Installation Instructions
TRANSPAK

Fits 1965-1987 GM Turbo Hydramatic 400, Turbo Hydramatic 375, and M40 Automatic Transmissions

Part No. 20228

Rev. 1/10/2020

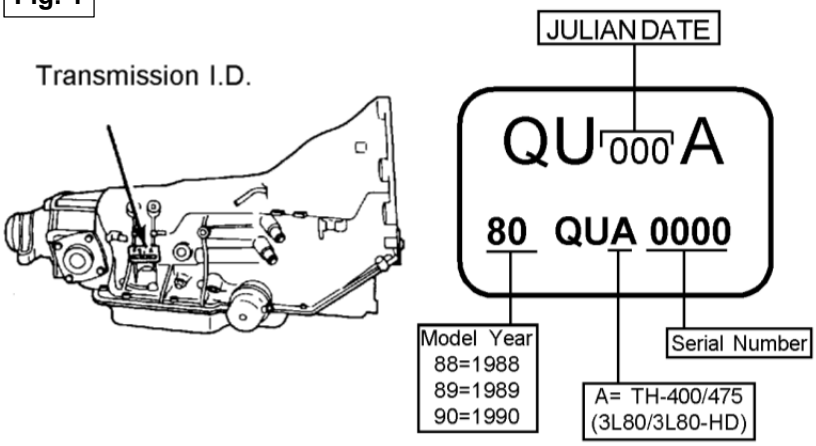
WORK SAFELY! For maximum safety, perform this installation on a clean, level surface and with the engine turned off. Place blocks or wedges in front of and behind both rear wheels to prevent movement in either direction.

CAUTION: To avoid any possibility of bodily injury or damage to vehicle, do not attempt installation until you are confident that the vehicle is safely secured and will not move.

IMPORTANT NOTICE

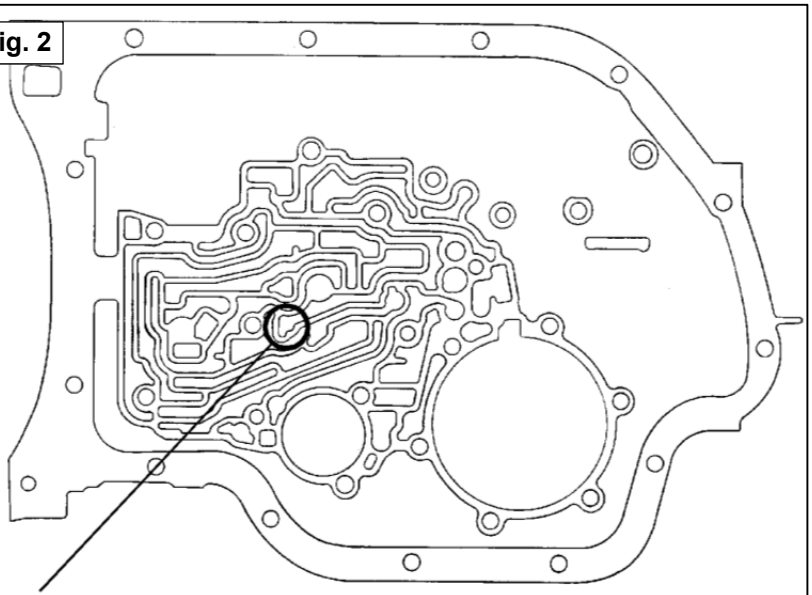
Hydramatic introduced a revised transmission case just after the beginning of the 1988 model year. If you are installing the B&M TH-400 Transpak in a late model vehicle which has had the transmission replaced after 1988 you must check the Julian date stamped on the transmissions I.D. tag (See Fig. 1) before attempting to install this kit. Do not use this kit in transmissions built on or after November 23, 1987 (Julian date 327).

Fig. 1



If the I.D. tag is unreadable or missing you will have to remove the oil pan and valve body from the transmission to determine if your transmission has an early or late style case (See Fig. 2). This kit will work correctly in all 1965-1987 TH-400 transmissions.

Fig. 2



Make sure there is **no** checkball in this location. **If 1988 and later TH-400 will have a checkball in this location in which this kit (#20228) will not work.**

NOTE: The B&M TH-400 Transpak is not a cure-all for an ailing transmission. If your transmission is slipping or in poor general shape, the installation of this Transpak may worsen the condition. However, on a properly operating transmission in average condition, the Transpak will provide the kind of transmission performance you're looking for.

When installing your B&M TH-400 Transpak there are several other B&M performance products you may wish to consider:

Transmission Oil Cooler - We feel that it is very important that every vehicle used in a heavy duty application and high performance applications (racing, towing, RV, etc.) should have an oil cooler. Heat is the major cause of transmission failures, and an oil cooler is an inexpensive safeguard against overheating and failure. B&M offers a wide range of transmission coolers to suit every application.

Trick Shift Performance ATF – Trick Shift performance automatic transmission fluid is the industry's leading performance ATF. A specially blended oil with foam inhibitors, extreme pressure agents and shift improvers, this fluid assures protection while delivering the fastest possible shifts. You literally "Pour in performance."

Drain Plug Kit - The TH-400 transmission is not factory equipped with a drain plug. The B&M Drain plug kit is inexpensive and easy to install. It eliminates the mess of pan removal and gasket replacement normally required when changing fluid.

Deep Pan – B&M offers seep pans for the TH-400 transmission that provide 3 to 4 quarts additional oil capacity which significantly contributes to the cooling ability of the oil. No modifications to the dip stick are necessary and a fluid pickup extension is provided.

Torque Converters – B&M offers a wide range of street torque converters for the TH-400 transmission. See your B&M dealer for details of the correct torque converter for your vehicle.

Adjustable Vacuum Modulator – This replacement vacuum modulator for the TH-400 has the added feature of being adjustable. The adjustable feature allows you to tailor your shift points within a range of 2-4mph.

Trans Temperature Gauge Kit – Most transmission and converter failures can be traced directly to excessive heat. The B&M transmission temperature gauge can save you a costly repair bill by warning you ahead of time of an overheated transmission. The B&M temperature gauge is extremely accurate and dependable, it comes with all necessary hardware and is easy to install.

B&M Shifters – B&M manufactures a complete line of automatic transmission shifters ideally suited for use with the TH-400. These shifters provide you with positive transmission control as well as stylish appearance for your vehicle's interior.

TH-400 Kickdown Switch – When installing a TH-400 transmission in a custom installation in place of a TH-350 or a TH-700 this kit provides a kickdown switch that will fit in place of the TH-350 or TH-700 throttle cable bracket.

INTRODUCTION

NOTE: The B&M TH-400 Transpak can be installed in a few hours by carefully following instructions. Transmission components are precision fit parts. Burrs and dirt are the number one enemies of an automatic transmission. Cleanliness is very important, so a clean work area or bench is necessary. We suggest a clean work bench top from which oil can easily be cleaned or a large piece of cardboard.

This kit contains all parts necessary to obtain three levels of performance depending on intended use:
Heavy Duty: For towing, campers, motorhomes and 4-wheel drive vehicles. Heavy Duty level is a good starting place for light weight, high powered vehicles such as street rods. Heavy Duty level produces firm noticeable shifts.

Street: Dual purpose performance vehicles, street and strip performance cars and off road vehicles. Street level produces very firm, positive shifts.

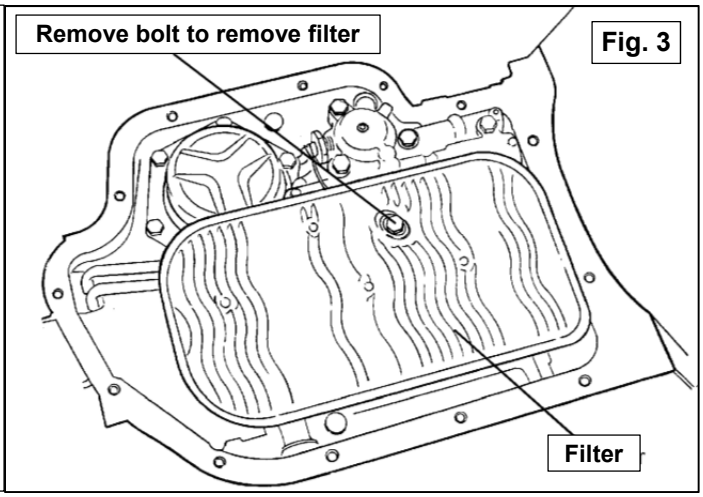
One of the main features of the B&M TH-400 Transpak is that it gives you the ability to downshift into low gear at any speed and you can also hold the transmission in low gear up to any speed you want.

DISASSEMBLY

Automatic transmissions operate at temperatures between 180°F and 240°F. We recommend that the vehicle be allowed to cool for several hours before attempting disassembly to avid serious burns from hot oil and parts. MAKE SURE THE VEHICLE IS RIGIDLY AND SECURELY SUPPORTED, JACKSTANDS, WHEEL RAMPS OR A HOIST WORK BEST. DO NOT USE JACKS ALONE.

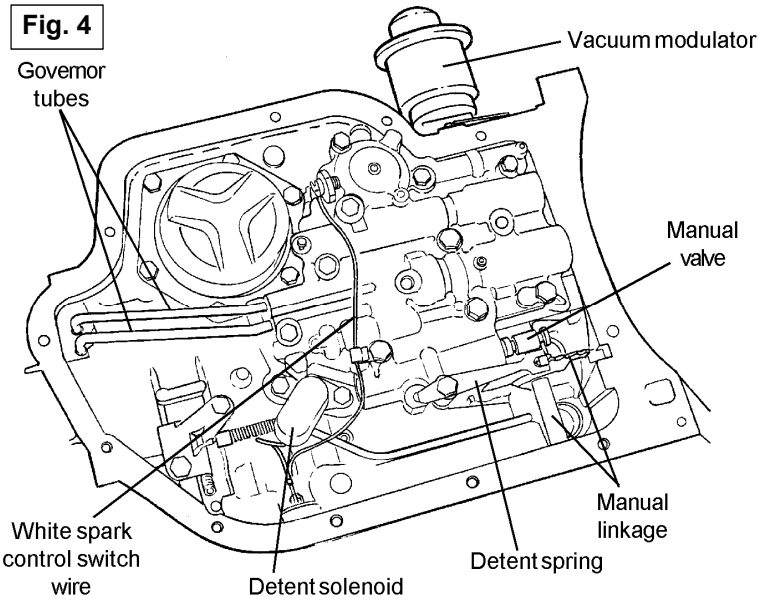
1. Have an oil drain pan ready to catch oil and a clean tray on which to put small parts so they won't get lost or dirty. Drain the oil by removing the rear pan bolts and work towards the front leaving the two front bolts in place. If the pan is stuck to the case pry the pan loose with a screw driver. Slowly remove the remaining two front bolts allowing the rest of the fluid to drain.

2. Oil Filter Removal (See Fig. 3): Remove the shoulder bolt holding the filter and pull the filter straight down. Some models also use a spacer between the filter and valve body. If the oil pick-up tube did not come out with the filter, pull it out. Remove the O-ring from the bore in the case if it did not come out with the oil pick-up tube. Be careful not to scratch the case bore when removing the O-ring.



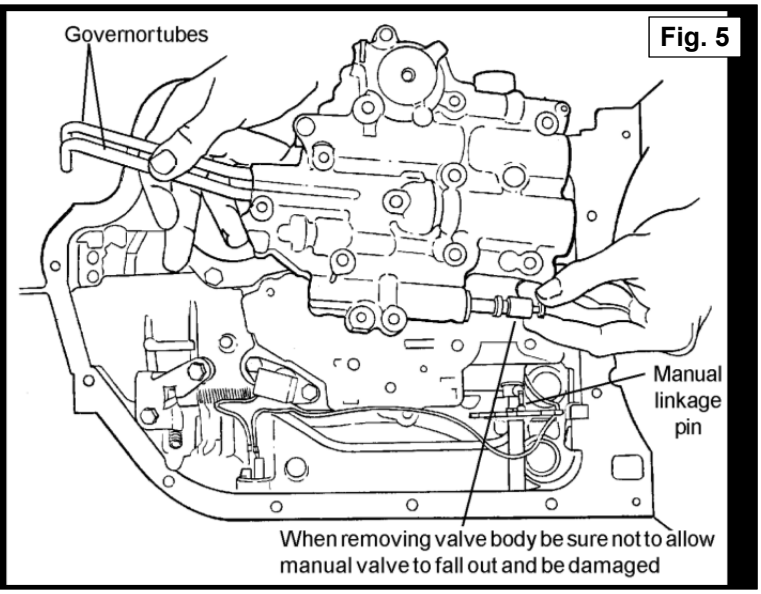
3. Observe the location of the following (See Fig. 4) Manual linkage, detent spring with roller and the way linkage engages the manual valve in the valve body, governor tubes and their outing, detent solenoid and its wire connector, white spark control switch wire and routing of the wire.

Fig. 4



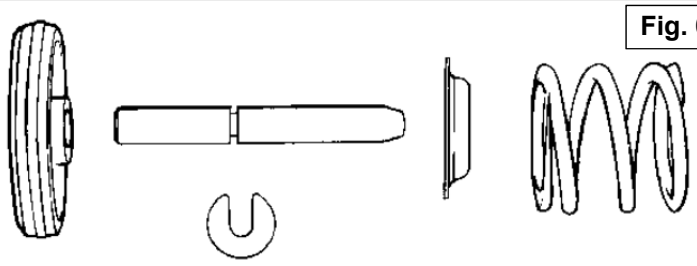
4. There are (3) 1/4-20 and (8) 5/16-18 bolts holding the valve body. Remove all but one valve body bolt and disconnect the spark control switch wire if present. Hold the valve body while at the same time pulling straight down on the governor tubes (See Fig. 5). Place the valve body in the oil pan to avoid contamination.

Fig. 5

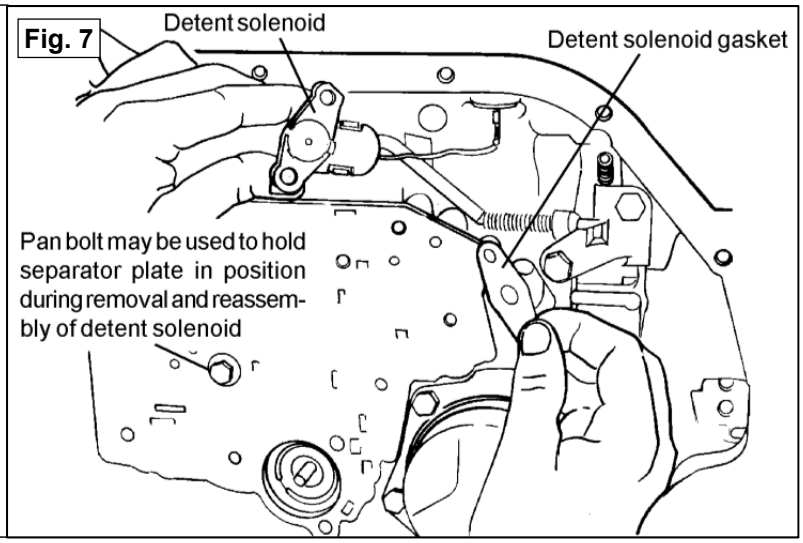


NOTE: The front servo may fall out of the case. If it does, See Figure 6 for reassembly order. Use grease or petroleum jelly to hold the servo components in place.

Fig. 6

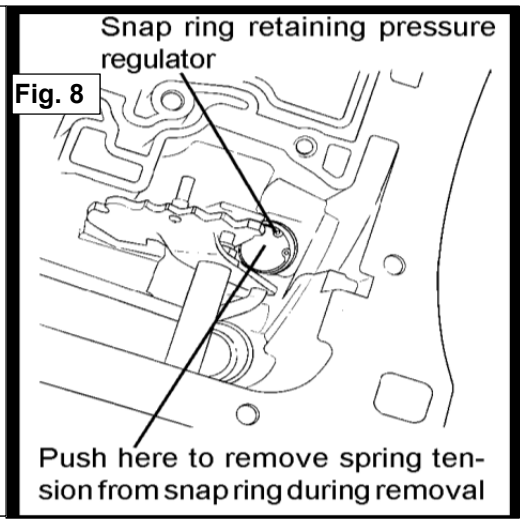


5. Use 1 pan bolt to hold the separator plate in place while removing the solenoid. Remove the two bolts holding the detent solenoid (See Fig. 7) and allow the solenoid to hang by its wire. Remove the pan bolt and carefully lower the separator plate. Be careful not to lose the (6) 1/4" steel check balls that are on top of the separator plate. The check balls will be used over again. Carefully remove all gasket material from the valve body and oil pan surfaces of the case and valve body. All old gasket material must be

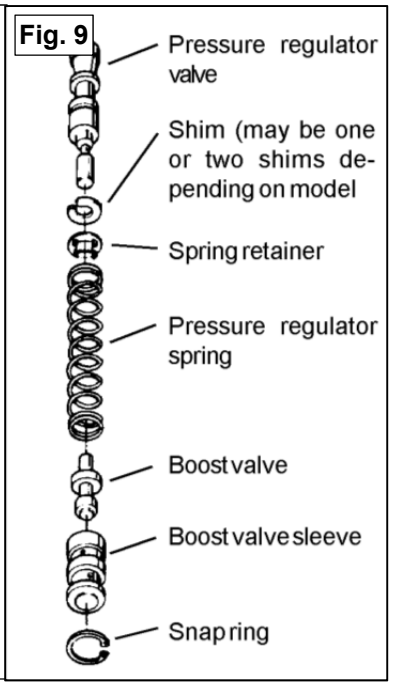


MODIFICATIONS

6. Pressure Regulator: Locate the pressure regulator bore near the selector lever linkage (See Fig. 8). Push up and hold the boost valve sleeve with a slender rod or screw driver, then remove the pressure regulator retaining ring. Slowly lower the boost valve assembly being careful not to let the spring loaded parts fly out. You may have to tap the boost valve sleeve to free it.



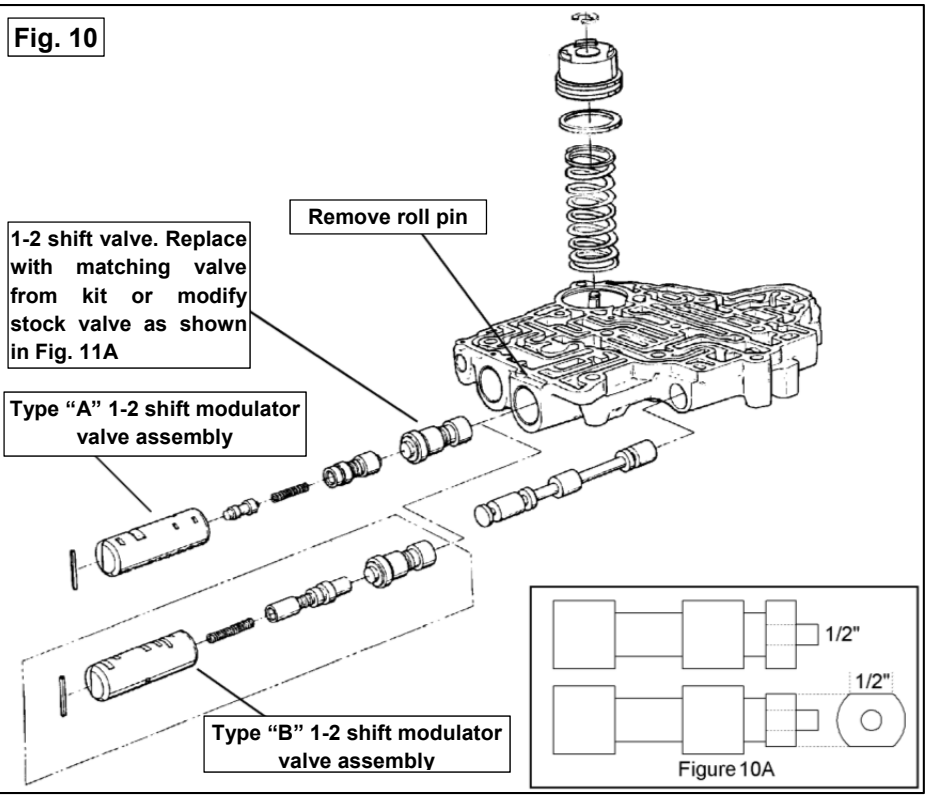
Remove the boost valve sleeve and valve, pressure regulator spring, pressure regulator valve, spring retainer and 1 (or possibly 2) “C” shaped shims (See Fig. 9). Replace the stock regulator spring with the spring supplied in the kit. To install the assembly place one shim on the pressure regulator valve followed by the spring retainer with its tangs facing toward the spring. Use a dab of grease or petroleum jelly to hold the shim and retainer in place. Slip the spring over the valve so it is centered on the retainer. Push the entire valve and spring assembly up into the bore. Make sure the boost valve is in the sleeve then install the sleeve up into the bore. Push the boost valve sleeve up in the bore and install the new retaining ring supplied in the kit. Double check the ring to make sure it is fully seated in its groove.



7. Valve Body: Place the valve body on a clean work bench with the channel side up. Remove the roll pin holding the 1-2 shift valve train in place (See Fig. 10). Carefully remove the 1-2 shift modulator sleeve and 1-2 shift valve from the bore. You may have to use a small screwdriver to pry the sleeve out. Try not to raise any burrs on the sleeve during removal.

Compare your stock 1-2 shift valve with the valve supplied in the kit. If your valve is the same diameter, you will need to modify the stock valve.

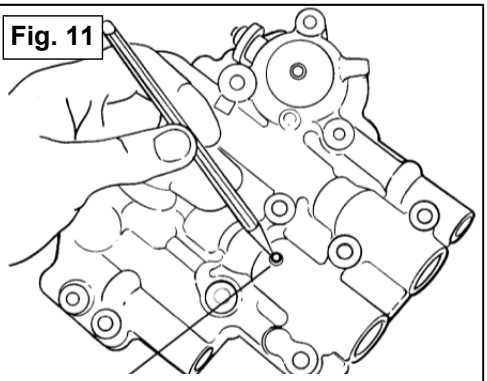
Fig. 10



Modification to stock valve: Grind (2) 1/2" wide flats onto the land nearest the 1-2 spring (See Fig. 10A). Install the 1-2 shift valve into the bore with the smallest diameter pointing out (See Fig. 10). Reinstall the 1-2 shift modulator valve assembly as removed and replace the roll pin. Using a small screwdriver check to make sure the 1-2 shift valve slides back and forth freely.

Turn the valve body over and install the special cup plug in the hole shown in Figure 11 and then tap it down until it is flush with the surface. Do not use excessive force when tapping the plug, it may distort the casting.

Fig. 11

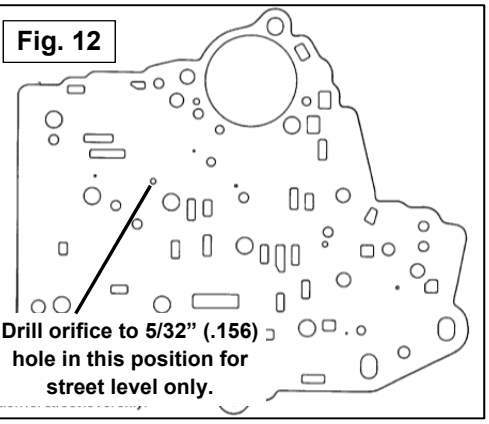


Install furnished expansion plug in the hole indicated. Tap gently until just flush.

8. **Street level only:** Drill the B&M Separator Plate orifice indicated in Figure 12 using the 5/32"(.156) drill supplied in kit.

9. Thoroughly clean the valve body and separator plate in clean solvent to remove any contamination. Remove any old gasket material stuck on the valve body channel surface.

Fig. 12



Drill orifice to 5/32" (.156) hole in this position for street level only.

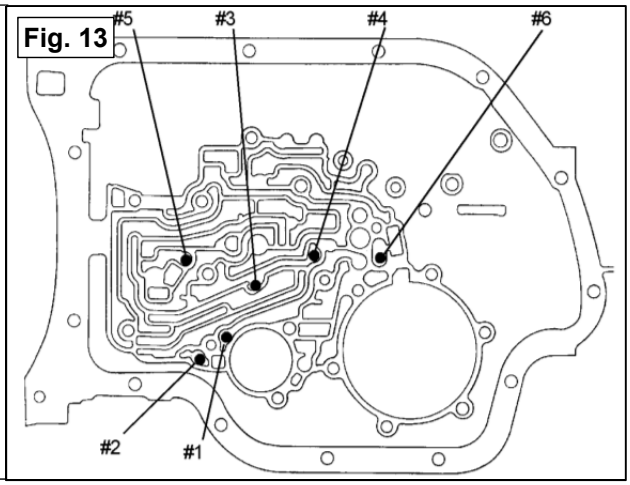
REASSEMBLY

10. Check Ball Placement: Install check balls in the locations shown in Figure 13 as follows:

Street: Three check balls, one each, in locations 4, 5 & 6 (do not install check balls 1, 2 & 3).

Heavy Duty: Six check balls, one each in locations 1, 2, 3, 4, 5 & 6.

Fig. 13

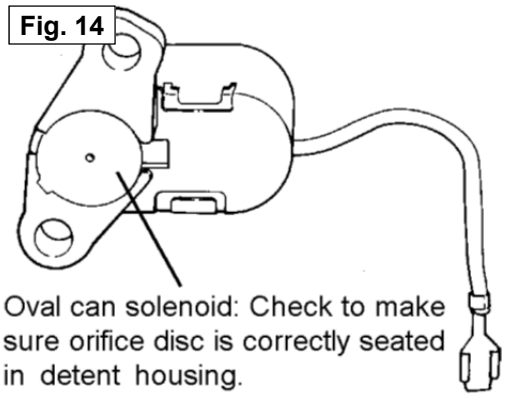


11. Place the upper valve body gasket (has "C" punched in it) on to the B&M separator plate (use grease or petroleum jelly to hold it in place). Install the plate and gasket against the case and use a clean pan bolt to hold it in position for now (See Fig. 7).

12. Carefully examine the Detent Solenoid.

Oval Can Solenoid: Make sure the orifice disk is present and properly seated in the casting (See Fig. 14). If the disc is missing, the transmission will be in passing gear all the time. Install the solenoid into position along with the new metal gasket supplied with the kit. Install the (2) 1/4-20 bolts, finger tight. Remove the pan bolt you used to hold the plate and gasket in place.

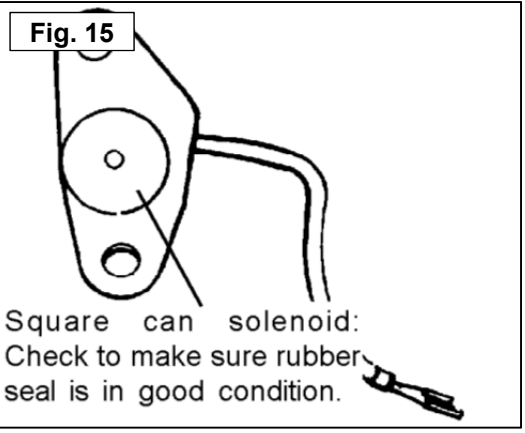
Fig. 14



Oval can solenoid: Check to make sure orifice disc is correctly seated in detent housing.

Square Can Solenoid: Make sure the rubber seal is in good condition and has not nicks or cuts (See Fig. 15). If the seal is damaged, you will have to replace the solenoid. If the seal leaks, the transmission will be in passing gear all the time. Install the solenoid into position, DO NOT use the metal gasket supplied in the kit. Install the (2) 1/4-20 bolts, finger tight. Remove the pan bolt you used to hold thd plate and gasket in place.

Fig. 15



Square can solenoid: Check to make sure rubber seal is in good condition.

13. Insert the governor tubes into the valve body (See Fig. 5). Lay the lower valve body gasket (has "VB" punched in it) into position on the valve body (use grease or petroleum jelly to hold in its place). Make sure the manual valve is in its bore. Install the valve body onto the transmission, guiding the governor tubes into their holes at the rear of the case. Push up on the valve body and tubes and engage the manual valve on the shift linkage. Install one bolt to hold the valve body in place.

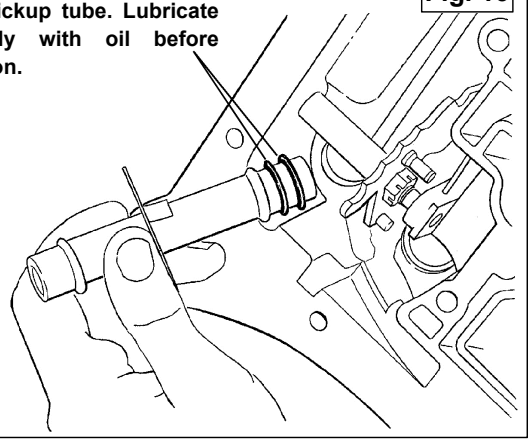
14. Install all the valve body bolts finger tight. Make sure the detent spring is in position and riding on the internal shift lever (See Fig. 4). Make sure the manual valve is engages with the pin on the internal shift lever. Tighten all valve body and solenoid bolts to 8-10ft.lbs (11-13.6Nm). Route the white spark control wire and connect to pressure switch on valve body. Check the operation of the manual valve by running the range selector through all gear positions.

15. Inspect your filter for damage or clogging. If it has more than 20,000 miles on it, we recommend it be replaced.

16. Install (2) filter O-rings on the filter pick-up tube (See Fig. 16). Lubricate the O-rings with clean ATF then push the pick-up tube and filter assembly up into the transmission. On 1968 and later models install filter spacer (if present) and should bolt then torque to 8-10ft.lb (11-13.6 Nm).

Install two furnished O-rings on the pickup tube. Lubricate thoroughly with oil before installation.

Fig. 16



17. Clean the oil pan and scrape off any old gasket material from the pan and case. You may want to install a B&M Drain Plug kit before installing the pan. The drain plug kit will help eliminate the mess when changing transmission oil. Install the pan and new gasket and torque bolts 8-10ft.lbs (11-13.6Nm). Do not overtighten the bolts.

18. Add 4 quarts of fresh ATF. Dexron II is fine for Heavy Duty Level applications, however we recommend B&M Trick Shift ATF for Street for firm positive shifts and improved transmission life. With the vehicle wheels still off the ground start the engine and shift the transmission through all the gears. Place the selector in Neutral and check the fluid level. It should be between the Add and Full marks. DO NOT OVERFILL! This can cause foaming and overheating. Stop the engine and lower the vehicle.

19. Drive the vehicle several miles to warm up the transmission. Park on a level surface and check the AFT level. It should be between Add and Full.

TOOLS

1	3/8” drive ratchet or speed handle
1	1/2" socket, 3/8” drive
1	7/16” socket, 3/8” drive
1	Small Flat Screwdriver
1	Small Internal Snap Ring Pliers
1	Small Hammer
1	Torque Wrench 0-10ft.lb (0-13.6Nm)
1	1/4" Drill Motor
1	Vise

TROUBLE SHOOTING GUIDE

Malfunction	Probable Cause
Slips	Valve body bolts loose. Low fluid level. Boost valve in Pressure regulator improperly installed.
Overheating	Insufficient cooler capacity clogged lines or cooler.
Foaming oil at dipstick or breather	Fluid level too high. Clogged lines or cooler.
Erratic shifting	Vacuum line cracked or leaking. Shifter not properly adjusted. Kickdown switch not properly adjusted. Low fluid level. High fluid level. Valve body bolts loose. Kickdown solenoid loose.
Late hard shifts	Vacuum line cracked or leaking. Kickdown solenoid loose or damaged. Kickdown solenoid gasket damaged.
Will not shift	Kickdown solenoid loose or damaged. Governor tubes not properly installed. 1-2 Shift valve sticking. Cup plug installed to deep.
Pump buzz or whine	Low fluid level. High fluid level. Cut, damaged or missing pick-up tube O-rings.

TH-400/TH-475 (3L80/3L80-HD) TRANSPAK PARTS LIST

Inspect the contents of your Transpak kit carefully. If you are missing any of the parts shown below, do not proceed. Contact your B&M dealer. Don't forget to purchase about 5 quarts of ATF (See #18.)

1	20228 Instructions
1	Solenoid Gasket
1	Separator Plate
1	Oil Pan Gasket
1	5/32" Drill
1	Separator Plate/Case Gasket
1	Valve Body/Case Gasket
2	Filter Pick-up Tube O-ring
1	Pressure Regulator Spring
1	Retaining Ring
1	Small Brass Plug
1	Large 1-2 Shift Valve

IMPORTANT: RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

B&M Performance & Off-Road