

## TH350/TH400/700R4/200R Installation Procedures

- 1- **CONVERTER WARNING** – NEVER install the transmission with the converter bolted to the engine. Pour one quart of transmission fluid into the converter to pre-lube it. Align the converter hub drive slots with the transmission pump drive lugs and install the converter onto the transmission, properly engaging the two sets of splines and the pump drive. The converter should be rotated back and forth until it is completely nested into the front pump.
- 2- **TRANSMISSION** – Bolt the transmission to the engine carefully, **DO NOT FORCE IT**. If the transmission will not install flat against the engine, **FIND OUT WHY**. The converter hub slots may not be properly engaging the transmission pump gear lugs and using force will result in both damage to the transmission pump and converter.
- 3- **CONVERTER CHECK** – **VERY IMPORTANT** – After bolting the transmission to the engine, make sure the unbolted converter is still nested into the transmission as far as it will go. Then check to be sure there is approximately a 1/8" to 3/16" gap between the converter mounting pad and the flex plate. Use a drill bit as a feeler gauge. (EXAMPLE: For Large Gap – For a clearance of 1/4", the gap must be reduced by installing one flat washer (1/16" thick) between each converter mount and the flex plate). The converter pilot should have a good fit into the crankshaft and extend 1/8" into the crankshaft pilot. NOTE: In the event there is less than 1/8" clearance, the converter mounting pads have to be modified. Do not install a converter with incorrect clearance.
- 4- **CONVERTER** – After installed converter clearance has been proven to be correct, bolt the converter to the flex plate. Proper converter clearance is required to allow normal movement of the crankshaft, converter and transmission pump gears. The clearance variation is caused by the manufacturing tolerances of all the related components.
- 5- **ADDING FLUID** – After installation is complete but while the car is still on jack stands, pour (4-5) quarts of transmission fluid into the transmission. Then place the transmission in neutral, start the engine and quickly add fluid until it reaches the full mark on the dipstick. Shift the transmission into reverse and let it run approximately (3) minutes. Running in reverse for three minutes will allow any contaminants in the transmission, cooler, converter or cooler lines a chance to settle into the transmission pan and not be introduced to the automatic shift control part of the valve body or governor, causing the shift valves to stick. NOTE: After running in reverse for three minutes, shift through all the gears and recheck the fluid level.

**DO NOT OVERFILL** – Overfilled will cause fluid foaming at dipstick or breather, overheating or premature unit failure.

**DO NOT UNDERFILL** – A low fluid level will result in damage to the pump, bushings, thrust washers, gears and burn the clutches and band.

After a short test drive, inspect the completed installation including the driveshaft to be sure everything is properly installed and safe. Check shifter adjustment in all gear positions. Check for fluid leaks and **RECHECK** the fluid level.

# 700R4 Lock Up Wiring

All Performance Automatic 700R4 transmissions (parts nos. PA70102 and PA70104) are wired for torque converter lock up in 4<sup>th</sup> gear only and are checked on our dyno for proper operation prior to shipment.

There are two types of installations.

**Type I**- Installation in a vehicle that did not have a 700R4 in it from the factory and/or does not use factory wiring. Examples would be street rods or replacing a TH350 or TH400.

**Type II** – Installation in a vehicle that already has a 700R4 in it and still uses the factory wiring for lock-up.

## Type I

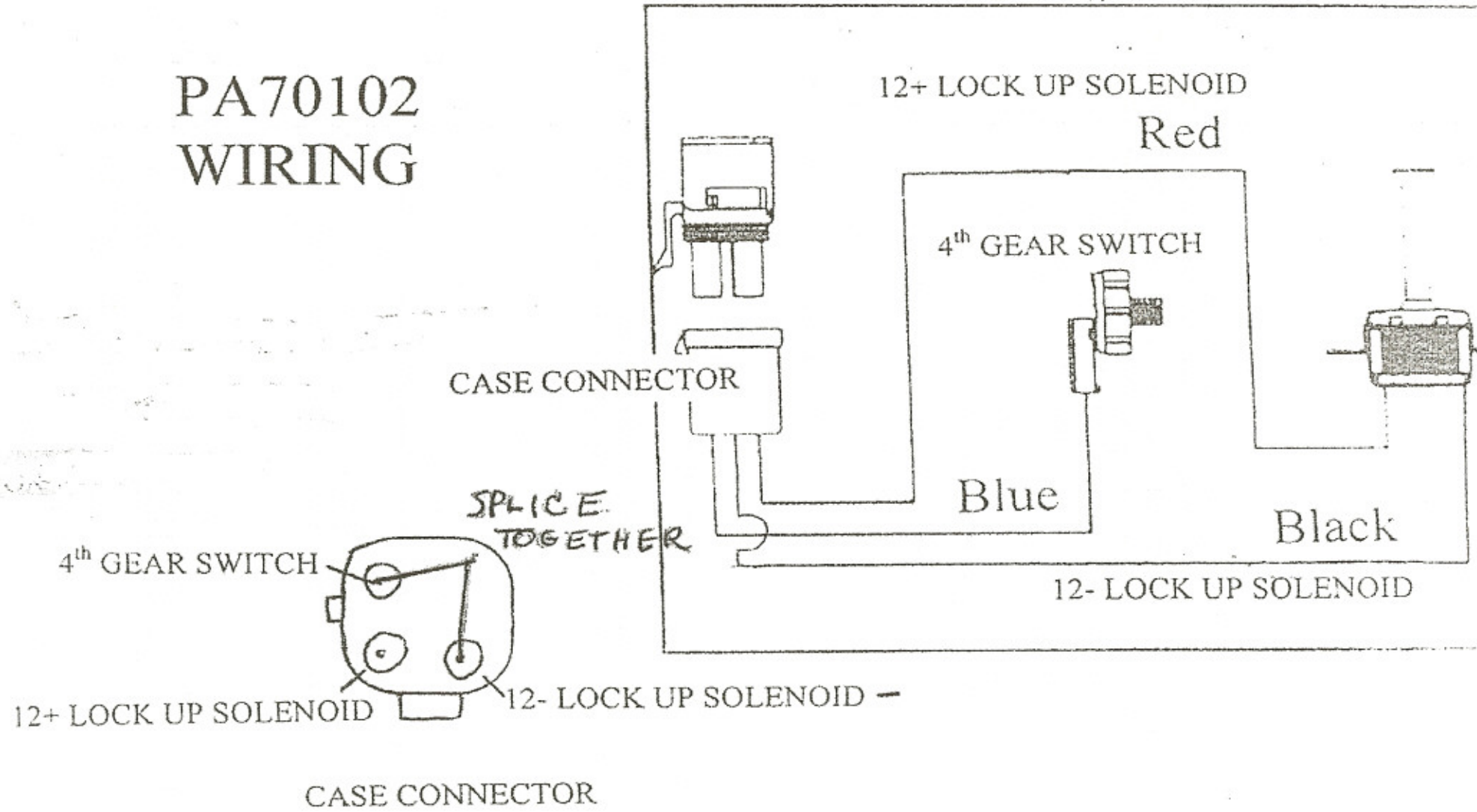
There is no need to remove the transmission pan. Connect the external wires from the white connector supplied to the appropriate source. If you desire a one wire toggle switch operated lock-up just splice together the 4<sup>th</sup> gear pressure switch wire and the 12 (negative) volt wires as indicated in the drawing. Then connect the 12 positive wire to a power source. The use of delay boxes or other devices may require a different procedure. Check the wiring instructions that come with the device. This simple wiring will provide for torque converter lock-up in fourth gear only. Performance Automatic does have an adjustable delay box for easier operation and better drivability. Part number PA11400. Contact Performance Automatic directly for this product and others like it.

## Type II

If you are installing the transmission in a vehicle that was originally equipped with a 700R4 and the computer is still functional the internal wiring must be changed from the original unit to the new unit. Failure to do this will result in no lock-up or shorted circuits. This is a simple procedure and is best done before the new transmission is installed. Simply remove both transmission pans and observe what wiring, solenoid and pressure switches need to be changed from your old unit. Make sure to switch *everything*. Do not re-use the switch that is connected to the blue wire in the new unit even though it may look the same as the original one. You can take a digital picture of the wiring to help you with this procedure. It is actually quite easy and should take only about 10 minutes. Again, failure to change this wiring in a factory replacement application will result in no lock-up, short circuits or check engine light.



# PA70102 WIRING



## Torque Converter & Transmission Installation Instructions

**STEP 1** – Before you begin, allow the vehicle cool for about one hour. Disconnect the battery. Raise the vehicle and support on jack stands. The higher you raise it, the easier it will be to work under. If you are installing a new converter and transmission, skip to STEP 3.

**STEP 2** – Drain oil from the transmission by removing the drain plug. Pans without plugs must be slowly removed by freeing one of the pan and allowing the bolts on the other end to hold the pan. The pan will drop down to allow the fluid to drain into the drain pan. Remove the remaining bolts and slowly lower the pan and pour the remaining fluid into the drain pan.

**STEP 3** – Expose converter-flex plate bolts by removing the converter dust cover. FORD-CHRYSLER rotate converter to locate the drain plug at 6 o'clock. Remove plug & drain converter. Separate converter from flex plate. Remove four bolts on Ford & Chrysler and three bolts on GM.

**STEP 4** – Remove drive shaft, disconnect speedometer, selector, throttle linkage, vacuum lines, cooler line connections, dipstick & filler tube and starter motor on Ford and Chrysler.

**STEP 5** – Support bottom of transmission with wide block of wood or a transmission jack. Remove cross member. Lower the transmission slightly. Support rear of engine if engine is mounted at the front. Remove engine to transmission bolts. Before separating engine & transmission, take precaution to keep the converter in the transmission- **DO NOT ALLOW IT TO FALL OUT!** Remove transmission with converter.

### FORD C4 & C6 TRANSMISSIONS CAUTION!

Input shaft may pull out with the converter. Be careful to avoid this from happening. Some Ford input shafts must be installed one way due to different length spline. Installing the wrong way will damage the converter. If the shaft has slipped part way out, simply push it back in as far as it will go. Inspect the input shaft for wear and burrs. You may need to replace the input shaft. Performance Automatic sell aftermarket hardened shafts.

### Converter Installation

**STEP 1** – Inspect 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 for dirt, rust, paint etc. Clean as necessary with emery cloth. Also check the conditions of the dowel holes and pins. Replace the pins if loose or damaged.

**STEP 2** – Coat the wiping surface of the converter hub with transmission fluid. Add one (1) quart of fluid to the converter. Install the converter on the transmission, support the weight of the converter as to not damage the front pump seal. Rotate the 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



into the transmission. Take measurement "A" shown in Figure 2. The correct method of measuring "A" is shown in Figure 3. Now take measurement "B" on the engine as shown in Figure 2. This is the distance between the engine block and the mating surface and the converter mount mating surface on the flex plate. 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 at the same time. Continue to do this until you feel the converter move inward and stop at proper engagement. Repeat measurement "A" and compare it again with "B". "A" must be greater than "B". Do not proceed further until you have installed converter properly. See Depth Chart for correct depths.

\*\* Before installation, make sure you have the correct dipstick configuration for your application. Performance Automatic offers a complete line of dipsticks for most applications. Improper fluid levels can lead to immediate failure and will void your warranty.

### **Initial Installation Checks**

- 1 – Check flex plate for cracks around crank and converter mounting holes.
- 2 – Make sure converter bolt pattern and bolt hole size matches the flexplate. Most 10" and smaller diameter converters utilize a 7/16"x20 bolt hole. It may be necessary to enlarge the converter bolt holes on the flexplate.
- 3 – Check driveshaft yoke for excessive wear and apply small film of transmission fluid to the yoke before installation.

### **Installation**

**STEP 1** – Install transmission on dowel pins. Converter **MUST** be free to rotate and move forward and backward (endplay) after the transmission is bolted to the engine. Transmission and converter should mate with the engine, crankshaft and flex plate with relative ease. Face of transmission flange must be flush with the engine all the way around before any bolts are tightened. **NEVER** use bolts to "draw up" the transmission to the engine. **DO NOT** allow the transmission to hang on the dowel pins. Transmission must be supported until at least two (2) bolts have been installed and completely tightened.

**STEP 2** – Check freedom of movement (thrust) of converter as soon as transmission and engine are bolted together. Converter must rotate freely and must have end play. Converter must be free to move at minimum of 1/8", but not more than 3/16". If no end-play exist, converter is not properly installed. Remove transmission and correct. **NOTE:** If using a motor plate/mid-plate please refer to the instruction sheet with the spacer kit.

### **Ford C4 & C6 Transmissions**

The Converter drain plug must be exposed thru holes in the flex plate.

### **Chrysler Transmissions**

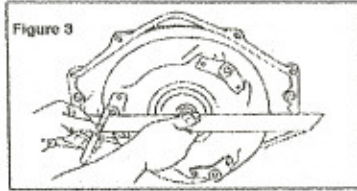
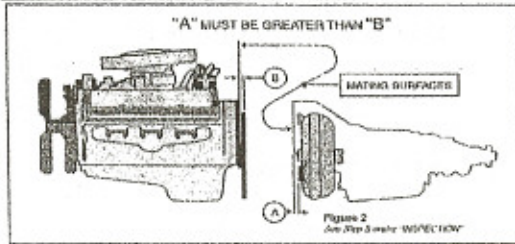
Align converter drain plug opposite small hole in the flex plate. This will align all four bolt holes properly.

**STEP 3** – When endplay is satisfactory, complete the transmission installation. Apply Loctite to the converter bolts before installing them. Tighten converter bolts to 30 ft/lbs.

**STEP 4** – Attach shifter linkage to shifter arm on transmission. If installing an aftermarket shifter, skip this step and follow that manufacturers instructions for shifter adjustment. Otherwise put the transmission and shifter in neutral and install cable/linkage to transmission and check for proper movement in each gear. There should be no tension on the shifter lever when in any gear and the cable should slide in and out of the lever with no resistance. If your transmission utilizes a vacuum modulator, hook that up as well as any wiring used. Attached cooler lines and tighten to 12 ft/lbs.

**STEP 5** – Rear wheels must be elevated at least 3 inches off the ground. Install four quarts of transmission fluid. Start engine and complete filling as quickly as possible. Do not overfill. Run the selector thru all ranges with light throttle and re-check fluid. Fluid level should be on full mark with selector gear in neutral or park when vehicle is on a level surface.

**STEP 6** – Inspect for leaks with engine running. Inspect all connections, especially cooler lines and radiator fittings.



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

**DEPTH CLEARANCE:**  
 Chrysler - Torqueflite 727 1-1/4" from Bell Housing to Ring Gear  
 Chrysler - Torqueflite 727 19/32" from Bell Housing to Pads  
 GM Turbo-Hydramatic 350 1-1/8" from Bell Housing to Pads  
 GM Turbo-Hydramatic 700R/4L60E/2004R 1-1/8" from Bell Housing to Pads  
 GM Turbo-Hydramatic 400 1-3/16" from Bell Housing to Pads  
 GM Powerglide 1-1/8" from Bell Housing to Pads  
 GM 4L80E 1-1/8" from Bell Housing to Pads  
 GM 4L60ELS1 1-1/8" from Bell Housing to Pads  
 GM Allison 1-1/8" from Bell Housing to Pads  
 Ford C-6/C-4 1-1/8" from Bell Housing to Pads  
 Ford Case Filled C-4 27/32" from Bell Housing to Pads  
 Ford AODE 1-1/32" from Bell Housing to Pads  
 Ford AOD 1" from Bell Housing to Pads  
 Ford 5R55S 1" from Bell Housing to Motor Plate  
 Ford E4OD/4R100/5R110 58/64ths from Bell Housing to Pads  
 \*Distances may vary either way .050".