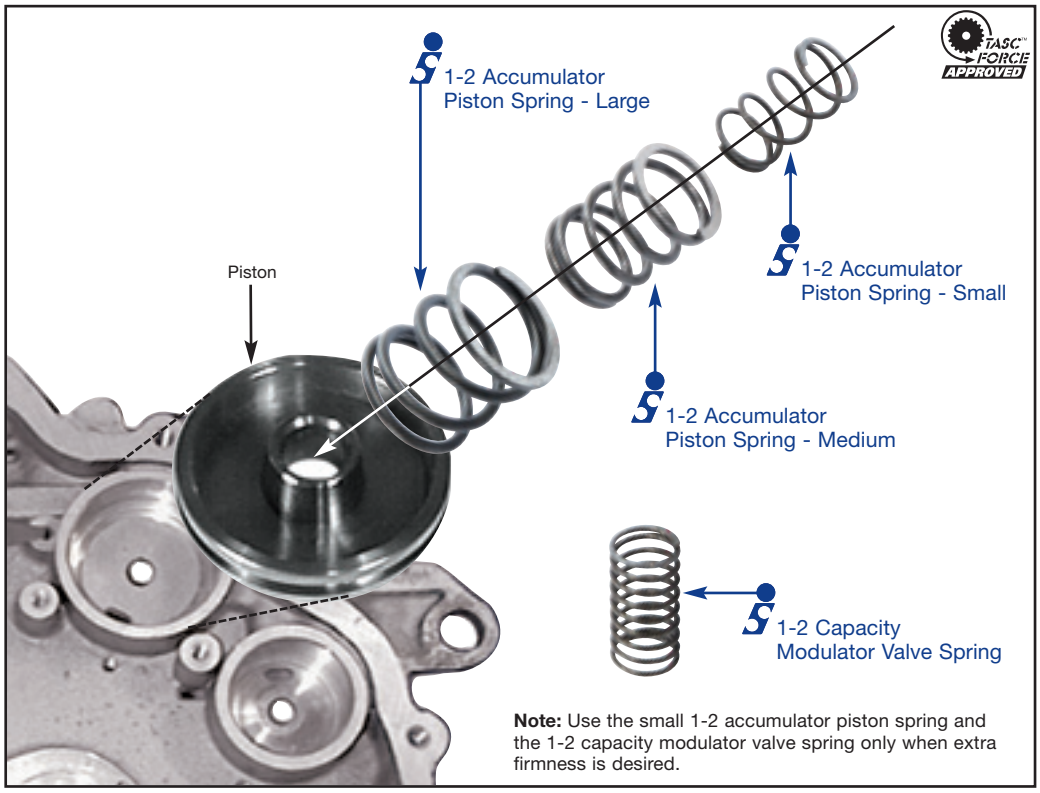
1-2 Accumulator Piston Spring Kit

1-2 Accumulator Piston Spring Kit

96706-02K

Includes 1 each of the following

1-2 Accumulator Spring	Large
1-2 Accumulator Spring	Medium
1-2 Accumulator Spring	Small
1-2 Capacity Modulator Valve Spring	



Note: Use the small 1-2 accumulator piston spring and the 1-2 capacity modulator valve spring only when extra firmness is desired.

Installation/Assembly Steps

Note: Be sure to review the Vehicle and Transmission Concerns on the following pages prior to installing the spring tuning kit.

1-2 Accumulator Tuning

	Large	Medium	Small	1-2 Capacity Modulator Valve Spring
'91-'98 with 3 OE springs	Yes	Yes	For firmer shifts (Not recommended for general rebuild)	For firmer shifts or persistent soft shifts after rebuild (Not recommended for general rebuild)
'91-'98 with 2 OE springs	Yes	For firmer shifts (Not recommended for general rebuild)	For firmer shifts (Not recommended for general rebuild)	For firmer shifts or persistent soft shifts after rebuild (Not recommended for general rebuild)
'99-Up with 3 OE springs	Yes	For firmer shifts (Not recommended for general rebuild)	For firmer shifts (Not recommended for general rebuild)	For firmer shifts or persistent soft shifts after rebuild (Not recommended for general rebuild)

AXODE, AX4S

PART NUMBER 96706-02K

1-2 Accumulator Piston Spring Kit

Step 1

Select correct spring combination on chart (see page 1).

Step 2

NOTE: Additional steps can also firm up 3-4 shifts if desired.

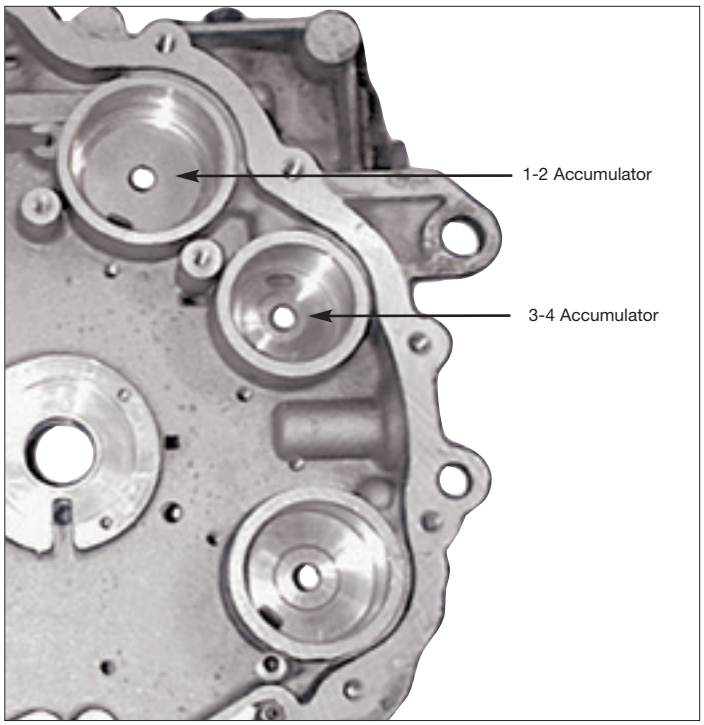
a. For firmer 3-4 shifts, a leftover or uninstalled medium spring from this kit can be installed in the inside the OE 3-4 springs.

b. Drill the separator plate in the 3rd and 4th feedholes as indicated.

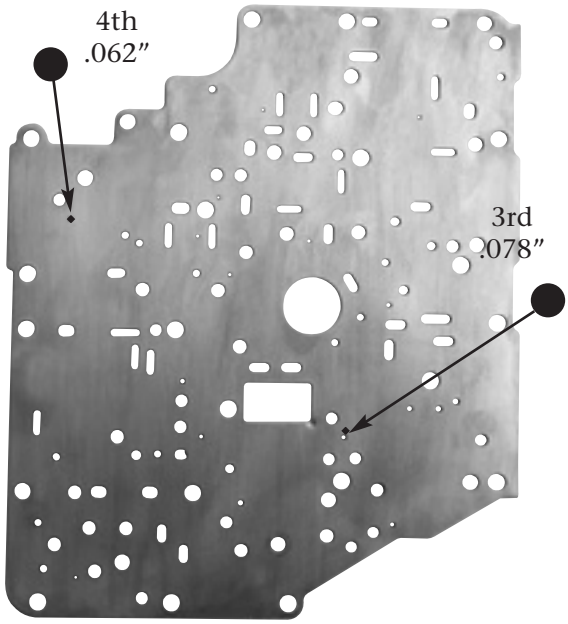
Step 3

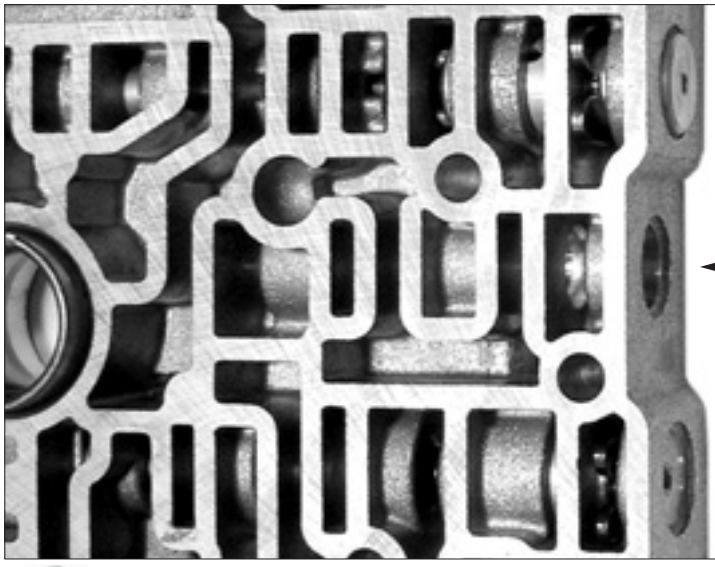
1-2 Capacity Modulator Valve Spring:

- It is not recommended to install the 1-2 capacity modulator spring at time of overhaul unless extra-firm shifts are desired.
- Check end plug for looseness even if spring is not being serviced. If loose, create ridge on end plug with tubing cutter for reduced leakage.
- If spring is to be installed, check end plug for looseness, then remove plug, valve and spring Reinstall line up with new spring and repaired end plug.



Valve Body Plate





1-2 Capacity Modulator Valve

PART NUMBER **96706-02K**

Vehicle and Transmission Concerns

Overall shift quality:

Poor 1-2 shift quality may be caused by vehicle or transmission conditions other than fatigued accumulator springs. Common mechanical and electrical system conditions leading to unsatisfactory shift quality must be eliminated as possible sources of shift problems. Follow the "Vehicle Conditions" checklist below to diagnose shift problems that are caused by system conditions external to the transmission. Once external systems have been eliminated as a source of shift problems, follow the list of internal transmission conditions requiring correction during rebuild.

Vehicle conditions leading to shift quality problems:

- Test drive the vehicle, include a few wide-open throttle accelerations, and monitor the Mass Air Flow sensor voltage. Clean as necessary (see MAF test procedure below).
- Rule out the possibility of restricted exhaust or fuel filter flow by visually or mechanically checking that both systems are functioning and in good condition.
- Battery voltage must not drop below 12.6 volts while cranking.
- ECU ground circuit voltage drop should not be greater than .07 volts. If the voltage drop (between negative side of battery and negative of ECU during test drive) measures more than .07 volts, install an additional parallel ground wire from the ECU back to the battery.

Internal transmission conditions leading to shift quality problems:

- The EPC solenoid should be replaced if there is any sign of low pressure-induced clutch failure or metal contamination. Never reuse an EPC solenoid that has the light color (raw aluminum) screen area snout. The later solenoids ('96-up) have a dark, hard-anodized snout. If you must reuse an EPC solenoid, we suggest you remove the spring from the failsafe valve. You do not need to block the valve outward, but you can.
- Solenoids that allow EPC pressure (accessed at EPC port) to drop below 10 psi will stroke the failsafe valve and cause erratic line pressure.
- A worn bore converter regulator valve bore or sticking valve will cause erratic EPC and accumulator pressure. The converter regulator valve has a similar function to the GM AFL valve. This is the outer valve in the bore just below the manual valve and above the regulator boost sleeve.
- AXODE, AX4S: These units use a 1-2 capacity modulator valve to control the intermediate feed to clutch and accumulator. A stronger spring here results in a shorter/firmer 1-2 shift. A sticking accumulator regulator valve, bound-up spring or a mismatched spring affects 1-2 and 3-4 shifts. A stronger spring results in higher accumulator pressure and firmer shifts for both gears.
- AXODE, AX4S: Intermediate servo travel and/or servo leaks are a factor in shift quality! Servo can be air tested at the tubes, with no cross leaks allowed. Servo travel (suggested at .100" to .120") can be checked using a spare cover with an off-center hole drilled through it.

Assembly suggestions:

- Use Mercon 5 or synthetic fluid. Use high-energy clutches and Kolene® steels in the intermediate when required by OE.
- Air check accumulator pins to ensure there is no leakage before installing the valve body.

Ford Mass Air Flow Sensor

Ford MAF problems contribute to soft shifts and poor line pressure rise. The MAF is a load-sensing input to the ECU. In order for the MAF sensor to correctly measure mass air flow, the sensor element must be clean. The sensor must also have the correct electronic control unit (ECU) ground and signal voltages.

Troubleshooting the Ford MAF sensor:

1. Check DC battery voltage to power side of sensor. It must be at least 12.6 volts with the engine running.
2. Switch your DVOM (DIGITAL VOLT/OHM METER) to AC voltage and ensure your alternator is not producing stray AC voltage at the battery.
3. The reference voltage must be a constant DC voltage between 4.8 and 5.0 volts.
4. The ground circuit must be tested between the MAF and the negative terminal of the battery. This ground path travels through the ECU. Measured DC voltage should not exceed .07 volts. If the voltage exceeds .07 volts, solder an additional ground parallel to the ECU ground circuit to try to reduce the voltage. High resistance grounds often cause erratic, harsh shifts or poor line rise.
5. The signal voltage or load sensing wire will start at .8 to 1.0 volts at idle and climb to 4.7 to 4.9 volts at WOT stall.
6. Using a scan tool, verify correct MAF operation by monitoring the calculated barometric pressure signal (BARO). The correct barometric pressure signal reading at sea level is 30 ±1.0" Hg (155 to 159 Hz). This reading will decrease by 1" Hg (3 Hz) for every 1,000-foot increment change in elevation above sea level and increase by .33" Hg (1 Hz) for every 330-foot increment change in elevation below sea level. For example, a barometric pressure reading of 140 Hz at 800' above sea level points to a MAF problem. The correct reading at that elevation should be 29.2 ±1.0" Hg (152.6 to 156.6 Hz).
7. A contaminated/dirty MAF sensor can cause overestimatation of long-term fuel trim (LFTRIM). Readings at idle in the negative range of –10% or less also point to a dirty MAF sensor. Refer to Ford Article No. 98-23-10, MASS AIR FLOW (MAF)-Sensor Contamination-Service Tip.
8. Clean the MAF sensor element with brake cleaner or electrical contact cleaner.
9. Disconnect battery to reset ECU calibration. Test drive again, include several sustained WOT accelerations, and monitor the BARO PID (parameter identification display).