SILVER SPORT
Transmissions

CORVETTE
1968 – 1982

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.

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 4). 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

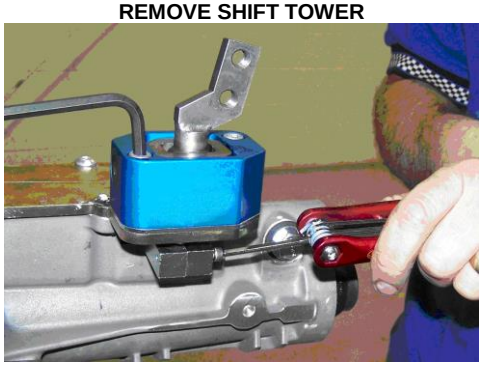
1. Disconnect negative (-) battery cable.
2. Remove LH & RH interior side panels from console.
3. Remove console top plate. Disconnect power window switch connector, if equipped (note orientation of connection). Remove power window switch heat shield cup and switch, if equipped.
4. Remove shifter knob & boot. Place shifter in neutral.
5. Remove breather assembly & ignition cluster cover/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.
6. Disconnect mechanical tachometer drive from distributor, if equipped.
7. Disconnect throttle linkage at carburetor.
8. Raise car securely on lift or jack stands. 6 ton jack stands will allow you to raise the car higher than 3 ton jack stands will, which makes the installation easier.
9. Loosen exhaust pipes at manifold and remove as required for working clearance and to allow the engine to drop. If using under-car exhaust, disconnect from the support bracket at the transmission crossmember. Vehicles with under car exhaust will need SST's optional exhaust support bracket (part #XMG-02502).
10. Unbolt starter and set aside.
11. Remove linkage pin & clip at torque arm (z-bar) to clutch fork.
12. Remove bellhousing dust cover.
13. Remove driveshaft at front yoke, then at rear differential.
14. Remove shifter assembly.
15. Remove speedometer cable.
16. Disconnect reverse lamp wiring.
17. Secure rear of engine with hydraulic jack.
18. Remove transmission mount bracket.
19. Secure transmission (jack recommended) and unbolt from bellhousing, then move rearward in vehicle, tilt transmission nose downward, and remove from vehicle.
20. Remove bellhousing and clutch unit.
21. Remove factory tunnel insulation, if equipped.
22. Remove clutch fork and release bearing from bellhousing. Inspect release bearing, fork, and pivot ball stud for wear. Replace if needed.
23. Inspect flywheel ring gear teeth (no cracks, chips, wear), and friction surface (no cracks, grooves, or hot spots). 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.
24. Remove pilot bushing using removal tool (not supplied).

B. INSTALL NEW EQUIPMENT

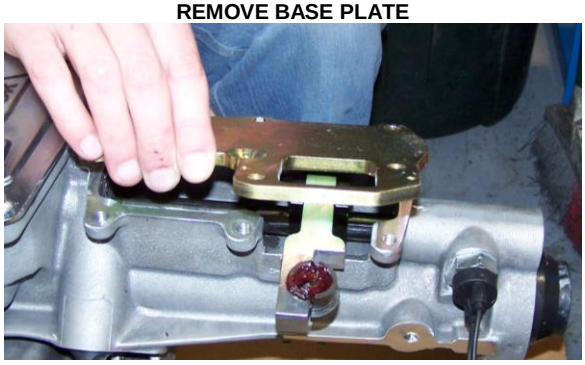
The SST 5-speed is designed so that the transmission can **possibly** be installed without removing the engine from the car. The instructions in the next section outline the required steps (5 thru 17).
Be aware that due to original factory build variations in addition to body movement over time, dimensional changes may have occurred and might prevent a successful installation. For these reasons, removing the engine and transmission as a unit from the vehicle and then reinstalling them as a unit is the only method "guaranteed" to be trouble-free.

1. Set transmission shift lever in reverse gear. Remove two small socket-head bolts from the horizontal shift link under the tower and remove clamp from horizontal shift link. Remove shift tower socket head bolts and remove shift tower (noting or marking orientation for reassembly) completely from the shift tower base plate and horizontal shift link. Remove shift tower baseplate shipping bolts and remove baseplate. These parts will be reinstalled.

REMOVE SHIFT TOWER

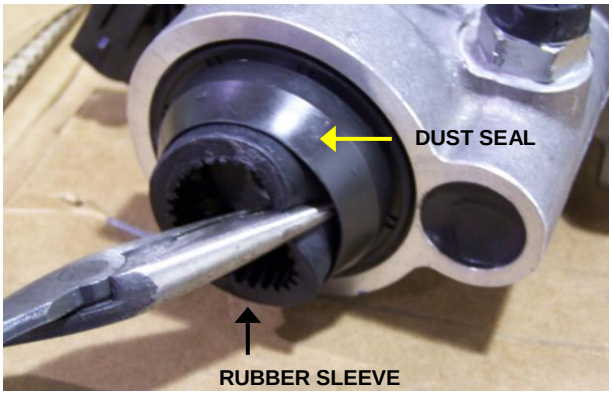


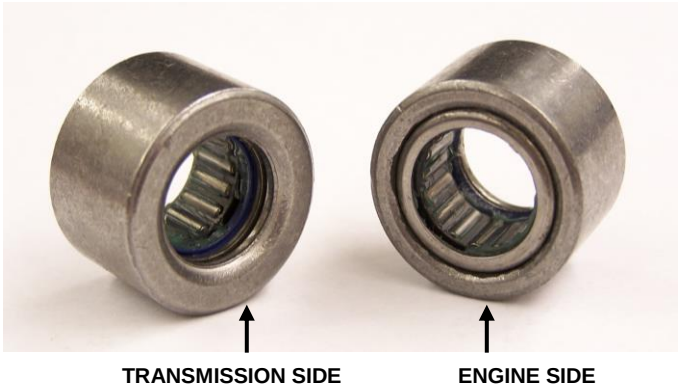
REMOVE BASE PLATE



2. Confirm existence of rubber sleeve on tailshaft. Reinstalling the rubber sleeve removed during test shifting will prevent oil leakage during 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.

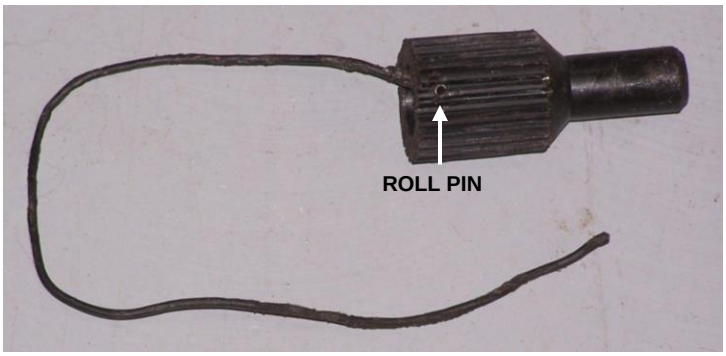
3. Install new pilot bearing assembly using a socket of similar diameter to the bearing and a rubber mallet. Gently tap bearing fully into crankshaft until bearing face is flush with crankshaft face.



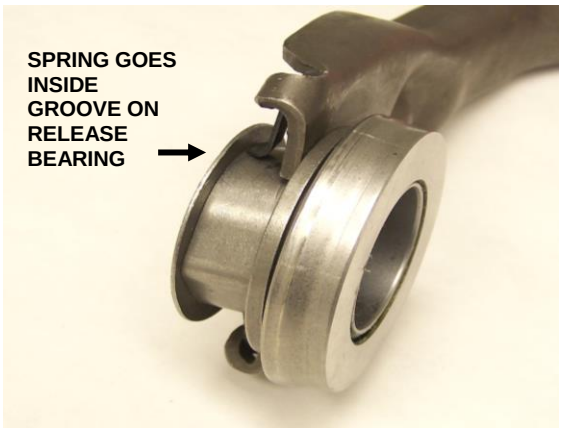


4. Install bellhousing and inspect for proper alignment to crankshaft using dial indicator or test indicator (SST can provide these tools at extra cost). See “Inspection and Correction of Bellhousing To Crankshaft Runout” provided with your literature package. Make sure to record your runout data in 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.

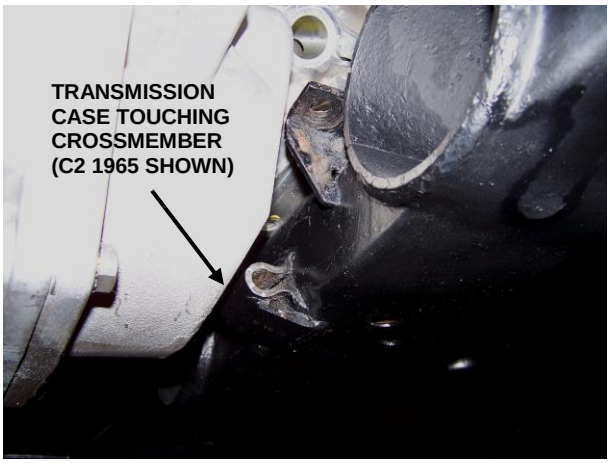
5. Your clutch alignment tool will need to be modified for this installation (see photo on next page). It will need to be shortened to 2-1/2 to 2-3/4” overall length by cutting off the back end (leave the smaller diameter pilot-bearing end attached). Drill a small hole through the splined part of the tool and install a roll pin in the drilled hole. If necessary, file the roll pin down to match the spline profile. Install a retrieval wire to the roll pin, with the wire exiting from the rear of the tool.



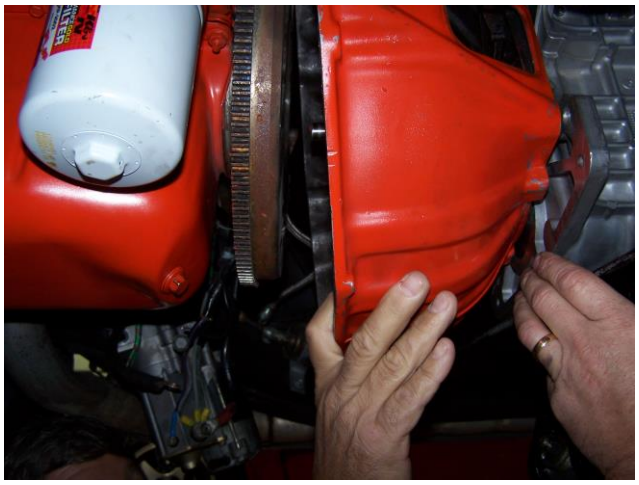
6. Lower engine to approximately 9 degrees down in the rear (required for new transmission installation).
7. With the bellhousing still removed from the engine, install clutch fork and release bearing in the bell-housing if using mechanical clutch linkage. *The tips of the clutch fork and the spring 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.



8. Set transmission into tunnel, sliding rearward until rear of case touches against welded-in crossmember. Transmission tailhousing should be centered in the tunnel, while the front should be angled towards the passenger side to facilitate installation of the bellhousing. Transmission input shaft should be pointed downwards as far as possible to provide clearance for the bellhousing.



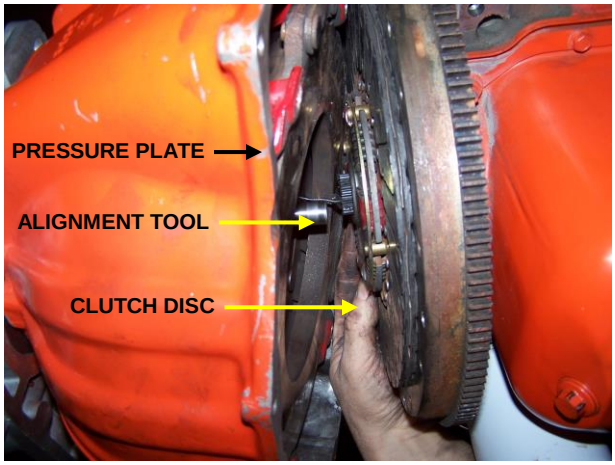
9. With the input shaft pointed down as far as possible, slide the bellhousing over the input shaft and up against the transmission case. The bellhousing may need to be upside down while being slid into place.



NOTE: CLUTCH FORK AND RELEASE BEARING SHOULD ALREADY BE INSTALLED AT THIS POINT, REMOVED FOR CLARITY IN PHOTO.

10. Insert pressure plate into bellhousing over input shaft. This may also be easier with the bellhousing upside down.
11. Orient the bellhousing so it is right side up. Loosely install (1) transmission to bellhousing bolt (HWG-PACK A). Do not tighten. This will keep bellhousing secured during the next step.
12. Raise transmission nose enough to insert clutch disc into bellhousing against flywheel and fully insert modified alignment tool through clutch disc and into pilot bearing. Raise transmission as required to allow pressure plate to be brought forward for assembly on the flywheel. It may be necessary to remove the transmission-to-bellhousing bolt to fit your hand in the bell and move the pressure plate at the same time. Begin installing pressure plate bolts, using flywheel spanner tool to rotate engine counter clockwise (facing flywheel) to access each of the (6) clutch 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.



13. Lower the nose of the transmission enough to remove alignment tool using retrieval wire.
14. Begin raising transmission. As needed, raise engine up to permit attaching the bellhousing to the engine.
15. Remove transmission to bellhousing securing bolt if not already removed and attach bellhousing to engine. Ensure 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.

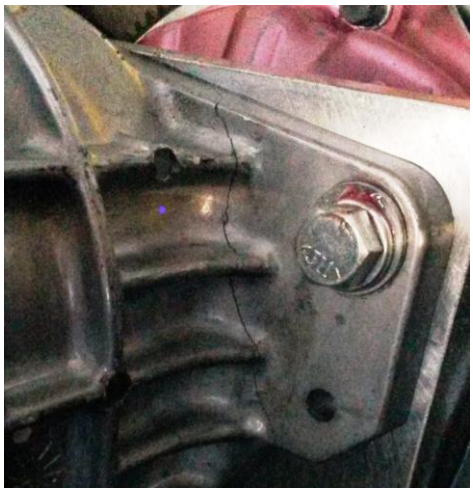
16. Move the transmission further forward, inserting the input shaft into the clutch disc and pilot bearing. Due to the tight clearance around the upper right transmission to bellhousing bolt, a socket head bolt can be substituted for the hex head bolt if you do not have a suitable hex head wrench. Use caution while engaging transmission input shaft into 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 and the tailshaft rotated, 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.

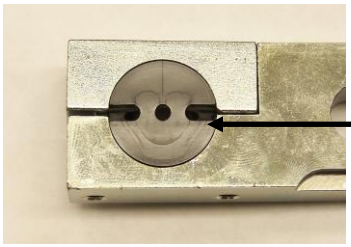
17. Once the transmission is fully seated by hand against the bellhousing, fasten with 1/2" x 1-3/4" bolts and washers provided (HWG-PACK A) and torque to 50 lb.-ft.

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.



18. While the transmission tail housing is sitting directly on the crossmember, re-install the shifter baseplate and attach using the **RO Baseplate Bolt Pack**. Tighten to 20 lb.-ft.
19. 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.



20. 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.

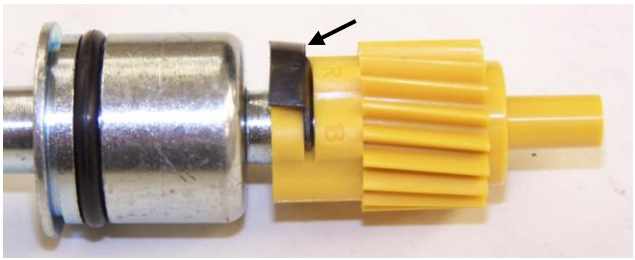
INSTALLING HORIZONTAL SHIFTER LINK CLAMP BOLTS

SHIFTER DUST COVER INSTALLED

21. Raise up engine/transmission until it rests firmly against floor pan.
22. Vehicles with under car exhaust will require SST's exhaust support bracket (part #XMG-02502). It will be sandwiched between the transmission and the isolator mount. If you have an exhaust joint at this location and need to use just one clamp to seal the joint and support the exhaust, the exhaust hanger bracket will need to be formed around your pipes (see photos above). Attach rubber isolator mount to the transmission using M10-1.5 x 30 bolts and lock washers (HWG-PACK H). Do not fully tighten fasteners.
23. Install new crossmember mount bracket by sliding the rear edge of the bracket up and over the ears on the factory crossmember, and then raising the front of the bracket to meet the isolator. Attach isolator to bracket loosely using HWG-PACK B. Lower transmission enough to line up the holes in the mount bracket with the holes in the crossmember. Attach the mount bracket to the crossmember using the factory hardware. Tighten all mount and crossmember fasteners.

24. Confirm no interference to car body exists or noise will occur as the driveline moves under load. If tunnel contact exists, aged body bushings may be present. Compressed, aged body bushings will require replacement & possible shimming to raise the body to obtain adequate transmission clearance. The body mount kit is available from restoration parts suppliers. Failure to correct body bushing problems can result in transmission contact problems with the body which will cause a gear-like “rattle” or “clunking” that is not associated with the gearbox internals, particularly when driving in the higher gears.
25. The original, factory driveline is offset approximately 1/2" to 3/4" towards the passenger side. Confirm that the transmission slip yoke clears the passenger side tunnel by 1/8 minimum. If the shifter tower is located less than 1/8” from either edge of the shifter hole, slot the holes in the transmission mount bracket, as required, to provide the required clearance for the tower in the shifter hole. **Cutting of the body is not required and should not be done.** Please contact Silver Sport if you need more information or support regarding this portion of the installation.
26. Remove the rubber sleeve from the tailshaft (see step B-2 and photo on pg. 4).
27. **Mark slip yoke to driveshaft orientation with a paint marker.** Remove slip yoke from new driveshaft, and insert slip yoke fully into the tailhousing, until the shoulder on the slip yoke is touching the rubber dust seal. Set driveshaft into place rear-end first, and seat u-joints into differential yoke. 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.
28. Assemble driveshaft to front yoke, making sure that the alignment marks line up. **Assembling the slip yoke to the driveshaft improperly will cause a vibration.** Make certain all parts are clean and properly assembled.
29. Reinstall bellhousing inspection cover and starter.
30. Connect clutch linkage - do not preload mechanical release bearing. Adjust linkage as required. If using a SST hydraulic system (available separately), follow instructions provided.
31. On some vehicles, the emergency brake cable may interfere with the slip yoke. The emergency brake cable pulley bracket may need to be bent to provide clearance to the slip yoke.
32. 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.

NOTE ORIENTATION OF RETAINING CLIP



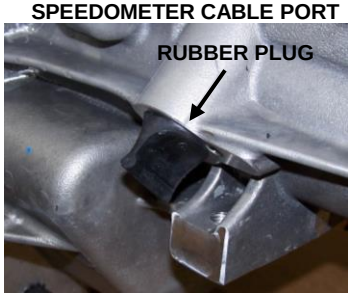
The TKO 500 and 600 have provision for electronic speedometer output also. The speed sensor is located on the passenger side of the transmission, directly opposite the mechanical speedometer output. The sensor is a standard two wire GM, sine wave, with 17 pulses per revolution of output shaft, which 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 3.70 gear will give 48,810 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.

33. 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 backup 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.

REVERSE LIGHT SWITCH

SPEEDOMETER CABLE PORT



NEUTRAL SAFETY SWITCH

ELECTRONIC SPEED SENSOR

34. Tighten exhaust.

35. Bolt on shifter handle with 3/8”-24 x 1” bolts and washers provided (HWA-PACK L). Use medium strength threadlock compound. Torque to 25 lb.-ft. Confirm shifter motion through all gears.

36. Install rubber boot/retainer ring.

37. Install power window heat shield, if equipped.

38. Install upper console plate and power window switch connector, if equipped.

39. Install LH & RH interior side panels.

40. Connect tachometer drive cable to distributor (if equipped).

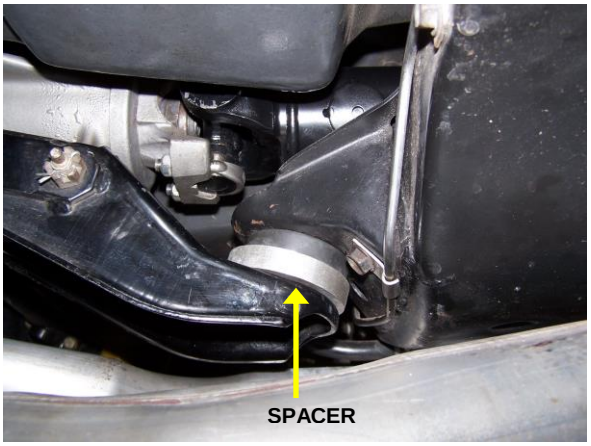
41. Connect throttle linkage to carburetor.

42. Install ignition cluster cover/distributor cap (if equipped), and breather.

43. 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.
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.
12. Some Corvettes may need the differential pinion lowered by installing shims or a spacer between the differential bracket and the rear crossmember to achieve the correct driveline angle. Shims may be installed if necessary by removing the nut from the differential mount bracket to the rear crossmember. Pry downwards on the front of the bracket to separate the bracket from the rear crossmember, and insert shims or spacers as required. Replace the retaining nut, and recheck your driveline angles in both the front and the rear after making any changes.



SPECIFICATIONS AND MAINTENANCE

TREMEC HighPerformance ManualTransmission Fluid is endorsed by Tremec for use in all Tremec brand aftermarket performance transmissions. **GM Synchromesh (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 Synchromesh.

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:

- 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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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!

NOTES