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## TORQUE CONVERTER & TRANSMISSION Installation Instructions

For over 45 years our goal has been to provide racers and enthusiasts with reliably engineered, U.S. manufactured, torque converters and drive train components for your high performance application. *Before you start your build, please take a few moments to review the important Product Safety Information and installation steps set out within this instruction manual.* If you still have questions; Hughes Performance® technical team is here to help: (1-800-274-RACE).

### Important Product Safety Information

Throughout these instructions important safety information is generally preceded by one of three signal words indicating the relative risk of injury. The signal words mean:

**! WARNING** a hazardous situation which if not avoided could result in death or serious injury. **You CAN be Killed or Seriously Injured if you do not follow instructions.**

**! CAUTION** a hazardous situation which if not avoided could result in minor or moderate injury. **You CAN be moderately INJURED and also may suffer property damage if you don't follow instructions.**

**NOTICE** careful attention is required to follow this installation instruction or operation but does generally not relate to personal injury. Damage to your product or other property may result if you do not follow instructions.

**! WARNING:** Improper selection of Hughes Performance® products, failure to follow installation instructions and/or misuse increases the risk of injury or accident. For your safety and the safety of others:

- Assure the Hughes Performance® product selected is intended for your application with an additional safety margin above your expected horsepower, torque, and intended usage of product and vehicle.
- These instructions are not intended to address all risks related to modification of your vehicle or use. Remember: *you are the builder and chief safety engineer for your modified vehicle.* Consult and follow all OEM warnings and operating limitations.

(For Calif. Residents-Prop. 65):

### **! WARNING**

This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. (for more information on Prop. 65 see [www.P65Warnings.ca.gov/product](http://www.P65Warnings.ca.gov/product))

To reduce risks: work with gloves, safety glasses, wash hands before eating, and dispose of any fluids properly.



# TORQUE CONVERTER & TRANSMISSION

## Installation Instructions

HUGHES PERFORMANCE RACE PRODUCTS

2244 West McDowell Road

Phoenix, Arizona 85009

(602) 257-9591 • 1-800-274-RACE

## REMOVAL

1. **!CAUTION:** Before you begin - let vehicle cool for about an hour. Disconnect battery. Raise vehicle and support on jackstands. The higher you raise it, the easier it is to work under.
2. Drain oil from transmission by removing the drain plug. Pans without plug must be slowly removed by freeing one end and allowing bolts on other end to hold pan. The pan will drop down to allow the fluid to run out the end. Use a drain pan to catch fluid. Expose converter- flywheel bolts by removing converter dust cover. **Ford and Chrysler**-rotate converter to locate drain plug at 6 o'clock. Remove and drain converter.
3. Separate converter from flywheel. Remove 4 bolts on Chrysler, 3 bolts on GM, and remove 4 nuts on Ford. (You should get a box to keep all bolts, parts, and etc...so they won't get lost.)
4. Remove driveshaft, disconnect speedometer, selector, and throttle linkage, wires, vacuum lines, cooler connections and remove dipstick and tube. Remove starter from bellhousing on Chrysler and Ford.
5. **!WARNING:** Support bottom of transmission with a wide block of wood or use a transmission jack. Remove cross-member. Lower transmission slightly. Support rear end of engine if engine is mounted at front end. Remove transmission to engine bolts. Before separating transmission from engine, take precaution to keep converter in transmission - **DO NOT ALLOW IT TO FALL OUT!!** Remove transmission with converter.
6. Remove converter from transmission **carefully**.

### FORD C-4 & C-6 TRANSMISSIONS CAUTION!

**!NOTICE:** Input shaft may pull out with converter. Be careful to avoid this. Some Ford input shafts must be installed one way only due to different length splines. Installing wrong way will damage converter. Check with local Ford service department for correct installation. If shaft has slipped part way out, simply push it back as far as it will go.

## INSPECTION

1. **!NOTICE:** Examine the mating surfaces of engine block and transmission case for nicks, dirt, etc. If necessary, use a mill file to remove raised areas - Be careful not to remove metal from mating surfaces! Examine crank pilot hole and converter pilot hub for dirt, rust, paint, etc., Clean as necessary with sandpaper.
2. Inspect dowel pins in engine block. Pins must be secure and must be in good condition. Replace if loose or damaged.
3. Coat the wiping surface of the hub of converter with a film of Automatic Transmission oil. Pour one quart Trans Fluid in converter. **!CAUTION:** Install converter on transmission carefully, supporting the weight of it to avoid damage to the front pump seal. Rotate converter as you push it on.

The splined couplings (input shaft and stator support), and the pump lugs must engage properly to allow the converter to slide all the way onto the transmission. Take measurement "A" shown in FIG. 1. The correct method of measuring "A" is shown in photo, FIG. 2. Now take a measurement "B" on the engine as shown in photo FIG. 1. This is the distance between the engine block mating surface on the flywheel or flexplate. Compare the two measurements that you have taken. "A" must be greater than "B". If "A" is not greater than "B", converter is not installed properly. Pull converter off slightly, then push it on again, rotating it at the same time. Continue to do this until you feel the converter move inward and stop at proper engagement. Repeat measurement "A" must be greater than "B". Do not proceed further until you have installed converter properly.



# INSTALLATION

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1. **NOTICE:** Install transmission on dowel pins. Converter **MUST** be free to move forward and backward (end-play) after transmission is bolted to engine. Transmission and converter should mate with engine, crankshaft and flywheel with relative ease. Face of transmission flange must be flush with engine all the way around before any bolts are tightened. NEVER use bolts to "draw up" transmission to engine. DO NOT allow the transmission to hang on the dowel pins. Transmission must be supported until at least two bolts have been installed and fully tightened.
2. Check freedom of movement (thrust) of converter as soon as transmission and engine are bolted together. **NOTICE:** Converter must be free to move a minimum of 1/8", but not more than 3/16. If no end play exists, converter is improperly installed. Remove transmission and correct.
3. When end-play is satisfactory, complete the transmission installation. **NOTICE:** Check that no wires have dropped between the transmission and engine before tightening any housing bolts. Apply Loctite to converter bolts before installing them. Tighten converter bolts or nuts to 30 lb./ft.
4. **CAUTION:** Rear wheel must be elevated 3" off ground. Install 4 quarts of Trans Fluid. Start engine and complete filling as quickly as possible. Do not overfill. Run selector through all ranges with light throttle and recheck fluid level. Fluid level should be one pint low with selector in neutral or park when vehicle is on level. **NOTICE:** Operating a vehicle "in the air" with the driving wheels hanging fully down is too much angle for the driveline components and can cause damage, especially if higher speeds are achieved.
5. Inspect for leaks with engine running. Inspect all connections-especially cooler lines and radiator fittings.
6. Cooler line fittings must be tightened to 12 ft./lbs.

## Ford C-4 & C-6 TRANSMISSION-

Drain plugs must be exposed through holes in flexplate. Heat causes 90% of all transmission failures so **NOW** is the time to install a Trans Cooler.

## Chrysler TRANSMISSIONS-

Align converter drain plug opposite small hole in flexplate. This will align all four converter bolts properly.

# GENERAL INFORMATION

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**NOTICE:** This section covers many procedures that can be applied to all vehicles as general practice as well as many procedures and precautions for specific application.

- O-rings and seals must be kept clean and lubricated prior to installation.
- **NOTICE:** All vehicles must have sufficient electrical grounding from the engine/transmission assembly to the frame or serious transmission bushing and washer failure can occur. Always check the vehicle for ground straps and install a new one if none is found.
- Always jack the transmission against the strong pan edges. Jacking in the center of the pan can bow it in, which can shut off the filter suction hole or break the filter. See FIG. 4.
- Check brake cables, vacuum lines, throttle cables, etc. for correct routing before disassembly to insure correct rerouting on assembly.
- Cars with T-tops should have top selections in place before raising to insure against distorting the weak roof structure.
- Disconnect all necessary under-hood items that are accessible before raising the vehicle. This saves time by not going back and forth from top to bottom.
- **CAUTION:** Loosen or remove any items that might be damaged when the engine tilts from the weight of the transmission, such as a distributor cap that is close to the firewall.
- Remember the exact and easiest order in which items were removed. Much time is saved by reinstalling items in reverse of the easiest removal.
- **NOTICE:** Limited space often attributes to fill tube bending and cable breakage and should be carefully avoided. Bent or cracked tubing and cables will leak repeatedly until repaired or replaced, and servicing them is often difficult with all else in place.



## GENERAL INFORMATION (CONTINUED)

- Don't waste time removing difficult items that will be easier to access once the crossmember is removed and the unit is lowered.
- **NOTICE:** Hold the case cooler line fittings with a wrench if it turns with the line fitting when removing or installing the cooler lines. When both fittings turn together, the line will twist or kink.
- Check or place the seals on the transmission side of a 4X4 transfer case after removal. These seals separate transmission and transfer case fluids and serve as a rear transmission seal. Check with a small dull screwdriver to confirm that the rubber is not hard or cracked.

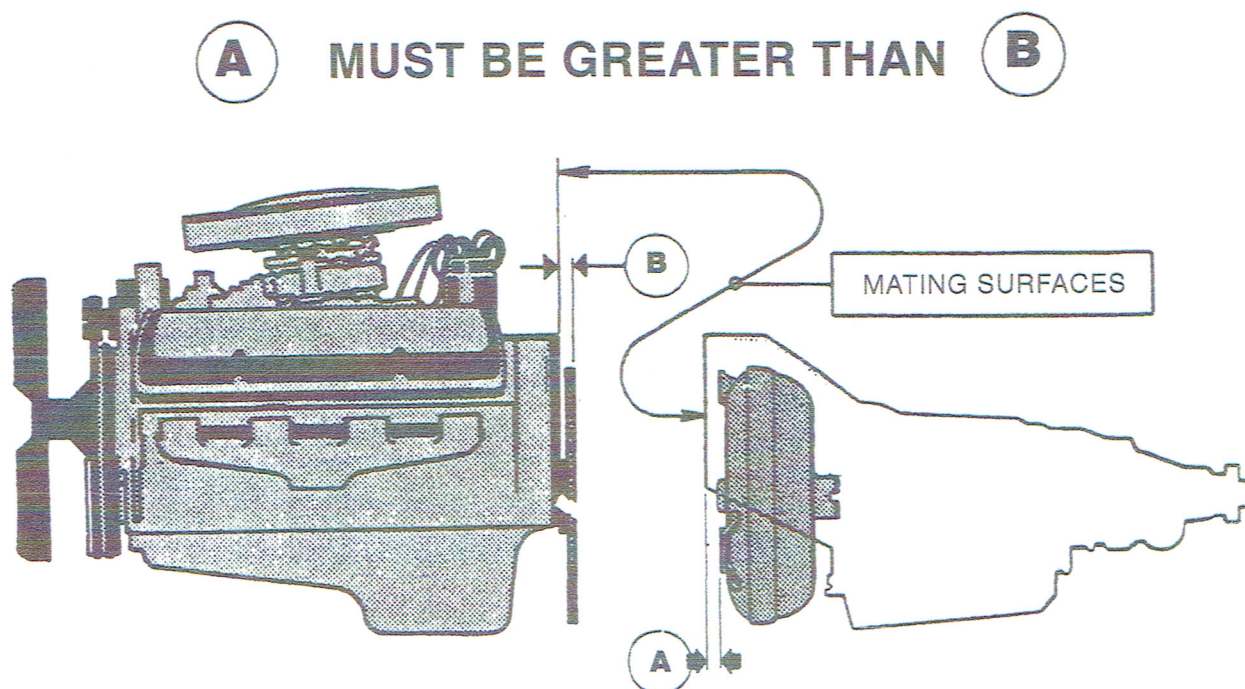


FIG. 1

### DEPTH CLEARANCE:

|                               |                                       |
|-------------------------------|---------------------------------------|
| Chrysler-Torqueflite 727..... | 1 1/4" From Bell Housing to Ring Gear |
| GM Turbo-Hydramatic 350 ..... | 1 1/8" From Bell Housing to Pads      |
| GM Turbo-Hydramatic 400 ..... | 1 3/16" From Bell Housing to Pads     |
| Ford C-6.....                 | 1 1/8" From Bell Housing to Ring Gear |

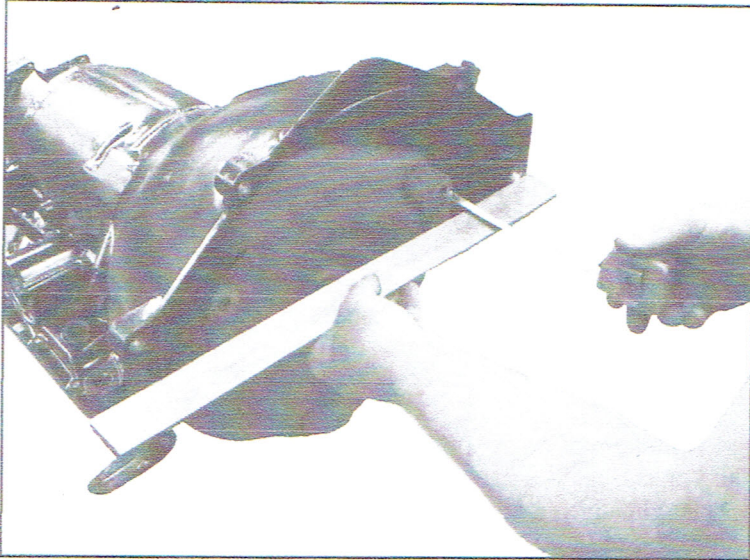
\* Distance may vary either way .050".

## THROTTLE CABLES AND LINKAGE

- Most transmission sense engine demands through the use of throttle linkage (cables or rods).
- Throttle linkage (abbreviated as T.V. linkage) provides a link between the engine throttle and the transmission. As engine throttle opens, the linkage works the transmission throttle valve and increases pressure accordingly.
- Proper adjustment is critical. When the T.V. is set too low, the transmission will shift too soon and too soft. If this occurs, the overall transmission is too low and excessive slippage will result. When the T.V. is set too high, the transmission will shift late and hard, because the pressure is too high.

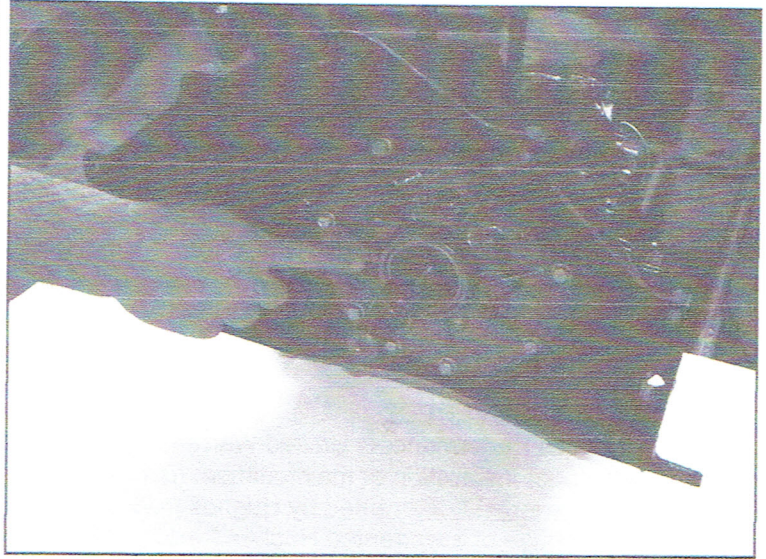


FIG. 2



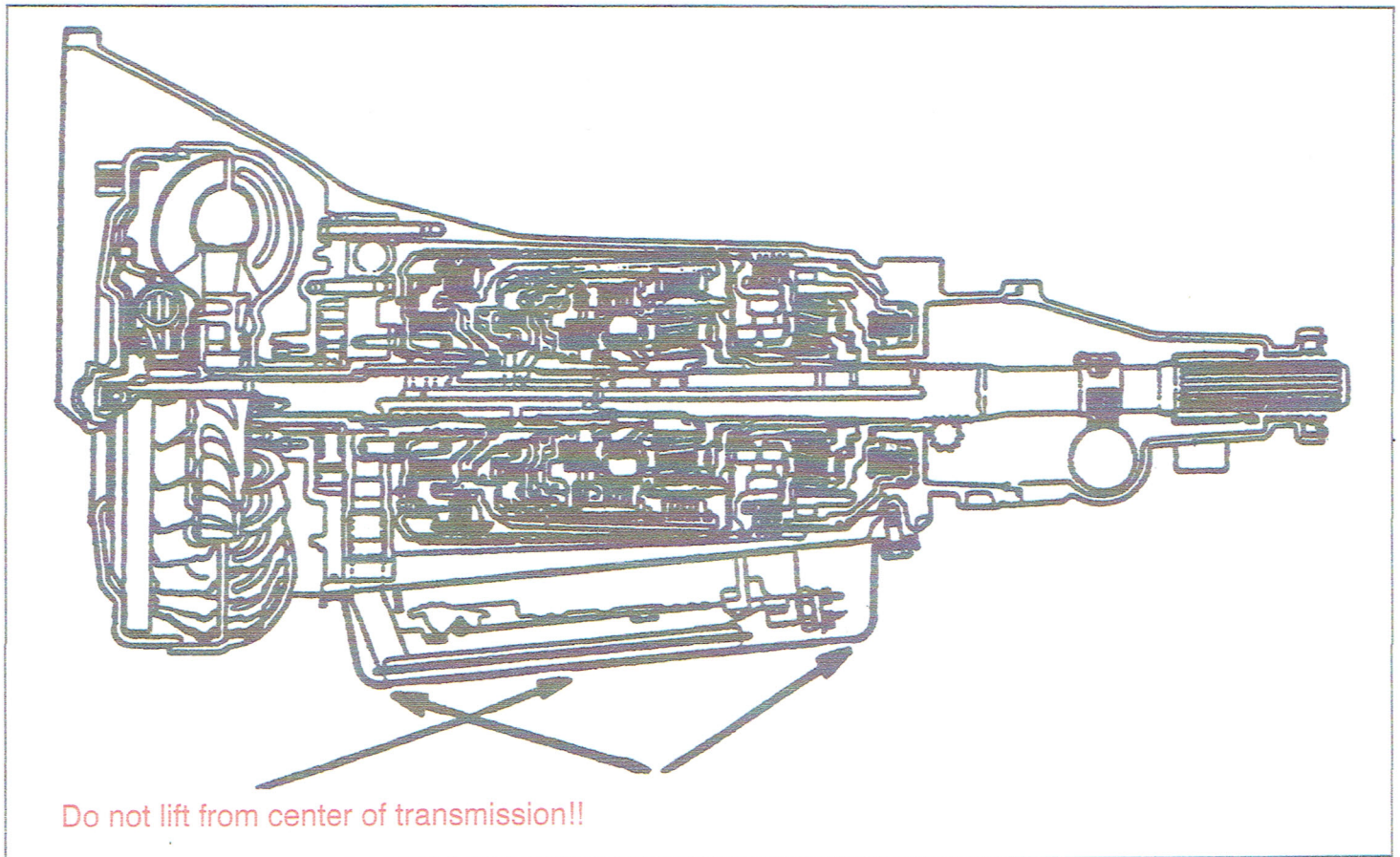
*Measure the depth of mounting pad face (A) from the mounting flange face. Notice that the left hand that is holding the straight edge is also pushing the converter in toward the transmission.*

FIG. 3



*The finger points to the front pump seal which wipes the hub of the converter. Be sure not to damage seal when indexing converter.*

FIG. 4





## Hughes Performance® Limited Warranty©

Hughes Performance® products are covered by the following **Limited Warranty** provided exclusively by Hughes Performance, 2244 W. McDowell Rd. Phoenix, AZ 85009.

### **WHAT IS COVERED?**

Subject to the terms, exclusions and limitations herein, Hughes Performance® warrants to the initial retail purchaser that your Hughes Performance® transmission, torque converter, or powerglide™ gear set are free of defects in material or workmanship for the following term, measured from the date of retail purchase: (A.) Street/Strip complete transmission & / or torque converter-1 year; (B.) Race complete transmission-30 days; (C.) Powerglide™ helical cut billet planetary gear sets-1 year; (D.) Powerglide™ straight cut billet planetary gear sets-2 years.(E.) All other components-1year; Subject to your rights under law as described below, Hughes Performance® makes no warranty with respect to other components, kits or services. Transmissions and / or torque converters for repair or freshening are warranted for 90 days; covering the repaired parts and labor only.

### **WHAT IS NOT COVERED?**

Your Hughes Performance® Limited Warranty does not cover: (A.) failure or defect of a Hughes Performance® product due to improper installation or maintenance; (B.) damage to your vehicle, related components, other products or property not expressly warranted by Hughes Performance® including failures or defects which contribute to or cause failure or damage of a warranted Hughes Performance® product; (C.) wear and tear or reduced performance reflecting customer use, (D.) Acts of God, weather, corrosion, accidents, theft, vandalism, neglect, vehicle construction or repair techniques, vehicle configuration or misuse contrary to: instructions, warnings, law or other exclusions of your vehicle or component limited warranties. (E.) Disassembly of any product by means other than a Hughes Performance® technician will void any potential warranty. (F.) there is NO warranty on any electrical part.

### **Remedy Limited to Repair/Replacement**

The exclusive remedy provided under this Limited Warranty shall be either repair or replacement of the failed or defective part, at the Hughes Performance's facility provided. Repair of a Street/Strip or Race transmission is limited to replacement of all friction material, seals, and gaskets. Customer requesting warranty consideration should first contact customer service (800-274-RACE) to obtain a Returned Merchandise Authorization (RMA) number. All Removal, shipping and installation cost are customer's responsibility.

### **Other Exclusions-Limitations of Damage-Your Rights Under State Law**

In consideration of the purchase price paid, neither Hughes Performance® nor any independent distributor are responsible for any time loss, loss of vehicle use, lost business or promotional opportunities, rental costs, transportation, labor or for any incidental, consequential, punitive or other damages you may have or incur in connection with your Hughes Performance® purchase. **Your exclusive remedy hereunder for covered parts is repair/replacement as described above.** This Limited Warranty gives you specific rights. You may also have other rights that vary from state to state. For example, some states do not allow limitations of how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the limitations and exclusions herein may not apply to you. All other warranties are hereby disclaimed, except to the extent prohibited by applicable law in which case any implied warranty of merchantability, fitness for a particular purpose or other implied warranty are limited to the period of express warranty provided above. Hughes Performance® reserves the rights to require invoice or other proof of purchase as a condition of repair or replacement.

**NOTE:** Cataloged, special order items or custom built parts that are waiting for payment and have not been shipped or picked up within 90 days of completion will become the property of Hughes Performance® and will be subject to sale. Items that are paid for will be stored at customer request for no longer than 120 days.