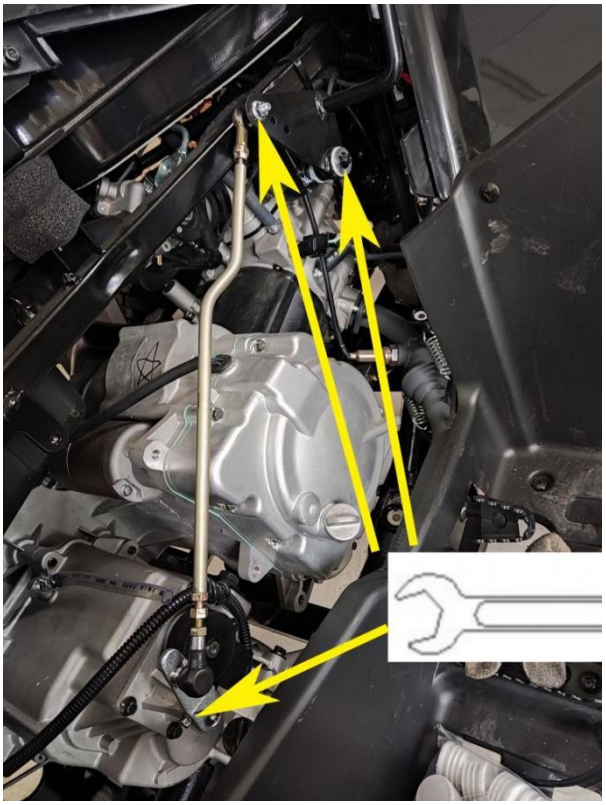
# CHAPTER 6 TRANSMISSION

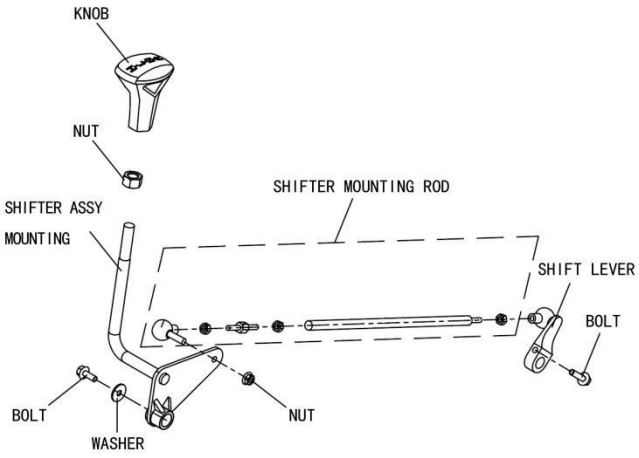
**WARNING**

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

## 6.1 SHIFTER REMOVAL

1. Remove parts that interfere with access to shift selector (seat, right side panel etc.).
2. Disconnect the two linkage rods from gear shift selector slides.
3. Remove five bolts attaching gear shift selector to the mounting bracket.
4. Lift gear selector out of mounting bracket and away from frame.






## 6.2 SHIFTER INSTALL ATION

1. Place shift rod back into the mounting bracket and replace five bolts.
2. Reconnect linkage rods to shift rod slides. Adjust as required. See linkage adjustment procedures.
3. Replace remaining parts.

## 6.3 SHIFT LINKAGE ADJUSTMENT

Linkage rod adjustment is necessary when symptoms include:

- Noise on deceleration
- Inability to engage a gear
- Excessive gear clash(noise)
- Shift selectors moving out of desired range

**NOTE:** When adjusting linkage, always adjust both linkage rods. The adjustment of one rod can prevent proper adjustment of the other rod. Remove necessary components to gain access to shift linkage rod ends.

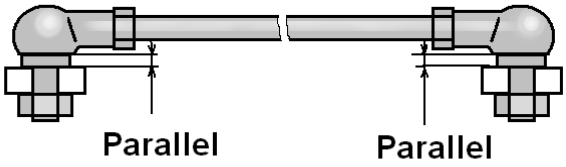
1. Inspect shift linkage tie rod ends, and pivot bushings and replace if worn or damaged. Lubricate the tie rod ends with a light aerosol lubricant or grease.
2. Loosen all rod end adjuster jam nuts.
3. Note orientation of tie rod end studs with stud up or down. Remove both rod end studs from transmission bell cranks.
4. Be sure idle speed is adjusted properly.

**NOTE:** It is important to disconnect both rod ends from the transmission bell cranks. If one linkage rod is incorrectly adjusted, it can affect the adjustment of the other rod.

5. Place gear selector in neutral. Make sure the transmission bell cranks are engaged in the neutral position detents.
6. Be sure the shift linkage rod ends are firmly attached to the gear selector slides. Adjust the low range (inside) rod so the rod end is centered on the transmission bell crank. Install the lock nut to the rod end and torque to 35 in.lbs ( 4 Nm)**.**
7. Rotate the linkage rod clockwise unit resistance is felt. Mark the rod so revolutions can be easily counter.
8. Rotate the linkage rod counterclockwise unit the same resistance is felt, counting the revolutions as the rod is turned.

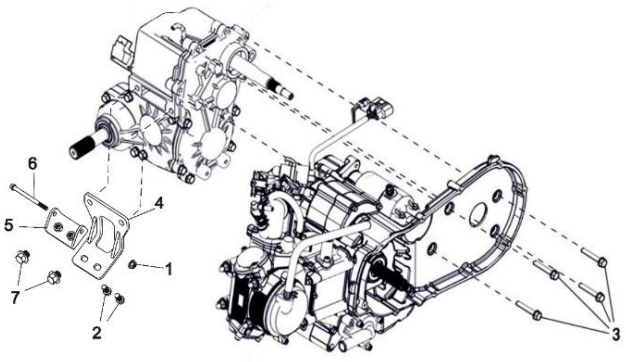

**Mark for counter**

9. Turn the rod clockwise again one half of the revolutions counted in Step 8.
10. Tighten the rod end jam nuts securely while holding the rod end. The jam nuts must be tightened with both front and rear rod ends parallel to each other. If jam nuts are properly tightened, the rod should rotate freely 1/4 turn without binding.
11. Repeat steps 7-10 for the High/Reverse rod.



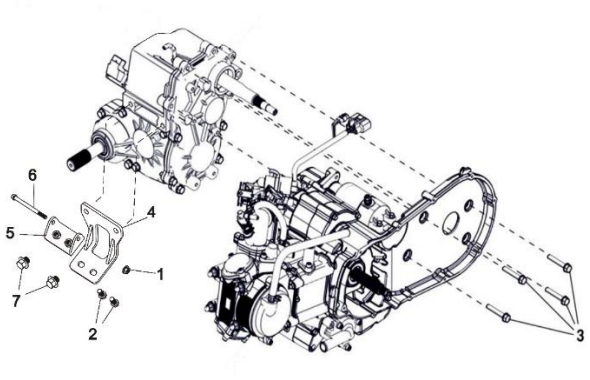

## 6.4 ENGINE AND TRANSMISSION DISASSEMBLY

1. Remove the bolts(6) and the nut(1);
2. Remove four bolts from the engine;
3. Remove the transmission;
4. Loosen two bolts(7)，Remove the engine connecting plate1(4).



## 6.5 ENGINE AND TRANSMSSION ASSEMBLY

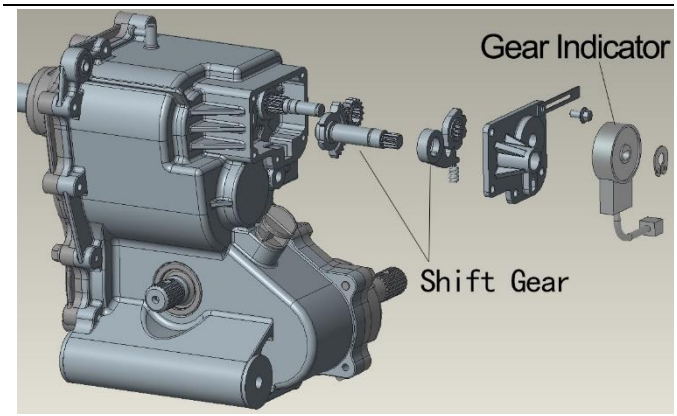
1. Install the engine connecting plate1(4) to the transmission, tighten two bolts(7) with LoctiteTM 243(Blue), the torque is 80-85N.m
2. Connectl the engine connecting plate1(4) to the engine connecting plate2(5), tighten two bolts(2) LoctiteTM 243(Blue), the torque is 50-55N.m
3. Install the transmission to the engine, tighten four bolts （ 3 ） with LoctiteTM 243(Blue), the torque is 28-32N.m
4. Install the bolts(6), tighten the nut(1), the torque is 28-32N.m



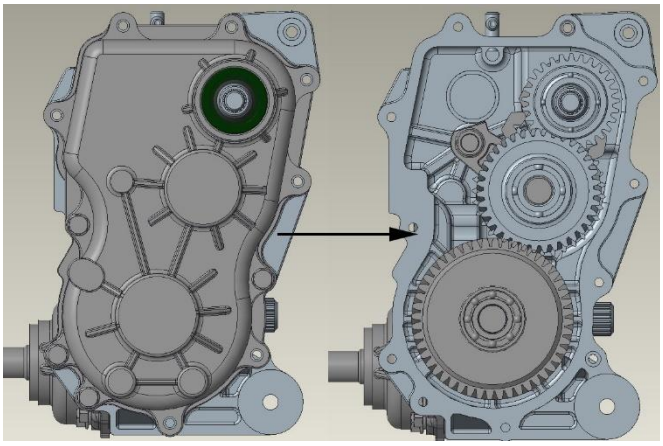

## 6.6 TRANSMISSION DISASSEMBLY

**IMPORTANT:** The gear position indicator must be removed prior to disassembly.

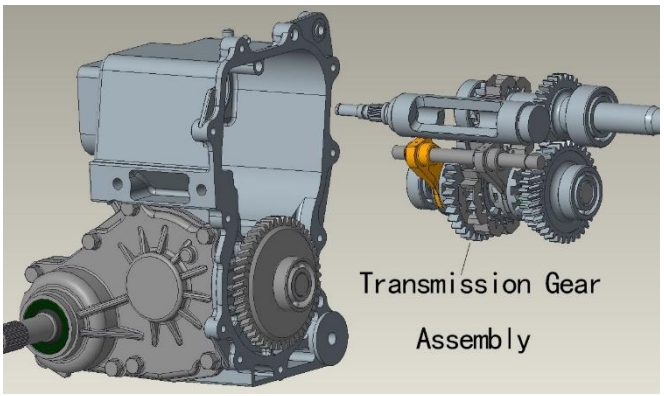
2. Place gears in neutral.
3. Remove gear position indicator, shift cover and shift gears.



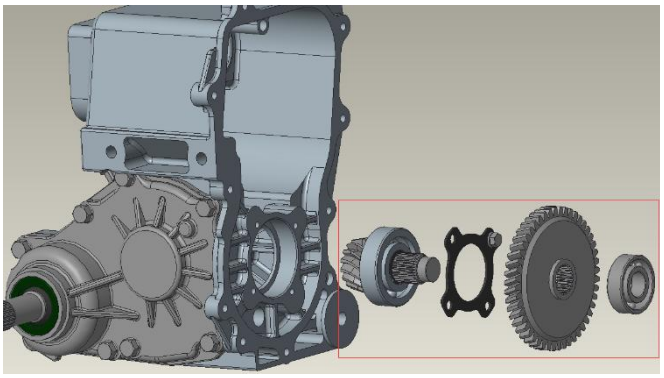

4. Remove the transmission cover bolts.
5. Carefully remove the cover with a soft face hammer tap on the cover bosses.



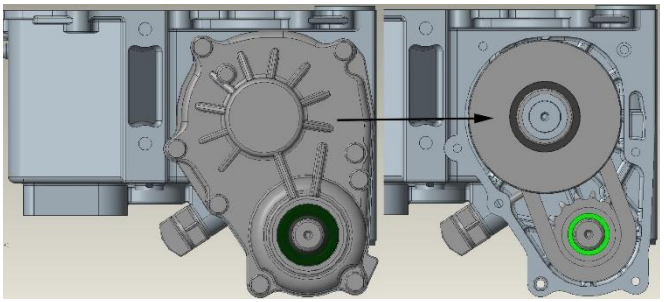
6. Remove transmission gear assembly.




7. Remove bearing, helical gear, pinion shaft retainer plate and pinion shaft.

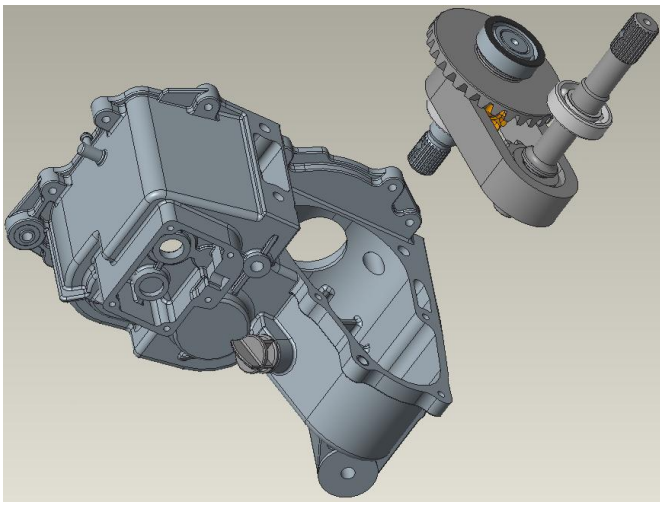


8. Remove front drive output housing cover screws. Carefully remove the cover with a soft face hammer tap on the cover bosses.



9. Remove shafts as an assembly.
10. Clean all components and inspect for wear.
11. Inspect engagement dogs of gears and replace if edges are rounded.
12. Inspect gear teeth for wear, cracks, chips or broken teeth.
13. Remove seals from transmission case.

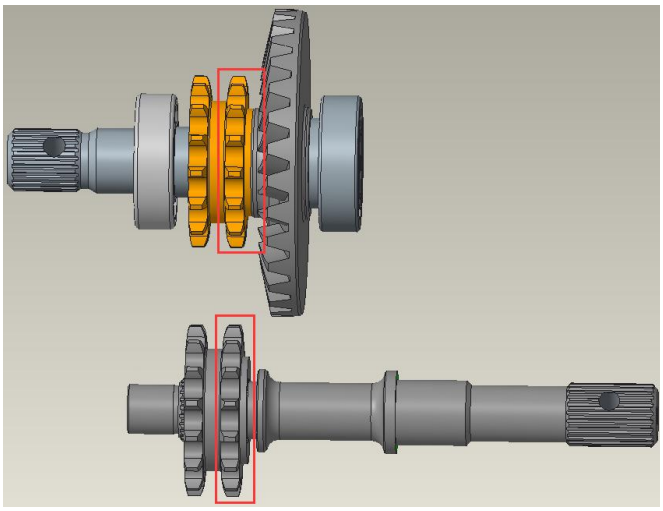
**IMPORTANT:** New seals should be installed after the transmission is completely assembled.



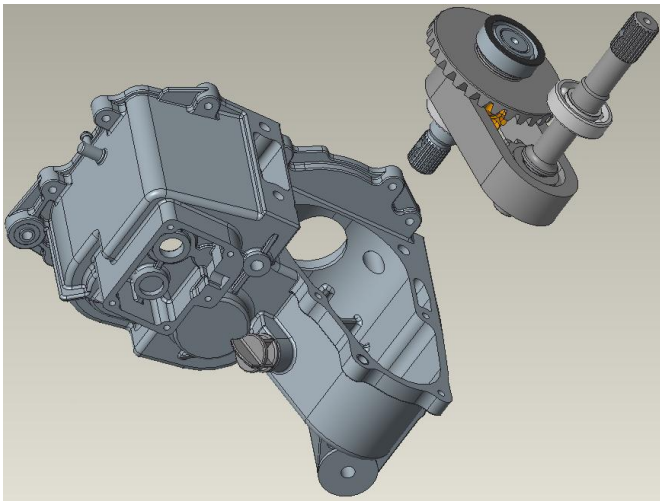
14. Inspect bearings for smooth operation. Check for excessive play between inner and outer race.

## 6.7 TRANSMISSION ASSEMBLY

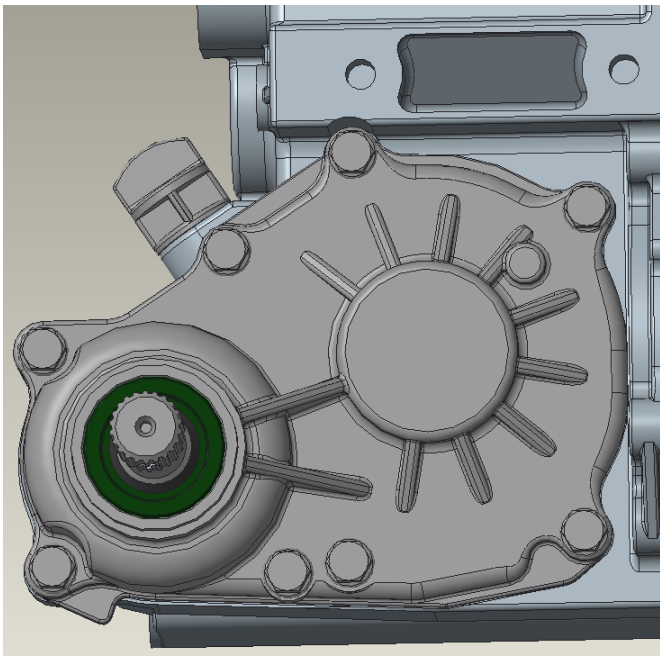
1. Install sprocket on front output shaft and rear output shafts, sprocket step facing right as shown.



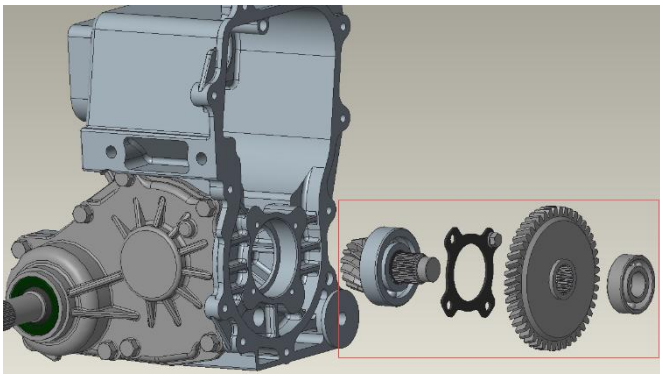
2. Install front and rear output shafts with chain as an assembly.
3. Before installing the cover make sure the sealing surfaces are clean and dry, and shafts are fully seated in the transmission case. Apply silicon glue to mating surfaces.



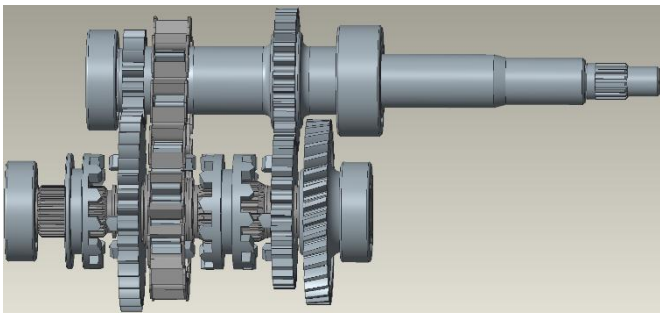
4. Reinstall cover and torque bolts in a criss-cross pattern in 3 steps to 14 ft. lbs. (20 Nm).
5. Install new front and rear output shaft seals.



6. Install pinion shaft, bearing, snap ring.
7. Install retainer plate with flat side toward bearing, apply LoctiteTM 242(Blue) to screw threads and torque screws to 8 ft-lb (12Nm).
8. Install helical gear and bearing.

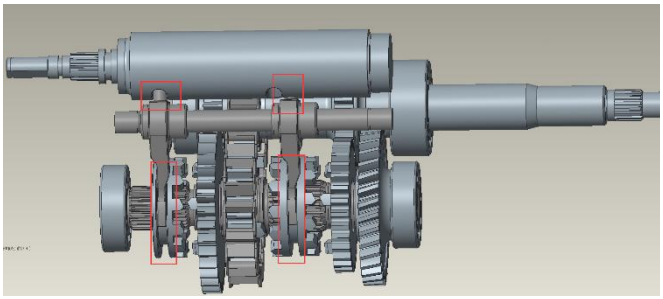


9. Assemble shafts with chain.

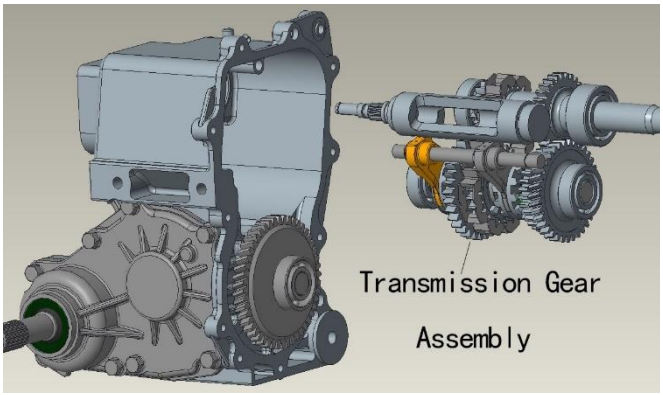


10. Install shift drum, shift fork and guide shaft.

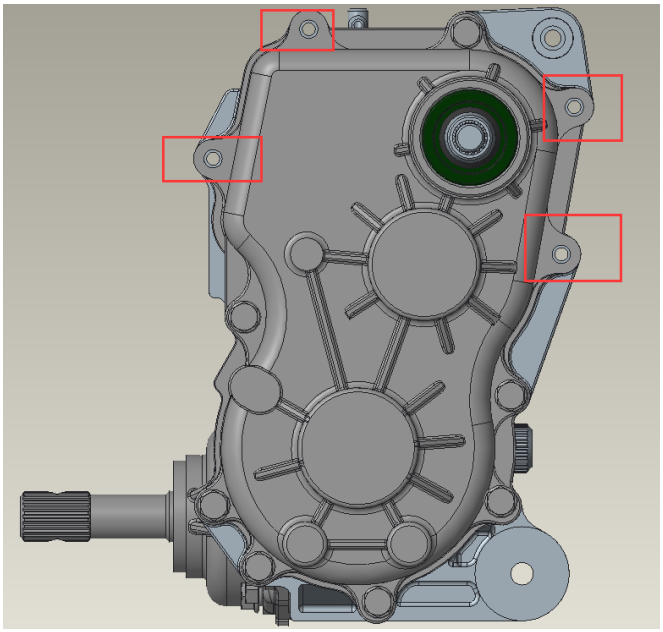
**NOTE:** Make sure shift forks are properly positioned in the slot on switching plate and shift drum.



11. Carefully install transmission gear assembly. Tap with a soft face hammer to seat shaft assemblies.



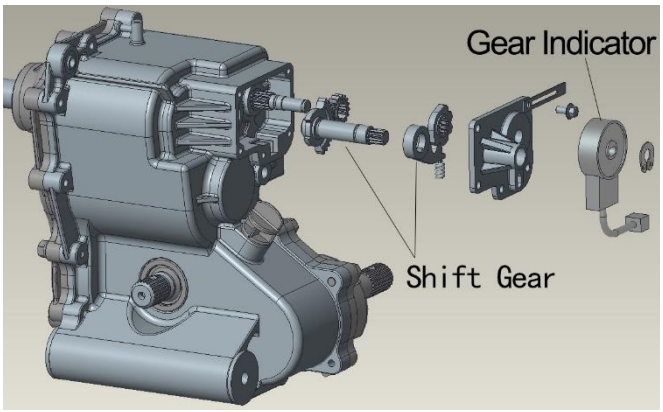
12. Prior to reinstalling the cover make sure the mating cover surfaces are clean and dry, and shafts are fully seated in transmission case. Apply silicon to mating surfaces.
13. Reinstall main cover and torque bolts in a cross pattern in 3 steps to 14 ft-lb (20Nm).



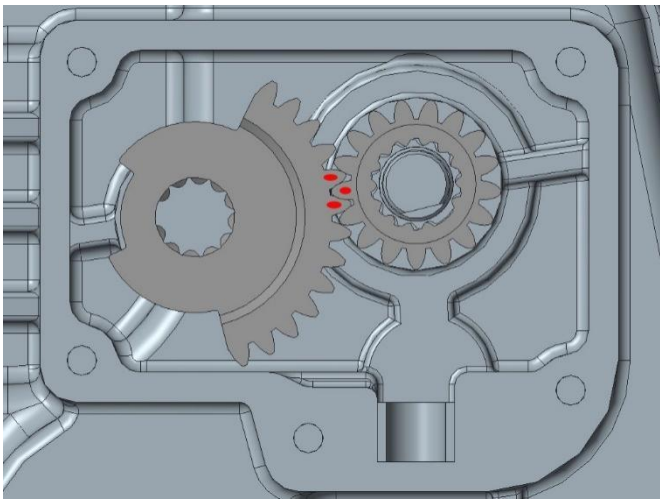
**NOTE:** The positions in the boxes shown in the figure are not fitted with bolts.

14. Install new input shaft seal.

15. Install shift gears, shift cover and gear position indicato.




**NOTE:** When installing the shift gear, the symbols on top should correspond, as shown in the figure.



16. Install drain plug with a new sealing washer. Torque drain plug to 14 ft-lb.(19Nm).
17. Install transmission and add 80W/90 oil in the recommended amount. Refer to Maintenance Chapter.

## 6.8 TROUBLE SHOOTING CHECKLIST

Check the following items when shifting difficulty is encountered

- Idle speed adjustment
- Transmission oil type/quality
- Driven clutch (CVT) deflection
- Loose fasteners on rod ends
- Loose fasteners on gear shift box
- Worn rod ends, clevis pins, or pivot arm bushings
- Linkage rod adjustment and rod end positioning
- Shift selector rail travel
- *Worn, broken or damaged internal transmission components

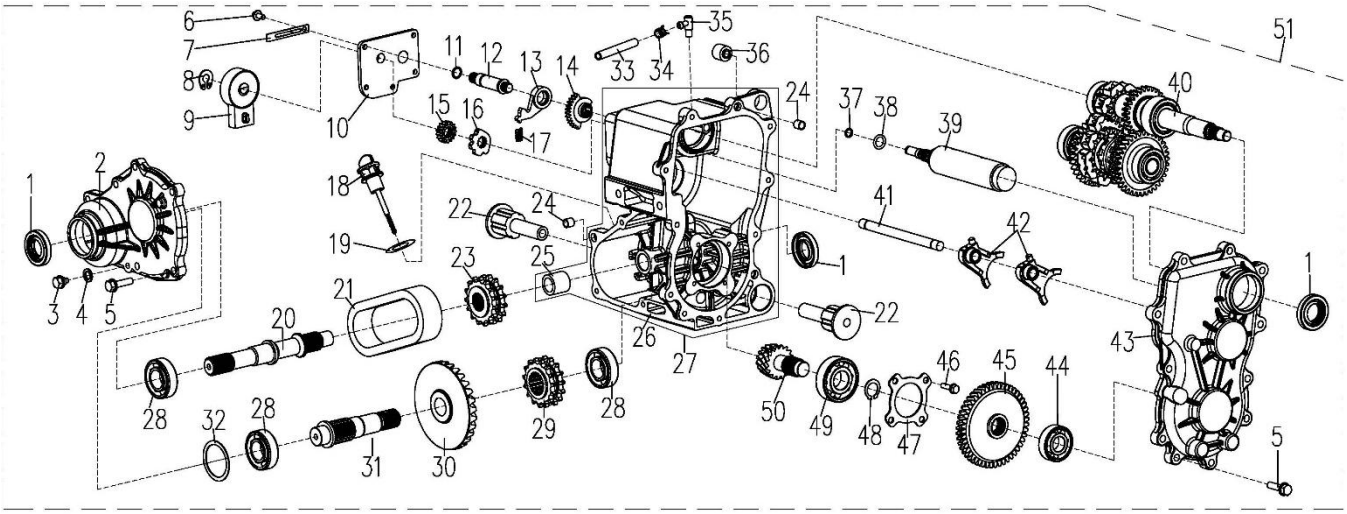
Check the following items when transmission locked

- Gear shifter malfunction (Selector lever end come out from slides notches), engage the Hi and Lo Gear at the same time.

***NOTE** : To determine if shifting difficulty or problem is caused by an internal transmission problem , isolate the transmission by disconnecting linkage rods from transmission bell cranks . Manually select each gear range at the transmission bell crank, and test ride vehicle. If it functions properly, the problem is outside the transmission.

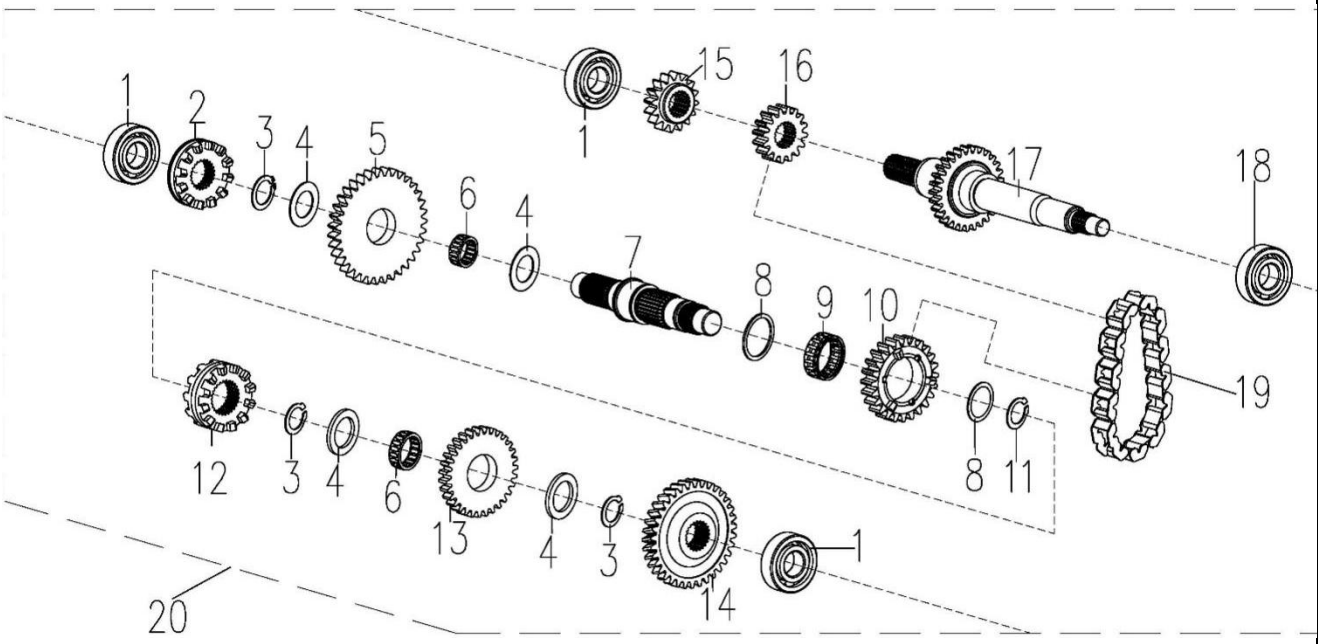
If transmission problem remains, disassemble transmission and inspect all gear dogs for wear (rounding), damage. Inspect all bearings, circlips, thrust washers and shafts for wear.

## TRANSMISSION EXPLODED VIEW




| REF. No. | DESCRIPTION | Q'TY | REF. No. | DESCRIPTION | Q'TY |
|---|---|---|---|---|---|
| **1** | SEAL 25X47X8 | 3 | **27** | Gear Case assembly | 1 |
| **2** | Front Cover | 1 | **28** | BEARING 6205C3 | 3 |
| **3** | DRAIN SCREW | 1 | **29** | Drive Sporcket | 1 |
| **4** | WASHER | 1 | **30** | REAR DRIVE GEAR | 1 |
| **5** | BOLT M8X28 | 14 | **31** | REAR OUTPUT SHAFT | 1 |
| **6** | BOLT M6×16 | 5 | **32** | SHIM 1 | 1 |
| **7** | CABLE CLAMP | 1 | **33** | VENT | 1 |
| **8** | Circlip 11 | 1 | **34** | CLAMP | 1 |
| **9** | Gear Shift Component | 1 | **35** | BEARING | 1 |
| **10** | Shift Cover | 1 | **36** | Rear Flex Sleeve | 1 |
| **11** | O-Ring 13.2X1.8 | 1 | **37** | O-Ring 9.5X1.8 | 1 |
| **12** | Shaft, Gear Shift | 1 | **38** | O-Ring 14.5X3 | 1 |
| **13** | Stop Swing Lever, Gear Shift | 1 | **39** | Drum, Fork Shift | 1 |
| **14** | Drive Gear, Gear Shift | 1 | **40** | Main transmission assembly | 1 |
| **15** | Driven Gear, Gear Shift | 1 | **41** | Guide Shaft, Shift Fork | 1 |
| **16** | Camshaft, Gear Shift | 1 | **42** | Shift Fork | 2 |
| **17** | Spring | 1 | **43** | Left Cover | 1 |
| **18** | DIPSTICK | 1 | **44** | BEARING 6204 | 1 |
| **19** | O RING 18X2.65 | 1 | **45** | GEAR HELICAL 46T | 1 |
| **20** | SHAFT FRONT OUTPUT | 1 | **46** | SCREW M6X10 | 4 |
| **21** | CHAIN | 1 | **47** | BEARING RETAINER PLATE | 1 |
| **22** | ENGINE MOUNT BUSHING | 2 | **48** | SNAP RING | 1 |
| **23** | Driven Sporcket | 1 | **49** | BEARING 6305 | 1 |
| **24** | DOWEL PIN | 4 | **50** | PINION SHAFT 10T | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **25*** | BUSHING | 1 | **51** | TRANSMISSION(4WD) | 1 |
| **26*** | GEAR CASE | 1 | | | |




| REF. No. | DESCRIPTION | Q'TY | REF. No. | DESCRIPTION | Q'TY |
|---|---|---|---|---|---|
| **1** | BEARING 6204 | 3 | **11** | SNAP RING | 1 |
| **2** | ENGAGEMENT | 1 | **12** | DOG GEAR | 1 |
| **3** | SNAP RING | 3 | **13** | GEAR 31T | 1 |
| **4** | THRUST WASHER 1 | 4 | **14** | GEAR, HELICAL 35T | 1 |
| **5** | GEAR 35T | 1 | **15** | GEAR 16T | 1 |
| **6** | NEEDLE BEARING 25 | 2 | **16** | SPROCKET | 1 |
| **7** | SHAFT | 1 | **17** | INPUT SHAFT | 1 |
| **8** | THRUST WASHER 2 | 2 | **18** | BEARING 5205 C3 | 1 |
| **9** | NEEDLE BEARING 25 | 1 | **19** | CHAIN | 1 |
| **10** | SPROCKET 24T | 1 | **20** | Main transmission assembly | 1 |

## NOTES