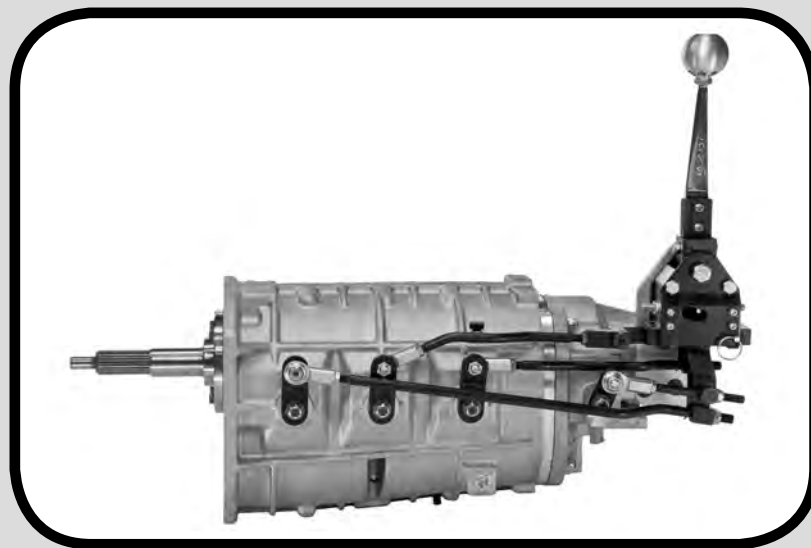




Hi-Performance Transmissions

SUPER STREET FIVE SPEED OVERDRIVE OWNER'S MANUAL



6755R



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SUPER STREET FIVE SPEED OVERDRIVE OWNER'S MANUAL

IMPORTANT!

Read ALL information prior to installation & operation of transmission. Transmission failure or personal injury may result from improper installation, operation, lubrication or maintenance.

Check to make certain the application does not exceed the allowable load capacities published in the catalog.

Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which buyer shall apply the product. The application by buyer shall not be subject to any implied warranty for fitness for that particular purpose.

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This unit is proudly assembled and individually tested in the USA. It is manufactured using premium grade materials, statistically controlled CNC machinery and state-of-the-art heat treatment.

The Richmond Over Drive has its roots on the racetrack and its future on the boulevard.

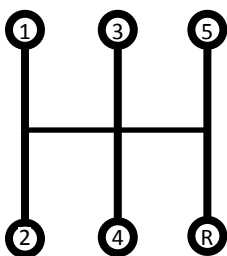
Performance enthusiasts are accustomed to the low rear end ratios needed for crisp acceleration, but low rear ends take their toll; mileage suffers and engine life is reduced. With a Richmond Over Drive, however “economy” rear axle ratios around 3.08:1 are practical, since the transmission’s gears do all the torque multiplying, plus additional over drive gear for low RPM highway driving.

Instead of running 4.56 gears with a close ratio four-speed you can run a 3.08 rear end with the Richmond Over Drive and still have the same overall torque multiplication.

The Richmond Over Drive has tremendous torque multiplication, easy serviceability – plus complete gear synchronization for smooth shifting.

Unlike so-called “ultra-low” four-speeds, there are no sharp drops between gears, the Richmond Over Drive is the sophisticated approach to performance.

The Richmond Over Drive should be your choice for performance type automobiles, light trucks and selected models of intermediate and full-sized cars. Our engineering expertise and a “PRO-QUALITY” approach to drivers demanding winning performance are built into every transmission that bears the Richmond name.



GENERAL SPECIFICATIONS

Part No.	Description	<i>Note: All transmissions include shifter, back-up light switch and wire harness.</i>
7020510	GM® 1-1/8" 10 Spline	
7020526	GM® 1-1/8" 26 Spline	* Furnished as a true bolt in GM “F” body T-5 Replacement comes with cross member, speedo cable extension and special shifter for torque arm hook-up.
7050526*	GM® 1-1/8" 26 Spline T-5 Replacement	
7070526***	GM® 1/8" 26 Spline Corvette 4+3 Replacement	*** Includes special tail housing & shifter for torque arm hook-up.
7040510	Ford® 1-1/16" 10 Spline	
7040526	Ford® 1-1/8" 26 Spline	
7080510****	Ford® 1/16" 10 Spline Mustang 5.0L T-5 Replacement 1984-1993	**** Includes cross member & speedometer hook-up kit. Bell housing must be replaced with Lakewood P/N 15202, or equivalent. May also use 1979 – 1983 Mustang V-8 bell housing.
7030518	Mopar® 1-3/16" 18 Spline	

Center Distance:	3.5 inches
Oil Capacity:	2 quarts (2-1/2 for GM T-5 Version)*
Approximate Dry Weights:	106.5
Case & Extension Housing:	Aluminum

* **CAUTION:** All units are shipped WITHOUT lube oil. Fill with oil before using the unit.

SERVICE PROCEDURES

GENERAL

Proper assembly of the **RICHMOND OVER DRIVE** is critical but not difficult. Use the exploded view as a reference while following these instructions and you'll find your **RICHMOND OVER DRIVE** is the most straight forward

transmission you've ever worked on. Use lube to coat the running surfaces of all gears and bushings during assembly.

Apply sealant (Loctite 242) to all thru bolts, fill and drain plugs, and cup plugs during assembly.

DISASSEMBLY

Follow the manufacturers recommended procedure to remove the transmission from the vehicle. Threading **TWO (2) STUDS** into the upper mounting holes will support the unit protecting the clutch disc.

The only special tools needed are a pair of large retaining ring (TRUARC) pliers, a pair of lock ring pliers, a ¼" and a 7/16" Allen wrench, a brass drift, and a tube of RTV sealant.

The **RICHMOND OVER DRIVE** may be disassembled with relative ease. Caged bearings allows reassembly without the tediousness associated with loose needles.

1. If not done previously, drain old lubricant.
2. Shift the transmission into neutral.
3. Remove the front bearing retainer and gasket.
4. Remove taper pin in reverse shift shaft and pull shaft outward to disengage shift fork.
5. Remove the extension housing. Use a soft faced hammer to loosen the extension.
6. Remove the speedometer circle gear and reverse gear.
7. Remove the idler gear and thrust washers. Use threaded puller to remove pin from maincase if desirable. Use drift to knock roll pin thru maincase before using puller.
8. Remove mid-plate.
9. Unbolt and separate the case halves. Use the screwdriver slots to gently pry apart the case halves.

WARNING: To prevent the spring loaded detent system from coming apart, leave the nuts and washers on the shift arm studs. Reassembly is difficult.

10. Remove the mainshaft and input shaft as an assembly.
11. Separate the input from the mainshaft, remove the pilot bearing and synchro ring.
12. Remove the countershaft cluster gear assembly and separate the countershaft cluster gears. The ball bearing on each end must be pressed off.
13. Disassemble the mainshaft by removing the 3-4 synchronizer snap ring and synchro assembly, mainshaft 3rd gear and bearings, 3-4 synchro assembly, split ring assy, O.D. synchro retainer, O.D. synchronizer snap ring, O.D. synchronizer assembly, O.D. gear and bearings.
14. With the pilot end down, support the mainshaft assembly under the mainshaft 1st gear. Remove the mainshaft bearing snap ring. Press the mainshaft through and separate the mainshaft bearing and 1st gear, 1-2 synchro assembly, and 2nd gear.

CAUTION: Used transmission oil can contain harmful contaminants that have caused skin cancer in laboratory animals. Avoid prolonged skin contact. Clean skin and nails thoroughly using soap and water – not mineral oil, fuels or solvent. Launder or discard clothing, shoes, or rags containing used transmission oils.

CLEAN AND INSPECT

1. Wash the case and extension thoroughly inside and out, removing all dirt, metal, and loose contaminants. Inspect all mating surfaces for dings and burrs and remove where found.
2. Wash the ball bearings in cleaning solvent. Blow out with dry compressed air while slowly turning the bearings by hand. **Do not allow the bearings to spin.** Lubricate and inspect. Replace the bearings if rough, noisy, or excessively loose.
3. Inspect all rollers, thrust washers, and spacers for wear and replace if necessary. Replace all spread or twisted snap rings. Use new parts (from a small parts kit) whenever possible.
4. Inspect the mainshaft and countershaft for wear and replace if worn.
5. Inspect all gears for missing, broken, or damaged teeth and replace if necessary. Small chips and blemishes can be blended with a die grinder to reduce induced noise. Replace any heat damaged ("blued") gear or shaft.
6. Inspect the synchronizer rings and gear cones for complete clutching. The rings should have straight (not flared or "bell-mouthed") strut pockets, fit the mating cones without rocking, and leave a gap when pressed tight. The gear cones should not show excessive polish, but have a uniform taper without ridges. Replace if necessary.
7. Inspect the synchronizers for broken, distorted, or worn struts. Hubs should be without burrs, and with straight strut pockets. Replace if necessary.
8. Remove and discard old oil seals and gaskets.

ASSEMBLY

ORGANIZING THE GEARSET

To avoid confusion, match the mating mainshaft and cluster shaft gears before beginning actual assembly. It is also helpful to group the hub, slider and synchro rings as show below.

PREPARING THE MAIN CASE

- A) Check Shift Detent System – The shifting mechanism has been fit at the factory for proper function. Each shift arm should rotate from the center neutral position to the two engagement positions. Also check that all shift arm seals are in place and in good condition.
- B) If Reverse Idler Shaft is to be Assembled –Align hole in shaft with hole in maincase. Tap shaft into case keeping holes aligned. Knock roll pin into maincase ½ way into shaft to lock shaft into position. Fill hole in maincase with RTV sealant.
- C) If Replacing Studs – Apply Loctite #242 sealer to all studs.



When assembling a Richmond Over Drive, the first step should be to group mating mainshaft and cluster shaft gears.

CLUSTER ASSEMBLY

1. Install third gear
2. Install heavy duty (2") retaining ring.
3. Install roller bearing in center of cluster shaft with 1-3/4" retaining ring in groove.
4. Install heavy duty (1-3/4") retaining ring in lower groove. Install overdrive and second cluster gears and heavy duty (1-3/4") retaining ring in remaining groove.

NOTE: Flat side of overdrive gear must face against snap ring. Assemble 2nd gear and snap ring.
5. Install first cluster gear with shoulder facing rearward.
6. Press rear bearing (#306) on cluster shaft.
7. Install front cluster gear with shoulder facing rearward. Press front bearing (#306) on cluster gear shaft, with retaining ring groove of bearing facing gear.

8. At this time place assembled cluster shaft into housing. Be sure snap ring on front roller bearing is seated against machined surface. The surface of the roller bearing at the tailhousing end must be flush or below transmission end face surface. Approximately .005 below maximum. If bearing extends beyond end of transmission remove 1 st gear from cluster shaft and grind stock off of hub end, reassemble and inspect.
9. Once cluster shaft is installed assemble reverse drive gear and snap rings.



MAINSHAFT ASSEMBLY

1. Pre-lube 2nd gear O.D. of mainshaft with standard gear lube.
2. Install 2nd gear with synchro teeth facing output end of mainshaft. Then install brass synchronizer ring.
3. Assemble a synchronizer assembly by placing hub inside of slider (tapered portion of slider and shoulder end of hub should be facing same direction) and keys in slots in hub. Then install key retaining springs on inside of hub hooking end of spring in key. Flip assembly over and install second spring in same manner, making sure that end of spring is not hooked in same key as first spring.
4. Slide complete synchronizer assembly (consisting of hub, 3 keys, springs and slider) over output end of mainshaft and position so that keys fit in slots of brass synchro ring, tapered end of slider must be facing output end of mainshaft. Install heavy duty 1-1/2" lock ring on mainshaft just above synchro hub.
5. Install brass synchronizer ring with slots aligned with keys. Check for .006"-.010" end clearance between second gear and shoulder on mainshaft.
6. Pre-lube first gear O.D. of mainshaft with standard gear lube.
7. Install first gear from rear of mainshaft, with synchro teeth forward.
8. Install thrust spacer and press on bearing (No. 307 non-shielded) with snap ring groove of bearing toward output end of mainshaft.
9. Install lock ring (1-1/4") behind bearing to retain bearing on mainshaft.



10. Check end clearance between first and thrust spacer; .006" to .010" is acceptable. If this amount of clearance is not present, check for dirt or other foreign material.
11. Pre-lube third gear O.D. of mainshaft with standard gear lube.
12. Install O.D. gear with synchro teeth forward.
13. Install brass synchronizer ring and complete O.D. synchronizer assembly following same procedure as outlined in steps 3 and 4. Tapered end of slider must face input end of mainshaft.
14. Install 1-1/2" lock ring just above hub. Check end clearance between O.D. gear and shoulder on

mainshaft (should be .006"-.010"). Assemble O.D. synchro retainer and split ring assy.

15. Pre-lube 3rd gear O.D. of mainshaft with standard gear lube.
16. Install third gear with synchro teeth forward.
17. Install brass synchronizer ring and complete third-fourth synchronizer assembly following same procedure as outlined in steps 3 and 4. Tapered end of slider must face input end of mainshaft.

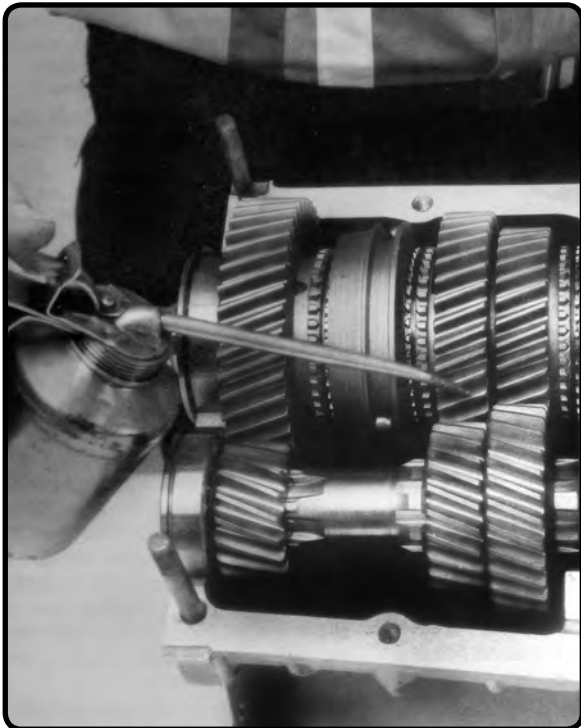
Install 1-1/2" lock ring just above hub and fourth gear brass synchro ring aligning slots with keys. Check end clearance between third gear and shoulder on mainshaft (should be .006"-.010").

INPUT SHAFT ASSEMBLY

1. Press bearing (No. 307) on input shaft, with retaining ring groove of bearing forward.
2. Install heavy duty (1-1/4") lock ring in front of bearing to position it on input shaft.

3. Install caged roller bearing on nose of mainshaft and pre-lube.

Place brass synchronizer ring on input shaft, assemble input shaft to mainshaft aligning slots in brass synchronizer ring with keys in 3rd and 4th hub.



NOTE:

It is important, when assembling the gearbox, to liberally coat gears and synchronizers with lubricant. After lube is applied, gears should be rotated and sliders moved to each gear position. Rotation of gears and movement of sliders should be smooth.

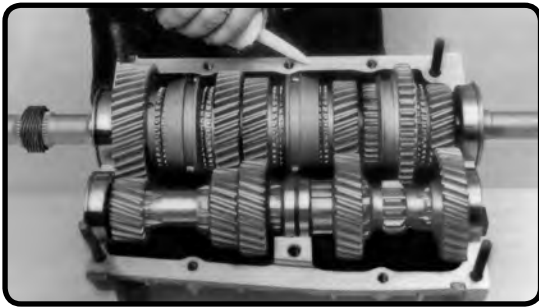
ASSEMBLING CASE HALVES, EXTENSION HOUSING AND BEARING RETAINER

1. Place all shift arms in neutral position. Place cluster assembly in case half with front snap ring tight against front bearing bore. Install shift forks 3rd and 4th fork with machined surface toward back side of transmission. Install input shaft assembly with internal needle bearing to mainshaft assembly and install into case half. Rotate to check for interference.

FUNCTIONAL CHECK

Pour gear lube over gears and work in. Make sure that all brass synchro rings are liberally coated with lube. Work all sliders back and forth to insure smooth operation. Check each gear for free rotation and engagement.

2. Apply 1/16" wide bead of RTV sealant around perimeter of case half and around front cluster bearing hole and set cluster bearing plug in lower case. Lower upper case half over studs.

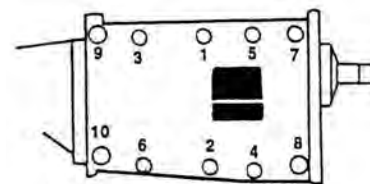


3. With proper flat washers in place, install four 3/8" x 20 nuts, one 7/16" x 2-1/2" socket head bolt and five 5/16" socket head screws. Tighten lightly.
4. Apply 1/16" wide bead of RTV sealant to transmission back face.
5. Slide mid-plate over studs and seat over mainshaft bearing.
6. Place thrust washer on mid-plate. Be sure tab on washer seats in slot in mid-plate. **NOTE:** A small amount of grease on back of washer will help hold it in place during assembly.
7. Assembly reverse idler gear and bearings onto shaft. **NOTE:** Rounded side of gear teeth must be outward.
8. Slide reverse slider gear over mainshaft. Place gear side onto shaft first. Slide gear past snap ring grooves.
9. Install speedometer gear and snap rings on mainshaft.
10. Place gasket onto mid-plate.
11. Apply a small amount of grease to back side of thrust washer. Place thrust washer into pocket in

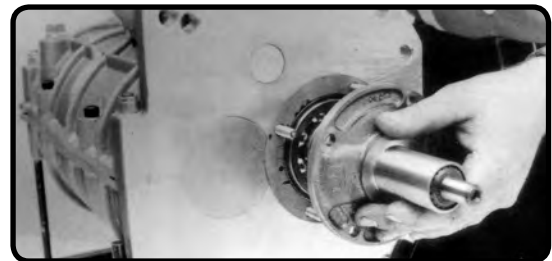
tailhousing. Be sure tab is seated into slot.

12. Place shift fork into reverse shift cam. Pull shift cam outward until cam bottoms out in tailhousing.
13. Carefully slide tailhousing in place. Hook shift fork over reverse slider gears hub. Once fork is engaged over hub, push shift cam into its approximate location. This will keep shift fork engaged over reverse gear hub. Slide tailhousing forward to align reverse idler shaft to tailhousing. Be sure thrust washer tabs are still seated in slots. Once shaft and tailhousing are engaged push tailhousing forward to seat against mid-plate. This may be a snug fit and require tapping into place with a soft hammer.
14. Install washers, nuts and 7/16" bolt. Torque each to 25-30 ft. lbs.
15. While keeping light inward pressure on reverse shift shaft, shift into reverse to be sure gear is still engaged.
16. Align groove in the reverse shift shaft to taper pin hole in tailhousing. Install taper pin and tap lightly to seat pin. Be sure O-ring is seating properly in housing.
17. Torque all nuts and bolts in maincase in proper sequence, below. Torque 5/16" socket head capscrews to 15-20 ft.lbs.; 7/16" bolt to 45-50 ft.lbs. and 3/8" nuts to 25-30 ft.lbs.

TORQUE SEQUENCE



18. Assemble gasket and front bearing retainer to case, being sure to line up drain slot with hole in case. If slot in gasket does not align with hole, cut hole in gasket. Retain with 5/16" x 24 nuts and small flat washers. Torque to 15-20 ft.lbs.



FINAL FUNCTIONAL CHECK:

Install exterior shift levers and check for free engagement and rotation in each gear position. If satisfactory, wipe off any excess RTV sealant and prepare to install transmission in car.

INSTALLATION/OPERATION INSTRUCTIONS

The 5-Speed Overdrive is based on the bullet proof design of the Richmond 5 Speed (formerly the Doug Nash 4 + 1).

We have also added what we call "Road Race Brass." This synchronizer was designed and built for long life under grueling conditions like the 24 hours of Daytona. It works great! Now all the major race teams in NASCAR retrofit their Richmond Super T10's to use this brass. You may find the shift a little stiffer, but the engagement is smooth and positive and nearly unbreakable.

This product was designed to work for street and pro street applications where strength was a top priority. It is also great for F-car/Mustang with a little added performance where the OEM transmission becomes the weak link.

As this is a strength-oriented bullet proof design you can expect possibly a little more gear noise than an OEM unit, but the trade-off for performance is well worth it.

INSTALLATION

As with any high performance product, proper installation and set-up is critical for optimum performance. The following are a few helpful hints to help you get the maximum performance from your new Richmond Over Drive.

**** Shifter Set-Up**

Mount and adjust the shifter linkage before you install the transmission. Make sure that all rods are mounted and working freely without binding at the shifter hangers or the transmission itself. (Be sure rod adjustment is made with the rail alignment pin in place.) Once rods are set, set the shifter stops to prevent overshift.

**** Lubrication**

Many technological improvements in gear lubricants are available in the market today. It is hard to recommend one particular product for all applications. Thus far in our testing we found that a standard 80-90 wt. petroleum oil will suit most applications. Synthetic gear lube, however, may be used to improve shiftability or cold weather start-up. In any event, use a well-known brand name. This transmission is a significant investment, and you certainly don't want to ruin your transmission with a cheap lube. **NOTE:** For best shifting, use lubrication WITHOUT limited-slip additive.

****The Clutch**

The clutch can truly be **THE** difference in the smoothness and shiftability of any transmission. In general, the more mass in the clutch, the more difficult shifting becomes. And, of course, shifting at high RPM makes proper clutch adjustment essential. In our testing thus far, we have found a good starting point is .070" clearance.

****Bellhousing Alignment**

Proper alignment of bellhousing to the motor is critical! The most common problems associated with a misaligned bellhousing are: jumping out of gear, vibration, excessive pilot bushing wear, difficult shifting, and loss or excessive wear of the tailhousing bushing.

OEM and high performance drive train components have manufacturing tolerances which can shift the bellhousing into an unacceptable position.

From the engine block viewpoint, all machining for the main bearings is done at a right angle to the surface where the bellhousing bolts to the block. Anytime an engine is line-honed or bored, it could move the crankshaft centerline to the dowel pins at the rear of the block.

Whenever a new bellhousing or a rebuilt motor is involved, we strongly recommend indicating the bellhousing to assure proper alignment.

An article specific to proper bellhousing alignment is included for your understanding of the importance of this matter. See page 8 for instructions.

**** Parts List (diagram view)**

A diagram view of the 5-Speed Overdrive is also enclosed for your convenience. You will also find a detailed parts list. In the unlikely event you will need to order parts, you can do so where you purchased the transmission.

**** The Shifter**

The shifter for the 5-Speed Overdrive is custom manufactured for Richmond by Long's Machine and Tool.

If you have questions specifically regarding your shifter, call Long's directly at 717-202-8374.

**** Warranty**

This unit carries the same warranty as all Richmond products. For purposes of clarification, the warranty statement is reprinted here.

Warranty is limited to material and/or workmanship defect at time of shipment from the factory, and in no event shall seller have any liability for consequential damages of any kind resulting from a breach of this warranty. This warranty will be void on all products that show evidence of misapplication, improper installation, abuse, lack of proper maintenance, negligence, or alteration from original design. This warranty is in lieu of any other warranties, either express or implied, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

WARNING: All mounting bolts used to install the transmission in your car should be grade 5 or higher. All mounting bolts should be checked periodically to make certain they maintain proper torque.

WARNING: Never operate the transmission without proper amounts of correct lubricant. Never allow vehicle to idle in neutral without applying parking brake. Check oil level between scheduled oil changes to insure proper oil level is maintained.

The manufacturer makes no warranty or representations, expressed or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages.

This instruction manual should be read together with all other printed information, such as catalogs, supplied by Richmond Gear.

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with election, installation, operation, lubrication, and maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to Richmond Gear.

BELLHOUSING ALIGNMENT

Bellhousing alignment is absolutely essential to smooth and reliable clutch and transmission operation. Of major importance is the position of the bellhousing on the rear of the engine; the centerline of the transmission input shaft must line up exactly with the centerline of the crankshaft. In addition, the transmission mounting surface (rear of the bellhousing) must be parallel to the clutch engagement surface of the flywheel.

All too frequently, the bellhousing, or scattershield, is merely bolted up by using the factory installed dowel pins as a guide. But the placement of the dowel pins and the positioning of the dowel pin holes in the bellhousing can be affected by the manufacturing tolerances of mass-production. Frequently, these tolerances multiply to produce a considerable alignment error.

A variety of problems can result from the bellhousing being out of alignment: pilot bearing failure, transmission bearing failures, clutch chatter, sloppy shifts, sluggish clutch movement, rapid synchronizer wear, or popping out of gear. And of course, the transmission and/or clutch takes the blame for what is really a bellhousing alignment problem.

A dial indicator (with a magnetic base) is needed to verify bellhousing alignment. Using stock dowel pins, install the bellhousing and tighten securely. The trueness of the flywheel should be the first checkpoint, because all subsequent alignment checks will use the flywheel face as a measuring point. The flywheel face must be perpendicular to the centerline of the crankshaft if consistent, smooth clutch action is to occur. This can be determined by mounting the dial indicator, by measuring from the flywheel to the bellhousing face (a runout of .005" is acceptable). If the flywheel runout is more than .005", check for dirt or burrs on the faces of the flywheel or crankshaft. If there are none, flywheel warpage may be the problem and the flywheel may be in need of resurfacing.

Next, affix the dial indicator to the flywheel (prior to clutch installation) and attached the indicator so that it contacts the bellhousing's transmission mating surface about one inch outside the rear opening. (Be sure to avoid the transmission mounting bolt holes and the clutch pivot ball hole.) Rotate the crankshaft by hand slowly and note any variations in the indicator reading to determine if the surface is parallel with the flywheel. Maximum variation between the highest and lowest readings is .005". If a greater variation is found, place shim stock in line with the low point between the bellhousing and the block. Adjust shim thickness until variations of .005" or less are obtained. Again, carefully check the mating surfaces for dirt and burrs to make sure these are not causing the problem.

Remount the dial indicator so that it measures the inside diameter of the rear opening in the bellhousing. Once again, be sure there is no paint buildup, nicks or burrs on the edges of the opening. Slowly, rotate the crankshaft and check the dial indicator readings. The maximum variation is .010" because the actual error is the total variation divided by two, or .005" misalignment. If the variation exceeds .010", realignment is required. Make several revolutions of the crankshaft to verify the readings.

If the bellhousing must be realigned, one of several approaches can be used, in any case, the stock dowel pins must be removed from the block and discarded. The stock pins must be removed carefully to avoid distorting or otherwise damaging the pin holes.

The first method consists of simply loosening the bellhousing bolts to permit repositioning of the bellhousing until dial indicator reading variation of .010" or less is obtained. It may be necessary to enlarge the bellhousing bolt holes slightly to obtain sufficient movement. Then tighten the bolts and recheck it to ensure the housing hasn't shifted. With the bolts securely tightened and the housing properly aligned, choose two points, approximately 180 degrees apart. It will be necessary to drill through the bellhousing flange and into the block for installation of the new dowel pins. The new pins need not be as large as the stock ones. A diameter of ¼-5/16" is sufficient. Once the new pins are in place, the bellhousing can be removed and reinstalled without the need to check alignment.

The second method utilizes offset dowel pins. These special pins are offered in three offsets, .007", .014" and .021", in both 5/8" and ½" diameters. Before installing the offset pins, drill and tap a small hole in the side of each dowel pin hole (in the block) so that a small Allen-head set screw can be used to lock the offset pins in place after alignment is completed.

When installed, the offset dowel pins can be adjusted with a screwdriver to obtain proper alignment. In some cases the dowel pins must be polished with a strip of emery cloth to permit them to be rotated in the dowel pin holes with a screwdriver. Adjustment with these offset pins can be tedious and time consuming, so be patient. After this is completed, tighten all bellhousing bolts and recheck the alignment one more time. If everything is okay, the bellhousing portion of the job is done.

But there's one more part to check; the front bearing retainer on the transmission. The outer diameter of this retainer, not the transmission bolts, determines placement of the transmission on the bellhousing. Therefore, it is

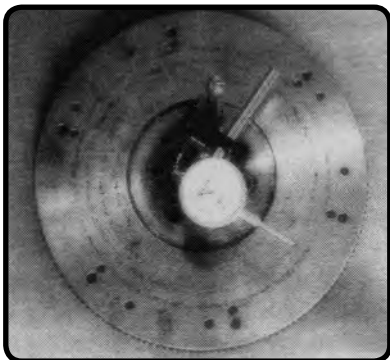
important that the bearing retainer be matched to the bellhousing being used. The retainer should fit snugly in the opening in the bellhousing. If it doesn't, another retainer of the proper diameter must be used.

"Bellhousing Alignment" article compliments of G-Force Products.

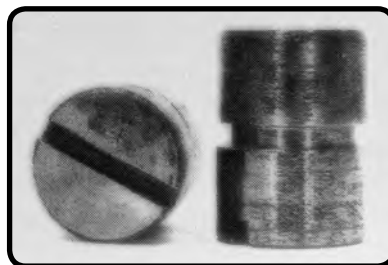
This is how the dial indicator must be positioned to check concentric alignment of the rear bellhousing opening with the crankshaft centerline.

Shown is a pair of the offset dowel pins, along with two 10-32 set screws to lock the dowels in place when the alignment process is completed.

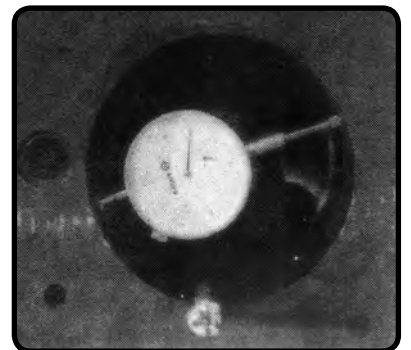
When bellhousing alignment is complete, tighten the set screws to secure the dowel pins for future reassembly without the hassles of realignment.



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When bellhousing alignment is complete, tighten the set screws to secure the dowel pins for future reassembly without the hassles of realignment

INSTALLATION INSTRUCTIONS: BASIC

Items required to complete installation of the 5-Speed Overdrive

1. **GM Transmission Mounting Pad:**
GM #17990869 (single crossmember mounting stud) or GM #3913498 (2 crossmember mounting holes)
2. **Speedo Driven Gear Fitting Seal Assembly:**
GM #345215
3. **GM Turbo 400 Spline Yoke:** *GM #7801551 Richmond #SY-1310 or SY-1330*

CAUTION: *On GM applications the yoke length may need to be shortened. Cut yoke length may need to be shortened. Cut yoke length down to 3-1/2". If yoke is not cut down it could interfere with speedometer gear inside of transmission and cause failure.*

NOTE: *Measure the drive shaft for proper length. Allow approximately 1" from end of tailhousing to face of yoke.*

Step 1: Remove Current Transmission

Remove the current transmission from the car.

Step 2: Mounting the Shifter

Attach the shifter plate to the transmission. With the shifter rail alignment pin installed, mount and adjust all shift rods so there is no binding of the rods. **Remove the alignment pin.** Shift transmission through all gears. Interference will cause **hard shifting**. Once the rods are in place, set the shifter stops to prevent overshift. Once the shifter is set, remove all rods and the shifter plate from the transmission. The transmission is now ready to install.

Step 3: Installing the Transmission

Install the transmission. Once transmission is aligned, slide forward to set flush with bellhousing. Tighten all bolts to approximately 40 ft.lbs. Next, lift the shift assembly into position, pushing shifter handle through the shifter boot. Now bolt the shifter assembly into place. Mount all rods (make sure alignment pin is in place for installation). Remove pin and shift through the gears. Make sure rods are still moving freely.

Step 4: Install Mounting Pad

Align the mounting pad to the transmission. Install (2) bolts and torque to approximately 40 ft.lbs.

Step 5: Install Crossmember

Bolt the crossmember to the mounting pad. Mark new hole position on the frame. Remove crossmember and drill new hole location. Bolt crossmember into position.

Step 6: Install Backup Light Switch

Cut the connector end off of the existing backup light switch wire. Splice wires to furnished backup light switch connector and plug into switch.

Step 7: Drive Shaft Installation

Install drive shaft. Again, be sure that you have adequate clearance from the end of the transmission to the face of the yoke.

Step 8: Recheck Installation

Go over entire installation, being sure bolts are tight and shifter rods are working freely.

Step 9: Lubrication

Fill the transmission with gear lube. Use a brand name lube, filling to the bottom of the pipe plug.

Step 10: Run In Procedure

With the car up on jack stands, run transmission a few minutes in each gear. This will allow the lube to be circulated to all bearings and gears.

Your transmission should now be ready for many miles of great service. You will find the shifter and synchronizers will have a tendency to "break in" and actually perform better after a few miles.

If you have any technical questions on the transmission, call the Tech Line at Richmond Gear at 864-843-9275.

INSTALLATION INSTRUCTIONS: GM T-5 REPLACEMENT

Items required to complete installation of the R.O.D.:

1. **GM Transmission Mounting Pad: GM #17990869**
2. **Speedo Driven Gear Fitting Seal Assembly**

GM #345215 –OR- use the assembly out of the T-5 transmission.

3. **GM Turbo 400 Spline Yoke: GM #7801551 Richmond #SY-1310**

NOTE: Measure the drive shaft for proper length. Allow approximately 1" from end of tailhousing to face of yoke.

Step 1: Remove Current Transmission

Remove the current transmission from the car. Be sure to save the rubber torque arm mounts. If these mounts are in good condition, they may be used on the shifter mounting plate. (See shifter instructions.)

It should not be necessary to remove the console if the following steps are observed.

Step 2: Mounting the Shifter

Install the rubber torque arm mounts to the shifter. (See shifter instructions.) Attach the shifter plate to the transmission. With the shifter rail alignment pin installed, mount and adjust all shift rods so there is no binding of the rods. **Remove the alignment pin.** Shift transmission through all gears. Interference will cause **hard shifting**. Once the rods are in place, set the shifter stops to prevent overshift. Once the shifter is set, remove the (3) bolts and the shifter plate from the transmission. Let shifter hang by the rods. The transmission is now ready to install.

Step 3: Installing the Transmission

Install the transmission. Let the shifter assembly hang in order to get the transmission aligned with the clutch plate. Once transmission is aligned, slide forward to set flush with bellhousing. Note that the transmission will bolt up directly to the bolt pattern in the bellhousing when the transmission is rotated 17° counterclockwise. Tighten all bolts to approximately 40 ft.lbs. Next, lift the shift assembly into position, pushing shifter handle through the shifter boot. Now bolt the shifter assembly into place. Make sure rods are still moving freely.

Step 4: Speedo Cable Installation

Pull the cable out of its casing and apply grease. A white lithium grease is recommended. Install the cable back into the casing and mount at the transmission, then connect to the existing cable.

Step 5: Install Mounting Pad

Align the mounting pad to the transmission. Install (2) bolts and torque to approximately 40 ft.lbs.

Step 6: Install Crossmember

Align the crossmember and bolt into place; tighten to 45 ft.lbs. Be sure crossmember is not making contact with the transmission; it should have approximately ¼" clearance. This clearance is a must to prevent vibration and resonance in use.

Step 7: Install Backup Light Switch

Cut the connector end off of the existing backup light switch wire. Splice wires to furnished backup light switch connector and plug into switch.

Step 8: Drive Shaft Installation

Install drive shaft. Again, be sure that you have adequate clearance from the end of the transmission to the face of the yoke.

Step 9: Torque Arm Installation

Install the torque arm. Attach at the rear of the car first, then at the shifter mount. Be sure arm fits securely in rubber mounts and tighten to 15 ft.lbs.

Step 10: Recheck Installation

Go over entire installation, being sure bolts are tight and shifter rods are working freely.

Step 11: Lubrication

Fill the transmission with gear lube. Use a brand name lube. Filling to the bottom of the pipe plug is not recommended due to transmission being tilted. Use approximately 2 to 2-1/2 quarts.

Step 12: Run In Procedure

With the car up on jack stands, run transmission a few minutes in each gear. This will allow the lube to be circulated to all bearings and gears.

Your transmission should now be ready for many miles of great service. You will find the shifter and synchronizers will have a tendency to "break in" and actually perform better after a few miles.

If you have any technical questions on the transmission call the Tech Line at Richmond Gear at 864-843-9275.

INSTALLATION INSTRUCTIONS:

FORD® 5.0L MUSTANG T-5 REPLACEMENT

Items required to complete installation:

1. Bellhousing

The stock T-5 bellhousing must be replaced. We recommend a Lakewood safety bellhousing, part number 15202, or equivalent aftermarket bellhousing which allows for Richmond Gear 5- or 6-speed bolt up.

2. GM Transmission Mounting Pad GM #17990869

3. GM Turbo 400 Spline Yoke GM #7801551 Richmond #SY-1310

NOTE: Offset U-joint is required. Measure drive shaft for its proper length. It should have approximately 1" from face of transmission to face of yoke. Make sure yoke does not bottom out on speedometer gear inside of transmission.

Step 1: Remove Current Transmission & Console

(If applicable.)

Step 2: Remove Exhaust System

Remove the complete system from the manifold exhaust back.

Step 3: Remove Bellhousing, Starter, Clutch Plate and Flywheel

Remove pivot ball and throwout bearing fork from bellhousing and install in new bellhousing.

Step 4: Install Bellhousing

(instructions for Lakewood 15202)

Prior to installing bellhousing, remove paint in index hole and transmission mounting surfaces. This is required in order to properly indicate bellhousing.

Install flex plate, flywheel and bellhousing. Hold in place with two bolts. Look at possible bellhousing interference with exhaust on passenger side. We have found that, due to the construction of the bellhousing, it may be required to remove part of the flange in order to get clearance with exhaust in place.

Now you are ready to indicate the bellhousing

NOTE: This is very important. See instructions for bellhousing alignment. Once bellhousing is aligned with

dowel pins, remove housing and install clutch assembly, reinstall bellhousing and bolt up starter.

Step 5: Mounting the Shifter

Mount Shifter. See step 2, page 10.

Step 6: Install the Transmission

Align clutch disc to crank. Lift transmission into position. Transmission should slide against bellhousing face. Be sure input bearing retainer locates properly into bellhousing index hole. Do not force with bolts. Tighten all bolts to approximately 40 ft.lbs.

Lift shifter assembly into place and bolt into position. Mount shift rods and set rod alignment.

At this time raise the back of transmission to its proper height with crossmember and spacer installed. Watch for shifter tower interference in shifter opening in tunnel. It may be required to trim out the opening for tower clearance. Also look at reverse shift rod clearance. It may be necessary to cut off the extra rod threads at the bottom for clearance.

Once again use alignment pin and set all rods. Make sure there is rod clearance when shifting through all the gears.

Step 7: Install Exhaust System

Again make sure the exhaust system clears the bellhousing. You may want to add exhaust hangers to help support the exhaust system since the existing hangers at the transmission mount cannot be used.

Step 8: Install Mounting Pad and Spacer

Place aluminum spacer at the transmission mounting pad surface and bolt mounting pad into place. Requires (2) 7/16-14 x 3" bolts.

Step 9: Install Crossmember

With the transmission still raised, install crossmember and tighten all bolts, including mounting pad bolt.

Step 10: Install Back-up Light Switch

Cut the existing connector end off of the back-up light switch wire. Splice the wires to the furnished back-up light switch connector and plug into switch.

Step 11: Install Speedometer Assembly

This kit allows you to use your existing "Ford"

speedometer end and assemble directly to the transmission.
NOTE: Do not put cable in a severe bend. This can lead to cable breakage.

Step 12: Drive Shaft Installation

Remove yoke and U-Joint from drive shaft at transmission end. Replace yoke with GM Turbo 400 Spline Yoke (1-3/8-32 Spline Yoke x 3-1/2" LG.) **NOTE:** You will need an offset U-joint to assemble. Install drive shaft. Be sure that you have approximately 1" clearance at the end of transmission to the yoke face.

Step 13: Recheck Installation

Go over the entire installation. Be sure all bolts have been tightened, shifter rods are working freely and all wires are fastened securely.

Step 14: Lubrication

Fill the transmission with gear lube. Use a brand name lube and fill to the bottom of the fill pipe plug (approximately 2 quarts).

Step 15: Run In Procedure

With the car on jack stands, run transmission a few minutes in each gear. This will allow the lube to be circulated to all bearings and gears.

Your transmission should now be ready for many miles of great service. You will find the shifter and synchronizers will have a tendency to "break in" and actually perform better after a few miles.

If you have any technical questions on the transmission, call the Tech Line at Richmond Gear at 864-843-9275.

INSTALLATION INSTRUCTIONS: ROD CORVETTE 4 + 3 REPLACEMENT

Items required to complete installation:

1. ELECTRONIC SPEEDO SENSOR, CONNECTOR AND DRIVEN GEAR.

GM #10456087 sensor

GM #14090595 driven gear (ref. for 22 tooth)

GM #12085498 connector

NOTE: Different driven gears are available depending on rear axle ratio.

2. TRANSMISSION OUTPUT YOKE GM #14075301 (uses standard U-joint)

3. SHIFTER BOOT

Any aftermarket floor shifter boot approx. 3.5" x 4.5" (REF. HURST #1148429)

CAUTION: GM has built into these vehicles a security device which will lock out the steering wheel to prevent theft when car is not in use. This locking pin mechanism is attached to the 4 + 3 shifter. Since it is not possible to attach this cable to the ROD shifter we strongly recommend that you remove the pin or override this device for your own safety. If this procedure is not done the steering wheel will lock out.

Step 1 Removing the 4 + 3 transmission

We recommend that you purchase applicable year Corvette shop manual to assist in disassembly of your transmission. Manuals are available thru GM dealers or directly from Helm Publications at www.helminc.com.

GENERAL OUTLINE FOR REMOVAL:

- * Disconnect battery positive cable.
- * Disconnect oxygen sensor wire connection.
- * Remove complete exhaust system from exhaust manifold back.
- * Remove driveshaft after first marking differential companion flange for reassembly.
- * Remove plenum extension (distributor cover) and loosen or remove distributor cap to prevent interference with firewall.
- * Support engine with floor jack under rear of oil pan.
- * Support transmission with transmission jack.
- * Remove driveline beam. (torque arm)
- * Lower engine/transmission for access and disconnect T.V. cable (throttle valve) if applicable. T.V. cables were used in 1984 thru part of 1986 models.
- * Disconnect T.V. cable at TPI throttle and remove from vehicle.
- * Disconnect overdrive cooler lines from overdrive and at radiator. Remove lines from vehicle.
- * Drain overdrive fluid from radiator and plug radiator fitting.
- * Disconnect shifter linkage at transmission and remove weather seals from floor pan.
- * Disconnect first gear switch (if applicable) and

overdrive electrical connectors. Tape connectors to prevent shorts and fasten out of the way with wire ties.

- * Disconnect speedometer sensor and replace connector plug with GM #12085498. Plug may be wired either way.
- * Disconnect back-up (reverse) light switch and replace connector with supplied plug. Plug may also be wired either way.
- * Remove transmission assembly (4) bolts at bellhousing being careful to properly support transmission weight to prevent damage to clutch.
- * Remove driver's seat (4) bolts for seat tracks to floor. Seat bottom can be loosened to get at electrical plugs.
- * Remove shifter console trim plate with shifter boot after first removing shifter knob.
- * Disconnect the reverse lock cable from shifter.
- * Remove console storage compartment lock assembly.
- * Remove the driver's side panel from console (screws along storage compartment edge and through carpet into transmission tunnel).
- * Remove shifter assembly and mounting bracket.
- * Cut out recessed shifter mounting pocket from floor pan using body saw or similar tool.

Step 2: Install speedometer sensor

Speedometer sensor GM#: 10456087

It may be necessary to re-align sensor retainer on sensor housing for sensor electrical connector to be positioned towards bottom of transmission.

Step 3: Prior to installing the transmission

we recommend that the shifter be assembled to the transmission and all rod adjustments made. Once all rods are set, disassemble shifter and rods from the transmission and set aside.

Step 4: Install ROD transmission

- * Tighten bolts at bellhousing. (approx. 40 ft.lbs.)
- * Install driveline beam. (torque arm)
- * Install driveshaft after modification of yoke to prevent bottoming out against speedometer gear. (Be sure yoke has end plug.)
- * It may be necessary to trim floor pan for additional clearance with shifter in place.
- * Connect speedo sensor and back-up light switch wire connectors.

Step 5: Mounting the shifter

Bolt shifter into place. Fasten shifter rods to the transmission. Place shifter alignment pin in place and reset the rod length, if required. NOTE: The shifter rods must work freely without binding. Binding rods will cause hard shifting. With rods set, now set the shifter stops to prevent overshift.

Step 6: Fabricate and install a weather seal at shifter opening

This can be made from light gauge aluminum sheet and fastened to floor pan using self-tapping screws and silicone sealer. Place shifter boot over shifter handle and fasten using self-tapping screws.

Step 7: Disconnect steering wheel lock out pin or override system

For disconnecting pin see applicable year of shop manual. To override system, push cable up into case. Fasten end of cable to body using a self-tapping screw. Be sure cable will not work out of case.

CAUTION: If cable works free, the steering wheel will lock if pin is not removed.

Step 8: Replace console panel and seat

Before installing make sure transmission shifts with no interference with console. Shift through all gears.

Step 9: Fill transmission with gear lube

Fill to fill plug in transmission, approximately two quarts.

Step 10: Run in procedure

With car on jack stands, run transmission a few minutes in each gear. This will allow the lube to be circulated to all bearings and gears.

Your transmission should now be ready for many miles of great service. You will find the shifter and synchronizers have a tendency to "break in" and actually perform better after a few miles.

If you have any technical questions on the transmission, call the Tech Line at Richmond Gear at 864-843-9275.

GM® PART NUMBERS LISTED BELOW (FOR CABLE DRIVER SPEEDOMETER)

DRIVEN GEAR:	DRIVE GEAR:	DRIVEN GEAR HOLDER:	HOLDER RETAINER:	BOLT:
3987917 - 17T	361002 - 7T (GREEN)	345215	3708148	6264903 (1/4-20 X 1/2)
3987918 - 18T (BROWN)	6260705 - 8T (BLUE)			
3987919 - 19T (WHITE)	14038093 - 9T (WHITE)			
3987920 - 20T (BLUE)				
3987921 - 21T (RED)				
3987922 - 22T (BLACK)				
3860346 - 23T				
3860347 - 24T				
3860348 - 25T				

SPEEDOMETER GEAR RATIO FORMULA

SPEEDOMETER GEAR RATIO (SGR) = $\frac{63360 \times \text{AXLE RATIO}}{3141.6 \times \text{TIRE DIAMETER}}$

EXAMPLE:

REAR AXLE RATIO = 3.08

REAR TIRE DIAMETER = 26" SGR = $\frac{63360 \times 3.08}{3141.6 \times 26}$ (=) 2.389

.....
To determine speedometer gears required, multiply the number of teeth on the speedometer drive gear by SGR to determine the number of teeth required for the driven gear.*

*Richmond Gear transmissions are supplied with an 8 tooth driver gear.

EXAMPLE:

SGR X 8 = Number of Driven Gear Teeth 2.389 x 8 = 19 Teeth on Driven Gear

GENERAL TORQUE SPECIFICATIONS**

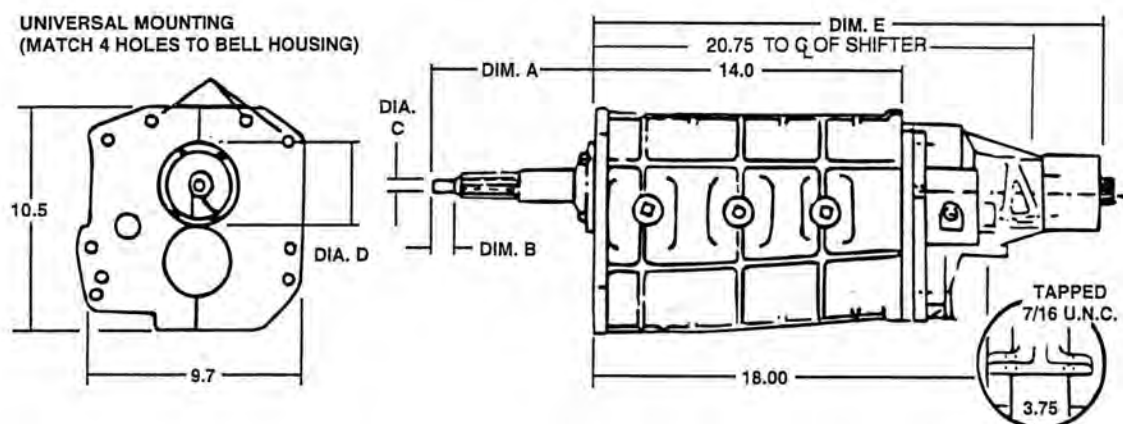
GRADE OF BOLT		SAE 1 & 2	SAE 5	SAE 6	SAE 8	N/A*		
MIN. TENSILE STRENGTH		60,000 PSI	105,000 PSI	133,000 PSI	150,000 PSI	160,000 PSI		
							SOCKET OR WRENCH SIZE	
US STANDARD							US STANDARD	
BOLT DIA.	US DEC. EQUIV.	TORQUE (IN FT.-LBS.)					BOLT HEAD	NUT
1/4	.250	5	7	10	10.5	11	3/8	7/16
5/16	.3125	9	14	19	22	24	1/2	9/16
3/8	.375	15	25	34	37	40	9/16	5/8
7/16	.4375	24	40	55	60	65	5/8	3/4
1/2	.500	37	60	85	92	97	3/4	13/16
9/16	.5625	53	88	120	132	141	7/8	7/8
5/8	.625	74	120	167	180	192	15/16	1
3/4	.750	120	200	280	296	316	1-1/8	1-1/8
7/8	.875	190	302	440	473	503	1-5/16	1-5/16
1	1.000	282	466	660	714	771	1-1/2	1-1/2
MULTIPLY READINGS BY 12 FOR INCH POUND VALUES								

*PREMIER SUPERTANIUM

**The following rules apply to the chart:

- Figures may be used directly when Never-Seer compound, Molykote, Fel-Pro C-5, graphite and oil or similar lubricants are used.
- Increase torque by 20% when using engine oil or chassis grease as a lubricant (generally not recommended for fasteners).
- Reduce torque by 20% when plated bolts are used.

MOUNTING SPECIFICATIONS



Mounting Specifications

Appl.	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Input	Output
CORVETTE	6.66	1.06	0.590	4.683	23.50	1 1/8-26	1 3/8-32
FORD	6.49*	1.14*	0.668	4.849	24.00	1 1/8-26	1 3/8-32
FORD**	7.18	1.14	0.668	4.849	24.00	1 1/16-10	1 3/8-32
FORD T-5***	7.18	1.14	0.668	4.849	24.00	1 1/16-10	1 3/8-32
GM	6.66	1.06	0.590	4.683	21.57	1 1/8-10	1 3/8-32
GM	6.66	1.06	0.590	4.683	21.57	1 1/8-26	1 3/8-32
GM T-5	6.66	1.06	0.590	4.683	24.00	1 1/8-26	1 3/8-32
GM TRUCK	6.66	1.06	0.590	5.124	21.57	1 1/8-10	1 3/8-32
MOPAR	8.57	2.54	0.748	4.807	24.00	1 3/16-18	1 3/8-32

* For small block engines - For big block cut pilot (Dim. B) by .38"

** 78-83 - 5.0L

*** 84 to 93 Mustang

Center Distance:	3.50 inches
Oil Capacity:	2 quarts (2-1/2 for GM T-5 Version)
Approximate Dry Weights:	106.500
Case & Extension Housing:	Aluminum
Controls:	Side Lever

SPEED RATIOS

INPUT SETS	26/33 RATIO INPUT/CLUSTER PART NUMBERS
GM® 1-1/8" 26 Spline	4520526/5550533
GM® 1-1/8" 10 Spline	4520510/5550533
Ford® 1-1/8" 26 Spline	4540526/5550533
Ford® 1-1/16" 10 Spline	4540510/5550533
MOPAR® 1-3/16" 18 Spline	4530518/5550533

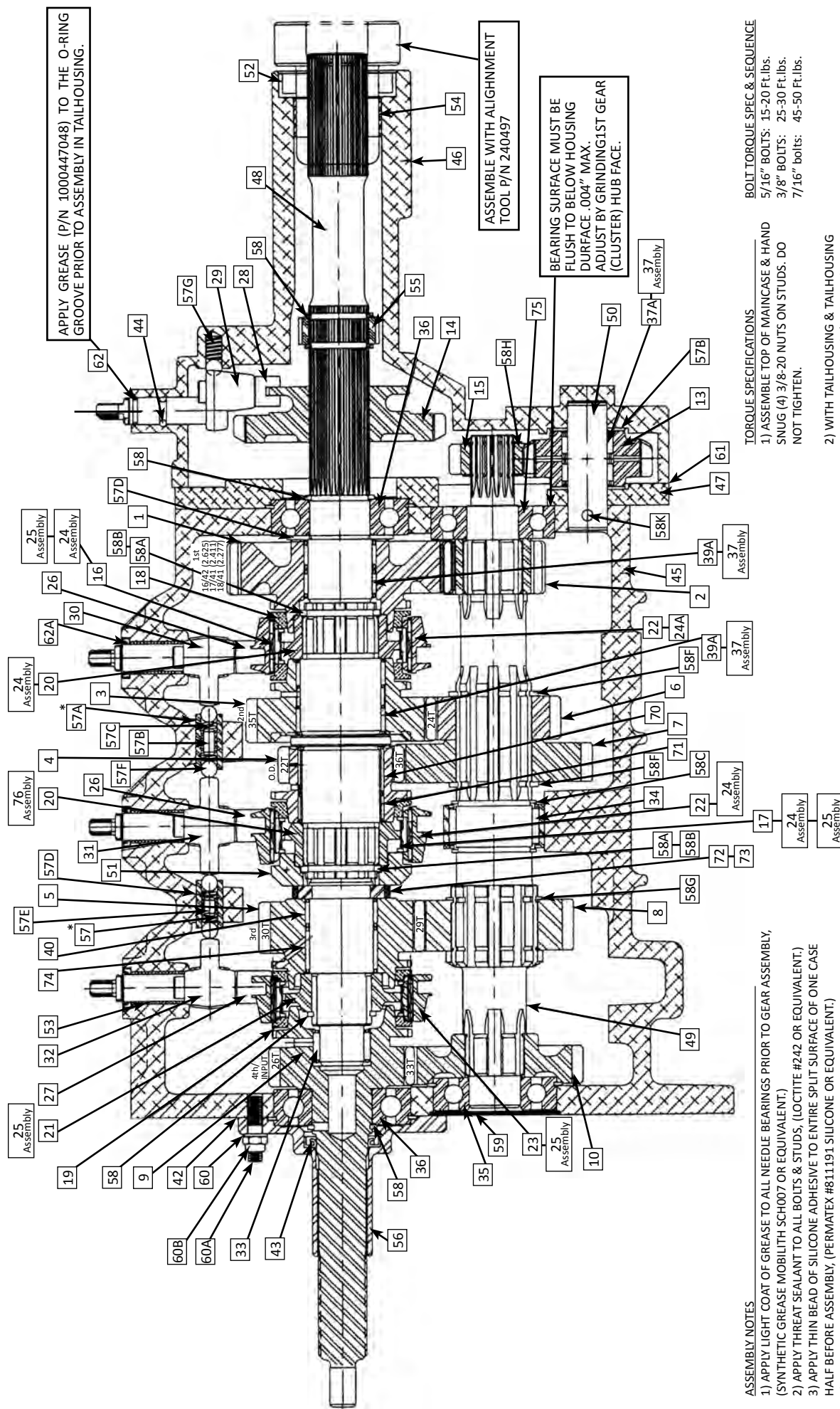
TRANSMISSION PART # DESCRIPTION

Part no. (7 digits) + Ratio Letter

EXAMPLE: 7020510A (GM® five speed, 10 spline, A Ratio)

TRANSMISSION RATIO SELECTION GUIDE			MASTER DRIVE = 26/33 SET DRIVE RATIO = 1.269			
GEAR	TOOTH COUNT	SET RATIO	MAINSHAFT GEAR	CLUSTER GEAR	RATIO	RATIO LETTER
1ST	42/16	2.625	1050542	1550516	3.33	A
	41/18	2.277	1050541	1550518	2.89	B
	41/17	2.411	1051541	1550517	3.06	C
2ND & 3RD	35/24	1.458	2350535	2550524	1.85	
	30/29	1.034	2350530	2550529	1.31	
4TH	-	-	-	-	1.00	
5TH	22/36	0.611	4150522	5150536	0.77	

SUPER STREET FIVE SPEED OVERDRIVE DIAGRAM & ASSEMBLY NOTES



ASSEMBLY NOTES

- 1) APPLY LIGHT COAT OF GREASE TO ALL NEEDLE BEARINGS PRIOR TO GEAR ASSEMBLY, (SYNTHETIC GREASE MOBILITH SCH007 OR EQUIVALENT.)
- 2) APPLY THREAD SEALANT TO ALL BOLTS & STUDS, (LOCTITE #242 OR EQUIVALENT.)
- 3) APPLY THIN BEAD OF SILICONE ADHESIVE TO ENTIRE SPLIT SURFACE OF ONE CASE HALF BEFORE ASSEMBLY, (PERMATEX #811191 SILICONE OR EQUIVALENT.)
- 4) APPLY THIN BEAD OF SILICONE ADHESIVE TO CLUSTER SHAFT CASE PLUG LOCATION, (PERMATEX #811191 SILICONE OR EQUIVALENT.)
- 5) APPLY SEALANT TO ALL OIL SEALS BEFORE PRESSING INTO ASSEMBLY, (LOCTITE #568 OR EQUIVALENT.)
- 6) ALL MAINSHAFT GEARS .006\"-.010\" ENDPLAY.
- 7) ALL GEARS .004\"-.008\" BACKLASH.

* USE SELECTIVE FIT DETENT SLEEVES TO PROVIDE .001 - .004\" CLEARANCE OF SHIFT CAM STOP WHEN 1-2 OR 3-4 CAM IS ENGAGED.

TORQUE SPECIFICATIONS

1) ASSEMBLE TOP OF MAINCASE & HAND SNUG (4) 3/8-20 NUTS ON STUDS. DO NOT TIGHTEN.

2) WITH TAILHOUSING & TAILHOUSING ALIGNMENT TOOL (P/N 240497) IN PLACE, TORQUE ALL NUTS & BOLT TO SPEC.

3) TORQUE MAINCASE BOLTS STARTING AT CENTER OF CASE, TIGHTENING IN OPPOSITE SEQUENCE, WORKING OUTWARD FROM CENTER OF CASE ENDING WITH 7/16\" NUTS.

BOLT TORQUE SPEC & SEQUENCE

5/16\" BOLTS: 15-20 Ft.lbs.
3/8\" BOLTS: 25-30 Ft.lbs.
7/16\" bolts: 45-50 Ft.lbs.

SUPER STREET FIVE SPEED OVERDRIVE REPLACEMENT PARTS

#	PART NO.	DESCRIPTION	VIEW#	PART NO.	DESCRIPTION
13	5271922	Reverse Idler Gear	58	8060000	Small Parts Kit
14	6560037	Reverse Mainshaft	59	8260000	Case Plug Kit
15	5260013	Reverse Clustershaft Gear	60	9060000	Fastener Kit
16	1304093020	Keys (All)	61	8180050	Tailhousing Gasket
17	4682AJ	Springs (All) (Not Shown)	62	8260001	Shifter Arm Seal Kit
18	1304091010	Synchro Brass 1-2 & O.D.	70	7899054	Overdrive Gear Bearing
19	6460001	Synchro Brass 3 & 4	71	7899053	Overdrive Bearing
20	6151600	Hub 1-2 & O.D.	72	8071400	Thrust Collar
21	6150000	Hub 3 & 4	73	6350006	Thrust Ring Sleeve
22	1304089006	Slider 1-2 & O.D.	74	7899442	3rd Gear Bearing
23	6520000	Slider 3 & 4	75	7855606	Rear Cluster Bearing
24	6591600	Synchro Assem. 1-2	76	6591601	Synchro Assy O.D.
25	6560002	Synchro Assem. 3 & 4	ADDITIONAL ITEMS NOT SHOWN		
26	1304096002	Shift Fork 1-2 & O.D.	PART NO.	DESCRIPTION	
27	6760000	Shift Fork 3 & 4	5980004	Reverse Back-Up Light Switch	
28	T-1024	Shift Fork, Reverse	5960000	Reverse Back-Up Switch Wire Harness	
29	6660001	Shift Arm, Reverse	63600005-21	Ford/GM Speedo Adaptor Kit	
30	6692012	Shift Arm 1-2	15202	Ford Mustang "Lakewood" Steel Bellhousing (for T-5 replacement only with Richmond 5 or 6 speed)	
31	6550005	Shift Arm O.D.			
32	6660050	Shift Arm 3 & 4			
33	7855112	Input I.D. Bearing	SY-1310	Slip Yoke Turbo 400	
34	7855716	Center Cluster Bearing	SY-1330	Slip Yoke Turbo 400	
35	7855306	Front Cluster Bearing	63600001	Ford Mustang Cross Member (T-5 Replacement Only)	
36	1000130010	Front & Rear Mainshaft Bearing			
37	7871030	Rev. Idler Gear Bearing Assem.	90600026	Screw (Ford Mustang T-5 Replace)	
38	7871052	2nd Gear Bearing Assem. (Not Shown)	6360000	GM 'F' Body Cross Member (T-5 Replacement Only)	
39	7871142	1st Gear Bearing Assem. (Not Shown)			
40	7899142	3rd Gear Bearing	63600002	Cross Member Spacer (Ford Mustang T-5 Rep.)	
42	8195086	Bearing Retainer Gasket (All)	HR5000-O	5 Speed Shifter All Except GM T-5	
43	8225750	Input Seal, Ford, Mopar & GM	HR5002-O	Replacement and Vette 4+3 Replacement	
	8245625	Input Seal, AMC	HR5003-O	5 Speed Shifter (GM T-5 Replacement Only)	
44	103565	Taper Pin			
45	7168113	Maincase (2) Halves	REPLACEMENT PARTS - GEARS		
46	7226000	Tailhousing, GM	1ST GEAR (MAINSHAFT)		
	7246000	Tailhousing, Ford & Mopar	#1	PART NO.	DESCRIPTION
	7276000	Tailhousing, (Vette 4+3)	1050542	42/16 Tooth Count	
	7246001	Tailhousing, (MUST. T-5 Rep.)	1050541	41/18 Tooth Count	
	7226001	Tailhousing, (GM 'F' body) T-5 Rep.	1051541	41/17 Tooth Count	
47	7360000	Mid-Plate	1ST GEAR (CLUSTERSHAFT)		
48	7520532	Mainshaft, GM	#2	PART NO.	DESCRIPTION
	7540532	Mainshaft, Ford, Mopar, Vette 4+3, GM T-5 Rep	1550516	42/16 Tooth Count	
49	7650000	Clustershaft (All)	1550518	41/18 Tooth Count	
50	7760001	Rev. Idler Shaft	1550517	41/17 Tooth Count	
51	6350005	Retainer O.D.	2ND & 3RD GEAR (MAINSHAFT)		
52	8255132	Tailhousing Seal	#3 & 5	PART NO.	DESCRIPTION
53	8358112	Shift Arm Bushings 1-2, 3-4 & 5	2350535	35/24 Tooth Count	
54	1000127050	Tailhousing Bushing	2350530	30/29 Tooth Count	
55	1304110002	Speedo Gear (All)	2ND & 3RD (CLUSTERSHAFT)		
56	86222911	Front Bearing Retainer, GM (26T)	#6 & 8	PART NO.	DESCRIPTION
	8644033	Front Bearing Retainer, Ford (26T)	2550524	35/24 Tooth Count	
	8644035	Front Bearing Retainer, Ford (10T)	2550529	30/29 Tooth Count	
57	6960000	Detent Kit			

OVERDRIVE GEAR (MAINSHAFT)		#4	PART NO.	DESCRIPTION
			4150522	22/36 Tooth Count
OVERDRIVE GEAR (CLUSTERSHAFT)		#7	PART NO.	DESCRIPTION
			5150536	22/36 Tooth Count
INPUT SHAFT		#9	PART NO.	DESCRIPTION
			4520510	26/33
			4520526	26/33
			4540510	26/33
			4540526	26/33
			4530518	26/33
INPUT DRIVE GEAR (CLUSTERSHAFT)		#10	PART NO.	DESCRIPTION
			5550533	26/33

TROUBLESHOOTING

All Gears Missing but Speedometer Functions

- (1) Broken mainshaft or driveshaft yoke

All Gears Missing and Speedometer does not Function

- (1) Broken maindrive or clutch

All Indirect Gears Missing/Direct Gear Present

- (1) Broken teeth on maindrive or countershaft cluster

All Indirect Gears Present/Direct Gear Missing

- (1) Broken clutching teeth on maindrive or sliding clutch

Only One Gear Missing/Others Present

- (1) Broken teeth on mainshaft gear or countershaft cluster
- (2) Broken clutching teeth on mainshaft gear or sliding clutch

Transmission Locked in all Gears

- (1) Worn or bent shift fork
- (2) Worn or broken synchronizer rings
- (3) Worn or broken detent spring
- (4) Worn or broken interlock

Transmission Locked in all Gears but One

- (1) Seized mainshaft gear

Persistent Mainshaft Oil Seal Leak

- (1) Worn universal joint
- (2) Bent or unbalanced driveshaft assy.
- (3) Worn mainshaft bushing

Noise with the Transmission in Neutral

- (1) Low oil level or improper oil used
- (2) Worn bearings
- (3) Loose material in transmission
- (4) Worn or spread case

Noise in all Gears (Quietest in Fifth)

- (1) Low oil level or improper oil used
- (2) Worn bearings
- (3) Broken or damaged maindrive or countershaft drive teeth

Noise in one or More Indirect Gears

- (1) Broken or damaged mainshaft gear or countershaft gear teeth
- (2) Broken or missing snap rings, washers, or spacers

Gear Clash in Shifting

- (1) Clutch not releasing fully
- (2) Bound clutch pilot bushing or bearing
- (3) Worn synchronizer rings or mating gear cones
- (4) Worn or broken synchronizer struts
- (5) Broken or missing synchronizer rings

Hard Shifting

- (1) Worn or bent external shift linkage
- (2) Worn or broken synchronizer struts
- (3) Broken or missing synchronizer rings
- (4) Excessively heavy oil used
- (5) Improper clutch plate clearance
- (6) Bellhousing out of alignment

Jumps Out of Fourth (Direct) Gear

- (1) Misaligned transmission case or clutch housing
- (2) Low oil level or improper oil used
- (3) Worn clutch pilot bearing or bushing
- (4) Worn clutching teeth or sliding clutch
- (5) Worn or broken detent spring
- (6) Worn or bent shift fork
- (7) Excessive maindrive endplay
- (8) Worn maindrive bearing

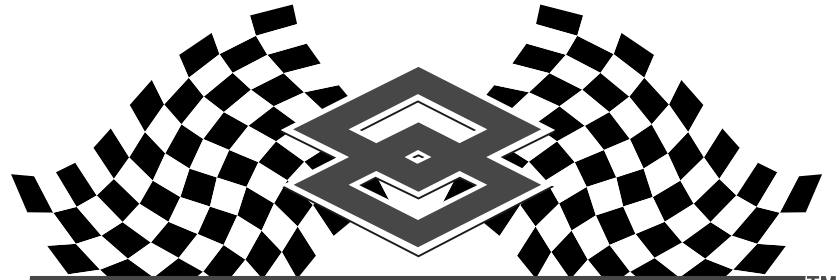
Jumps Out of One or More Indirect Gears

- (1) Low oil level or improper oil used
- (2) Worn mainshaft pilot or pilot rollers
- (3) Worn clutching teeth or sliding clutch
- (4) Worn or broken detent spring
- (5) Worn or bent shift fork
- (6) Excessive mainshaft endplay
- (7) Worn mainshaft bearing

Warranty

Warranty is limited to material and/or workmanship defect at time of shipment from the factory, and in no event shall seller have any liability for consequential damages of any kind resulting from a breach of this warranty. This warranty will be void on all products that show evidence of misapplication, improper installation, abuse, lack of proper maintenance, negligence, or alteration from original design. This warranty is in lieu of any other warranties, either express or implied, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

NOTES



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