



SILVER SPORT

Transmissions

MUSTANG

1964½ - 1970



TKX 5-SPEED

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.

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. All kits – MAA-00100 Driveshaft Measuring Procedure
3. MAM-00201 Hydraulic Kit Instructions for FORD
4. TMF-00101, TMF-00201 templates for body modification for the shifter opening and for the transmission tunnel rib. If your vehicle requires modification, these templates will guide you through the process. Further instruction for body modification is provided within this manual.

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 more easily (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 help.

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

A. REMOVE EXISTING EQUIPMENT (IF FACTORY MANUAL CAR SKIP TO SECTION B)

1. Disconnect negative (-) battery cable.
2. If equipped with console, remove to permit disconnecting and removing floor shift components. If equipped with key/steering wheel lock, the linkage must be locked in position to permit key removal and turning steering wheel at all times. If column shift, remove linkage at steering column. Remove linkage from transmission.
3. Remove engine breather assembly, throttle linkage, ignition cap and components and any other items that would restrict lowering the back of the engine for transmission removal.
4. Remove the automatic dipstick tube bracket from its attachment at the engine. Some vehicles will permit removal of the dipstick tube from the transmission while others are removed with the transmission. Fluid may drain from the transmission at this point if the dipstick tube is removed.
5. Remove the transmission kickdown cable/linkage and brackets from the engine and vehicle. If a column shift, remove linkage between steering column and transmission and any associated brackets.
6. If equipped, remove vacuum modulator vacuum line from its connection at the engine and plug the engine vacuum source.
7. Remove fluid cooling lines at radiator and transmission. Fluid may drain. Plug the radiator connections.
8. Locate and disconnect the neutral safety switch wiring and backup light wiring, if equipped. Tag for future reuse during manual transmission installation.
9. Remove the automatic brake pedal. Depending on the vehicle and the under dash access, pedal removal may require removal of the front seat, underdash facia and or dropping the steering column. If the new pedal kit includes a new pedal support bracket, the original pedal bracket will also need to be removed. Retain all parts until the new pedals are installed.
10. Locate the factory clutch rod hole used for standard transmission vehicles. The hole generally has a factory rubber plug sealing it and is located behind the factory insulating/carpeting material.
11. Raise car securely on lift or jack stands (6-Ton recommended).
12. Loosen exhaust at manifold and remove as required for working clearance and to allow the engine to drop during transmission removal.
13. The emergency brake cable may need to be disconnected for working clearance.
14. Remove the driveshaft at the differential and transmission, if necessary, and remove driveshaft from vehicle.
15. Unbolt starter and set aside.
16. Remove speedometer cable.
17. Remove torque converter dust cover.
18. Remove the torque converter to flex plate fasteners. The engine will need to be rotated manually to access all the fasteners. (**NOTE:** The battery should have already been disconnected as directed in step number 1 to prevent accidental startup)
19. Secure rear of engine with hydraulic jack.
20. Remove bolts from transmission isolator at the crossmember and raise engine slightly to remove weight from crossmember.
21. Secure and support transmission (transmission jack recommended) and remove the crossmember.
22. Remove the bellhousing bolts holding transmission to the engine, lowering back of engine and transmission, as required, permitting access to all bolts.

23. Move transmission and torque converter rearward as a unit and disengage the transmission bellhousing from dowel pins. Continue moving rearward until the transmission unit can be lowered and removed from the car and remove flex plate from the crankshaft.

B. REMOVE EXISTING EQUIPMENT

1. Disconnect negative (-) battery cable.
2. Remove any components that may be damaged when the engine/transmission is lowered (breather assembly, fan shroud, etc.).
3. 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.



4. Place transmission neutral.
5. Remove exhaust, as required, for working clearance and to permit the back of the engine to drop for transmission removal and installation.



6. Remove upper and lower shift boot and trim ring.
7. If converting from automatic you may need to remove car seat(s) from car, sill plates, console, and pull carpet back to expose transmission tunnel for the factory 5 speed tunnel hump.
8. Remove shift lever and shifter from transmission.



9. Remove starter.



Fig 5-1.

10. Drain transmission.



Fig 5-2.

11. Remove driveshaft at rear differential and remove from car.

Fig 5-3.



Fig 5-4.

12. Disconnect speedometer cable from transmission and disconnect any electrical connections from transmission.

13. Remove clutch linkage at torque arm to clutch fork.



TRANSMISSION
REMOVED FOR
CLARITY

Fig 5-5.

14. Secure rear of engine with hydraulic jack.

15. Secure transmission (jack recommended) to support transmission, in addition to engine support jack.

16. Raise the transmission off the crossmember and remove the isolator and the crossmember.

Fig 6-1.



Fig 6-2.

17. Unbolt transmission from engine, then move transmission unit rearward and remove from vehicle.

Fig 6-3.



Fig 6-4.

18. Remove bellhousing and clutch unit.

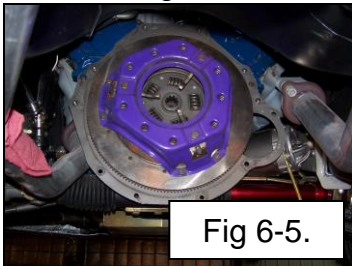


Fig 6-5.



Fig 6-6.



Fig 6-7.

- 19. Remove clutch fork and release bearing from bellhousing. Inspect release bearing, fork, and pivot ball stud for wear. Contact Silver Sport for replacement or repair.
- 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 surfaced, 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 (not supplied).



Fig 6-8.

22. Clean the bellhousing mounting surface of the engine, the crankshaft flange, the pilot bore in the crankshaft and the dowel pins.

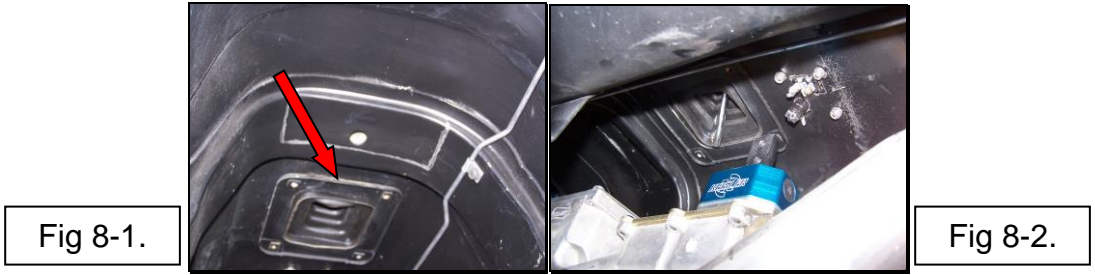
C. TEST FITMENT AND TUNNEL MODIFICATION



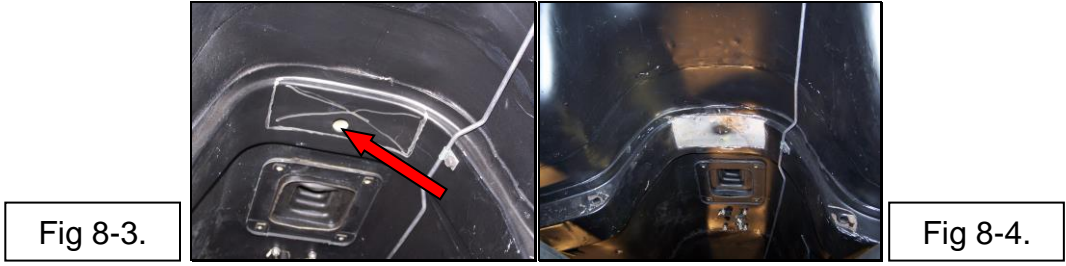
IMPORTANT: The TKX is a physically smaller transmission than the previous generation TKO and may not require any floor modification. Test fit the transmission before cutting the floor. Test fit the transmission into the car and check fitment with the crossmember and isolator mount installed. A minimum of 1/4 inch clearance around the entire transmission is required. Some dimpling of the floor may be all that is required for fitment or smaller cuts than the following instructions show. The amount of tunnel clearance that exists can vary from car to car. Silver Sport Transmissions' template and sheet metal is designed to be large enough to allow the TKO/TKX to fit in most if not all vehicles of this type, with plenty of clearance in the tunnel. Your car may not require as much clearance as our modification provides.

BODY MODIFICATIONS

1. Modify the shifter opening to achieve 1/4" clearance around shift tower. Most driveline / chassis combinations do not require shifter opening modifications. Generally, only the front edge of the opening is trimmed naturally, see template for specific information.



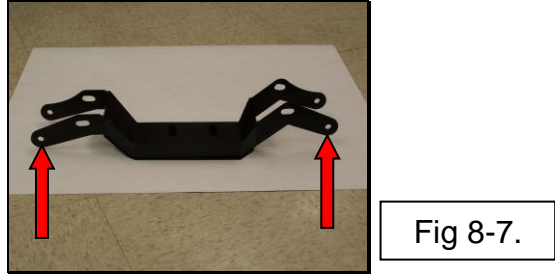
2. The rib inside of the tunnel will need to be modified. Cut out the template and mark the area to be cut by tracing around the template. Cut and remove material based on template and test fitting.



3. After the tunnel rib is cut out, seal the cut opening with a durable silicone sealant or seam sealer and paint the modified area. The edge of the shifter opening should also be painted if modified.



4. The supplied crossmember has two additional mounting holes for strength so two corresponding holes need to be created in the chassis during the installation.



D. INSTALL NEW EQUIPMENT (IF FACTORY MANUAL CAR SKIP TO SECTION E)

The vehicle is now ready for installation of the components to convert it to a manual style vehicle.

1. For all vehicles, install new pedals and pedal supports bracket and components. See supplied diagram with pedals if applicable.
2. If a Silver Sport hydraulic system is to be installed, refer to the appropriate portions on the installation manual for mounting of the hydraulic master cylinder.
3. If the original style mechanical linkage (clutch rod, Z bar, Z bar mounts, fork rod) is to be used, install the components per the Factory Service Manual for the particular vehicle.
Note: On some vehicles, the frame side Z bar support is not bolted in but must be welded in.
4. To locate the shifter hole for vehicles whose kit did not include a shifter hole location on the template or in the sheet metal, the following procedure can be used to locate the shifter hole. Temporarily install the bellhousing to the engine and raise the engine to approximate final elevation. Measure from the bellhousing mounting face of the transmission to the center of the shift lever location, including offset from the centerline of the transmission. 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. Measure the square section of the shift tower and transfer this to the underside of the floor pan. Drill pilot holes and cut out the required area. It would be good 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.** Remove the bellhousing from the engine and lower the engine.
5. Complete the remaining installation per the instruction manuals provided with the transmission kit.

E. INSTALL NEW EQUIPMENT

- 1) Clean all mating engine surfaces and dowel pins.
- 2) Install new flywheel and flywheel bolts torqued to factory spec. Be sure to tighten bolts in alternating cross pattern sequence.



Fig 9-1.

3) Install new pilot bearing assembly into crankshaft using a socket of similar diameter to the bearing and a rubber mallet.

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.

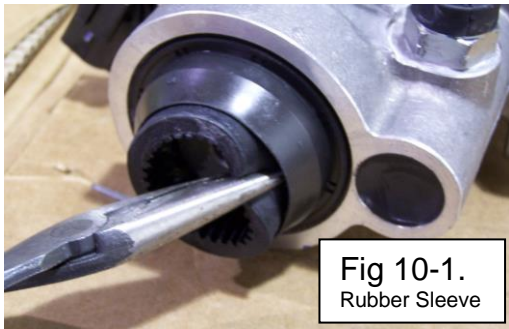


Fig 10-1.
Rubber Sleeve

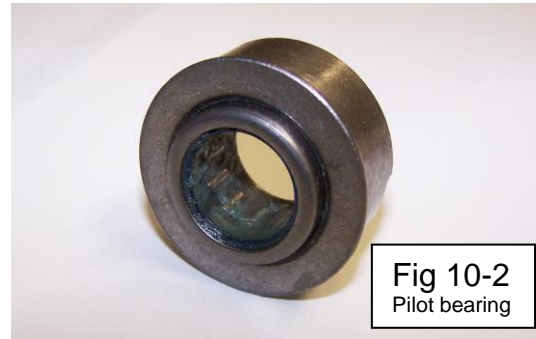


Fig 10-2
Pilot bearing

TRANSMISSION SIDE SHOWN



Fig 10-3



Fig 10-4

- 4) Use the provided 26T alignment tool with large pilot diameter 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.



Fig 11-1.

- 5) 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.



Fig 11-2.

- 6) Install bellhousing to engine, while making sure that there are no hoses, cables, or wires caught between the bellhousing and engine block.

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.



Fig 12-1.

- 7) Reinstall the rubber sleeve (Fig. 5-1) 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 plug hole with the vehicle level. Reinstall the fill plug after adding fluid.
- 8) When installing transmission, use 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 output shaft sleeve may be temporarily removed and a slip yoke inserted for the output shaft to be rotated to facilitate engagement into clutch disk splines.

DO NOT UNDER ANY CIRCUMSTANCES use the transmission-to-bellhousing bolts to draw/pull the transmission up to the bellhousing!

NOTE: MECHANICAL LINKAGE ONLY If the transmission stops approximately 1/2" 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.

- 9) Once the transmission is fully seated by hand against the bellhousing, fasten with bolts provided (HWM-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.**

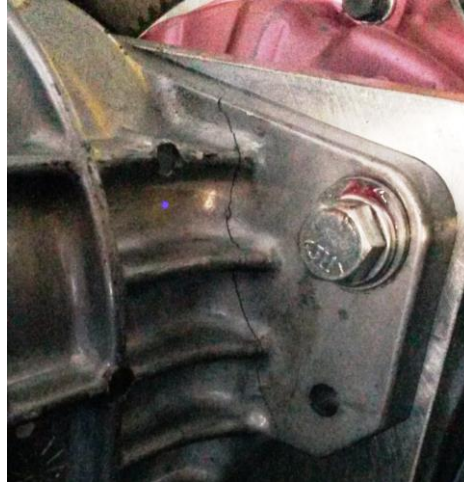


Fig 13-1.

- 10) Raise up engine/transmission until transmission contacts the top of the tunnel.
- 11) Attach rubber isolator mount to transmission using 1/2-13 x 1" bolts and lock washers from hardware pack HWF-PACK C.
- 12) Attach crossmember to the transmission using the hardware supplied HWF-PACK A. Temporarily bolt crossmember to chassis using factory crossmember mounting holes and supplied hardware (1964-66 HWF-PACK B; 1967-1970 HWF-PACK E). Mark the two new crossmember holes. Remove crossmember and drill mounting holes and debur.

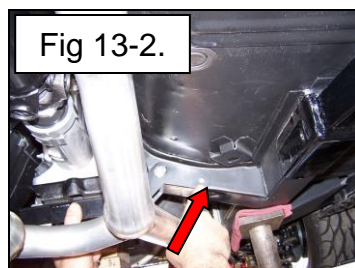


Fig 13-2.

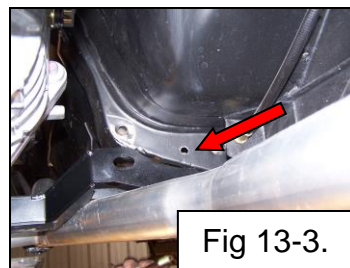
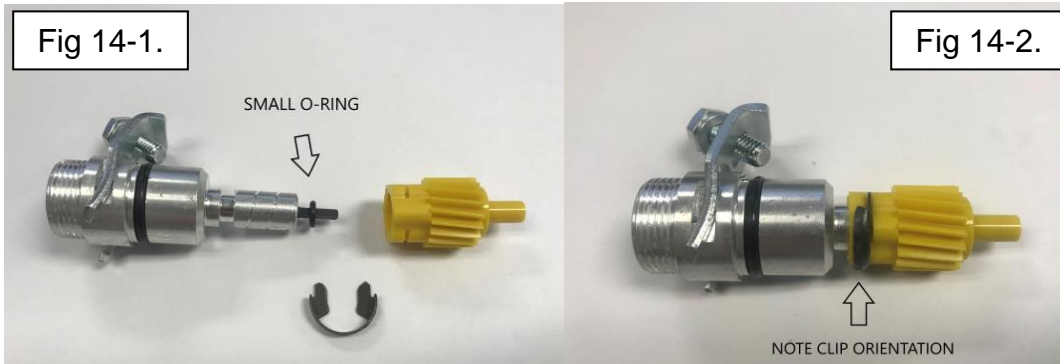


Fig 13-3.

- 13) Reinstall crossmember to isolator mount and mount crossmember to chassis.
- 14) Remove shipping plug and insert drive shaft slip yoke fully until touching transmission seal rubber dust boot. Set driveshaft into position at differential and seat u-joints into differential pinion yoke. Make certain all parts are clean and properly assembled.

- 15) Install 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.
- 16) This would be a good time to double check driveline operating angles to confirm front and rear angles are within recommended values. Adjust as necessary.
- 17) Connect clutch linkage - do not preload mechanical release bearing. Adjust linkage as required. If using a SST hydraulic system (available separately), follow instructions provided
- 18) Install new speedo cable per MAA-00102. 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 right) 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.



- o 1969-1970 CARS REQUIRE A RETAINING COLLAR (SUPPLIED)



The TKX has a 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 two wire, sine wave output, with 17 pulses per output shaft revolution for GM and 12 pulses for Ford, 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.

- 19) 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 B/U light switch. It can be spliced into your car's wiring harness in place of your original switch.
- 20) 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.

REVERSE LIGHT SWITCH



NEUTRAL SAFETY SWITCH



MECHANICAL SPEEDOMETER PORT



ELECTRONIC SPEED SENSOR



- 21) Install exhaust.
- 22) 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.
- 23) Install front carpet and seat(s).
- 24) Install shifter boot and retainer ring, and/or console if equipped.
- 25) Connect tachometer drive cable to distributor (if equipped).
- 26) Connect throttle linkage to carburetor.
- 27) Install distributor cap and breather.
- 28) Tighten fan shroud if it was loosened earlier.
- 29) Reconnect the negative (-) battery cable.

F. FINAL INSPECTION AND START UP PROCEDURE

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.

G. 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: 2.7 QUARTS (U.S.)

DO NOT EXCEED MAXIMUM INPUT TORQUE:

- TKX: 600 lb.-ft. in 4th gear

GEAR RATIOS:

- TKX Wide Ratio
 - 1ST 3.27
 - 2ND 1.98
 - 3RD 1.34
 - 4TH 1.00
 - 5TH 0.72
- TKX Close Ratio
 - 1ST 2.87
 - 2ND 1.89
 - 3RD 1.28
 - 4TH 1.00
 - 5TH 0.68

(0.81 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!