



**SILVER SPORT**  
*Transmissions*

# **1997 – 2006 JEEP TJ**

## **TR-4050 5-SPEED INSTALLATION MANUAL**

FOLLOW FACTORY SERVICE MANUAL (FSM) RECOMMENDED SAFETY PRECAUTIONS. TRANSMISSION REMOVAL AND INSTALLATION IS A LABOR INTENSIVE JOB, WHICH CAN RESULT IN SERIOUS INJURY OR DEATH IF CAUTION IS NOT TAKEN. PLEASE BE CAREFUL PERFORMING THIS JOB, OR HAVE A PROFESSIONAL PERFORM THE JOB FOR YOU. REFER TO FSM FOR ADDITIONAL DETAILS OF THE PROCEDURES BELOW, AS REQUIRED.

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Before you start:

Test drive the vehicle, if possible, before you begin. Pay attention to noise and vibration and record your observations. At the end of the installation, perform another test drive to compare.

In addition to this manual, you should have received instructions for checking your bellhousing runout. **The bellhousing runout must be checked (and corrected if necessary) for Tremec's warranty coverage.**

You should also verify the parts you received. Compare the received items to the detailed invoice provided in your shipment.

## **PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION**

In addition to these instructions, you should receive the following instructions based on your order, **if applicable**:

1. All kits – MAA-00101 Inspection and Correction of Bellhousing to Crankshaft Runout
2. MAA-00220 – Hydraulic Kit Instructions.
3. MAA-05000 Clutch Installation instructions.

Your invoice lists the individual hardware packs and where they are used.

**NOTE:** Transmission **must** be test shifted before installation. Due to jostling during shipping, some transmissions will not shift properly when removed from the box. Please make sure that the gear selector will move into each of the (6) possible positions while rotating the input shaft and checking for output shaft rotation. If the input shaft will not turn, slide the clutch disc over the input shaft and jerk the clutch disc left and right to break it free. If this does not correct the issue, call Silver Sport Transmissions' Technical Support at **888-609-0094** for assistance.

**THIS CANNOT BE CORRECTED WITH THE TRANSMISSION INSTALLED IN THE CAR!**  
**TEST SHIFT FIRST!**

### **A. REMOVE EXISTING EQUIPMENT**

1. Disconnect negative (-) battery cable.
2. Remove shifter knob and boot. Place shifter in neutral.
3. Remove console.
4. Remove the lower shift boot and the noise and vibration dampener. If automatic remove the automatic shifter.
5. Remove the transfer case shifter.
6. Remove the shifter tunnel plate.
7. Remove 4 shifter bolts and remove shifter.
8. Raise Jeep securely on lift or jack stands. Make sure you give yourself enough working room under the Jeep.
9. Using an angle finder or digital level, measure the transmission angle, front differential, rear differential, front driveshaft, and rear driveshaft. The most reliable place to get the engine/transmission measurement is from the machined vertical face that the rear seal goes into at the back of the tailhousing. Record this measurement for future reference.

10. Disconnect front driveshaft at transfer case and at front differential and remove from vehicle.
11. Disconnect rear driveshaft from rear differential and remove from vehicle.
12. Secure rear of engine with hydraulic jack. While lowering engine the fan shroud may need to be loosened as fan blades may contact it as the engine is lowered in the back during transmission removal.
13. Support skid plate and remove the transmission mount and the six bolts for skid plate. Remove skid plate and set aside.
14. Remove the transmission isolator.
15. Drain transmission and transfer case.
16. Disconnect transfer case linkage.
17. Remove the 4 bolts for the transfer case linkage support bracket.
18. Remove clutch slave cylinder from bellhousing.
19. Unbolt starter and set aside.
20. Remove 2 bolts for crank sensor from bellhousing.
21. Remove bellhousing dust cover.
22. Remove transfer case lever assembly.
23. Disconnect speedometer wiring from transfer case.
24. Disconnect reverse lamp wiring.
25. Remove exhaust, as required, for working clearance and to permit the engine to drop.
26. Unbolt transfer case from transmission.
27. Secure transmission (jack recommended) and unbolt transmission from engine, then move rearward and remove from vehicle.
28. Remove clutch unit.
29. Inspect flywheel ring gear teeth (no cracks, chips, wear), and friction surface (no cracks). Silver Sport Transmissions strongly suggests removing flywheel and having it resurfaced, then dynamically balanced at a reputable automotive machine shop **unless** the engine was externally balanced with the flywheel installed.
30. Remove pilot bushing using removal tool.

## B-1. VEHICLE PREPARATION – AUTOMATIC to 5 SPD CONVERSION

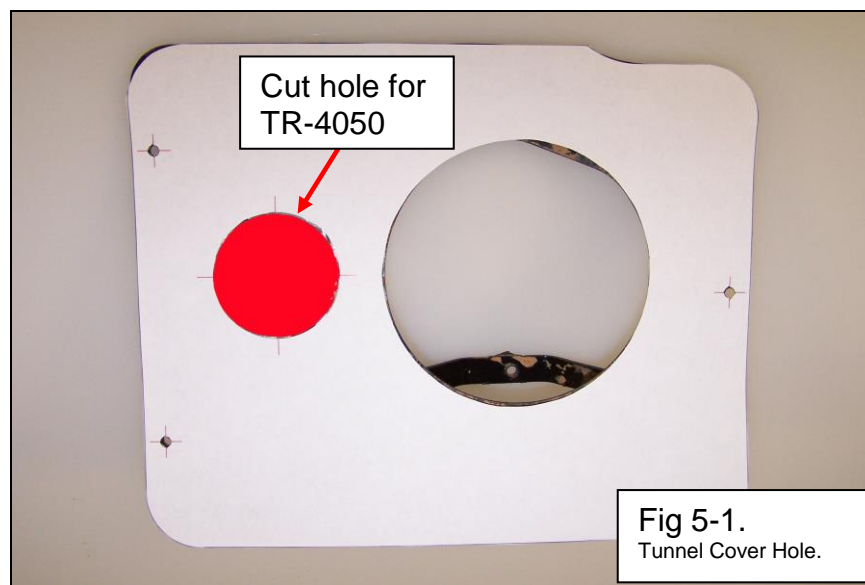
If you are converting from factory auto transmission, the existing tunnel hole can be used for installation of the TR-4050 transmission with the following modifications.

1. Remove the center console.
2. Remove floor shifter and shift cables and disconnect floor shifter wire.
3. Loosen the transfer case linkage mounting flange to separate it from the tunnel cover. Remove floor shifter mounting/tunnel cover plate (11 screws). The cover will not be reused – but save the attachment screws for later.
4. Proceed to Section C. Transmission Installation.

## B-2. VEHICLE PREPARATION – MANUAL to 5 SPD CONVERSION

If you are converting from factory manual transmission, the existing tunnel shifter hole can be used for installation of the TR-4050 transmission with the following modifications.

1. Remove the center console.
2. Loosen the transfer case linkage mounting flange to separate it from the tunnel cover. Remove the tunnel cover with shifter lower body boot. Remove boot from the cover. Save the screws for reuse. Discard the shifter lower body boot.
3. The tunnel cover must be modified for the TR-4050 shifter. Cut out the tunnel cover hole cutting template TMJ-01001 and place over bottom surface of tunnel cover and align with the (3) screw holes as shown. See Fig. 5-1. Mark the new hole area (shown in red) and cut hole in cover.



4. Proceed to Section C. Transmission Installation.

## C. TRANSMISSION INSTALLATION

1. Install new flywheel and flywheel bolts torqued to factory spec. Be sure to tighten bolts in alternating star pattern sequence.
2. Install new pilot bearing assembly using a socket of similar diameter to the bearing and a hard rubber mallet. Make sure the bearing is installed facing the right direction (see photo below). Gently tap bearing fully into crankshaft until bearing face is flush with crankshaft face.

**NOTE:** The pilot bearing is designed to be a slight press fit in the bore, and the pilot bearing hole is not always sized correctly in some crankshafts. Your pilot bearing OD should be between one-half of a thousandth and two thousandths of an inch (0.0005" - 0.002") larger than the ID of the hole in your crankshaft. If outside of this range, a different pilot bearing is required, or your crankshaft or pilot bearing may be modified to fit. Contact your local parts store or machine shop for a suitable replacement or to modify your existing parts.



(TRANSMISSION SIDE SHOWN)

3. Install bellhousing and inspect for proper alignment to crankshaft using dial indicator or test indicator (SST can provide these tools at extra cost). See "Inspection and Correction of Bellhousing To Crankshaft Runout" instructions MAA-00101 provided with your literature package. Make sure to record your runout data in a safe place, as it will be required in the event of a warranty issue. Mark offset dowel pin position if used to correct bellhousing runout, and carefully remove bellhousing.

**IMPORTANT !!! Refer to MAA-00101 Inspection and Correction of Bellhousing to Crankshaft Runout**

It is an absolute **requirement** that **runout** is **checked** and **corrected** **PRIOR** to installing the transmission. The runout specification for all of Silver Sport's kits is **0.005" (5 thousandths of an inch) MAXIMUM**. You **MUST** document the results **PRIOR** to installation of transmission and keep these measurements recorded in a safe place for your transmission warranty. Silver Sport's Customer Service will need this information if a warranty issue arises.

4. Using clutch alignment tool, attach clutch disc and pressure plate to flywheel. Install each bolt with medium thread locking compound only finger tight on the first round, then incrementally tighten each one in a star pattern sequence until all are snug. Torque each one in the same sequence to 35 lb.-ft.

**NOTE: When installing the pressure plate and clutch disc onto the flywheel, NEVER use power or air tools. Using power or air tools will cause the flanges of the pressure plate to distort. This will in turn cause uneven pressure plate finger heights, which will lead to inconsistent or unsuccessful clutch releases. See MAA-05000 clutch installation instructions for more details.**

5. Install bellhousing with inspection cover to engine, while making sure that there are no hoses, cables, or wires caught between the bellhousing and engine block. Torque the fasteners to the specification found in your Factory Service Manual.
6. Refer to Hydraulics manual to measure for proper bearing cushion distance.
7. Reinstall starter.
8. Reinstall crank sensor onto the new bell.
9. Attach hydraulic line to slave cylinder. Test fit in bellhousing, then tighten the line.
10. Install transmission, using caution when inserting the input shaft into the slave cylinder bearing, clutch disc and pilot bearing. Do not allow weight of transmission to rest on assembly until fully engaged (doing so can misalign disc or damage pilot bearing). The tailshaft rotated, as required, to facilitate engagement into clutch disk. **DO NOT** use the transmission to bellhousing bolts to draw the transmission up to the bellhousing!

NOTE: If the transmission stops approximately 1/2 - 3/4 inch away from seating fully against the bellhousing, install and **finger-tighten** bellhousing to transmission bolts (HWG-PACK A). Connect clutch linkage and depress pedal lightly while pushing transmission forward to facilitate alignment of clutch disk to input shaft and pilot bearing. **DO NOT** force the transmission into engagement – damage to the pilot bearing may result. Tighten bellhousing to engine bolts once the transmission is seated against the bellhousing.

**WARNING: THE FOLLOWING CAN CAUSE THE EARS OF THE TRANSMISSION CASE TO BREAK AND IS NOT COVERED UNDER WARRANTY (SEE PHOTO):**

- a) DRAWING THE TRANSMISSION UP TO THE BELLHOUSING BY THE BOLTS.
- b) NOT TORQUING THE TRANSMISSION-TO-BELLHOUSING BOLTS TO 50 lb.-ft.
- c) NOT HAVING THE TRANSMISSION FULLY SEATED AGAINST THE BELL HOUSING WHEN TORQUING THE TRANSMISSION-TO-BELLHOUSING BOLTS.

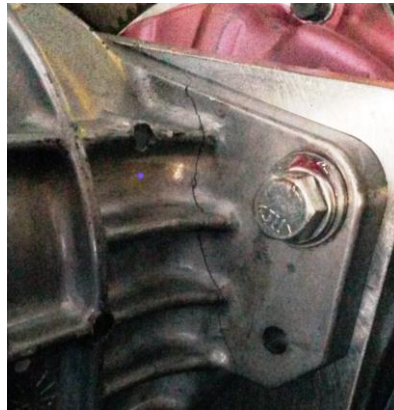


Fig 7-1.

11. Once the transmission is fully seated by hand against the bellhousing, fasten with 7/16" x 1-1/2" bolts and lock washers provided (HWM-PACK A) and torque to 50 lb.-ft.

**Note: The next four steps may be optional depending on your transfer case and build.**

12. Attach Advance Adaptors pn: 716008 isolator mount kit to transmission.

13. Install Advance Adapter 50-7906 slip yoke eliminator kit to your transfer case.

14. Install Advance Adapters 50-8603 transfer case adapter to the transfer case.

**NOTE: Some clearancing may be needed to bolt the NP231 transfer case directly to the TR-4050. Should not be needed if using the transfer case adapter (Figure 7.2).**

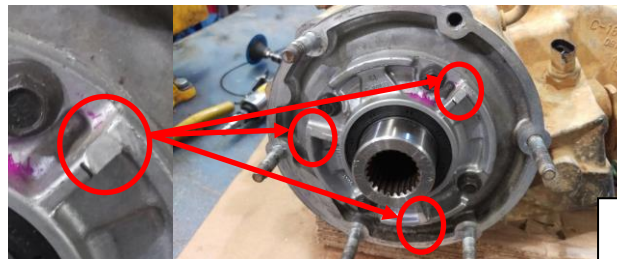


Fig 7-2.

15. Bolt the transfer case to the transmission. Index the transfer case to have clearance for the factory skid plate. The transfer case should be about level horizontally.

16. Install AA 715543-231 cable shifter kit. You will discard the Advance Adaptors transfer case bracket and use TRJ-01009 cable bracket and TRJ-01013 spacer.

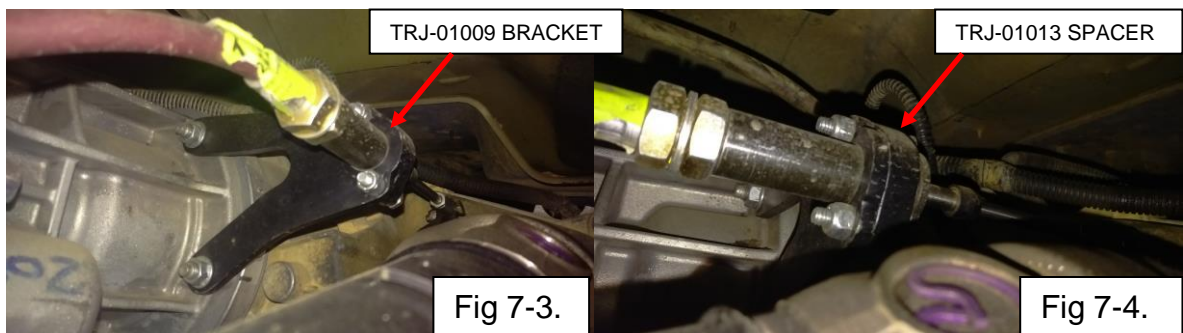


Fig 7-3.

Fig 7-4.

17. The reverse light switch is located on the driver's side of the top plate and is a white-bodied switch. The switch is a normally open, non-directional switch that will complete the lighting circuit when the transmission is in reverse. SST has provided a two-wire harness with your kit that will attach to the 5-speed reverse light switch. It can be spliced into your car's wiring harness in place of your original switch.

REVERSE LIGHT SWITCH



Fig 8-1.

18. Trim the front of the skid plate for transmission clearance using template TMJ-01002.



Fig 8-2.

19. Install skid plate. Attach to frame using original hardware. Confirm no interference to Jeep body or noise will occur as the driveline moves under load.
20. This would also be a good time to take the driveline measurement per the driveline instruction sheet so that the new SST driveshafts can be ordered.
21. Install front and rear driveshafts. Use the factory torque specs: 17 lb-ft for 1310/1330 U-bolts; 24 lb-ft for 1350 U-bolts.
22. Tighten exhaust.

### STEPS 16 THRU 19 ONLY FOR INSTALLATION INTO FACTORY MANUAL TRANS JEEP

16. Apply body sealer LORD® Fuser 803DTM Metal Sealer or equivalent to tunnel hole perimeter to prevent water intrusion. Install modified tunnel cover with original screws.
17. Install new tunnel cover shifter boot TRJ-01001 over TR-4050 shifter stub with notch cut toward the passenger side to clear the console mounting bracket. Position the boot shifter stub hole lip over the rounded section of the shifter stub.
18. Apply body sealer only around the perimeter of the original lower body boot (large) hole in tunnel cover and up to the edge of new shifter boot. Install tunnel cover body metal BMJ-01001 over tunnel cover and new shifter boot. Attach the body metal to tunnel cover with sheet metal screws. See Fig. 9-1. (shown with upper shifter handle installed).
19. Skip to Step 23 to complete installation of upper shift handle.



**STEPS 20 THRU 22 ONLY FOR INSTALLATION INTO FACTORY AUTO TRANS JEEP**

20. Apply body sealer LORD® Fuser 803DTM Metal Sealer or equivalent to tunnel opening perimeter to prevent water intrusion. Install new tunnel cover assembly BMJ-01011 with original screws.
21. Install new tunnel cover shifter boot and trim ring assembly TRJ-01011 over the TR-4050 shifter stub with mounting holes aligned with tunnel cover. Position the boot shifter stub hole lip over the rounded section of the shifter stub.
22. Attach TRJ-01011 to new tunnel cover with sheet metal screws.
23. Bolt on upper shift handle with 3/8"-24 x 1" bolts and lock washers (HWA-Pack L). Use medium strength thread lock compound. Torque to 25 lb.-ft. Confirm shifter motion thru all gears.
24. Reinstall console with upper boot and trim ring.
25. Reconnect the negative (-) battery cable.



## **FINAL INSTALLATION STEPS**

1. If you did not fill the transmission with fluid before installation, remove the fill plug on the passenger's side of the transmission and fill with 3.7 QUARTS, (3.5 liters) of transmission fluid, or until fluid runs out of the fill hole with the vehicle level. Reinstall the fill plug after adding fluid.
2. Start engine and allow engine to idle for a few minutes.
3. Check for leaks while warming up.
4. Slowly rev engine in neutral and listen for any unusual sounds or vibration.
5. Shift through all forward gears with the clutch disengaged (clutch pedal depressed).
6. Test drive at low speeds and low RPM.
7. Gradually increase engine RPM and vehicle speed.
8. Compare this test drive to the pre-installation test drive.
9. Drive conservatively for the first 500-1000 miles for transmission break-in.
10. If you experience vibration at highway speeds, verify that there is no body contact with the new transmission. If there is no contact, it may be necessary to adjust your driveline angle. Much has been written about driveline angles and how to determine them, and there is a lot of great information available online from multiple websites. If you need further help with your driveline angle, call Silver Sport Transmissions' Customer Service at 865-609-8187.

## SPECIFICATIONS AND MAINTENANCE

**TREMEC HighPerformance ManualTransmissionFluid** is endorsed by Tremec for use in all aftermarket high performance Tremec brand manual transmissions. **Dexron III Automatic Transmission Fluid (ATF) and Mobil 1 ATF are the only other fluids approved by Tremec.** The proper fill level is achieved when the oil reaches the fill plug hole. **The use of ANY other fluid will void your warranty.** Silver Sport Transmissions recommends that the fluid be replaced after the first 500-1000 miles of normal driving, and then every 30,000 miles thereafter. It is acceptable to use the less-expensive DEXRON/MERCON fluid for the break-in period and then replace it with the Tremec HP MTF or Mobil 1 ATF.

FLUID CAPACITY: 3.7 QUARTS, (3.5 liters)

DO NOT EXCEED MAXIMUM  
INPUT TORQUE:

- TR-4050: 425 lb.-ft. in 4<sup>th</sup> gear

GEAR RATIOS:

- 1<sup>ST</sup> 6.16
- 2<sup>ND</sup> 3.11
- 3<sup>RD</sup> 1.71
- 4<sup>TH</sup> 1.00
- 5<sup>TH</sup> 0.76
- REV. 6.03

### CONTACT INFORMATION

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TRANSMISSION SYSTEM!**