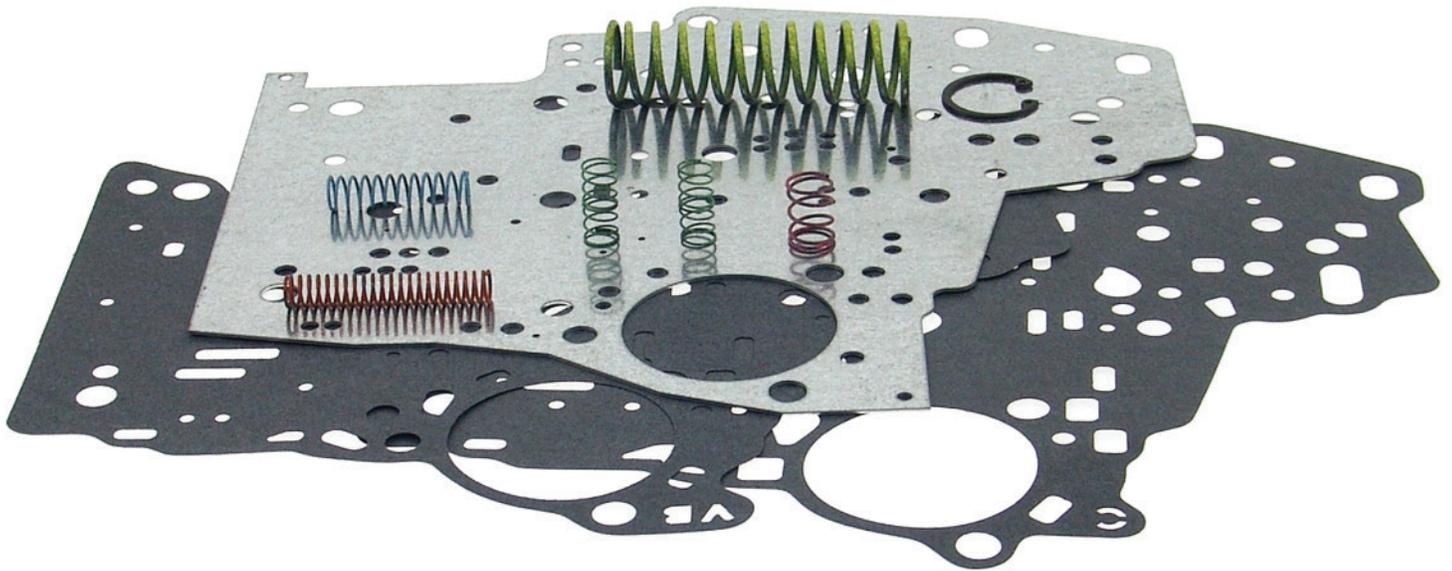


Shift Improver Kit

555-60931

1965-1987 GM TH400



Introduction

The 400 has proven itself to be very reliable transmission. It's ruggedness allows it to continue to operate for many miles with smooth even shifts.

This kit improves:

- Transmissions that are being overhauled
- Transmissions that are being serviced
- Transmissions in new cars
 - Eliminates the issues of late, soft shifts and excessive passing gear.

Get improved up-shift timing. Shifts will occur at the proper speed (before the power falls off).

Eliminate excessive passing gear and late shifts which makes the car feel like it's hesitating.

Issues

1st - 2nd Gear Shift Bump/Chatter/Slide

It is easy to think that bump or chatter is caused by the intermediate clutches applying too fast or holding too good. Just the opposite is true Here is why. During the 1-2 shift, intermediate oil flows to clutches and to the 1-2 accumulator.

If clutches are not firmly applied before the accumulator is compressed, a bump or chatter will occur. A long slide is because the clutches apply too slowly.

The separator plate in this kit, working in coordination with the pressure regulator spring, furnishes more oil flow and pressure to the intermediate clutches allowing them to engage before the accumulator is compressed. If the clutches are of reasonable quality and condition, the result will be a quick and smooth 1-2 shift.

Soft 2nd - 3rd Gear Shift

Often this condition is worn clutch plates. Even when this is true the clutch plate wear and slippage has usually been caused by excessive oil leaks between the valve body and the clutches and a slow release during passing gear. This is why replacing the clutches will not always restore good shift performance, and durability.

Separator plate, pressure regulator spring and modulator valve coordinate to furnish as up to twice as much oil to the

direct (high) clutches. This means that half the oil could be lost in excessive leaks without causing a malfunction.

Excessive Passing Gear

Common even with low miles. This kit has proven to be a 90% cure for this complaint.

- *Cause 1:* Leaks to the direct clutches.
- *Correction 1:* Increased oil flow to the clutches
- *Cause 2:* Low performance in relationship to manifold vacuum.
- *Correction 2:* Decreasing modulator pressure while maintaining correct mainline pressure. This is accomplished with a modulator spring and pressure regulator spring.

Slow Acting Passing Gear

This is one of the main causes of direct (high) clutch wear. Most customer and mechanics don't notice this weak point.

Cross leaks and original orifices releases the direct clutches very slowly and lets them drag while the 2-3 accumulator is un-stroking.

This condition causes more heat and wear than the 2-3 up-shift. Recalibration to improve shifts and to correct this condition require a new separator plate because several holes need to be smaller and others need to be bigger.

Late Shifts

Nothing is more annoying to the car owner than a transmission that runs in low or second when it should have already shifted. They know they're using extra gasoline and it also causes extra wear on the transmission and engine.

The modulator system, pressure regulator and 2-3 shift valve springs work together to furnish shifts at the correct time with the correct pressure. The results are improved up-shift timing. Shifts will occur at the proper speed (before the power falls off). This eliminates that hanging hold back feeling and gives the car a healthy responsive feel.

Normal wear in a 400 transmission lets the 1-2 shift get late, long and rough and the 2-3 shift late, long and soft. This kit is calibrated to make the 1-2 earlier smoother and quicker and the 2-3 shift earlier, quicker and firmer.



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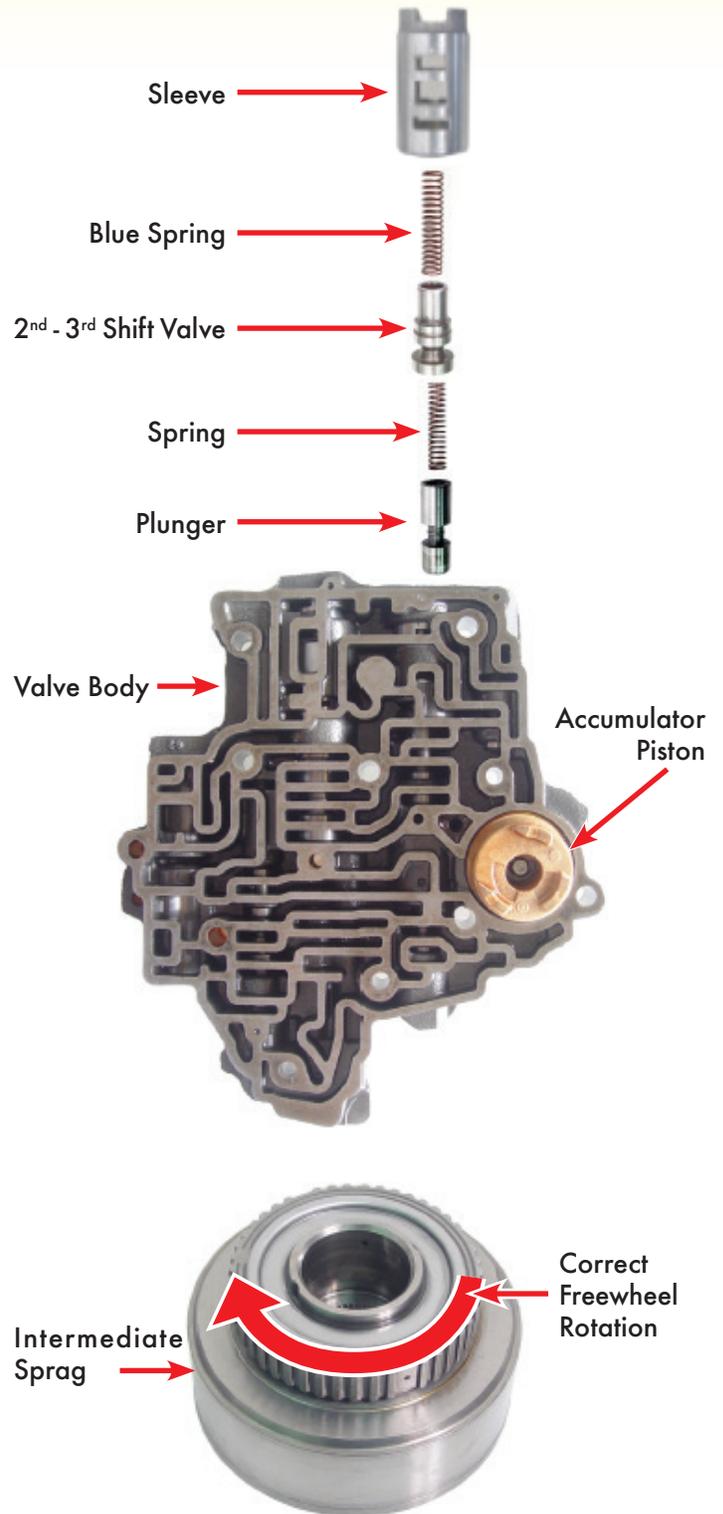
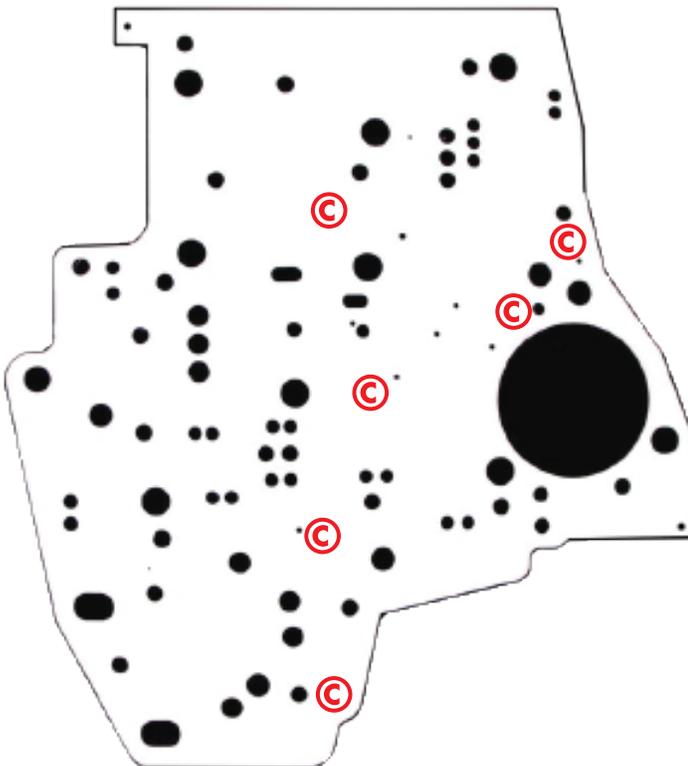
Valve Body & Plate

The new Shift Improver Kit plate produces short smooth shifts. This product is not intended for making firm high-performance style gear changes.

Assembly Notes:

1. Install the Blue spring between 2nd - 3rd shift valve and bushing.
2. The plastic accumulator pistons are prone to breaking. It is ideal to replace them with aluminum pistons.
3. The Direct Drum or Piston must have a check ball.
4. The Intermediate Sprag Outer Race must freewheel clockwise.
5. Install (6) 0.250" check balls on all models
 - Even 1987 and newer

CHECK BALL LOCATIONS ON PLATE TRANSMISSION INSTALLED

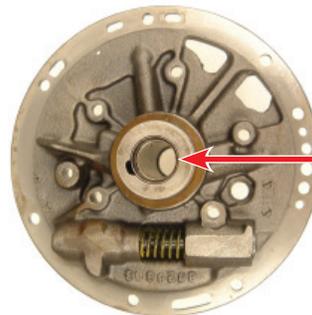


Assembly

1. Install (6) 0.250" check balls as shown in illustration.
2. Remove & discard any Horseshoe shims. Install Yellow spring included.
 - If transmission is in the vehicle, install the Yellow spring through the case window.
3. Modulator Valve Spring: Install Pink spring. After road test, if later/shorter $\frac{3}{8}$ throttle shafts are needed, remove Pink spring.
4. For earlier shifts install new Green governor springs.
 - Don't disassemble the governor.
5. Start "Z" bolts first to align Valve Body, Plate, Gaskets, and Case.

Notes

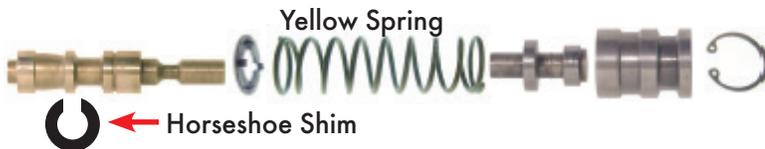
- The correct filter O-ring is the one that doesn't need stretched to go over tube.
- Don't reduce front end play by installing thicker washer. Forward rings can mis-locate the stator, causing forward clutch failure. Shim drums forward to reduce front end play. Rear unit end play (behind support) must remain less than front end play so that rear unit thrust does not reach the pump washer. (See Image Below)



Don't install a thicker washer here to reduce front end play.

②

Remove and discard Horseshoe Shims. Install Yellow Spring



③

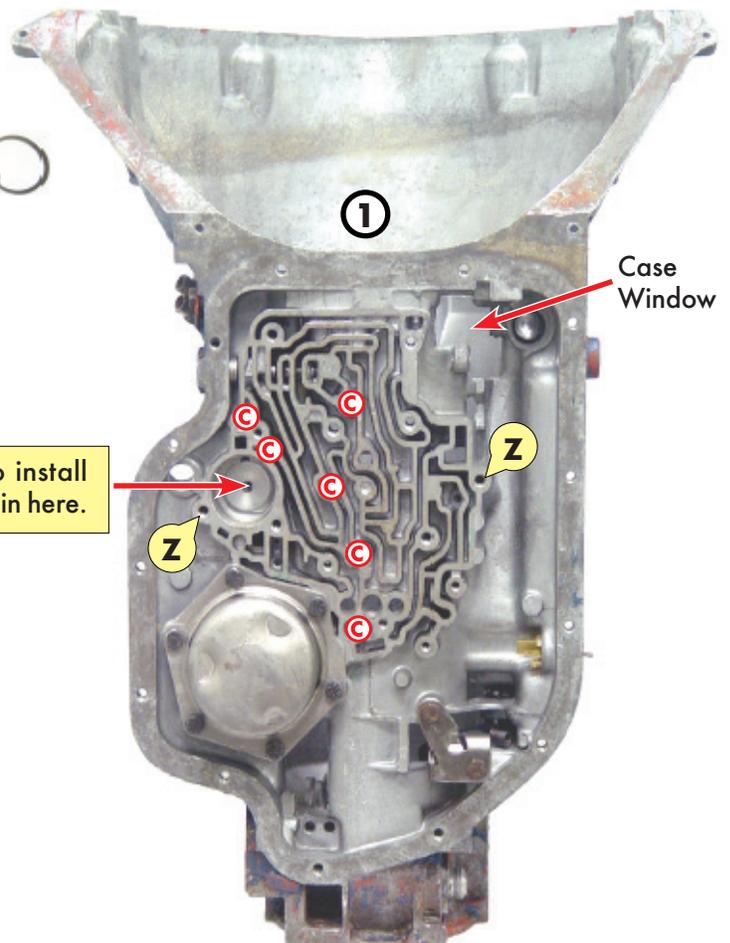
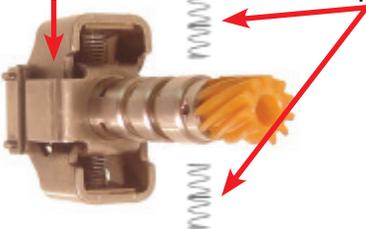
Modulator Valve Pink Spring Modulator



Don't forget to install the piston and pin here.

④

Governor Green Springs



Case Window

Additional Information

Friction Plates

Soak friction plates in transmission fluid for no less than 5 minutes before installation.

Dry lining on clutches or bands acts as insulator that holds friction heat. This can cause premature failure due to surface glazing or burning. A thoroughly soaked plate dissipates heat, away from the surface, and through the fluid retained in the lining.

High Quality Friction

This trans loves the original plain tan Borg Warner clutches. Other styles can cause slide bump, chatter, squawk or jerk during 1-2 shift, and soft shifts into high.

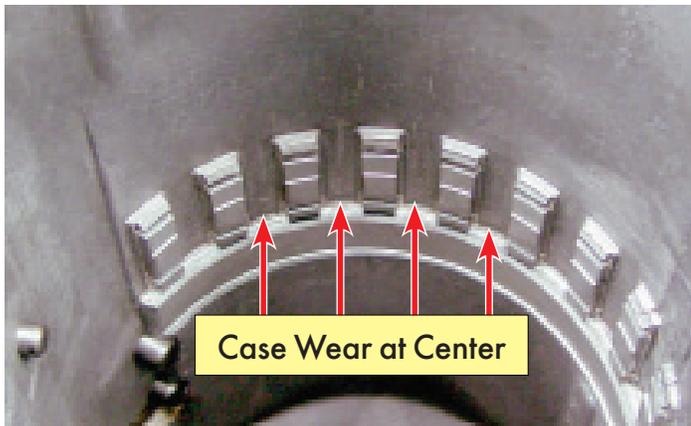
Steel Plates

Condition of the steel plates in this trans is important to shifting quality.

Don't use glazed steel plates. Use new plates or hand sanded or tumbled plates.

Case Wear

This case wear problem that has driven many a good man right up the wall. Wear at this point allows excessive center support movement and misalignment. This can cause high clutch failure, late or no 2nd- 3rd shift, falls out of high when hot; center support bushing wear, front planet wear and stator support failure. Only use center support that uses a steel shim in the case under the support.



Valve Bodies

Be sure that gaskets do not cover any holes in the separator plate.

VB is easy to over tighten (Never use Impact wrench). Tighten valve body to 100 inch pounds.

Fluid Level is Critical

Before road testing fluid should be just below the "ADD" mark. At normal temperature (4-5 miles of road testing) fluid level should be right at or slightly above the add mark. Over filling can cause foaming and loss of oil on freeway or highway driving, especially in hot weather.

Vacuum Flow

Restricted vacuum is a common causes of trouble with this transmission.

Check: With engine idling, pull off hose at modulator, engine must speed up, or idle rough, with hose off. If engine does not speed up, or idle rough, vacuum is restricted.

Correction. Check for collapsed hose. Drill out restriction with $\frac{3}{32}$ " or larger drill. Engine must speed up with the hose off.

Governor Cover and Gasket

A worn governor or over thick gasket can cause a temporary neutral condition during passing at highway speeds. Tap the center of cover with ball peen hammer to reduce governor end clearance.

It is never a bad idea to install an engine to body ground strap. To prevent starter motor from burning the transmission bushings.