



Installation Instructions

Ford C-6 Shift Improver Kit

1967-1991

© B&M Automotive Products 1997

The **B&M Ford C-6 Shift Improver Kit** has been designed to work on all **1967 thru 1991 Ford C-6's**.

WARNING: Incorrect checkball placement can result in serious transmission damage. Be sure to follow the instructions carefully.

We recommend that you read through the instructions completely before beginning the installation, so you can familiarize yourself with the installation procedure and tools required. Check the tool list at the end of these instructions for the tools required to install your **B&M Ford C-6 Shift Improver Kit**.

Installation of the **B&M Ford C-6 Shift Improver Kit** can be accomplished by anyone with minimum mechanical experience. It is however, important to closely follow the instructions.

NOTE: The **B&M Ford C-6 Shift Im-**

prover Kit is not a cure-all for an ailing transmission. If your transmission is slipping or in poor general shape, the installation of this Shift Improver Kit may worsen the condition. However on a properly operating transmission in average condition, the Shift Improver Kit will provide the kind of transmission performance you are looking for.

When installing your Shift Improver Kit there are several other **B&M** 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 (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 need, which are

available at your **B&M** dealer.

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." Available at your **B&M** dealer.

TEMPERATURE GAGE KIT 80212 Most transmission and converter failures can be traced directly to excessive heat. The **B&M** transmission temperature gage can save you a costly repair bill by warning you ahead of time of an overheated transmission. The **B&M** temperature gage is extremely accurate and dependable, it comes with all necessary hardware and is easy to install.



C-6 INTRODUCTION

This kit can be installed in a few hours by carefully following directions. Read all instructions first to familiarize yourself with the parts and procedures. Work slowly and do not force any parts. Transmission components and valves 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 two levels of performance depending on intended use:

1. **Heavy Duty:** Towing, campers, motorhomes, police, taxi, etc.
2. **Street/Strip:** Dual purpose performance vehicles. Street and strip high-performance cars, on and off road desert vehicles and 4-wheelers.

Automatic transmissions operate at temperatures between 150°F and 250°F. It is suggested that the vehicle be allowed to cool for a few hours to avoid burns from hot oil and parts. The vehicle should be off the ground for ease of installation. Jack stands, wheel ramps, or a hoist will work fine. **Make sure the vehicle is firmly supported!!**. Try to raise it 1-2 feet so you have plenty of room to work easily. Have a box or pan handy to put small parts in so they won't be lost.

DISASSEMBLY

STEP 1. C-6's do not have drain plugs. You may want to install a B&M Drain Plug Kit at this time, Part No. 80250. Drain the oil by removing the back oil pan bolts and work towards the front slowly. (Note: Some vehicles will require removal of the cross-member to remove the pan. Make sure you support the back of the transmission so you don't damage linkage or engine parts.) Do not remove the front two bolts yet. If the pan sticks to the gasket, insert a screwdriver between the pan and the case and pry the pan down slightly to break it loose. Now remove the two front bolts slowly. This will lower the pan to allow the rest of the fluid to drain. Lower the pan and set it aside. Put the pan bolts in your tray.

STEP 2. Manually operate the kickdown rod from the carburetor with the gas pedal depressed half way. (See Fig. 1) Note how it moves freely with no bind. Observe how the internal linkage engages the valve body. Note: Some '75 models may have a slightly different oil filter than pictured.

STEP 3. Remove the eight valve body attaching bolts (See Fig. 2) and remove the valve body by pulling straight down. Put the valve body in the oil pan.

STEP 4. Adjust the front band. Loosen the outer jam nut with a 13/16" wrench. (See Fig. 1) Tighten the band adjusting screw to 120-in. lbs and back off 1-1/2 turns. Hold the band adjusting screw in this position and tighten the jam

nut securely. Now move to the bench and work on the valve body.

STEP 5. Lay the valve body on the bench with the filter side down. Remove the two upper bolts. (See Fig. 3) Note: One is short and one is long. Set them aside.

STEP 6. Turn the valve body over and remove the filter retaining bolts. (See Fig. 4) These are long bolts with one bolt being extra long. Remove filter and gasket.

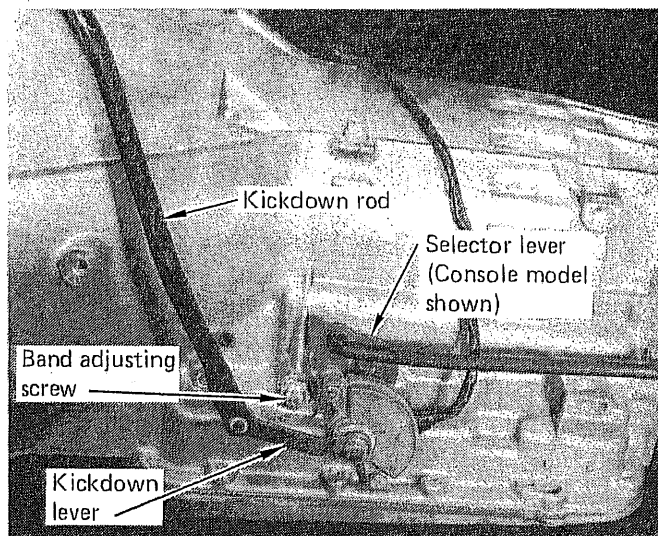


FIGURE 1

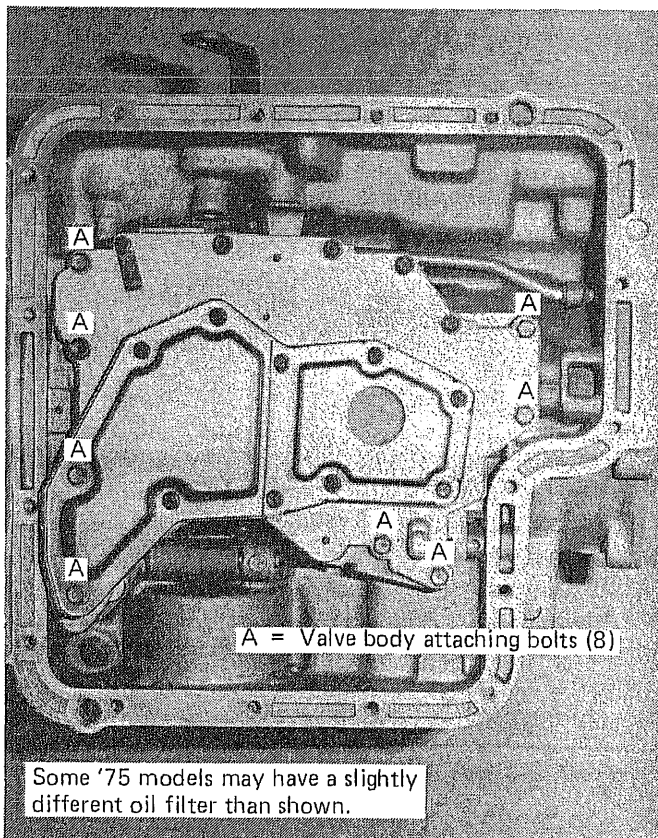


FIGURE 2

STEP 7. Remove the remaining valve body bolts as shown in Figure 5. Note these are short bolts with one long bolt. The valve body consists of three parts. The thick aluminum housing with all the valves is called the casting, a thin alumi-

num plate called a transfer plate that the filter was attached to, and a thin steel plate called a separator plate.

STEP 8. Lift the transfer plate assembly up, turn it over and set it aside. Remove the converter check valve assembly. This is a small steel valve or ball with a fine pitch spring. (See Fig. 6) Set them aside so they won't be confused. (The check valve may be stuck to the separator plate). Remove the throttle pressure check ball assembly. (See Fig. 6) This ball uses a coarse pitch spring. Set it aside so it won't be confused. Remove the 2-3 check ball from its pocket. (See Fig. 6) Do not lose the 3-2 downshift valve retainer. Some 1977 and later models have a low reverse check ball (See Fig. 6) **Do not** discard low-reverse check ball, if equipped. Set aside for later reinstallation.

STEP 9. Turn the casting so the long end plate faces up. (See Fig. 7) This end plate holds seven sets of valves in place. Remove eight bolts holding the end plate in place. Hold the end plate in place with your thumb while removing the last bolt. Slowly lift the end plate off to expose seven sets of valve and springs. If you hold the casting with the valves facing up, they won't come out and get mixed up. Remove one at a time as follows:

- A. Intermediate Servo Modulator Valve – All models: Remove the exposed spring and replace it with the special plug supplied with kit.
- B. The following valves remain stock: 2-3 back-out valve, 2-3 shift valve, 1-2 shift valve, and line pressure coasting regulator valve.
- C. Cut-back valve:

Heavy Duty: No modifications are necessary for this application

Street/Strip: Remove cut-back valve and install the 1/4" steel ball supplied with the kit into the valve bore. Install the valve as removed.

No modified valve should be above the surface of the casting. If the plug is not below the surface of the casting, it will have to be ground down slightly.

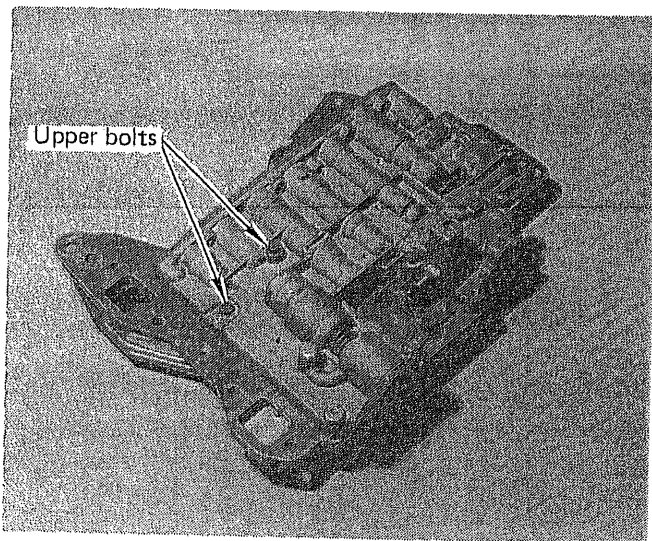


FIGURE 3

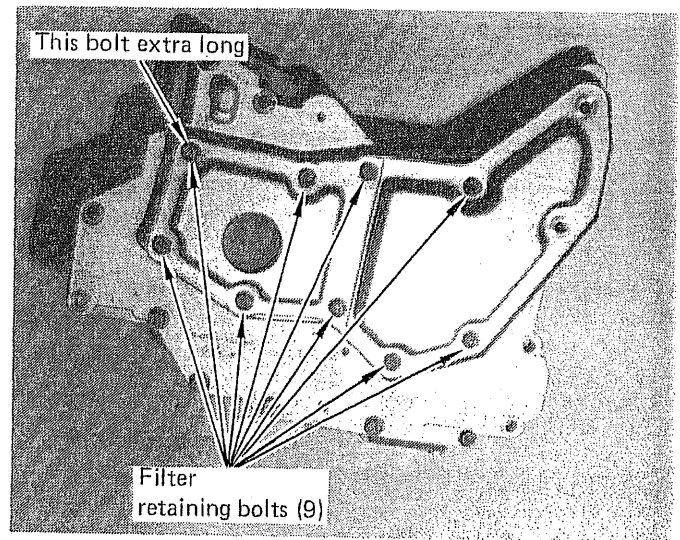


FIGURE 4

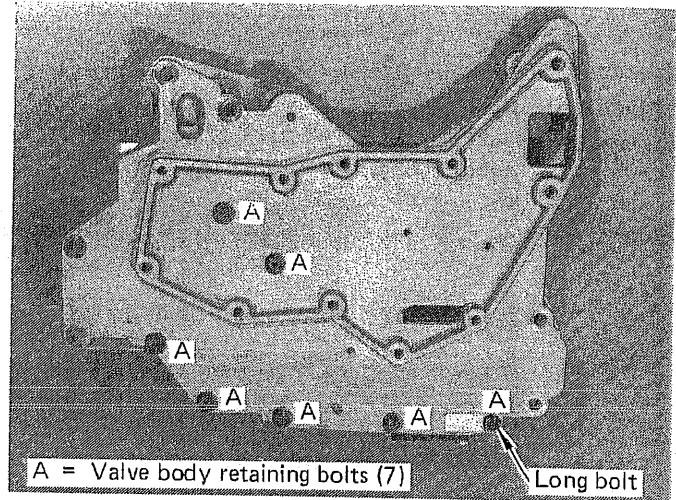


FIGURE 5

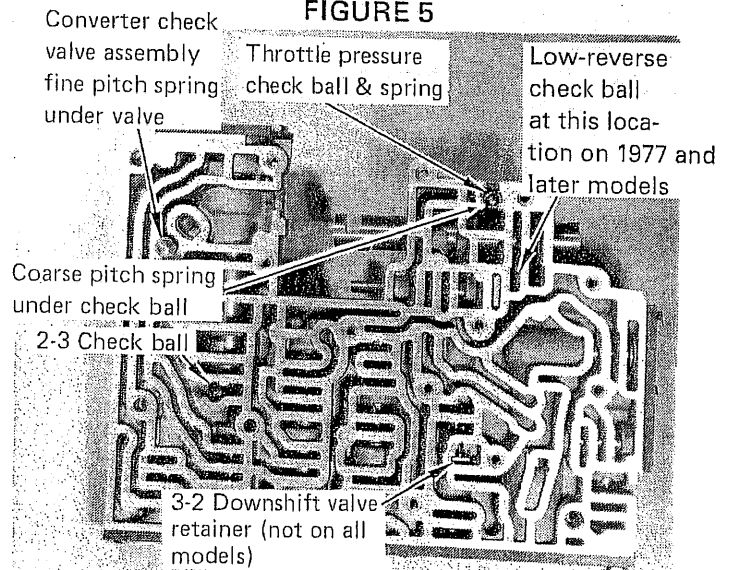


FIGURE 6

STEP 10. Slide end plate into place, pushing each valve down into position as necessary. Install all end plate bolts into place and tighten finger tight.

STEP 11. Lay casting on bench with passages facing up. Install converter check valve assembly into place. (See Fig. 6)

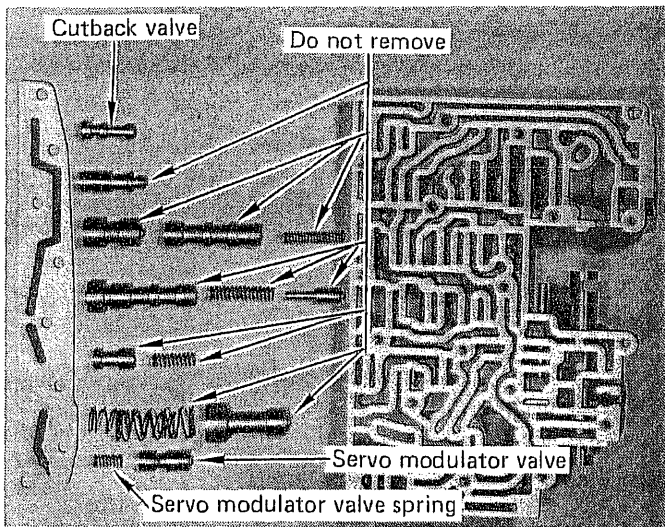


FIGURE 7

Install throttle pressure check ball assembly into place. Check installation of 3-2 downshift valve retainer. Install 2-3 check ball into position. If your transmission had a low reverse check ball (See Fig. 6.) reinstall it at this time.

STEP 12. Set transfer plate in front of you with the separator plate facing up. Note position of the hold down plates. (See Fig. 8) Note the stud-type bolt on the large plate. Remove hold down plates and bolts. Remove separator plate from transfer plate. If there is a filter screen in the separator plate, discard it.

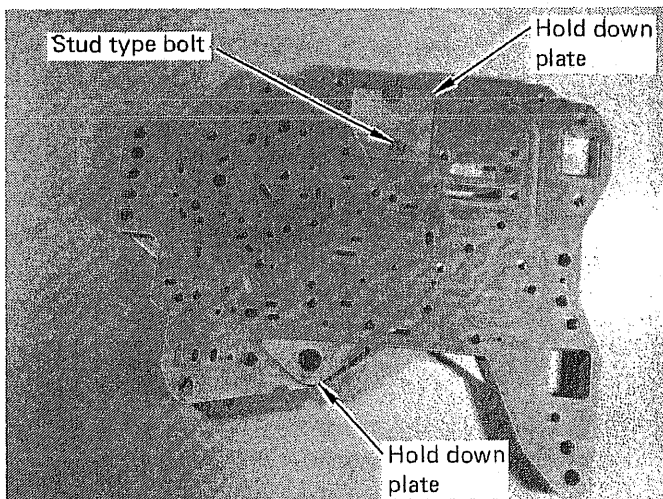


FIGURE 8

STEP 13. Compare your stock separator plate with the B&M plate for the position of hole location A or B. (See Fig. 9) Lay your stock plate on top of the B&M plate for a drill guide. Carefully drill an identical hole in the B&M plate in the same location A or B using the 1/8" drill supplied. All stock plates will have a hole at location A or B. Typically hole A: 1968 and later, hole B: 1967. Drill only one hole. Deburr the hole with a file, stone or sandpaper.

1977 & Later: On valve bodies equipped with a low reverse check ball, as shown in Figure 6, you must drill a hole in the B&M separator plate in the location shown in Figure 9. Use the 3/16" drill supplied in the kit. Align your stock plate with the B&M plate as a drill guide. Drill and then thoroughly deburr the hole. Proceed with Step 13.

Street/Strip: Use the 3/16" drill supplied with the kit and

drill out the hole in the B&M plate as shown in Figure 9. Deburr the hole with a file or sandpaper after drilling.

STEP 14. Scrape any excess gasket material off the transfer plate. Wash transfer plate in solvent

STEP 15. Install the B&M separator plate into position on the transfer plate. Do not reinstall the stock separator plate. Do not use a gasket between the two. Install the hold down plates into position and install three bolts finger tight. (See Fig. 8) Make sure stud bolt is in the correct location.

STEP 16. Install separator plate — transfer plate assembly on to casting. Make sure check valve assemblies are in position. (See Fig. 6) Hold the valve body halves together and install six short bolts and one long bolt in place. (See Fig. 5) Tighten bolts finger tight.

STEP 17. Tighten bolts in this sequence: Valve body bolts (7) 30 to 45-in. lbs. Hold down plate bolts (3) 30 to 45-in. lbs. End plate bolts (12) 30 to 45-in. lbs. Be sure end plates do not contact separator plate.

STEP 18. Install filter and new gasket. Install eight long filter bolts and one extra long filter bolt. (See Fig. 4) Align two large bolt holes with casting and tighten bolts to 30 to 45-in. lbs.

STEP 19. Turn valve body over and install one short and one long bolt in position (See Fig. 3), tighten to 30 to 45-in. lbs. The valve body is now complete.

STEP 20. Install valve body onto transmission, engaging shift and kickdown linkage. Hold valve body in place and install valve body attaching bolts finger tight. Note: Two long bolts go through filter. Check operation of kickdown and shifter linkage. Reference Step 2. If everything is operating properly, tighten bolts to 95 to 125-in. lbs. If there is any binding action or valve body does not sit flat against case, check engagement of levers now! Failure to properly install valve body can result in damage to linkage, valve body and/or case. Check operation of shifter and kickdown linkage again.

STEP 21. Clean pan and scrape any old gasket off the pan and case. Install pan and new gasket and tighten pan bolts to 12 to 16-ft. lbs.

STEP 22. Check shifter adjustment: Make sure detents in shifter coincide with detents in transmission. Adjustment should be made in Drive. Loosen pinch bolt located on shift rod and align shifter and transmission in Drive position and tighten pinch bolt.

STEP 23. Check kickdown adjustment: Depress gas pedal and make sure you are getting full throttle. Adjust if necessary. Hold kickdown rod in full throttle position. There should be about 1/16" clearance between the adjustment screw and its stop.

STEP 24. Lower vehicle. Try to keep the rear wheels off

the ground. Add four quarts of B&M Trick Shift or Type "F" ATF. While Trick Shift is superior in lubrication, heat capacity and friction material performance, we recommend Ford fluid over Dexron or Type A. Place shifter in neutral, start engine and check the fluid level. Add fluid until it is at the "add" mark. Shift transmissions through all gear positions.

If the rear wheels are off the ground, allow the transmission to shift through all gears. Check fluid level.

STEP 25. Road Test: Drive vehicle for 1-2 miles to warm up fluid. Check fluid level and add to "full" mark. **Do not overfill!!!** This will cause foaming and over heating.

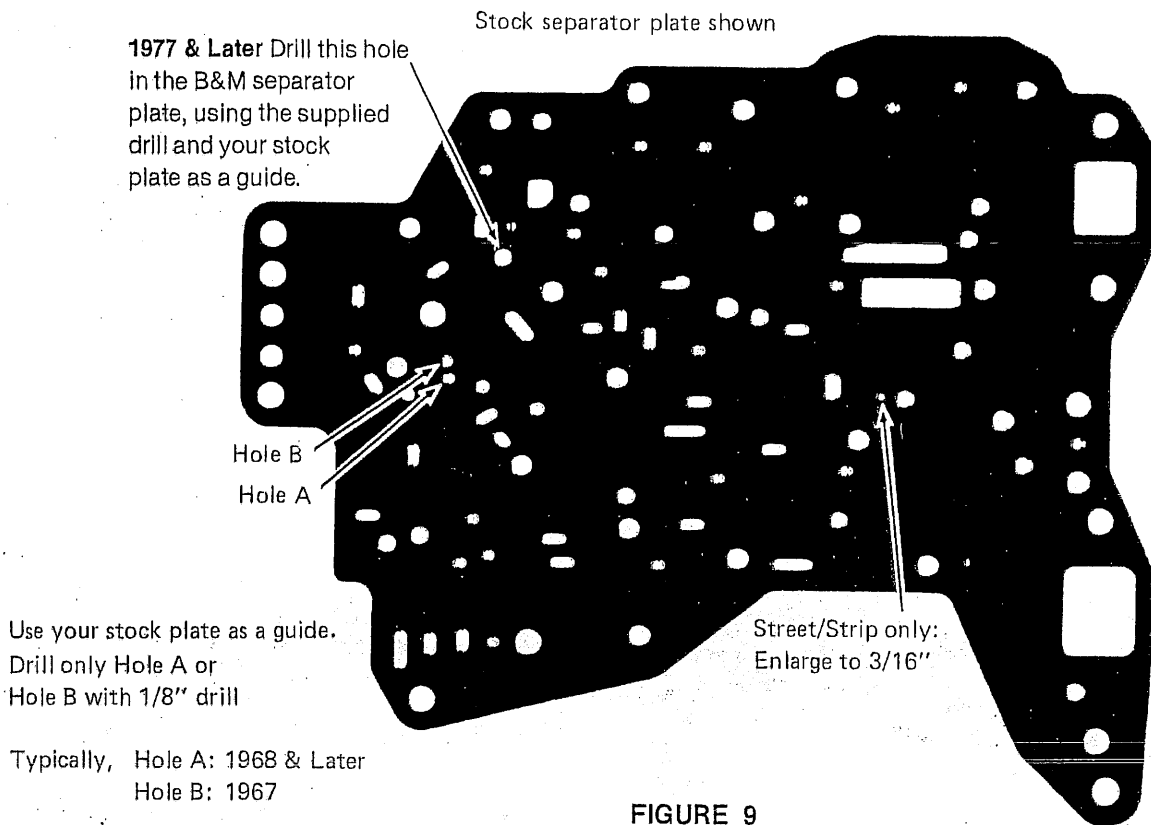


FIGURE 9

TROUBLE SHOOTING GUIDE FORD C-6

Malfunction	Probable Cause	Malfunction	Probable Cause
Slips	Low fluid level	Late hard shifts	Vacuum line cracked or leaking
	Valve body or end plate bolts loose		Valve body bolts loose
Overheating or foaming at dipstick tube or breather	High fluid level		End plate bolts loose
	Cooler plugged	Vacuum line cracked or leaking	
	Cooler insufficient	Modulator damaged	
Erratic shifting	Shifter misadjusted	Kickdown linkage misadjusted	
	Kickdown rod misadjusted	Will not shift	Valve bolts loose
	Low fluid level		End plate bolts loose
	High fluid level	One gear only.	Shifter not engaged properly
Slips in reverse	Low reverse check ball not installed (1977 & later)		

TOOLS REQUIRED FOR C-6 SHIFT IMPROVER KIT INSTALLATION

- | | |
|--|---------------------------------------|
| (1) Speed Handle or Ratchet – 3/8" Drive | (1) 3/8" 12 Point Socket – 3/8" Drive |
| (1) 1/2" Socket – 3/8" Drive | (1) Torque Wrench 0–250-in. lbs. |
| (1) 3/8" Socket – 3/8" Drive | (1) 1/4" Drill Motor |
| (1) 5/16" Socket – 3/8" Drive | (1) Small Screwdriver |
| (1) 13/16" Wrench | (1) Small File |

C-6 SHIFT IMPROVER KIT PARTS LIST

