



Fitting instructions for

**PAJ-2.85M 24T & PAJ-2.85 23T**

**LOW RANGE TRANSFER CASE GEARS**

**TO**

**MITSUBISHI GENERATION ONE TRANSFER CASE**

Thank you for purchasing a product manufactured by Marks 4WD Adaptors. The following instructions are intended as a guide. It is recommended that you purchase a workshop manual to suit your Vehicle and the transmission you are fitting.

These instructions assume the gearbox transfer case has been removed from the vehicle.

1. Remove the transfer case to adaptor attaching bolts (4 each) and nuts (2 each). The bolts on top of the t-case can't be reached with a standard ratchet. A ratchet with a swivel head works well.
2. Pull the transfer case back to separate it from the transmission adaptor.
3. Once it is loose, rotate the transfer case to extract the control lever assembly from the cab access opening and drop the case down.
4. Remove the plug from the right side of the transfer case and take out the selector spring and selector plunger.
5. Remove the control lever housing assembly, cover and gasket.
6. Remove the two 4WD light switches. Remove the two steel balls.
7. Remove the speedometer sleeve clamp. Remove speedometer assembly. **Note:** Take note of the orientation markings on the extension housing in relation to the speedometer drive housing. This location will be needed for reassembly.
8. Note which rear cover attaching bolt has the cable clip installed on it. They are usually located on both the rear cover and the chain cover.
9. Remove the rear cover attaching bolts and the rear cover, then remove the spacer, if fitted along with the gasket.
10. Remove the seal from the rear cover using a seal puller.

11. Remove the pulse generator from the cover.
12. Remove the cover and take out the wave washer, spacer and gasket.
13. Remove the pulse rotor.
14. Remove the side cover and gasket.
15. Remove the roll pin from the H-L shift fork by using a pin punch. Take care not to lose the roll pin once it is driven out.
16. Remove the two seal plugs and take out the two detent springs and balls.
17. Remove the H-L shift rail.
18. Take out the interlock plunger. The plunger is located in the chain cover next to the 2WD 4WD shift rail.
19. Remove the snap ring from behind the rear output shaft bearing.
20. Remove the chain cover bolts. Remove the chain cover and gasket.
21. Remove the oil guide.
22. Remove the countershaft locking plate and pull out the countershaft.
23. Take out the counter gear, two thrust washers and needle bearings and spacer from the side cover hole.
24. Remove the snap ring from the 2WD /4WD shift rail and remove the two spring retainers and spring from the shift rail.
25. Remove the front output shaft, rear output shaft, 2WD/4WD shift fork and chain, together from the transfer case.
26. Tap the roll pin out so that the 2WD/4WD shift rail, distance piece and 2WD/4WD shift lug can be removed.
27. Remove the H-L shift fork and clutch sleeve.
28. Remove the needle bearing from the input gear.
29. Remove the snap ring and then remove the input gear assembly.
30. Remove the old gasket residue from all of the parts, and thoroughly clean all other parts.
31. Remove the input gear oil seal taking care not to damage the baffle plate behind. Remove the baffle plate. Remove the oil seal from the front output shaft portion of the transfer case.

32. Remove the snap ring and remove the bearing from the input gear using a bearing puller.

### **Disassembly of Rear Output Shaft**

1. Remove the snap ring from the rear output shaft front end and remove the Hi-Low clutch hub, thrust washer, low speed gear and needle bearing.
2. Remove the rear output shaft lock nut.
3. Remove the rear bearing from the shaft using a bearing puller.
4. Remove the sprocket spacer and steel ball.
5. Remove the drive sprocket, two needle bearings, sprocket sleeve and steel ball.
6. Remove the 2WD-4WD clutch sleeve, 2WD-4WD clutch, and stop plate. Remove the bearing.

### **Spacers and Snap Rings**

Spacers and snap rings are available in various thicknesses and are used to reduce end float of shafts, gears and bearings. The various size spacers and snap rings are available from Mitsubishi spare parts.

### **Reassembly of Rear Output Shaft**

1. Prior to reassembly, inspect the parts for damage. Replace any worn or damaged parts.
2. Apply gear oil to rotating or sliding parts before reassembly.
3. Tap on the bearing hammering on the inner race.
4. Install the stop plate.
5. Install the 2WD 4WD clutch hub.
6. Install the 2WD 4WD clutch sleeve. Check that the sleeve slides smoothly when installed.
7. Install the steel ball, sprocket sleeve, two needle bearings and the drive sprocket.
8. Install the steel ball and sprocket spacer.
9. Install the bearing on the rear end by tapping on the inner race with a hammer.
10. Install the lock nut and tighten it to 72-94 ft-lbs. Stake the lock nut into the groove with a punch.
11. Install the needle bearing, thrust washer, and the new low speed gear.
12. Install the Hi-Low clutch hub.
13. Install the snap ring into the groove on the front end of the rear output shaft.

### **Transfer Case Reassembly**

1. Replace the front output shaft bearing if required.
2. Fit the baffle plate on the input gear shaft side prior to fitting the oil seal. Press fit the new oil seals in the input gear portion and front output shaft portion of the transfer case. Lubricate the oil seal lips.
3. Remove the welsh plug from the old input gear and fit it to the new input gear. **NOTE:** Use Loctite to retain and seal this part.

**Note: Some vehicles were fitted with a backlash eliminator on the input gear. The backlash eliminator helps prevent low speed gear chatter which is more commonly experienced in vehicles fitted with automatic transmissions. Fitting the backlash eliminator is optional when installing these gears. Install the new backlash eliminator onto the new input gear using the old wave washer and snap ring and fit the spacer.**

4. Press fit the bearing onto the new input gear.
5. Fit the snap ring on the front of the input gear.
6. Slowly insert the input gear assembly in the transfer case, making sure that the shaft does not press the oil seal lip outward.
7. Position the transfer case so the front of the input gear is on the bench and the top of the input gear is facing up.
8. Fit the snap ring.
9. Determine where the Hi-Low shift fork will interfere with the low speed gear. Put the rear output shaft assembly on the bench and slide the Hi-Low selector ring over the Hi-Low hub and onto the low speed gear. Fit the Hi-Low shift fork in the center groove of the selector ring and determine where the shift fork will interfere with the low speed gear.
10. Grind out the section of fork that will interfere using an angle grinder or similar tool. Clean and deburr the fork thoroughly.
11. Remove the snap ring from output shaft in front of the selector hub. Remove the low speed gear, thrust washer, and needle bearing.
12. Install the Hi-Low selector ring and shift fork on the input gear.
13. Insert the needle bearing in the input gear.
14. Through the side cover opening, stack the following components on the input gear in this order from bottom to top: snap ring, selector hub and low speed gear.
15. Insert the thrust washer, then the needle bearing into the low speed gear from the top.
16. Using a screwdriver, line up all the components so the rear output shaft can be slid through them.
17. While holding the shift fork engaged with the selector ring on the rear output shaft, slide output shaft through the case into the center of the stacked components. Manipulate the shaft so the bearing of the shaft begins to enter into the bearing retainer of the case.
18. Engage the chain on the rear output shaft drive gear and position the rest of the chain around the

front output shaft opening. Take the front output shaft and begin inserting the long end into the transfer case between the chain. As you do this, engage the chain on the front output shaft drive gear. Using a plastic hammer, tap the front output shaft rear bearing to align the shaft so that the front bearing will enter the case housing. Tap the rear of the front output shaft to fully seat the bearing into the case.

19. Turn the case so you can work through the side cover opening. Manipulate the components of the rear output shaft so that they begin self-installing on the shaft and so that you can create a 3-4mm gap between the input gear and the Hi-Low selector hub. This will require tapping the rear output shaft to gradually insert the shaft almost completely into its final position. When complete, you should have enough gap to be able to see the snap ring at the bottom of the gap.

20. Using a modified pair of snap ring pliers, fit the snap ring in the groove of the rear output shaft. This may require you to first install the snap ring on the splined end of the shaft. If required, tap the rear of the shaft to drive it in enough to see the groove on the shaft. Then fit the snap ring.

21. With the correct orientation, install the 2WD-4WD shift rail through the shift fork. For ease of identification, the 2WD-4WD shift rail is shorter than the Hi-Low shift rail. When the rail starts to enter the housing opening, install the distance piece, then the 2WD-4WD shift lug. Tap the roll pin into position.

22. Install the two spring retainers and spring over the 2WD-4WD shift rail and fit the snap ring.

23. Install the spacer in the centre and two needle bearings on each side of the spacer into the new counter gear and install the assembly in the transfer case through the side cover opening.

24. Install a thrust washer on each side of the counter gear.

25. Remove the O-ring on the countershaft and replace it with a new one if required.

26. Insert the counter shaft.

This step is tricky. When inserting the countershaft, the O-ring tends to squeeze out of position against a sharp edge of the case. Pressing the countershaft further will cut off that section of the O-ring. Rotating the shaft as you install it tends to make it worse. Install the countershaft without rotating it. As the O-ring moves out of position, press it back in with a narrow tool such as a curved pick as you tap in the countershaft slowly.

27. Fit the locking plate and tighten the locking plate bolt to 11-15 ft-lbs.

28. Install the oil guide.

29. Apply sealer to the gasket.

30. Install the chain cover and gasket, making sure that the oil guide is in the chain cover window. Insert the chain cover bolts, with the cable fastener under the proper bolt. Tighten the chain cover bolts to 22-30 ft-lbs.

31. Fit the snap ring in the groove of the bearing at the rear end of the rear output shaft.

32. Insert the interlock plunger in the hole of the chain cover next to the 2WD-4WD shift rail.

33. With the correct orientation, insert the Hi-Low shift rail through the Hi-Low shift fork. The shift rail cannot be inserted unless the 2WD-4WD shift rail is shifted to the 4WD side.

34. Aligning the roll pin holes of the Hi-Low shift fork and shift rail, drive the roll pin in by using a pin punch. Position the Hi-Low shift fork and 2WD-4WD shift lug. This will allow easier fitment of the selector plunger.

35. Install the detent balls and springs and fit the plugs. Face the smaller end of the detent springs

toward the ball. Tighten the plugs to 22-30 ft-lbs.

36. Apply sealer to a new side cover gasket and install the side cover. Torque side cover bolts to 5-7 ft-lbs.

37. Press fit the seal into the rear cover. Apply a smear of gear oil to the oil seal lips.

38. If a shim spacer was installed behind the output shaft rear bearing reinstall it. Check the end float if its excessive rectify the problem by purchasing new shims from Mitsubishi.

39. Apply sealer to a new rear cover gasket and attach it to the chain cover side.

40. Install the rear cover and tighten the bolts to 11-15 ft-lbs.

41. Install the pulse rotor. Tighten bolt to 25-30 ft-lbs.

42. Install the wave spring spacer on the rear of the bearing.

43. Fit the transfer case to the gearbox and install it in the vehicle.

44. Connect the drive shafts, levers wiring etc.

45. Fill the transfer case with hypoid gear oil API classification GL-4 or higher SAE viscosity No. 80W, 75W-85W until oil runs out of the fill hole (approximately 1.5 to 2ltrs).

46. Fill the gearbox with oil.

47. Tighten the filler plugs.

48. Start the engine and shift through the gears with the transfer case in neutral.

49. Check for oil leaks.

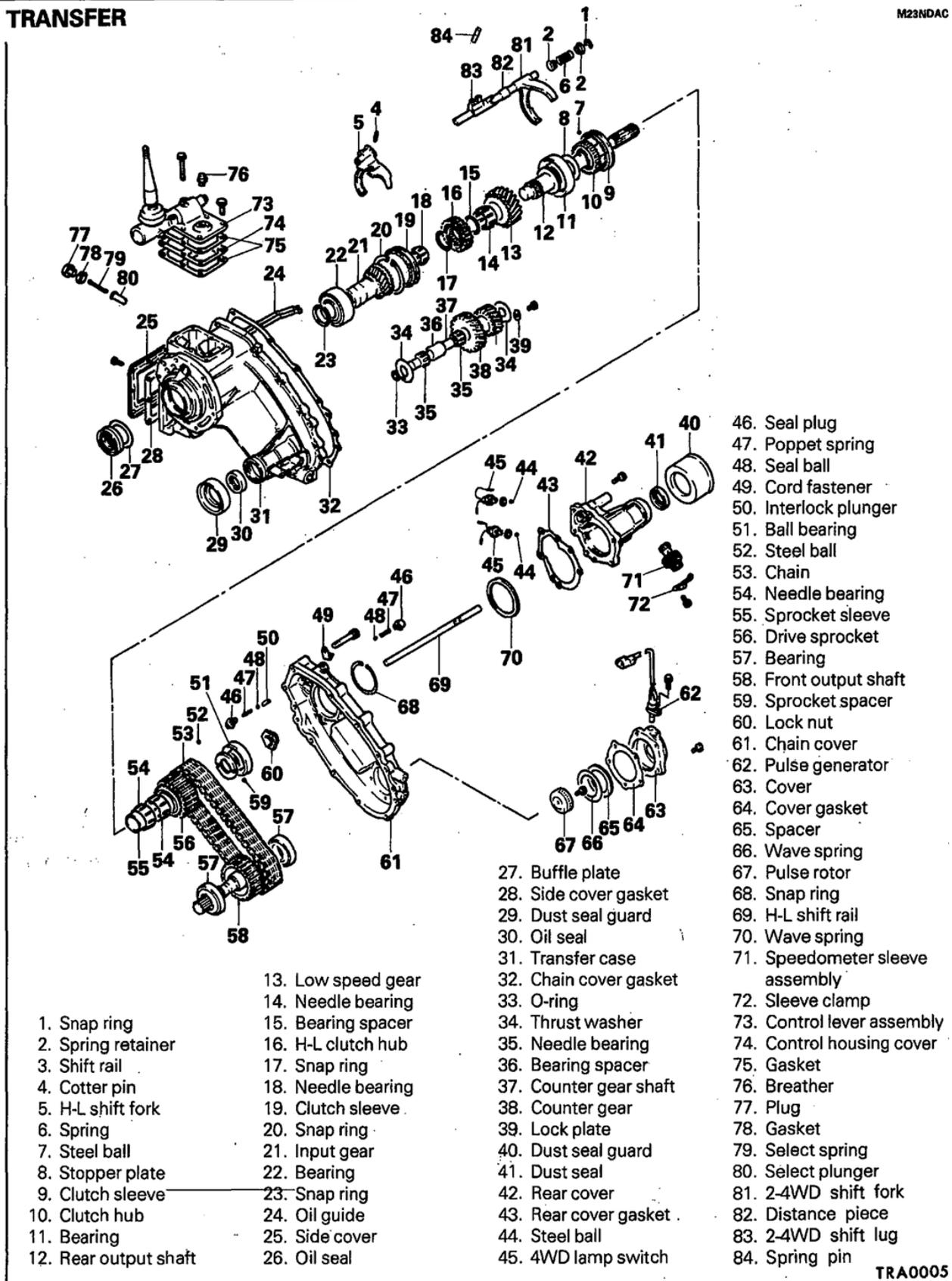
50. Road test the vehicle for 2 to 3 km and then again check for oil leaks.

51. If all is well you are now finished.

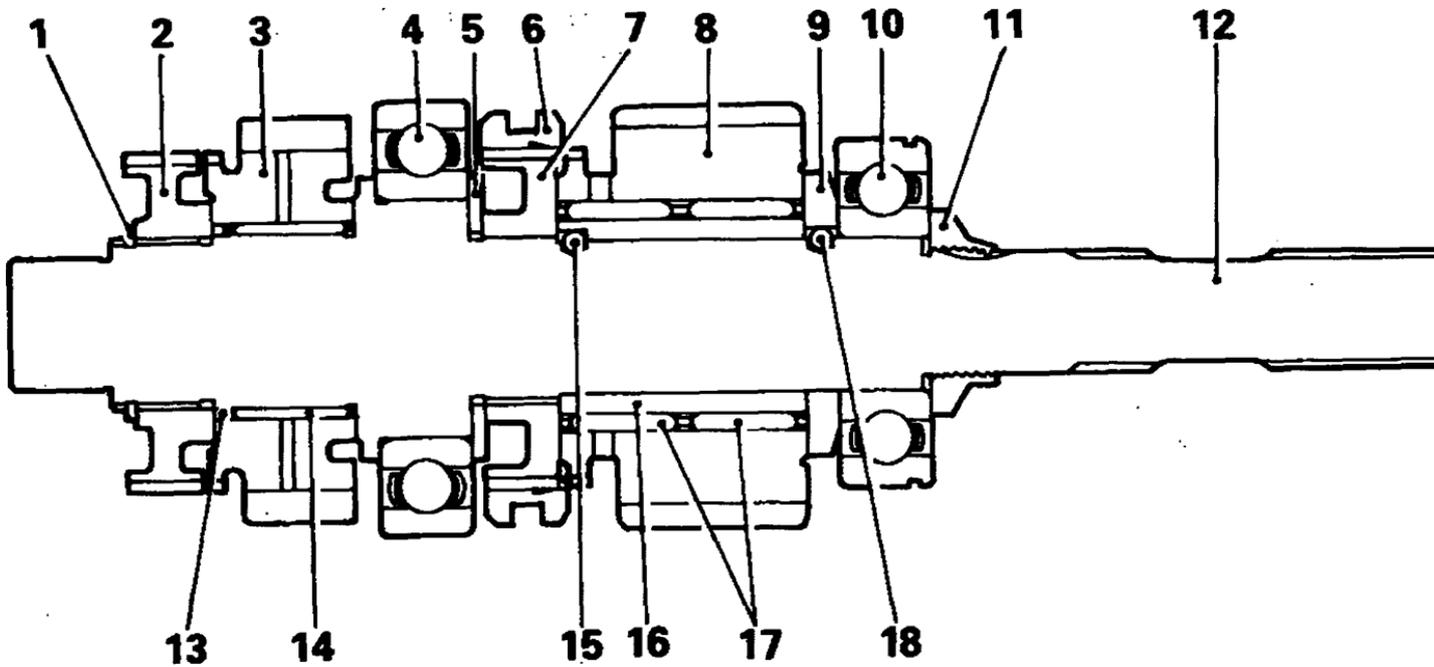
# Main Transfer Case Illustration

## TRANSFER

M23NDAC



TRA0005



- |                        |                       |                     |
|------------------------|-----------------------|---------------------|
| 1. Snap ring           | 7. 2-4WD clutch hub   | 13. Thrust washer   |
| 2. H-L clutch hub      | 8. Drive sprocket     | 14. Needle bearing  |
| 3. Low speed gear      | 9. Sprocket spacer    | 15. Steel ball      |
| 4. Ball bearing        | 10. Ball bearing      | 16. Sprocket spacer |
| 5. Stop plate          | 11. Lock nut          | 17. Needle bearing  |
| 6. 2-4WD clutch sleeve | 12. Rear output shaft | 18. Steel ball      |

The components supplied in the kit are designed for specific type conversions. Modifications to any components without the written consent from Marks 4WD Adaptors will void any possible warranty or return privileges. Should you have any further questions that are not covered in the instruction sheet, please contact our sales department for assistance.

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