



# SILVER SPORT *Transmissions*

## GM G-BODY 1978 - 1988



## TKO 5-SPEED COLUMN SHIFT AUTOMATIC 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 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. Hydraulic throw out bearing kit – MAG-00402 "Hydraulic Kit Instructions For GM"
3. MAG-00414 G-Body Manual Pedal Kit 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. The rubber sleeve may need to be removed from the output shaft to allow it to turn easier (see photo on page 5). 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 **888-609-0094** for instructions.

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

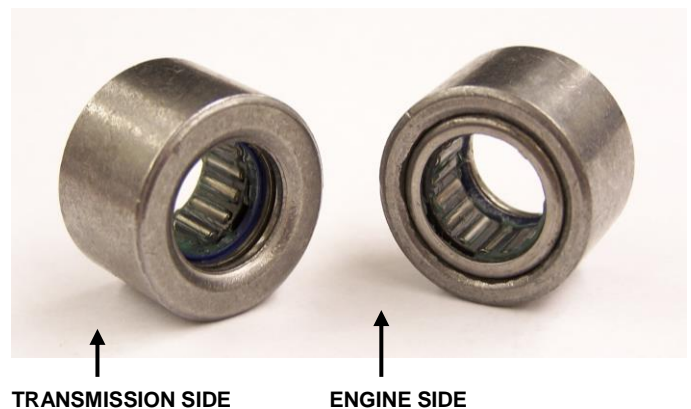
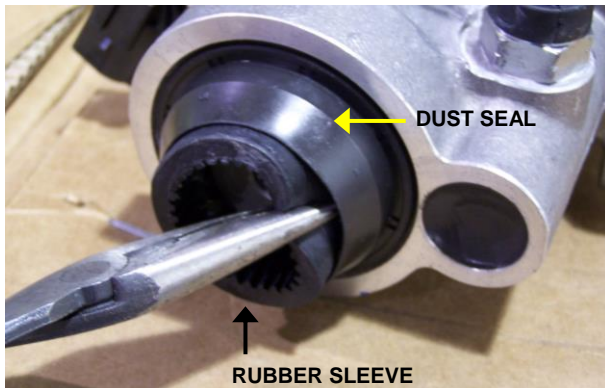
## A. REMOVE EXISTING EQUIPMENT

1. Disconnect negative (-) battery cable.
2. Remove transmission kickdown cable from carburetor and brackets.
3. Disconnect transmission dipstick/fill tube from engine.
4. Remove distributor cap and any other components that may be damaged when the engine/transmission is lowered.
5. Raise car securely on lift or jack stands (Sears 6 ton recommended).
6. Place transmission in neutral.
7. Remove exhaust, as required, for working clearance and to permit the back of the engine to drop for transmission removal and installation.
8. Remove shift linkage from transmission and steering column.
9. Remove car seat(s) from car, sill plates and pull carpet back to expose transmission tunnel.
10. Remove starter and the torque converter dust cover.
11. Remove the driveshaft tunnel strap.
12. Remove transmission cooling lines.
13. Remove driveshaft at rear differential and remove from car.
14. Remove speedometer or cruise control cable from vehicle and disconnect any electrical connections from transmission.
15. Secure rear of engine with hydraulic jack.
16. Secure transmission (jack recommended) to support transmission, in addition to engine support jack.
17. Raise the transmission off the crossmember and remove the isolator and the crossmember.
18. Unbolt torque converter from the flexplate.
19. Unbolt transmission from engine, then move transmission with torque converter unit rearward and remove from vehicle.
20. Unbolt and remove flexplate from engine.
21. Clean the bellhousing mounting surface of the engine, the crankshaft flange, the pilot bore in the crankshaft and the dowel pins.

## B. INSTALL NEW EQUIPMENT

1. 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, or until fluid runs out of the fill hole with the vehicle level. Reinstall the fill plug after adding fluid.
2. Install new pilot bearing assembly using a socket of similar diameter to the bearing and a mallet. Make sure the bearing is installed facing the right direction (see photo on next page). 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.



3. Install new flywheel and torque fasteners (GM SB to 65 ft.-lb., GM BB to 60 ft.-lb.)
4. Check bellhousing face parallelism using height gauge (not supplied; your local machine shop can inspect this). Faces should be within 0.002" parallel. If out of specification, bellhousing should be surfaced (milling) – Silver Sport or your local machine shop can perform this service. If a bellhousing problem exists, i.e., cracks, excessive runout, worn/damaged bore, etc. several styles of new bellhousings are available from Silver Sport.
5. 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" 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.
6. With bell housing still attached to engine, measure from the bell housing rear face (mounting face of the TKO) to the center of the TKO shift lever location (approx. 16.75") and transfer this dimension to underside of the tunnel floor pan. Confirm nothing is in the way inside or under the vehicle when cutting.

7. Measure the shift tower and add 3/8" clearance and transfer to underside of floor pan centered on the shift lever location from step 6. Cut the shifter opening.
8. Temporarily install transmission to confirm shifter opening location and clearance. **See Fig. A.** Remove the transmission and the bell housing.
9. Use the provided 26T alignment tool with large pilot dia end to center the clutch disk when applying torque to the pressure plate bolts. Install the bolts with medium thread locking compound per clutch instructions and tighten in a star pattern, one turn at a time to prevent distorting the pressure plate fingers, until the cover is snug against the flywheel. Torque the bolts to 35 lb.-ft. in a star pattern.

**NOTE: When installing the pressure plate and clutch disk 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.

10. Lower rear of engine as far as possible (required for new transmission installation).

11. With the bellhousing still removed from the engine, install clutch fork and release bearing in the bellhousing if using mechanical clutch linkage. *The tips of the clutch fork and the spring fingers on the rear side of the clutch fork both fit inside the groove on the release bearing.* 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.
12. 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 specification found in your factory service manual.



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

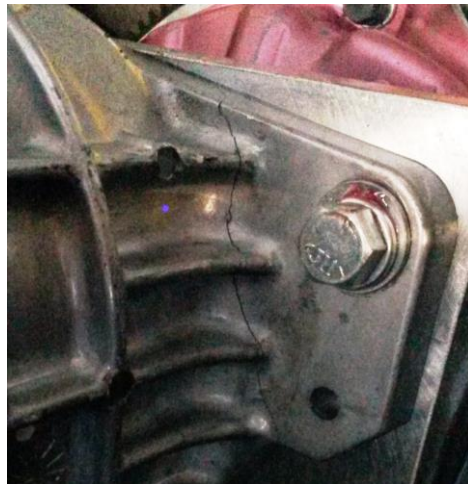
It is an absolute **requirement** that **runout** is **checked** and **corrected** **PRIOR** to installing the transmission. The runout specification for all of Silver Sport's kits is **0.005" (5 thousandths of an inch) MAXIMUM**. You **MUST** document the results **PRIOR** to installation of transmission 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.

13. 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). Due to the tight clearance around the upper right transmission to bellhousing bolt, a socket head bolt can be substituted for the hex head bolt if you do not have a suitable hex head wrench. The rubber sleeve may be temporarily removed from the output shaft, the slip yoke inserted and the output shaft rotated, as required, to facilitate engagement into clutch disk. **DO NOT UNDER ANY CIRCUMSTANCES use the transmission-to-bellhousing bolts to draw/pull the transmission up to the bellhousing!**

**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.

**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.**



14. Once the transmission is fully seated by hand against the bellhousing, fasten with 1/2" x 1 -3/4" bolts and washers provided (HWG-PACK A) and torque to 50 lb.-ft.
15. Raise up engine/transmission until transmission contacts the top of the tunnel.
16. Attach rubber isolator mount to transmission using M10-1.5 x 30 bolts and lock washers (HWG-PACK H).

17. Install new crossmember on frame rails and lower transmission onto crossmember, lining up bolts holes at transmission. Confirm no interference to car body (or noise will occur). Confirm transmission is centered in floor tunnel. Mark and drill new crossmember frame mounting bolt holes and wrench access holes. Permanently mount crossmember to frame. See Fig. B, crossmember installed.
18. The rubber sleeve **MUST** be removed from the output shaft at this point (see step B-1 on pg. 3 and photo on pg. 4). 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 rotate the rear wheels. Install rear straps and torque to factory specs. 17 lb.-ft. for 1310/1330 U-bolts; 24 lb.-ft. for 1350 U-bolts. (excessive torque can distort bearing cap leading to premature failure).  
Double check your assembly.
19. Reinstall the driveshaft tunnel strap using the (4) aluminum spacers (XMG-02301) and HWG PACK G, which consists of (4) washers and (4) longer bolts to space the tunnel strap further away from the body and driveshaft.



Strap with spacers

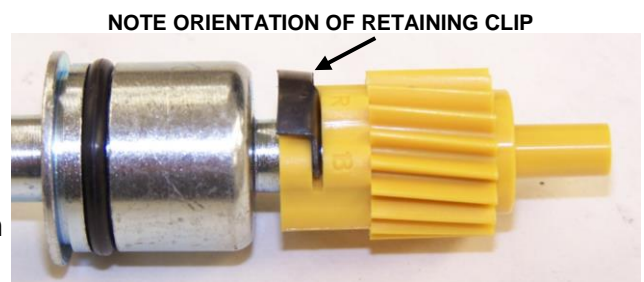
20. Install bellhousing inspection cover and reinstall the starter
21. Remove the existing brake pedal and install new brake and clutch pedal set. See MAG-00414 for detailed instructions.
22. Complete installation of the hydraulic kit by referring to the general instructions in MAG-00402. The G-Body hydraulic kit uses a bracket kit (**see Fig. C**) that attaches to the clutch pedal and accepts the master cylinder push rod. As a result, the G-Body master cylinder attachment differs from the general instructions in the following:
  - a) Thread (2) 5/16" nuts to the bottom of the threaded master cylinder rod.
  - b) Slide the master cylinder rod into the pedal bracket. The link welded to the tubular portion of the bracket needs to be installed so that it is closest to the pedal.

- c) Loosely thread on (2) additional 5/16" nuts on to the end of the master cylinder pushrod. The tubular portion of the bracket should be loose between the two sets of nuts.
- d) A hole is provided in the new clutch pedal for attaching the new bracket and hardware. Attach the bracket to the clutch pedal using the hardware and locknut provided. **See Fig. D**, bracket assembled to clutch pedal.
- e) After the bracket with the master cylinder rod is attached to the clutch pedal and the master cylinder is bolted to the body, adjust the bracket nuts on the push rod up or down to obtain the necessary travel, tighten the adjustment nuts and the backer nuts.
- f) Complete installation and bleeding per the general instructions "Hydraulic Kit Instructions For GM".

**NOTE: Fig. E shows the location of the clutch rod hole. The brake mastercylinder is removed for access.**

23. Tack weld, bolt or otherwise secure the reverse lock-out linkage such that key can be remove from ignition and steering wheel turned at all times.

24. 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 on left side (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.

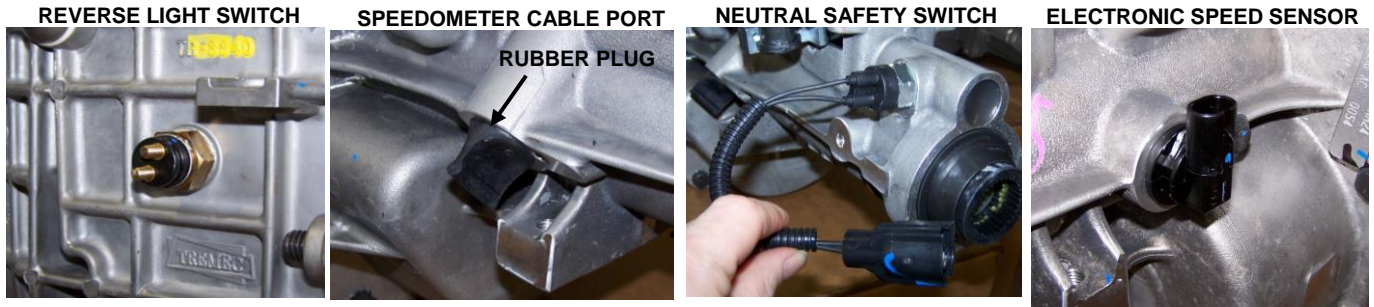


The TKO 500 and 600 have provision for electronic speedometer output also. The speed sensor is located on the passenger side of the transmission, directly opposite the mechanical speedometer output (see photo below). The sensor is a standard (2) wire GM, sine wave output, with 17 pulses per output shaft revolution, which equates to roughly 33,000 to 60,000 pulses per mile depending on axle ratio and tire size. For reference, a 26" tire with a 3.73 gear will produce 49,212 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.

25. The reverse light switch is located on the driver's side of the main case and is a black-bodied switch with (2) studs (see photo below). 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 backup light switch. It can be spliced into your car's original wiring harness.



26. The wire pigtail at the very back of the tail housing is a neutral safety switch (see photo below). 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.



- 27. Install exhaust.
- 28. Reinstall shift tower if it was removed earlier.
- 29. Bolt on shifter handle with 3/8"-24 x 1" bolts and washers provided (HWA-PACK L). Use medium strength thread lock compound. Torque to 25 lb.-ft. Confirm shifter motion through all gears.
- 30. From inside the car, reinstall front carpet and seats.
- 31. Install the new boot, retainer ring, and/or console.



- 32. Reinstall sill plates.
- 33. Connect Tachometer drive cable to distributor (if equipped).
- 34. Connect throttle linkage to carburetor.
- 35. Reinstall the distributor cap and other engine components removed for installation.
- 36. Tighten fan shroud if it was loosened earlier.
- 37. Reconnect the battery negative (-) cable.

## B. 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. 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. 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, 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 ManualTransmission Fluid** is endorsed by Tremec for use in all Tremec brand aftermarket performance transmissions. **GM Synchronesh (part #88900333; formerly part #12345349) or Pennzoil (part #3501), 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 the Tremec HP MTF or GM Synchronesh.

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

DO NOT EXCEED MAXIMUM  
INPUT TORQUE:

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

GEAR RATIOS:

o	TKO 500	
<input type="checkbox"/>	1ST	3.27
<input type="checkbox"/>	2ND	1.98
<input type="checkbox"/>	3RD	1.34
<input type="checkbox"/>	4TH	1.00
<input type="checkbox"/>	5TH	0.68
o	TKO 600	
<input type="checkbox"/>	1ST	2.87
<input type="checkbox"/>	2ND	1.89
<input type="checkbox"/>	3RD	1.28
<input type="checkbox"/>	4TH	1.00
<input type="checkbox"/>	5TH	0.64
		(0.82 OPTIONAL)

### CONTACT INFORMATION

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*SILVER SPORT TRANSMISSIONS IS DEDICATED TO YOUR SATISFACTION AND ENJOYMENT OF THIS PRODUCT. PLEASE SEND US PICTURES OF YOUR CAR ALONG WITH A TESTIMONIAL OF HOW YOU RATE THIS PRODUCT. WE WILL BE POSTING MANY CUSTOMER FEEDBACK LETTERS AND PICTURES ON OUR WEBSITE AND BROCHURES.*

**ENJOY YOUR SILVER SPORT  
TRANSMISSION SYSTEM!**

Figure A



Figure B



Figure C



Figure D



Figure E



Figure F

