



SILVER SPORT *Transmissions*

MOPAR E-BODY 1970-1974
MOPAR B-BODY 1971-1974



TKO 5-SPEED MANUAL TO MANUAL

TRANSMISSION CONVERSION 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 FACTORY SERVICE MANUAL (FSM) FOR ADDITIONAL DETAILS OF THE PROCEDURES BELOW, AS REQUIRED.

FOR BOLT TORQUE SPECIFICATIONS, REFER TO YOUR FACTORY SERVICE MANUAL.

The material herein is the intellectual property of Silver Sport Transmissions ("SST") and is to be used by SST customers or their authorized installers for the sole purpose of installing SST-supplied transmissions and related parts. Under no circumstances shall the manual or any portion thereof be copied, duplicated, distributed or incorporated in any written or printed document without the express written approval of Silver Sport Transmissions.

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

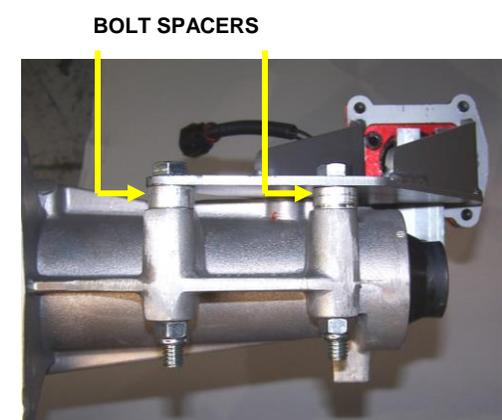
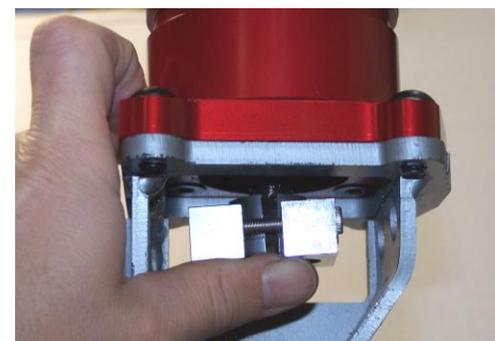
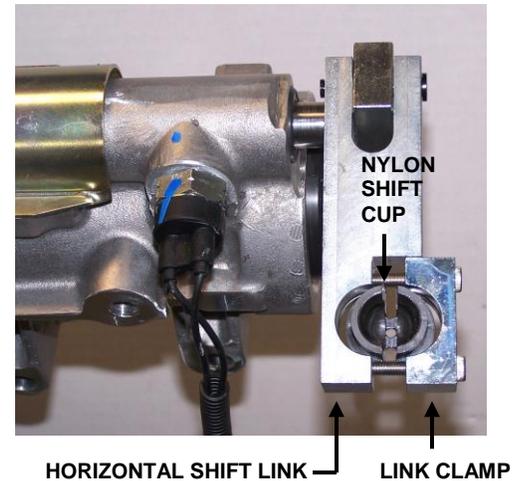
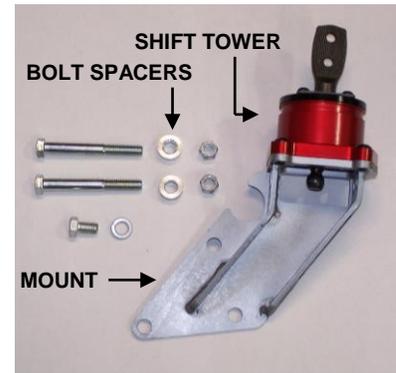
In addition to these instructions, you should receive the following instructions based on your order, **if applicable**:

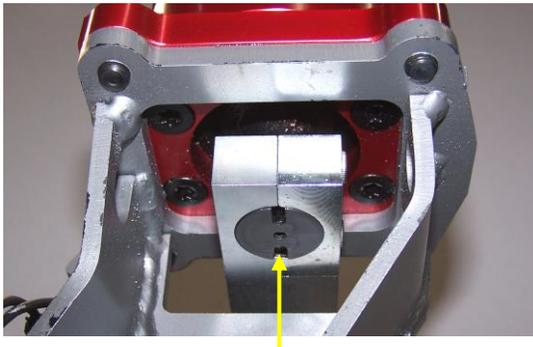
1. All kits – Inspection and Correction of Bellhousing to Crankshaft Runout MAA-00101
2. 4 Speed hump – Floor Hump Sheet Metal Installation Instructions MAM-01401
3. Automatic to Manual conversion, General Guidelines MAA-00201
4. Manual Pedal Installation Instructions MAM-01501
5. Hydraulic Kit Instructions for MOPAR MAM-00201
6. Firewall Stiffener kit – Hydraulic Kit Supplement MAM-00501

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

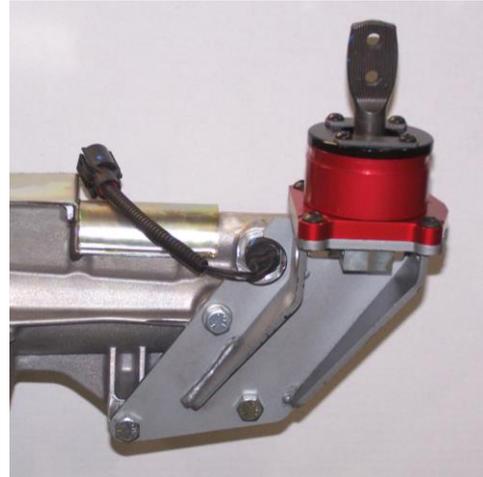
A. INSTALL SHIFT TOWER AND MOUNT

1. Loosen the bolts on the horizontal shift link at the rear of the transmission, and pull the link clamp away from the horizontal shift link. It is not necessary to remove it completely, but you will need a gap of 3/8" or so between the horizontal shift link and the link clamp.
2. Apply a light coat of grease to the inside of the nylon shift cup.
3. Position the nylon shift cup so that the slots in it line up with the split between the horizontal shift link and link clamp, as pictured.
4. Place the shift tower and mount in position on the transmission, and insert the ball at the bottom of the shifter stub into the nylon shift cup. Push up on the nylon shift cup and the horizontal shift link until the nylon shift cup snaps into place around the ball.
5. Install the short bolt and lockwasher loosely through the upper bolt hole in the mount and into the transmission tailhousing.
6. Position one of the bolt spacers between one of the two lower bolt holes in the mount and the tailhousing, and insert one of the long bolts through the mount, bolt spacer, and tailhousing. Repeat with the other long bolt and bolt spacer in the remaining hole.
7. Install locknuts on the two long bolts, and tighten all three mount bolts.
8. Make sure that the slots in the nylon shift cup are still lined up with the split between the horizontal shift link and the link clamp as pictured. Push the nylon shift cup forward so that it is fully seated in the horizontal shift link, and slide the link clamp forward on the bolts so that it meets the horizontal shift link. There should be no gap between the horizontal shift link and the link clamp at this point.
9. Tighten the bolts on the horizontal shift link.
10. Temporarily bolt the shifter handle to the shifter stub. Shift the transmission into each gear and check for interference between the horizontal shift link and the mount. If the horizontal shift link touches the mount in any gear, loosen the three mount bolts and move the mount slightly in order to gain clearance. Re-tighten the mount bolts and check again.





NOTE ORIENTATION OF SLOTS IN NYLON
SHIFT CUP



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 six possible positions while rotating the input shaft and checking for output shaft rotation. The rubber sleeve may need to be removed from the output shaft to allow it to turn more easily (see photo on page 6). 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 at **865-609-8187 extension 118** for further instructions.

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

B. REMOVE EXISTING EQUIPMENT

1. Disconnect negative (-) battery cable.
2. Remove breather assembly and fan shroud.
3. Remove distributor cap if the engine is a small block.
4. Place shifter in neutral. Remove shift boot and lever.
5. Remove console, if equipped.
6. Raise car securely on lift or jack stands. 6 ton stands are usually taller and will give you more room under the car. Eighteen inches or more of working room is recommended.
7. Measure and record the existing stock driveline angles with the weight of the vehicle supported by the rear axle. This information may be helpful later. 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 additional help determining your driveline angle, call Silver Sport Transmissions' Customer Service at 865-609-8187 extension 118.
8. Remove exhaust, as required, for working clearance.
9. Unbolt starter and set aside.
10. Remove clutch linkage at torque arm to clutch fork.
11. Remove bellhousing dust cover.
12. Disconnect driveshaft from differential and remove from car.
13. Remove shifter assembly.
14. Remove speedometer cable.

15. Disconnect reverse lamp wiring.
16. Secure rear of engine with a hydraulic jack.
17. Unbolt transmission isolator from the crossmember and remove crossmember.
18. Secure transmission (jack recommended) and unbolt from bellhousing, then move rearward and remove from vehicle.
19. Remove bellhousing and clutch unit.
20. Remove clutch fork and release bearing from bell housing. Inspect fork and pivot for wear. Contact Silver Sport Transmissions or your local parts supplier if replacements are needed.
21. 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.
22. Remove pilot bushing using removal tool (not supplied).
23. If you did not purchase a new bell housing from Silver Sport with your transmission system, you will need to send your factory bell housing to SST for modification. Write the RMA number you were given on the inside and outside of the bellhousing with a permanent marker. If you do not have an RMA number, please call Silver Sport Transmissions' Customer Service and Technical Support at **865-609-8187 extension 118** to obtain one. Please **DO NOT** send your bellhousing without marking it with an RMA number!

C. SHEET METAL INSTALLATION AND TEST FITMENT

If your car is a factory 4 speed, you will already have the required 4 speed hump and correct console trim. If your car is an automatic, a column shift 3 speed, or the vehicle was previously converted from such to a 4 speed:

- A factory reproduction 4 speed tunnel hump must be installed in the vehicle before proceeding. Contact Silver Sport Transmission to purchase a reproduction four speed tunnel hump if you do not already have one. You may also need to install carpet for a 4 speed car.
- Console-equipped cars will require a four speed top plate, available from many restoration parts suppliers. The automatic console base can be retained.

Due to variation in dimensions on these cars from the factory, some cars will need an additional tunnel modification in order to achieve the correct driveline angle with the SST 5 speed. Unfortunately, there is not any way to predict which cars will require the modification. If you prefer to shorten the test fitment procedure and would rather make the tunnel modification (needed or not), continue to "SHEET METAL INSTALLATION" below. If you would like to avoid modifying your tunnel if possible, skip to "TEST FITMENT" below.

SHEET METAL INSTALLATION

1. Remove the front seats and carpet.
2. Cut out the paper template following the instructions found on the template itself. Place the paper template on the tunnel so that the 4 speed shifter opening on the template matches the opening in the tunnel. Mark the section to be cut out by tracing on the floor inside the area designated on the paper template. Remove the paper template from the floor.
3. Cut out the section that is marked and de-burr the edges.

4. Align the new sheet metal so that the slit is towards the rear of the car. Slightly bend the sheet metal along the slit to form a shallow corner. Align the slit approximately 1 ¾" to the right of the edge of the 4 speed hump seam. Begin attaching the new sheet metal to the floor just left of the slit, working clockwise around the edge with tack welds, rivets or screws. When you are finished, you should have a small peak in the new metal at the inboard end of the slit (see photo below).
5. Complete by permanently attaching new metal by welding or other secure method. Use a seam sealer such as 3M Fast 'n Firm or equivalent between new and old metal. Paint both sides for corrosion protection. If large gaps exist between old and new metal, urethane foam can be used as a filling agent, then trimmed and painted after drying. Continue to "TEST FITMENT" below.



TEST FITMENT

1. Temporarily install bellhousing to engine. No clutch or flywheel is necessary for this step.
2. Lower engine, and install transmission to bellhousing using HWM-PACK A. Support the transmission with a jack.
3. Attach isolator mount to transmission using hardware pack HWM-PACK D.
4. Raise the transmission enough to be able to install the new crossmember under the isolator mount. If you did not install the new sheet metal and the transmission contacts the tunnel before it rises far enough to get the crossmember in place, check for interference on the passenger's side towards the front. If the transmission is contacting the tunnel in the area that is cut out in the photos on the previous page, return to the "SHEET METAL INSTALLATION" section above and install the new sheet metal.
5. Bolt the new crossmember to the front side of the torsion bar support in the car using hardware pack HWM-PACK C.
6. Lower transmission with isolator mount onto the new crossmember.
7. The next step is to determine if your car will need any spacers in order to achieve an acceptable driveline angle. Ensure that the rear suspension is weighted as the car will be when it is being driven. Pull a string from the center of the transmission tailshaft to the center of your differential pinion to simulate the driveshaft, and measure the angle of the string. Also measure the transmission angle and the pinion angle, and calculate your driveline angles to determine if you need to add spacers to raise the rear of the transmission (see step D-12). Acceptable driveline angles are between ½ degree and 4 degrees front and rear on these cars with a SST 5 speed. Your kit includes three spacers that can be installed between the transmission and the isolator mount: two ¼" spacers and one ½" spacer. This makes it possible to raise the transmission anywhere from ¼" to 1" in quarter-inch increments. If your car requires one or more spacers, install the spacer(s) and then measure and recalculate your new driveline angles.

NOTE: Some cars have an undesirable pinion angle from the factory. If you find this to be the case with your vehicle, now is the time to correct it. It may be necessary to add shims or wedges to your rear end in order to achieve an acceptable pinion angle.

8. Once you have achieved front and rear angles within the ½ to 4 degree range, check for interference with floor tunnel, especially on the passenger's side towards the front of the transmission. You will need a minimum of ¼" of clearance between the transmission and the tunnel. An easy way to check areas that you cannot see is to use a length of rubber hose that is 1/4" outside diameter. Loop it over the transmission at the bellhousing and see if you can slide it all the way to the tailhousing. If the transmission has less than ¼" clearance at any point in the tunnel, you may be able to "massage" the tunnel with a hammer and dolly to prevent cutting the tunnel. If you did not install the new sheet metal and you cannot create enough clearance with the transmission at the correct height, the new sheet metal will need to be installed. Return to the "SHEET METAL INSTALLATION" section above. If you have sufficient clearance, continue with the installation.

D. TRANSMISSION INSTALLATION

1. This is a good time to take the driveline measurement, per the driveshaft instruction sheet, as long as the total weight of the car is still supported on the axles to provide an accurate measurement. After the final clearance check and the driveshaft measurements, remove the transmission and bellhousing to complete the remaining work.
2. Reinstall the rubber sleeve on the output shaft if it was removed during test shifting to help prevent fluid leakage during the installation. Fill transmission with 2 quarts, 20 ounces of transmission fluid. **GM Synchronesh (part #88900333; formerly part # 12345349) or Pennzoil (part #3501) is the recommended fluid and will provide the best shift quality. DEXRON/MERCON ATF (non-synthetic) and Mobil 1 ATF are the ONLY other fluids approved by Tremec. 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 GM Synchronesh.
3. Remove your original pilot bushing or bearing (if equipped) using a pilot bearing removal tool. Clean the inside of the **larger** diameter recess in your crankshaft hub. This recess is the pilot bore for the nose of an automatic transmission torque converter. The new custom pilot bearing assembly will fit into this larger recess; **an original equipment style pilot bushing or bearing will not work with the SST 5 speed.** Install the new SST pilot bearing assembly using a bearing driver or a socket of similar diameter to the outer bronze bushing of the new bearing assembly. Make sure the bearing assembly is installed with the needle roller bearing protruding out towards transmission (see photo below). Gently tap bearing fully into crankshaft until the outer bearing face is flush with crankshaft face.



4. 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 Alignment" 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.
5. Using the provided clutch alignment tool, attach clutch disc (1 1/8" x 26 spline) and pressure plate to flywheel. Install each bolt only finger tight on the first round, then incrementally tighten each one in an alternating sequence until all six are snug. Then tighten each one in the same alternating sequence to 35 lb.-ft.

NOTE: If using a diaphragm-style pressure plate, it will be necessary to remove the large over-center spring from the clutch pedal. The over-center spring can hold the clutch disengaged or cause unusual fluctuations at the clutch engagement and release points. If using a three-finger style pressure plate, the over-center spring will be retained.

6. Lower rear of engine as far as possible (required for new transmission installation).
7. With the bellhousing still removed from the engine, install clutch fork and new SST release bearing in the bellhousing if using mechanical clutch linkage. **An original equipment style release bearing will not fit the SST 5 speed.** If you purchased the SST hydraulic system with your transmission, the hydraulic release bearing will already be installed and you will not be using a clutch fork.

NOTE: Make sure you have the correct clutch fork for your car and engine. Check length by fully engaging the fork in the pivot bracket and release bearing, with the pushrod disconnected from the clutch fork. Verify that the pushrod is aligned with the fork eyelet. Silver Sport Transmissions can provide a new clutch fork, pivot, and boot kit if needed.

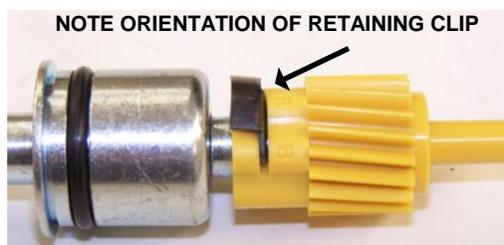
8. Install bellhousing to engine, while making sure that there are no hoses, cables, or wires caught between the bellhousing and engine block. Torque the fasteners to the factory specification.
9. Install transmission, using caution when inserting the input shaft into the clutch disc and pilot bearing. Do not allow weight of transmission to rest on assembly until fully engaged (doing so can misalign disc or damage pilot bearing). The rubber tailshaft sleeve may be temporarily removed and the slip yoke inserted in order to rotate the tailshaft, as required, to facilitate engagement into clutch disk.

NOTE: If the transmission stops approximately 1/2 inch away from seating fully against the bellhousing, install and **finger-tighten** bellhousing to transmission bolts. 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.

10. Once the transmission is fully seated by hand against the bellhousing, fasten with 7/16" x 1 1/2" bolts and washers provided (HWM-PACK A) and torque to 50 lb.-ft.
11. Raise up engine/transmission until transmission contacts the top of the tunnel.
12. Attach the spacer(s) if needed (see step C-7) and the rubber isolator mount to transmission using 1/2"-13 x 1-1/2" bolts and lockwashers (HWM-PACK D).
13. Install new crossmember using 7/16"-14 x 4-1/2" bolts, washers, and nuts provided (HWM-PACK C) to attach to the frame. Lower transmission fully onto crossmember. Place the emergency brake mounting plate over the isolator mount studs (underneath the crossmember, see photo on

page 10) and attach to mount with 3/8" flat washers, lockwashers, and nuts (HWM-PACK B). Confirm no interference to car body or noise will occur as the driveline moves under load. Confirm shifter is centered in tunnel hole.

14. The rubber tailshaft sleeve must be removed at this point (see step D-2 and photo on pg. 7). Install driveshaft by inserting the slip yoke into the rear of the transmission first. Then position the rear U-joint in the differential U-joint saddles. It may be helpful to be able to turn the rear wheels. Install rear straps and torque to factory specs. Make certain all parts are clean and properly assembled.
15. Reinstall bellhousing inspection cover and starter.
16. Connect clutch linkage - do not preload mechanical release bearing. Adjust linkage as required. If using a SST hydraulic system (available separately), follow instructions provided.
17. Wrap tape around speedometer cable ends to prevent damage and keep them clean while routing new speedometer cable to transmission. Remove rubber plug from the speedometer cable port (see photo below) and install new speedometer cable with gear, clip and O-ring (HWA-PACK S) into transmission case. Install cable retainer bolt and tighten bolt to 4 lb.-ft. Connect cable to speedometer.



The TKO 500 and 600 have provision for electronic speedometer output also. The speed sensor is located on the passenger side of the transmission, directly opposite the mechanical speedometer output. The sensor is a standard two wire Ford, sine wave, with 12 pulses per revolution of tailshaft, which equates to roughly 24,000 to 42,000 pulses per mile depending on axle ratio and tire size. For reference, a 26" tire with a 3.73 gear will produce 34,738 pulses per mile. Please refer to your speedometer's installation instructions or contact the speedometer manufacturer for information on connecting and calibrating your electronic speedometer.

SPEEDOMETER CABLE PORT



ELECTRONIC SPEED SENSOR



REVERSE LIGHT SWITCH



NEUTRAL SAFETY SWITCH



18. The reverse light switch is located on the driver's side of the main case, and is a black-bodied switch with two studs. 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 that was mounted to your 4 speed shift linkage.
19. The wire pigtail at the very back of the tailhousing is a neutral safety switch. It is a normally open, non-directional switch that will complete the circuit when the transmission is in neutral. The plastic connector may be removed and the neutral safety switch may be spliced in to your starter circuit between the ignition switch and the starter solenoid if you so choose.

20. Tighten exhaust.
21. Reinstall shift tower that was removed earlier.
22. Bolt on shifter handle with 3/8"x1" bolts and washers provided (HWA-PACK L). Use medium strength threadlock compound. Torque to 25 lb.-ft. Confirm shifter motion through all gears.
23. Install shifter boot and retainer ring, and/or console if equipped.
24. Connect throttle linkage to carburetor.
25. Install fan shroud and breather.
26. 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 2 quarts, 20 ounces of transmission fluid, or until fluid runs out of the fill hole with the vehicle level. **GM Synchronesh (part #12345349; formerly part # 12345349) or Pennzoil (part #3501) is the recommended fluid and will provide the best shift quality. DEXRON/MERCON ATF (non-synthetic) and Mobil 1 ATF are the ONLY other fluids approved by Tremec. 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 GM Synchronesh. Reinstall the fill plug after adding fluid.
2. Start engine and allow it 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. Do not shift into reverse above idle speed, reverse is not synchronized. Shifting into reverse may require shifting into a forward gear first to prevent grinding.
7. Test drive at low speeds and low RPM.
8. Gradually increase engine RPM and vehicle speed.
9. Compare this test drive to the pre-installation test drive.
10. Drive conservatively for the first 500-1000 miles for transmission break-in.
11. If you experience vibration at highway speeds, verify that there is no body contact with the new transmission. If there is no contact, recheck your driveline angles. If you need further help with diagnosing a vibration, call Silver Sport Transmissions' Customer Service at 865-609-8187 extension 118.

SPECIFICATIONS AND MAINTENANCE

GM Synchronesh (part # 88900333; formerly part # 12345349) or Pennzoil (part #3501) is the recommended fluid and will provide the best shift quality. DEXRON/MERCON ATF (non-synthetic) and Mobil 1 ATF are the ONLY other fluids approved by Tremec. 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 GM Synchronesh.

FLUID CAPACITY: 2 QUARTS, 20 OUNCES (U.S.)

DO NOT EXCEED MAXIMUM
INPUT TORQUE:

- TKO 500: 500 ft-lb. in 4th gear
- TKO 600: 600 ft-lb. in 4th gear

GEAR RATIOS:

- TKO 500
 - 1ST 3.27
 - 2ND 1.98
 - 3RD 1.34
 - 4TH 1.00
 - 5TH 0.68

- TKO 600
 - 1ST 2.87
 - 2ND 1.89
 - 3RD 1.28
 - 4TH 1.00
 - 5TH 0.64
(0.82 OPTIONAL)

CONTACT INFORMATION

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SALES EXTENSION: 113

CUSTOMER SERVICE AND TECH SUPPORT
EXTENSION: 118

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**ENJOY YOUR SILVER SPORT
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