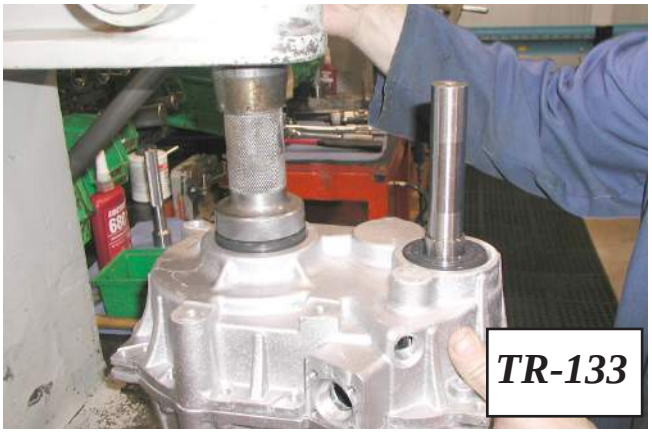
***TR-129***



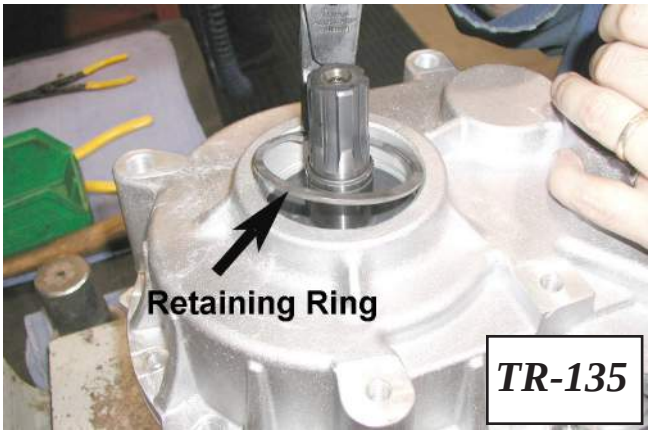


35. Install the 102-05 Oil Seal to the Input Shaft. ***Photo TR-131 & 132***
36. Install the 102-03 Oil Seal to the Output Shaft. Seat below the Retaining Ring groove. ***Photo TR-133 & 134***
37. Seat a 106-03 Retaining ring to the machined groove just above the previously installed Oil Seal. ***Photo TR-135***

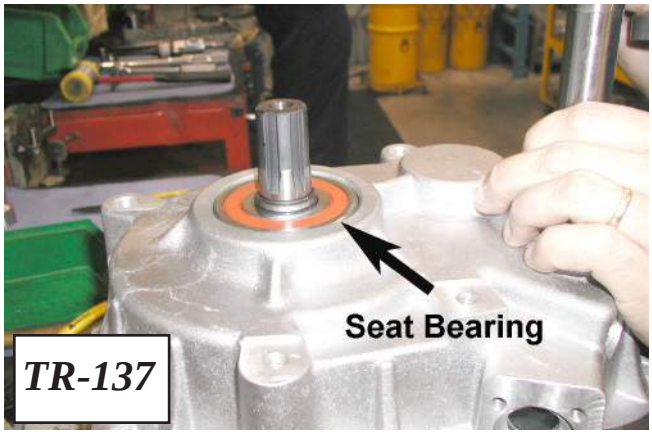






38. Install a 101-05 Bearing to the Output Shaft. ***Photo TR-136 & 137***

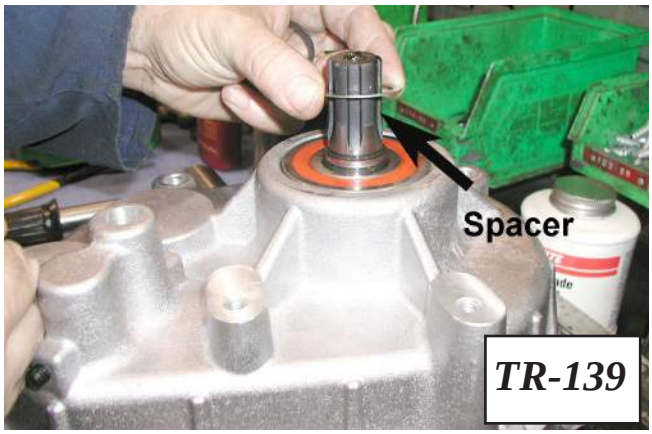



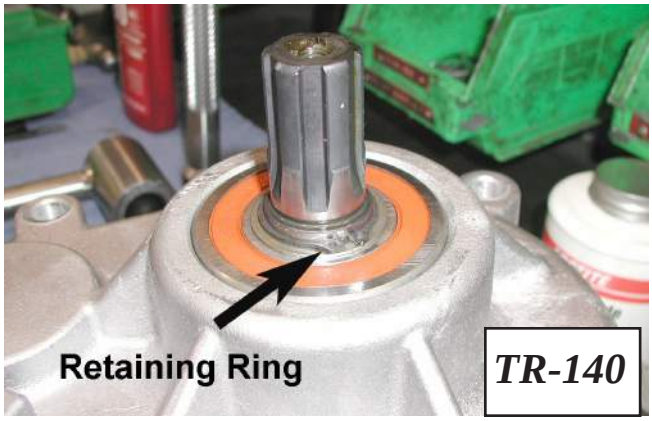

39. Repeat Steps 36 through 38 for the other Output Shaft.

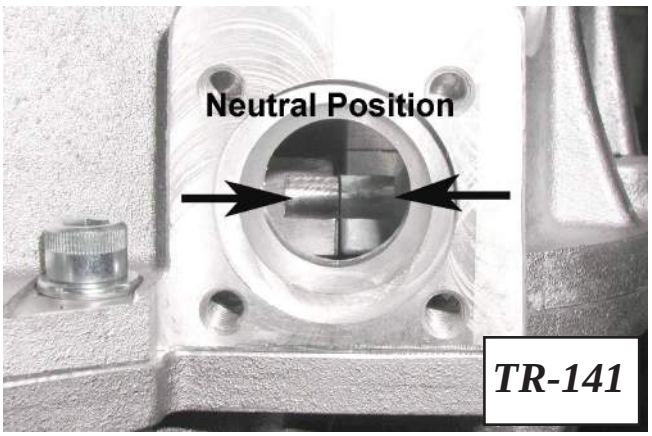
40. Using the Output Shaft puller, pull each of the Output Shafts. Install a 114-04 Shim under the 107-02 Retaining Ring at the Output Shaft on the Left Side Housing. Install a 114-05 Shim under the 107-02 Retaining Ring at the Output Shaft on the Right Hand Side Housing. ***Photo TR-138, 139 & 140***

**IMPORTANT**

**Ensure that all retaining rings are seated properly**

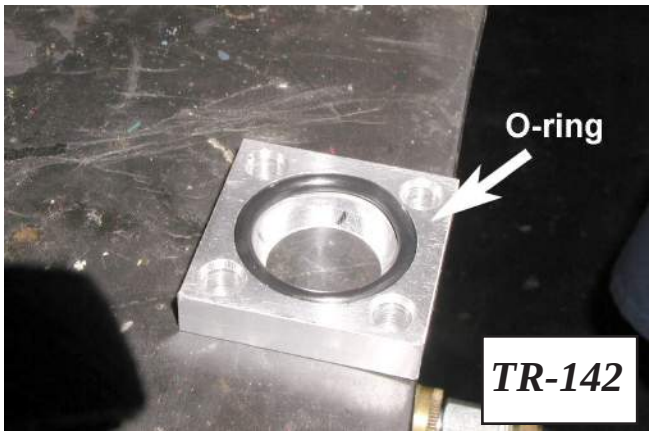






41. Locate the shift lever opening and place the transmission shift blocks in the neutral postion. ***See Photo TR-141***

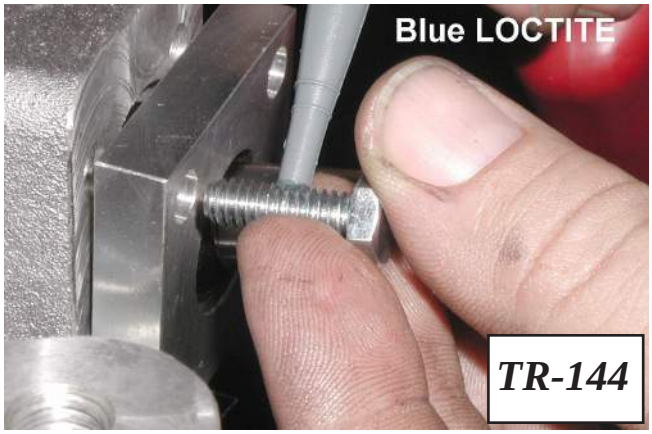
42. Place the 113-11 O-ring into the 34-118 Shifter Plate. ***Photo TR-142***

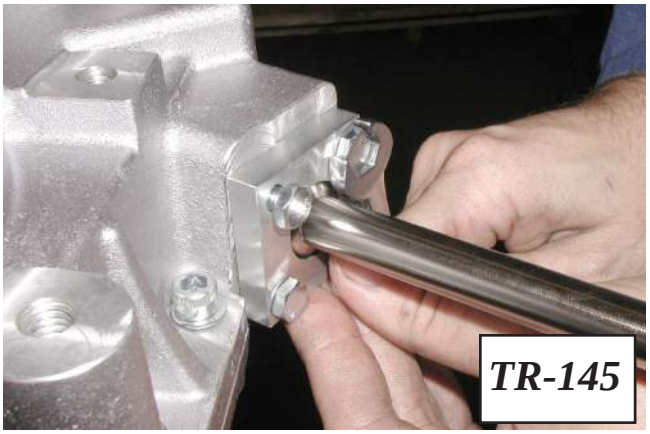
43. Assemble the 34-117 Shift Lever to the Shifter Plate. Apply a small amount of axle grease to the ball area of the shifter lever. ***Photo TR-143***





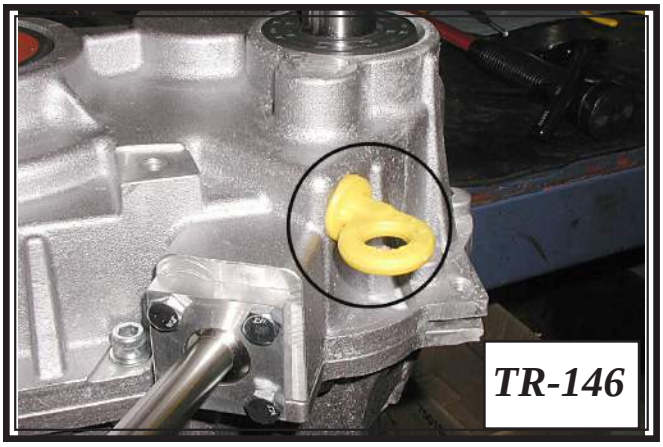
44. Apply Blue LOCTITE to each of the 112-04 Fasteners and secure the Shift Lever assembly to transmission. ***Photo TR-144 & 145***



46. Install the CE-035 Dipstick. ***Photo TR-146***

47. Fill the transmission with 1.1 L (38.7 oz of 80 W 90 Gear Lube HYPOY-C.



## Re & Re Transmission (HDi)

**IMPORTANT**

**Refer to your illustrated parts manual for correct hardware identification and location. Refer to Vehicle Torque Chart for all specified torques.**

### Removing the Transmission

1. Perform the Servicing Procedure, **Removing the Front Floor Pan**

2. Perform the Servicing Procedure, **Removing the Firewall.**

3. Perform the Servicing Procedure, **Removing the Drive Belt**

4. Perform the Servicing Procedure, **Removing the Driven Clutch**

### Left Hand Side of Vehicle

5. Remove the two (2) fasteners securing the Service Brake Caliper at the brake bracket. ***Photo 1***

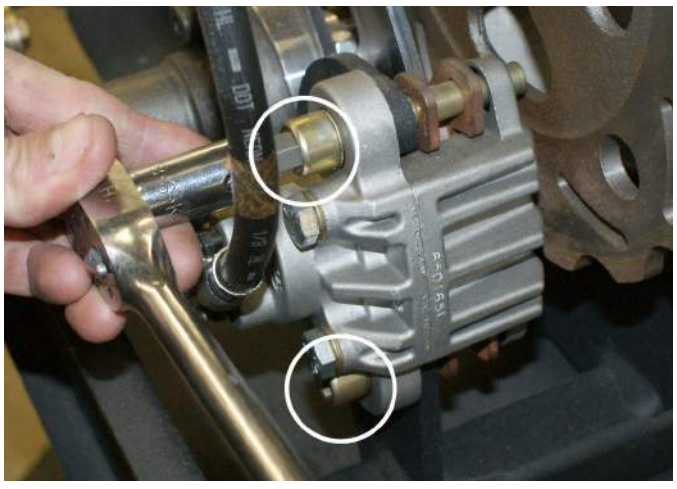


***Photo 1***

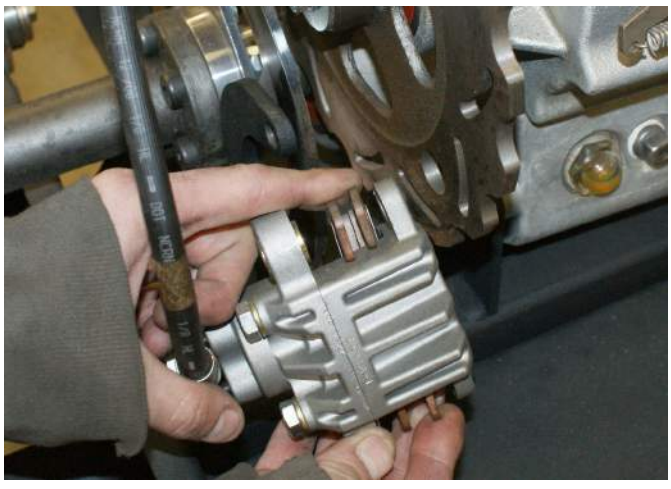


***Photo 2***

6. Pull the caliper assembly from the mounting bracket. There is no need to disconnect the brake line from the caliper. ***Photos 2 & 3***

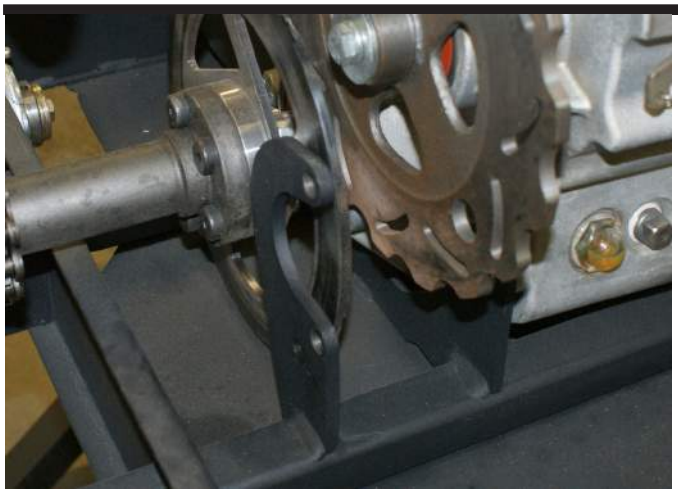


***Photo 3***

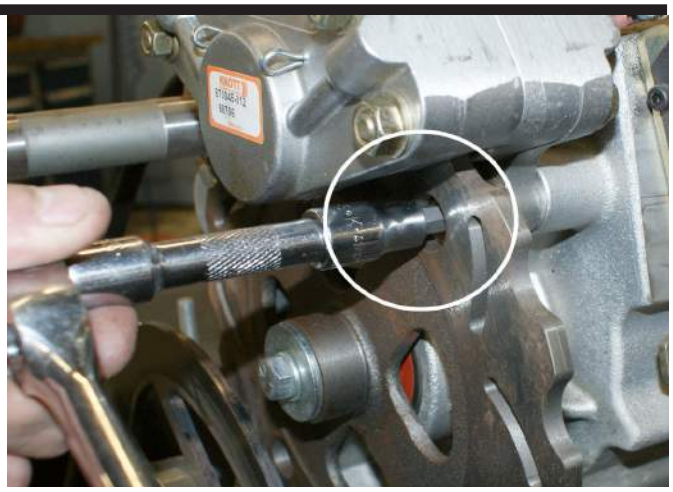


***Photo 4***

7. Rotate the Steering Brake Disc until the access hole in the disc is aligned with the brake fastener that secures it to the transmission. Remove the fastener. ***Photo 4***

8. Rotate the brake disc to align it with the second fastener securing the brake caliper. ***Photo 5***

9. Remove the second fastener. ***Photo 6***

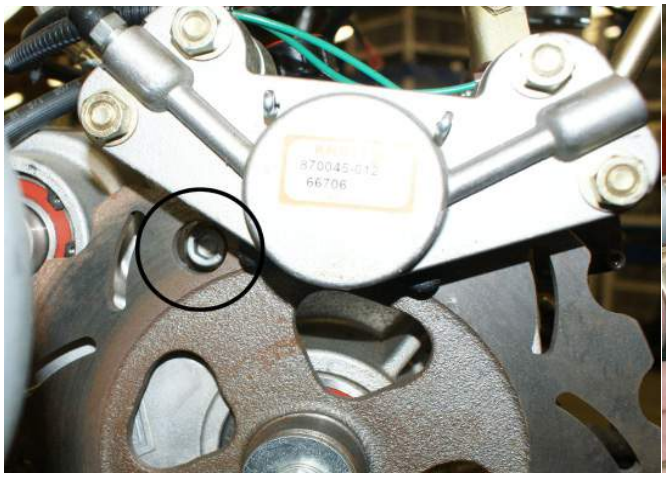


***Photo 5***

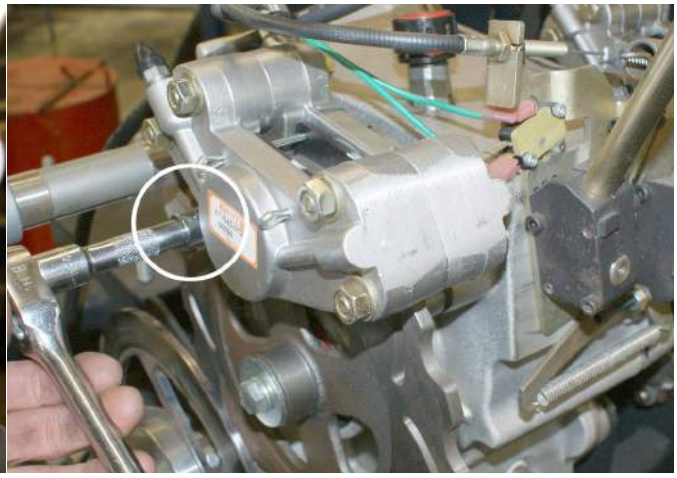


***Photo 6***

10. Slide the Steering Brake Caliper from the disc. There is no need to disconnect the brake line from the caliper. ***Photo 7 & 8***

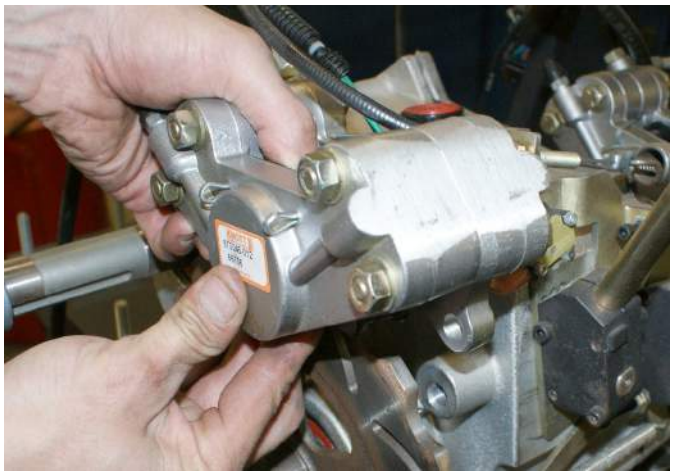


***Photo 7***

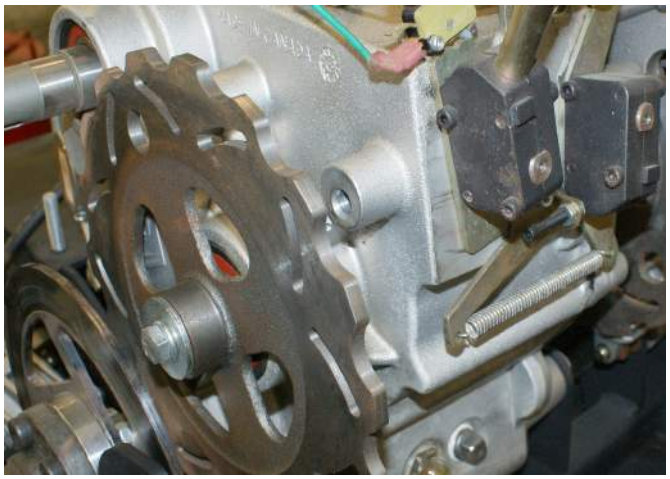


***Photo 8***

11. Remove one fastener from the inner Idler Shaft Coupler and Service Disc Brake. ***Photos 9***

**NOTE**

*There is a lockwasher and locking nut to the inside of the fastener which will need to be held with an open end wrench*

12. Remove the fastener securing the Steering Brake Disc to the output shaft. ***Photo 10***


***Photo 9***

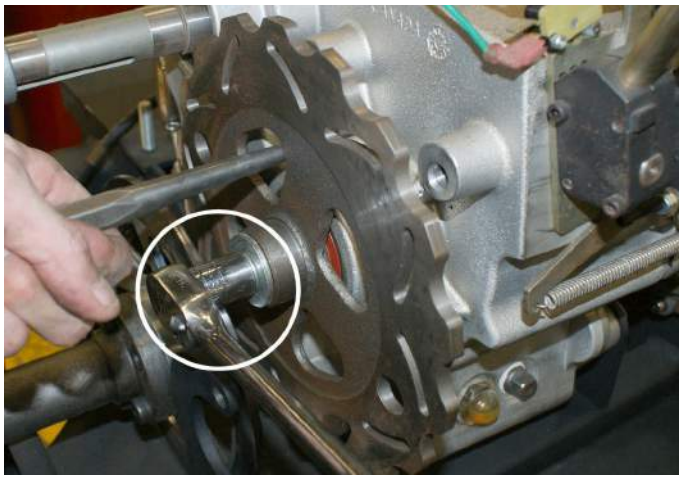


***Photo 10***

13. Rotate the Steering Brake Disc until one of the scalloped areas aligns with the fastener previously removed in step 11. ***Photo 11***

14. Slide the brake disc from the Brake Shaft and free of the transmission. ***Photos 12***

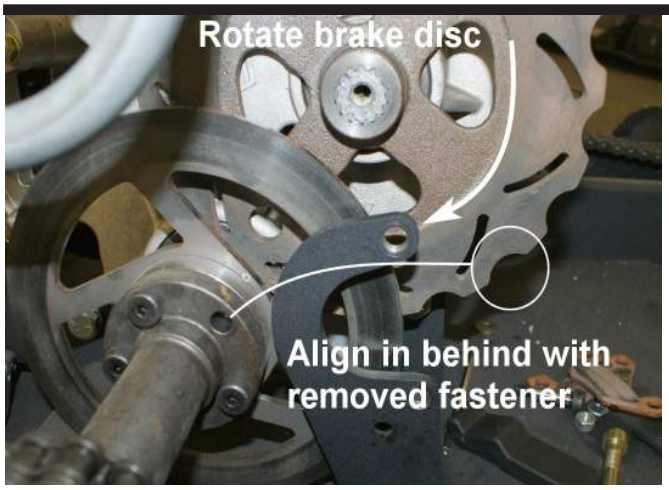



***Photo 11***

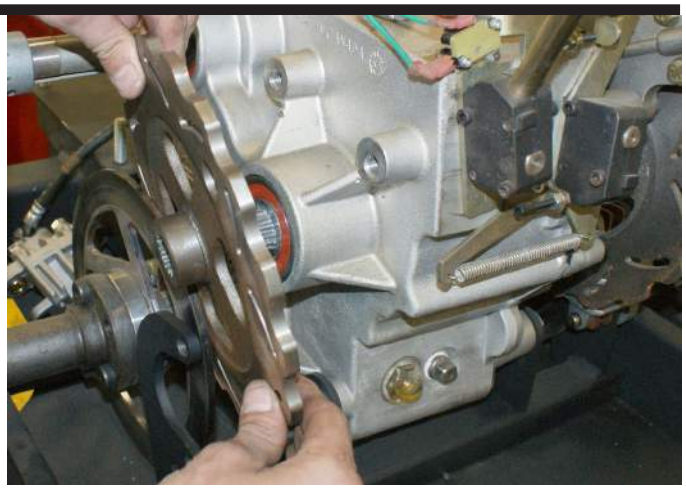


***Photo 12***

15. Remove the rest of the fasteners from the Idler Axle, Coupling and Steering Disc Brake. ***Photo 13***

16. Repeat Steps 5 through 15 for the right hand side of the vehicle.

17. Disconnect the wiring at the Neutral Start Switch. ***Photo 14***

18. Unthread the nut securing the Hi/Lo Shifter Cable to the retaining bracket on the transmission. ***Photo 15*** Thread the nut completely to the end and off.

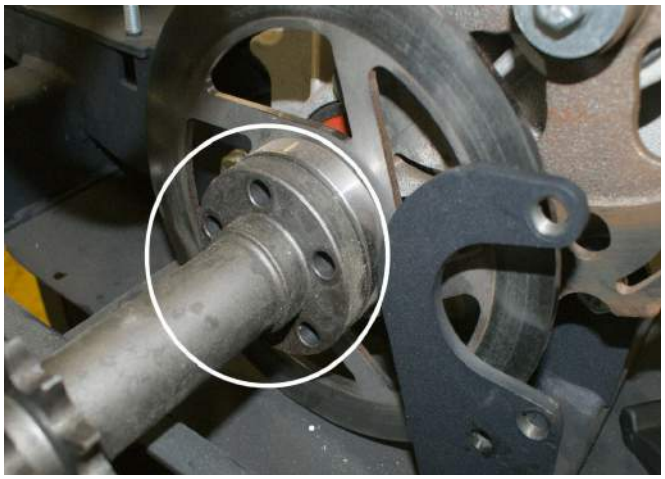


***Photo 13***

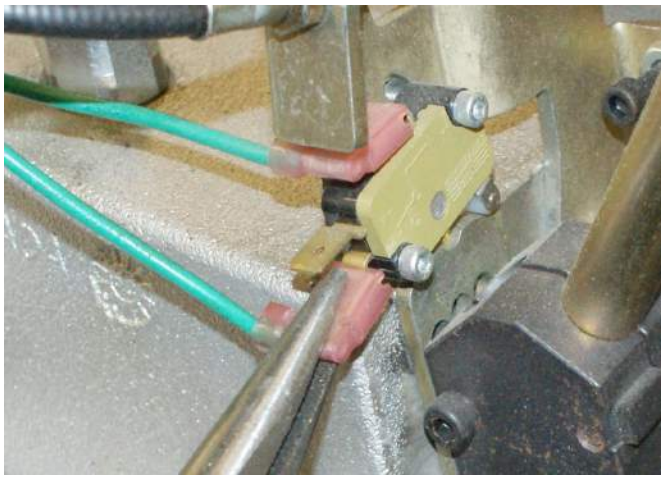


***Photo 14***

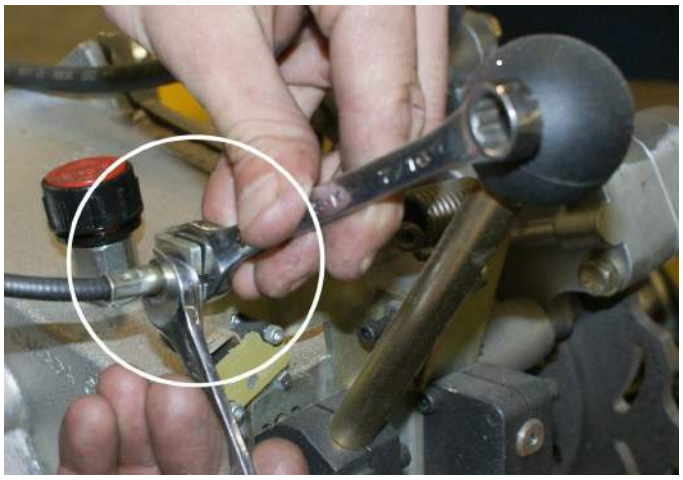


***Photo 15***

19. Disconnect the Spring from the end of the Hi/Lo Shifter Cable. ***Photo 16***

20. Remove the cable from the bracket and place it out of the way. ***Photo 17***

21. Locate the Emergency/Parking Band Brake Assembly and remove the hardware securing it to the transmission. ***Photo 18***


***Photo 16***

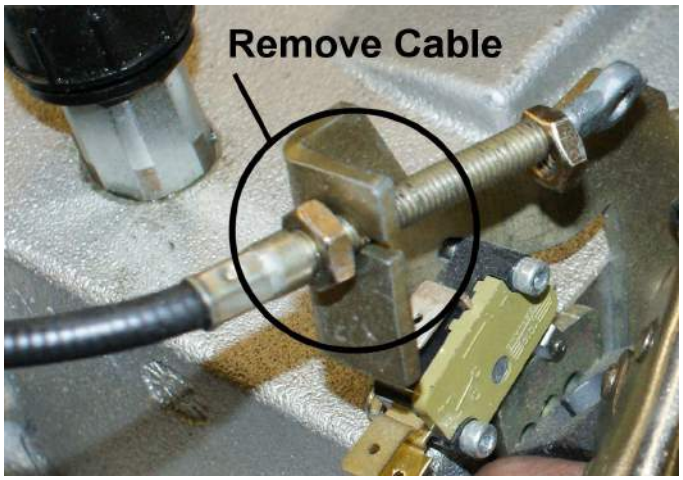



***Photo 17***

**IMPORTANT**

**Be aware of the Spacer Washers used to the inside of the mounting bolts, *Photo 19* There are three (3) located on each mounting bolt. Excercise caution to keep from dropping and losing them in the drive train below.**

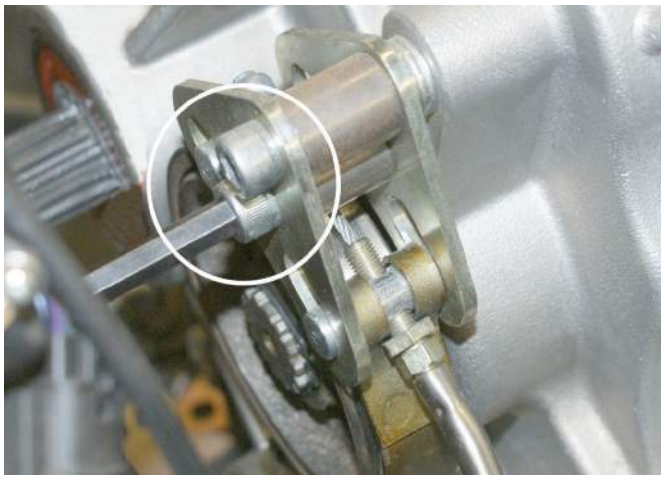


***Photo 18***

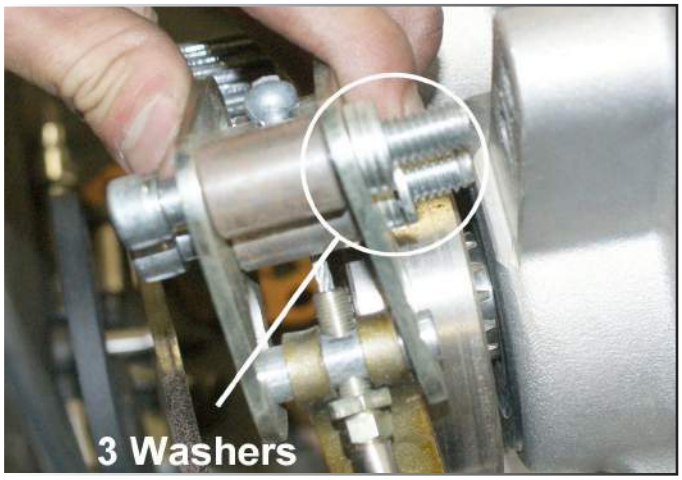



***Photo 19***

18. Slip the band brake out of the mounting assembly while keeping the mounting assembly intact. ***Photos 20& 21***

***Photo 20***

***Photo 21***

19. Remove both REAR Transmission mounting bolts (left hand and right hand side). ***Photo 22 & 23***

**NOTE**

*Notice the difference in bolt length between the right hand side and the left hand side. The right hand side bolt is 3.0" in length compared to the 1.25" length bolt used on the left hand side.*

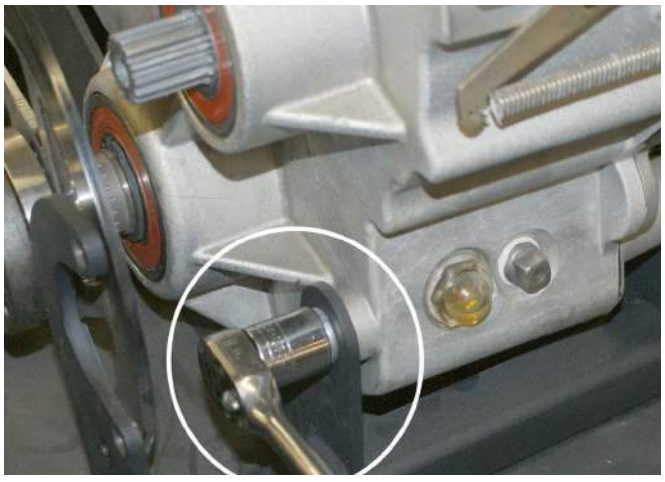


***Photo 22***

***Photo 23***

20. Remove the two transmission mounting bolts located at the FRONT of the transmission. To access these it is suggested to use a 45 degree ratchet style closed wrench. ***Photo 24 & 25***

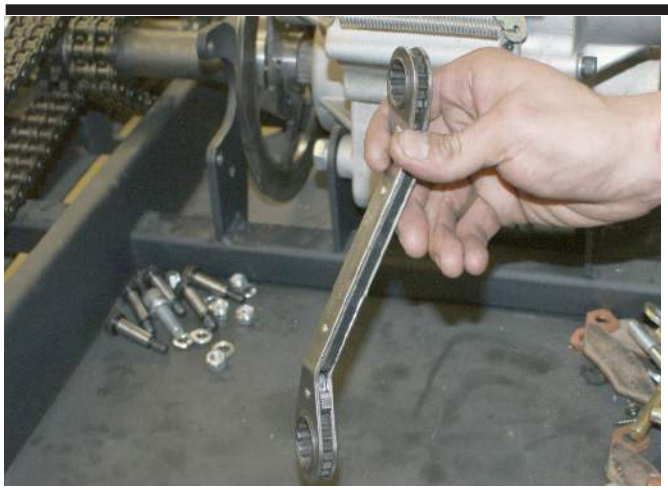


*Photo 24*

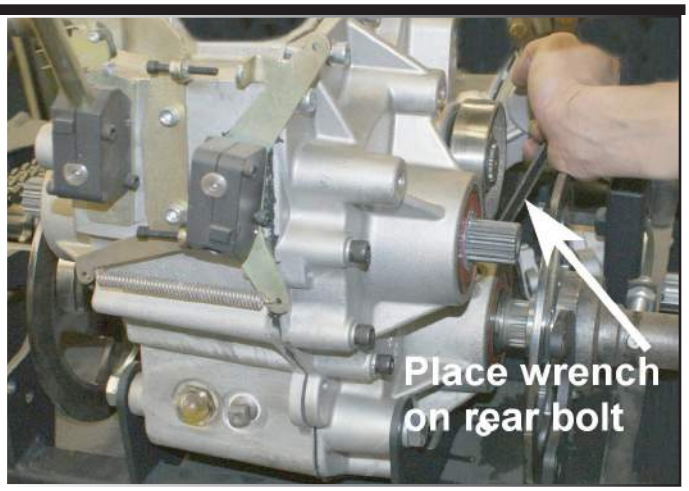



*Photo 25*

**NOTE**

*When removing both FRONT & REAR 3.0" Bolts securing the right hand side of the transimission, you will need to swivel the Service Brake Disc enough to clear the bolt when pulling out.* ***Photo 26 (rear bolt - view from front of vehicle)***

21. Lift the transmission carefully from the frame. This will require the aid of another person. ***Photo 27***

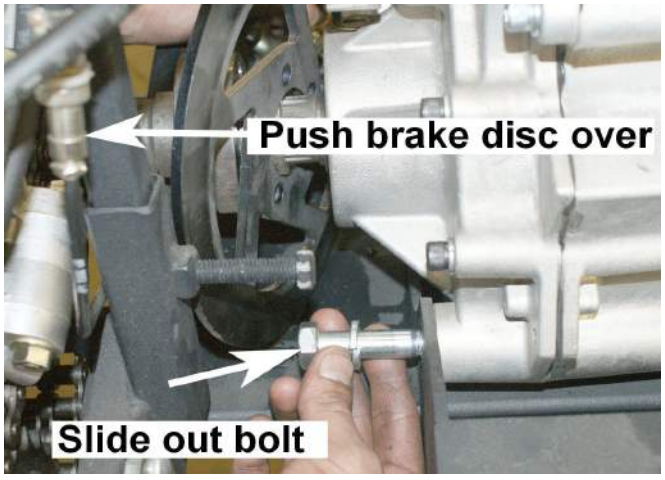



*Photo 26*

*Photo 27*

**Installing the Transmission**

1. Loosely place the Service Disc Brakes onto the left and right Output Shafts, followed by each of the Output Shaft Couplers. Apply anti-seize compound to the spline of each Output Shaft before installing the Couplers. Install the Couplers with the collar facing in. ***Photo 27a*** *Please note there is no unique direction the spokes of the Service Brake Disc needs to be facing.*

2. With the aid of a second pair of hands, position the transmission back into the frame aligning the mounting holes to insert the bolts. ***Photo 28***

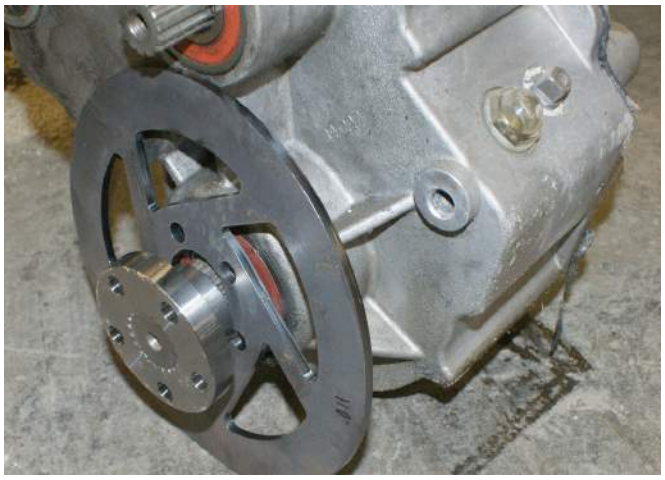


***Photo 27a***

***Photo 28***

3. Install all four (4) Mounting Bolts to secure the transmission to the vehicle frame. Remember to install the 3.0" length bolts to the RIGHT side of the transmission, and the 1.25" Bolts to the LEFT hand side. ***Photo 29***

4. Torque Front and Rear Mounting Bolts to Specifications. ***Photo 30 & 31***

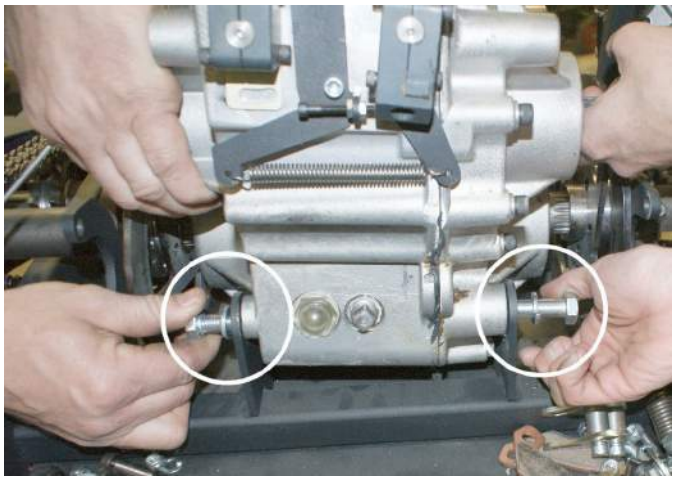


***Photo 29***

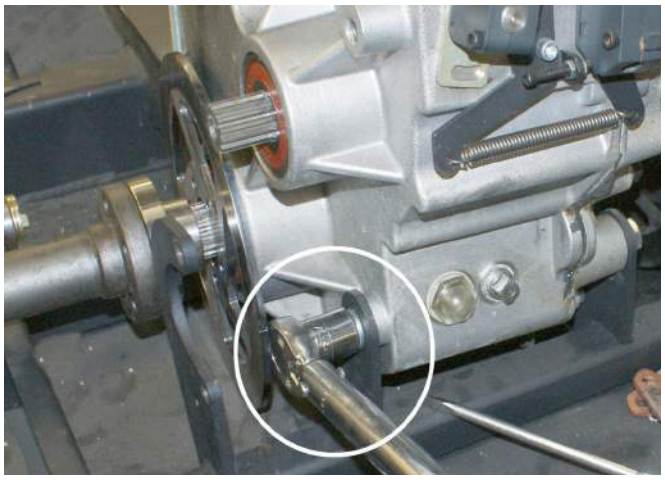


***Photo 30***

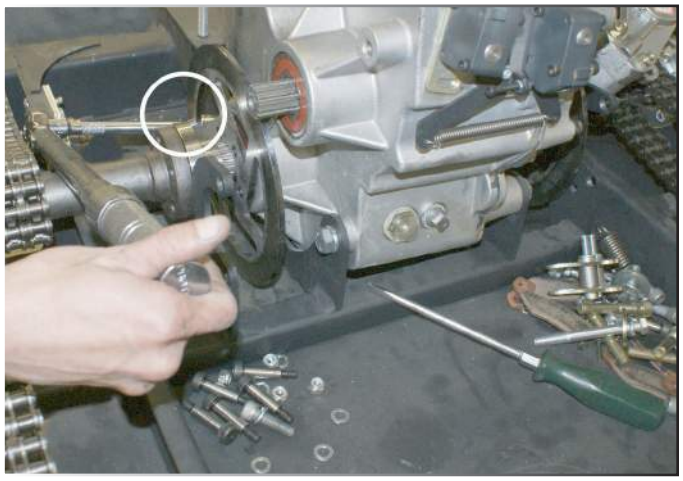


***Photo 31***

5. Apply anti-seize compound to the unthreaded portion of the Idler Shaft/Steering Brake/ Coupler Bolts, and install them to connect the Idler Shaft to the transmission Output Shafts. ***Photo 32 & 33***

**NOTE**

*Install only Four (4) Fasteners (leaving one (1) out for now). Secure with Lockwashers and Nuts.* ***Photo 34 & 35*** *Torque to Specifications.*

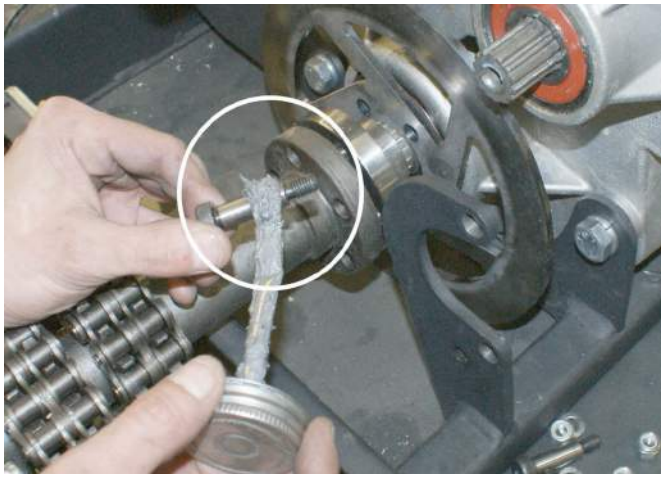


***Photo 32***

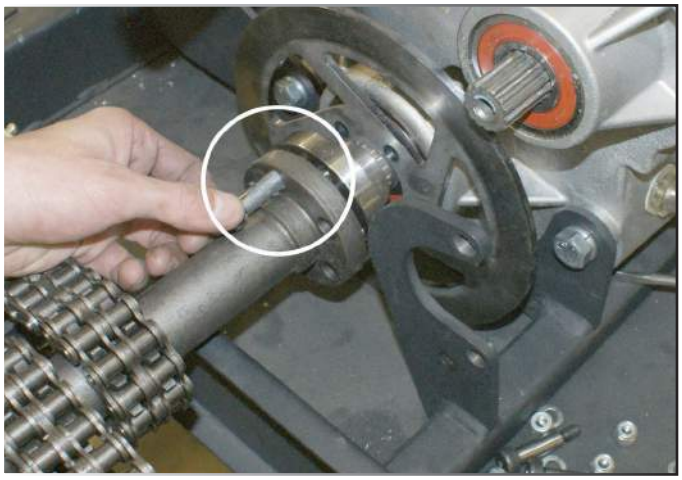


***Photo 34***

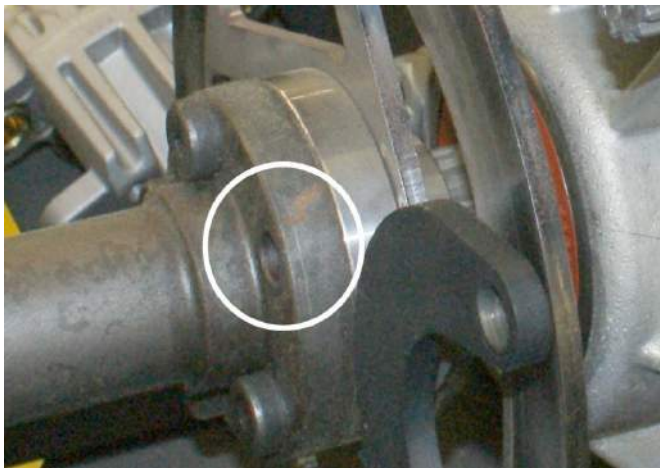


***Photo 34***

***Photo 35***

7. Locate and install the band brake back to the mounting assembly. Apply Blue 242 LOCTITE to the threads of each mounting bolt. ***Photo 36***

**IMPORTANT**

**Please ensure all Spacer Washers are in place on the Mounting Bolts before re-attaching to the transmission housing. There are three (3) Spacers per bolt.**

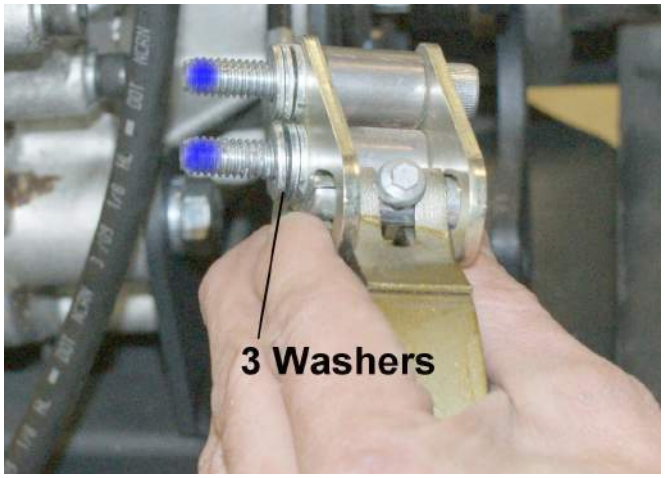



Photo 36

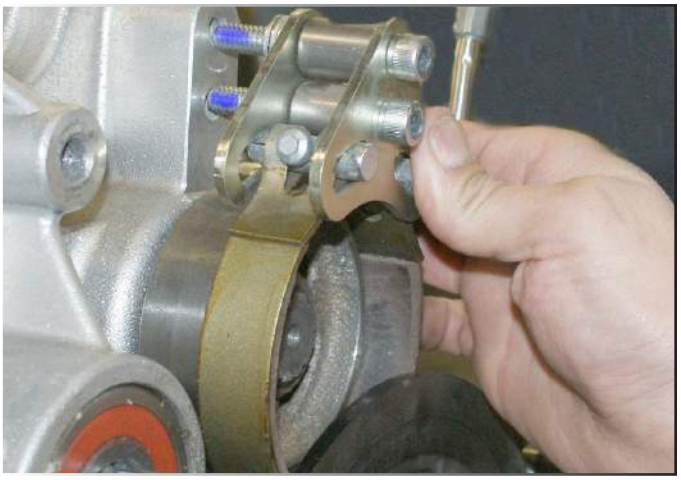


Photo 37

8. Slip the Band Brake over the E Brake Drum and secure to the transmission with the two (2) Bolts. Torque to specifications. ***Photo 37***

9. Reconnect the Extension Spring between the Hi/Lo Shift linkage on the transmission and the end of the Hi/Lo Shift Cable. Using a needlenose vise grip pull on the spring and install the cable back into the Cable Retainer. ***Photo 38 & 39*** Secure wth the jam nut.

Photo 38

Photo 39

10. Perform the Servicing Procedure, **Hi/Lo Shifter Adjustment.**

11. Reconnect the Neutral/Safety Switch wiring back to the terminals of the switch. Refer back to ***Photo 14*** for correct terminal location. Orientation of green wires do not matter.

12. Apply anti-seize compound to the splined Brake Shaft and install the Steering Brake Disc securely up against the shoulder of the Brake Shaft. ***Photo 40***

**NOTE**

*Rotate the Steering Brake Disc until one of the scalloped areas aligns with the removed fastener on the Idler Shaft . This will allow enough room to install the disc back onto the splined Brake Shaft. Refer back to* ***Photo 11***

13. Install the Steering Brake caliper. Spread the brake pads apart as you slide it over the brake disc and align the mounting ears with the mounting bosses on the transmission housing. ***Photos 41 & 42***

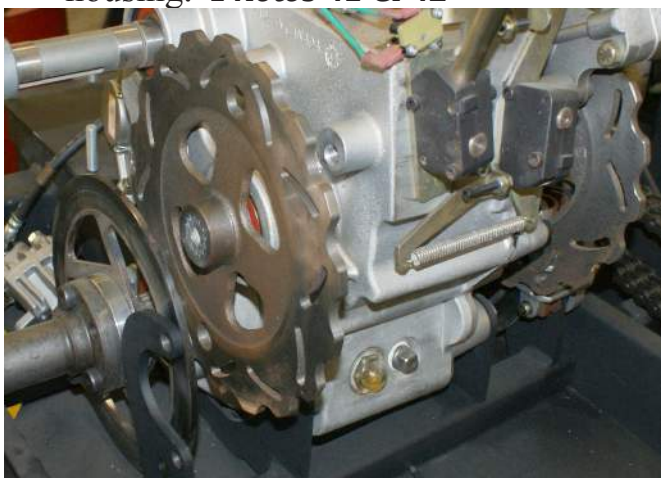


***Photo 40***

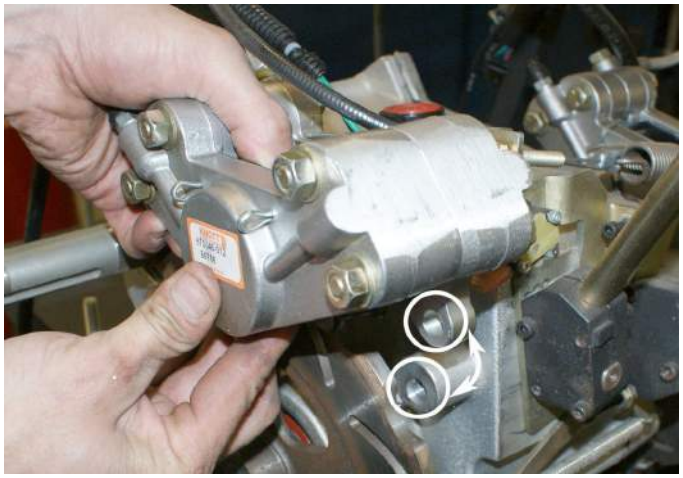


***Photo 41***

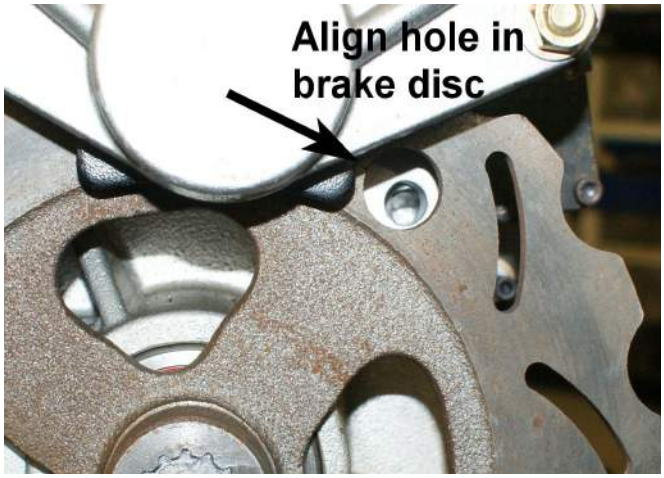



***Photo 42***

14. Secure the Caliper by applying Blue 242 LOCTITE to the threads of the two (2) Fasteners and mounting it to the transmission along with a Lockwasher. Torque to specifications. ***Photos 43& 44***

15. Blue LOCTITE the hardware required to secure the Brake Disc and torque to specifications. ***Photos 45 & 46***

16. Reinstall the Fastener that was left out in Step 5. See IMORTANT below.

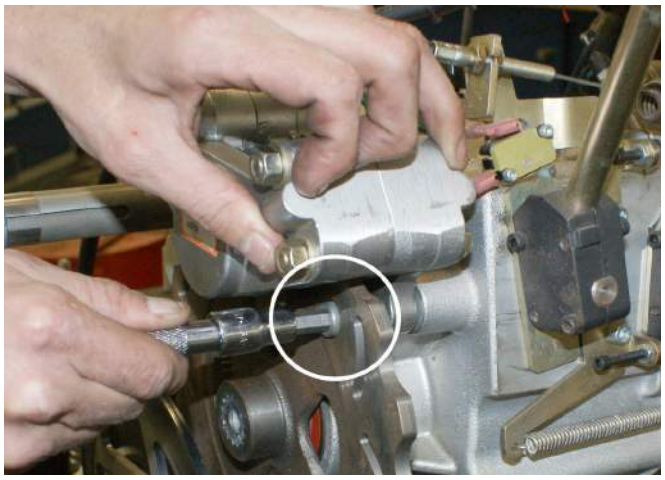


***Photo 43***

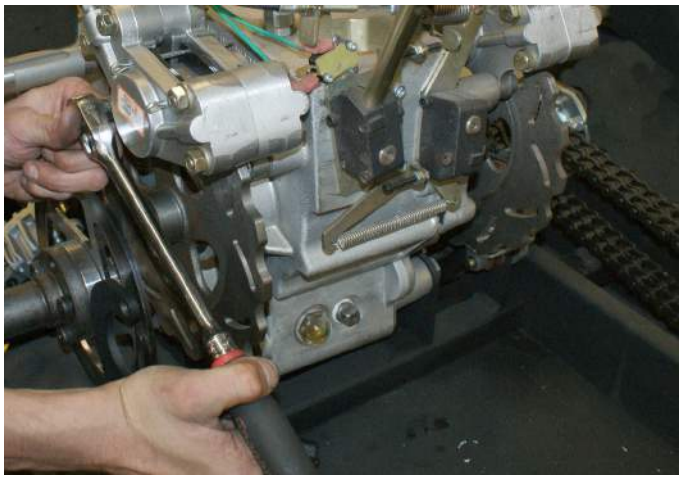


***Photo 44***

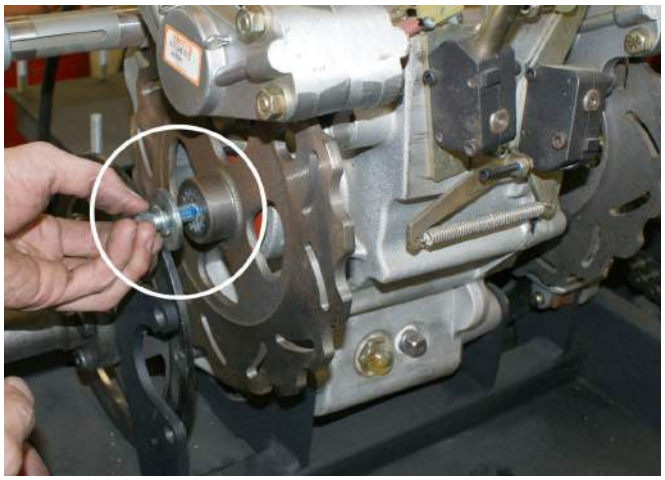


***Photo 45***

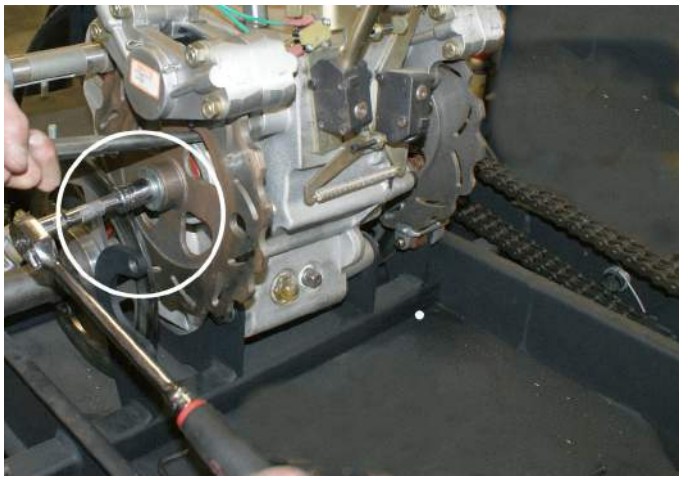


***Photo 46***

**IMPORTANT**

**Ensure that the Fastener has had Blue 242 LOCTITE applied to the threads and that the Lockwasher has been reinstalled along with the Locknut to the inside. Torque to specifications.** ***Photo 47 & 48***

17. Locate the Service Brake Caliper bracket and reassemble the Service Brake Caliper securely into place. ***Photo 49***

18. Torque to Specifications. ***Photo 50***


*Photo 47*

*Photo 48*

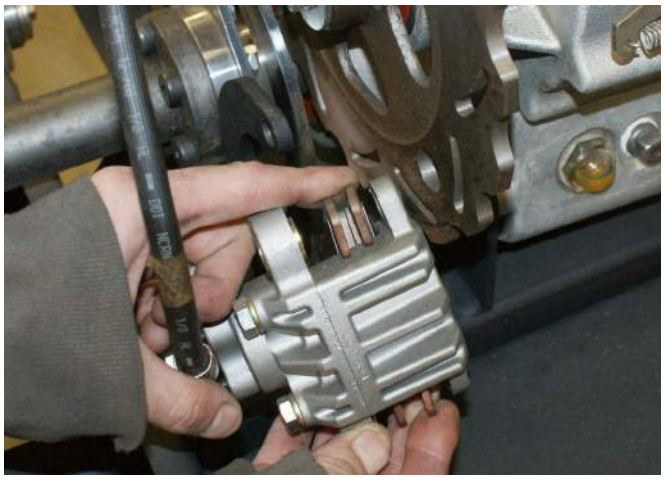


*Photo 49*

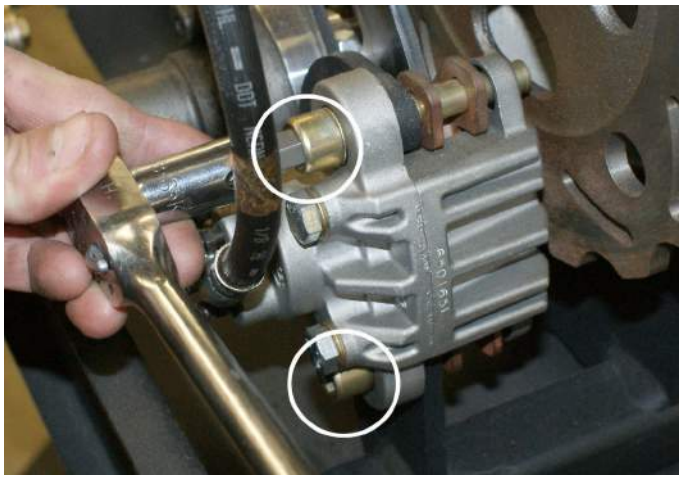


*Photo 50*

19. Perform the Servicing Procedure, **Installing the Driven Clutch**

20. Perform the Servicing Procedure, **Installing the Drive Belt**

21. Perform the Servicing Procedure, **Installing the Firewall.**

22. Perform the Servicing Procedure, **Installing the Front Floor Pan**

## Adjusting Hi/Lo Shifter Lever

1. Place the Hi/Lo Shift Lever into High Gear. Ensure that it is in high gear by rotating the tires until you feel that it is engaged. ***Photo 1***

2. Through the engine compartment, ensure the shift cable is installed properly into the retainer of the shift lever. ***Photo 2***

***Photo 1***

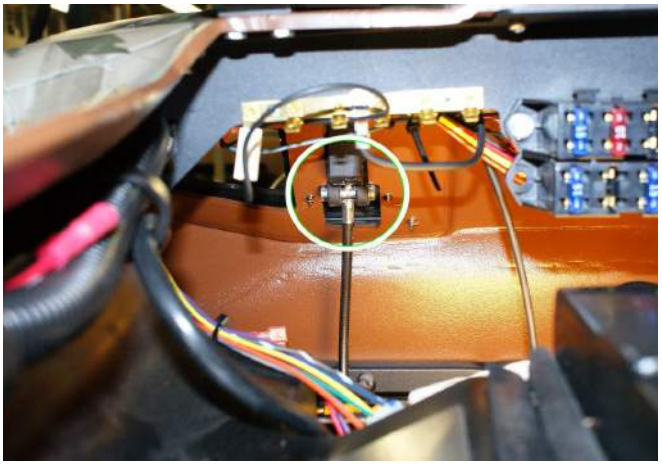


***Photo 2***

3. Adjust the cable at the transmission such that any slack is removed, yet not enough to start putting tension on the spring. ***Photo 3***

4. Check for any interference at the lower return spring between spring and casting of transmission. If necessary, bend the lever slightly out to eliminate any. ***Photo 4***

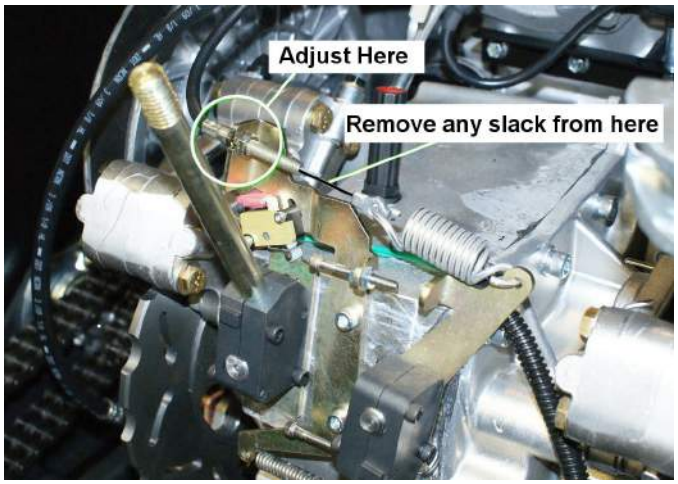



***Photo 3***

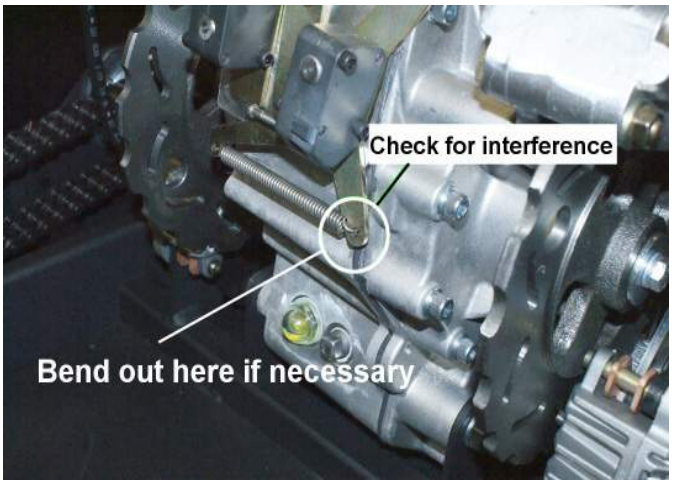



***Photo 4***

5. With the transmission still in High Gear, adjust the High Stop Pin such that it is making contact with lower shift block as illustrated in ***Photo 5***

**IMPORTANT**

**Do not adjust stop screw too far in. Screw is adjusted just enough to contact the stop.**

6. Place the vehicle into Low Gear (rotate the tires once again to ensure the transmission has engaged into low gear) Adjust the Low Stop Pin such that it is making contact with the upper stop on shift bracket. ***Photo 6***

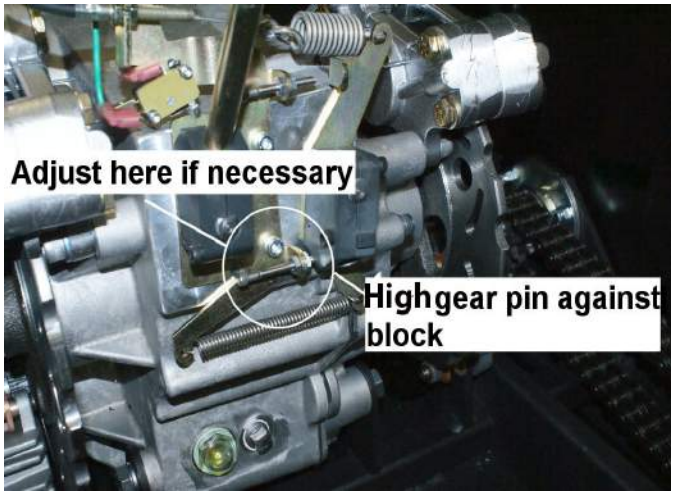



***Photo 5***

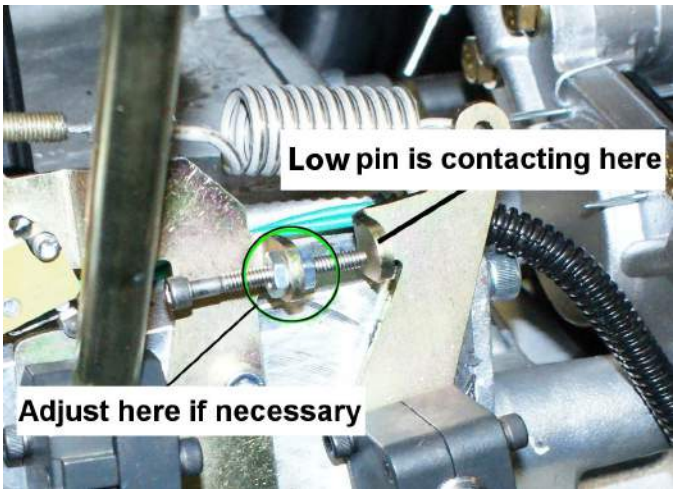
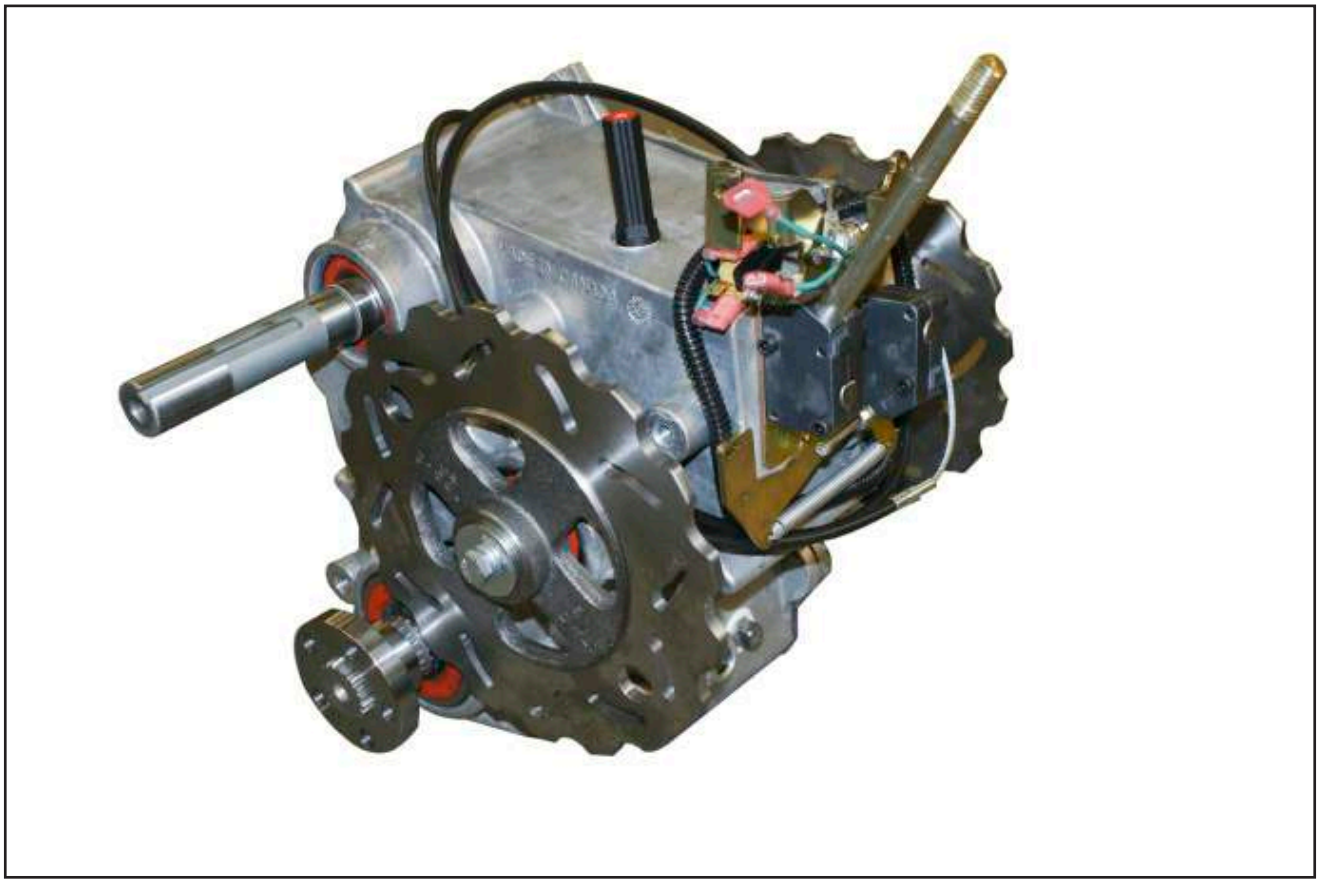



***Photo 6***

# HDi Transmission

## Disassembly



1. Locate the E-Drum brake on the transmission. Remove the outer retaining ring. ***Photo 1.***
2. Slip off the e-brake drum. Take this opportunity to inspect it. Inspect the drum surface, the spline or any cracks that may be present. ***Photo 2.***

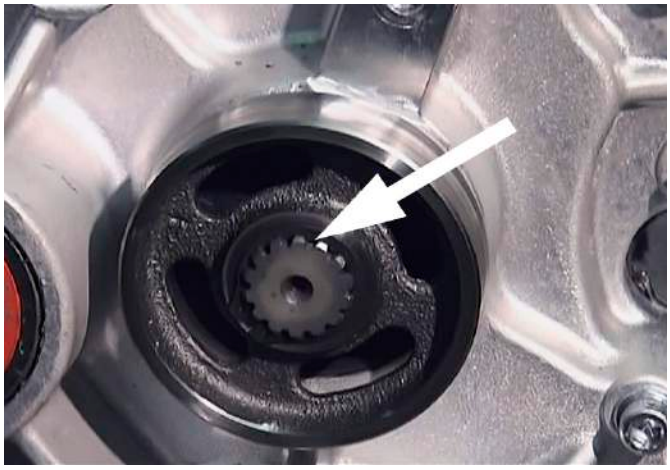


**Photo 1**

***Photo 2***

3. Remove the inner Retaining Ring. ***Photo 3.***
4. Disconnect the extension spring from the spring mount bracket. ***Photo 4.***

5. Loosen off the fasteners securing the shift lever clamp to the high/lo shift shaft and slide it off of the shift shaft.The spring mount bracket will come off attached to the shift clamp. ***Photo 5 & 6***

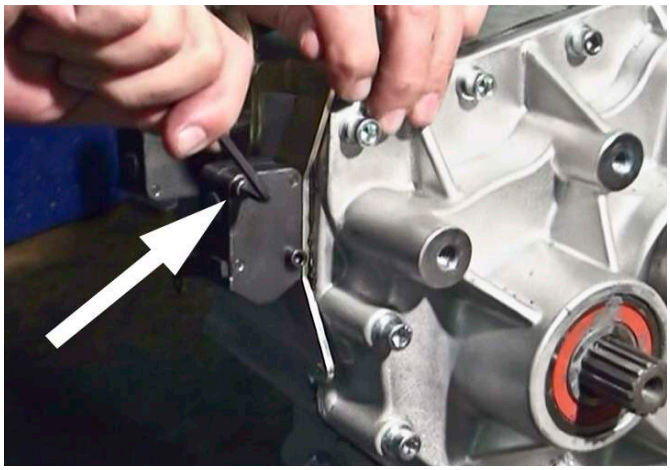


***Photo 5***

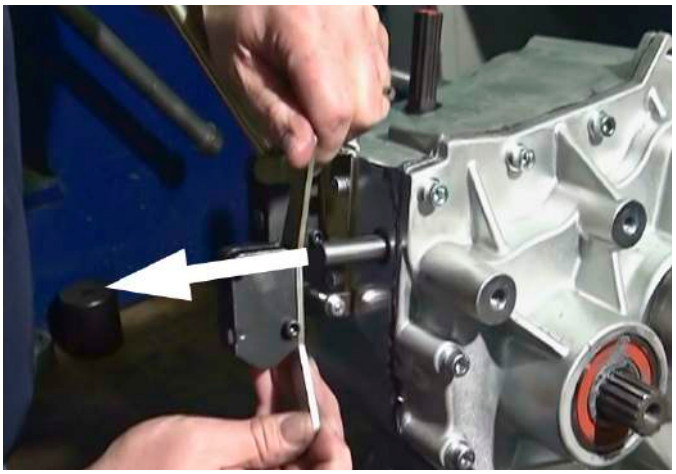


***Photo 6***

6. Remove the 2 fasteners that are securing the second spring mount bracket to the transmission housing. Set this bracket aside to a clean work area. ***Photo 7 & 8***.

***Photo 7***

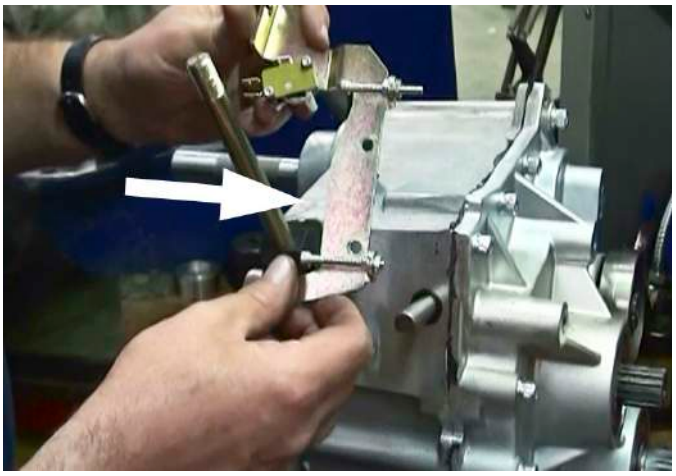


***Photo 8***

7. Loosen off the 4 fasteners securing the shift lever clamp to the forward reverse shift shaft. Be aware when removing this assembly that there is a small ball and spring located in behind the detent plate. As you pry the shift block with a slot screwdriver you will notice that the assembly will slowly spring forward. ***Photo 9.***

***Photo 9***

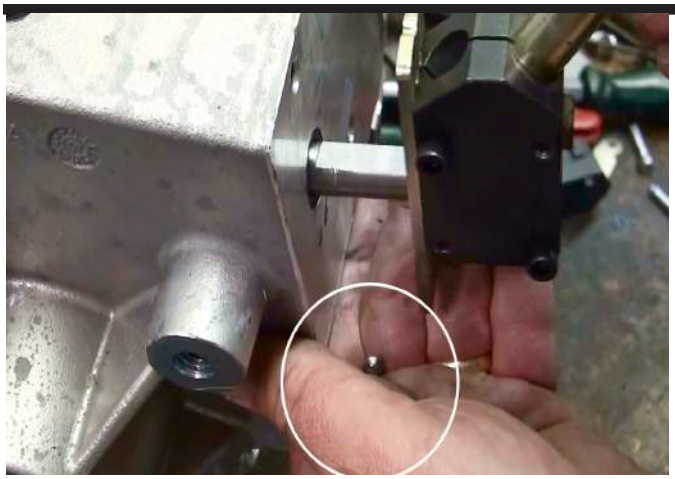


***Photo 10***

***Photo 11***

8. As you slide the shifter assembly off of the shaft, be prepared to catch the ball in your hand. ***Photo 10*** . Remove the spring from the transmission housing. This ball and spring provides the shift gate notches you feel when you are shifting from forward to neutral to reverse. ***Photo 11.***
9. Place the transmission to the transmission holding fixture and remove all fasteners securing the right hand housing to the left hand side. ***Photo 12***.

**NOTE**

*Fasteners used in the top half of the transmission are shorter than the ones used in the lower half of the transmission*

10. To separate the housing there are 3 locations provided on the right hand housing to install some threaded rod. as the threaded rod is turned in at these locations, the cover will begin to separate. ***Photo 13 & 14***

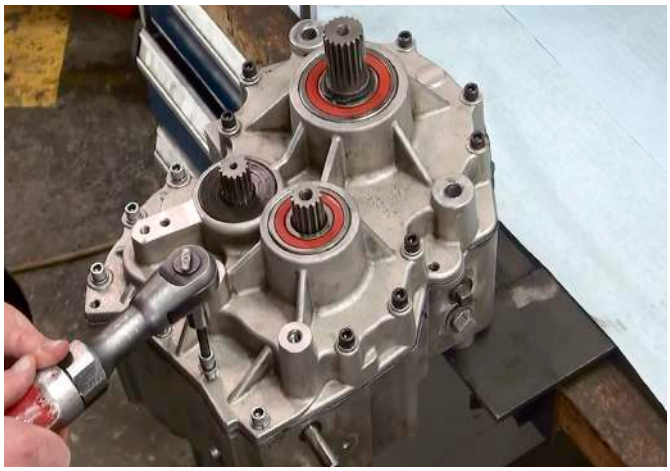


***Photo 13***

***Photo 14***

**NOTE**

*To be sure that the cover separates evenly, thread each of these a little at time alternating between the 3. as the housing begins to separate, periodically tap between the idler shaft and brake shaft.* ***Photo 15***

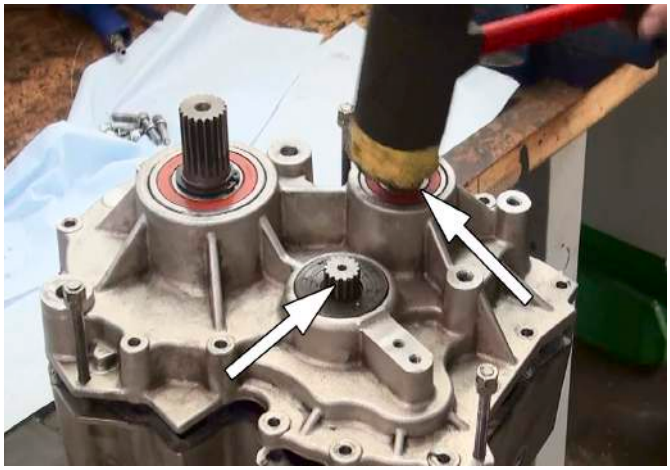


***Photo 15***

***Photo 16***

11. Once the right hand housing is free from the left hand housing,separate and place on the bench. ***Photo 16***.
12. Remove the threaded rod from each of the three locations on the right hand housing.

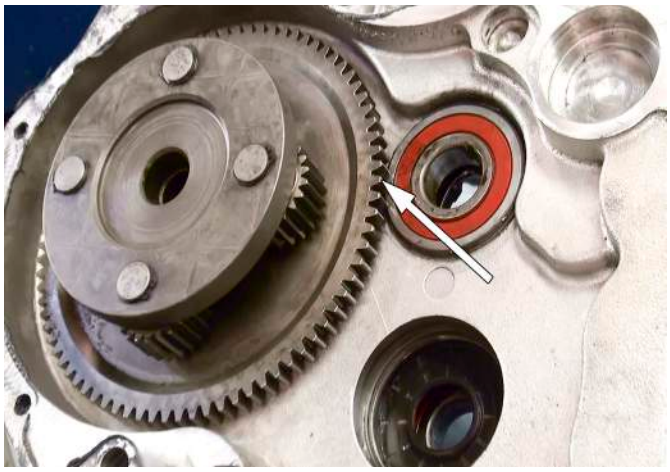


***Photo 17***

***Photo 18***

**NOTE**

*You will notice that the right hand output shaft stays with the right hand housing.* ***Photo 17****. The sun gear from that assembly is also coming into contact with one of the bearings left in the housing. Use a soft face hammer and a bearing seating tool to reseat that bearing back into the housing.* ***Photo 18.***

13. Next locate and remove each of the retaining rings that are securing the hi/lo shift shaft in the housing. ***Photos 19 & 20***.

***Photo 19***


***Photo 20***

14. Pull the hi/lo shift shaft from the transmission. As the shift shaft is pulled from the transmission,remove both shift forks, spring, washers and spacer as well. ***Photo 22.***

**NOTE**

***You may find it beneficial to install half of a 34-232 shift fork on to the reverse shift shaft, this will ease in helping to pull out the shift shaft from the housing. Photo 21.***

***Photo 21***

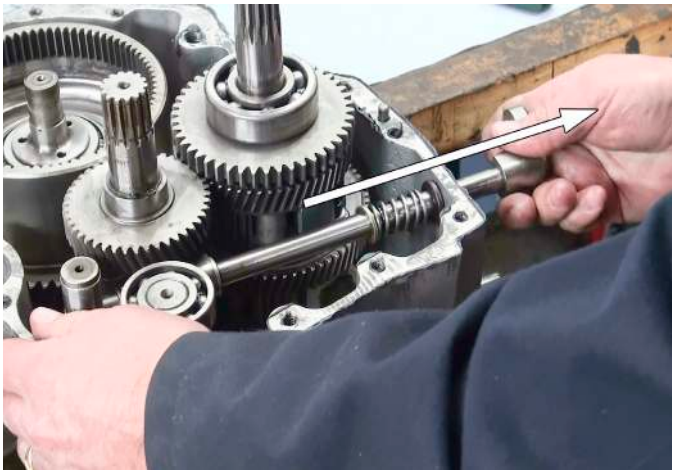


***Photo 22***

15. As the shift shaft is pulled from the transmission, remove both shift forks, spring, washers and spacer as well. Take the opportunity to reassemble these components back to the shift shaft. ***Photo 23.***

***Photo 23***

***Photo 24***

16. Remove the retaining ring securing the spacer on top of the 45 tooth helical pinion of the idler shaft assembly. ***Photo 24.*** Remove the spacer as well. ***Photo 25.***

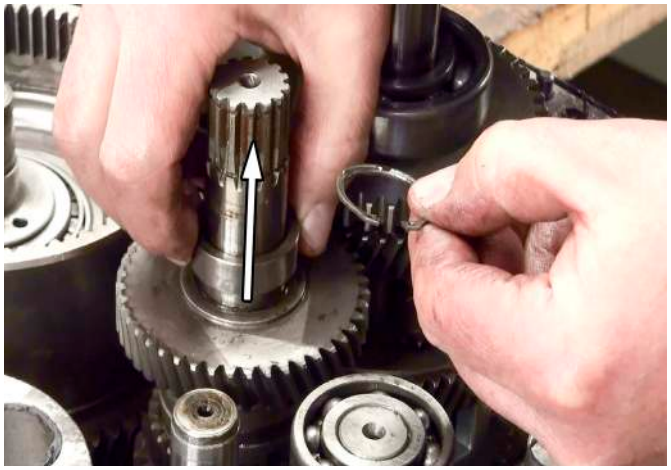


***Photo 25***

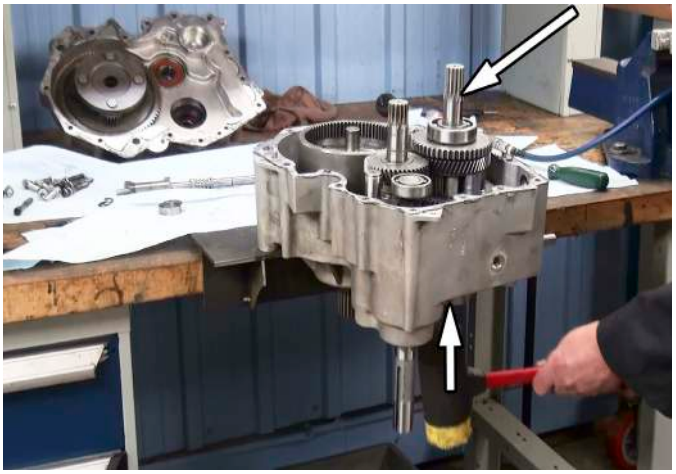


***Photo 26***

17. From below the transmission tap on the upper differential brake shaft to remove it from the housing. ***Photo 26***.

**NOTE**

*Raise the helical gear pinion from the idler shaft to allow for clearance when pulling the brake shaft upper differential assembly from the housing.* ***Photo 27****. Move the upper differential brake assembly to a clean work area.*

18. Temporarily place the spacer back on to the helical gear pinion and secure with the retaining ring. ***Photo 28.***
19. Place a pry bar under the helical gear pinion and gently pry upwards. ***Photo 29.***

*Photo 27*

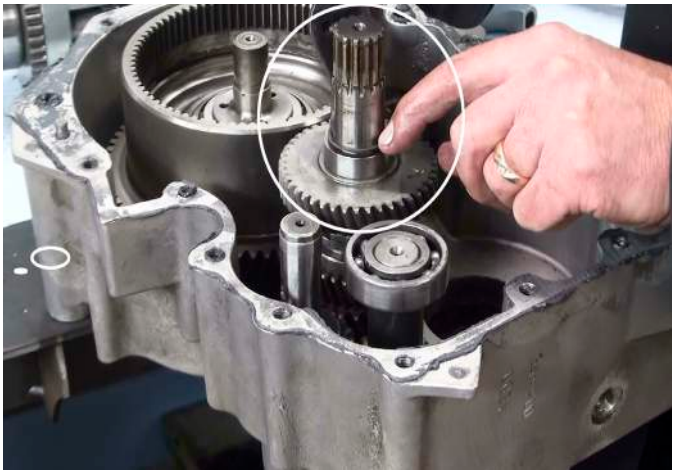


*Photo 28*

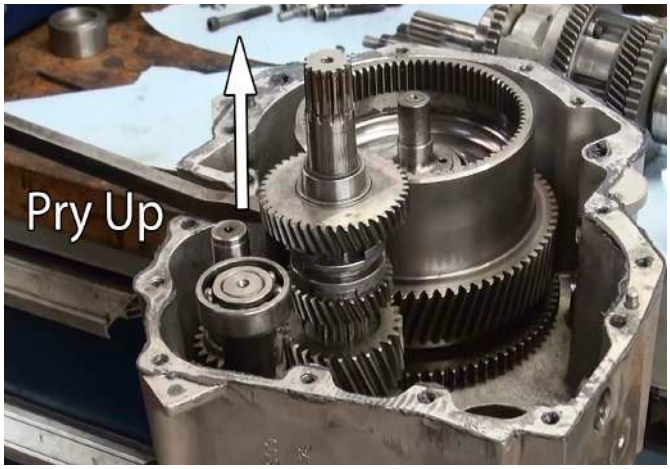



*Photo 29*

*Photo 30*

20. Remove the 27 tooth helical pinion below as well as the spacer. ***Photo 30.***

**NOTE**

*Note the remaining 35 tooth helical gear below. this will be removed at a later stage.* ***Photo 31.***

*Photo 31*

21. Remove the forward reverse shift shaft. Remove the retaining rings that are securing the shift shaft within the housing. ***Photos 32 & 33***

***Photo 32***

***Photo 33***

22. Gently pull the shift shaft from the housing along with the shift forks, spring, spacer and washers. ***Photo 34***

**NOTE**

*Once again try to assemble these components back to the shift shaft*

23. Pull the Reverse Idler Shaft from the housing. ***Photos 35 & 36***

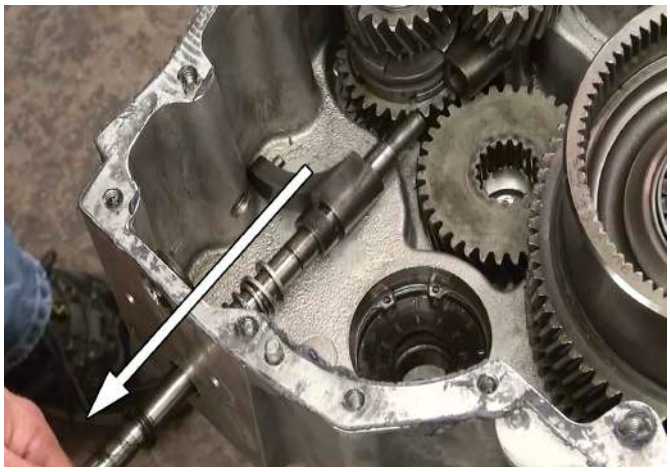


***Photo 34***

***Photo 35***

*Photo 36*

*Photo 37*

24. Using a soft faced mallet, gently tap the input shaft from the housing. ***Photos 37 & 38***. Set the assembly to a clean work area.

25. Remove the helical gear. ***Photo 39***.

*Photo 38*

*Photo 39*

26. Remove the transmission from its stand and set it upright. Locate the retaining ring on the output shaft. Remove this retaining ring. ***Photos 40 & 41***.

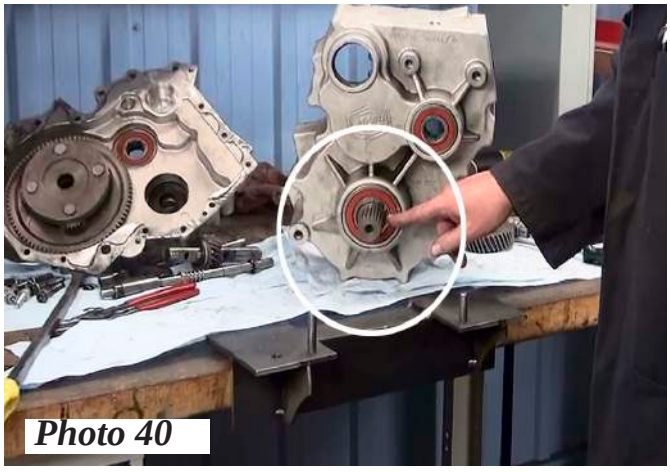


*Photo 40*

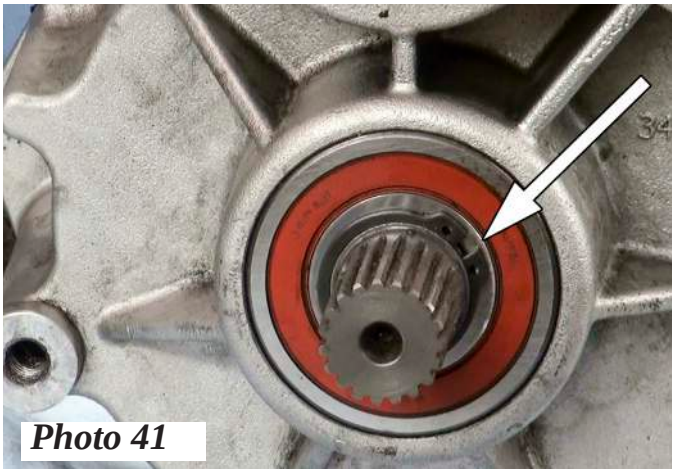


*Photo 41*

27. Taking the housing to a press, press out the left hand side output shaft assembly. ***Photos 42 & 43.***

***Photo 42***

***Photo 43***

28. Using a drift punch, gently tap the output shaft outer bearing from the housing. ***Photos 44 & 45***.

***Photo 44***

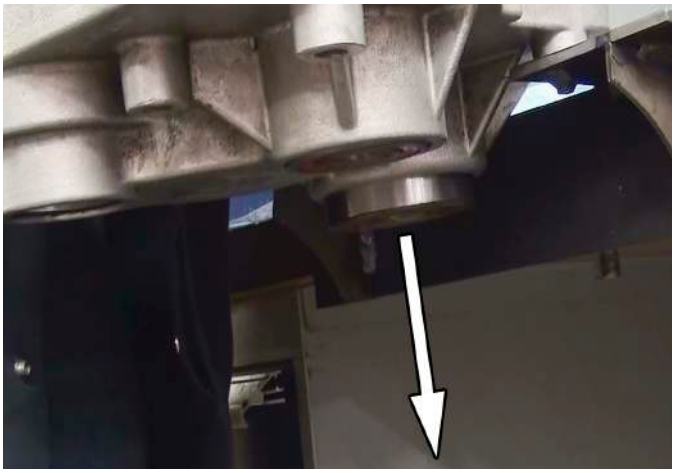


***Photo 45***

29. Remove the output shafts inner retaining ring and remove the inner retaining ring of the brake shaft assembly. ***Photo 46***.

***Photo 46***

30. Remove the flanged bushing from the bearing of the idler shaft assembly. ***Photo 47.***
31. Using a drift punch, gently tap the outer bearing of the brake shaft assembly from the housing. ***Photo 48.***

***Photo 47***

***Photo 48***

32. Flip the left hand housing over to remove the remaining outer retaining rings. ***Photo 49***.
33. Remove all seals from the housing. ***Photo 50***.

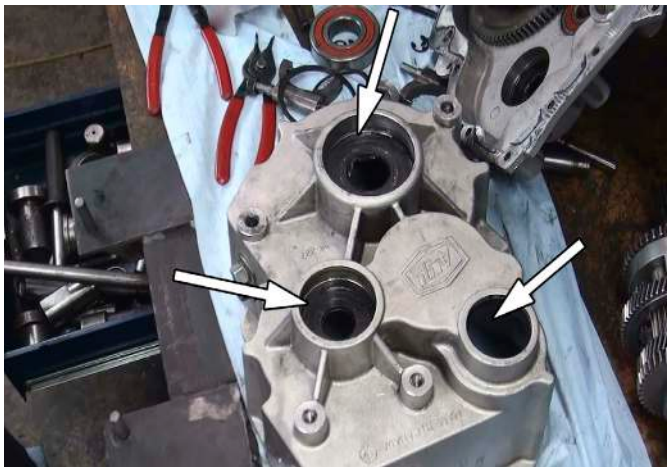


***Photo 49***

***Photo 50***

34. Remove the remaining idler shaft bearing using an internal bearing puller. ***Photos 51 & 52***
35. Remove both shift shaft bushings from the housing. ***Photo 53***
36. Locate the right hand side transmission housing and remove the retaining ring at the output shaft. ***Photo 54***.
37. Take the housing to a press and push out the righthand side output shaft assembly. ***Photo 55.***

*Photo 51*

*Photo 52*

*Photo 53*

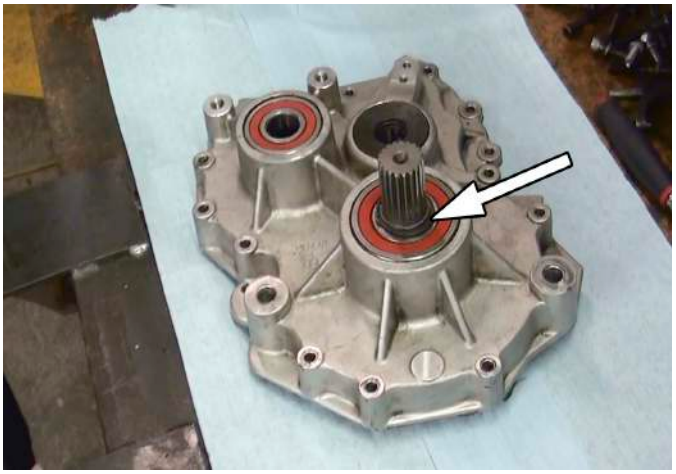


*Photo 54*

*Photo 55*

38. Remove the inner retaining ring of the brake shaft assembly. ***Photo 56***.
39. Using a drift punch gently tap out the outer bearing of the brake shaft assembly. ***Photo 57.***

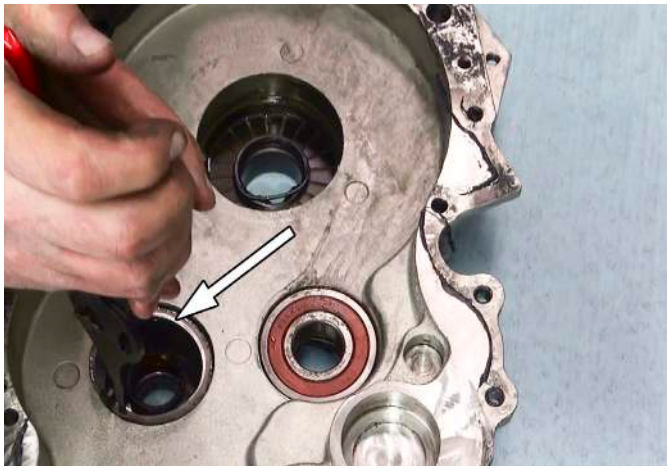


***Photo 56***

***Photo 57***

40. Turning the housing over, remove the second retaining ring at the brake shaft assembly and remove the seal. ***Photo 58 & 59***

***Photo 58***

***Photo 59***

41. Place the transmission housing back on to the stand to remove the idler shaft bearing. ***Photo 60***.
42. Flipping the housing back over, remove the retaining ring at the idler shaft location. ***Photo 61.***
43. Remove the idler shaft seal. ***Photo 62.***
44. Remove the outer output shaft bearing. ***Photo 63.***

*Photo 60*

*Photo 61*

*Photo 62*

*Photo 63*

45. Remove the retaining ring to the inside of the seal at the output shaft location. ***Photo 64.***

46. Flip the housing over and remove the second retaining ring at the outside of the seal ***Photo 65.***

*Photo 64*

*Photo 65*

47. Remove the output shdft seal. ***Photo 66***.

***Photo 66***

**Disassembling the Input Shaft.**

1. Lay out the input shaft assembly on a clean work surface. ***Photo 1***
2. Take input shaft to press and remove bearing from the end of shaft. ***Photo 2.***

3. Remove the retaining ring located beneath the bearing and slip off the spacer. ***Photo 3 & 4***

***Photo 3***

***Photo 4***

4. Remove the thrust washer. ***Photo 5***.
5. Remove the reverse pinion. ***Photo 6***.

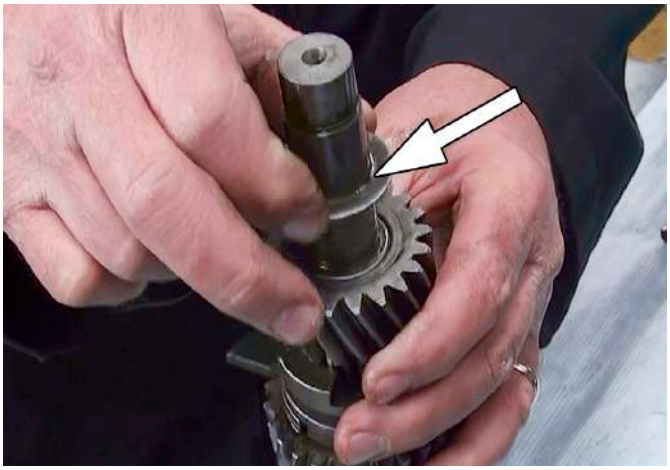


***Photo 5***

***Photo 6***

6. Slip off the forward/reverse shift collar. ***Photo 7.***
7. Flip the input shaft around to remove the two bearings that are located one on top of the other. Install a bearing removal tool between the two bearings and take to the press to remove the first bearing. ***Photo 8*** & 9

***Photo 7***

***Photo 8***

***Photo 9***

***Photo 10***

8. Remove the spacer located between the two bearings. ***Photo 10***
9. Place the bearing removal tool beneath the second ball bearing and use the press to remove. ***Photo 11 & 12***

***Photo 11***

***Photo 12***

10. Slide the bearing from the shaft. ***Photo 13.***
11. Remove the retaining ring securing the forward pinion. ***Photo 14.***

***Photo 13***

***Photo 14***

12. Slip the forward pinion off of the input shaft.

**IMPORTANT**

**Please take note that there is a thrust washer located located on both sides of the forward pinion.**

Complete disassembled input shaft. ***Photo 15***

***Photo 15***

Clean all components in a varsol bath or an environmentally safe solution before Inspecting for any damaged or worn parts.

**Disassembling the Idler Shaft Assembly**

1. Lay out the idler shaft assembly on a clean work surface. ***Photo 1***
2. remove the 35 tooth helical gear. ***Photo 2.***

***Photo 1***

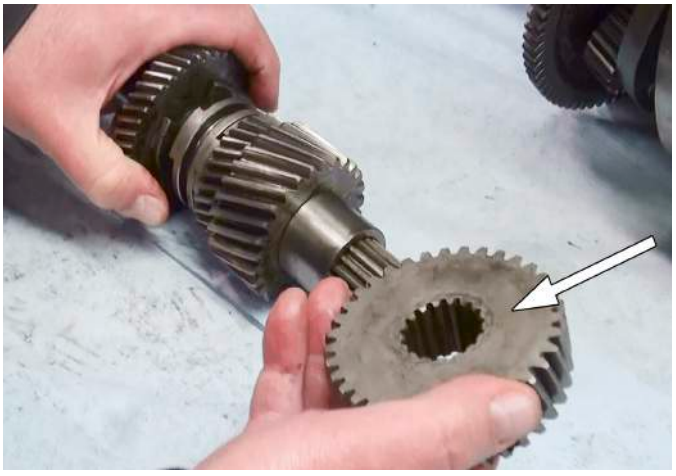


***Photo 2***

3. Remove the spacer. ***Photo 3***.
4. Slide off the 27 tooth helical pinion and note the machined recess on the one side. ***Photo 4***.

***Photo 3***

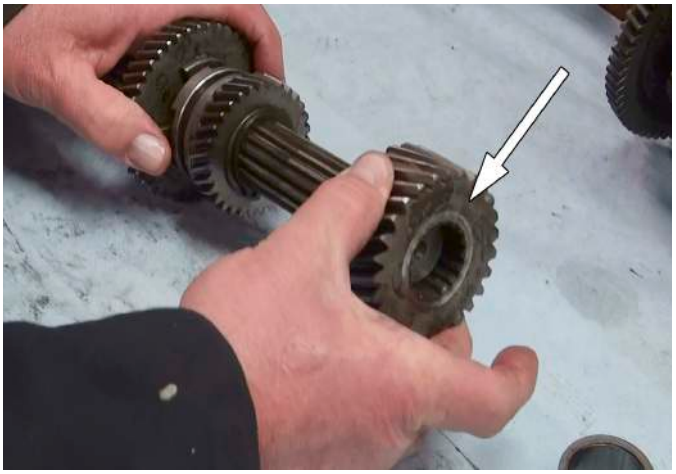


***Photo 4***

5. Next locate the retaining ring securing the 31 tooth helical pinion. ***Photo 5.***
6. Remove the retaining ring. ***Photo 6***.

***Photo 5***

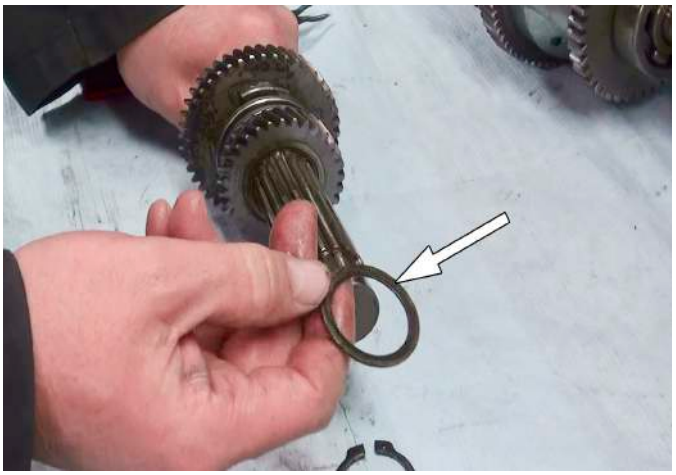


***Photo 6***

7. Slide off the thrust washer. ***Photo 7.***
8. Slide off the the 31 tooth helical pinion. Take note of the thrust washer located to the dog tooth side. ***Photo 8***.

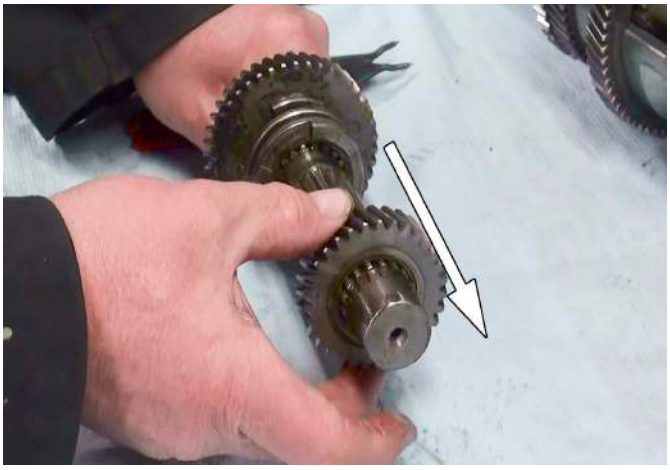


*Photo 7*

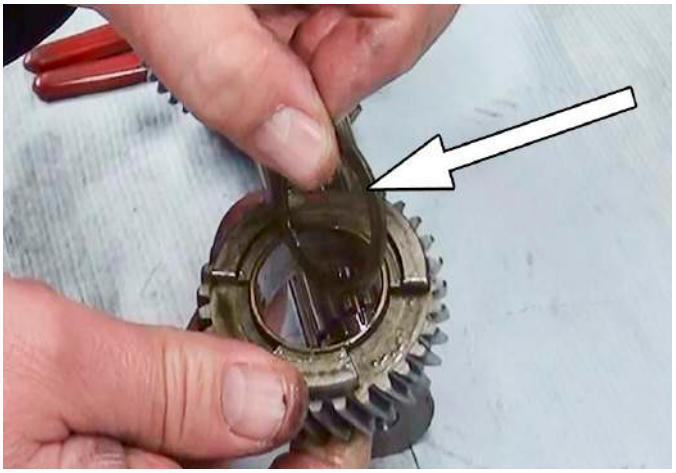


*Photo 8*

9. Slide the hi lo/shift collar from the idler shaft. ***Photo 9.***
10. Flipping the idler shaft to the other side, locate and remove the retaining ring securing the spacer below. ***Photo 10.***

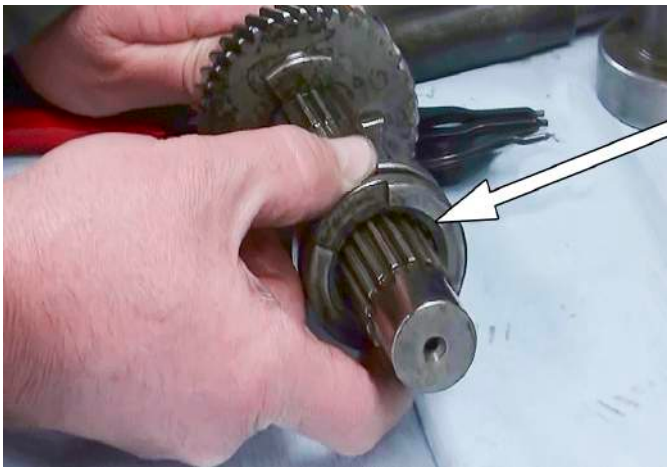


*Photo 9*

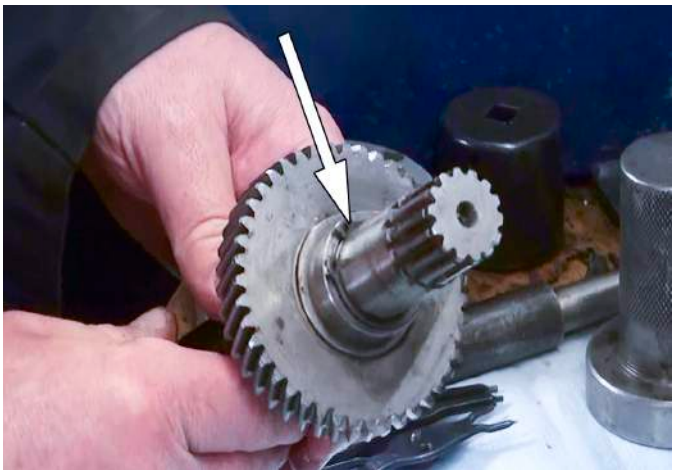


*Photo 10*

11. Remove the spacer. ***Photo 11***.
12. Slide the 45 tooth helical pinion from the idler shaft. ***Photo 12.***

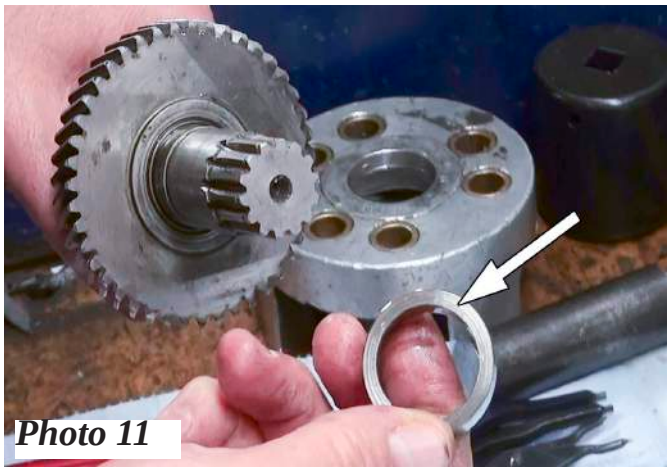


*Photo 11*

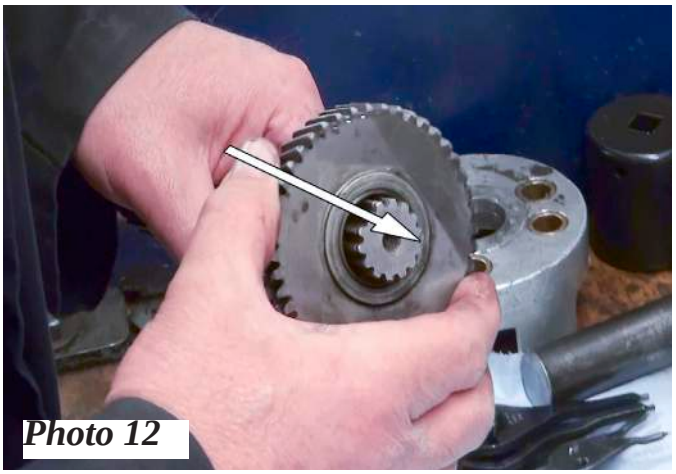


*Photo 12*

Clean all components in a varsol bath or environmentally safe cleaning solution and lay out on a clean work bench for inspection.

**Disassembling the Brake Shaft Assembly (upper differential assembly)**

1. Set the brake shaft assembly to a clean work surface. ***Photo 1.***
2. Secure the differential into a aluminum jawed vice. ***Photo 2***.

***Photo 1***

***Photo 2***

3. Install a bearing removal tool to remove the ball bearing from the one end of the differential. ***Photo 3 & 4***

**NOTE**

*There is a the shim washer beneath the ball bearing.* ***Photo 5***

**Photo 3**

**Photo 4**

4. Remove the 46 tooth spur pinion. Gently pry off with a pry bar. ***Photo 6.***
5. Remove the thrust washer located below the spur pinion. ***Photo 7.***

*Photo 5*

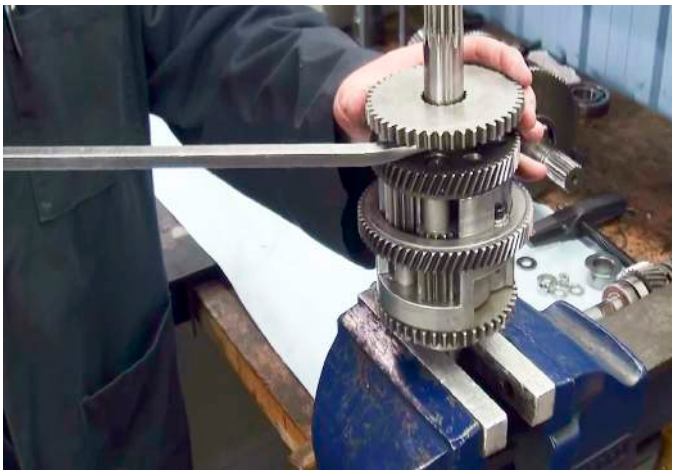


*Photo 6*

*Photo 7*

*Photo 8*

6. Remove four fasteners securing the 55 tooth helical gear. ***Photo 8***
7. Using a pry bar gently pry the helical gear from the differential cage. Note the dowel bushings at each fastener location. ***Photos 9 & 10.***

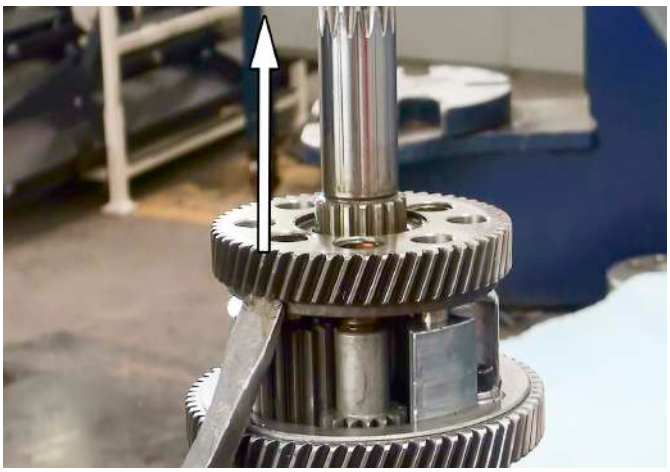


*Photo 9*

*Photo 10*

***Photo 11***

***Photo 12***

**NOTE**

*Each planet gear is staggered one up and one down.* ***Photo 11****.*

8. Pull up and remove the brake shaft. ***Photo 12.***

9. Remove each planetary gear. ***Photo 13.***

***Photo 13***

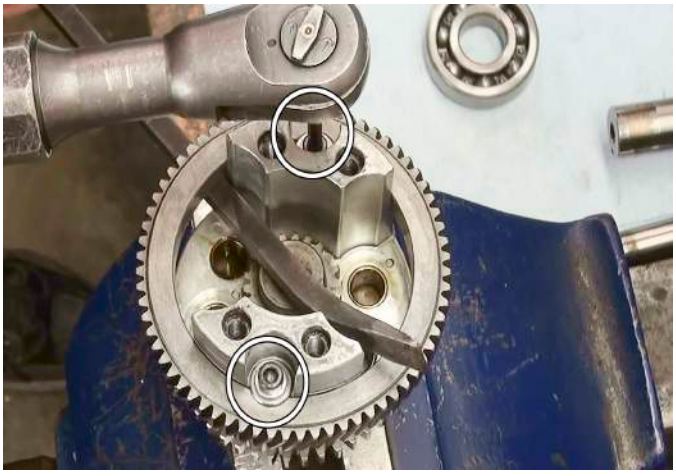


***Photo 14***

10. Remove the two fasteners securing the 67 tooth helical gear to the differential cage. ***Photo 14.***

**NOTE**

*Each fastener has a dowel bushing and lockwasher.* ***Photo 15.***

11. Remove the 67 tooth helical gear. take note of the machined area to the one side of the gear. ***Photo 16***. This will be important when the differential is reassembled.

*Photo 15*

*Photo 16*

12. Press the second brake shaft (located on the differential cage side) out of both ball bearing and 46 tooth spur pinion below. ***Photos 17, 18 & 19.***

**IMPORTANT**

**Take note of the shim washer above the spur pinion. Photo 20.**

*Photo 17*

*Photo 18*

*Photo 19*

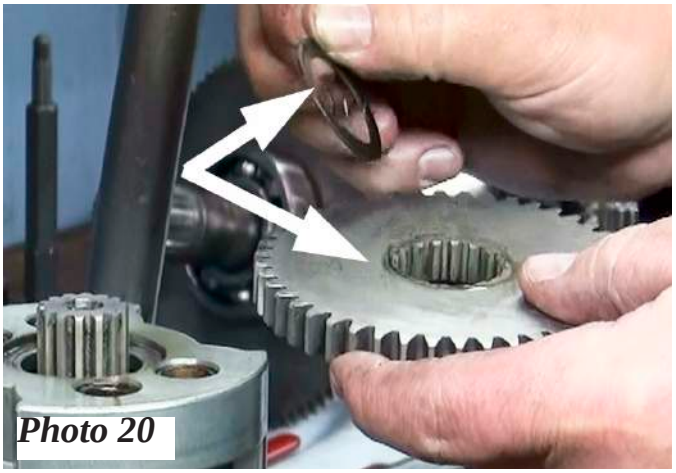


*Photo 20*

***Photo 21***

***Photo 22***

13. Remove the thrust washer from the cage below. ***Photo 21***
14. Separate the differential cage from the brake shaft. ***Photo 22.***
15. Remove the needle bearing from the differential cage with the specialized bearing remover. ***Photo 23***.
16. Remove the needle bearing from the 55 tooth helical gear. ***Photo 24***.

***Photo 23***

***Photo 24***

17. Press out each of the four olite bushing from the 5 tooth helical gear. ***Photo 25.***
18. Press out each of the four olite bushing from the differential cage. ***Photo 26.***
19. Wash all components is a varsol bath or environmentaly friendly solution and lay out for inspection.

*Photo 25*

*Photo 26*

**Disassembling the Reverse Idler Shaft**

1. Remove the retaining ring securing the 20 tooth idler pinion on the reverse shift shaft. ***Photos 1 & 2.***
2. Slide the idler pinion off of shaft along with the thrust washer installed above it. ***Photo 3 & 4***.

*Photo 1*

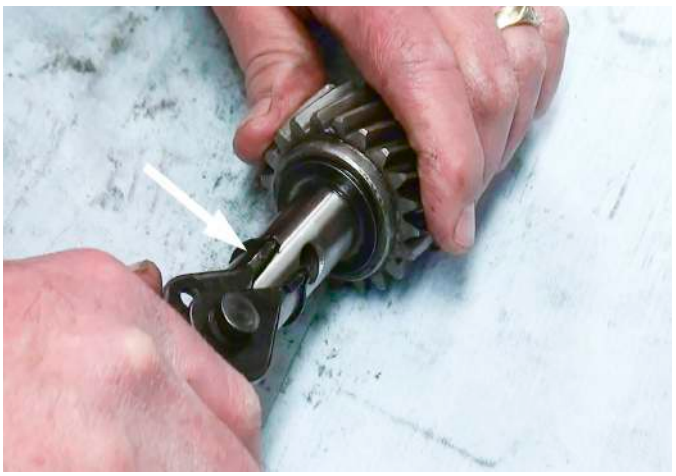


*Photo 2*

*Photo 3*

*Photo 4*

3. Remove the thrust washer from the shaft located behind the idler pinion. ***Photo 5.***
4. Remove the retaining ring. ***Photo 6.***

**Photo 5**

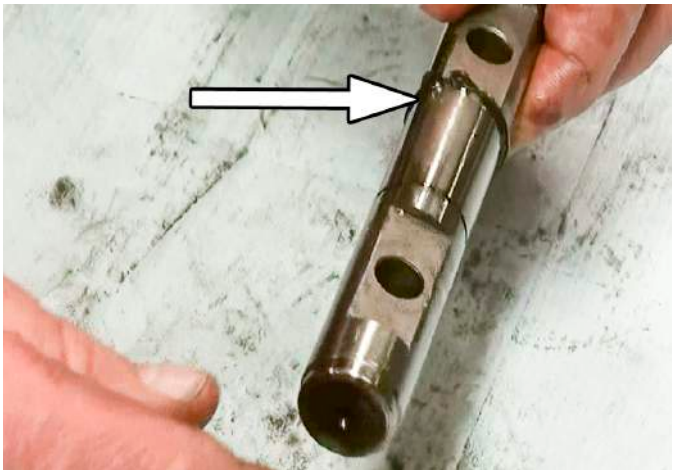


**Photo 6**

5. Clean all components in a varsol bath or environmentally friendly cleaning solution and lay out on a clean work bench for inspection. ***Photo 7.***

***Photo 7***

**Disassembling The Left Hand Side Output Shaft Assembly**

1. Place the left hand side output shaft assembly into the assembly/disassembly fixture and remove the planetary stub shaft. This stub shaft requires a specialized socket tool to unthread it from the output shaft. ***Photos 1, 2 & 3***

*Photo 1*

*Photo 2*

*Photo 3*

*Photo 4*

2. Pull the stub shaft and tapered needle from the assembly. ***Photo 4.***
3. Remove the planetary hub. ***Photo 5***.
4. Remove the second tapered bearing. ***Photo 6.***

*Photo 5*

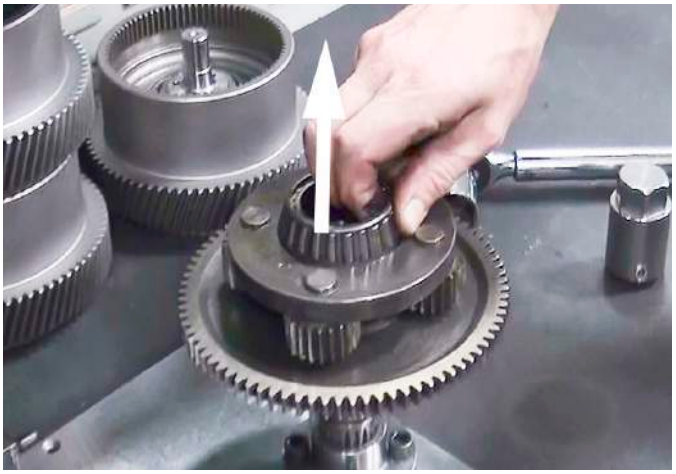


*Photo 6*

5. Slip the tapered bearing off the previously removed stub shaft and separate the spacer from the bearing. ***Photo 7 & 8.***

***Photo 7***


***Photo 8***

6. Press the output shaft from the sun gear and ball bearing. ***Photo 9 & 10.***

***Photo 9***


***Photo 10***

7. Locate each of the 21 tooth planet gears. Remove the retaining rings that secure each of them to the planet carrier pins. ***Photos 11***

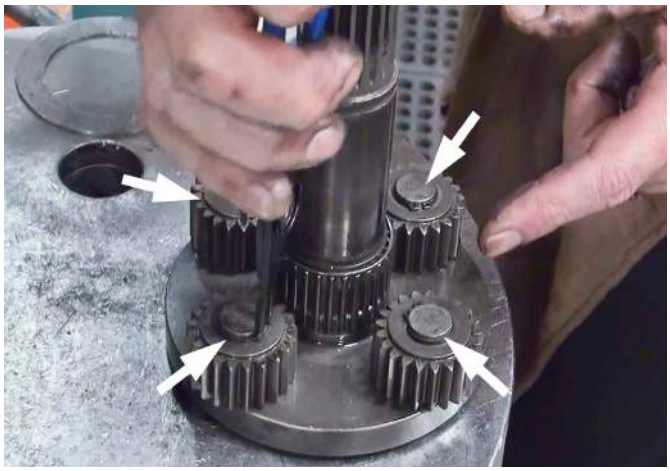


***Photo 11***

***Photo 12***

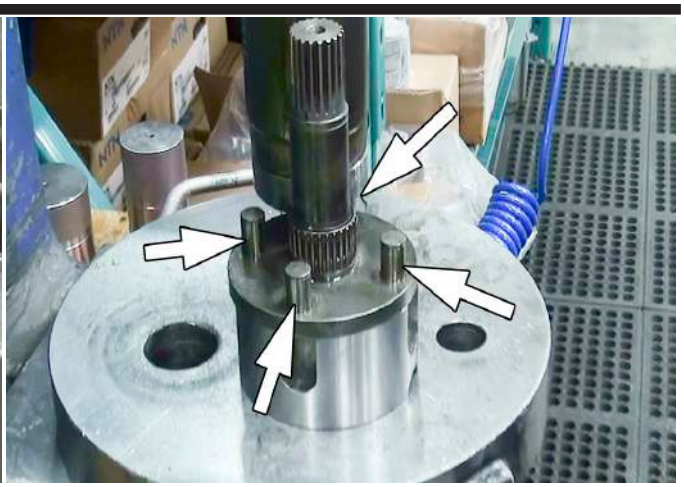


***Photo 13***

8. Slip each planet gear off the carrier pins and set aside each flat washer located to the top of each one. Remove each needle bearing from the planet carrier pins. ***Photo 12.***
10. Place the output shaft to the arbor press and remove each of the planet carrier pins. ***Photo 13.***
11. Remove the retaining clip above the needle bearing and slip the needle bearing off of the output shaft. ***Photos 14 & 15***.

***Photo 14***

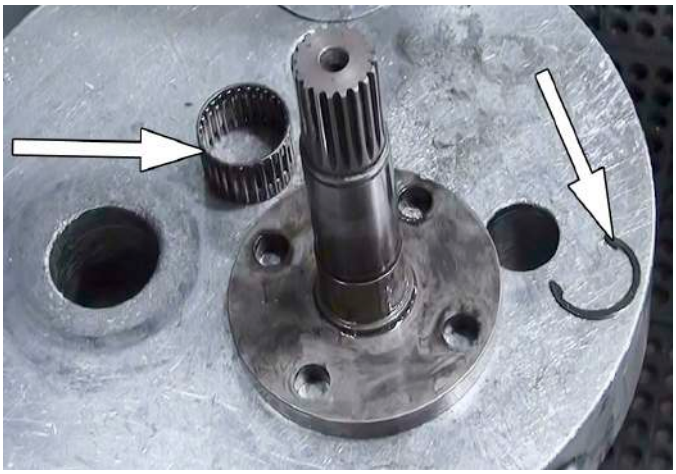


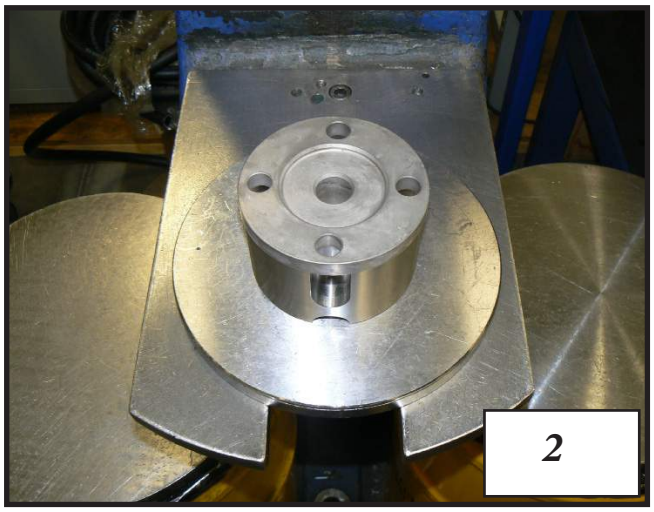
***Photo 15***

**Disassembling The Right Hand Side Output Shaft**

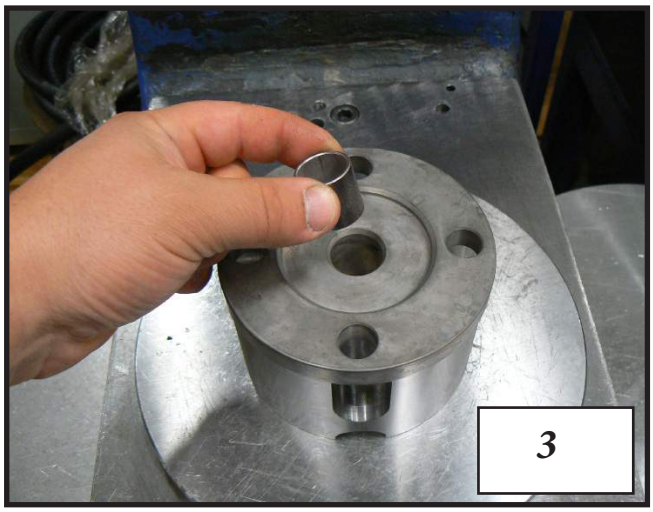
1. Locate the right hand side output shaft assembly and repeat steps 6 through 11 of **Disassembling The Left Hand Side Output Shaft Assembly**

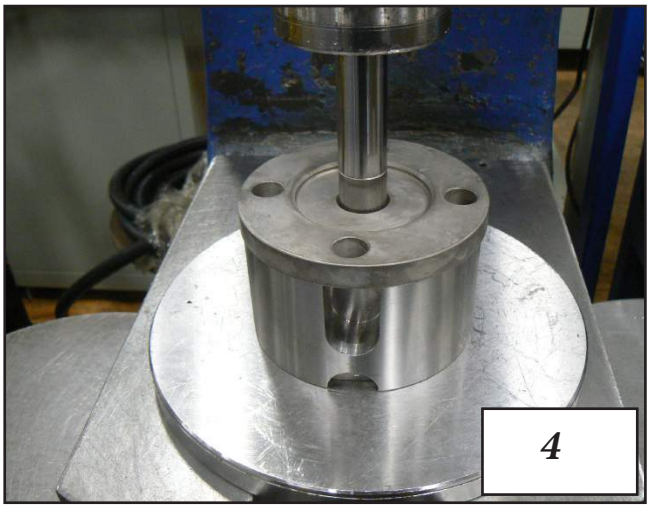
# Admiral Transmission Assembly

## RIGHT OUTPUT SHAFT ASSEMBLY

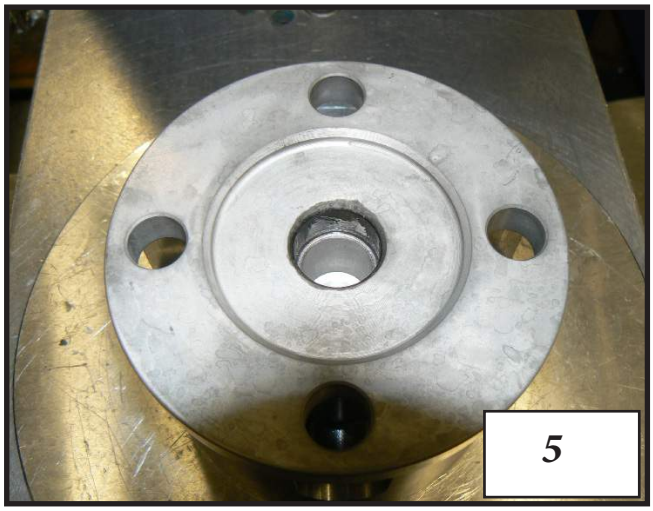



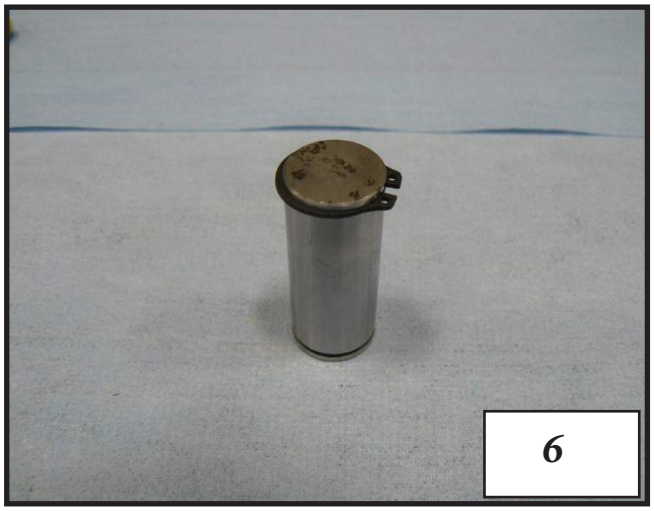

Position Output Shaft on special fixture on press. ***Photo 1 & 2.***



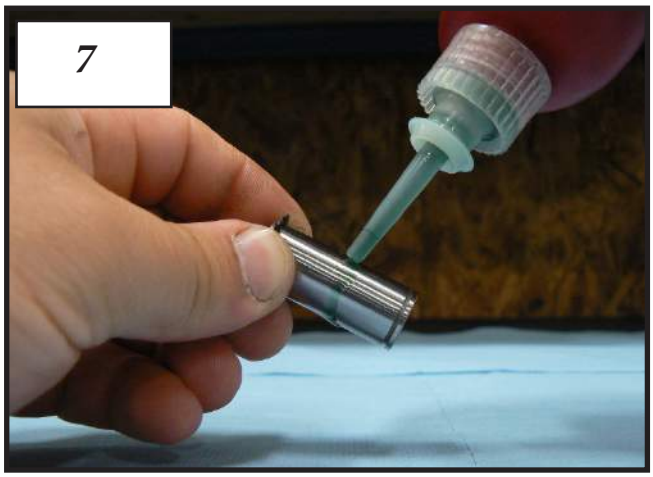

Install **105-26 Bushing** into end of shaft using a special fixture. ***Note:*** **Bushing must go in all the way to the bottom of the bore.** ***Photo 3, 4 & 5.***

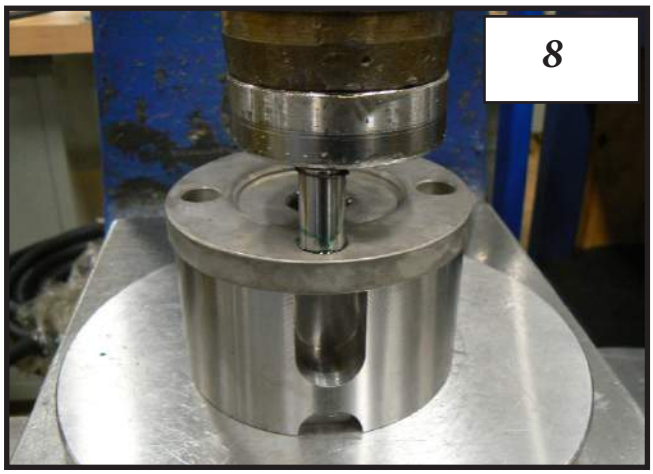


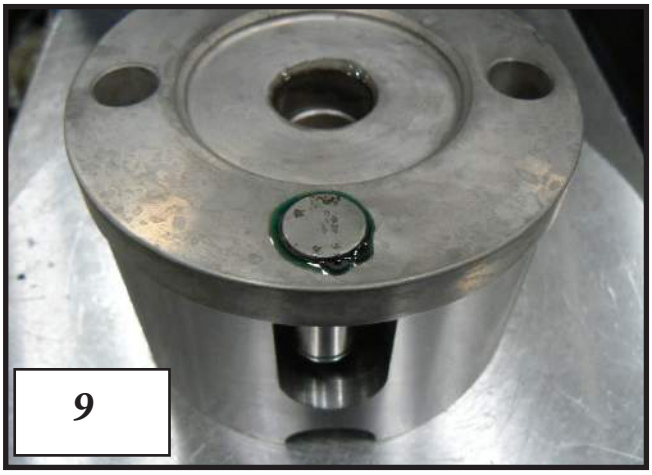



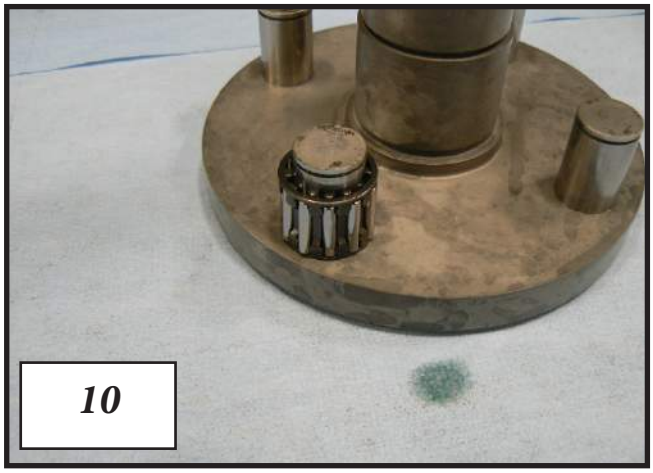

Install (1) **106-22 Retaining Ring** on end of **34-225 Pin**. ***Photo 6.***

Apply 60941 Loctite on middle of the pin and press through the output shaft until the retaining ring touches the shaft. ***Photo 7, 8 & 9. Note:*** **If pin is pressed too hard against the shaft it will crack.** Repeat for other three pins. Wipe off excess loctite.

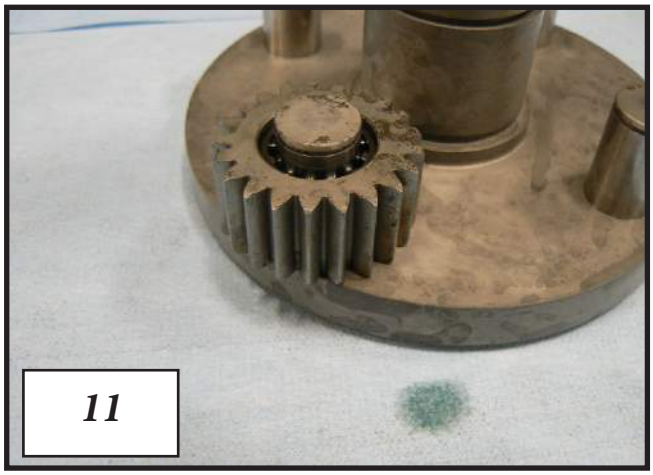


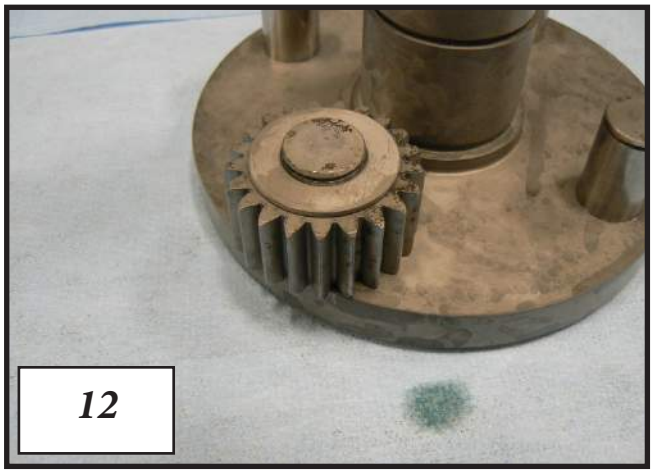



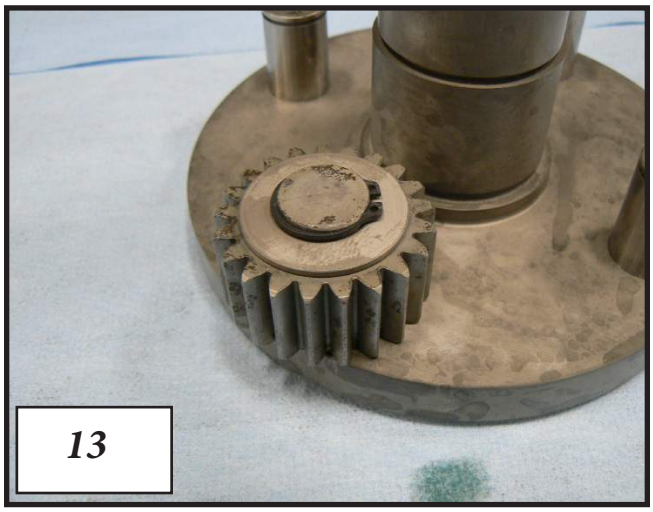




Install **101-82 Needle Bearing** on pin, ***Photo 10*** followed by **34-217 Planetary Gear** with the step downwards, ***Photo 11,*** **108-93 Washer** ***Photo 12*** and **106-22 Retaining Ring** ***Photo 13.*** Repeat for other three pins.

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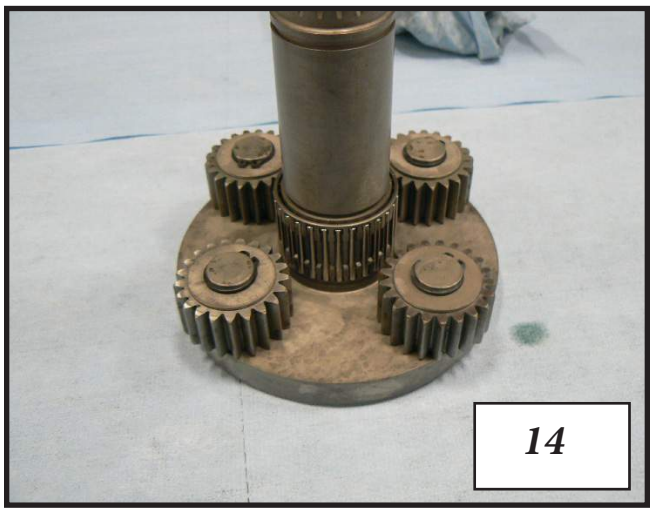
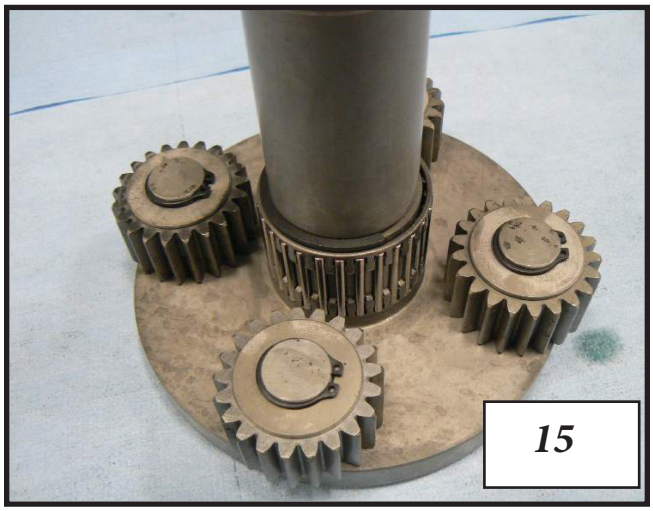

14

Install **101-83 Needle Bearing**, ***Photo 14***, **106-31 Retaining Ring**, ***Photo 15***, **34-207 Spur Gear, *Photo 16 & 17,*** and **101-73 Ball Bearing, *Photo 18***. **Note: Once pressed together, 34-207 Spur gear should spin freely.**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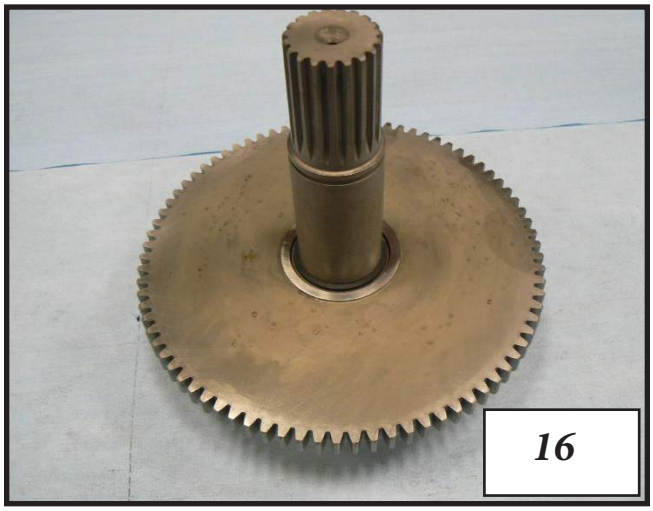
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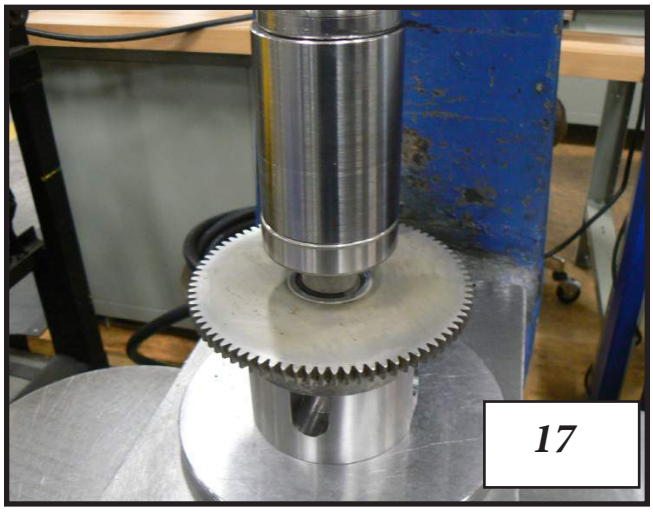
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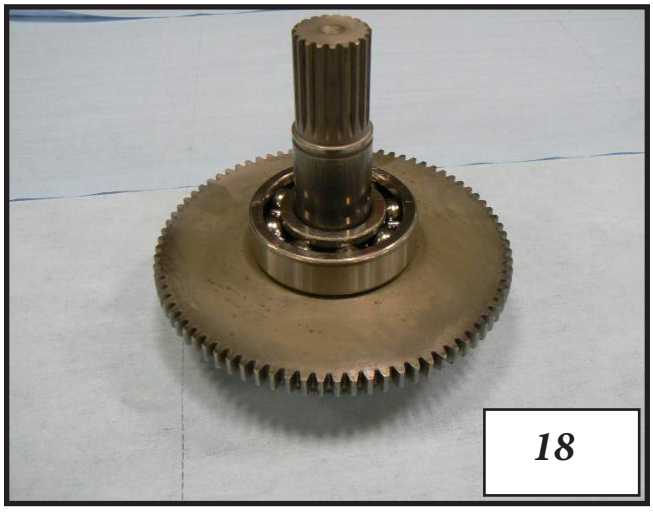
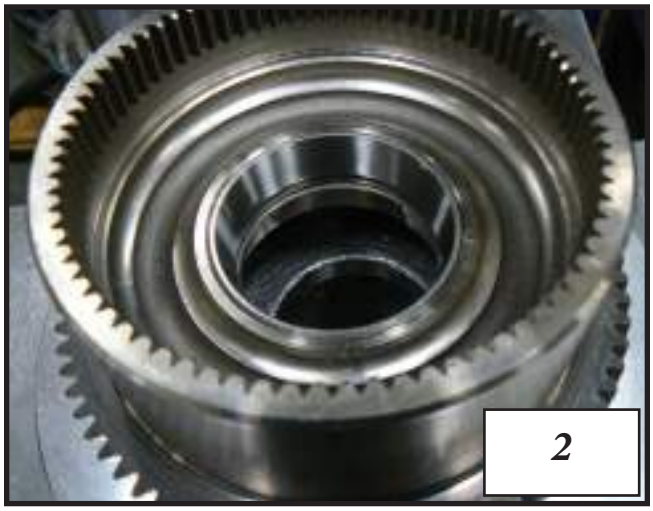

18

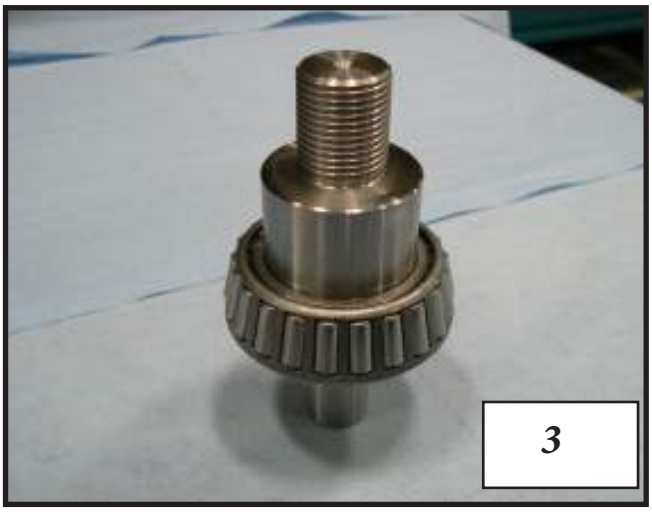
# LEFT OUTPUT SHAFT ASSEMBLY

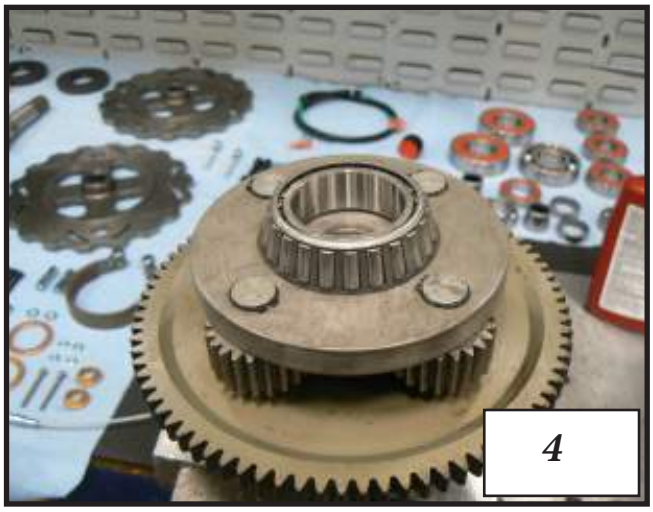
Assemble same as right side. Using **34-216 Output Shaft** instead of **34-226 Output Shaft** and no **105-26 Bushing**.


Components: 101-76 Tapered Roller Bearing, 114-22 Spacer, 34-218 Planetary stub shaft, 34-219 Planetary Hub, 34-216 Output Shaft

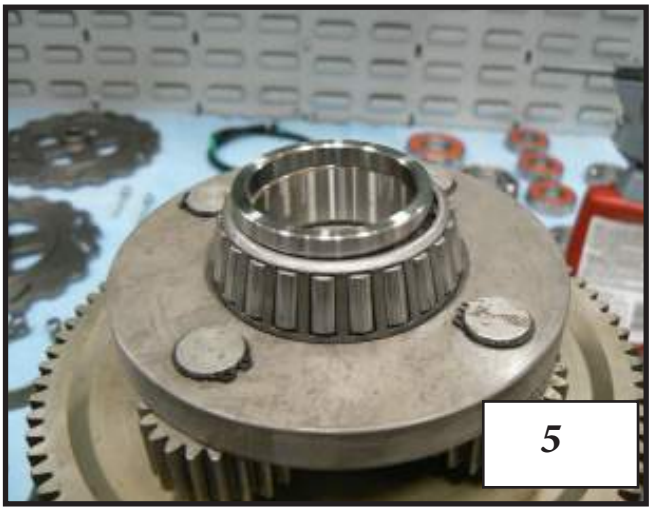

Press **101-76 Bearing Cups** into the **34-219 Planetary Hub** using a special fixture. ***Photo 1. Note:*** **Bearing Cups need to be installed with cup facing upwards so that the bearing cones can be installed later.** ***Photo 2.***




Slide (1) **101-76 Bearing Cone** onto **34-218 Stub Shaft** with cone facing threaded side. ***Figure 3.***

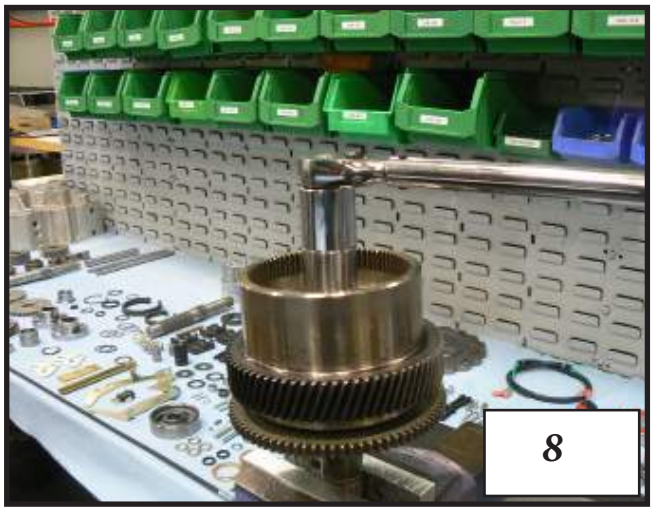
Take the output shaft to the vise, clamp with shaft facing down ***Photo 4.*** (Make sure you use aluminum vise attachments).



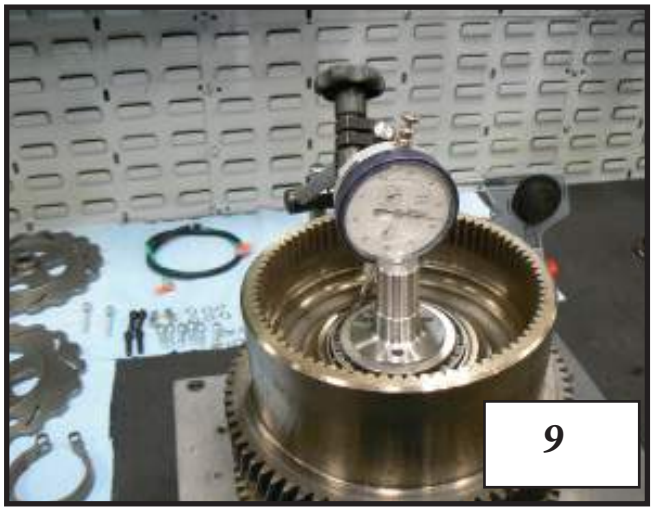


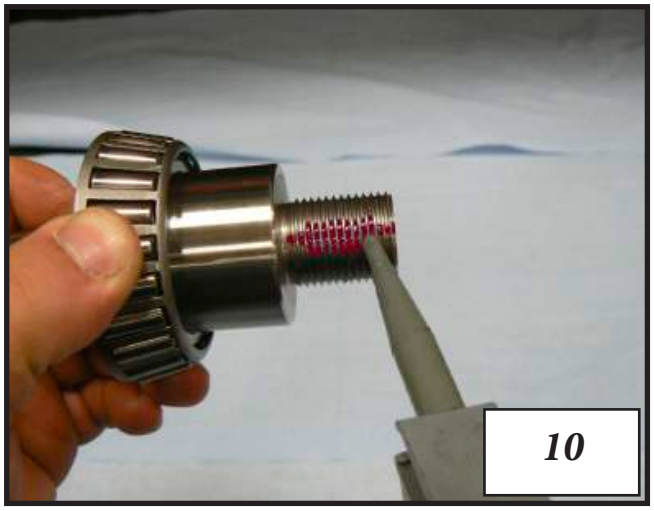
Place bearing on top of **34-216 Output Shaft** with cone facing upwards. ***Photo 5.***
Place **114-22 Spacer** on top. ***Photo 5.***

Place planetary hub with outside gear facing down. ***Photo 6.***


Thread **34-218 Stub Shaft** with **101-76 Bearing Cone** into the **34-216 Output Shaft**. ***Photo 7.*** Torque to 100 ft lbs. ***Photo 8.***




Check endplay with dial indicator (.0005 to .0025) ***Photo 9.*** If endplay is not enough, use required shim size.

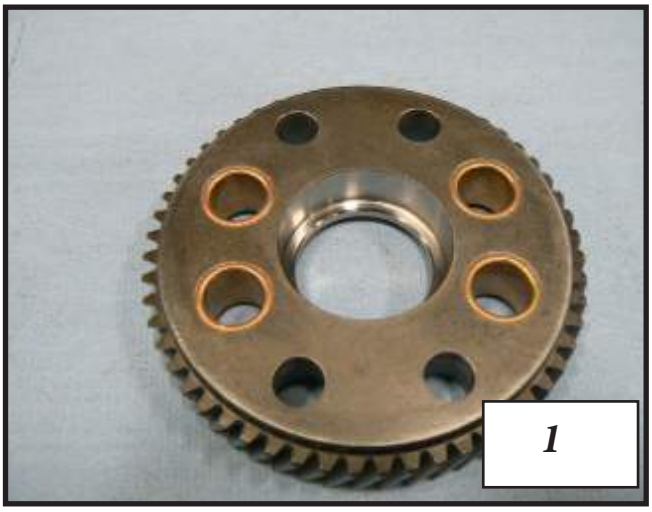
When endplay is ok, pull apart **34-218 Stub Shaft** and apply Red 2760 LOCTITE on threads of both stub shaft (***Photo 10***) and internal threads of Output Shaft ***Photo 11***

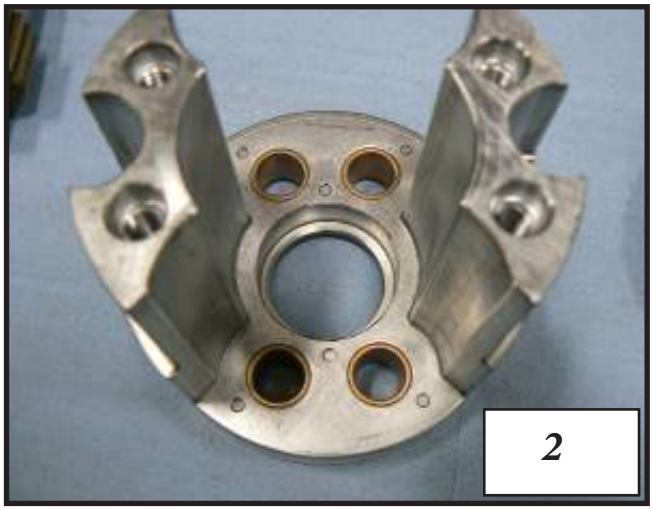
Re-install and re-torque. ***Photo 8.***

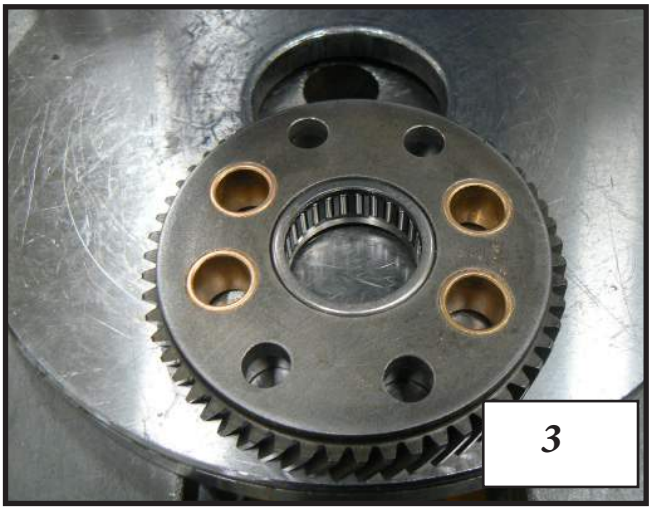
## Upper Differential Assembly

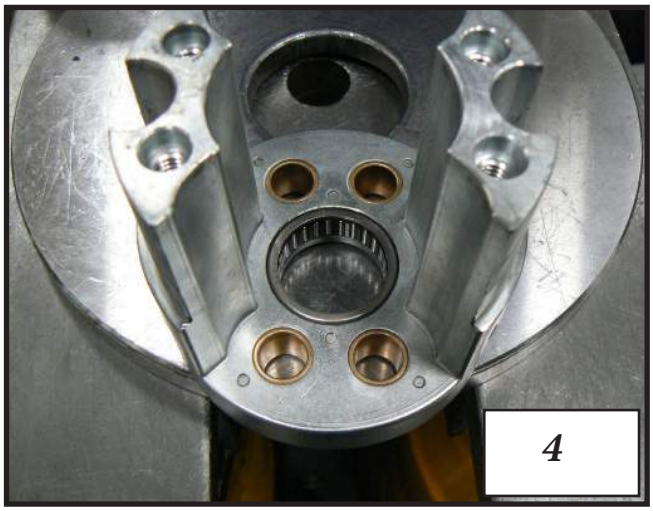

Components
101-84 Needle Bearing, 101-40 Ball Bearing, 103-69/P2 Bolt 105-23 Dowel, 105-27 Bushing, 105-28 Dowel bushing, 108-03/P2 Lockwasher, 108-94 Thrust washer, 112-64 Bolts, 114-16 Shim, 34-201 Brake shaft, 34-202 Planet gear, 34-203 Spur pinion, 34-204 Helical gear, 34-205 Helical gear, 34-206 Differential Cage

Install **105-27 Bushings** into **34-204 Helical Gear** ***Photo 1*** and **34-206 Differential Cage**. ***Photo 2,*** from the inside of both the helical gear and cage. This can be identified by having a big counter bore for the **101-84 Needle Bearing** which can also be installed with the writing on the bearing facing upwards. ***Photo 3.***



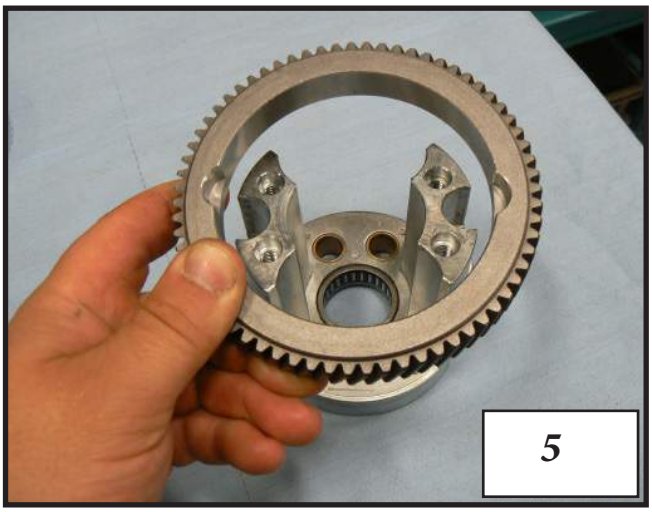



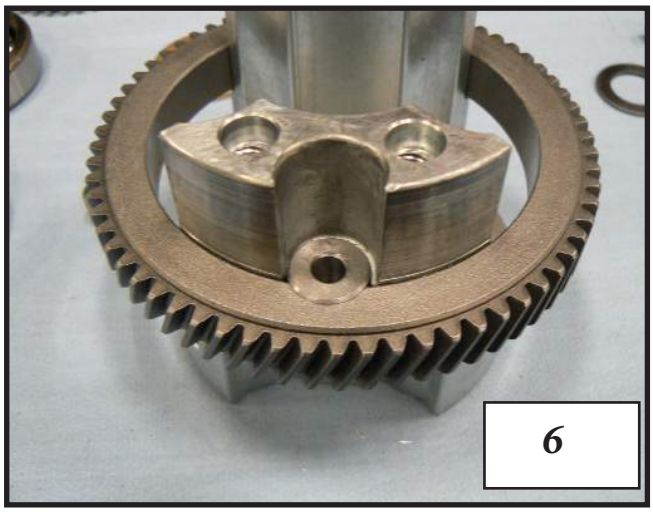



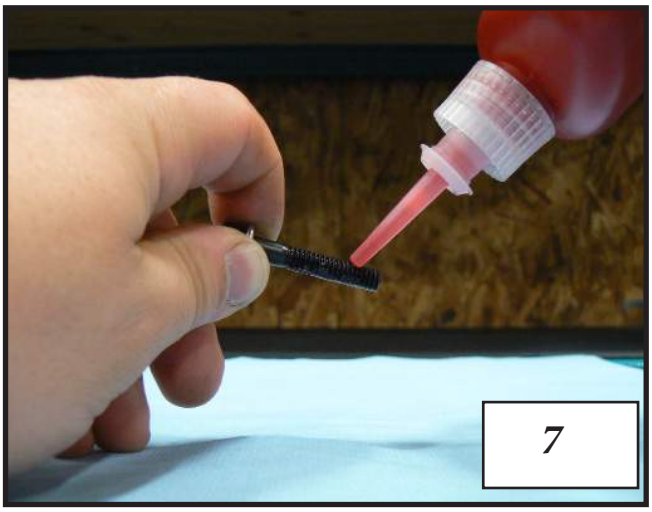

Install **101-84 Needle Bearing** into **34-206 Differential Cage** ***Photo 4.***

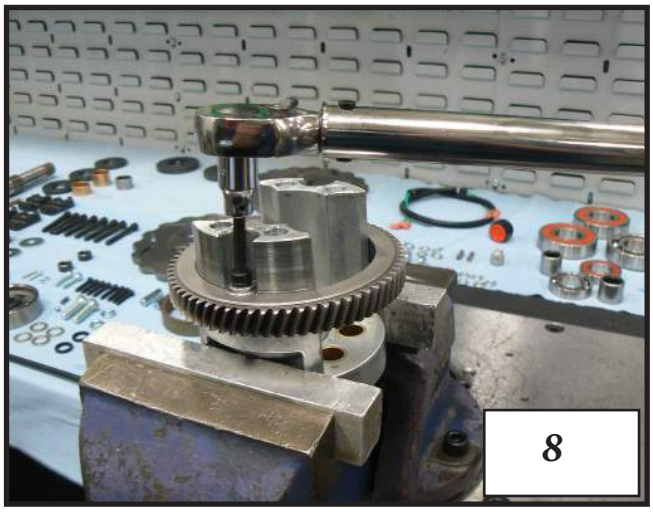
Slide **34-205 Helical Gear** onto differential cage with inside slots facing up. ***Photo 5.***

Install **105-28 Dowel Bushings** into slots on helical gear and cage. ***Photo 6.***

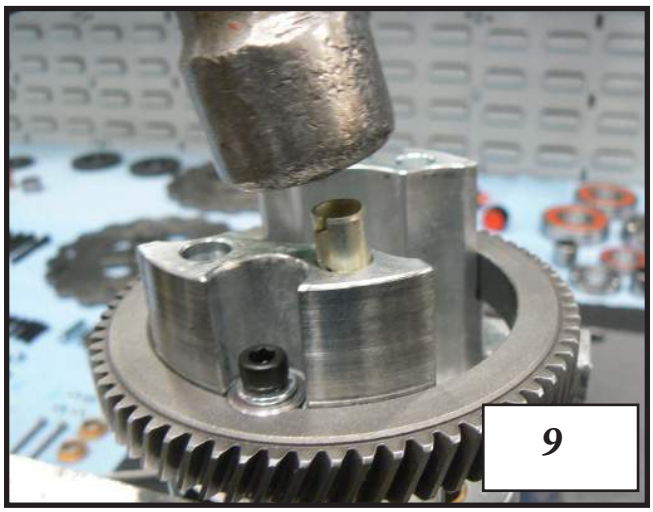


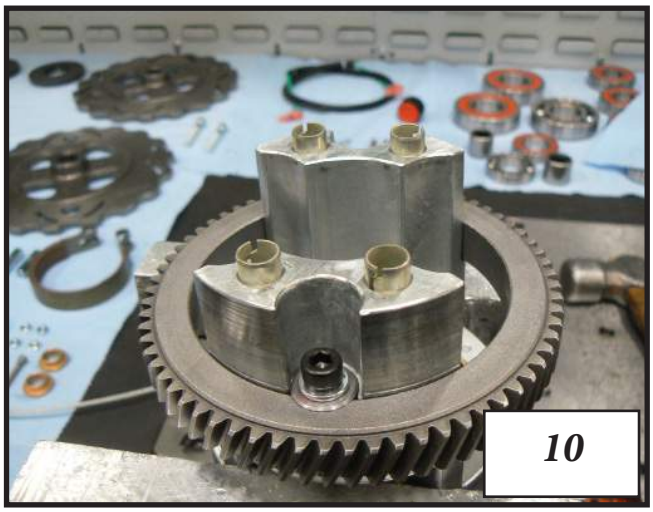



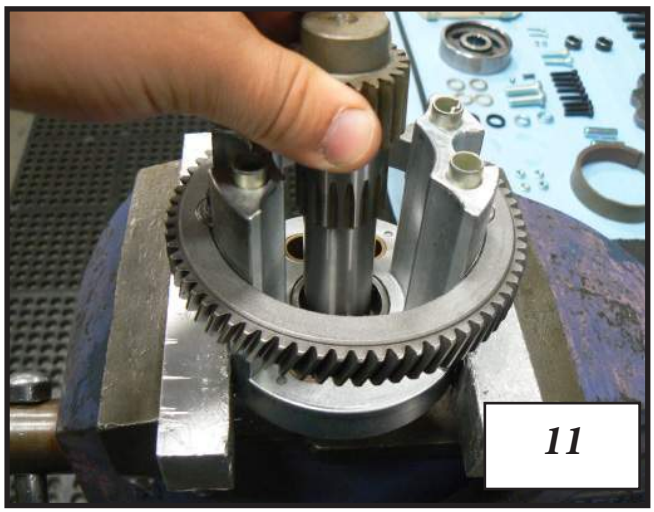



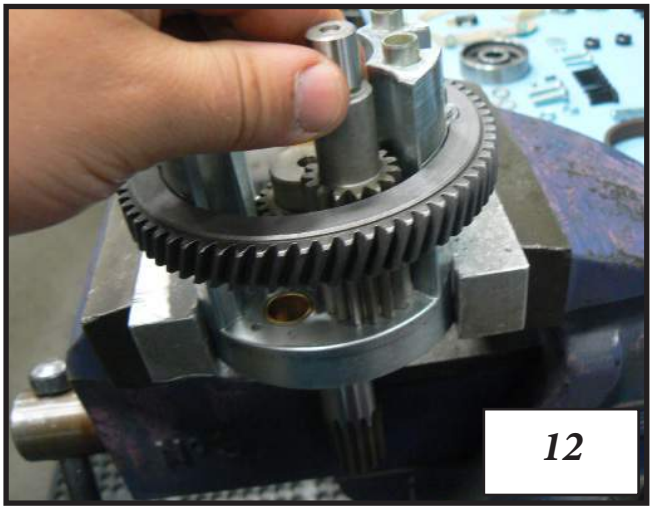

Apply 2760 Red LOCTITE to the threads of both **103-69 Bolts** and to the threads of the mounting holes in the aluminum cage where they will be installed, ***Photo 7,*** and install with **108-03 Lockwashers**. Torque bolts down to 16 ft-lbs ***Photo 8.***



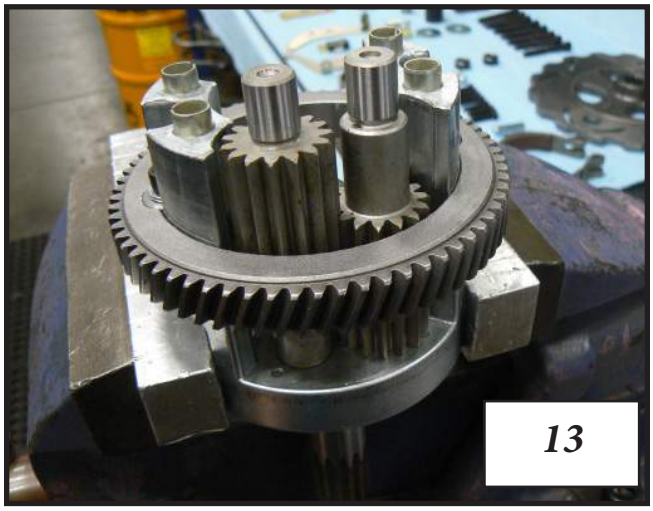



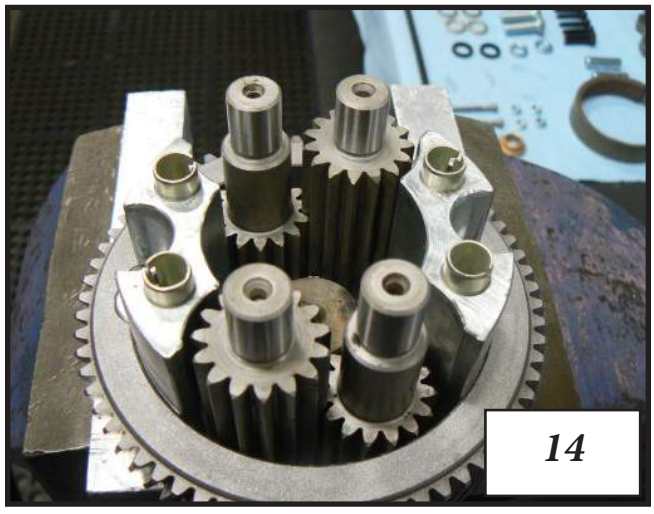

Install **105-23 Dowels** into top of cage by gently tapping with a hammer. ***Photo 9 & 10.***



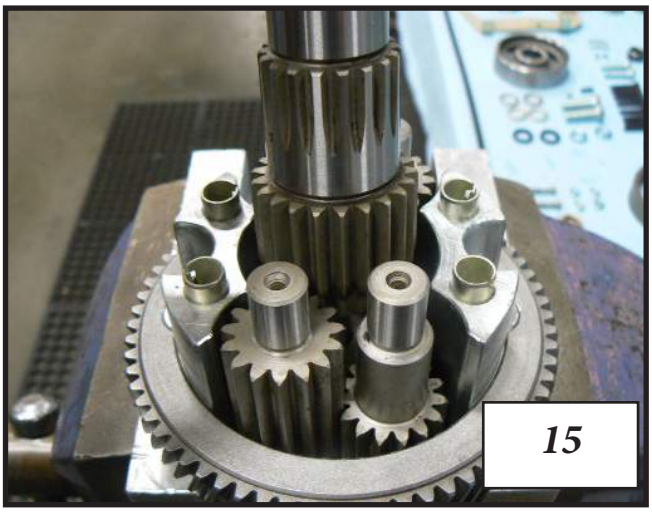

Install **34-201 Brake Shaft** in the **34-206 Differential Cage** ***Photo 11,*** followed by the **34-202 Planetary Gears** ***Photo 12*** which need to be staggered (one up and one down). ***Photo 13 & 14.***

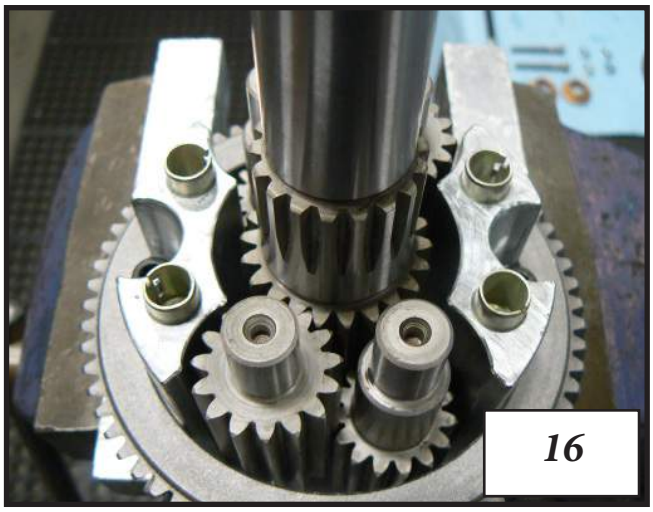


Install another **34-201 Brake Shaft**. ***Photo 15.***

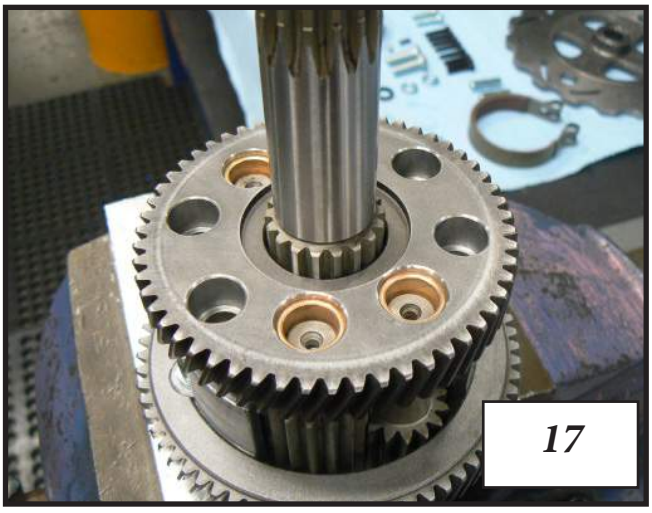
***Note:*** **When installing the second 34-201 Brake shaft, shaft must be centered in the cage otherwise next step will be difficult.** ***Photo 16.***

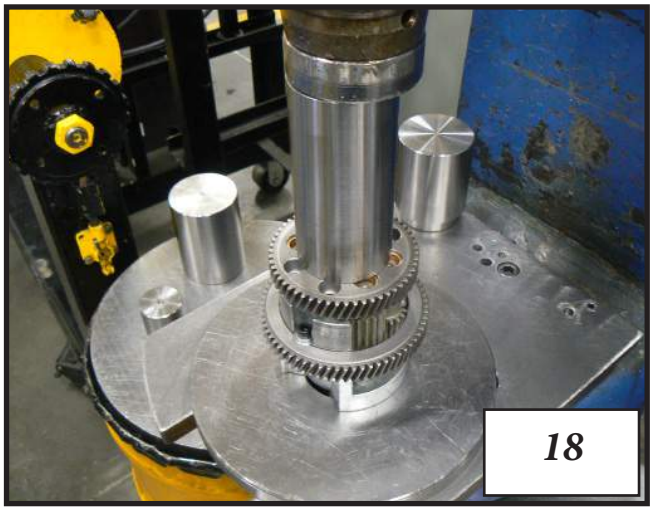


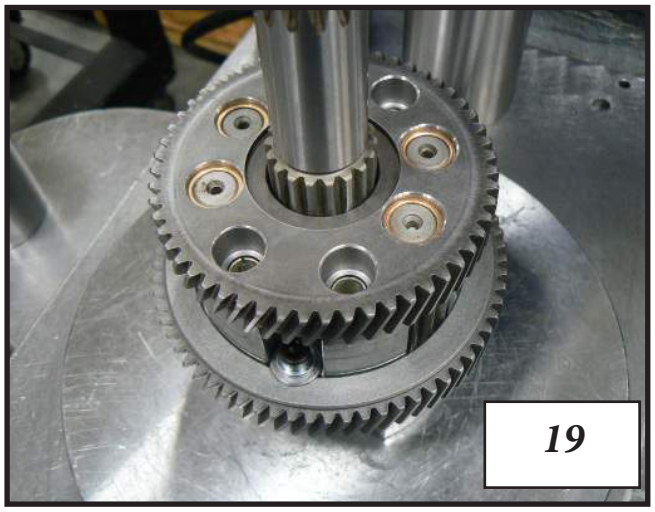




Drop on the **34-204 Helical Gear** and align the bushings with the **34-202 Planetary Gears**. The **34-204 Gear** should drop on half way. ***Photo 17.*** Pick up the whole assembly and spin the bottom **34-201 Brake Shaft** to insure proper assembly.

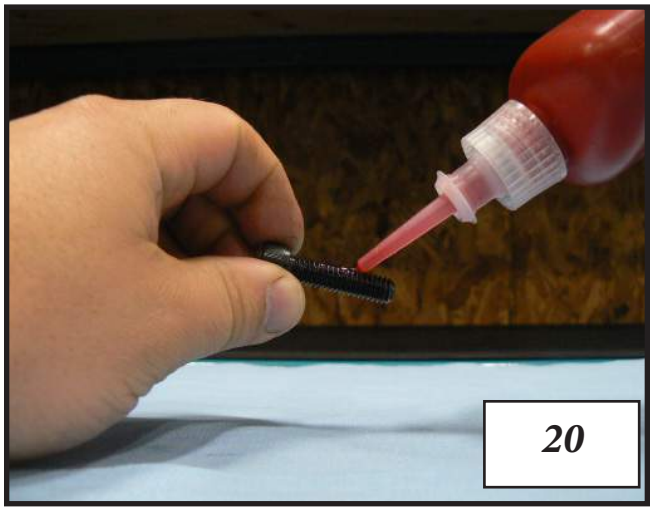
Press down evenly on **34-204 Helical Gear** until it is seated against the differential cage. ***Photo 18 & 19.***

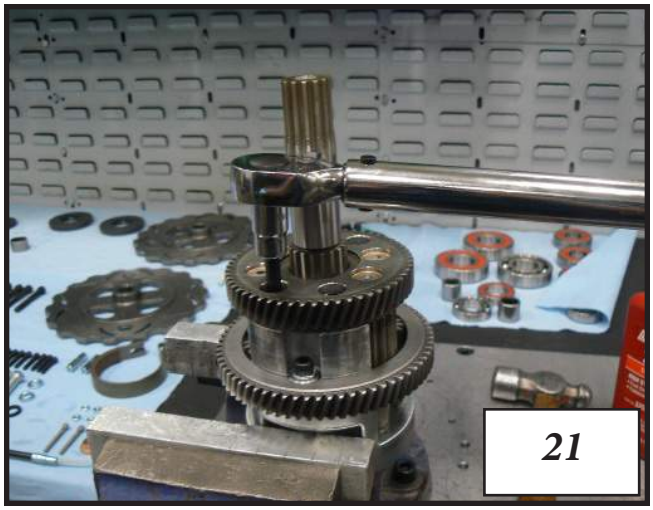


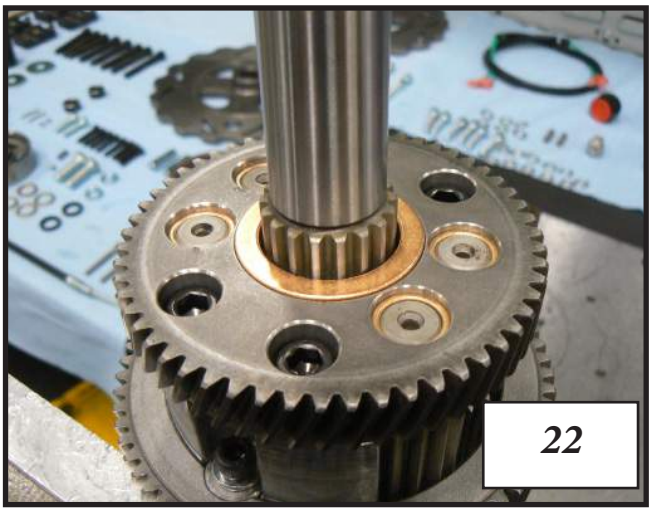


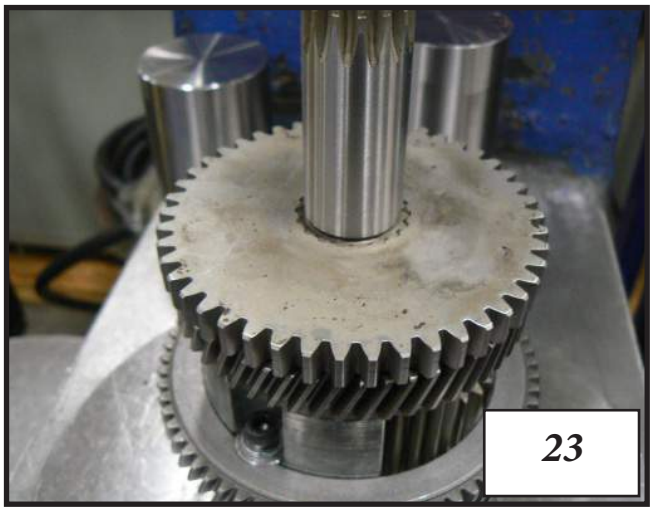

***Note:*** **Any resistance due to parts being too tight, do not force. If this occurs, disassemble and check parts for interference.**



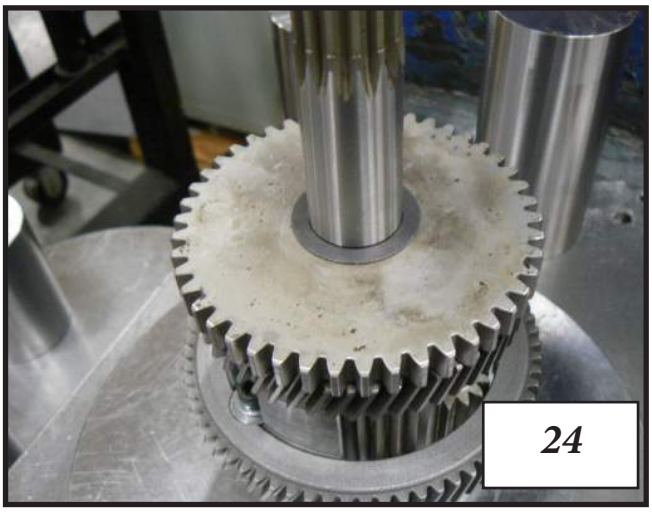



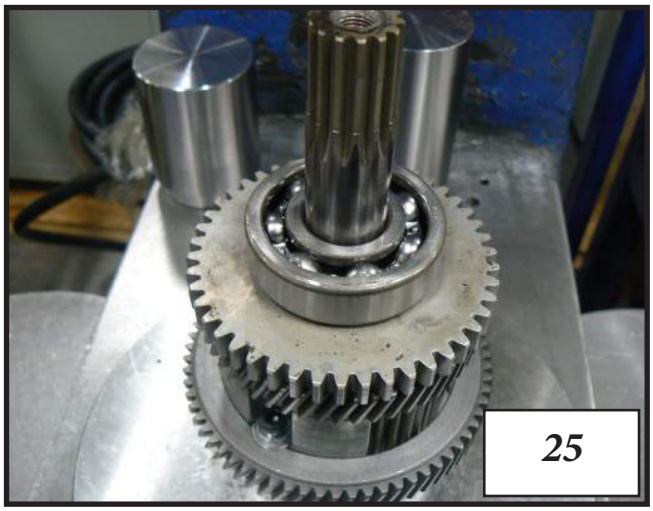

Install **112-64 Bolts** with 2760 Loctite applied to the threads of the fasteners as well as the internal threads of the aluminum cage to which they will be installed. ***Photo 20*** and torque to 35 ft-lbs ***Photo 21.***




Install **108-94 Washer** onto the end of the **34-201 Brake Shaft** ***Photo 22*** followed by a **34-203 Spur Gear**, ***Photo 23,*** **114-16 Washer** ***Photo 24*** and press on a **101-40 Ball Bearing** ***Photo 25.***

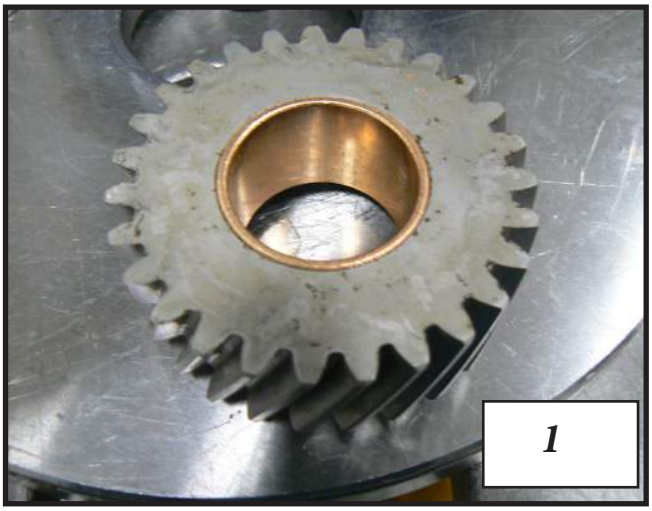


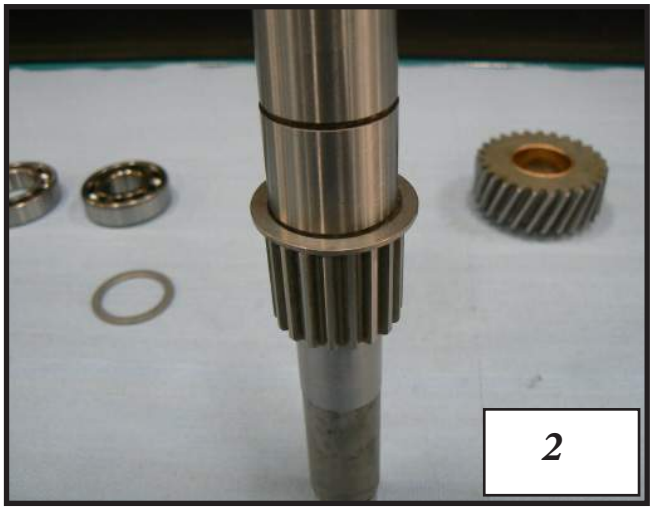




Repeat for the other side of differential assembly.

# INPUT SHAFT ASSEMBLY

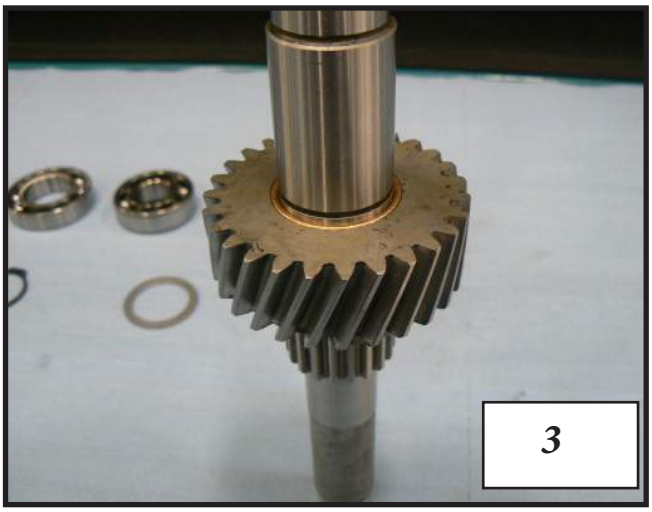

Components
101-01 Ball Bearing, 101-88 Ball Bearing, 101-89 Ball Bearing 101-90 Needle Bearing, 105-32 Bushing, 106-25 Retaining Ring, 106-27 Retaining Ring, 108-98 Washer, 114-17 Washer, 114-18 Spacer, 114-19 Spacer, 34-213 Input Shaft, 34-214 Reverse Pinion, 34-215 Forward Pinion, 34-224 Shift Collar

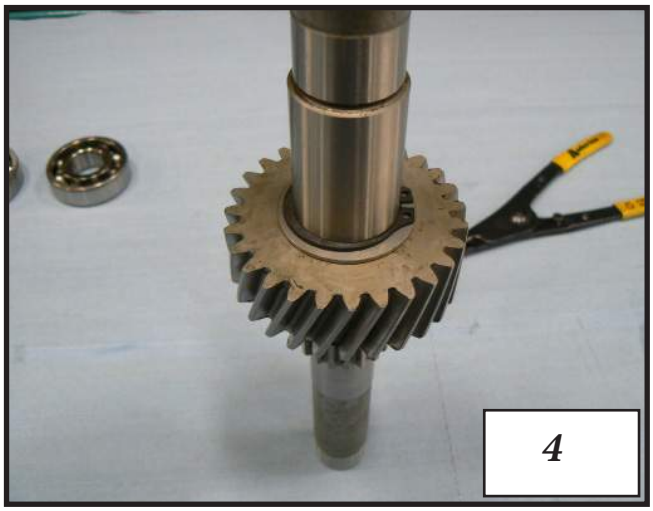



Press **105-32 Bushing** into **34-215 Forward Pinion**. ***Photo 1.***

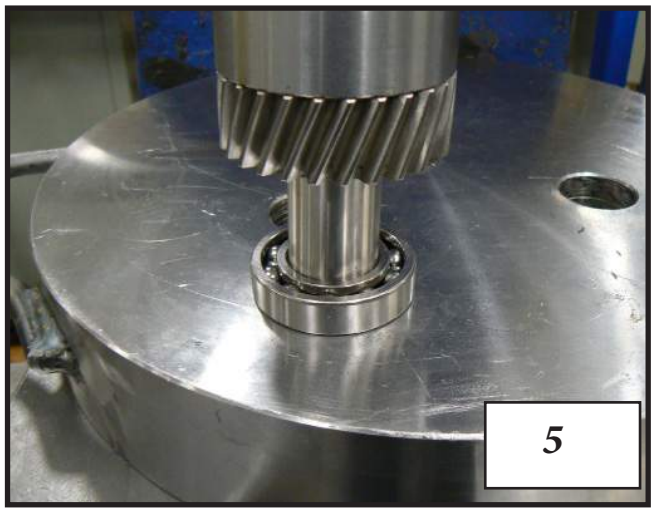
Install a **108-98 Washer** onto left side of input shaft. ***Photo 2.***

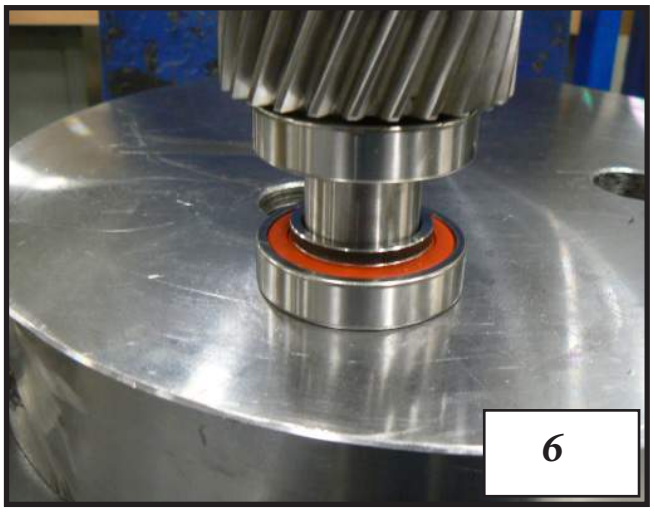



Slide the **34-215 Forward Pinion** onto left side of input shaft. ***Photo 3.***

Install another **108-98 Washer** onto left side of input shaft followed by a **106-27 Retaining Ring**. ***Photo 4.***

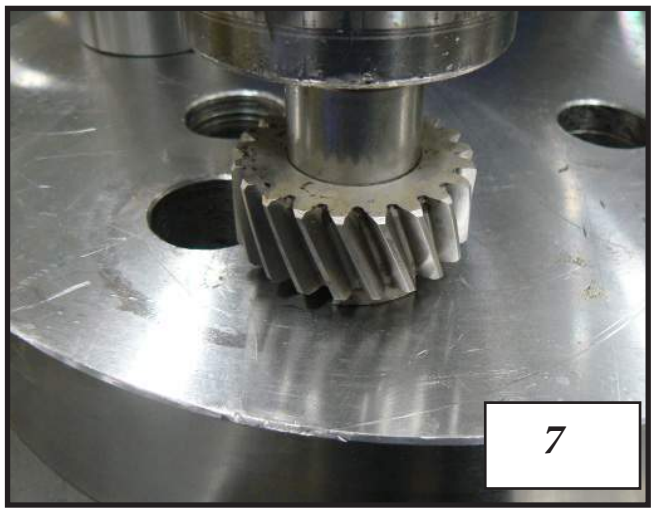


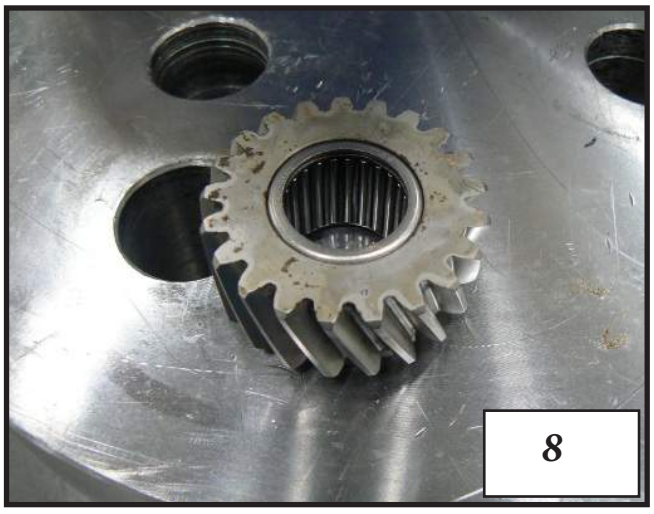




Press **101-88 Ball Bearing** on next. ***Photo 5.***

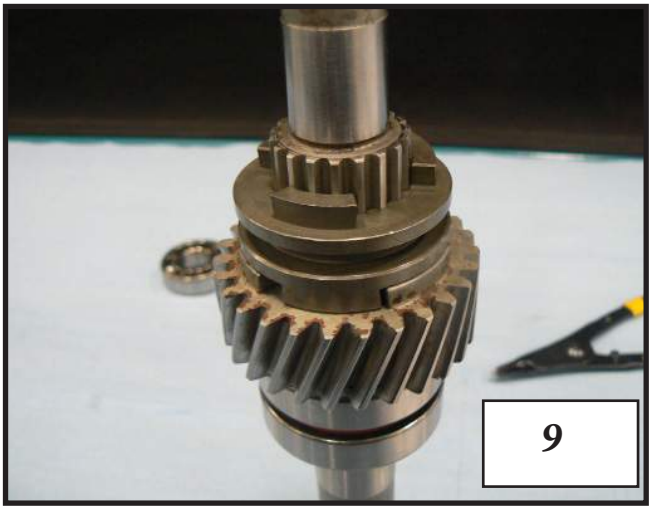
Install **114-19 Spacer**. Press **101-89 Bearing** on next. ***Photo 6.***

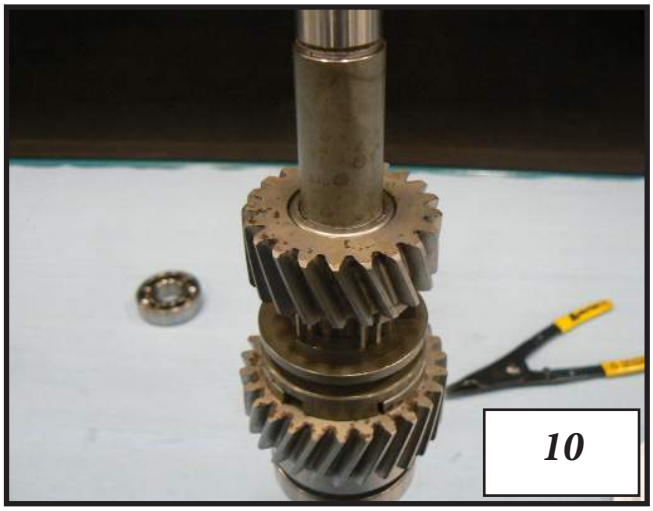
***Note:*** **When pressing on 101-88 and 101-89 Bearings hold shaft assembly in press on the 34-215 Pinion.**



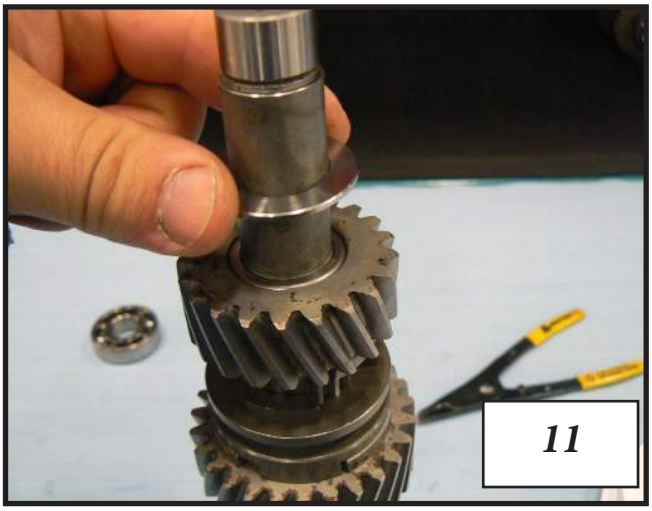

Press **101-90 Needle Bearing** into the **34-214 Reverse Pinion.** ***Photo 7 & 8.***

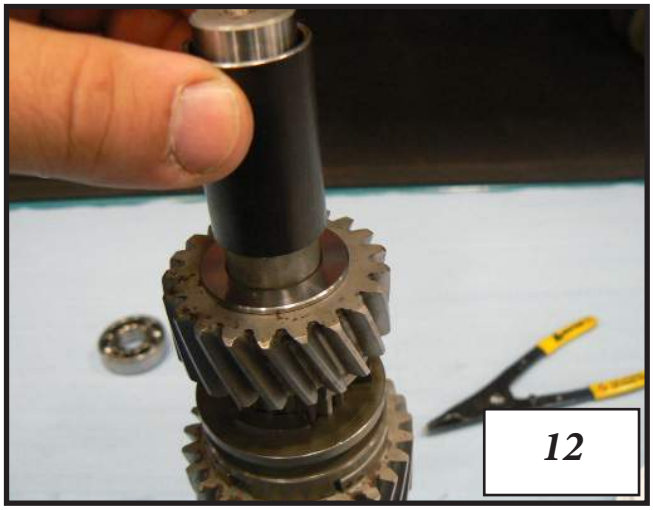


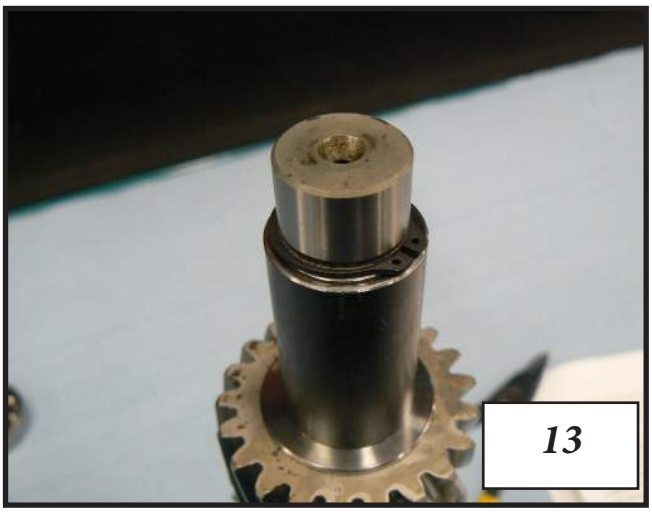



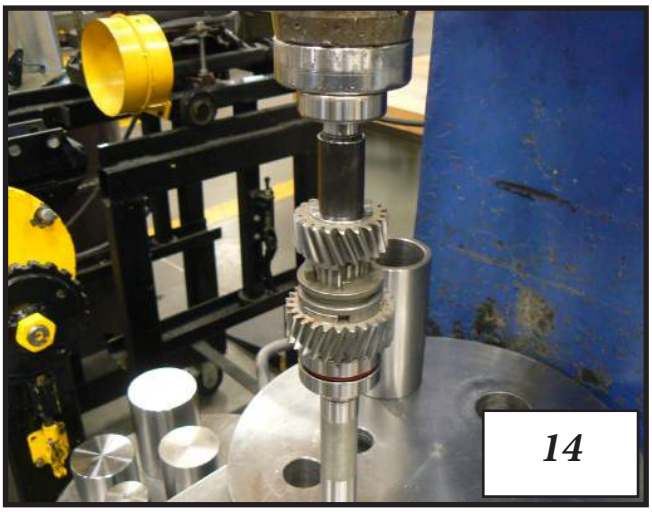

Install **34-224 Shift Collar** on right side of input shaft. ***Photo 9. Note:*** **Shift collar must slide freely on shaft and fully engage with forward pinion.**

Install **34-214 Reverse Pinion** ***Photo 10,*** followed by the **114-17 Washer**, ***Photo 11,*** **114-18 Spacer**, ***Photo 12,*** and a **106-25 Retaining Ring** ***Photo 13.***



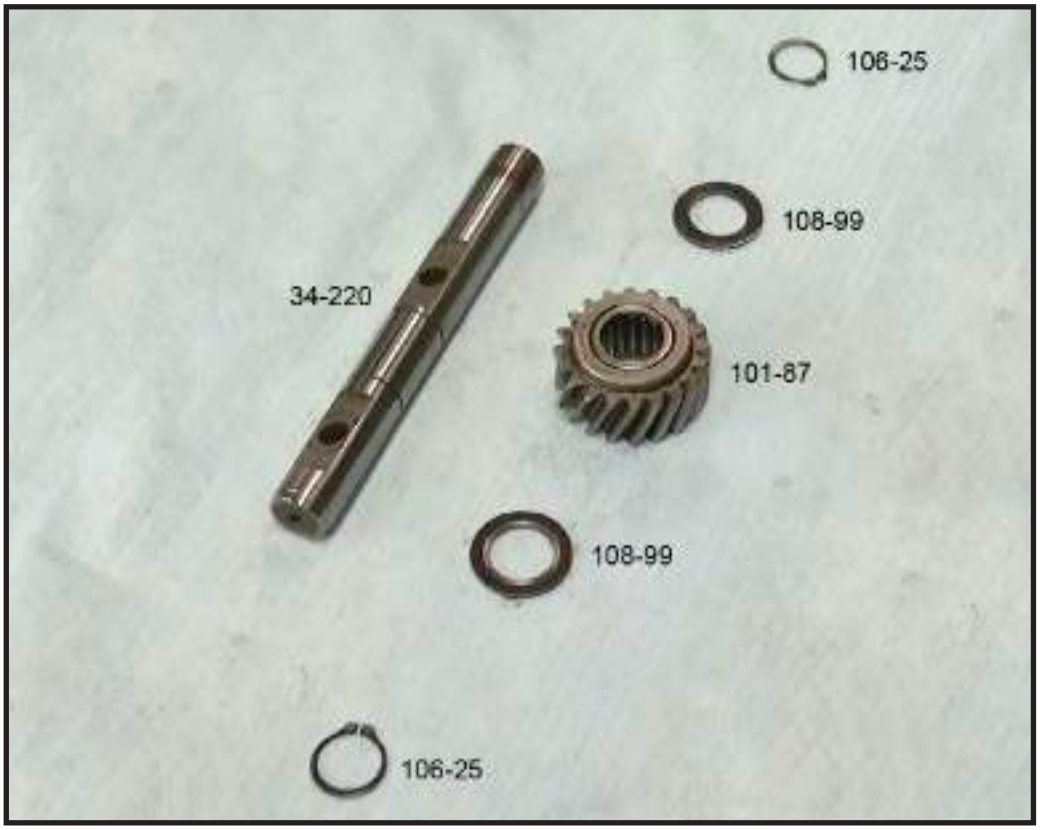





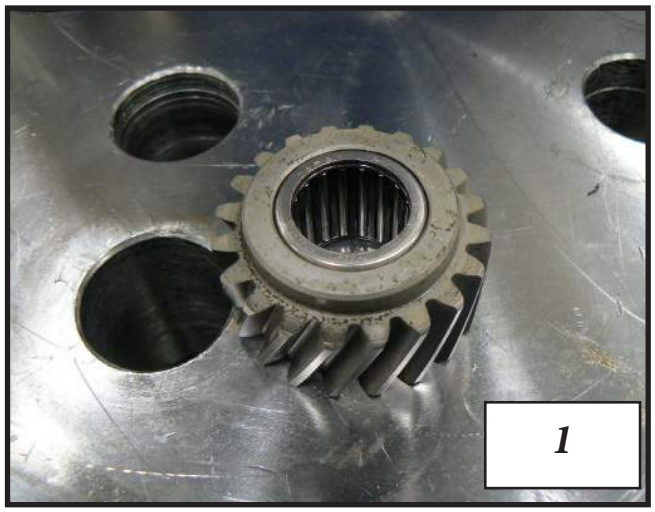



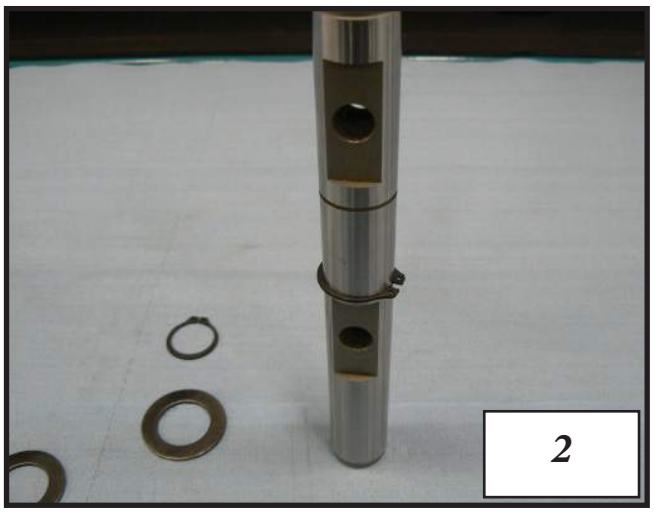

Press **101-01 Bearing** onto shaft ***Photo 14.***

# REVERSE IDLER SHAFT ASSEMBLY




Components
101-87 Needle Bearing, 106-25 Retaining Ring, 108-99 Thrust Washer, 34-220 Idler Pinion, 34-221 Shift Shaft Reverse

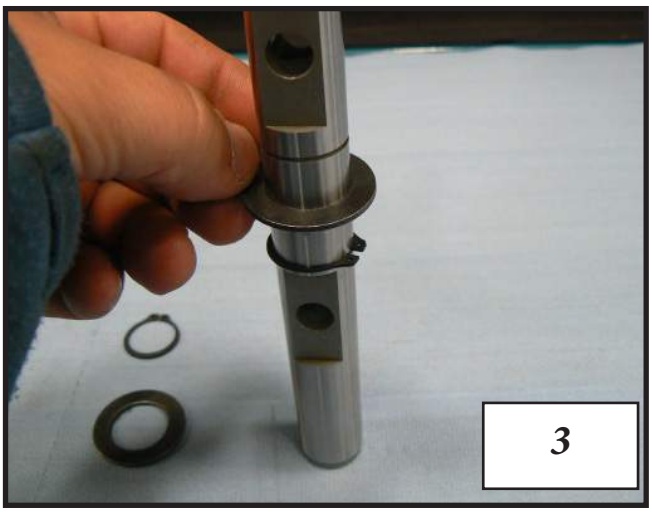


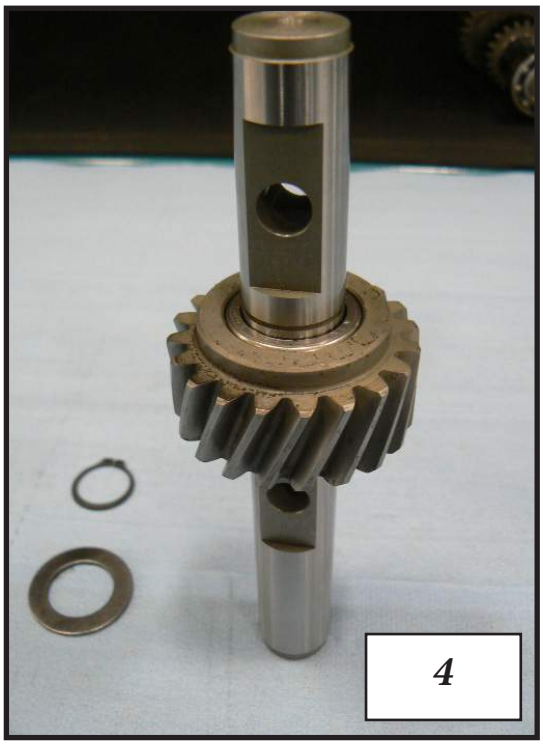




Press **101-87 Needle Bearing** into the **34-220 Idler Pinion** ***Photo 1.***

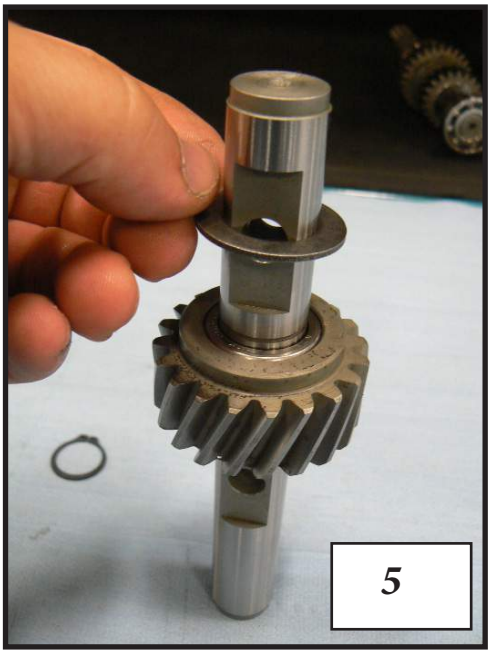
Install (1) **106-25 Retaining Ring** into a groove, ***Photo 2,*** then slip on a **108-99 Thrust Washer *Photo 3.***

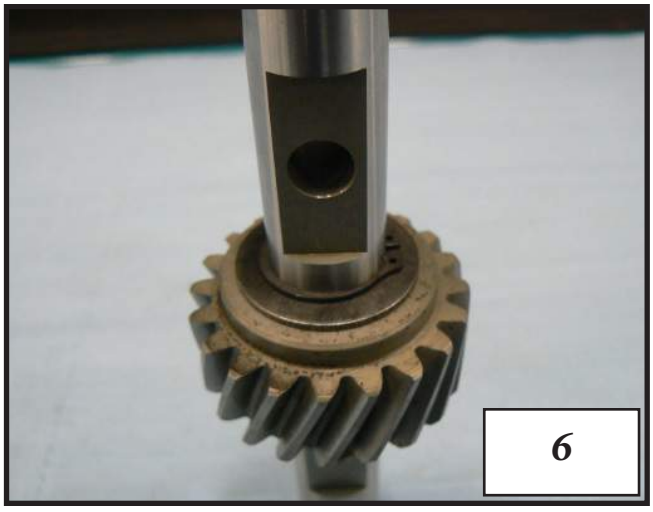
Slide on the **34-220 Idler Pinion** that has the **101-87 Needle Bearing** installed on to shaft. ***Photo 4.*** ***Note:*** **Step on 34-220 Idler Pinion must face towards the end of the 34-221 Shaft that is the shortest.**




Slide on another **108-99 Thrust Washer *Photo 5,*** and install a **106-25 Retaining Ring**, ***Photo 6.***

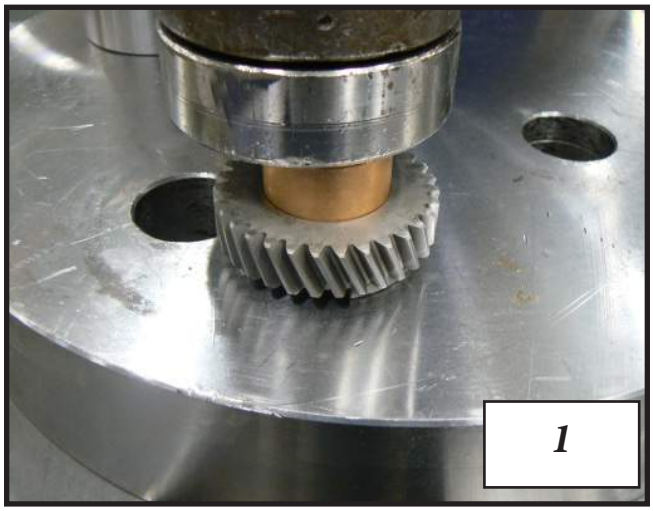


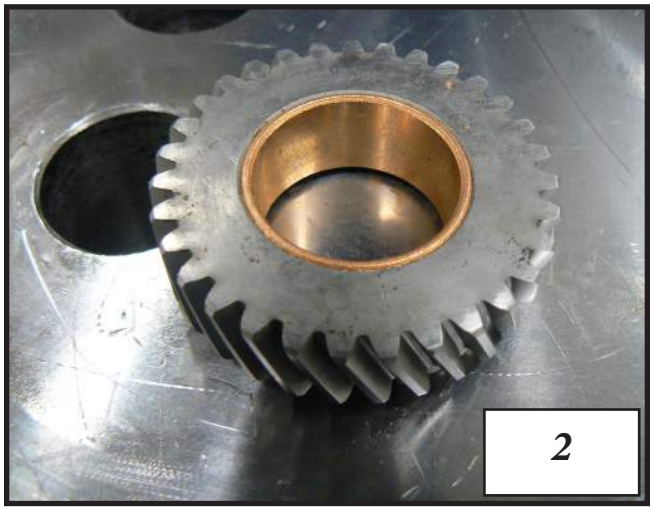



# IDLER SHAFT ASSEMBLY


Components: 108-96 Spacer, 34-209 Helical pinion, 106-28 Retaining ring, 34-210 Helical Pinion, 105-31 Bronze Bushing, 108-98 Thrust Washer, 34-223 Shift Collar, 34-208 Idler Shaft

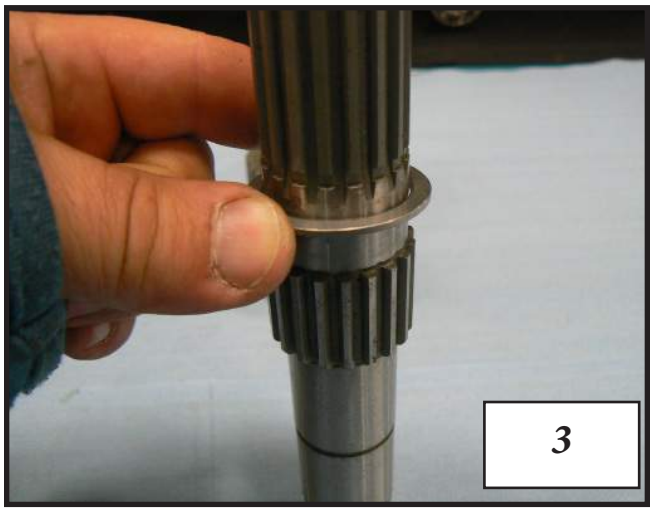
Press **105-31 Bronze Bushing** into **34-210 Helical Pinion**, ***Photo 1 & 2.***

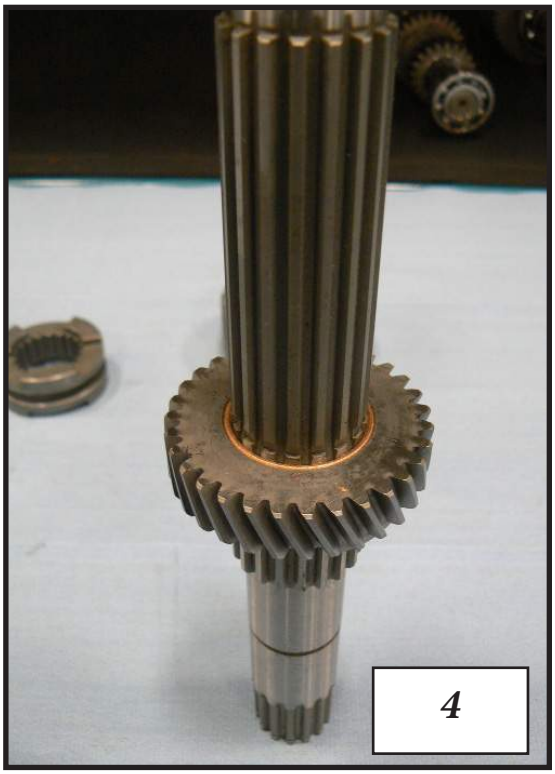


Install **108-98 Thrust Washer** onto left side (longer side) of **34-208 Idler Shaft**. ***Photo 3.***

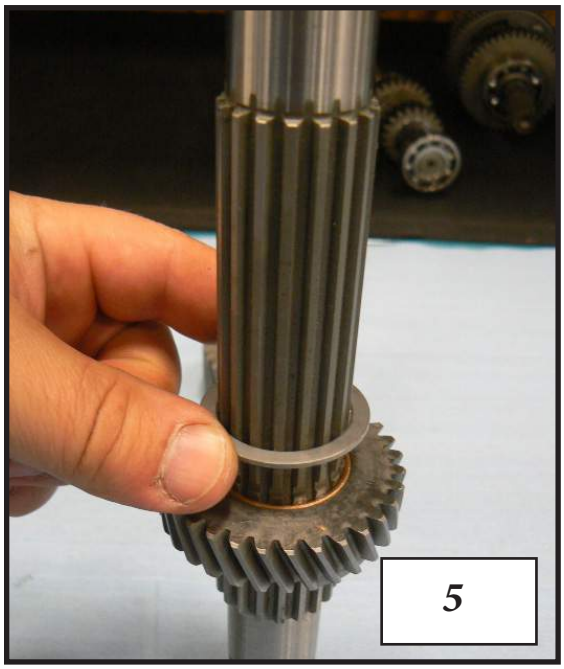
Slide **34-210 Helical Pinion** on the shaft ***Photo 4.***

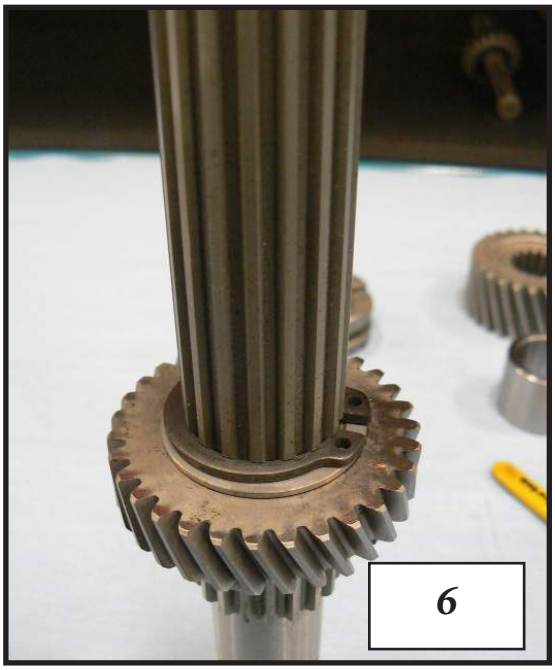


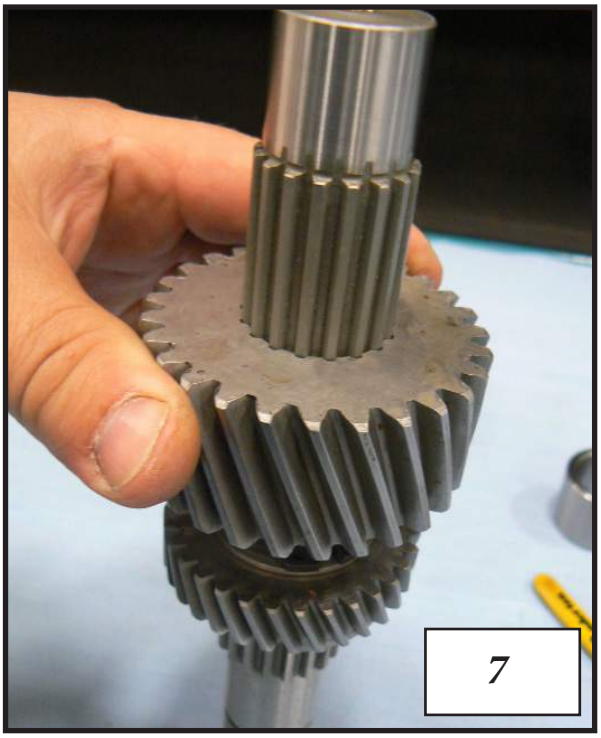

Install another **108-98 Washer** ***Photo 5.***

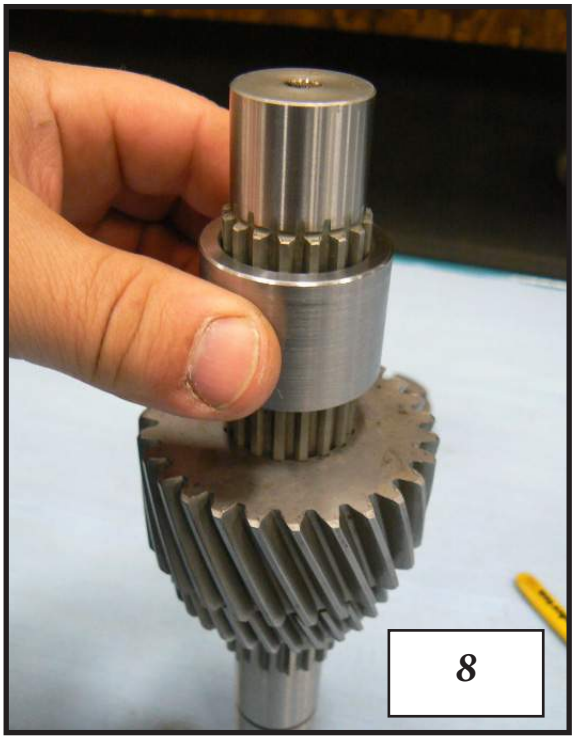
Install the **106-28 Retaining Ring** ***Photo 6.***



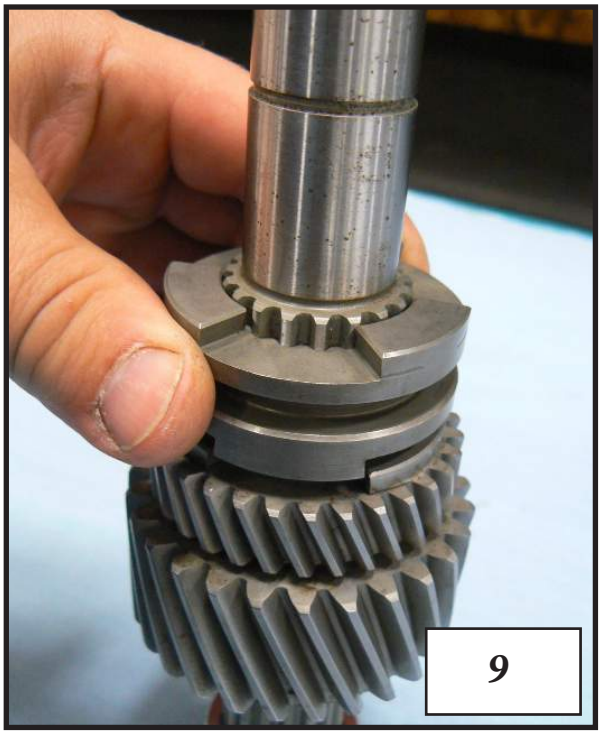



Slide **34-209 Helical Pinion** onto the idler shaft, ***Photo 7,*** followed by the **108-96 Spacer** ***Photo 8.***



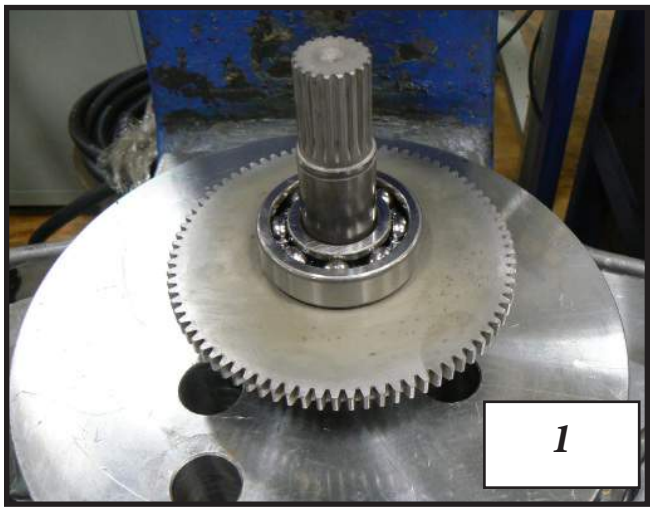

Slide the **34-223 Shift Collar** onto the idler shaft. ***Note:*** **Shift Collar must slide freely on idler shaft and not get tight.** ***Photo 9.***

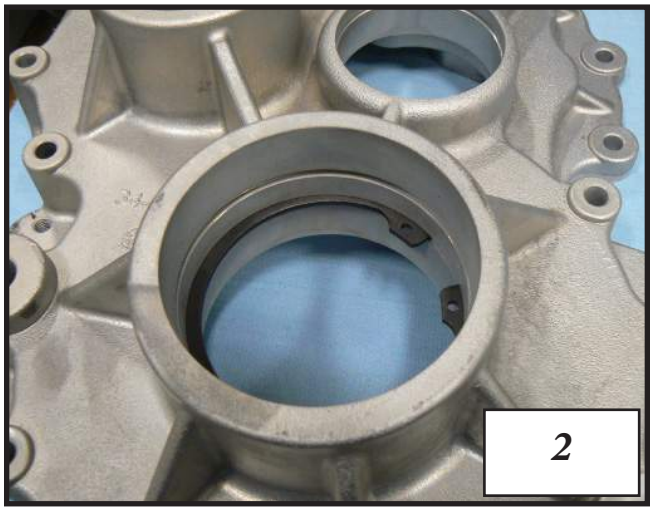


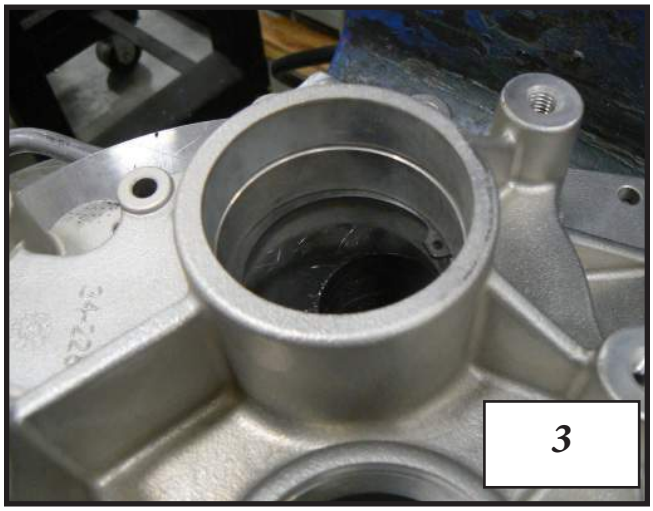
# HOUSING COVER ASSEMBLY

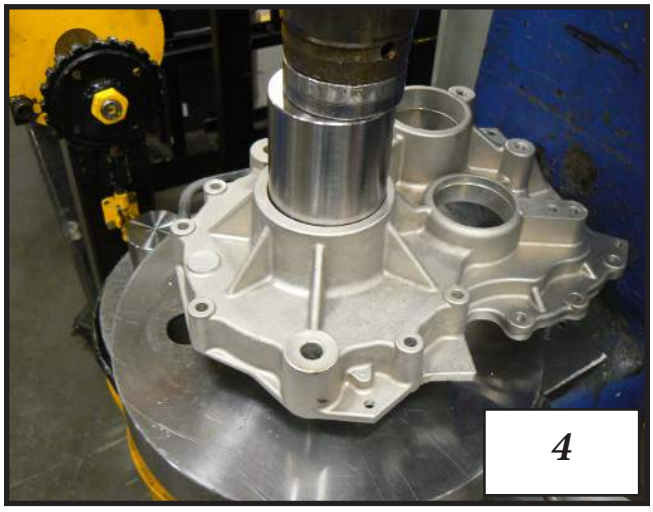
Put the **Right Output Shaft Assembly** on the press ***Photo 1.***

Install a **106-24 Retaining Ring** into the bottom groove in the **34-228 Cover** ***Photo 2*** and **106-05** in the bottom groove of the upper differential bore in the cover ***Photo 3.***



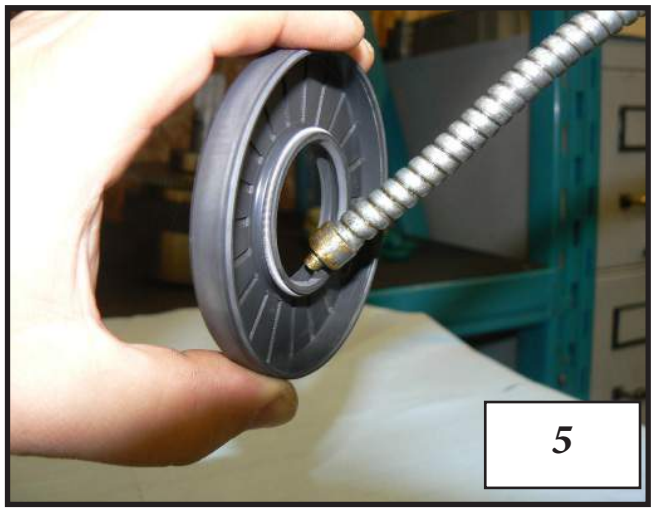



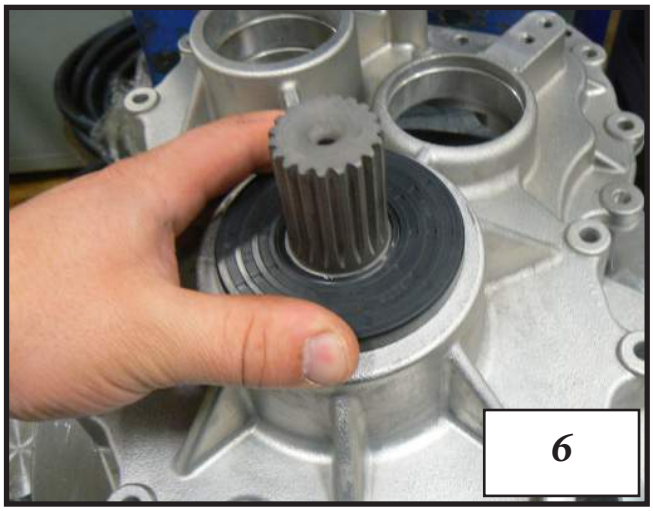

Press the **34-228 Cover** onto the Output Shaft assembly ***Photo 4.***

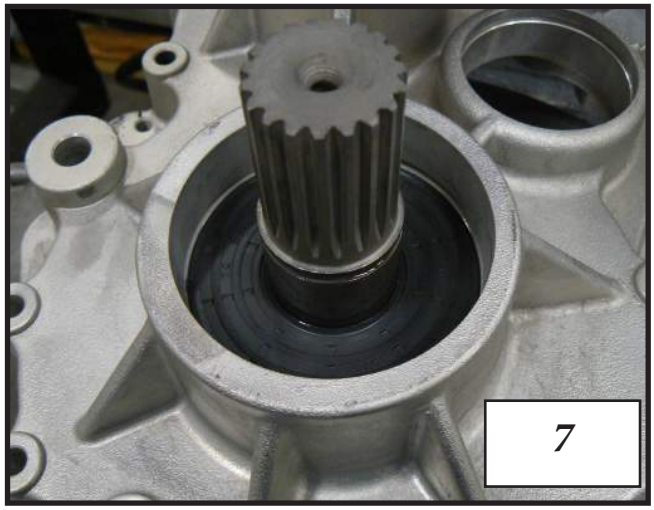
Put a small amount of oil on the inside of the **102-33 Oil Seal *Photo 5*** and put seal on end of shaft and press down. ***Photo 6 & 7.***

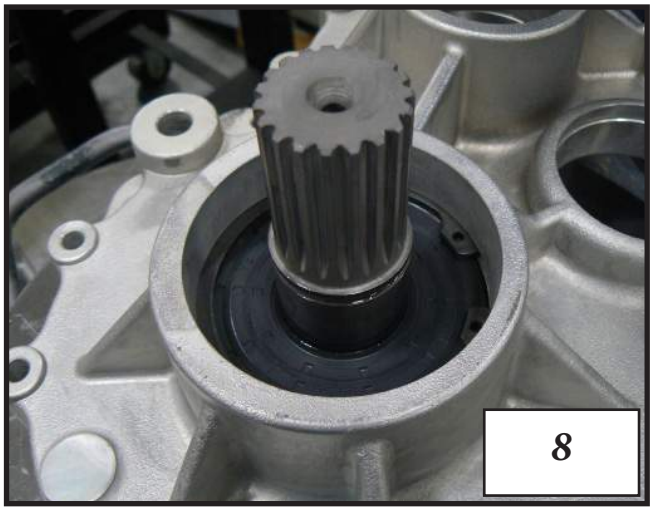
***Note:*** **Make sure oil seal spring is facing the inside of the transmission. To insure that spring stays on seal, press seal on shaft as far as possible by hand.**

Install **106-24 Retaining Ring** into second groove of housing right in front of the oil seal ***Photo 8.***



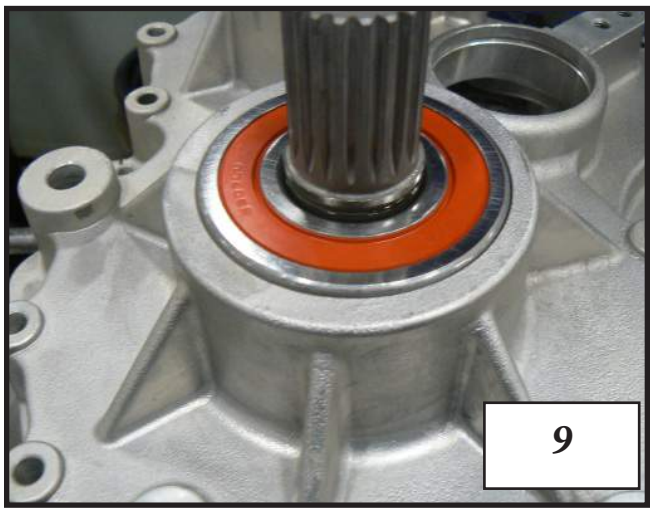



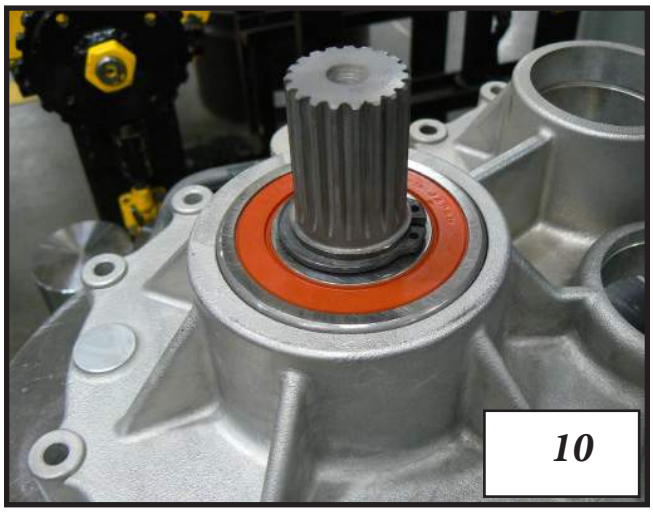



Press **101-81 Ball Bearing** onto housing and shaft. ***Photo 9.***

Install **106-23 Retaining Ring** onto the output shaft. ***Photo 10.***



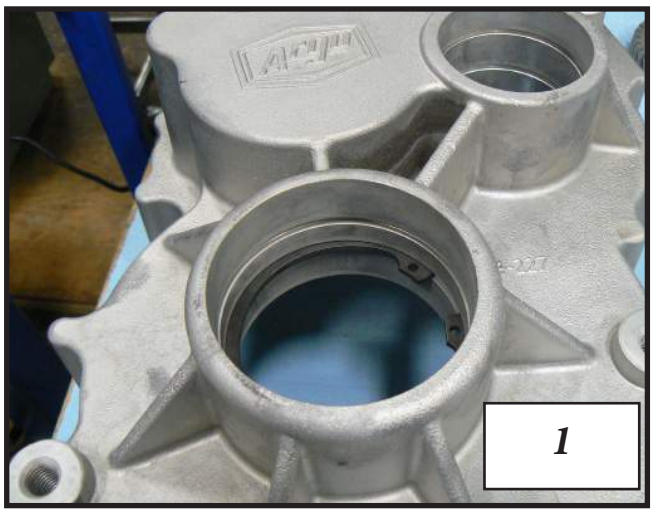



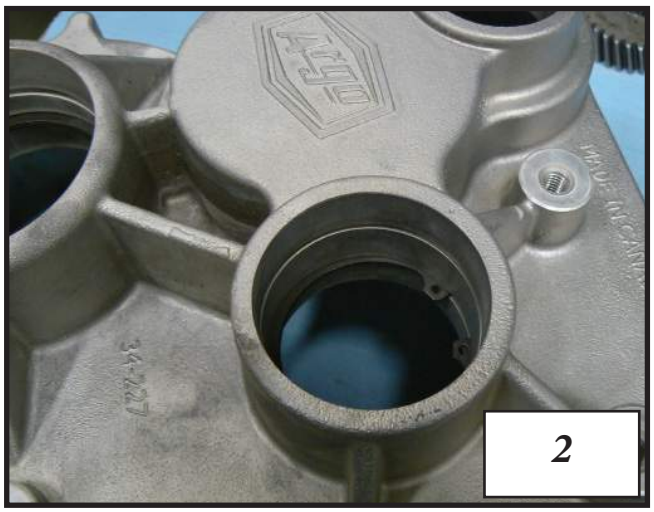
# HOUSING PRE-ASSEMBLY

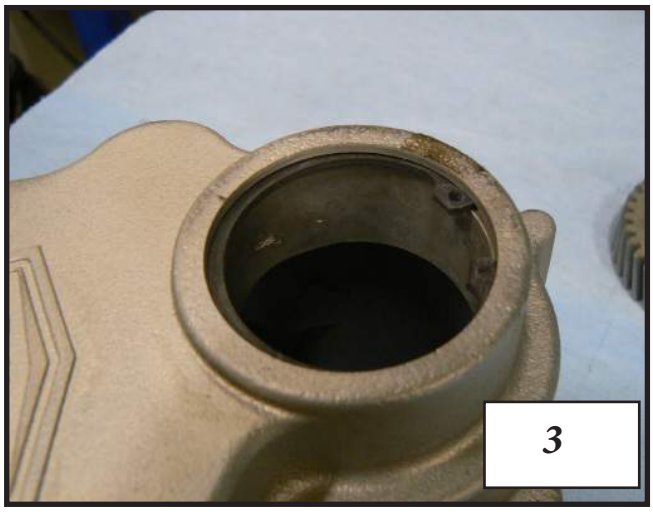
Components
101-81 Ball Bearing, 102-33 Oil Seal, 106-05 Retaining Ring, 106-23 Retaining Ring, 106-24 Retaining Ring

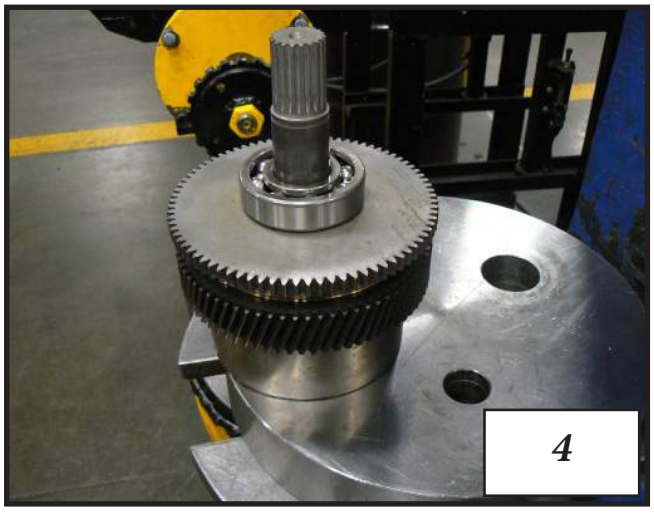
Install **106-24 Retaining Ring** into the largest hole opening on inside groove of housing. ***Photo 1.***

Install **106-05 Retaining Ring** into the small hole in the housing ***Photo 2,*** followed by the smallest **106-26 Retaining Ring** ***Photo 3.***

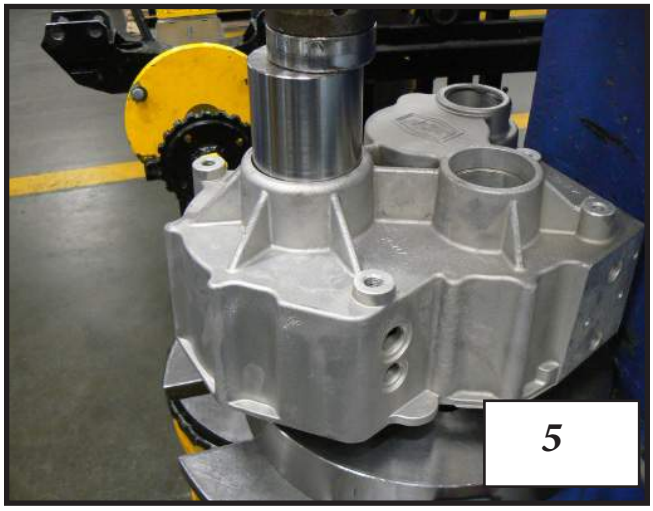


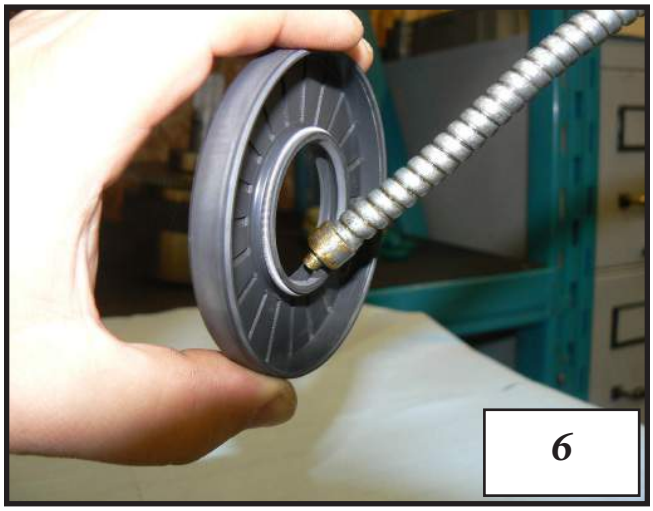



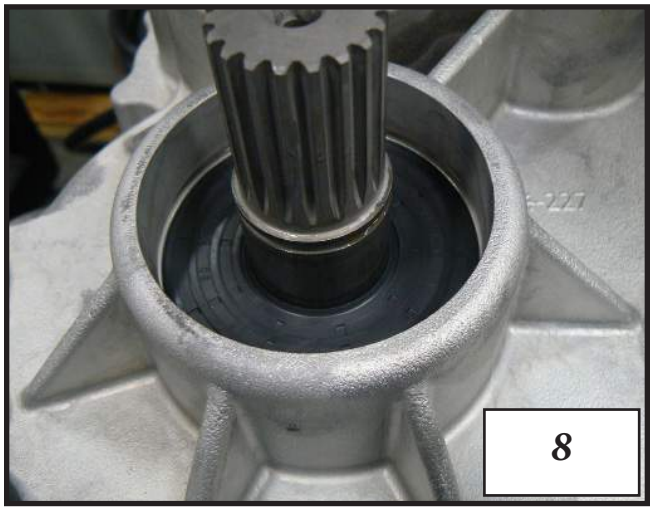




Set Planetary Hub assembly on press ***Photo 4,*** and press the housing onto the Planetary assembly ***Photo 5.***



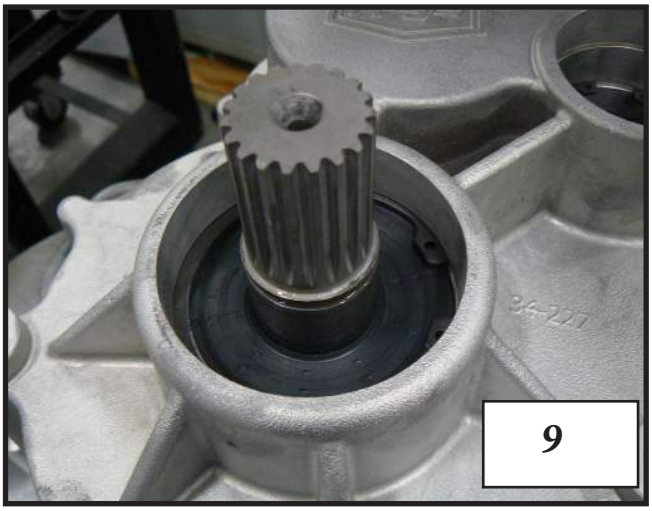

Put a small amount of oil on the inside of the **102-33 Oil Seal *Photo 6,*** and put seal on end of shaft and press down. ***Photo 7 & 8.***

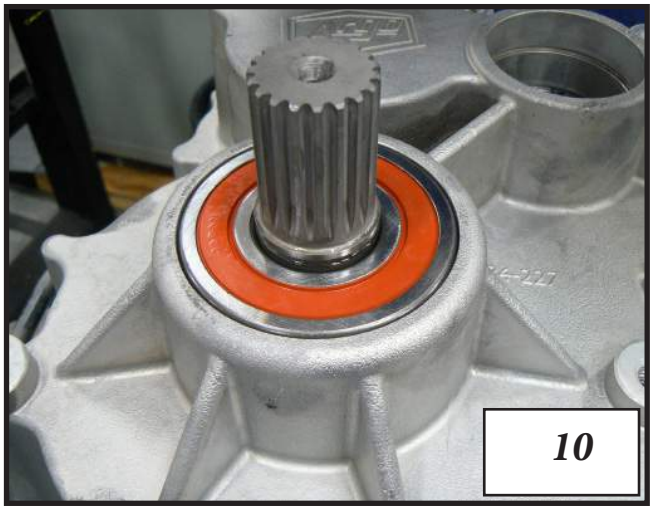




***Note:*** **Make sure oil seal spring is facing the inside of the transmission. To insure that spring stays on seal, press seal on shaft as far as possible by hand.**

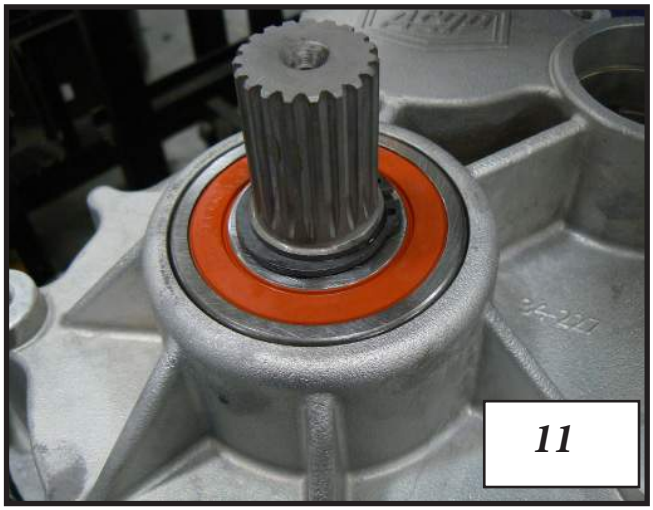
Install **106-24 Retaining Ring** into second groove of housing right in front of the oil seal ***Photo 9.***

Press **101-81 Ball Bearing** onto housing and shaft. ***Photo 10.***




Install **106-23 Retaining Ring** onto the output shaft. ***Photo 11.***

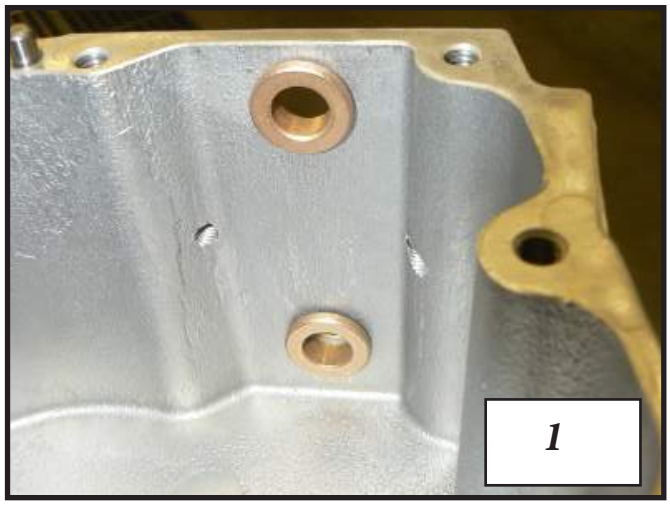


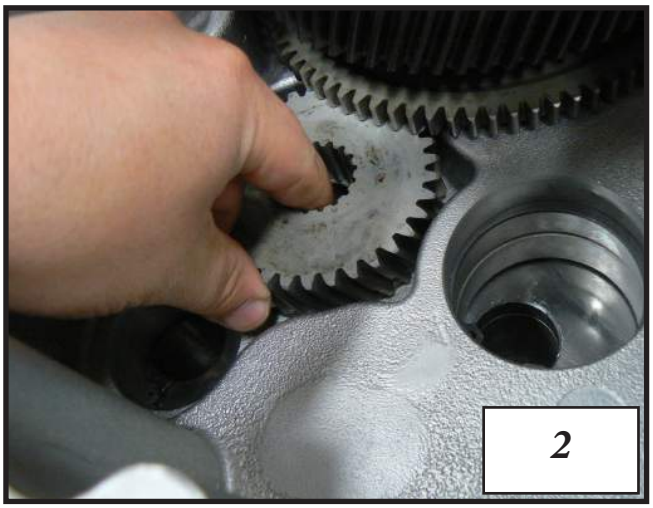
# TRANSMISSION ASSEMBLY

Install **105-33 Flanged Bushing** into both holes in housing from the inside. ***Photo 1.***

Install **104-03 Dowel Pins** into holes in the housing.

Install **101-73 Ball Bearing** into housing followed by **105-30 Flanged Bushing**.

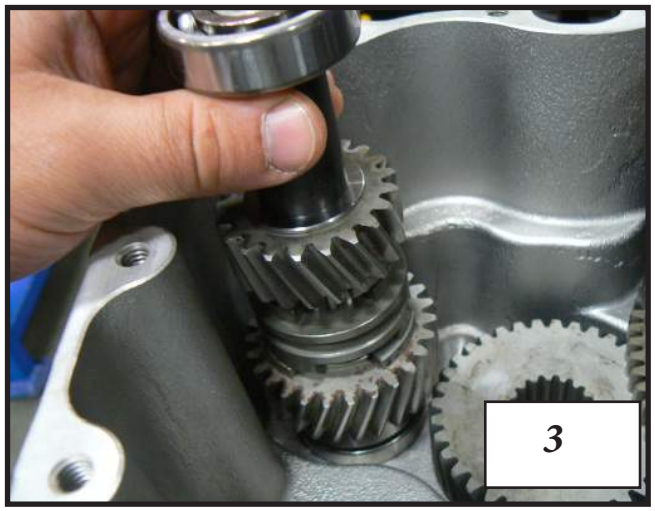


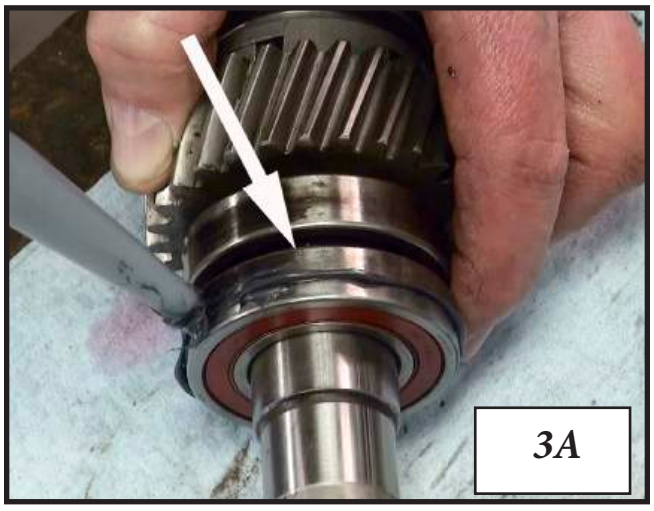




Place **34-211 Helical Gear** on top of the **105-30** ***Photo 2.***

Insert the input shaft assembly into the housing with the **101-01 Ball Bearing** facing upwards. ***Photo 3.***

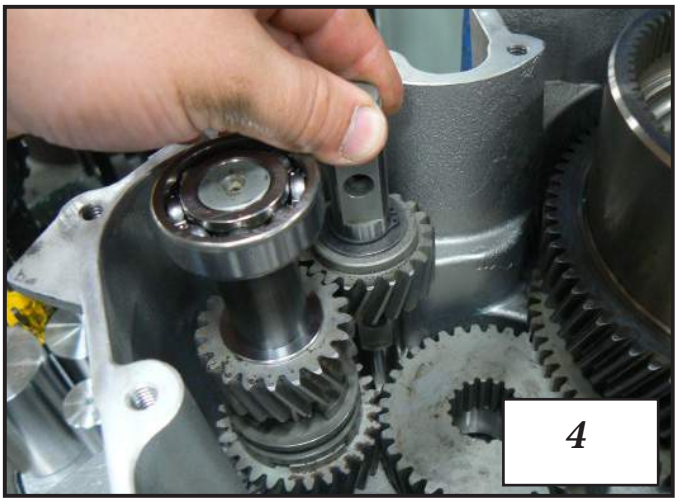
Put 598 Gasket Maker on first bearing input shaft before installing ***Photo 3A.***

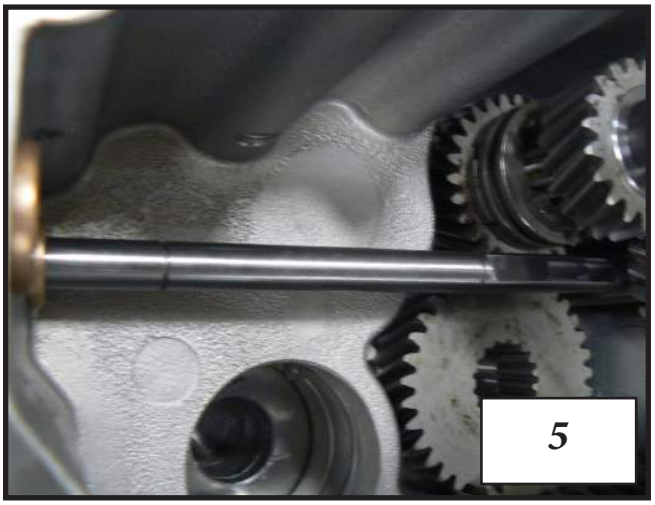


***Note:*** **If input shaft needs to be pressed into housing you must use a special fixture that pushes on the 34-215 Forward Pinion or else transmission may not spin freely.** Install reverse idler shaft assembly with the flats on the 3/8" holes facing towards the inside of the transmission. ***Photo 4.***

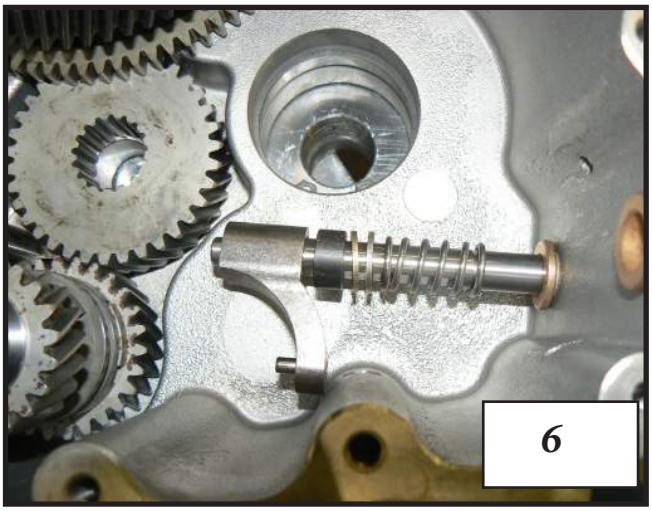
***Note:*** **Step on 34-220 Idler Pinion must face upwards.**

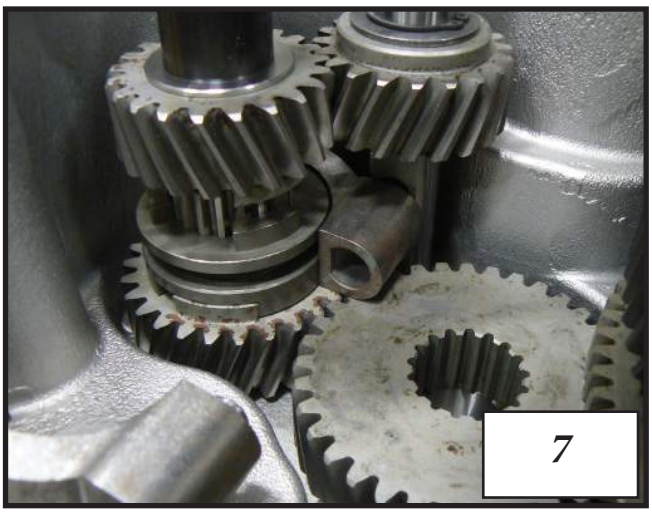

*4*


*5*

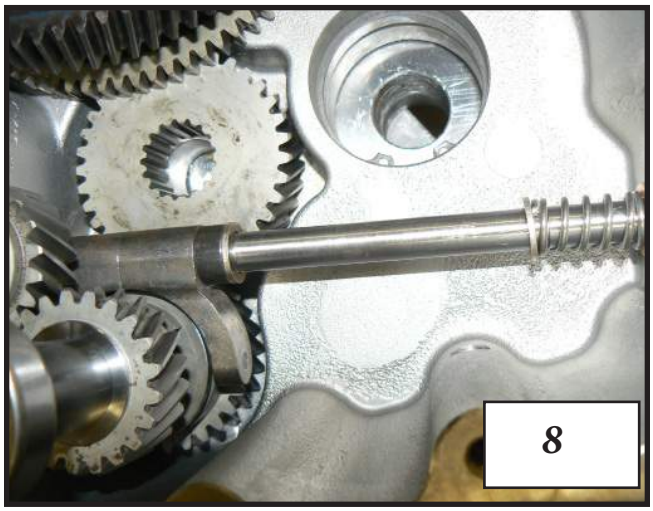
Insert a **34-231 Shift Shaft** through the **105-33 Flanged Bushing** and through the **34-221 Shift Shaft** ***Photo 5,*** and make sure it spins freely and does not bind.
***Note:*** **If shaft is tight to turn the 34-221 Shaft must be rotated.**

Pull the **34-221 Shift Shaft** back out half way and slide on a **127-186 Spring** followed by (2) **12731594 Washers**, (1) **114-21 Spacer** and a **34-232 Shift Fork** ***Photo 6.***


*6*


*7*

Put a second **34-232 Shift Fork** in the clutch of the input shaft and in between the reverse idler shaft assembly ***Photo 7.*** Slide the **34-231 Shift Shaft** back into the **34-221 Shaft**. Make sure the shaft is all the way in by looking at the retaining ring groove. It should be against (1) **12731594 Washer** which goes against the **114-21 Spacer** and **34-232 Shift Fork.** ***Photo 8.***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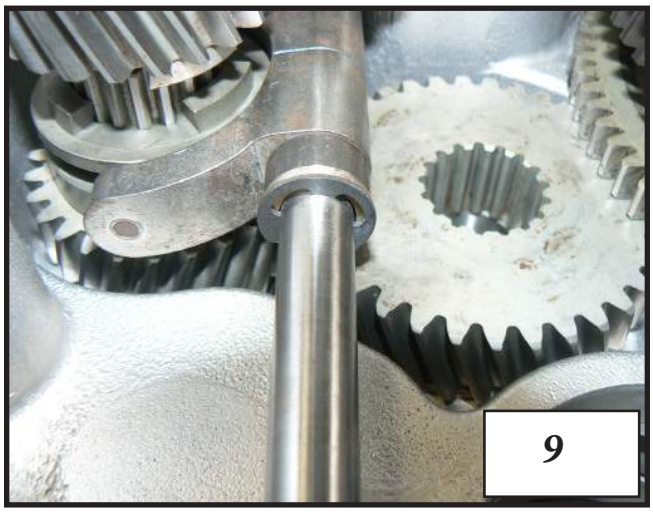
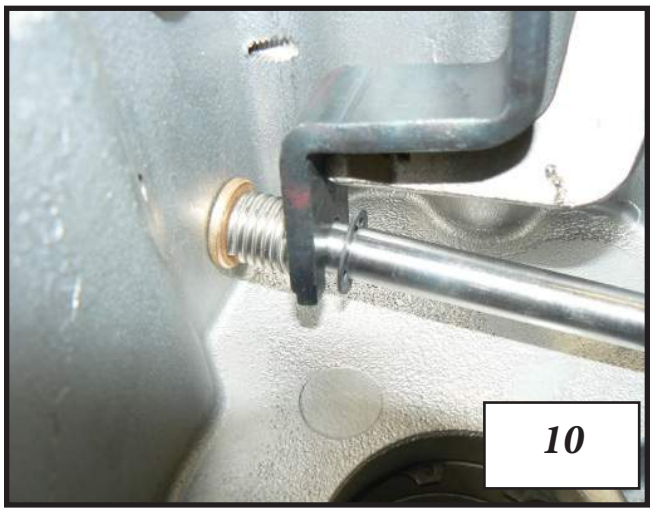

***9***

Install (2) **106-30 Retaining Rings** onto the **34-231 Shift Shaft**. ***Photo 9 & 10.***
***Note:*** **For the retaining ring on the spring end, a special spring compressor must be used.** ***Photo 10.***


***10***

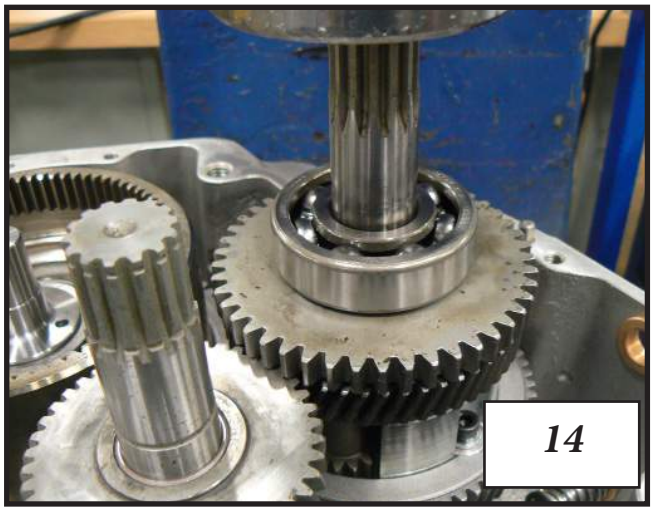

***11***

Install Idler Shaft Assembly; make sure to align the spline on shaft with the **34-211 Helical Gear.** ***Photo 11.*** ***Note:*** **Shaft must be pressed into 105-30 Flanged Bushing.** Press a **105-29 Bushing** into the **34-212 Helical Pinion**, then drop it on top of the idler shaft ***Photo 12.***


12

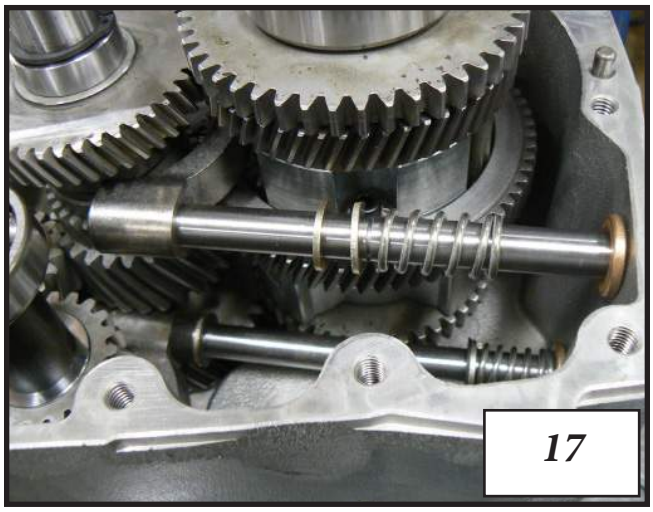

13

Install Upper Differential. ***Photo 13 & 14.*** ***Note:*** **Make sure 34-212 Pinion is on the idler shaft before installing differential. 34-212 might need to be lifted higher on shaft to allow differential to fit in housing. When pressing differential into housing it is important to keep spinning lower differential to align gear teeth with upper differential.**


14

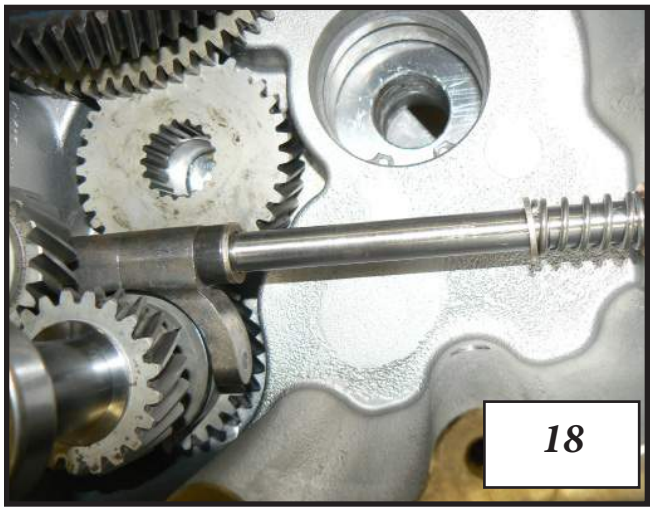

15

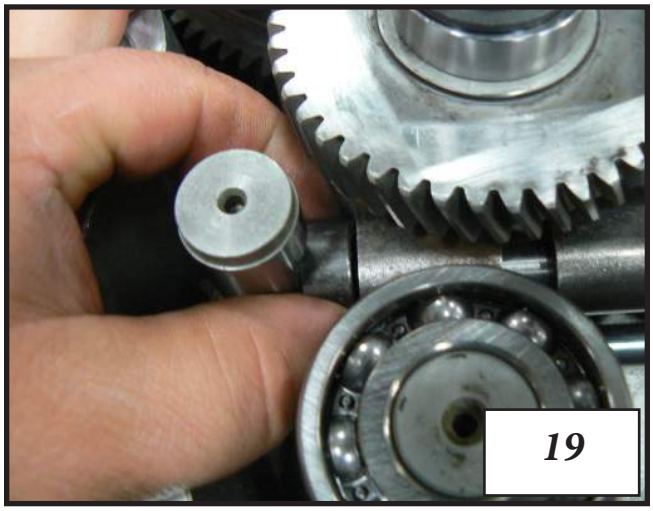
Install **108-97 Spacer** onto the idler shaft ***Photo 15,*** as well as a **107-15 Retaining Ring** ***Photo 16.***

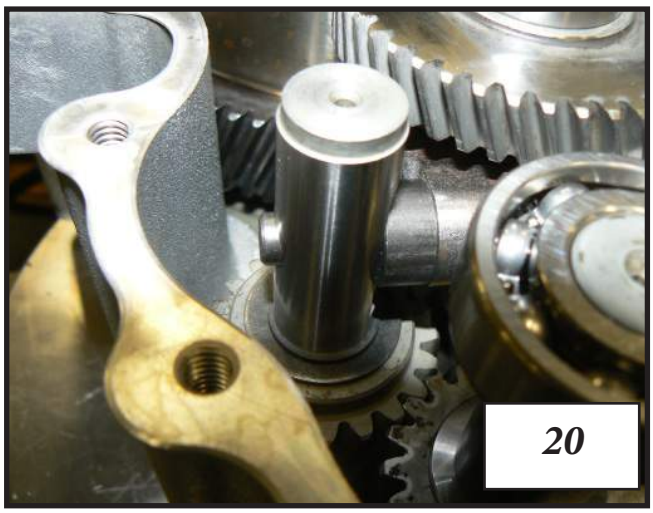



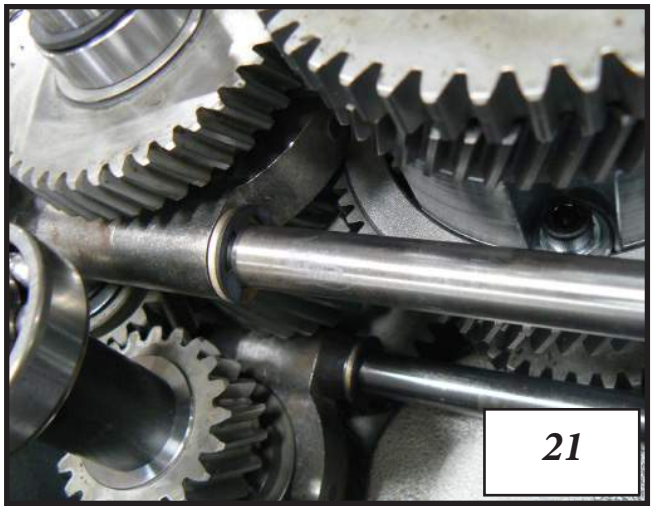

Slide a **34-231 Shift Shaft** into housing and install (1) **127-186 Spring**, (2) **12731594 Washers** and (1) **34-232 Shift Fork**. ***Photo 17.***

Once the shift fork is aligned in the Shift Collar have the shift shaft stick out 1/4" past the end of the fork, ***Photo 18,*** then install another **34-232 Shift Fork** on the other side of the shift collar followed with a **114-21 Spacer** ***Photo 19 & 20.***

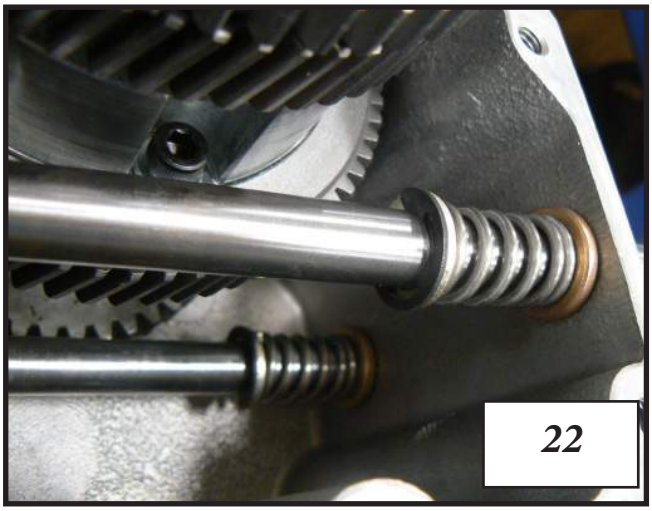




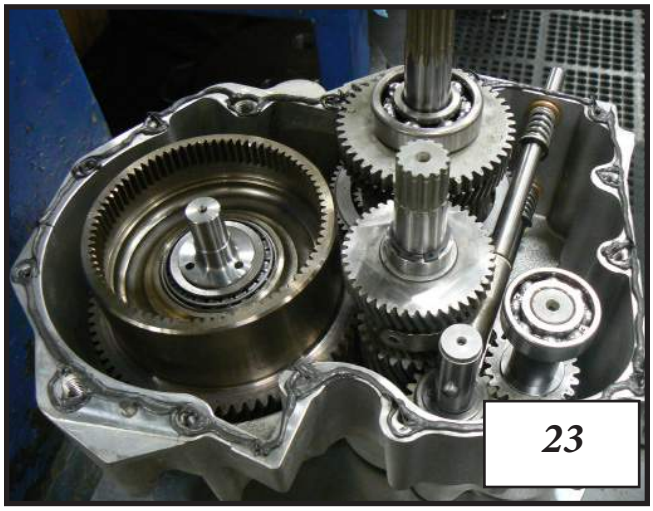



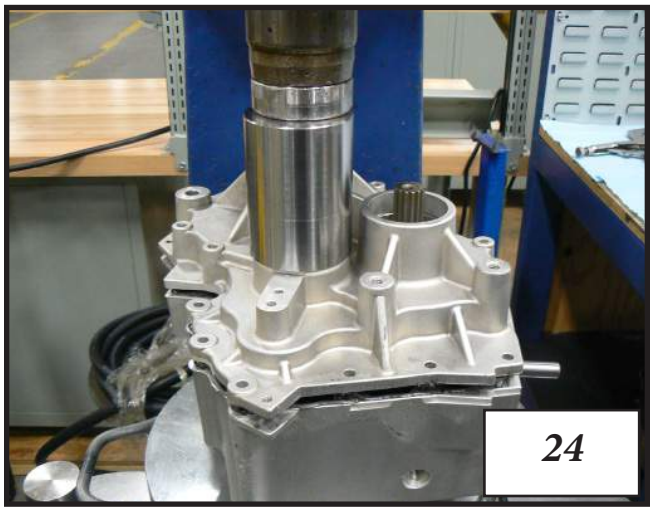

Install (2) **106-30 Retaining Rings** on the **34-231 Shift Shaft** ***Photo 21 & 22.***




***Note:*** **Special tool is not required to install any of the retaining rings, should be able to do it by hand.**

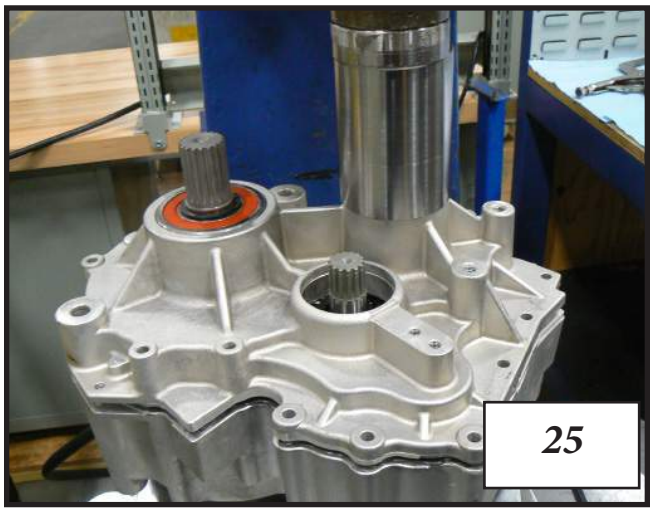
Make sure that transmission spins in every gear, shifts with ease and does not spin when in neutral.

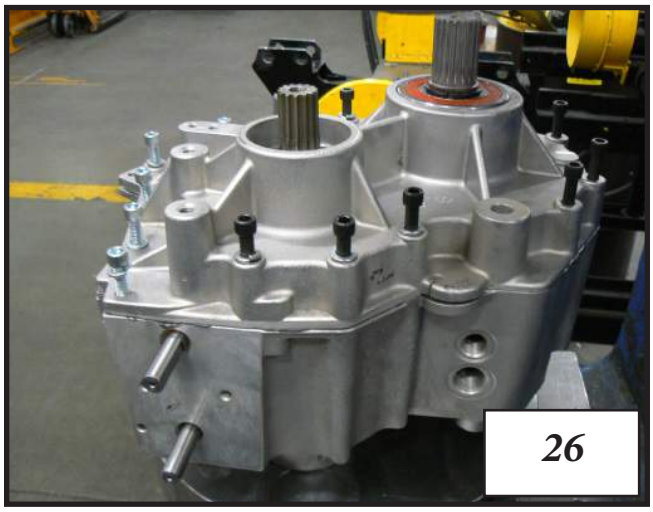


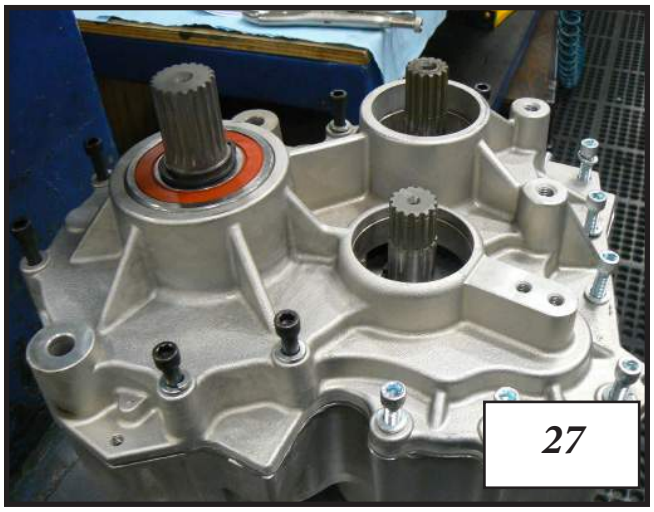

Run a bead of 598 Gasket Maker around the matting surface on the housing and go around all of the holes. ***Photo 23.*** Fit cover assembly overtop of the housing assembly and press down on both idler shaft bearing bore ***Photo 24***, and the upper differential bearing bore, ***Photo 25*** until cover is all the way down.

***Note:*** **Spin output shaft on cover while pressing down to align gear teeth. If it gets tight, stop pressing and keep spinning until teeth mesh properly.**



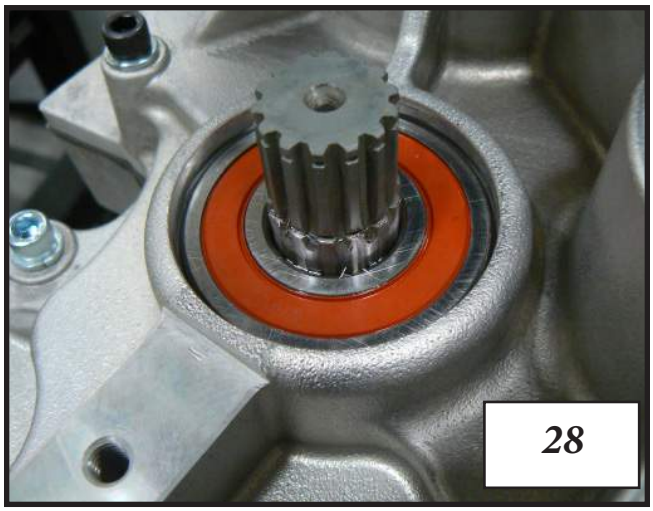



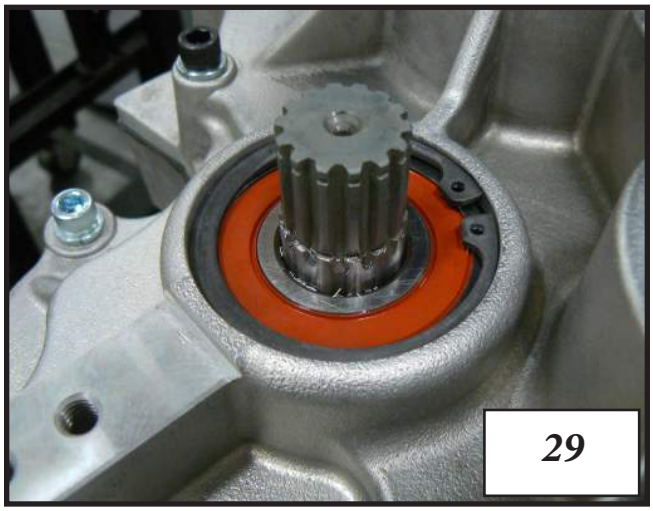

Install (8) **112-18 Bolts** and (5) **108-05 Lockwashers** on the bottom end of the transmission ***Photo 26. Note:*** **Bottom 3 bolts do not get lockwashers.**



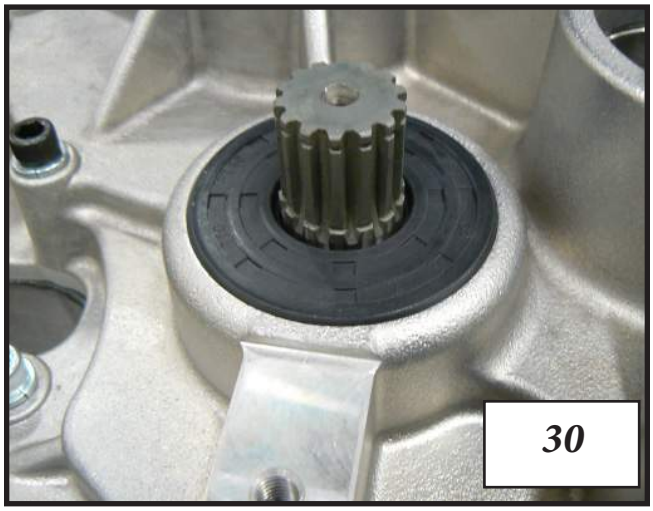

Install (6) **112-143 Bolts** and (6) **108-05 Lockwashers** at the top end of the transmission ***Photo 27.*** Torque all of the bolts to 20 ft-lbs.

Press in a **101-86 Sealed Bearing** onto the Idler shaft. ***Photo 28. Note:*** **Bearing must not be pressed in too far or it will hit the 34-207 Gear. To install bearing without pressing it too far, press it in far enough that you can insert the 106-05 Retaining Ring, then press down on the Retaining Ring until it sits in its' groove.** ***Photo 29.***




Install a **106-05 Retaining Ring** if not installed from previous step ***Photo 29.***

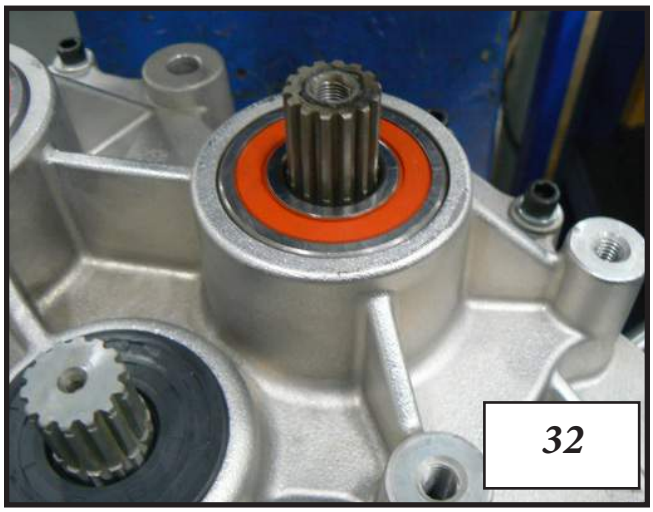




Press in a **102-37 Oil Seal** on the end of the idler shaft ***Photo 30.*** May have to release air or seal may come back off.

Press in a **102-37 Oil Seal** on the Differential shaft ***Photo 31.***

Install a **106-05 Retaining Ring** ***Photo 31.***





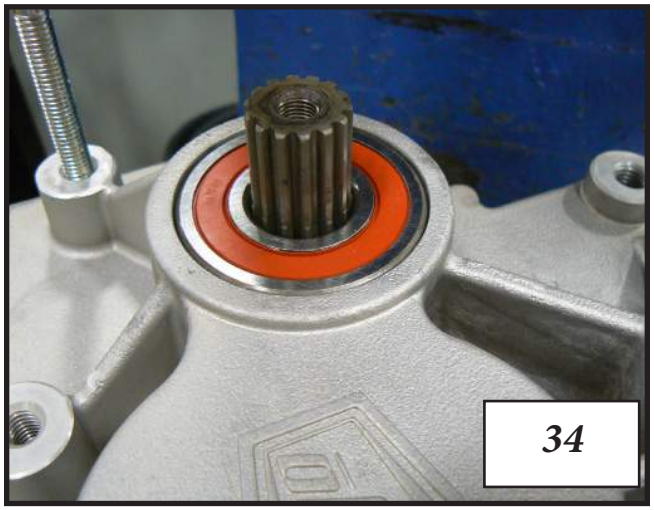
Press on a **101-86 Sealed Bearing** on the end of the Differential Shaft ***Photo 32.***

Flip Transmission over.

Press in a **102-37 Oil Seal** on the Differential shaft ***Photo 33.***

Install a **106-05 Retaining Ring** ***Photo 33.***

Press on a **101-86 Sealed Bearing** on the end of the Differential Shaft ***Photo 34.***

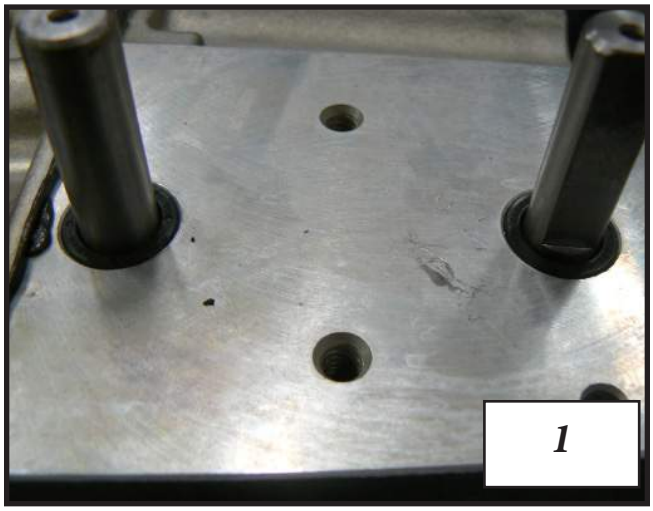


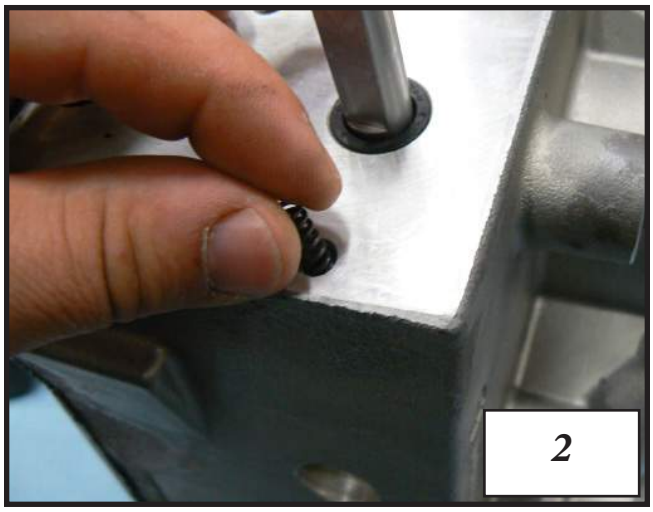

Take transmission out of the press and put it on the bench.

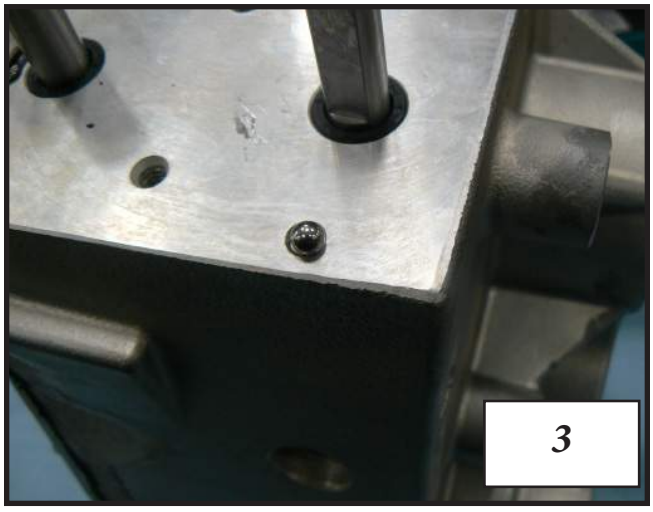
## EXTERNAL SHIFTING DEVICES

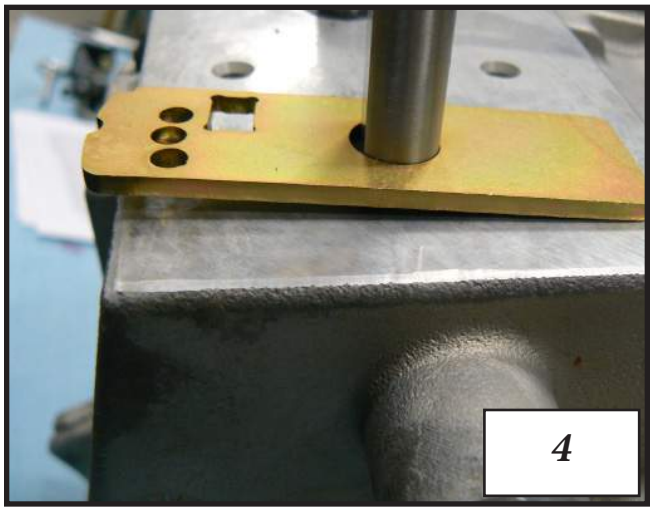
Install a **102-36 Seal** on both shift shafts ***Photo 1.***

Insert a **34-32 Spring,** ***Photo 2*** and a **109-05 Steel Ball,** ***Photo 3*** into blind hole on the housing.



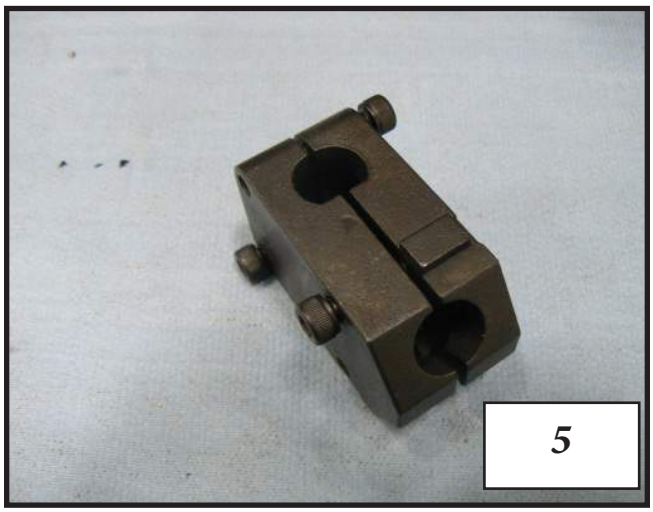



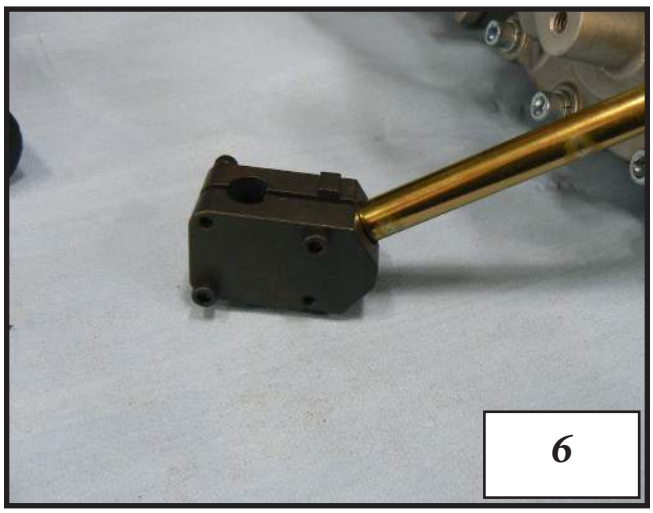




Install a **34-233 Detent Plate** on the shift shaft ***Photo 4.***

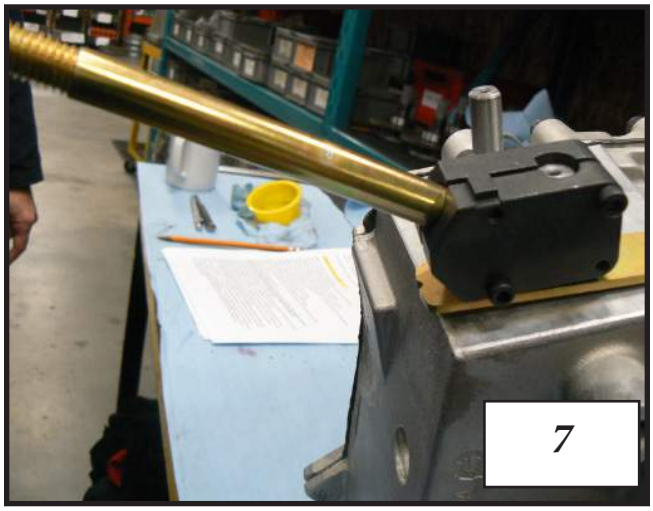
Loosely bolt together (2) **34-236 Shift Clamps** with (4) **112-184 Bolts *Photo 5.***

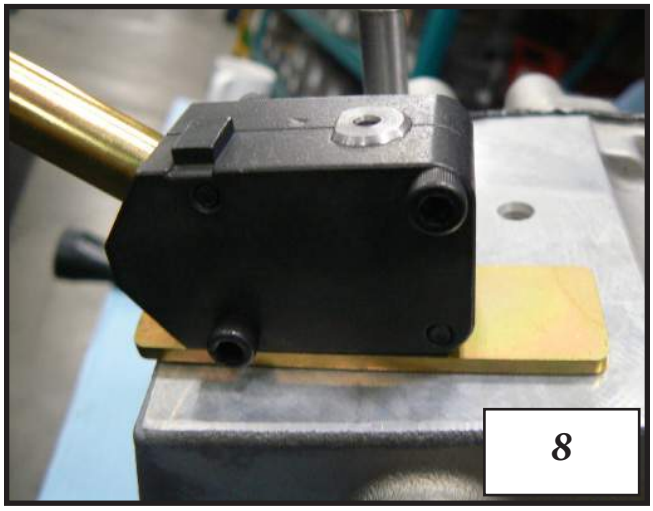
Insert a **34-235 Shift Lever** into the two shift clamps ***Photo 6,*** and install on the shift shaft ***Photo 7.***




Tighten bolts until shift clamp assembly is almost clamping on the shift shaft ***Photo 7.***



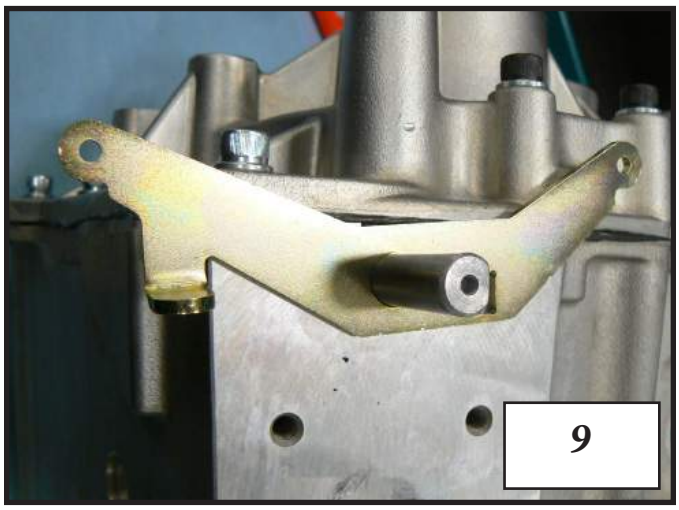



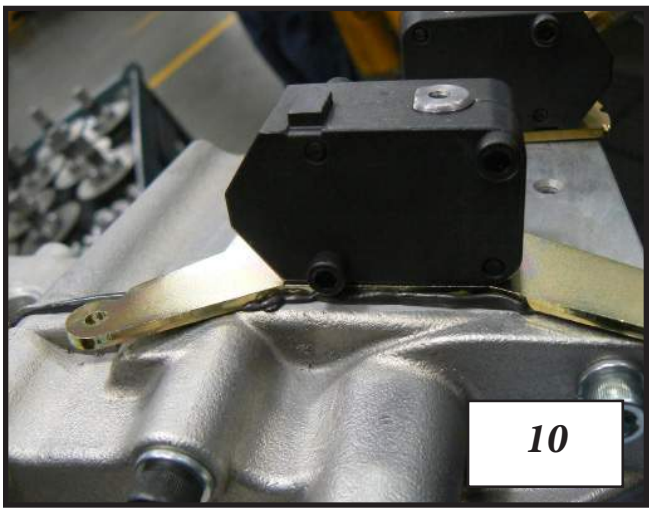

Hammer down clamp assembly into the **34-233 Detent Plate** until shift shaft sticks out of the assembly a little bit and detent plate is flat against the housing ***Photo 8.*** May have to hammer down and tighten at same time so it does not slide back off shift shaft.

Torque the bolts on the shift clamps to 10 ft-lbs.

Install a **34-242 Spring Mount Bracket** onto the other shift shaft ***Photo 9.***

Loosely bolt together (2) **34-236 Shift Clamps** with (4) **112-184 Bolts** ***Photo 5.***



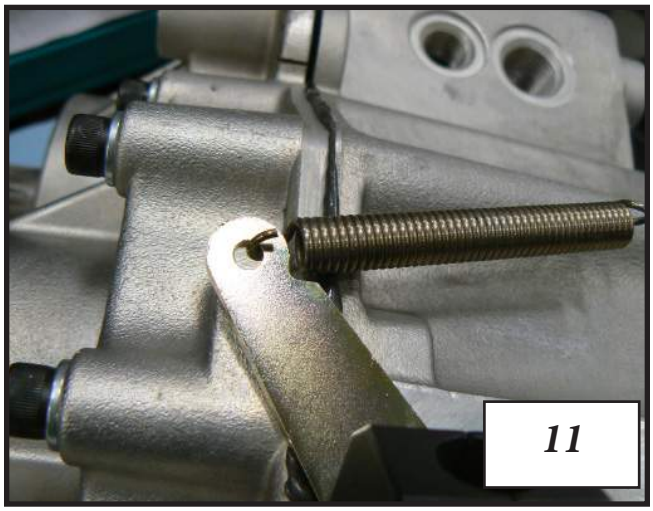

Tighten bolts until shift clamp assembly is almost clamping on the shift shaft ***Photo 6.***

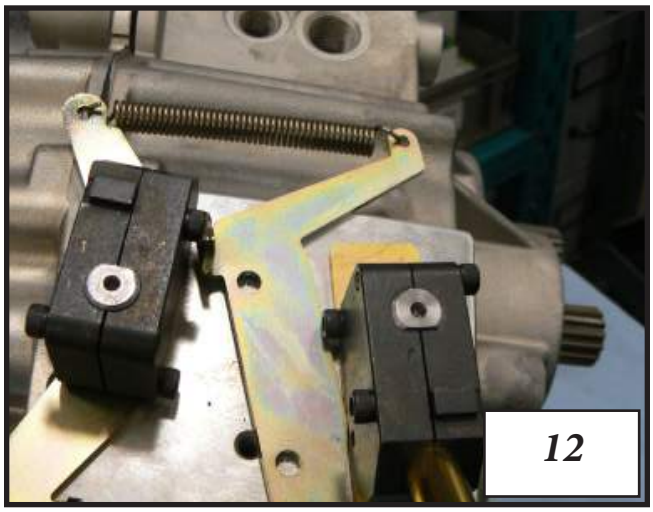
Hammer down clamp assembly into the **34-242 Spring Mount Plate** and until shift shaft sticks out of the assembly a little bit ***Photo 10.***

Torque the bolts on the shift clamps to 10 ft-lbs.

Install a **127-194 Extension Spring** onto the **34-242 Spring Mounting Plate** ***Photo 11***. ***Note:*** **Install spring so that the open end is facing outwards so that the spring can not get caught on the housing at all.**

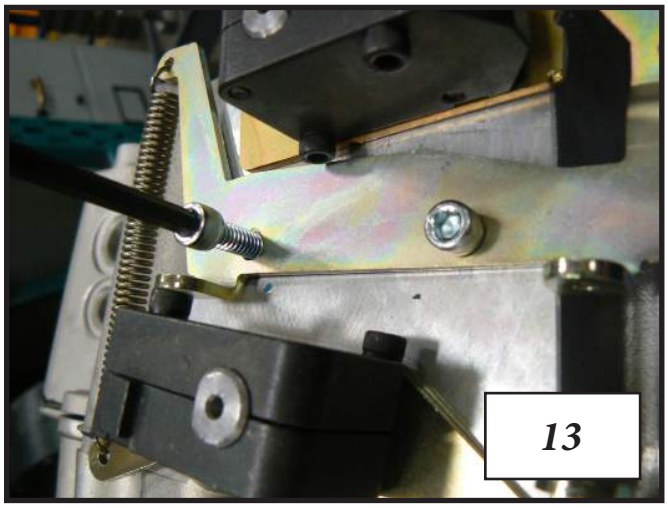
Attach the other end of the spring to the **34-241 Switch Bracket** ***Photo 12.***

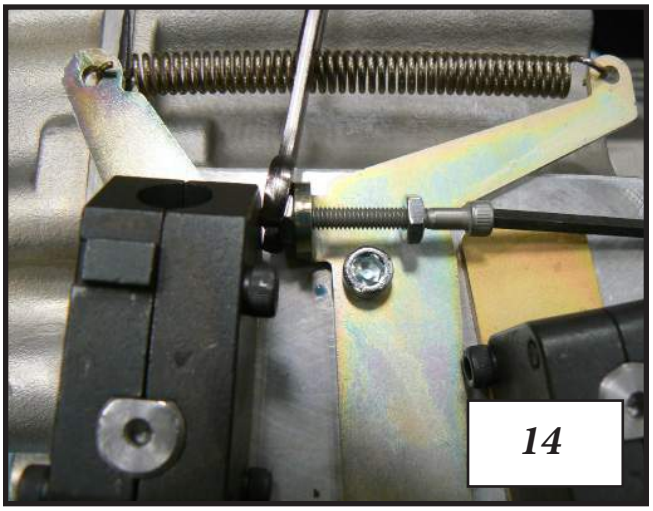


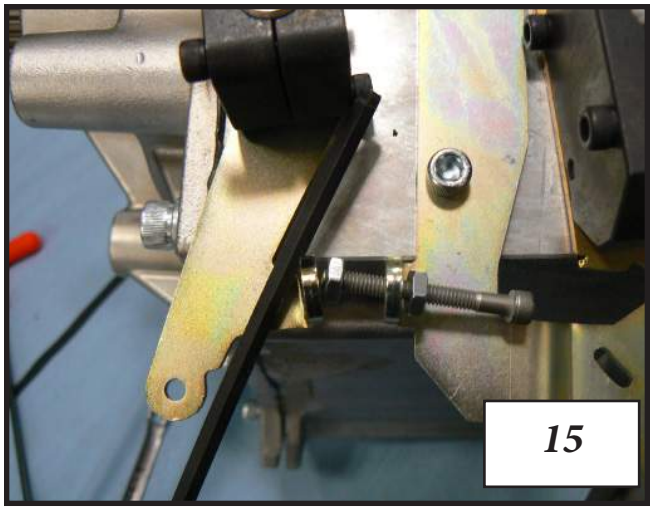
Bolt the Switch Bracket to the transmission with (2) **112-47 Bolts** with Blue 243 LOCTITE and torque them to 16 ft-lbs ***Photo 13.***

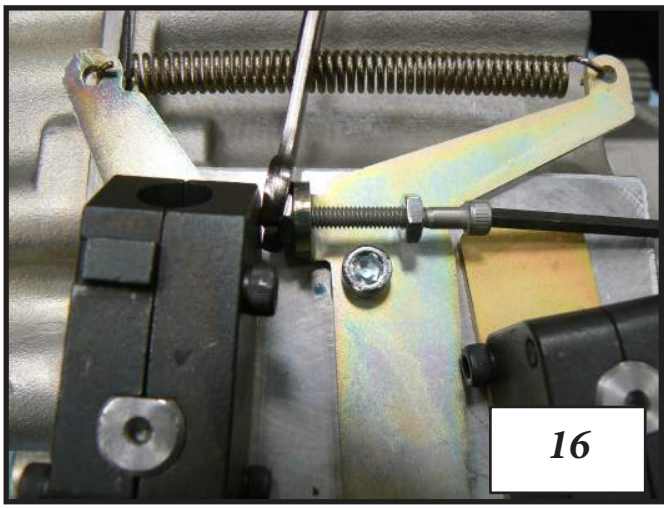
Set the High-Low shifting stops by installing (2) **112-195 Bolts** and (4) **117-92 Nuts**.




Set the low gear shifting stop by threading (1) **117-92 Nut** onto the **112-195 Bolt** most of the way on, then insert the bolt through the bottom hole in the **34-241 Switch Bracket**. Install another **117-92 Nut** on the other end. ***Photo 14.***



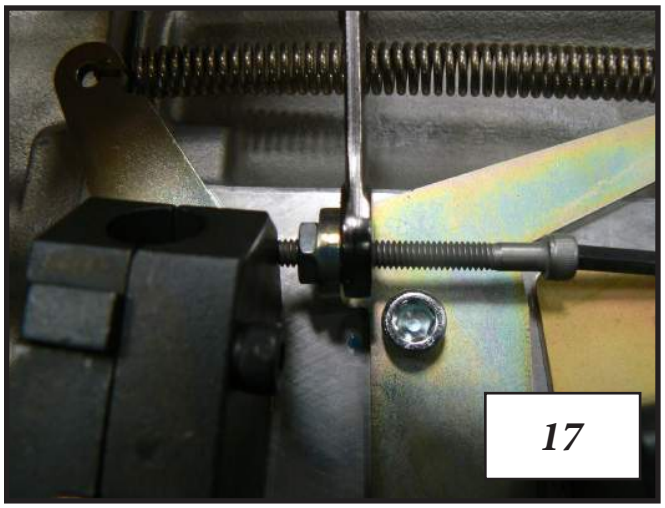

Screw the bolt threw the nut until the bolt hits the **34-236 Shift Clamp** then turn the bolt 1/2 more of a turn. Tighten the first nut back to the **34-241 Switch Bracket** to lock the bolt in place. ***Photo 14.***

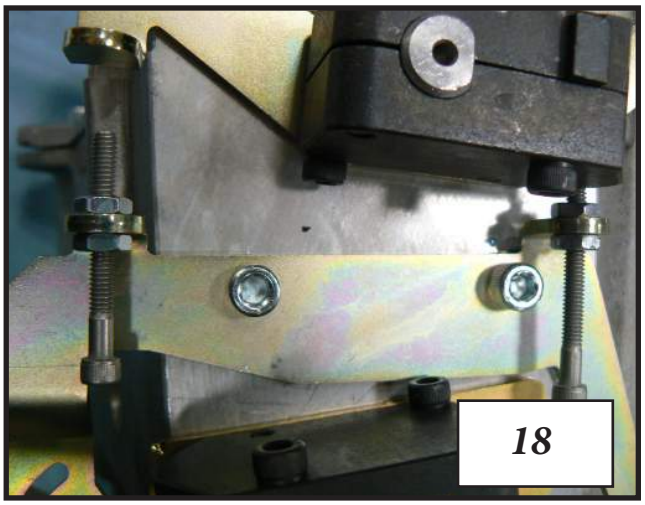
To set the high gear shifting stop, first turn transmission until you can engage the transmission into high gear. ***Photo 15.***

Thread (1) **117-92 Nut** onto the **112-195 Bolt** all the way on, then insert the bolt through the top hole in the **34-241 Switch Bracket**. ***Photo 16.***

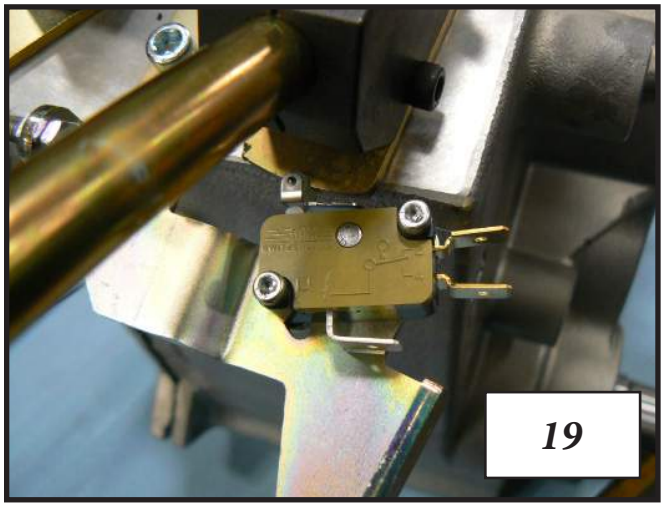
Install another **117-92 Nut** on the other end until the threads on the bolt just stick through. ***Photo 16.***

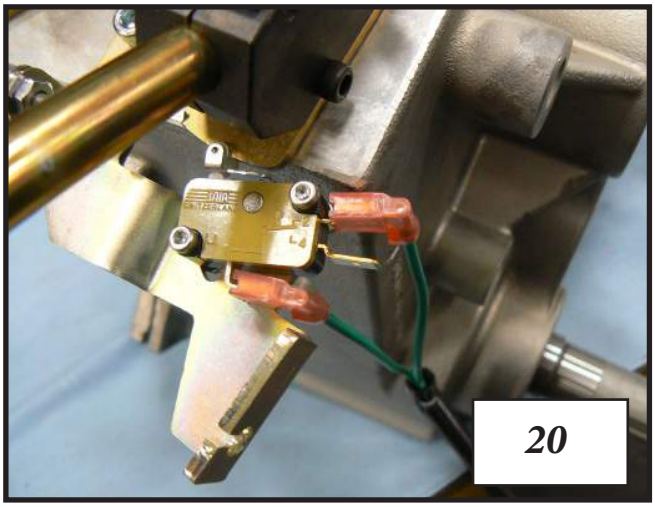
Shift the transmission into high gear and hold it there. Push the bolt nut assembly against the **34-236 Shift Clamp** and tighten the first nut against the **34-241 Switch Bracket**. ***Photo 16.*** Let the transmission switch out of gear and hold the nut against the Switch Bracket and turn the bolt 1/2 turn more towards the Shift Clamp. Tighten the second nut to lock bolt in place. ***Photo 17 & 18.***




Install the 613-151 Neutral Safety switch with (2) **112-172 Bolts** and (2) **112-173 Nuts**. ***Photo 19. Note:*** **Do not over tighten bolts, the switch will break or crack. If switch is cracked or broken it must be replaced.**



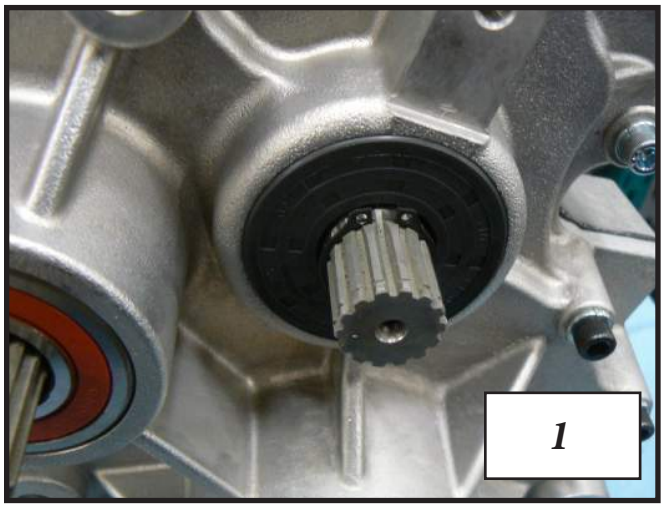
Make sure switch is functional by shifting the transmission into neutral and checking that you can trip the switch and hear a loud clicking sound. When transmission is in gear (forward or reverse) you should not be able to trip the switch and not hear a clicking noise.

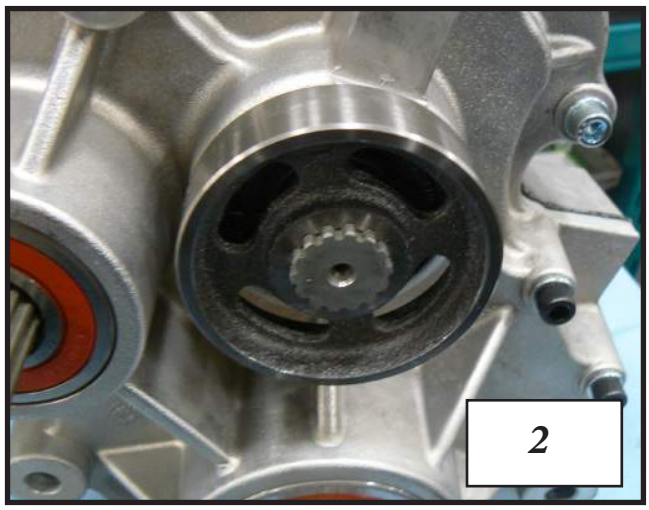
Install the **613-112 Wiring Harness** onto the **613-151 Neutral Safety Switch *Photo 20.***

# BAND BRAKE INSTALLATION

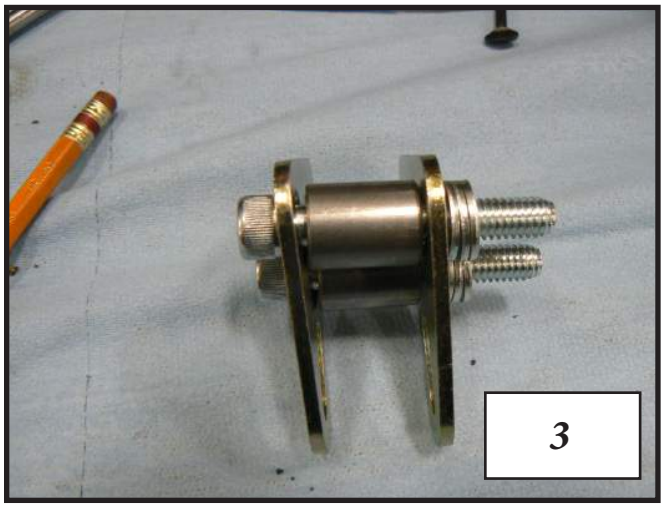
Install (1) **106-29 Retaining Ring** onto the **34-208 Idler Shaft** ***Photo 1***.

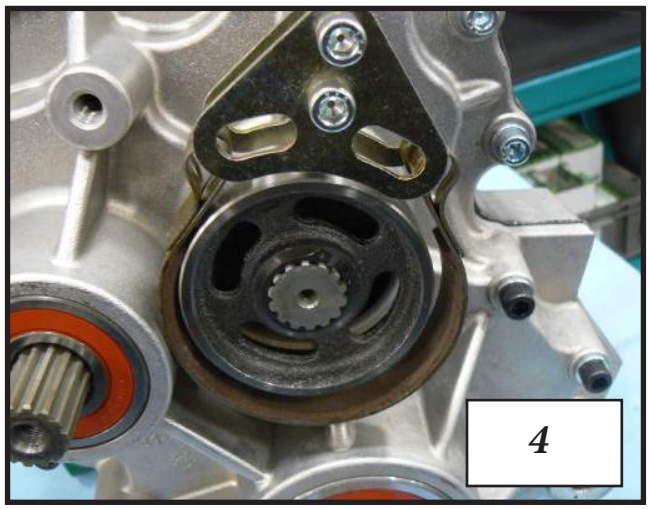
Slide on the **34-243 E-Brake Drum** and install another **106-29 Retaining Ring** ***Photo 2.***




Assemble (2) **165-27 E-Brake Brackets**, (2) **112-185 Bolts**, (2) **114-23 Spacers** and (6) **108-76 Washers** ***Photo 3.***

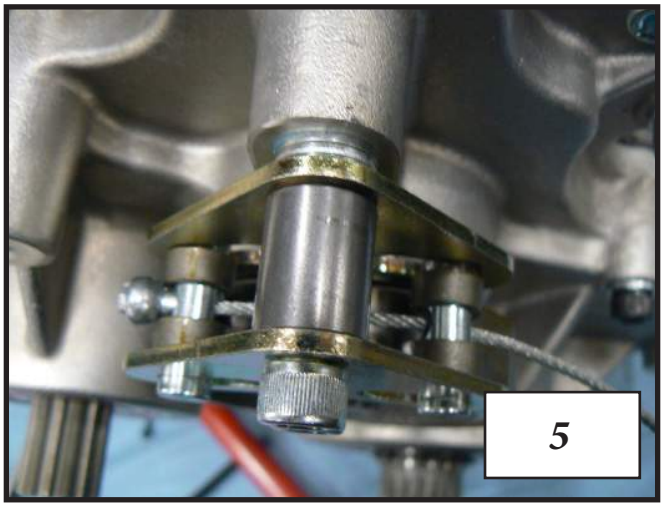



Apply Blue 243 LOCTITE to bolt threads and install the assembly onto the cover ***Photo 4.***

Take the **165-28 E-Brake Band** and stretch it over the **34-243 E-Brake Drum** and the **165-27 E-Brake Bracket** ***Photo 4.***

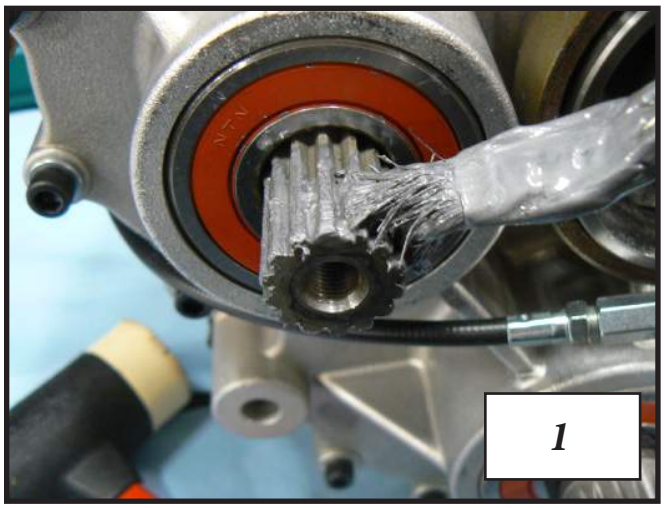
Insert a **104-57 E-Brake Cable Pin** half way through the **165-27 E-Brake Bracket** and **165-28 E-Brake Band** and install the **165-33 Parking Brake Cable** into the **104-57**, then push the **104-57 E-Brake Cable Pin** in the rest of the way so that it is sitting on both **165-27 E-Brake Brackets**. Repeat previous step for the second **104-57 E-Brake Pin** installation ***Photo 5.***

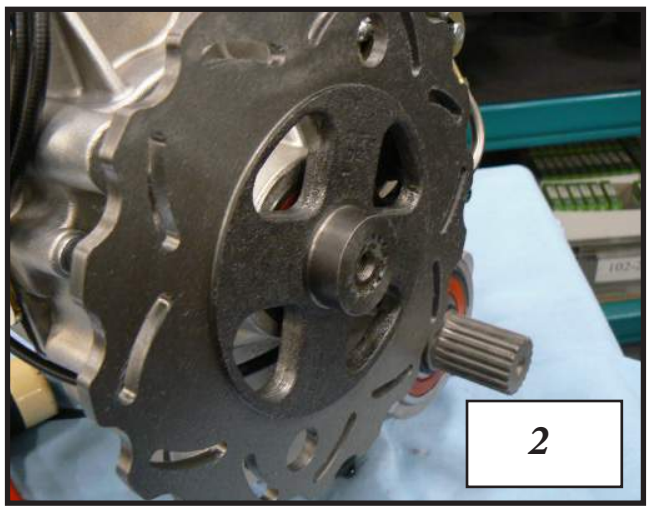


# BRAKE DISC INSTALLATION

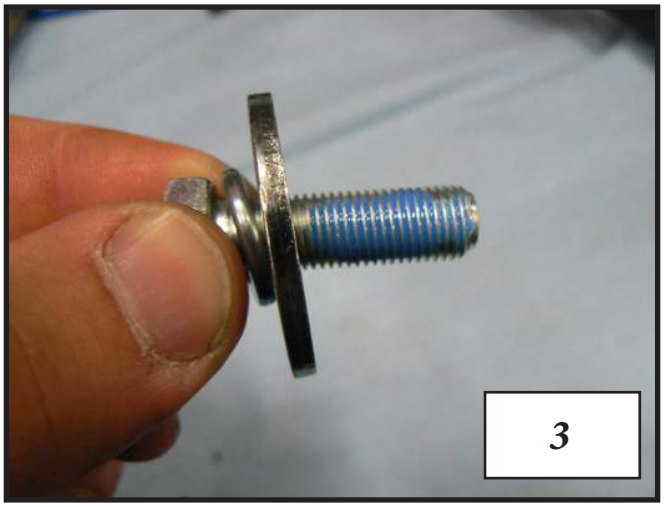
Apply Silver Grade Anti-Seize to both upper differential output shafts ***Photo 1.***

Slide on **165-22 Brake Discs** ***Photo 2.***



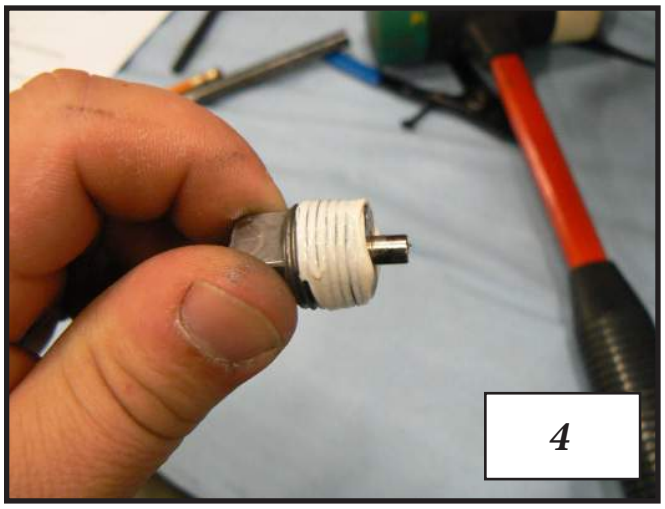



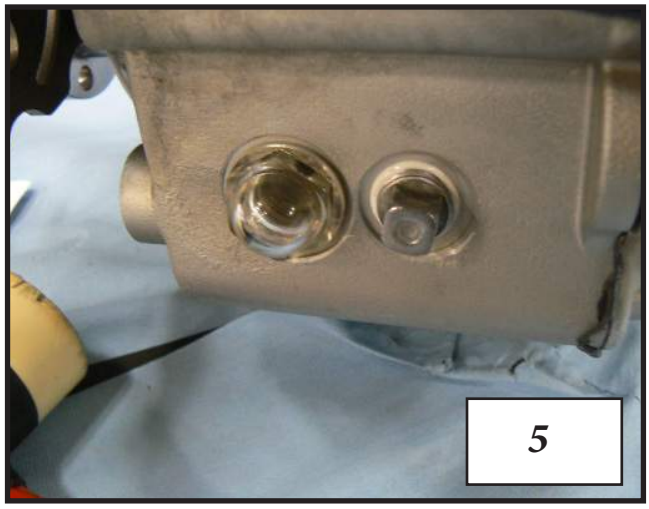

Bolt on with **103-18/P2 Bolts**, **108-06/P2 Lockwashers**, and **108-18/P2 Washers**. Apply Blue 243 LOCTITE to threads ***Photo 3,*** and torque bolts to 40 ft-lbs.



Install a **103-02 Magnetic Plug** into the housing using the Loctite 592 Thread Sealant and torque to 15 ft-lbs ***Photo 4.***

Install a **34-251 Site Glass** and tighten until snug ***Photo 5.***




Fill transmission with 1.200 Litres of 80W-90 Gear Oil.

Install **34-245 Fill Vent Plug**. ***Note:*** **only tighten by hand so you don't break it.** .

**Removing the Transmission (34-100)**

1. Disconnect all wiring to the battery before proceeding with the following component removal.

2. Perform servicing procedure, **Removing the Firewall** (Quick Release),

3. Perform the servicing procedure, **Remove the Front Floor Pan.**

4. Perform the servicing procedure, **Remove the Drive Belt**

5. Perform the servicing procedure, **Remove the Driven Clutch.**

6. Perform the servicing procedure, **Remove the Hydraulic Brake Calipers** from the transmission. There are holes in the brake discs to access the fasteners. Do NOT disconnect the brake lines.

7. Loosen the 2 power pack mounting bolts. One is located in front of the idler shaft sprocket, the other behind the idler shaft sprocket

8. Loosen the 2 idler chain adjustment bolts to slacken the drive chains.

9. Remove the Drive Chains

10. Loosen the fasteners that secure the brake cooling duct and slide the duct to allow removal of brake discs (Vehicles equipped with brake cooling system only).

11. Perform the servicing procedure, **Remove the Brake Discs.**

12. Locate, unfasten and remove the (2) bolts, lock washers and nuts that se cure the transmission to the power pack frame.

13. Tilt the transmission back towards the drivers compartment and lift it from the power pack frame

# ARGO SERVICE MANUAL

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