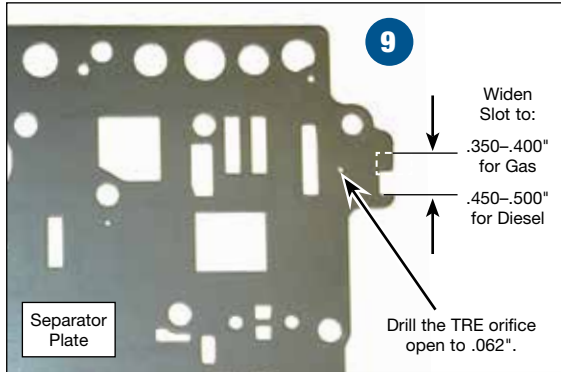
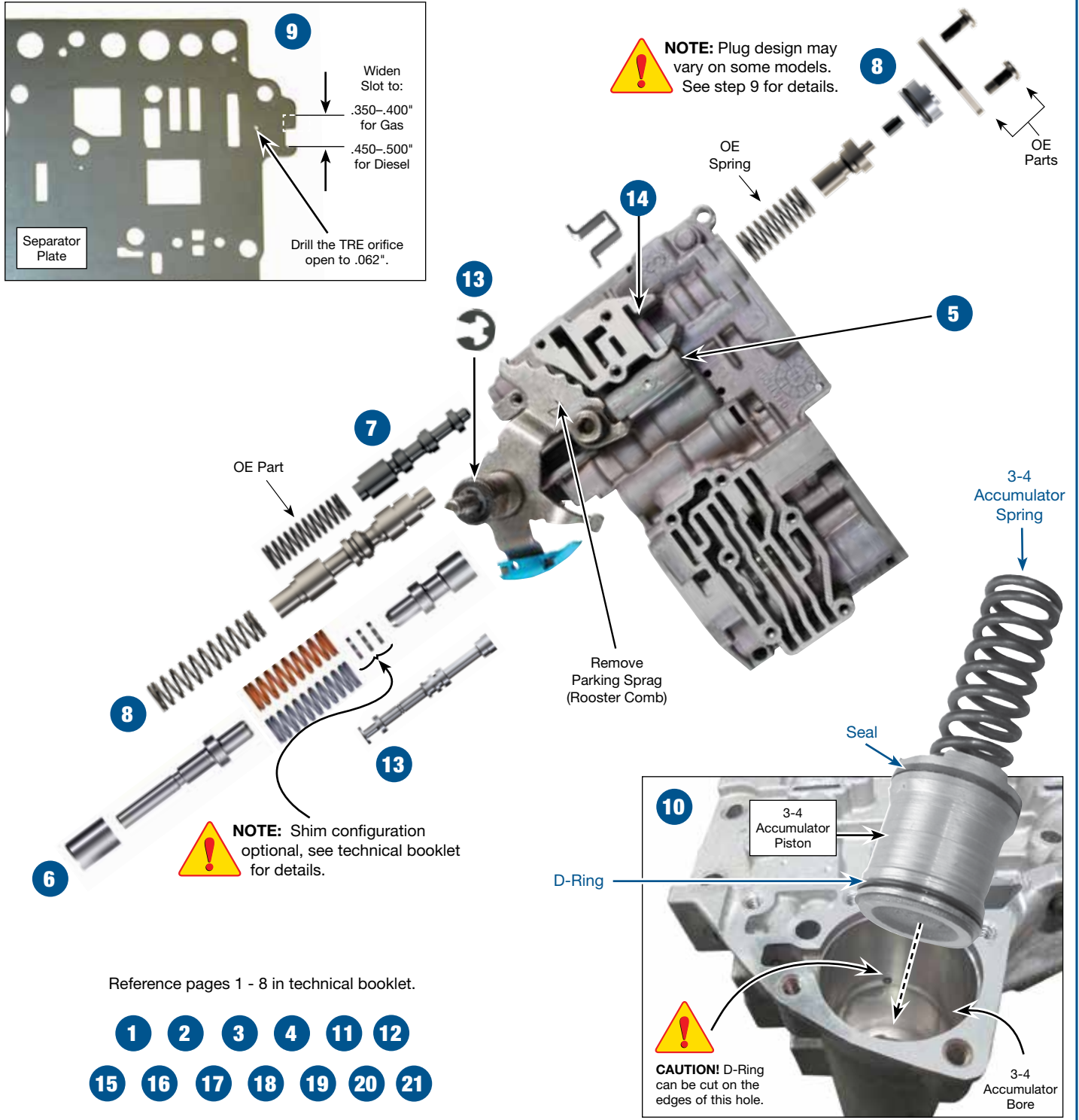


*Parts are labeled here in order of installation. See other side of sheet for details on kit contents.*

**INSTALLATION DIAGRAM**



**NOTE:** Plug design may vary on some models. See step 9 for details.



Reference pages 1 - 8 in technical booklet.

- 1**
- 2**
- 3**
- 4**
- 11**
- 12**
- 15**
- 16**
- 17**
- 18**
- 19**
- 20**
- 21**

## Sure Cure Contents & Installation Steps See Instruction Booklet for detailed instructions

### Step 1 Disassemble Valve Body & Manual Lever

### Step 2 Ream Pressure Regulator Valve & Throttle Pressure Plug Bore

NOTE: Requires Sonnax tool kit F-22771A-TL7 and VB-FIX alignment fixture, not included in this kit.

### Step 3 Ream Throttle Valve Bore

NOTE: Requires Sonnax tool kit F-22771-TL and VB-FIX alignment fixture, not included in this kit.

### Step 4 Ream Switch Valve Bore

NOTE: Requires Sonnax tool kit 22771A-TL13.

### Step 5 Ream Detent Bore & Install Detent Sleeve & Pin

NOTE: Requires Sonnax tool kit 22771-TL12 not included in this kit.

#### Packaging Pocket 1

• Sleeve • Detent Ball (*installed in Step 14*)

### Step 6 Install Oversized Throttle Valve Kit

#### Packaging Pocket 2

• Throttle Valve • Plunger • Sleeve • Spring • Shims (3)

### Step 7 Install Oversized Switch Valve

#### Packaging Pocket 3

Oversized Four-Spool Switch Valve

### Step 8 Install Oversized Lube Regulated Pressure Regulator Valve, Throttle Plug & Line Pressure Plug/Sleeve

NOTE: Components provided are designed to replace an OE 3 piece line pressure plug and sleeve arrangement. If an OE 2 piece design is found during disassembly, alternative components (not included) may be required.

#### Packaging Pocket 4

• Oversized Lube Regulated PR Valve • White-Striped Spring • Throttle Plug • Line Pressure Plug/Sleeve • O-Ring (2) 1 extra

### Step 9 Separator Plate Modification

#### Packaging Pocket 5

.062" Drill

### Step 10 Replace 3-4 Accumulator Spring & Seals

#### Packaging Pocket 6

• Spring • Seal • D-Ring

### Step 11 Vacuum Test Verification

### Step 12 Replace Checkballs & Assemble Valve Body Sections

#### Packaging Pocket 7

• 3/16" Checkball • 1/4" Checkball (8) • 11/32" Checkball

### Step 13 Replace Manual Valve, Reinstall Throttle Pressure Adjusting Screw Bracket & Parking Sprag

#### Packaging Pocket 8

• Manual Valve • E-Ring • Detent Ball (*included in Step 5*)

### Step 14 Replace Boost Valve Retainer, Adjust Pressure Regulator Spring, & Set Throttle Lever Stop

#### Packaging Pocket 8

Retainer

### Step 15 Replace Intermediate Shaft Pilot & End Plug

#### Packaging Pocket 9

• Shaft Pilot • Cup Plug

### Step 16 Replace Output Pilot Bushing

#### Packaging Pocket 10

Bushing

### Step 17 Install Rear Planet Endplay Shims

#### Packaged Separately

Shims (2)

### Step 18 Replace Turbine Shaft Seals

#### Packaging Pocket 11

Seals (2)

### Step 19 Replace Rear Servo Piston Plug

#### Packaged Separately

• Plug • O-Ring • Retaining Ring

### Step 20 Replace Front Servo Piston Cover & O-Ring

#### Packaged Separately

• Cover • O-Ring

### Step 21 Replace Kickdown Servo Band Strut

#### Packaging Pocket 12

Strut

The parts listed here may be protected by patent number 6,689,007.

Technical Specifications	
<b>Pump-to-Stator Bolts</b> 15 ft-lb	<b>Valve Body-to-Case Bolts</b> 106 in-lb
<b>Pump-to-Case Bolts</b> 15 ft-lb	<b>OE Endplay</b> .034-.084"
<b>Valve Body Assembly Bolts</b> 35 in-lb	

**PART INSTALLATION:** To implement best practices and avoid chip contamination, wait until all valve body reaming operations are finished before installing Sonnax products. Detailed installation instructions steps are explained later in this booklet.

**F-TOOL REAMING:** Visit Sonnax web site [www.sonnax.com](http://www.sonnax.com) for general F-Tool reaming fixture instructions, as well as best practices for bore preparation, cautions and suggestions on bore reaming.

## Step 1 Disassemble Valve Body & Manual Lever

- a. Remove shouldered bolt retaining the solenoid wiring harness case connector to the valve body.
- b. Secure manual lever detent ball with Chrysler tool #6583 (**Figure 1**). An alternative method: use a dull wood workers gouge tool to compress the detent ball while removing the manual lever.



**CAUTION:** The detent ball and spring will launch out of the detent bore by spring tension if not retained during manual lever removal. Never reuse the OE detent ball with the Sonnax sleeve. The Sonnax ball is specially toleranced to work with the Sonnax sleeve, preventing binding of the ball in the bore.

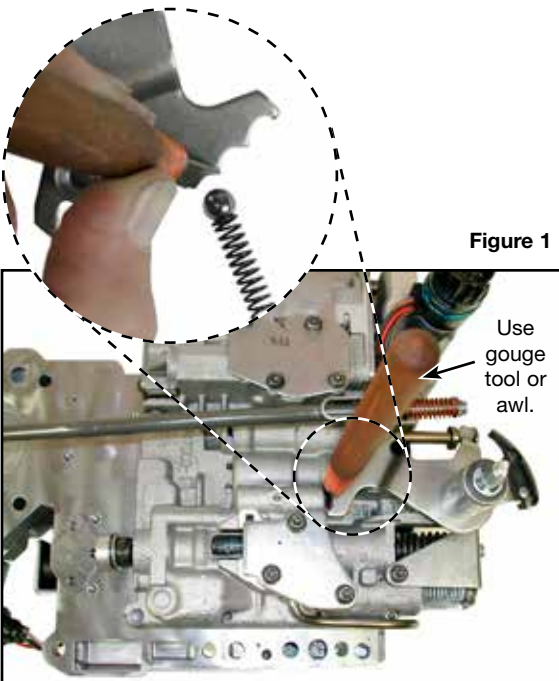
- c. Remove OE E-clip, washer and manual lever from valve body. Slide out throttle lever. Discard detent ball. Save detent spring for reassembly.
- d. Disconnect governor pressure sensor and governor pressure solenoid connectors.
- e. Remove governor body screws and then governor body.
- f. Take out three screws holding overdrive/lockup solenoid from lower casting. Then, remove solenoids with wiring harness from valve body.



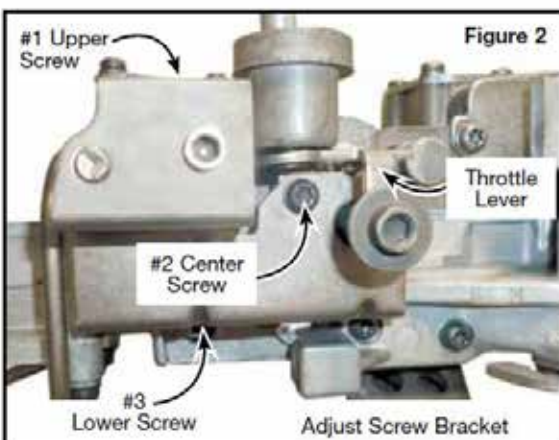
**CAUTION:** The pressure adjusting bracket is under spring tension by the pressure regulator and switch valve springs.

- g. Remove the center screw from the adjusting screw bracket. Temporarily remove one of the long screws holding the three valve body castings together and install it in place of the center screw (**Figure 2**). This will help to hold the bracket in place when removing the upper and lower screws. Remove the upper and lower bracket screws while holding the adjusting screw bracket. Remove the center screw. Save the OE switch valve spring, line pressure screw and adjusting bracket for reassembly. Discard the OE pressure regulator spring.
- h. Remove two screws holding the throttle pressure plug retaining plate. Remove the retaining plate, sleeve, plug and spring from valve body. Discard the OE plug and sleeve. Save OE spring for reassembly.
- i. Bend tabs securing boost valve tube to valve body. Then, remove OE boost valve tube.
- j. Remove the bolts from the lower housing which clamp the three valve body castings together.
- k. Remove and discard OE switch valve and pressure regulator valve. Remove throttle valve assembly, discarding all parts except the TV and switch valve springs which will be reused at assembly.
- l. Remove all the remaining valves and springs from the upper casting. Reinstall valves and springs after all reaming operations are completed.
- m. Disassemble, clean and reassemble the lower casting.

**NOTE:** The only casting requiring reaming is the upper casting.




**Figure 1**



**Figure 2**

## Step 2 Ream Pressure Regulator Valve & Throttle Pressure Plug Bore

### 1. Valve Body Inspection

 **CAUTION:** If a line-to-lube hole has been drilled in the pressure regulator valve circuit, it should be plugged to reduce converter drainback (Figure 3).

### 2. Disassembly

- a. Remove and discard OE pressure regulator valve and spring.
- b. Remove OE end plate and screws. Set aside for reuse.
- c. Remove and discard OE line pressure plug/sleeve and throttle plug.
- d. Remove OE throttle pressure spring. Set aside for reuse.

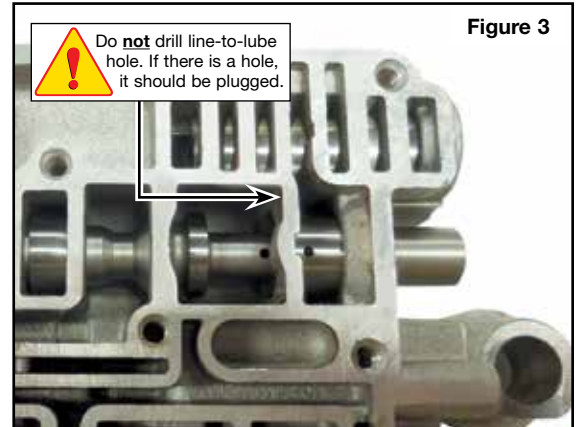



Figure 3

### 3. Ream Bore

 **NOTE:** These two bores require the use of tool kit **F-22771A-TL7** and the alignment fixture **VB-FIX** (not included in this kit).

**NOTE:** Do not install valves at this time. Wait until all reaming operations are finished.

## Step 3 Ream Throttle Valve Bore

### 1. Disassembly

Remove and discard OE throttle valve, spring, plunger valve and sleeve.

### 2. Ream Bore

 **NOTE:** This bore requires the use of tool kit **F-22771-TL** and the alignment fixture **VB-FIX** (not included in this kit).


**NOTE:** Do not install valves at this time. Wait until all reaming operations are finished.

## Step 4 Ream Switch Valve Bore

### 1. Disassembly

- a. Remove OE valve and discard.
- b. Remove OE spring. Set aside for reuse.

### 2. Ream Bore

 **NOTE:** This bore requires the use of tool kit **22771A-TL13** (not included in this kit). These piloted reamers do not require a reamer guide.


**NOTE:** Do not install valves at this time. Wait until all reaming operations are finished.

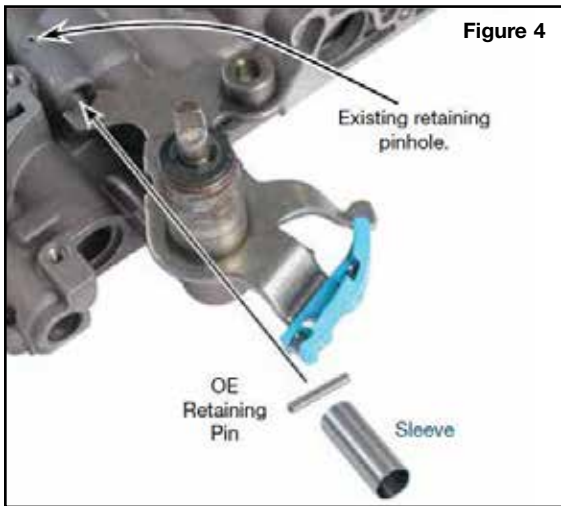
## Step 5 Ream Detent Bore & Install Detent Sleeve & Pin

### 1. Disassembly

Remove and save the OE retaining pin.

### 2. Ream Bore

 **NOTE:** This bore requires the use of tool kit **22771-TL12** (not included in this kit).



**3. Install Detent Sleeve & Pin (Figure 4)**

**NOTE:** The Sonnax sleeve is designed as a slip fit, and is secured by drilling through the sleeve with the tool kit drill bit and reinstalling the OE retaining pin. However, it is highly recommended that Loctite® (or equivalent) be used with the sleeve.

- a. Secure the Sonnax sleeve in the detent bore using Loctite® retaining compound per the manufacturer's directions.
- b. The sleeve should be pushed in until the face is flush with the face of the ball end of the detent bore.

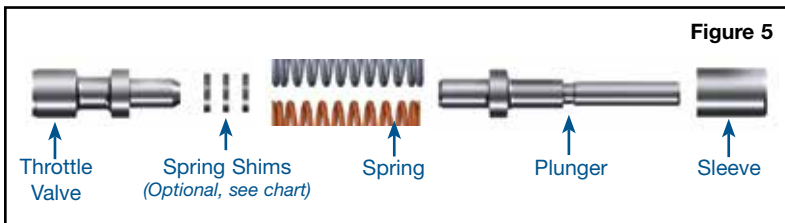
**NOTE:** Before drilling, it helps to use the retaining pin as a center punch and make a slight indentation in the sleeve to hold the drill bit on-center and prevent the drill bit from walking off and making the pinhole in the casting larger.

- c. After the Loctite® has cured, use the existing retaining pinhole in the casting to guide the drill bit through both sides of the sleeve.



**CAUTION:** Do not drill any deeper than the depth of the pin.

- d. Reinstall the OE retaining pin and use a flat blade screwdriver, center punch or other tool to swage the aluminum casting over the top of the pin. Confirm retaining pin is secured in place.



**Step 6 Install Oversized Throttle Valve Kit**

(Figure 5)

- a. Reference Spring & Shim Usage chart. Install any desired shims over spring stem of Sonnax throttle valve. Install valve in bore, spring stem outboard.
- b. Install Sonnax spring.
- c. Install Sonnax throttle plunger and sleeve.

Spring & Shim Usage for Desired Change in TV Pressure			
	Spring	No. of Shims	Approx. Change to TV psi
Higher Upshifts	Sonnax	2	+ 14 psi
	Sonnax	1	+ 7 psi
	Sonnax	0	0 psi

**Step 7 Install Oversized Four-Spool Switch Valve**

(Figure 6)

Install Sonnax oversized switch valve. The OE switch valve spring will be installed while installing the pressure adjusting bracket in Step 13 (Figure 15).



**Step 8 Install Oversized Lube Regulated Pressure Regulator Valve, Throttle Plug & Line Pressure Plug/Sleeve**

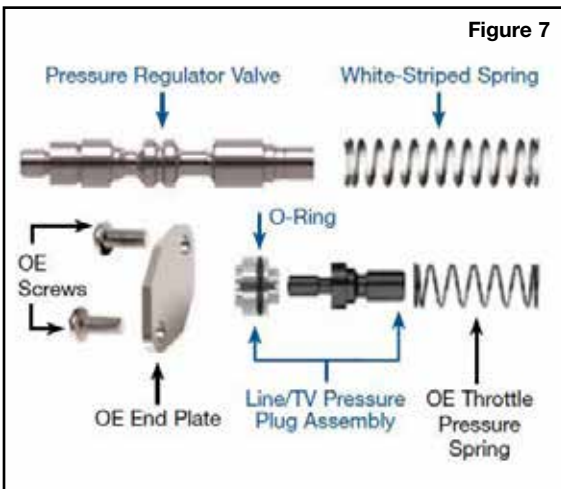
- a. At the opposite end of the pressure regulator bore, reinstall the OE throttle spring, followed by the Sonnax oversized throttle plug and line pressure plug/sleeve (Figure 7).
- b. Install the OE end plate with the two screws.

**NOTE:** Check to be sure the end cap (plate) sits flush against the valve body and seals the bore. If the plate is not flush, remove material from the castellated side of the O-ringed sleeve. Remove the minimum material necessary to allow the plate to seal the bore. Do not remove more than .015" [0.38 mm] total from the sleeve.



**CAUTION:** Pressure leaking at the plate will result in increased line pressure.

- c. Install Sonnax oversized pressure regulator valve. The Sonnax white-striped spring will be installed later in Step 13 (Figure 15).



OE Line/TV Spring Specs	
Free Length	1.460"
Wire Diameter	.035"
Number of Coils	6
<i>NOTE: Chart for reference only.</i>	

## Step 9 Separator Plate Modification

Enlarge TRE orifice in OE separator plate from original size .045" to .062" (Figure 8).



**CAUTION:** Drilling larger than .062" will create a bump on TCC apply.

- a. Drill with 1/16" (.062") drill bit.
- b. Remove burrs with a large drill bit.

## Step 10 Replace 3-4 Accumulator Spring & Seals

### 1. Disassembly

- a. Remove cover plate and screws.
- b. Remove and discard OE accumulator spring and seals.

### 2. Installation (Figure 9)

- a. Use red-colored Scotch-Brite™ to remove glaze from bore. Clean bore until spotless.
- b. Install Sonnax scarf-cut seal at open end of OE piston.
- c. Install Sonnax D-ring by the closed end of the piston.
- d. Install OE piston, then Sonnax spring.
- e. Return OE cover plate and screws, torquing to 35 in-lbs.



**CAUTION:** The 4th accumulator D-ring can be easily cut on hole edge in accumulator bore during installation.

## Step 11 Vacuum Test Verification

**NOTE:** To verify reaming operations use Sonnax vacuum test stand kit VACTEST-01K (not included with this kit).

A vacuum test at the ports indicated should hold the recommended in-Hg of vacuum or more (Figure 10).

## Step 12 Replace Checkballs & Assemble Valve Body Sections

- a. Install the 3/16" checkball as shown (Figure 11).
- b. On other side of the channel plate, install two 1/4" checkballs as shown (Figure 12).
- c. Install one 11/32" and six 1/4" checkballs in the lower valve body (Figure 13).

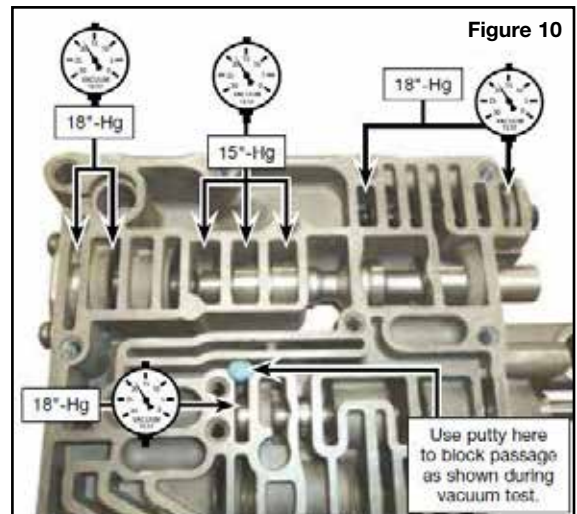
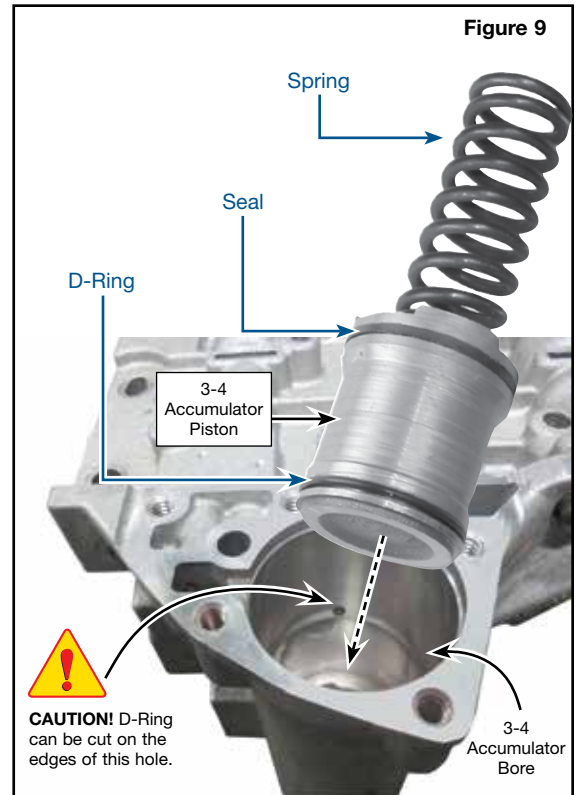
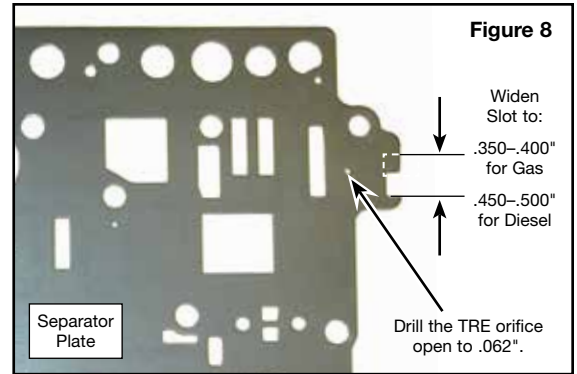


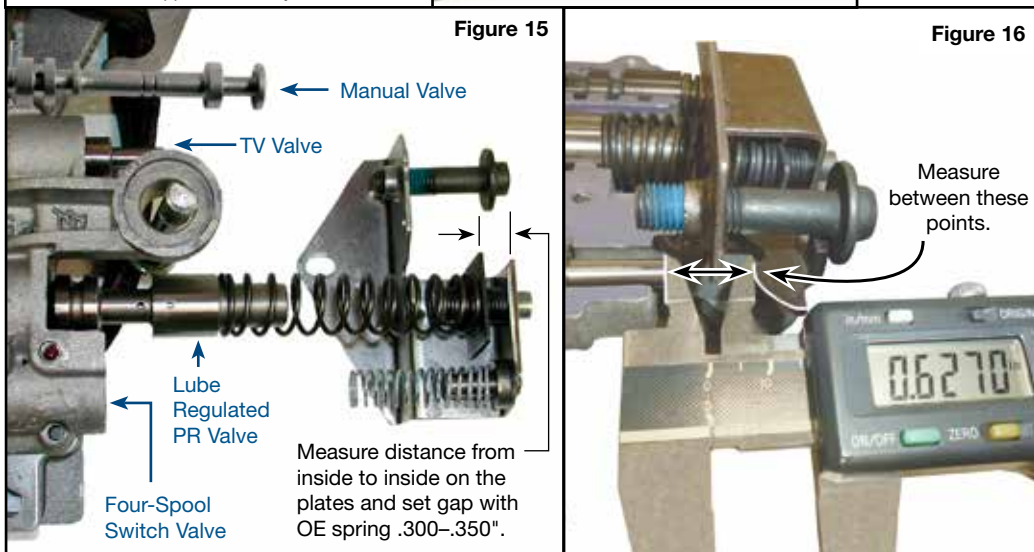
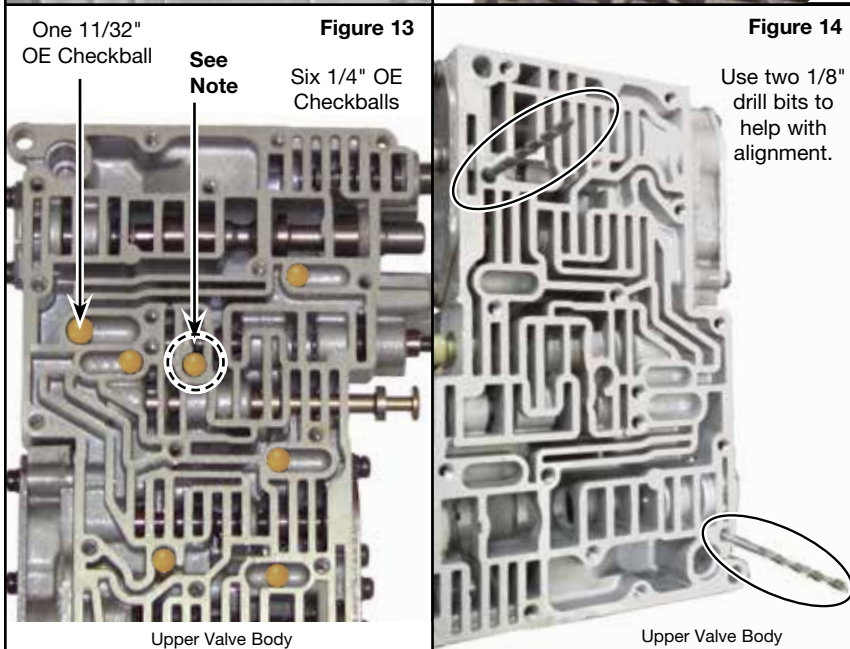
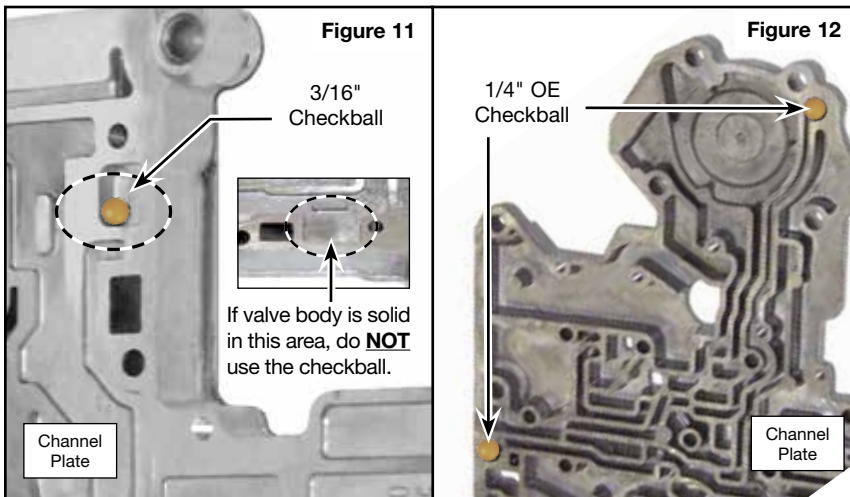
**CAUTION:** Forward clutch failure will occur if the ball seat of the TV ball in the spacer plate leaks.

**Helpful Valve Body Alignment Hint:** It can be helpful to use two 1/8" drill bits, in locations shown, to keep the valve body sections and separator plates in alignment during assembly (Figure 14).

## Step 13 Replace Manual Valve, Reinstall Throttle Pressure Adjusting Screw Bracket & Parking Sprag

### 1. Replace Manual Valve (Figure 15)





**2. Reinstall Throttle Pressure Adjusting Screw Bracket (Figure 15)**

- a. Install included white pressure regulator spring over pressure regulator valve stem.
- b. Install OE 4-spool switch valve spring.
- c. Torque screws to 35 in-lbs.

**3. Reinstall Parking Sprag (Figure 1)**

- a. Reinstall OE spring and Sonnax detent ball into sleeved detent bore.
- b. Reinstall OE parking sprag on casting boss. Reference **Figure 1** and use gouge tool or awl for compressing detent ball during assembly.
- c. Install Sonnax E-clip, ensuring it is installed in proper orientation (**Quick Guide**).
- d. Ensure leg on parking sprag engages manual valve.

**Step 14 Replace Boost Valve Retainer, Adjust Pressure Regulator Spring, & Set Throttle Lever Stop**

**1. Replace boost valve retainer**

(Quick Guide)

**2. Adjust pressure regulator spring**

- a. Line pressure must be between 60–65 psi at idle in drive with minimum TV pressure. This is accomplished by setting distance to .300–.350" between inside of spring retaining plates (**Figure 15**).
- b. Each clockwise turn of the adjuster will move the plate by approximately .050". Adjust gap between plates to .300–.350".



**NOTE:** This adjustment can only be made with an OE spring. Aftermarket springs will require pressure gauge reading and subsequent readjustment of the distance setting to obtain correct line pressure.

- c. Verify line pressure after assembly with a gauge hooked into the line pressure tap located on passenger side, middle of case, between the accumulators. Line pressure will be boosted at TCC apply and 4th gear. Line pressure must be between 60–65 psi at idle in Drive with minimum TV pressure.



**CAUTION:** Use caution adjusting the spring or high pressure will create bindups from cross leaks and increase throttle sensitivity.

**3. Set Throttle Lever Stop**

- a. With throttle valve fully bottomed in bore, measurement between cam and plunger valve must be .627" (Figure 16).
- b. Adjust throttle adjusting screw as needed to meet .627" measurement specification.

**Step 15 Replace Intermediate Shaft Pilot & End Plug**

**1. Disassembly**

- a. Using a sheet metal screw, remove and discard the OE cup plug from the OE intermediate shaft (Figure 17).
- b. Using a steel rod (3/16" x 17"), drive the OE shaft pilot out from the cup plug end of the OE intermediate shaft, then discard pilot (Figure 18).

**2. Installation (Figure 19)**

- a. Clean the OE intermediate shaft bore thoroughly.
- b. Install the Sonnax cup plug by driving it into the OE intermediate shaft.

**NOTE:** An AXOD servo pin works well for this.

- c. Install Sonnax shaft pilot into position by driving it in the front of intermediate shaft. If the OE intermediate shaft does not have an internal stop to locate the pilot, position it so that .230-.280" of the pilot protrudes out of the shaft.

**Step 16 Replace Output Pilot Bushing**

- a. Remove and discard pilot bushing.
- b. Press the Sonnax output shaft pilot bushing into the OE overdrive output shaft (Figure 20).

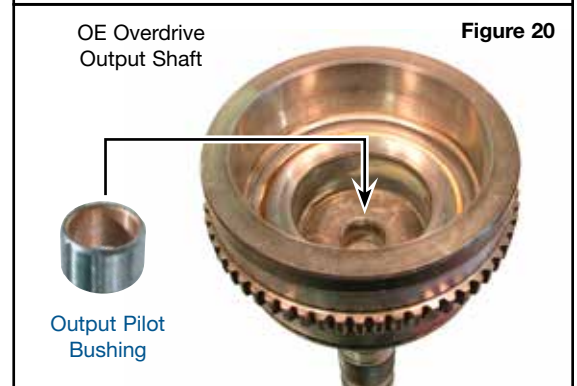
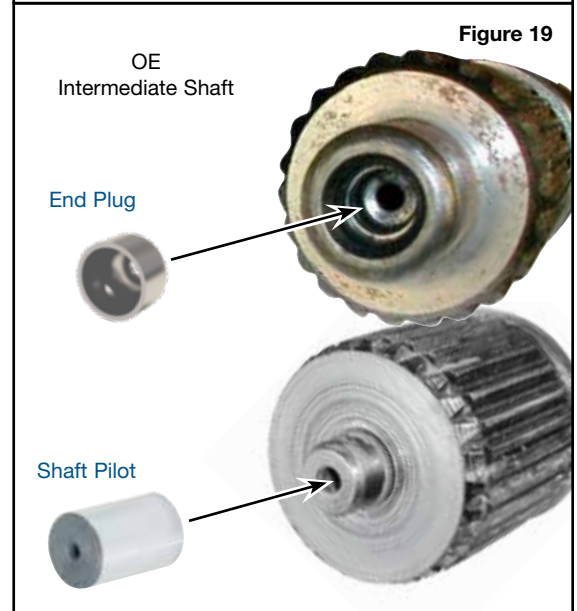
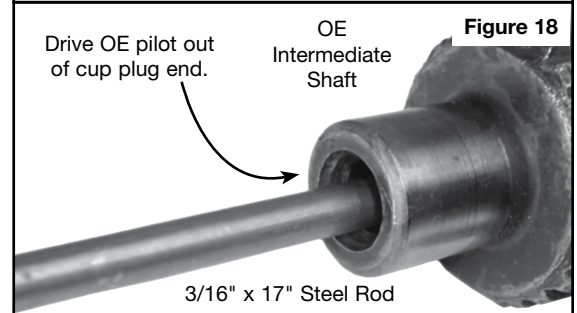
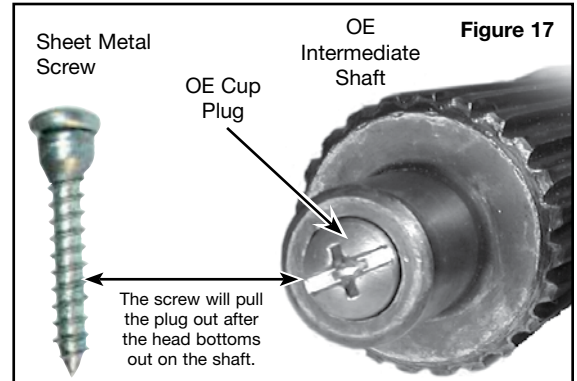
**Step 17 Install Rear Planet Endplay Shims**

If inspection of rear annulus gear or intermediate shaft indicates visible wear, the Sonnax endplay shim is generally required to reduce geartrain endplay (Figure 21). To verify:

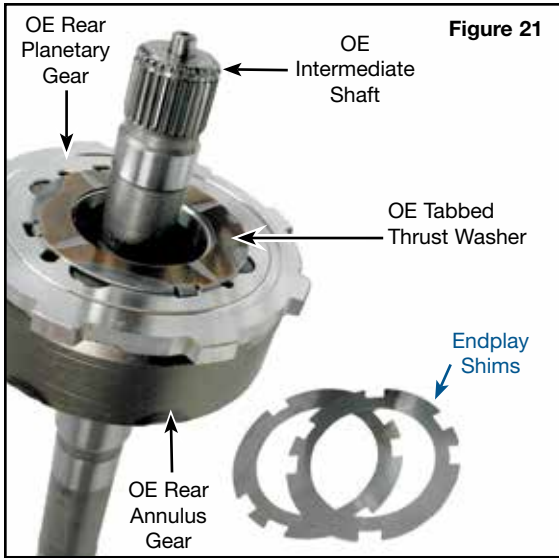
- a. Measure the endplay of rear planetary gear, rear annulus gear and driving shell as an assembled unit as illustrated (Figure 22).
- b. Stand the assembly upright, with the snap ring installed, on a flat surface. Pull upward on the intermediate shaft and measure the clearance.
- c. Insert feeler gauge between rear annulus gear support hub and intermediate shaft shoulder. The factory specification for the clearance should be between .005" and .048". A minimum of .005" to .010" endplay is preferred. If the clearance exceeds these specifications, Sonnax endplay shim(s) should be inserted between the OE tabbed thrust washer and rear planetary assembly.

**Step 18 Replace Turbine Shaft Seals**

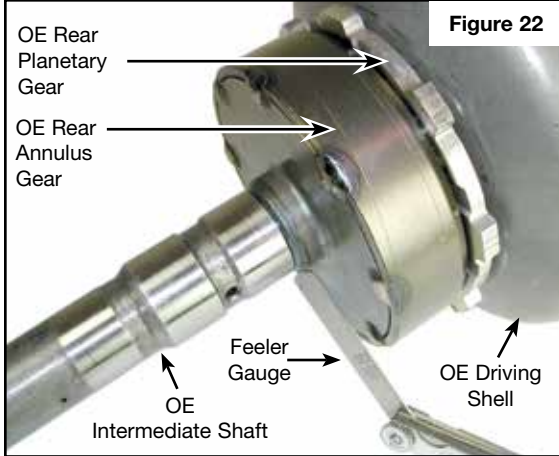
- a. Remove and discard OE shaft seals.
- b. Install the two PTFE Sonnax turbine shaft seals on the turbine input shaft (Figure 23).







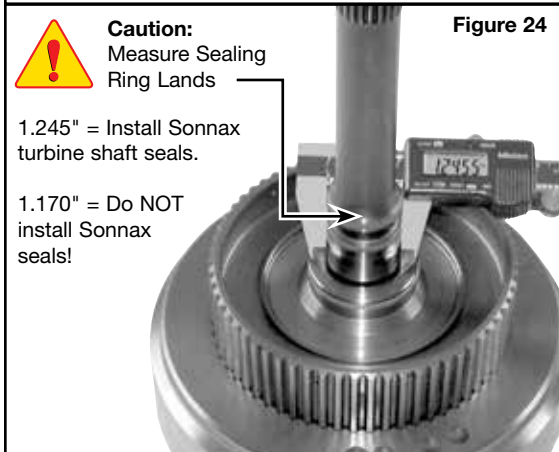
**Figure 21**



**Figure 22**



**Figure 23**



**Figure 24**



**NOTE:** Measure sealing ring lands. These seals will NOT work on seal lands measuring 1.170". Only install these seals on landings measuring 1.245" (Figure 24).

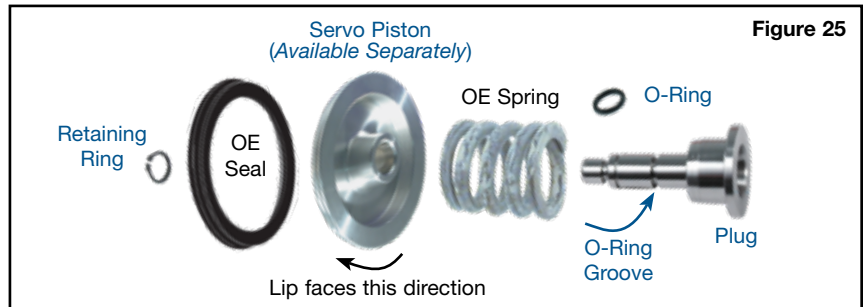
## Step 19 Replace Rear Servo Piston Plug (Figure 25)

### Disassembly

- Remove and discard OE plug.
- Examine the servo piston for bore wear and replace as necessary (Sonnax part numbers 22912, 22912B). **NOTE:** Pistons not included in this kit.

### Modification & Installation (Figures 26 & 27)

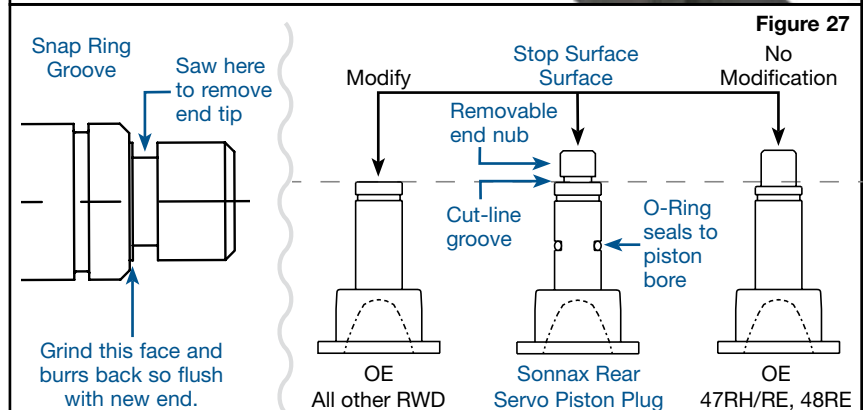
- If installing in a 47RH/RE (618) NO plug modification necessary.
- If installing in a 46RH/RE (518) the tip of the replacement plug must be cut off.
  - Use a band saw or hack saw at the indicated groove (Figures 26 & 27), to cut off the plug tip. Then grind flush to the new plug. Failure to remove burrs and grind flush can lead to contamination and incorrect assembly height.
  - Install the O-ring in the indicated plug groove, and lube with assembly lubricant.
  - Reassemble OE spring, piston and O-ringed plug.
  - Use the included heavy-duty retaining ring to secure O-ringed plug to the piston.
  - Adjust the servo travel to OE specifications.



**Figure 25**



**Figure 26**



**Figure 27**

## Step 20 Replace Front Servo Piston Cover & O-Ring

### Disassembly

- Remove retaining ring from case and save for reuse.
- Remove and discard OE servo piston cover.
- Buff off any servo pin scoring with 400-grit emery cloth followed by Scotch-Brite™.

### Installation

- Place included O-ring into groove in pin bore of Sonnax servo piston cover (Figure 28).
- Install Sonnax servo piston cover in case (Figure 29).
- Reinstall OE retaining ring.



### Wet Air Test

- Place a small amount of oil into the front servo release port and follow with 30-40 psi of air pressure.
- Verify that there is no leakage at the servo cover (Figure 29).



**NOTE:** Oil leaking into the servo apply circuit indicates cross leakage at the servo piston. This means lost clutch oil can result in direct clutch failure.

## Step 21 Replace Kickdown Servo Band Strut

### Disassembly

Remove OE strut and discard.

### Installation

- Insert Sonnax strut with the flat surface facing away from the band (Figure 30).
- Set band adjustment to OE specification.

