2004R SHIFT RECALIBRATION KIT #24RSRK

This easy to install kit includes all the necessary parts to recalibrate the hydraulic circuitry of the GM2004R transmission for high performance street and drag strip usage. The main focus of this kit is to reduce clutch and band slippage common with the factory hydraulic calibration. All the components in this kit work together to achieve the desired results. Mixing parts and tech from other kits will produce undesirable results and make it difficult for us to assist you if there are problems or issues that the kit has not corrected, or that result after installation. New boost valves and high rate pressure regulator spring significantly raise transmission mainline pressure to increase clutch and band apply pressures and torque capacity. This reduces friction element failure and excessive heat buildup during ratio changes. A newly designed separator plate increases the flow of oil to the friction elements and eliminates unnecessary circuits. Re-engineered springs for the accumulator valve, line bias, and 1-2 accumulator furnish a throttle sensitive accumulator and pressure rise system that meets the demands of high output engines. This kit allows the shifts to get shorter and firmer as the throttle is opened, resulting in clean, positive gear changes at small throttle angles, and short firm shifts at larger throttle angles. Most kits do not have this feature engineered into them resulting in brutal part throttle shifts that beat and break internal components as well as generate many new drivability complaints. Several thousand of these kits are in use and this kit is recognized as the best of its kind. Shift point rpm and road speed are a function of the tv cable adjustment and geometry, valve body, governor and axle ratio in use. This kit will not change shift point rpm or road speed. If higher or lower shift points are needed, contact us for assistance. Please note that high performance applications will benefit from the use of a larger intermediate servo to multiply the clamping force applied to the intermediate band. If your transmission is not from an 86 - 87 Buick Grand National or 89 Turbo Trans Am which was factory equipt with a high performance intermediate servo assembly (cover casting number ends in 694), the use of a high-performance servo assembly should be considered. We can supply you with one of our custom billet aluminum servos.

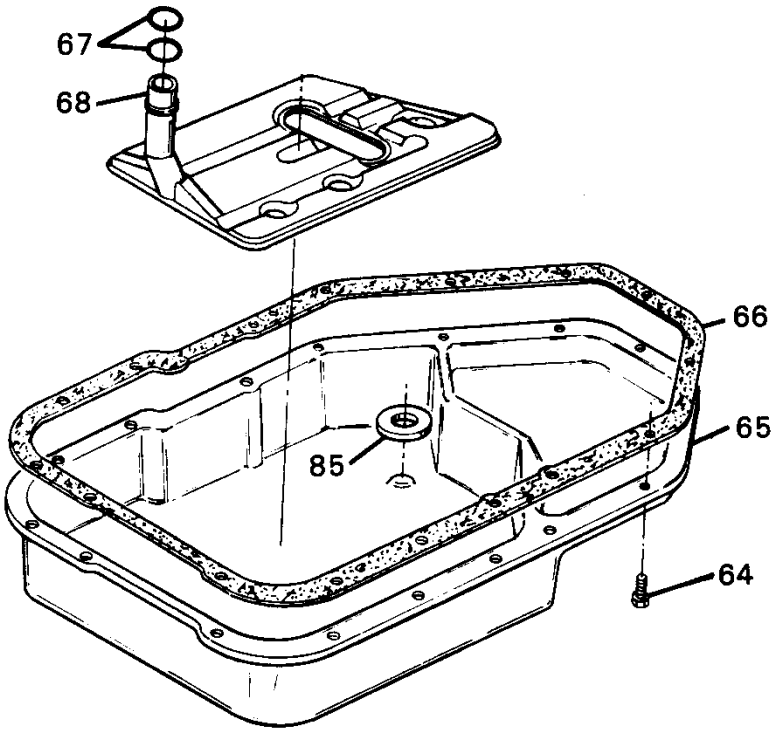
****CONTACT INFORMATION****
WWW.CKPERFORMANCE.COM

KIT CONTENTS FOR PART # 24RSRK-A
2004R SHIFT RECALIBRATION KIT

1 PRESSURE REGULATOR VALVE SPRING
1 .500" TV BOOST VALVE AND SLEEVE
1 .300" REVERSE BOOST VALVE AND SLEEVE
1-2 ACUMULATOR SPRING (LARGE PLAIN)
3-4 ACUMULATOR SPRING (LARGE PLAIN)
3-4 ACUMULATOR PISTON
4 .250" CUP PLUGS
1 ACCUMULATOR VALVE SPRING (LONG PLAIN)
1 LINE BIAS VALVE SPRING (SHORT TIGHT WOUND)
1 SEPERATOR PLATE
1 CASE TO SEPERATOR PLATE GASKET
1 SEPERATOR PLATE TO VALVE BODY GASKET
1 ACCUMULATOR HOUSING GASKET
1 PAN GASKET

INSTALLATION INSTRUCTIONS FOR PART #24RSRK/A
2004R SHIFT RECALIBRATION KIT

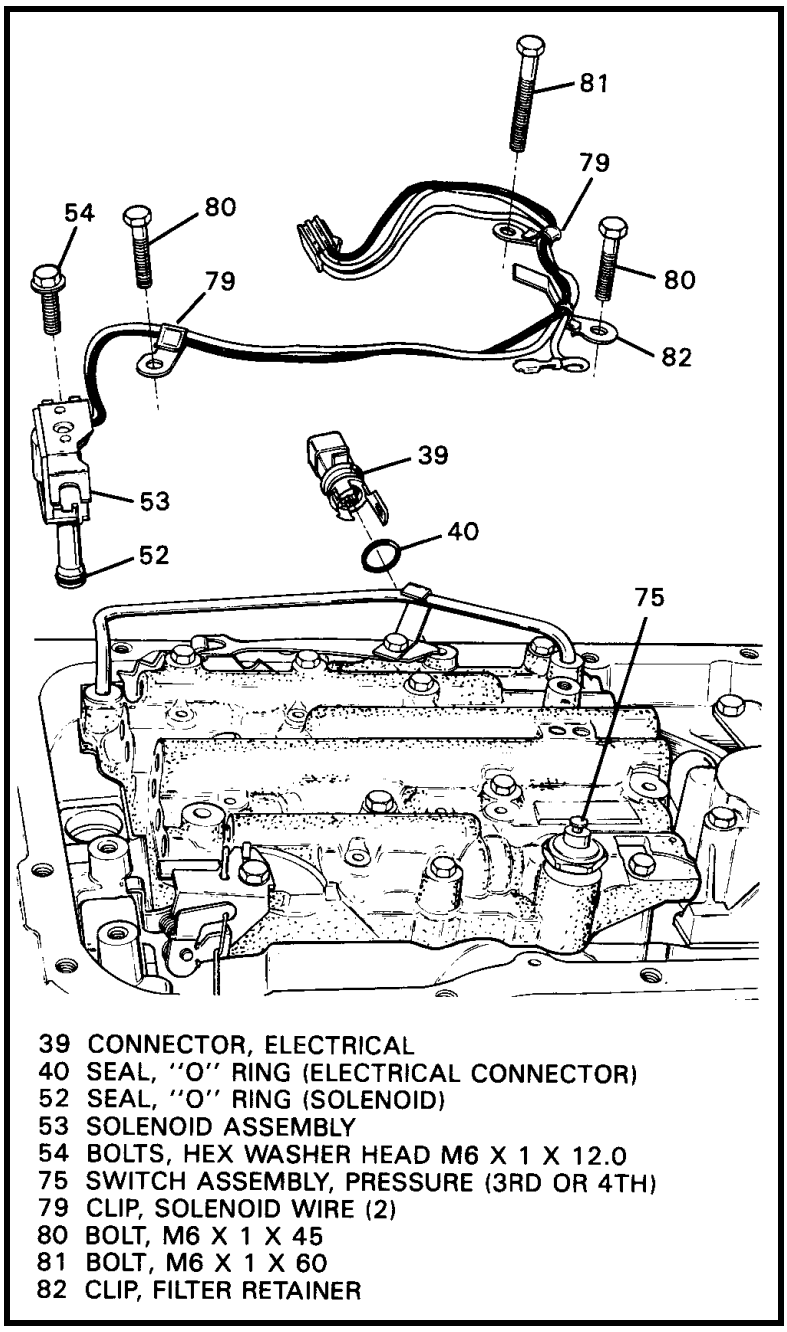
Begin by removing the transmission oil pan. If the transmission is in the vehicle when installing this kit, be sure to allow adequate time for the vehicle to cool before removing the oil pan. Remember that the pan is full of oil when removing it. Be careful so that you do not spill oil in your work area. Remove the transmission oil filter. Verify the presence of the oil filter o-ring seal or multi lip seal on the oil filter neck. If the o-ring seal is not present, remove it from the pump bore and reinstall it. If the filter is equipt with a multi lip seal, it is ok if it remains in the pump bore. Remove and discard the transmission oil pan gasket. Thoroughly clean the transmission oil pan and magnet. Clean the gasket mounting surfaces on oil pan and transmission case.



ILL. NO.	DESCRIPTION
64	SCREW, CONICAL WASHER ASSEMBLY
65	PAN, TRANSMISSION OIL
66	GASKET, PAN
67	SEAL, ''O'' RING (FILTER)
68	FILTER ASSEMBLY, TRANSMISSION OIL
85	MAGNET, CHIP COLLECTOR

OIL PAN AND FILTER

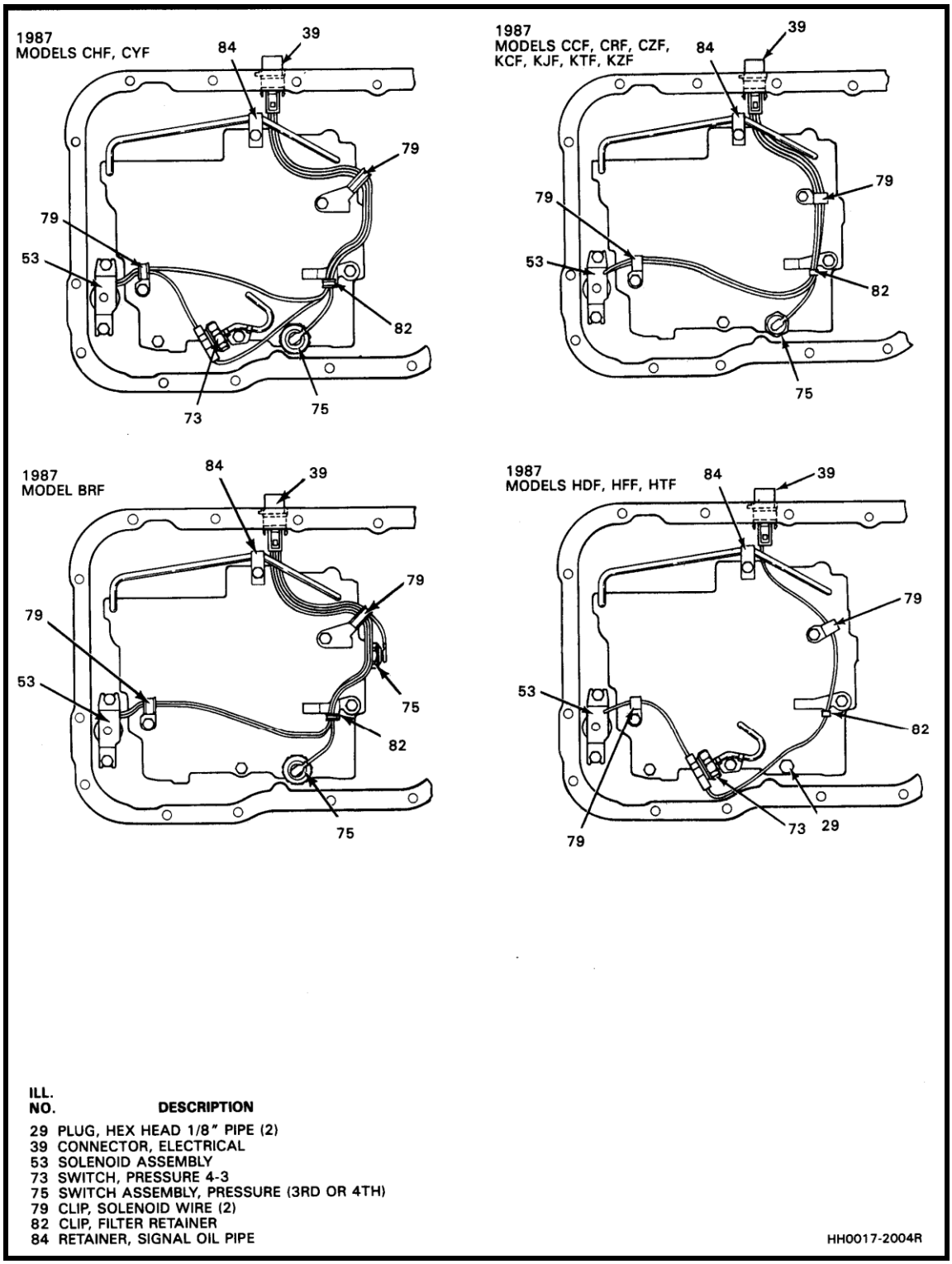
Remove the two bolts (54) that fasten the solenoid assembly (53) to the case. Unplug the wiring harness from the electrical connector (39). Disconnect any of the pressure or temperature switches from the wiring harness and unhook the wiring harness from any solenoid wire and filter retainer clips (79, 82) that are installed on the valve body.



39 CONNECTOR, ELECTRICAL
40 SEAL, ''O'' RING (ELECTRICAL CONNECTOR)
52 SEAL, ''O'' RING (SOLENOID)
53 SOLENOID ASSEMBLY
54 BOLTS, HEX WASHER HEAD M6 X 1 X 12.0
75 SWITCH ASSEMBLY, PRESSURE (3RD OR 4TH)
79 CLIP, SOLENOID WIRE (2)
80 BOLT, M6 X 1 X 45
81 BOLT, M6 X 1 X 60
82 CLIP, FILTER RETAINER

INTERNAL WIRING HARNESS

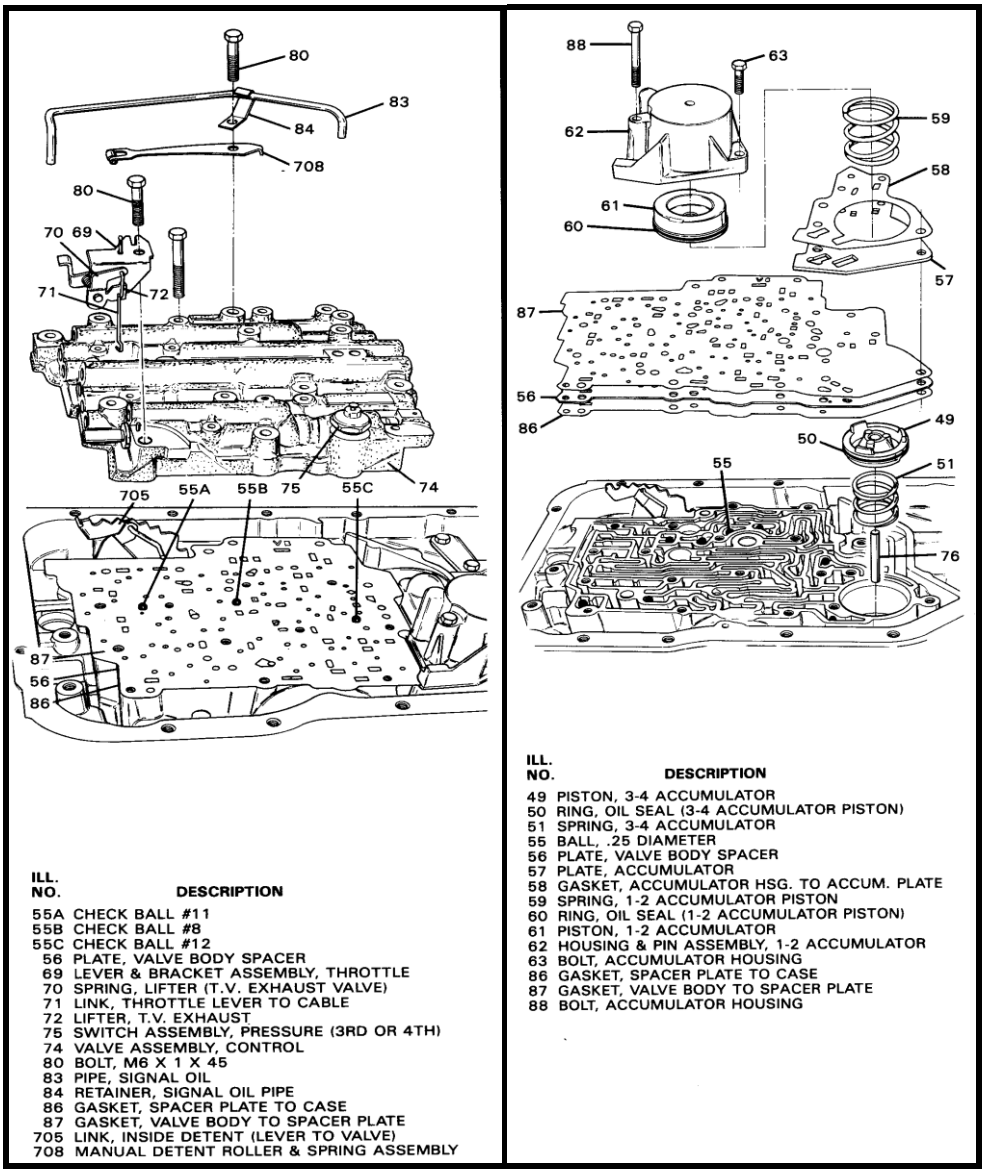
There are a few different types of internal wiring harnesses. The most common types are shown here.



COMMON INTERNAL WIRING HARNESS'S

Remove and discard both the signal oil pipe retainer (84) and signal oil pipe (83). Remove the throttle lever and bracket assembly and related components (69, 70, 71 and 72). Remove the remaining bolts that fasten the valve body assembly to the

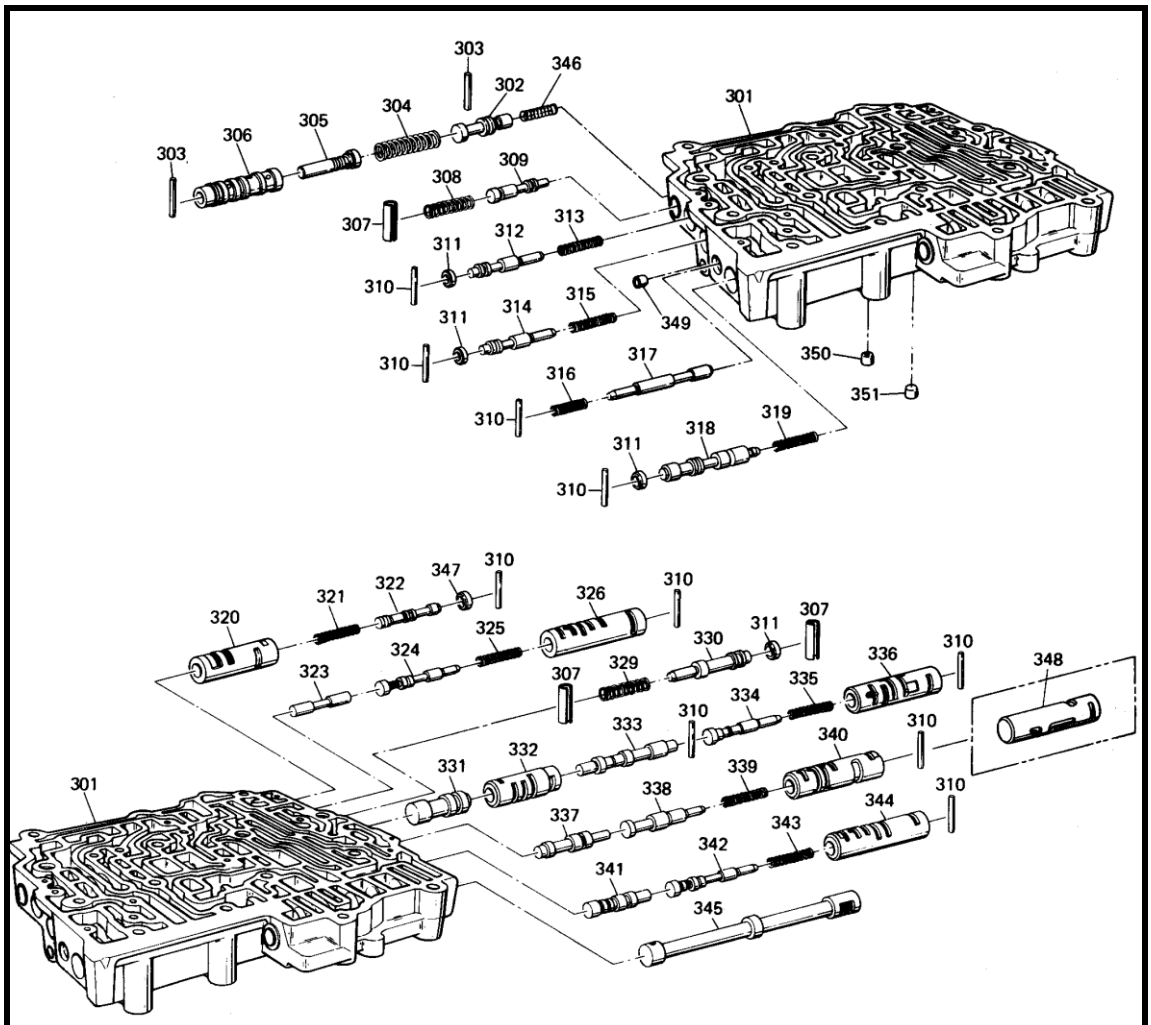
transmission case and remove the valve body. If the transmission is in the car be sure to support the valve body when removing the bolts. Remember there are checkballs in the valve body, do not lose them. Remove the 1-2 accumulator housing (62) and its related components. Discard the accumulator housing gasket (58) and remove the 1-2 accumulator spring (59). Remove and discard the separator plate and gaskets (56, 86 and 87). Remember there are checkballs on top of the separator plate, do not lose them.



ILL. NO.	DESCRIPTION
55A	CHECK BALL #11
55B	CHECK BALL #8
55C	CHECK BALL #12
56	PLATE, VALVE BODY SPACER
69	LEVER & BRACKET ASSEMBLY, THROTTLE
70	SPRING, LIFTER (T.V. EXHAUST VALVE)
71	LINK, THROTTLE LEVER TO CABLE
72	LIFTER, T.V. EXHAUST
75	SWITCH ASSEMBLY, PRESSURE (3RD OR 4TH)
74	VALVE ASSEMBLY, CONTROL
80	BOLT, M6 X 1 X 45
83	PIPE, SIGNAL OIL
84	RETAINER, SIGNAL OIL PIPE
86	GASKET, SPACER PLATE TO CASE
87	GASKET, VALVE BODY TO SPACER PLATE
705	LINK, INSIDE DETENT (LEVER TO VALVE)
708	MANUAL DETENT ROLLER & SPRING ASSEMBLY

ILL. NO.	DESCRIPTION
49	PISTON, 3-4 ACCUMULATOR
50	RING, OIL SEAL (3-4 ACCUMULATOR PISTON)
51	SPRING, 3-4 ACCUMULATOR
55	BALL, .25 DIAMETER
56	PLATE, VALVE BODY SPACER
57	PLATE, ACCUMULATOR
58	GASKET, ACCUMULATOR HSG. TO ACCUM. PLATE
59	SPRING, 1-2 ACCUMULATOR PISTON
60	RING, OIL SEAL (1-2 ACCUMULATOR PISTON)
61	PISTON, 1-2 ACCUMULATOR
62	HOUSING & PIN ASSEMBLY, 1-2 ACCUMULATOR
63	BOLT, ACCUMULATOR HOUSING
86	GASKET, SPACER PLATE TO CASE
87	GASKET, VALVE BODY TO SPACER PLATE
88	BOLT, ACCUMULATOR HOUSING

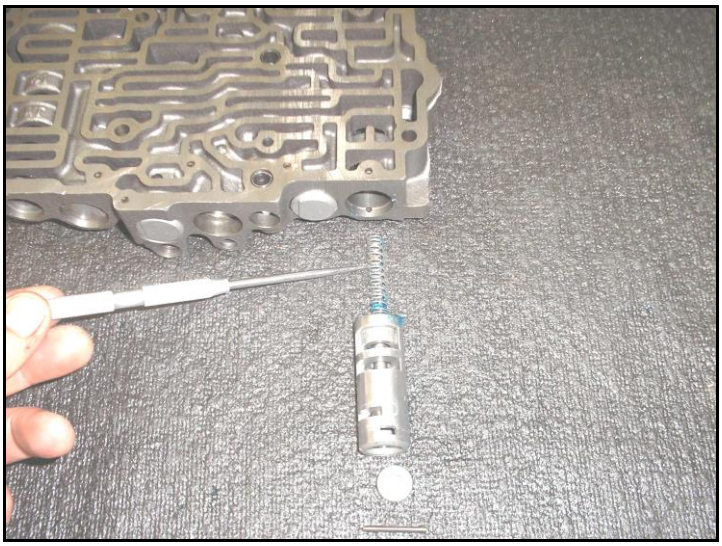
VALVE BODY AND RELATED COMONENTS



301 BODY, CONTROL VALVE
302 VALVE, THROTTLE
303 PIN, COILED SPRING 2.72 X 25 (2)
304 SPRING, THROTTLE VALVE
305 PLUNGER, THROTTLE VALVE
306 BUSHING, THROTTLE VALVE PLUNGER
307 SLEEVE, SPRING RETAINING (3)
308 SPRING, T.V. LIMIT VALVE
309 VALVE, T.V. LIMIT
310 PIN, COILED SPRING 2.72 X 20 (10)
311 PLUG, VALVE BORE 12.5mm (4)
312 VALVE, T.V. MODULATOR UPSHIFT
313 SPRING, T.V. MODULATOR UPSHIFT VALVE
314 VALVE, T.V. MODULATOR DOWNSHIFT
315 SPRING, T.V. MODULATOR DOWNSHIFT VALVE
316 SPRING, 3-2 CONTROL VALVE
317 VALVE, 3-2 CONTROL
318 VALVE, LINE BIAS
319 SPRING, LINE BIAS VALVE
320 BUSHING, ACCUMULATOR VALVE
321 SPRING, ACCUMULATOR VALVE
322 VALVE, ACCUMULATOR
323 VALVE, 3-4 SHIFT
324 VALVE, 3-4 THROTTLE
325 SPRING, 3-4 THROTTLE VALVE
326 BUSHING, 3-4 THROTTLE VALVE
329 SPRING, LO OVERRUN CLUTCH VALVE
330 VALVE, LO OVERRUN CLUTCH
331 VALVE, 1-2 SHIFT
332 BUSHING, LO-1ST/DETENT VALVE
333 VALVE, LO-1ST/DETENT
334 VALVE, 1-2 THROTTLE
335 SPRING, 1-2 THROTTLE VALVE
336 BUSHING, 1-2 THROTTLE VALVE
337 VALVE, CONVERTER CLUTCH SHIFT (NON ECM)
338 VALVE, CONVERTER CLUTCH THROTTLE (NON ECM)
339 SPRING, CONV. CLUTCH THROTTLE VALVE (NON ECM)
340 BUSHING, CONV. CLUTCH THROTTLE (NON ECM)
341 VALVE, 2-3 SHIFT
342 VALVE, 2-3 THROTTLE
343 SPRING, 2-3 THROTTLE VALVE
344 BUSHING, 2-3 THROTTLE VALVE
345 VALVE, MANUAL
346 SPRING, THROTTLE VALVE BOOST
347 PLUG, VALVE BORE (.56 DIA.)
348 BUSHING, CONVERTER CLUTCH THROTTLE (DUMMY ECM CARS ONLY)
349 PLUG, CUP (7)
350 PLUG, CUP 4TH EXHAUST
351 PLUG, CUP 2-1 COASTDOWN

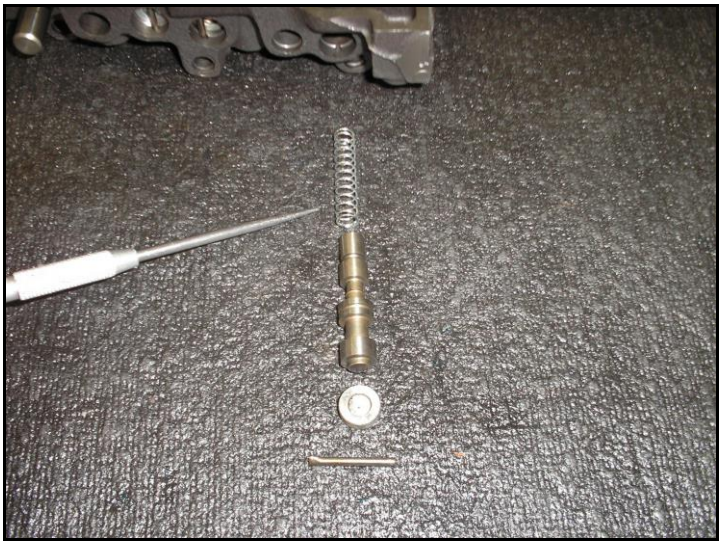
VALVE BODY EXPLODED VIEW

Locate the accumulator valvetrain and related components (310, 347, 322, 321 and 320) and remove them from the valve body as shown in the figure below. Replace the accumulator valve spring (321) with the one supplied in this kit and install the components back into the valve body exactly as shown in the figure. The replacement accumulator valve spring in this kit is approximately .265" in diameter and has an overall length of approximately 1.320".



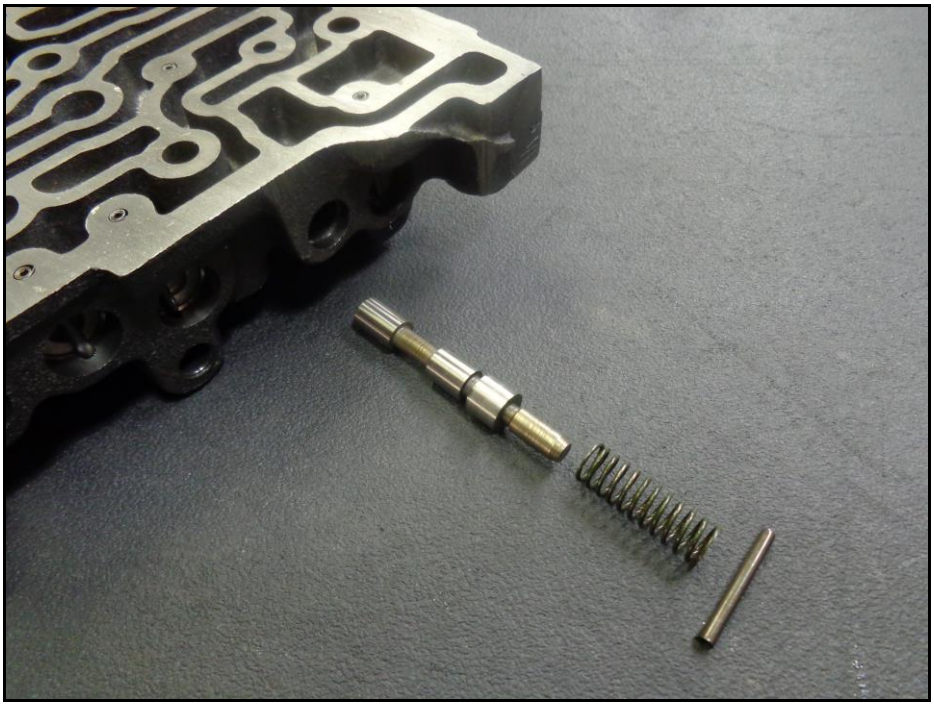
ACCUMULATOR VALVETRAIN

Locate the line bias valve and related components (310, 311, 318 and 319) and remove them from the valve body as shown in the figure below. Replace the line bias valve spring (319) with the one supplied in this kit and install the components back into the valve body exactly as shown in the figure. The replacement line bias valve spring in this kit is approximately .187" in diameter and has an overall length of approximately .925". This is a tightly wound spring. It may be necessary to gently tap the valve bore plug (311) to permit installation of the roll pin (310).

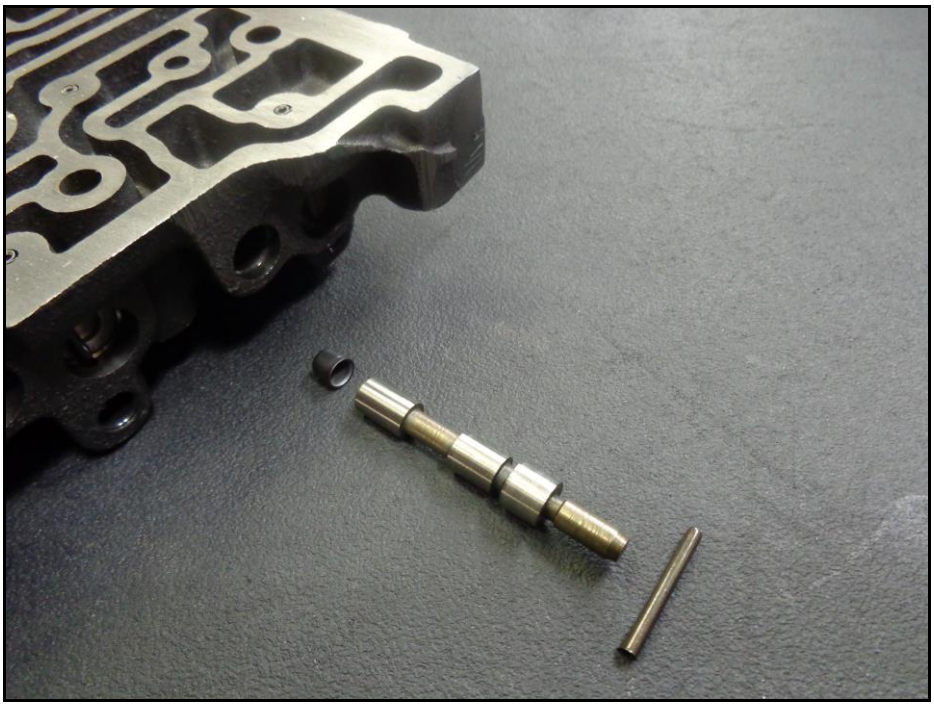


LINE BIAS VALVETRAIN

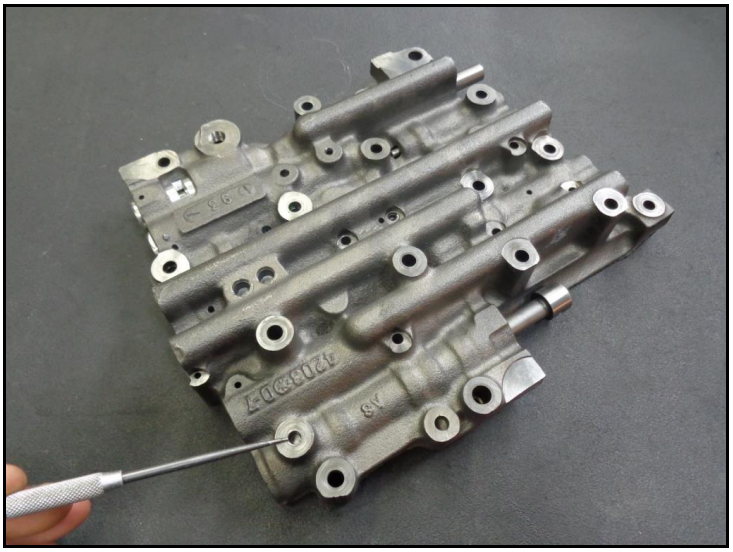
Locate the 3-2 control valvetrain and related components (310, 316 and 317) and remove them from the valve body as shown in the figure below. Discard the 3-2 control valve spring (316).



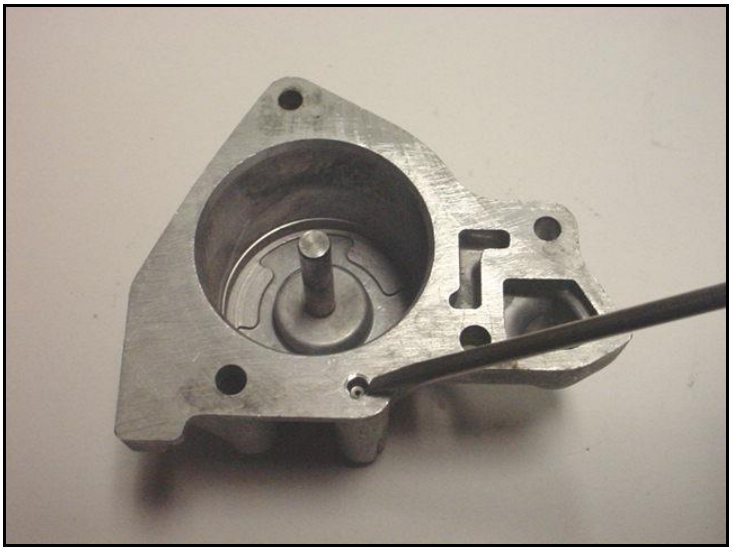
Install one .250" cup plug (cupped end toward the valve) onto the inboard end of the 3-2 control valve (retain with petroleum jelly) and install the valve into the bore exactly as shown in the figure below.



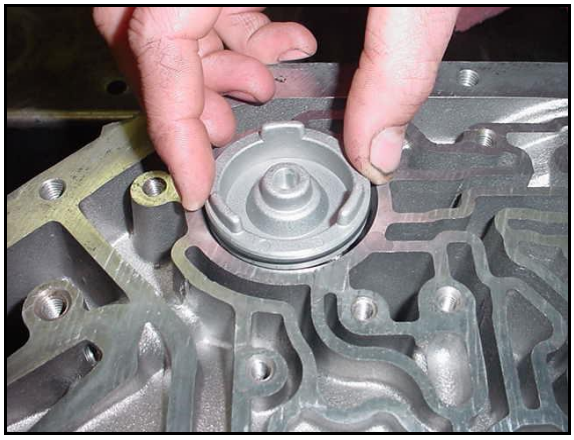
Install one .250” cup plug (cupped end up) into the valve body passage as shown in the figure below. The plug is meant to close off the rear signal oil pipe passage. The front signal oil pipe passage must be left open as a vent.

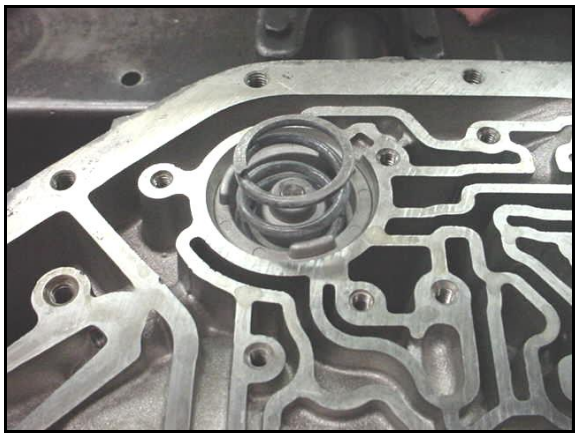


The 1-2 accumulator influences 1-2 upshift feel. To give tunability over the circuit there are two possible 1-2 accumulator combinations. The first is for all engines with up to 350 horsepower, with performance axle ratio (i.e. 3.23:1-3.73:1) and stall converters up to 2200 rpm. Install the supplied 1-2 accumulator spring (59) on top of the 1-2 accumulator piston as shown in the figure. Install it into the 1-2 accumulator housing (62) as shown in the figure used for disassembly. The second combination is for all applications above 350 horsepower. Omit the 1-2 accumulator piston (60) and spring (59). Using a small punch install one of the supplied .250” cup plugs flush into the 1-2 accumulator feed hole in the 1-2 accumulator housing (62). This is shown in the figure below. After installing the cup plug, be sure to deck the housing so that is completely flat.

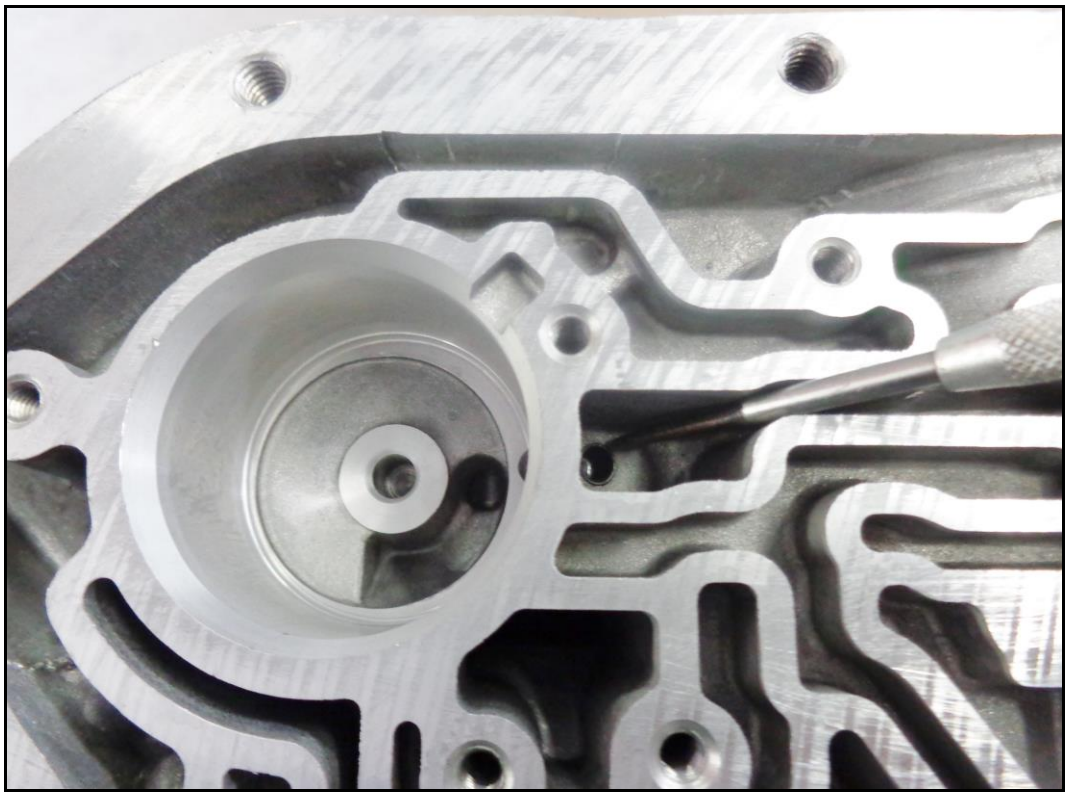


Remove the 3-4 accumulator piston and 3-4 accumulator spring as shown in schematic. Component orientation may not agree with schematic. For street applications with engines producing up to 350 lbs. ft with a redline of @ 5500 rpm install the supplied accumulator piston down over the pin, followed by the supplied accumulator spring as show below.

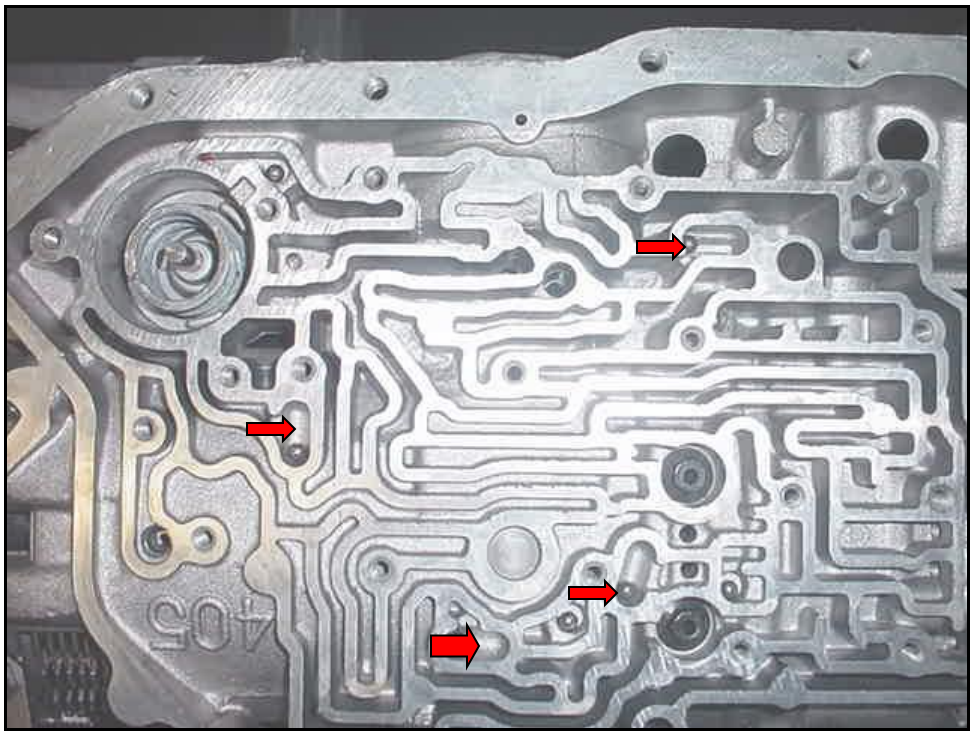




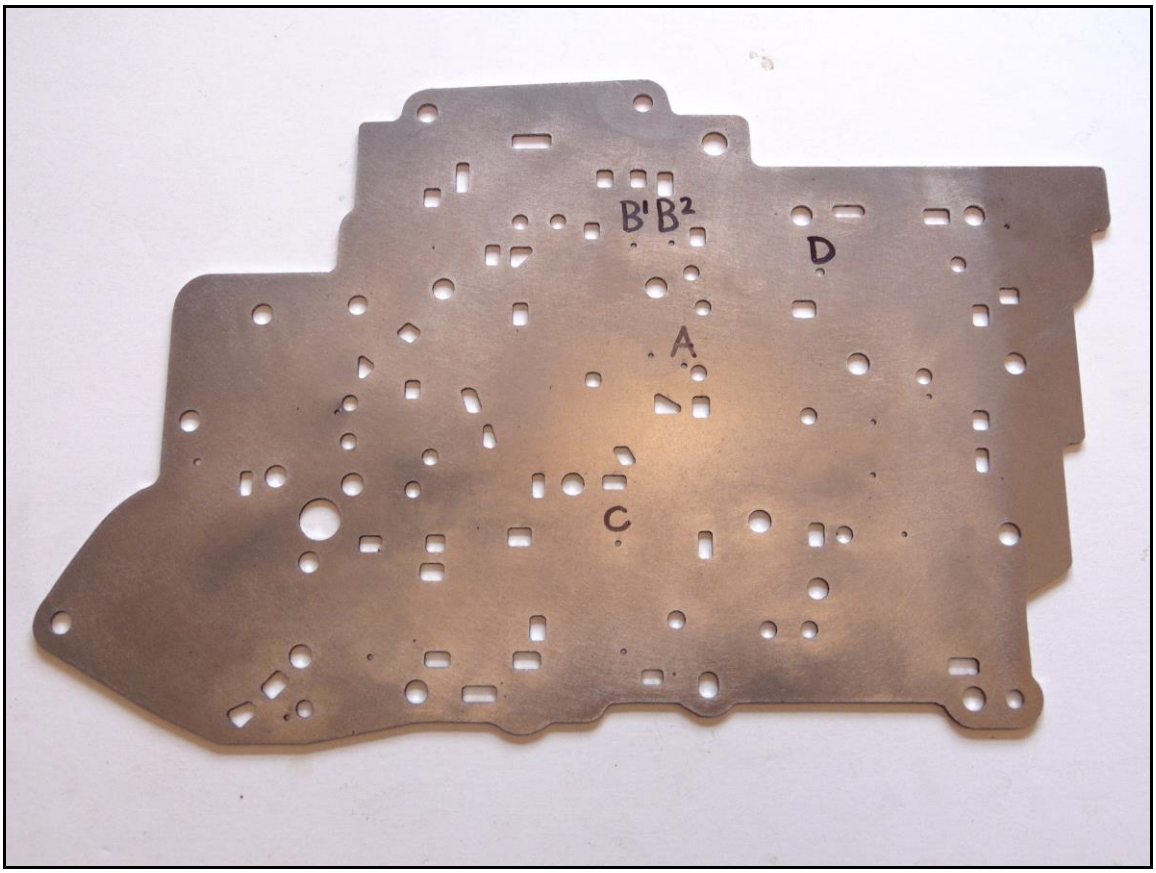
For street/strip applications with engines producing in excess of 350 lbs. ft with a redline of beyond @ 5500 rpm delete the 3-4 accumulator. Use a suitable method to install one of the supplied .250" cup plugs flush into the 3-4 accumulator feed hole in the case. This feed hole is pointed out in the figure below. The hole intersects with the 3-4 accumulator piston bore in the transmission case.



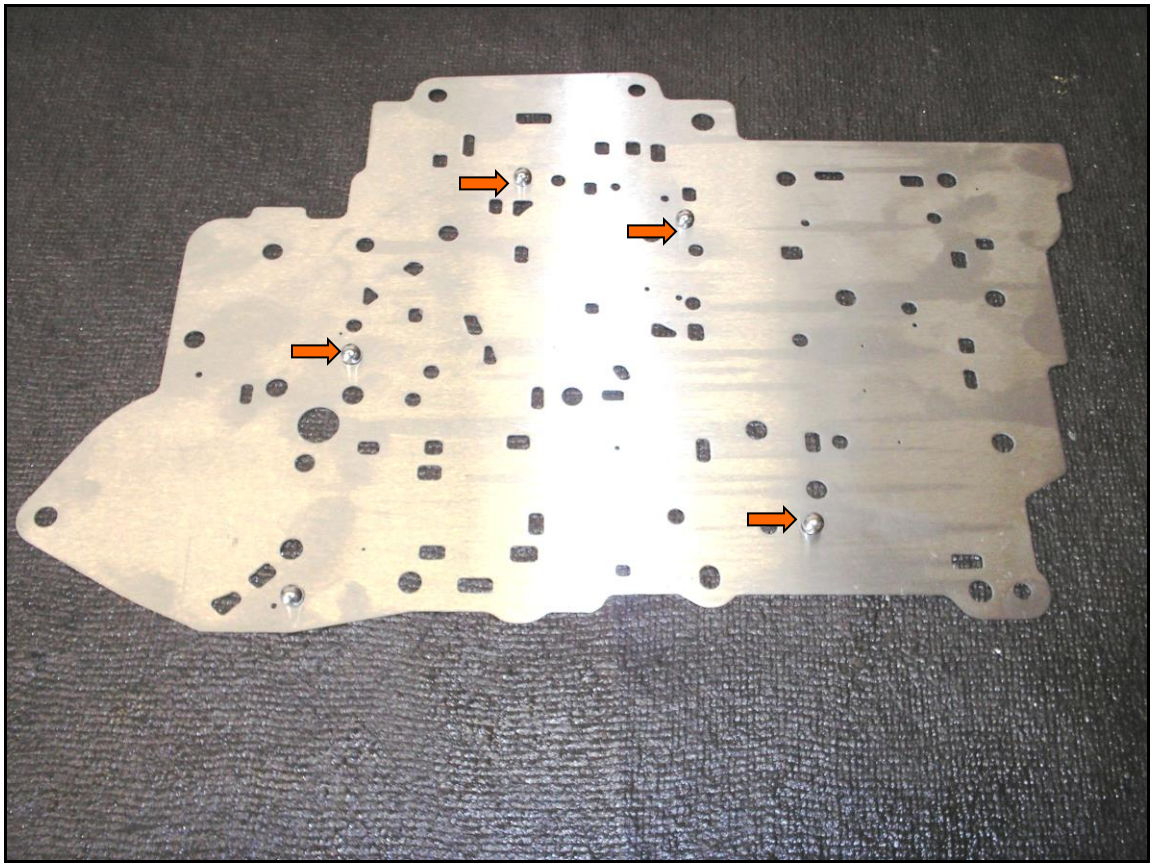
If this kit is being installed with the transmission out of the vehicle, install four .250" checkballs at the locations shown in the figure below. All the locations will resemble "bathtubs". Your transmission will have extra checkballs in the case. Only install the four shown in the figure.



The size of the orifices at locations A, B1, B2, C, and D called out on the separator plate influence shift feel during the upshifts. The orifice immediately below the letter "A" is for the 1-2 upshift. The orifice immediately below the letter/number combinations "B1" and "B2" are for the 2-3 upshift. The orifice immediately below the letter "C" is for the 3-4 upshift. For engine combinations producing up to 250 horsepower drill orifices out "A" and "C" between .078" to .088", and "B1" and "B2" to between 084" to .094". For engine combinations producing up to 350 horsepower drill orifices out "A" and "C" between .084" to .094", and "B1" and "B2" to between 090" to .098". For engine combinations producing over 350 horsepower drill orifices out "A" and "C" to .110", and "B1" and "B2" to .125". Be sure to use the sizes recommended. Orifice "D" is for the 2-3 accumulator feed. For engine combinations producing up to 350 horsepower, drill it out to between .115" and .125". For engine combinations producing over 350 horsepower drill out to .140"



If this kit is being installed with the transmission in the vehicle, use a slight dab of petroleum jelly to retain the checkballs to the plate.



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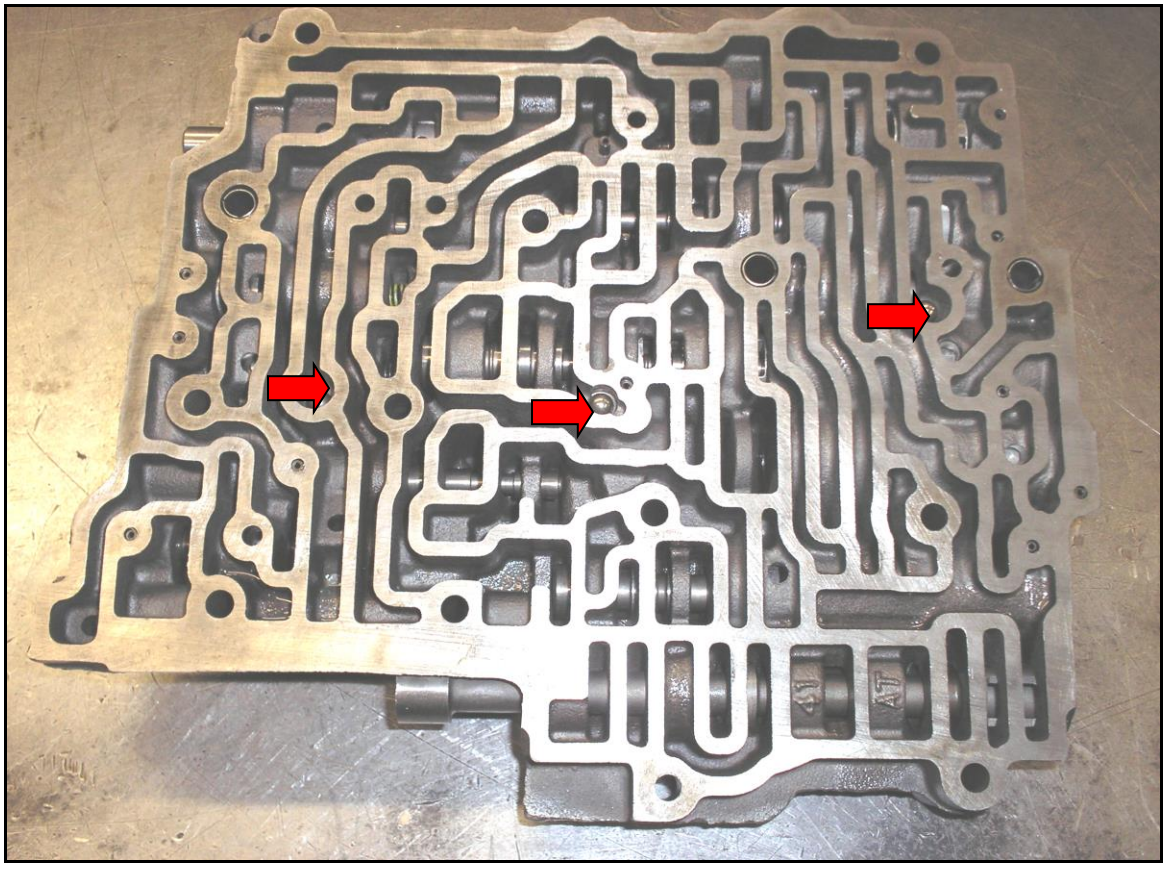
Reinstall the separator plate and gaskets (56, 86, 87), accumulator plate and gasket (57, 58), and the 1-2 accumulator housing (62) and its related components onto the transmission case. Finger tighten the accumulator housing bolts.

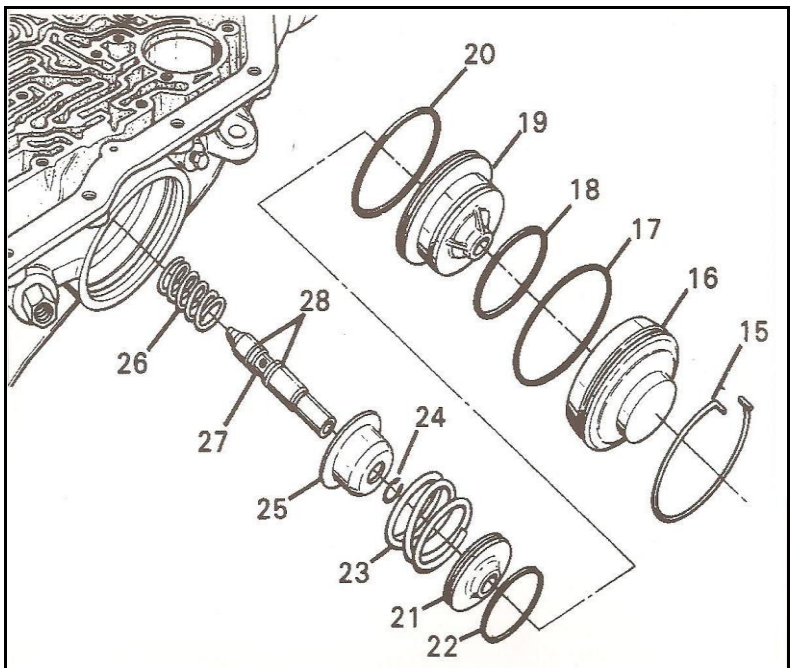
Install three .250" checkballs at the locations shown in Figure. If the vehicle has over 500 horsepower or a torque converter with over 3200 RPM stall speed, you may omit the center or middle checkball. This will give the firmest 1-2 upshift. DO NOT OMIT the checkball with low RPM stall converter or harsh 1-2 upshifts will result.



INTERMEDIATE SERVO ASSEMBLY

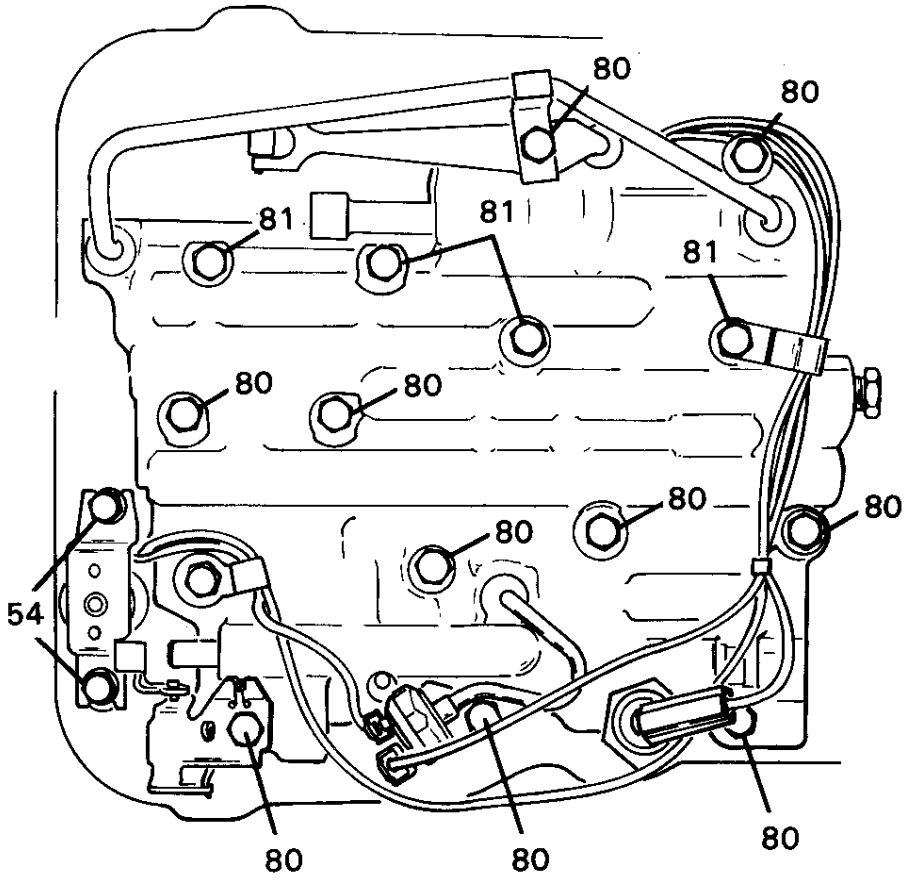
INSTALLATION INSTRUCTIONS

This servo assembly is installed and adjusted just as the OEM. Before beginning installation of this servo assembly make note that the OEM intermediate servo inner piston and seal (21- 22) are no longer required. The piston is an integral part of the supplied assembly. The supplied shim is to be installed between the supplied intermediate servo piston (19) and the OEM intermediate servo cushion spring (23). This is done to insulate the soft aluminum from the hard spring. It is never recommended to run this servo with either spring (23-26) omitted.



15 RING, SERVO COVER RETAINING
16 COVER, INTERMEDIATE SERVO
17 SEAL, ''O'' RING (INTERMEDIATE SERVO COVER)
18 RING, OIL SEAL (INNER)
19 PISTON, INTERMEDIATE SERVO (OUTER)
20 RING, OIL SEAL (OUTER)
21 PISTON, INTERMEDIATE SERVO (INNER)
22 RING, OIL SEAL PISTON (INNER)
23 SPRING, INTERMEDIATE SERVO CUSHION
24 RING, SNAP (APPLY PIN/RETAINER)
25 RETAINER, SERVO SPRING
26 SPRING, INTERMEDIATE SERVO (INNER)
27 PIN, INTERMEDIATE BAND APPLY (SELECTIVE)
28 RING, OIL SEAL (INTERMEDIATE BAND APPLY PIN)

Install the valve body and related components to the transmission case. Finger tighten the bolts. Install the solenoid wiring harness assembly onto the valve body and plug it into the case connector. Install the solenoid into its bore and torque the retaining bolts (54) to 100 inch lbs. Reinstall the remaining valve body bolts and working your way from the inside out, torque the 15 valve body and accumulator housing bolts to 125 inch pounds. Before continuing, check for proper operation of the manual linkage by moving it back and forth. It should click 6 times in each direction and lock the drive shaft when shifted into park.



ILL. NO.	DESCRIPTION
54	BOLTS, HEX WASHER HEAD M6 X 1 X 12.0
80	BOLT, M6 X 1 X 45
81	BOLT, M6 X 1 X 60

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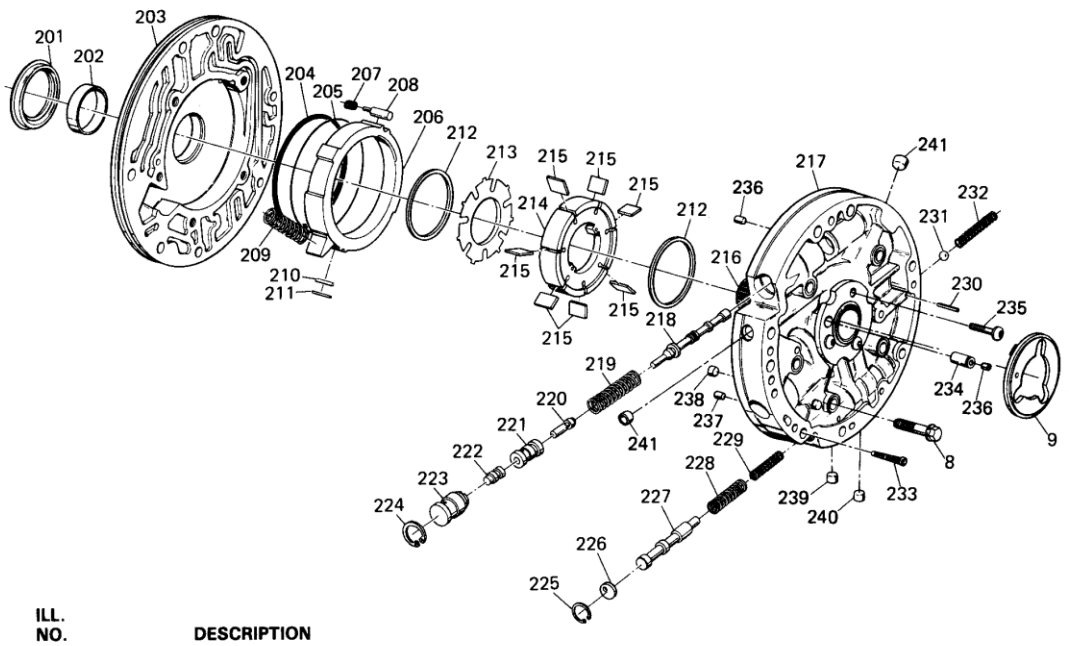
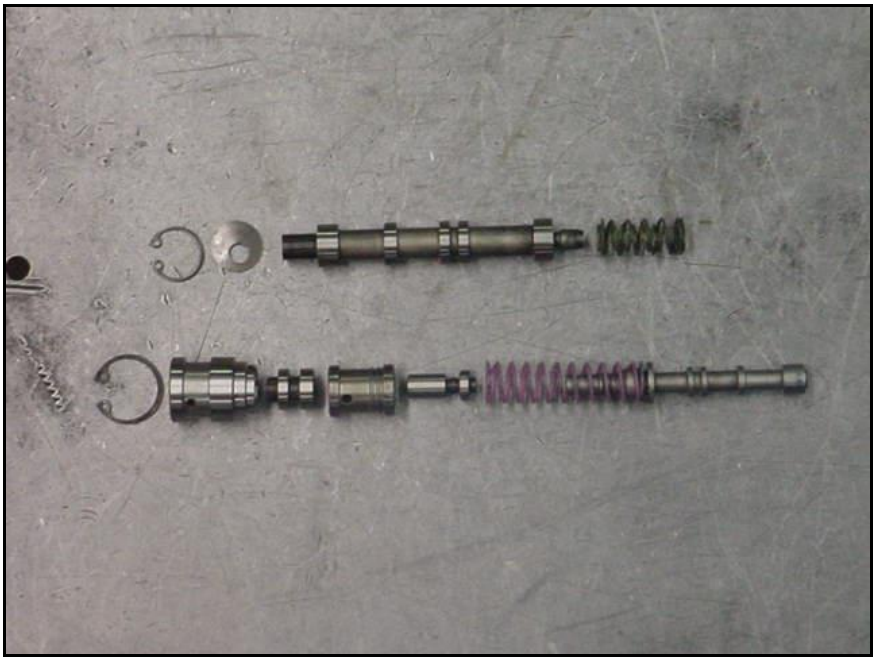


ILL. NO.	DESCRIPTION
8	BOLT, PUMP COVER TO BODY
9	WASHER, THRUST (HOUSING TO PUMP)
201	SEAL, HELIX (PUMP BODY) (FRONT)
202	BUSHING, PUMP BODY
203	BODY, PUMP
204	RING, OIL SEAL (SLIDE TO WEAR PLATE)
205	SEAL, ''O'' RING (SLIDE SEAL BACK-UP)
206	SLIDE, PUMP
207	SPRING, PIVOT PIN
208	PIN, PIVOT SLIDE
209	SPRING, PUMP SLIDE (INNER/OUTER)
210	SUPPORT, PUMP SLIDE SEAL
211	SEAL, PUMP SLIDE
212	RING, PUMP VANE
213	GUIDE, ROTOR
214	ROTOR, OIL PUMP
215	VANE, PUMP
216	SHAFT & FLANGE ASSEMBLY, STATOR
217	COVER, PUMP
218	VALVE, PRESSURE REGULATOR
219	SPRING, PRESSURE REGULATOR VALVE
220	VALVE, REVERSE BOOST
221	BUSHING, REVERSE BOOST VALVE
222	VALVE, T.V. BOOST
223	BUSHING, T.V. BOOST VALVE
224	RING, SNAP PRESSURE REGULATOR CASE
225	RING, SNAP (CONVERTER CL. PUMP VALVE RET.)
226	STOP, VALVE (CONVERTER CLUTCH)
227	VALVE, CONVERTER CLUTCH
228	SPRING, CONVERTER CLUTCH VALVE (OUTER)
229	SPRING, CONVERTER CLUTCH VALVE (INNER)
230	RIVET, FLAT HEAD (.156 X 1.0)
231	BALL, PRESSURE RELIEF
232	SPRING, PRESSURE RELIEF
233	SCREEN ASSEMBLY, GOVERNOR
234	PIN, DOWEL (PUMP COVER)
235	SCREW, SOCKET BUTTON HEAD (M6 X 1 X 16)
236	PLUG, CUP (SELECTIVE WASHER LUBE) (2)
237	PLUG, ORIFICE (CONV. CLUTCH SIGNAL) 4.84 DIA.
238	PLUG, ORIFICE (COOLER FEED) 6.84 DIA.
239	PLUG, CUP (COOLER FEED) 6.8 DIA.
240	PLUG, CUP (CLUTCH RELEASE) 6.8 DIA.
241	PLUG, CUP (LINE/CASE) .511 DIA. (2)

HH0110200-4B

OIL PUMP EXPLODED VIEW

Identify the TV Boost Valve and Sleeve, Reverse Boost valve and Sleeve, and Pressure Regulator Spring supplied in this kit. Identify their installed locations in the front pump of the transmission. Their bore in the oil pump is to the left of the oil filter bore. Review the front pump illustration on the previous page and note the orientation of items 224, 223,222,221,220, 219 and 218. Remove the snap ring (224) that retains the pressure regulator assembly into its bore. Remember that the parts are spring loaded and will pop out once the snap ring has been removed. Remove and discard item numbers 223,222,221,220, and 219. Using the oil pump illustration and the photo below reinstall the updated pressure regulator assembly components into their bore in the oil pump. Coating the pressure regulator valve with Vaseline will help retain it in the bore while fitting the remaining pressure regulator assembly components. Be sure that the snap ring (218) is completely seated into its groove before proceeding. Never skip over installation of the tv boost valve assembly. Its installation is critical to optimum product performance. Oil pressure readings in all ranges excluding Reverse should be between 75psi and 100 psi @ 1000 rpm with zero pull on the throttle valve cable, and between 260 psi and 290 psi @ 1000 rpm with full pull on the throttle valve cable. Reverse pressure should be between 160 psi and 250 psi between zero pull and full pull of the throttle valve cable and in some cases may remain steady regardless of cable position. If Reverse psi remains steady when pulling on the cable it is OK providing pressure value no lower than 160psi @ 1000rpm, regardless of throttle valve cable position.



Verify the presence of the o-ring on the filter neck and reinstall the oil filter into the pump. Install the supplied pan gasket and oil pan and torque the 16 pan bolts to 180-inch pounds. Start the engine and fill the transmission oil to its proper level as shown on the dipstick. Road test the transmission, recheck the oil level and readjust the TV cable and manual linkage if necessary.