



# SILVER SPORT *Transmissions*

## **NOVA – VENTURA - OMEGA - APOLLO 1968-1974**



## **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 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 – MAA-00101 Inspection and Correction of Bellhousing to Crankshaft Runout
2. Hydraulic throw out bearing kit – MAG-00402 Hydraulic Kit Instructions for GM

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' 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, if equipped.
4. Raise car securely on lift or jack stands. 6 ton stands are taller and will give you more working room under the car.
5. Remove clutch linkage at torque arm to clutch fork.
6. Unbolt starter and set aside.
7. Remove bellhousing dust cover.
8. Remove driveshaft at rear differential and remove from car.
9. Remove shift lever and shifter assembly.
10. Remove breather assembly and distributor cap from engine. Big block vehicles may need the fan shroud loosened as fan blades may contact it as the engine is lowered in the back during transmission removal.
11. Disconnect throttle linkage.
12. Remove speedometer cable.
13. Disconnect reverse lamp wiring.
14. Secure rear of engine with hydraulic jack.
15. Remove exhaust, as required, for working clearance and to permit the engine to drop.
16. Unbolt transmission isolator from the crossmember and remove crossmember.
17. Secure transmission (jack recommended) and unbolt from bellhousing, then move rearward and remove from vehicle.
18. Remove bellhousing and clutch unit.
19. Remove clutch fork and release bearing from bellhousing. Inspect release bearing, fork, and pivot ball stud for wear. Contact Silver Sport Transmissions or your local parts supplier if replacements are needed.
20. 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.
21. Remove pilot bushing using removal tool.

## B. INSTALL NEW EQUIPMENT

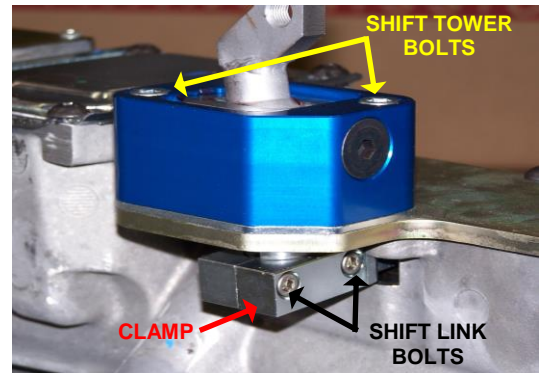
1. Using the paper template provided, make necessary cut in the floor tunnel from inside the car based on the following conditions:
  - a. Non-console cars – The non-console car uses the full cutting template (approx. 10-3/4" long) as a cut pattern from the existing shifter hole to the stiffener rib located at the tunnel/firewall intersection. The template should be positioned against the rib and lines scribed for cutting. The rib is not removed. Some variation at the factory shift hole may exist due to factory tolerances.
  - b. Console cars – The console car will use the template shortened by the customer to the cut line (approx 9" long). The template will be positioned against the stiffener rib, as for non-console cars above. The rear of the template will sit on the front sloped part of the factory 4 speed hump such that when the cut is made, you will be cutting out a small section of the sloped portion of the four speed hump.

2. Install the new sheet metal as follows:

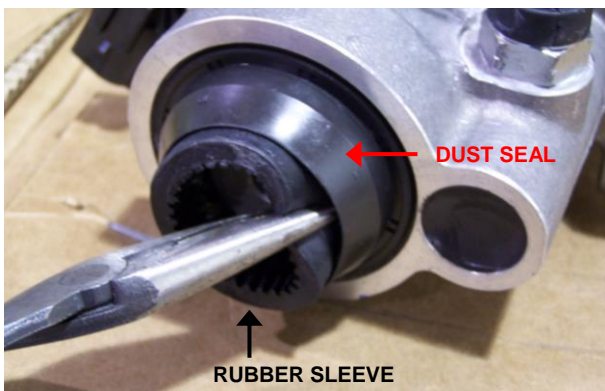
- a. Non-console cars – The entire piece of sheet metal will be used to overlap and fill the cutout portion of the tunnel. The metal is bent with a shallow bend parallel to the centerline and in line with the two slits at the front edge. The metal is placed over the opening with the crown of the stiffener rib located approximately 1” back from the front edge under the metal and the back edge of the sheet metal closely matching the front of the shifter hole. Some variation can occur due to factory tolerance. The metal needs to be placed so the shift boot and trim ring can be reinstalled as original. Install the sheet metal by welding or other method of permanent attachment, seam seal and paint.
- b. Console cars – The sheet metal is installed, as above for the non-console vehicle, except the rear portion of the sheet metal is cut out approximately as indicated to fit around the front of the four speed hump, above the cut. The initial cut should be short to allow for fit up. See photos below.



3. Remove the (2) small socket-head bolts from the horizontal shift link underneath the shifter, then remove the clamp from the link (see photo on right). Take care not to lose or damage the nylon shifter cup that is retained by the clamp. Next, remove the two large socket head bolts from the top of the transmission shift tower and lift up on the tower to remove it. Note the orientation of the shift tower (for reference when reassembling).



4. 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.
5. 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 holes in some crankshafts are not sized consistently. The pilot bearing is designed to be a slight press fit in the bore. 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.



6. 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, and carefully remove bellhousing.
7. To locate the shifter hole for automatic or column shift vehicles, use the following procedure:
  - a) Temporarily install the bellhousing to the engine and raise the engine to approximate final elevation.
  - b) Measure from the bell housing mounting face of the transmission to the center of the shift lever location, including the offset from the centerline.

- c) Transfer this dimension to the underside of the floor pan by measuring from the transmission mounting face of bellhousing down the underside of the floor pan and mark the shift lever location, including offset.
- d) Measure the square section of the shift tower and transfer this to the underside of the floor pan.
- e) Drill pilot holes and cut out the required area. It would be a good idea to temporarily install the transmission to verify the accuracy of the work.

**NOTE: Confirm nothing is in the way inside or under the vehicle during cutting.**

8. 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.**

9. Lower rear of engine (required for new transmission installation).

10. 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 same 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.



11. 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.

1. 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 tailshaft sleeve may be temporarily removed and 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 - 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.

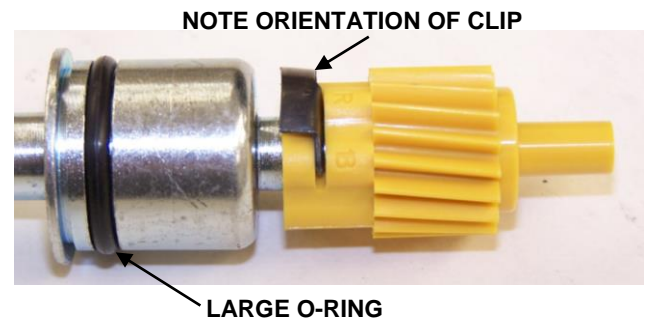
**WARNING: THE FOLLOWING CAN CAUSE THE EARS OF THE TRANSMISSION CASE TO BREAK AND IS NOT COVERED UNDER WARRANTY (SEE PHOTO):**

- 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 BELLHOUSING WHEN TORQUING THE TRANSMISSION-TO-BELLHOUSING BOLTS.



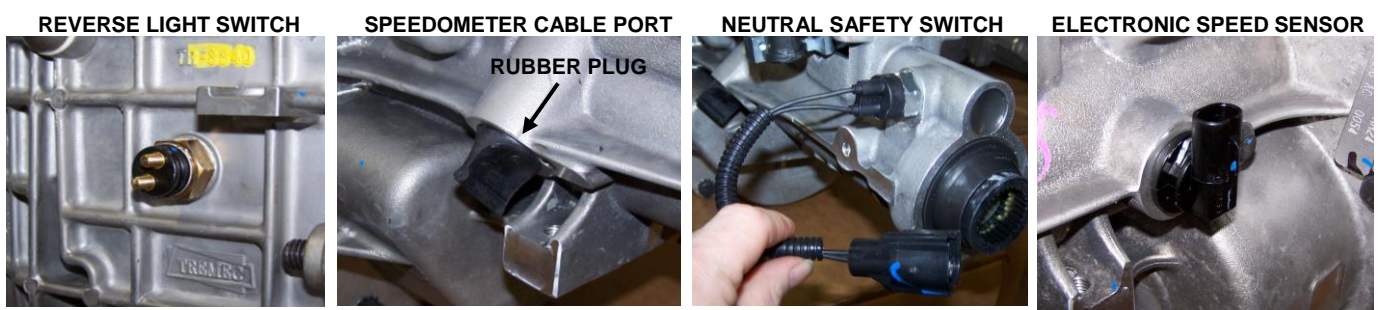
12. Once the transmission is fully seated by hand against the bellhousing, fasten with 1/2" x 1-3/4" bolts and washers provided (HWG-PACK A) and torque to 50 lb.-ft.
13. Raise up the engine/transmission until transmission contacts the top of the tunnel.
14. Attach rubber isolator mount to transmission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

15. Install new crossmember using your original hardware to attach to the frame. Lower transmission fully onto crossmember, and attach to mount with hardware pack HWG-PACK B. Confirm no interference to car body or noise will occur as the driveline moves under load. Confirm transmission is centered in floor tunnel.
16. The rubber tailshaft sleeve **MUST** be removed at this point (see step B-4 and photo on pg. 5). 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. 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.
17. Reinstall bellhousing inspection cover and starter.
18. Connect clutch linkage - do not preload mechanical release bearing. Adjust linkage as required, following the method laid out in your Factory Service Manual. If using a SST hydraulic system (available separately), follow instructions provided.
19. 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 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.



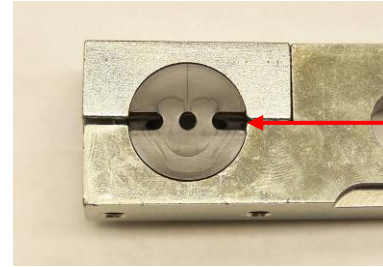
The TKO 500 and 600 have provision for electronic speedometer output also. The speed sensor is located on the passenger side of the transmission, directly opposite the mechanical speedometer output. The sensor is a standard two wire GM, sine wave, with 17 pulses per revolution of output shaft, which 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 give 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.

20. The reverse light switch is located on the driver's side of the main case and is a black-bodied switch with (2) 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. 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.





21. Tighten exhaust.
22. Reinstall shift tower, making sure it is oriented the same direction as it was originally. Make sure the nylon shifter cup is positioned in the horizontal link so that the splits in the cup are aligned parallel to the clamp.
23. 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.
24. Install shifter dust cover using (2) small screws provided and seal around the cover and the vertical seams with Permatex Ultra Grey Sealant or equivalent.
25. Install shifter boot and retainer ring, and/or console if so equipped.
26. Connect tachometer drive cable to distributor (if equipped).
27. Connect throttle linkage to carburetor.
28. Install distributor cap and breather.
29. Reconnect the negative (-) battery cable.



NYLON  
SHIFTER CUP  
ORIENTATION

## **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 888-609-0094.

## 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 4<sup>th</sup> gear
- TKO 600: 600 lb.-ft. in 4<sup>th</sup> gear

GEAR RATIOS:

- TKO 500
  - 1<sup>ST</sup> 3.27
  - 2<sup>ND</sup> 1.98
  - 3<sup>RD</sup> 1.34
  - 4<sup>TH</sup> 1.00
  - 5<sup>TH</sup> 0.68
- TKO 600
  - 1<sup>ST</sup> 2.87
  - 2<sup>ND</sup> 1.89
  - 3<sup>RD</sup> 1.28
  - 4<sup>TH</sup> 1.00
  - 5<sup>TH</sup> 0.64  
(0.82 OPTIONAL)

### CONTACT INFORMATION

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SALES EXTENSION: 113

CUSTOMER SERVICE AND TECH SUPPORT  
EXTENSION: 118

[WWW.SHIFTSST.COM](http://WWW.SHIFTSST.COM)

*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!**