






37947 Series Instructions

Contents:

This booklet contains instructions for all 37947 series kits.	PAGE NUMBER
Sonnax parts, tooling and bore locations	Pages 2, 3
OE exploded views	Pages 4, 6
General reaming instructions	Page 13
Complete valve body disassembly instructions	Pages 14, 15

Individual Part Number Reaming & Installation Instructions:

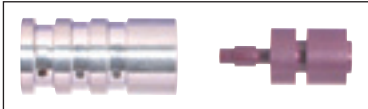
Note: The instruction section for each part will refer you to the specific disassembly steps to be used for that part. In many cases, where multiple bores are to be reamed, it is recommended that the entire valve body be stripped. Follow either the complete disassembly procedure or the individual steps as needed to complete your repair. Each kit also includes specific reaming instructions. However, we strongly recommend that you read the general reaming instructions included with this manual.

KIT DESCRIPTION	PART NUMBER	NOTES	BORE LOCATION	PAGE NUMBER
Pressure Regulator Sleeve Kit	37947-05K 37947-TL5*	 Tool Kit for -05K	Bore 2	Pages 7, 8
TCC Modulator Valve Sleeve Kit	37947-07K 37947-TL5*	 Tool Kit for -07K	Bore 10	Pages 7, 8
TCC Regulator Sleeve Kit	37947-09K 37947-TL9	 Tool Kit for -09K	Bore 9	Pages 9, 10
EPC & Engagement Control Kit	37947-11K 37947-TL11	 Tool Kit for -11K	Bores 3, 5, 6, 7	Pages 11, 12
End Plug Kit	37947-13K		Bores 13, 14, 15	Page 13
Oversized Coast Clutch Valve Kit	37947-33K 37947-TL33	 Tool Kit for -33K	Bore 9	Pages 9, 10
Boost Valve & Sleeve Kit	37947-01K 37947-03K	OEM Ratio Increased Ratio	Bore 2 Bore 2	Pages 7, 8

*Note: Tool kit 37947-TL5 works with both 37947-05K & 37947-07K.

For additional troubleshooting information, e-mail Sonnax at info@sonnax.com

37947-01K (OEM ratio)
37947-03K (increased ratio)
 HIGH OR LOW LINE PRESSURE, LOW COOLER FLOW
 AT IDLE, OVERHEAT CONDITIONS
 BOOST VALVE & SLEEVE KIT



37947-05K
 DELAYED ENGAGEMENTS DUE TO POOR CONVERTER FILL
 PRESSURE REGULATOR SLEEVE KIT

REQUIRES TOOL **37947-TL5**

Reaming:

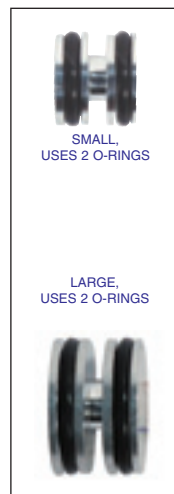
Step 1 Core Drill Drill Jig

Step 2 Reamer Reamer Jig

LARGE DIAMETER, INSERTED ON BORE 2, SMALL DIAMETER INSERTED AT BORE 10.

TOOL KIT **37947-TL5** ALSO USED FOR **37947-07K**

37947-13K
 LOSS OF 4TH GEAR, NO 3RD GEAR, HOT, ERRATIC SHIFTING
 END PLUG KIT



Page
13

Page
13

15

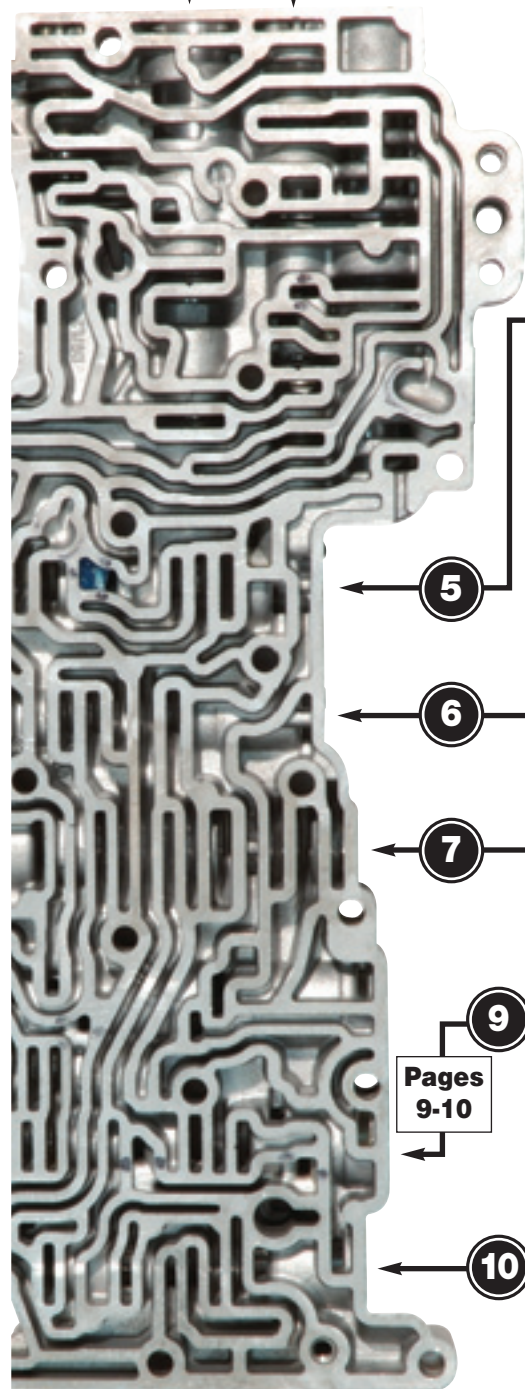
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13

12

11





**Pages
11-12**

37947-11K
2-3 FLARE (4R44E/55E), POOR SHIFT QUALITY, DELAYED FORWARD OR NO REVERSE
 EPC & ENGAGEMENT CONTROL KIT

REQUIRES TOOL **37947-TL11**

Reaming:

Step 1 Forward Modulation Reamer Jig #1 Forward Modulation Reamer #1

Step 2 Forward Modulation Reamer Jig #2 Forward Modulation Reamer #2

Reaming:

Step 1 Reverse Modulation Bore Drill Jig Core Drill with Shaft Collar: Reverse Modulation Bore

Step 2 Reverse Modulation Reamer (#1) Jig Reverse Modulation Reamer #1

Step 3 Reverse Modulation Reamer #2 (Self-piloting)

37947-33K
NO 4th GEAR (4R44E), NO 2nd OR 5th GEAR (5R55E)
 OVERSIZED COAST CLUTCH VALVE KIT

REQUIRES TOOL **37947-TL33**

Reamer Jig Reamer #1 Reamer #2

**Pages
9-10**

37947-09K
CONVERTER APPLY ISSUES
 TCC REGULATOR SLEEVE KIT

AVAILABLE SEPARATELY
 STANDARD TCC REGULATOR VALVE
37947-38



REQUIRES TOOL **37947-TL9**

**Pages
7-8**

Reaming:

Step 1 Guide Pin Drill Jig Core Drill

Step 2 Reamer Jig Reamer

37947-07K
NO TCC APPLY, CODE 1741, ERRATIC TCC, CONVERTER OVERHEAT
 TCC MODULATOR VALVE SLEEVE KIT

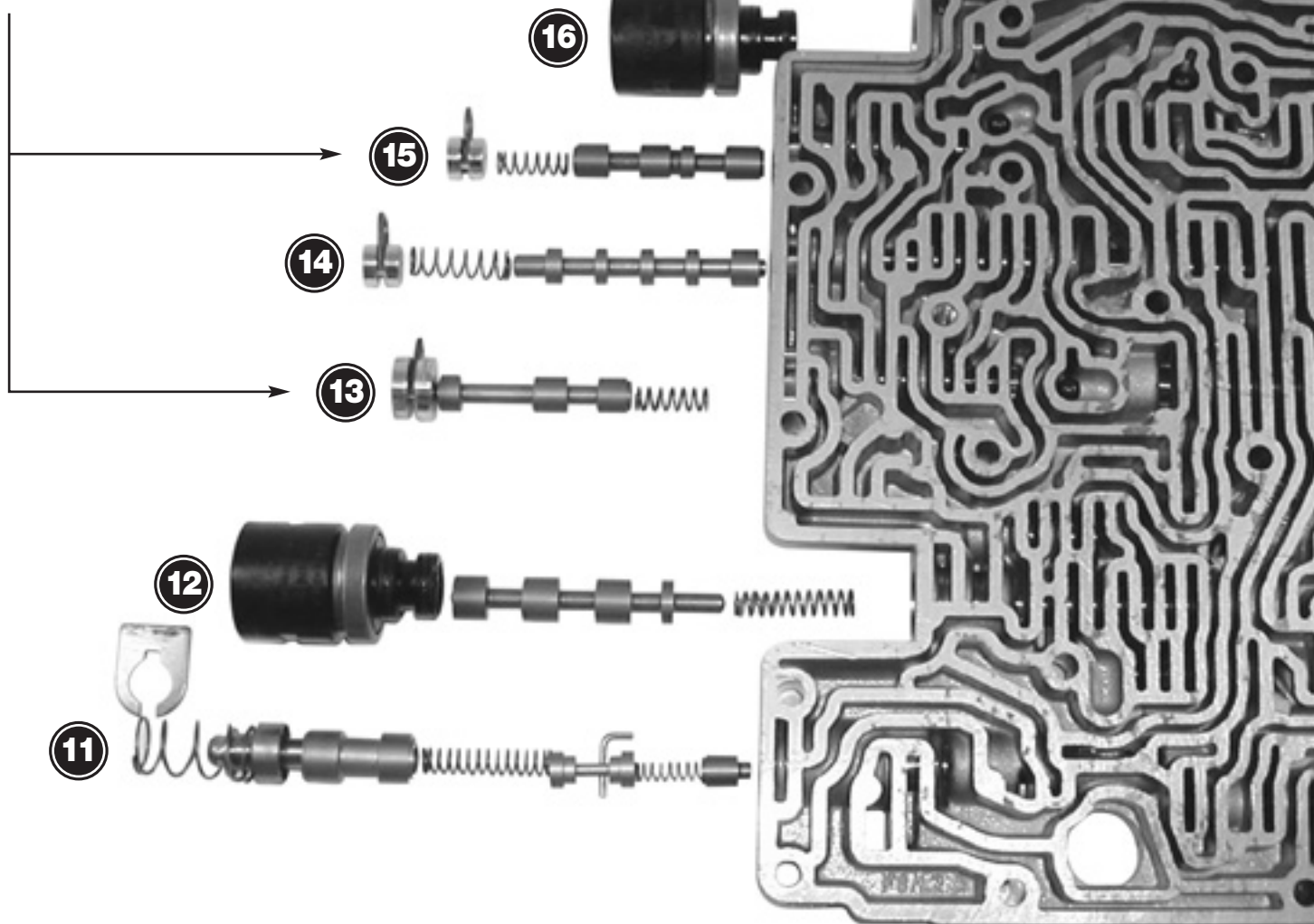


REQUIRES TOOL **37947-TL5**

Bore Locations 11-16

OEM exploded view. Bore numbers follow detailed bore notes in general disassembly instructions.

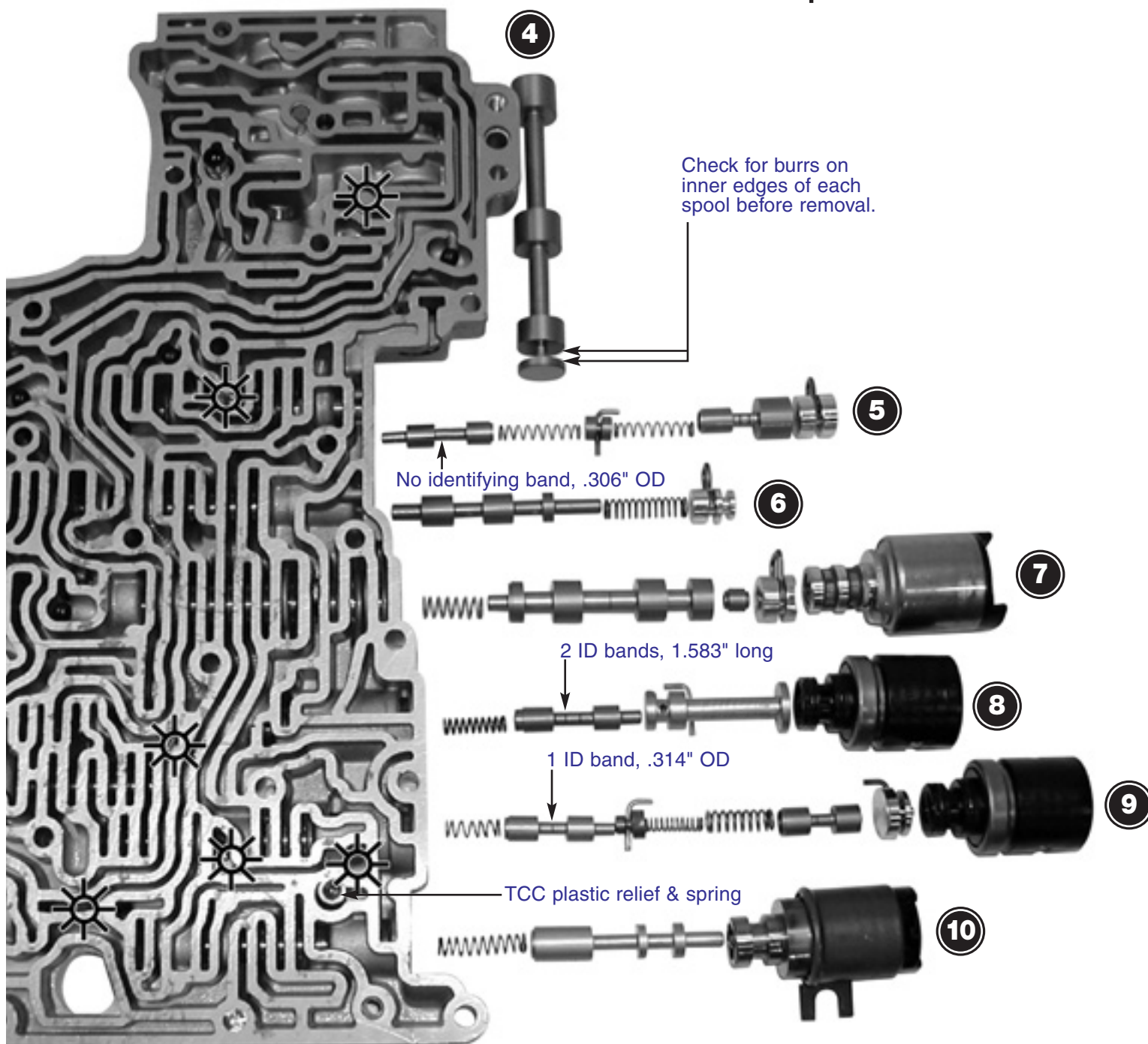
Bores 15 and 13 have through holes. A rod can be inserted to push out valves 5 and 7.



Bore Locations 4-10

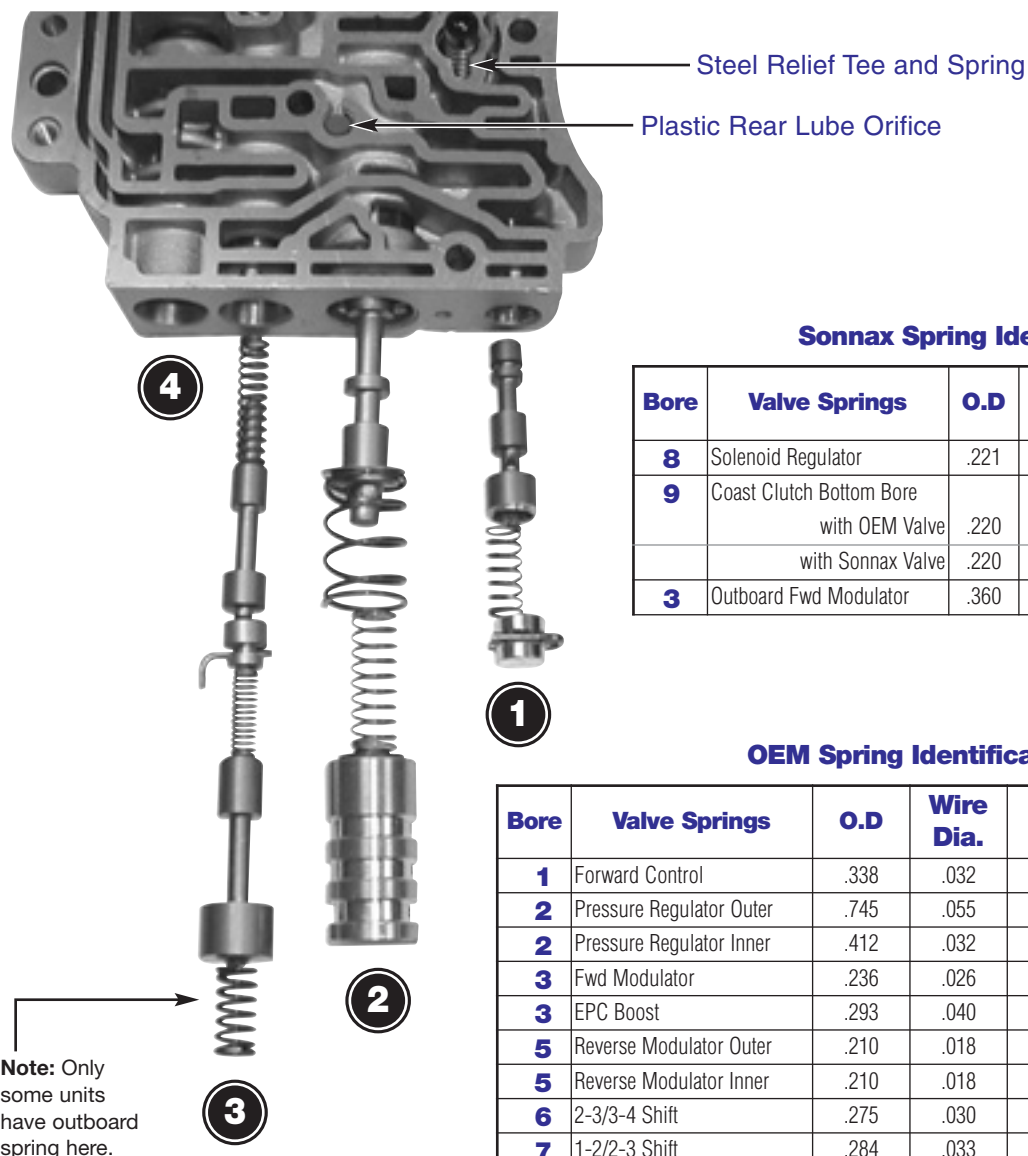
OEM exploded view. Bore numbers follow detailed bore notes in general disassembly instructions.

 "L" Retainer Locations



Bore Locations 1-4

OEM exploded view. Bore numbers follow detailed bore notes in general disassembly instructions.



Sonnax Spring Identification Chart

Bore	Valve Springs	O.D	Wire Dia.	Free length	Coils	Color
8	Solenoid Regulator	.221	.034	.760	10	Yellow
9	Coast Clutch Bottom Bore					
	with OEM Valve	.220	.022	.875	10	Plain
	with Sonnax Valve	.220	.022	.920	8.75	Plain
3	Outboard Fwd Modulator	.360	.038	.700	4.5	Plain

OEM Spring Identification Chart

Bore	Valve Springs	O.D	Wire Dia.	Free length	Coils	Color
1	Forward Control	.338	.032	.665 - .775	6.5	White
2	Pressure Regulator Outer	.745	.055	1.065	4	Plain Or Lt. Purple
2	Pressure Regulator Inner	.412	.032	1.135	9.5	Lt. Green
3	Fwd Modulator	.236	.026	0.738	14	White
3	EPC Boost	.293	.040	1.210	12	Orange
5	Reverse Modulator Outer	.210	.018	1.080	10.5	Plain
5	Reverse Modulator Inner	.210	.018	1.080	10.5	Plain
6	2-3/3-4 Shift	.275	.030	1.052	13	Plain
7	1-2/2-3 Shift	.284	.033	0.730	7	Lt. Purple
8	Solenoid Regulator	.218	.030	0.830	8.5	Yellow
9	TCC Regulator, Inner	.187	.028	0.720	12	White
9	TCC Regulator, Outer	.285	.040	0.787	9.5	Orange
9	Coast Clutch Bottom Bore	.222	.023	0.840	9.5	Red
10	TCC Modulator	.238	.023	1.230	11.5	White Or Yellow
11	Thermal Outer, Big	.575	.042	1.045	4.5	White
11	Thermal Middle	.264	.026	1.232	13.5	Lt. Green
11	Inner Limit (smallest)	.200	.018	0.840	12	Blue
12	3-4/4-5 Shift	.280	.032	1.162	12	Plain
13	Throttle Downshift	.263	.028	0.700	6.5	Orange
14	Manual Low	.320	.032	0.985	7.5	Yellow
15	Kickdown	.262	.028	0.670	7	Orange
	Steel EPC Relief Tee	.292	0.04	0.982	13.5	Plain
	Plastic TCC Relief Tee	.292	0.04	0.982	13.5	Plain

Pressure Regulator, TCC Modulator Sleeve & Boost Valve Kits

Pressure Regulator Sleeve Kit

37947-05K

1 Sleeve
1 Retaining Clip
1 Spring (for solenoid regulator valve)



TCC Modulator Valve Sleeve Kit

37947-07K

1 Sleeve
1 Spacer
1 Spring (for solenoid regulator valve)



Tool Kit for 37947-05K & 37947-07K

37947-TL5

1 Core Drill
1 Drill Jig
1 Reamer
1 Reamer Jig

Boost Valve & Sleeve Kit

37947-01K

OEM Ratio

37947-03K

Increased Ratio

Each kit includes the following

1 Boost Valve
1 Boost Sleeve

Disassembly

For the pressure regulator sleeve kit 37947-05K and/or the boost valve and sleeve kits 37947-01K or -03K, follow the general disassembly instructions, Step 4, **Bore #2**.

For the TCC modulator valve sleeve kit 37947-07K, follow the general disassembly instructions, Step 4, **Bore #10**.

Reaming:

The 37947-TL5 tool kit is used for both the 37947-05K pressure regulator sleeve and the 37947-07K TCC modulator sleeve. No reaming is required for the 37947-01K and -03K boost valve sleeve kits.

The drill jig and reamer jig have two diameters, small for TCC modulator bore, and large for pressure regulator bore. These tools are designed to fit snugly in the bore, so ensure both are clean and free of burrs. If they stick upon removal, rotate them as you heat the valve body slightly.

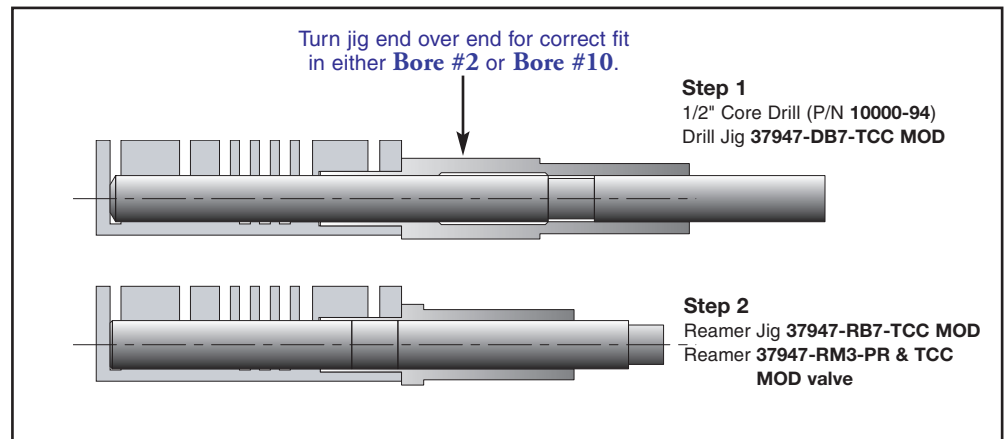
Step 1: Insert drill jig into mating bore diameter.

Step 2: Insert core drill and drill slowly until it bottoms in blind hole. The core drill will stop cutting once it bottoms out on either bore. You do not need to worry about overdrilling.

Step 3: Clean the bores after drilling.

Step 4: Insert reamer jig into mating bore.

Step 5: Ream with plenty of cutting fluid. If done by hand, use a speed handle with a wobble head socket. We suggest a 200 RPM 1/2 drill with wobble socket. Ream very slowly for a good finish. Reamer will stop cutting at the base of the bore.



Pressure Comparison Between OEM and Increased Ratio Boost Valves

EPC PSI	37947-01K (OEM Ratio)		37947-03K (Increased Ratio)	
	Line	Reverse	Line	Reverse
30	107	135	114	143
75	178	224	194	243
120	250	313	275	343

Pressure Regulator, TCC Modulator Sleeve & Boost Valve Kits

Assembly of 37947-05K Pressure Regulator Sleeve and 37947-01K and -03K Boost Valve & Sleeve Kits

Note: The 37947-05K kit includes a spring that does not go in the PR bore. This spring has been included to be used in **Bore #8** for the solenoid regulator valve if you disassembled that bore as well and damaged the spring during removal.

Instructions:

1. Locate **Bore #2**, identified on page 6.
2. Rotate the sleeve so that the 2 large slots are facing sideways. Insert retainer clip into the groove.

Note: The clip must wrap around, lock into the groove and hold the sleeve. If it does not grasp the sleeve equally at both ends of the clip legs, remove the sleeve and remove approximately .015" from that end of the sleeve. This will allow the sleeve to travel further into the bore.

3. Remove sleeve and clean it and the bore with Loctite™ primer or comparable product. Install the sleeve until it is about .080" from bottoming in the bore. Place a small drop of Loctite™ or equivalent sleeve retaining compound onto the sleeve where it is exposed under an open slot. Place the Loctite™ on the sleeve in the location shown in Figure 1. Slide the sleeve the rest of the way in while twisting. Allow for complete cure time to make sure no Loctite™ gets on the valve during installation. (See Loctite™ or product instructions for curing time.) Once fully cured, install valve and stroke to ensure free movement.
4. Complete the assembly as pictured in Figure 1, installing the 37947-01K OEM ratio boost valve, the 37947-03K increased ratio boost valve, or the original boost valve.

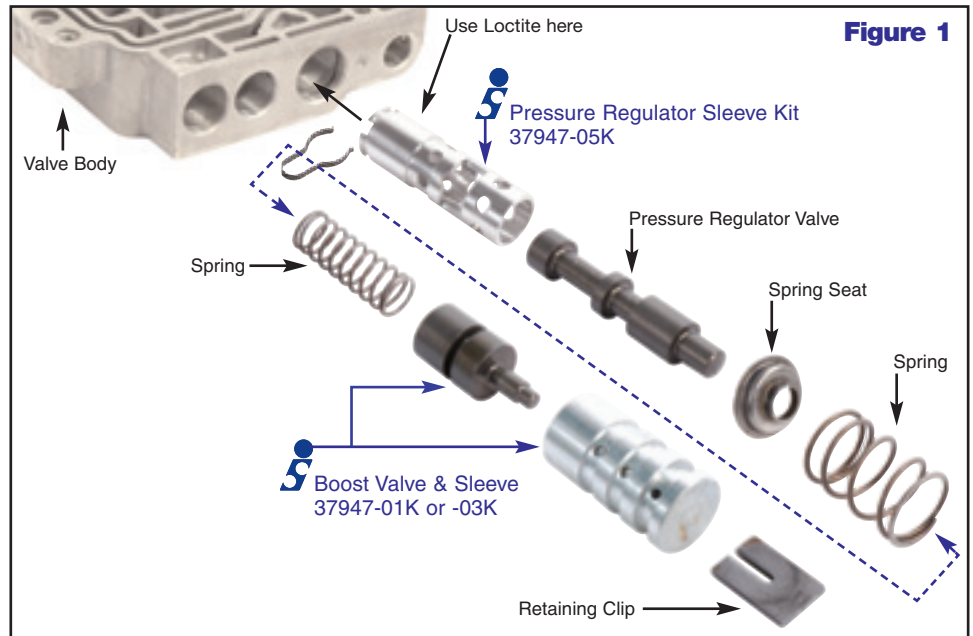


Figure 1

Assembly of 37947-07K TCC Modulator Bore

Note: The 37947-07K kit includes a spring that does not go into the TCC modulator valve bore. Reuse the OEM spring and valve when assembling this bore. The spring in the kit has been included to be used in **Bore #8** for the solenoid regulator valve if you disassembled that bore as well and damaged the spring during removal.

Instructions:

1. Locate **Bore #10**, identified on page 5.
2. With Trans-gel, load the OE spring into the open end of the valve.
3. Lay the sleeve and spacer out (see Figure 2) and slide them over the valve until both are held by spools.
4. Start inserting the valve and assembled sleeve and spacer into the bore.
5. Just before the spacer enters the bore, use the TCC solenoid to push the assembly into place.
6. When fully seated, ensure that a valve body bolt will fit through the solenoid bracket and valve body. If the solenoid bracket partially covers the bolt hole, preventing the bolt from being fastened in place, remove material from the short sleeve. Remove only enough to allow installation of the bolt. Adjustment is not required in most applications. Spool length is long by design to eliminate movement.

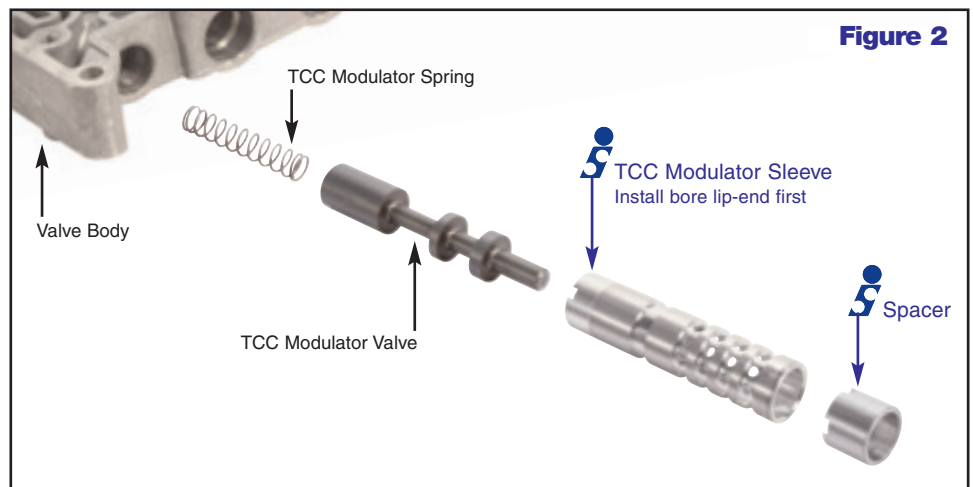


Figure 2

TCC Regulator Sleeve Kit & Oversized Coast Clutch Kit

TCC Regulator Sleeve Kit

37947-09K

- 1 TCC Regulator Sleeve
- 1 O-Ringed End Plug
- 1 Coast Clutch Valve Spring (OEM style)
- 1 Solenoid Regulator Valve Spring
- 2 Spring Pins
- 1 "L" Shaped Retaining Pin
- 2 O-Rings (1 extra)
- 3 Lube Modification Plugs (1 extra)



37947-TL9

- 1 Core Drill
- 1 Drill Jig
- 1 Reamer Jig
- 1 Reamer
- 1 Dowel Pin

Oversized Coast Clutch Valve Kit

37947-33K

- 1 Valve
- 1 Spring
- 1 O-Ring
- 1 End Plug



37947-TL33

- 2 Reamers
- 1 Reamer Jig

Disassembly

For the TCC regulator sleeve kit **37947-09K** and/or the oversized coast clutch valve sleeve kit **37947-33K**, follow the general disassembly instructions, Steps 5 and 6, **Bore #9**.

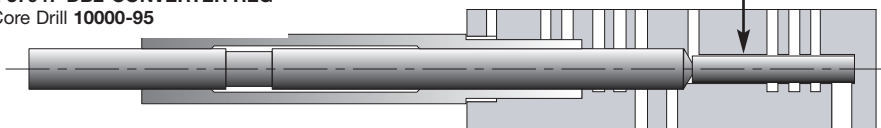
Kits can be installed independently or as a pair.

Reaming for 37947-09K, TCC Regulator Sleeve Kit:

1. Insert the 1.750" pin (see Figure 1).
2. Insert the long drill jig into solenoid bore, then core drill until it stops hard against the pin.
3. Remove all the tooling, to include the pin stop. Clean the bore.
4. Insert reamer jig and ream until it stops cutting. Reamer will stop at the end of the drilled hole.

Step 1

Drill Pin **10000-50**
Drill Jig **37947-DB2-CONVERTER REG**
7/16" Core Drill **10000-95**



Step 2

Reamer Jig **37947-RB2-CONVERTER REG**
Reamer **37947-RM6-CONVERTER REG**

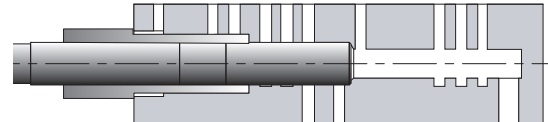


Figure 1

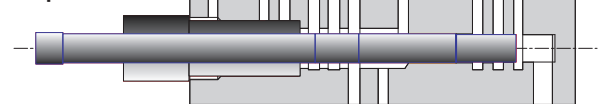
Reaming for 37947-33K, Oversized Coast Clutch Valve Kit

1. Coat the tooling and bore with cutting fluid. Insert the reamer jig into the bore. Gently insert Reamer # 1 into the bore until the cutting tip contacts the first bore to be reamed.
2. Ream the bore until the reamer pilot bottoms in the bore. Use plenty of fluid.
3. Remove the tooling and clean debris from the bore with low air pressure and clean in a solvent tank.
4. Recoat the tooling and bore with cutting fluid. Insert the reamer jig into the bore. Gently insert Reamer #2 into the bore until the cutting tip contacts the first bore to be reamed. Be sure reamer is fully bottomed.
5. Ream the bore until the reamer bottoms in the bore. Use plenty of fluid.
6. Remove tooling, clean and inspect the bore. Flashing on the exit side of casting bores can be carefully removed with Scotchbrite™ on the end of a long wire, if needed.

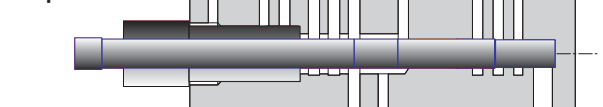
Reamer **37947-RM11-COAST CLUTCH 1**
Reamer Jig **37947-RJ1**

Figure 2

Step 1

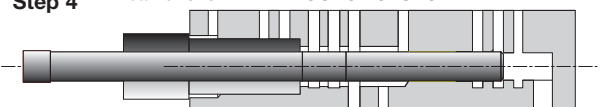


Step 2

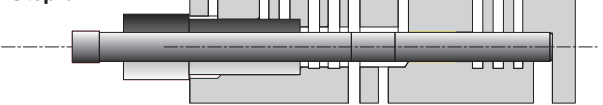


Step 4

Reamer **37947-RM12-COAST CLUTCH 2**



Step 5



TCC Regulator Sleeve Kit & Oversized Coast Clutch Kit

Installation

CAUTION: Both kits include a new coast clutch valve spring but they are not the same. If you are installing the **37947-33K** Sonnax coast clutch valve, be sure to use the spring that came with the valve. If you are reinstalling the OEM coast clutch valve, there are two new springs in the **37947-09K** TCC valve kit. The longer one with thinner wire diameter is for the coast clutch. The shorter heavier wire spring does not go in this bore. It has been provided to be used in **Bore #8** if you disassembled that bore as well and damaged the spring during removal. Insert the correct spring into either the OEM or Sonnax coast clutch valve and slide them into the bore. Choose the appropriate step 1.

1a. If the OEM TCC regulator valve is to be reinstalled, install the coast clutch spring and valve and secure with the OEM plug and L retainer. Reinstall the OEM TCC regulator valve springs, valve, new o-ringed end plug and retainer as shown in **Bore #9** of the OEM valve line-up (page 5).

- 1b.** If a new Sonnax TCC regulator valve is to be installed, install the new coast clutch spring and valve or the original pair. The Sonnax regulator valve sleeve will retain the coast clutch valve.
- Install the OEM regulator valve springs and valve or our **37497-38** replacement valve as shown in Figure 3.
 - Retain the sleeve with either the L pin or the long spring pin provided (see Figure 4). Retain the new end plug with either the OEM L pin or the short pin provided (see Figure 5). Both a spring pin and an L pin are supplied due to different tolerances in valve body castings. Use either retainer at the nub on the TCC sleeve, whichever holds or positions the sleeve accurately and securely. The end plug can be held with the original L pin or the short pin provided.

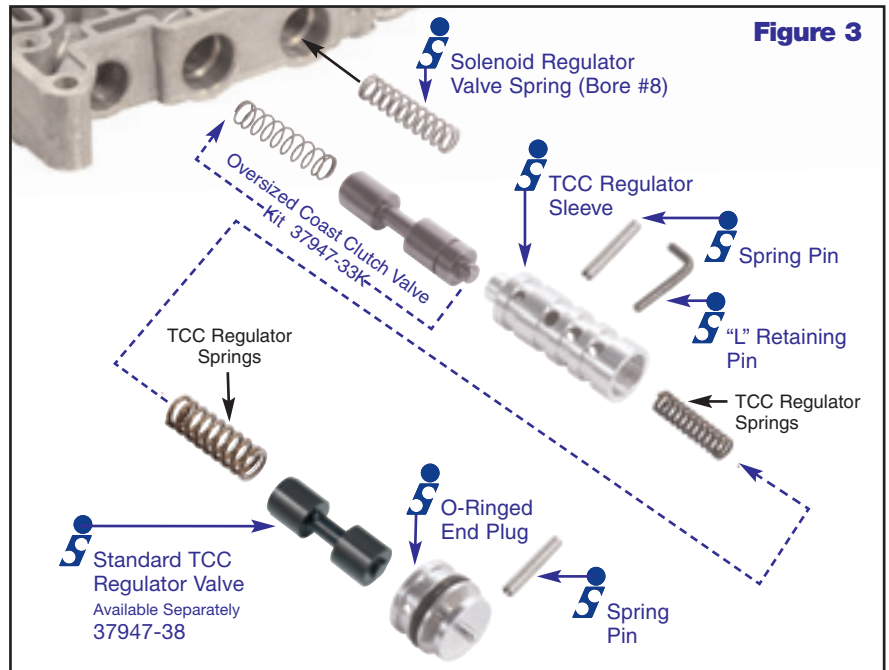
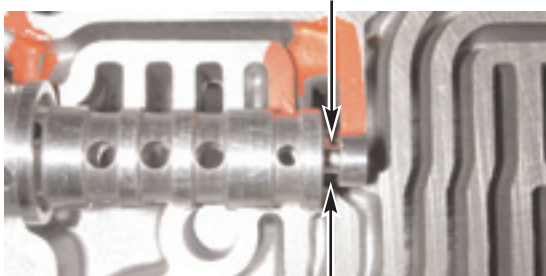


Figure 3

"L" pin or long (.750") spring pin and sleeve recess here for proper location and retention.



If using round spring pin, be careful the recess is fully visible. If not fully visible, spring pin may break off the nub end.

If neither spring or L pin will insert, ream was not deep enough. If so, insert reamer jig and reamer and remove amount required.

When correct, the circuits on the sleeve should align with casting.

Figure 4

Optional TCC Plate Modification:

For continued 741 codes and/or TCC slippage concerns, the following plate modification can be made (see Figure 6). Use the included .062" diameter aluminum plugs for blocking the indicated plate orifice. Remove the small, innermost spring from **Bore #11**.

Use short (.625") spring pin in this port and plug groove for proper location and retention.

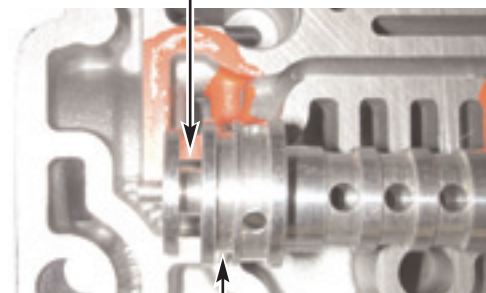


Figure 5

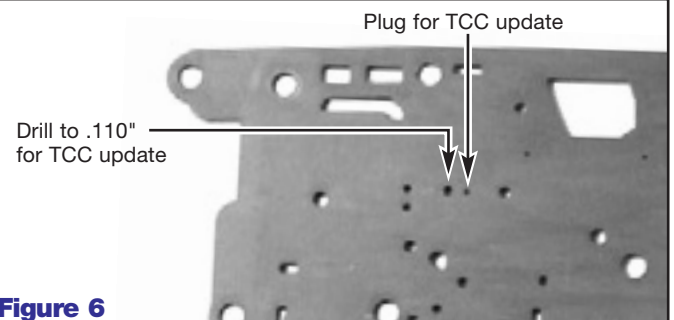


Figure 6

EPC & Engagement Control Kit

EPC & Engagement Control Kit

37947-11K

- 1 EPC Boost Valve Sleeve
- 1 Forward Modulation Valve w/Teflon® Seal
- 1 Forward Modulation Valve Sleeve
- 1 Forward Modulation O-Ringed End Plug
- 1 Forward Modulation Spring
- 2 Reverse Modulation Sleeves
- 1 Reverse Modulation O-Ringed End Plug
- 1 O-Ringed 2-3 Shift Valve End Plug
- 1 O-Ringed 1-2 Shift Valve End Plug
- 1 Solenoid Regulator Valve Spring
- 1 Rear Lube Orifice
- 4 Torlon® Checkballs
- 4 "L" Retaining Pins
- 2 Coiled Spring Pins
- 10 O-Rings



Note: This kit contains a total of 10 o-rings: 2 large for the reverse modulation end plug; 1 large for the forward modulation end plug; 2 medium for the 1-2 shift valve end plug; 2 small for the 2-3 shift valve end plug; and an extra o-ring of each size.

37947-TL11

- 2 Forward Modulation Reamers
- 2 Forward Modulation Reamer Jigs
- 2 Reverse Modulation Reamers
- 1 Reverse Modulation Reamer Jig
- 1 13/32" Core Drill
- 1 Core Drill Jig
- 1 Steel Shaft Collar

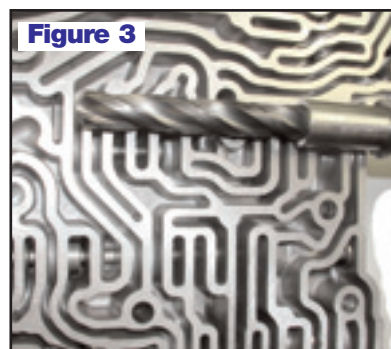


Figure 3

Disassembly

For the EPC and engagement control kit 37947-11K, we recommend that the valve body be entirely stripped because of the chips generated by the reaming process. With some practice, following these steps, you can strip a valve body in about 20 minutes. Follow the complete valve body disassembly procedures outlined at the end of this manual. **Save all OE parts.**

If the valve body is not being stripped, go to page 15, steps 9 & 10.

Reaming Instructions:

Bore 3:

Step 1: Use **RM-13** reamer and **RB-9** jig shown.

Reamer will stop cutting as the pilot contacts the casting (see Figure 1).

Step 2: Use **RM-10** reamer and **RB-10** jig shown.

This is the finishing reamer. It will stop cutting as pilot contacts the casting (see Figure 2).

FORWARD MODULATOR VALVE LINE-UP

Step 1

Reamer #1 37947-RM13-FWD MOD 1
Reamer Jig #1 37947-RB9 FWD MOD RJ1

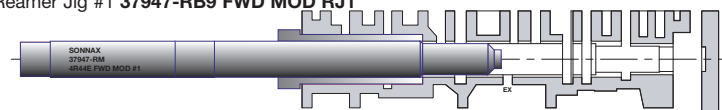
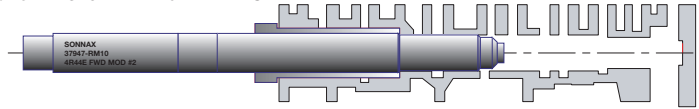


Figure 1

Step 2

Reamer #2 37947-RM10-FWD MOD 2



Reamer Jig #2 37947-RB10-FWD MOD RJ2

Figure 2

Bore 5:

Step 1: Verify core drill stop collar is positioned correctly, (see Figure 3).

Visual method: Insert 13/32" core drill through the stop collar, and **DB-1** drill jig. Lay the drill jig over the body with shoulder resting against the edge as shown. The collar screw will be set, so the tip sets at the middle of the circuit shown in Figure 3.

Caliper measurement: From the tip of the core drill to the inside of the drill stop collar should be 5.550" to 5.565". Insert the **DB-1** drill jig into **Bore #5** and complete the drilling process until the collar stops inward movement.

Step 2: Use **RM-1** reamer & **RB-1** jig as shown.

Reamer will stop at the edge left by the core drill (see Figure 4).

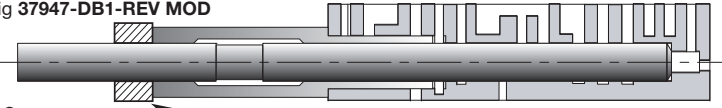
Step 3: Finish with the large two diameter piloted **RM-2** reamer. This reamer is self piloting and will stop at the edge left by core drill.

REVERSE MODULATOR VALVE LINE-UP

Figure 4

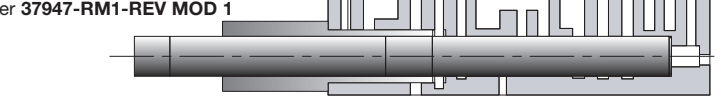
Step 1

13/32" Core Drill 10000-98
Drill Jig 37947-DB1-REV MOD



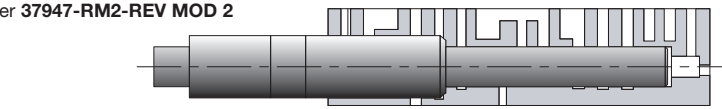
Step 2

Reamer Jig 37947-RB1-REV MOD
Reamer 37947-RM1-REV MOD 1



Step 3

Reamer 37947-RM2-REV MOD 2



EPC & Engagement Control Kit

Note: The 37947-11K kit includes two springs. The shorter/fatter spring (.720"/.360") is the outboard forward modulator spring for Bore #3. The longer/slimmer spring (.720"/.218") is for Bore #8 at the solenoid regulator valve, if you disassemble that bore as well and damage the spring during removal. All other OEM springs in the affected bores (3, 5, 6 & 7) will be reused.

Assembly Instructions: Bore #3, Fwd Modulator & EPC Booster Sleeves

Preparation:

Inspect the large bore of the forward modulator. If wear or machining marks are visible, buff them out with Scotchbrite™ wrapped over a wire and turned by a drill. Always clean thoroughly after using any abrasives.

Booster Sleeve Installation:

Both sleeves will be installed with the booster valve and spring as an assembly. The larger outside diameter of the EPC booster sleeve has an opposing .110" hole and .16" wide slot. The hole should face the spacer plate side of the casting to accept the "L" pin, and the slot should face the filter side. The forward modulator sleeve fits into the booster sleeve. The top or pin side has a tapered pin hole for ease of installation. Insert a 25/64" drill shank into the open end of the forward sleeve to position it for the L retainer.

Forward Valve Installation:

Place the Teflon® seal on the Sonnax forward modulator valve. Invert the valve and bore fit the Teflon®. If the seal hangs up, remove the edge with a deburring tool or screwdriver blade. Pre-lube and install the OE inner spring into the valve and install into the sleeve.

End Plug & Spring Installation

Use of the outer forward modulation spring is optional, although using the spring will result in firmer 1-2 shifts in 4R44Es and firmer 2-3 shifts in 5R55E units.

IMPORTANT NOTE: If you use the OE end plug with internal relief, this spring cannot be used. The end plug supplied requires use of the o-ring and can only be used with internal relief tee, spring and corresponding plate. (See separator plate information on page 16.)

Bore #5, Reverse Modulator Sleeves

Inner Sleeve Installation:

Prelube the sleeve to retain the valve, then assemble with the spring end entering the sleeve.

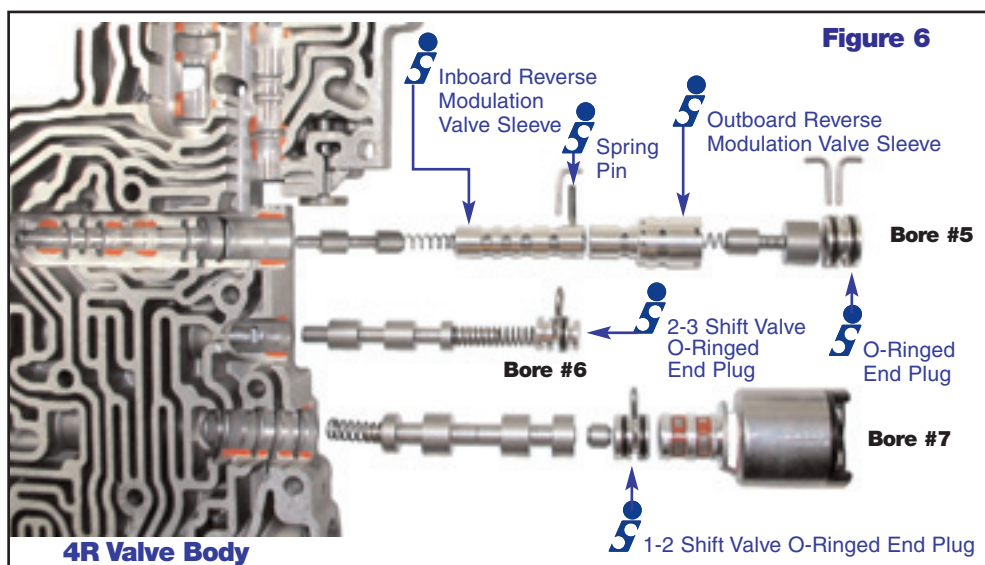
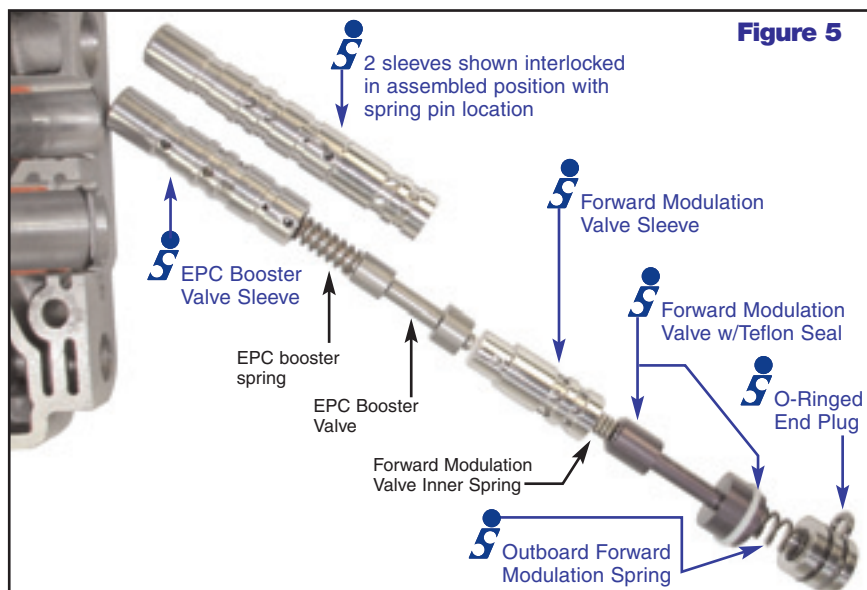
With the sleeve in position, insert the long (.625") spring pin. Ensure the pin does not cause the separator plate to stand too high. If so, grind pin to fit or insert the short (.500") pin instead.

Outer Sleeve & Plug Installation:

Pre-lube the sleeve to retain the valve and assembly.

The end plug requires two o-rings. Two L pins can be placed on each side of the plug for increased stability.

Install bore plugs with o-rings for Bore #6 and #7.



End Plug Kit

End Plug Kit

37947-13K

2 Small End Plugs

1 Large End Plug

5 Small O-Rings

3 Large O-Rings

4 Checkballs

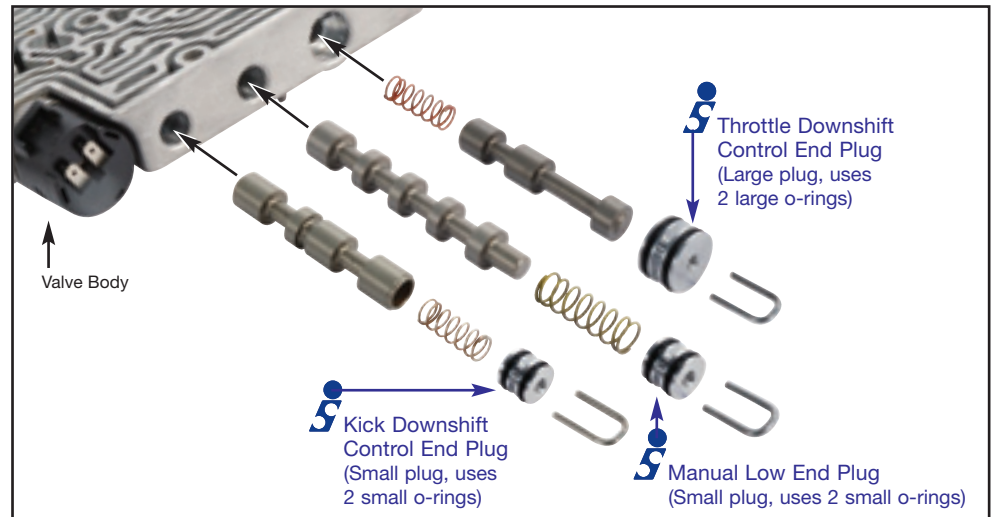
4 "L" Retaining Pins

(1 Extra)

(1 Extra)

Disassembly

Use the OEM bore location guide to locate Bores #13, #14, and #15 for disassembly and assembly. There are no special disassembly procedures for these bores. Remove the retainers and plugs using standard methods.



Installation:

Each end plug will require 2 o-rings. Lube the plug, slip on the o-rings and roll the plug on a clean surface to seat the o-rings. The end plugs have a tapped hole to allow for easy removal in the future. Verify that the valves and springs are in their original positions and install the end plugs with the tapped hole facing out. One extra o-ring of each size has been added to the kit in case an o-ring is torn during installation. The kit also included 4 checkballs and 4 L retainers to be used as needed if any become lost or damaged during valve body servicing.

General Reaming Instructions

Drilling

1. Soak the bore and core drill with cutting fluid (Mobilmet S-122, Lubegard Bio-Tap, Tap Magic™, etc.). For best results, provide a continuous flow of water soluble cutting fluid (e.g. Mobilmet S-122) during the drilling process.
2. Depth of drilling will be controlled by either a drill collar provided with the kit or the core drill stopping at the bottom of the bore. See specific kit instructions.

Reaming

1. The reamer should be turned either by hand using a speed handle or by a low rpm, high torque air drill regulated to a maximum of 200 rpm. A wobble adapter should be used for either method.
2. The reaming action should be clockwise in a smooth and continuous motion, at 60-200 rpm. The reamer should actually pull itself through the bore, so little or no forward force should be applied.
3. Depth of reaming will be controlled by the reamer tip. See specific kit instructions.
4. Using low air pressure, blow the chips free before removing the reamer.
5. To remove the reamer, turn clockwise while slowly pulling outward on the reamer.
6. Remove any remaining debris from the bore with low air pressure and clean in a solvent tank.
7. Examine the bore after cleaning for surface finish, debris and burrs. Flashing and burrs on the exit side of the casting bore can be carefully removed with a small piece of Scotchbrite™ on the end of a long wire.

Cautions and Suggestions

1. Turning the reamer backward will dull it prematurely.
2. Pushing on the reamer will result on poor surface finish, and inadequate and sporadic material removal.
3. Never use a crescent wrench, ratchet or pliers to turn the reamer.



General Disassembly Instructions

Use the OEM and Sonnax bore locations and photos, and parts installation steps in this manual as a guide to tearing down and reassembling your valve body. Follow these steps in sequence for complete disassembly.

Instructions:

1. Remove all brackets and solenoids.
2. Remove the separator plate, checkballs, rear lube orifice and relief tees. The relief springs are interchangeable.
3. Remove all L pins and U retainers. Refer to the exploded views on pages 4-5 for exact locations. U retainers are removed by prying up on both legs at the same time. Later U retainers grab the end plug and require more force to remove (see Figure 4).
4. Remove retainers and valve line-ups from the following bores: #1, #2, #6, #10, #11, #12 and #14.
5. Locate **Bore #9**, identified on page 5. To remove the TCC regulator valve and/or coast clutch valve, use a 1/8" drill bit and drill at an angle through the bolt hole (see Figure 1). Your drill should exit at the centerline of the valve (see Figure 2). The gasket will seal the base of the hole and the bolt hole makes surface contact.

Note: The drill should be angled so the tip exits into the valve centerline or valve spring pocket. You may use the bit to mill off the casting (as shown) to gain a better angle. Check that all retainers are removed before driving out the valves.

6. Remove the two L retainers from the line-up if not previously done. To drive out the valves from the pre-drilled hole outlined in Step 5, insert a .110" OD x 3" wire into the pre-drilled hole and drive the valves out the bore into a rag (see Figure 5). Both kits needed for this bore include a new spring (.225" O.D. x .023" diameter x .840" long) for the coast clutch valve in case the original spring is damaged.
7. Locate **Bore #8**, identified on page 5. To remove the solenoid regulator valve line-up, use a 1/8" drill bit and drill at an angle through the web casting (see Figure 3). Your drill should exit at the centerline of the exposed spring. A new spring is included with all kits where the bore might be serviced.

Figure 1

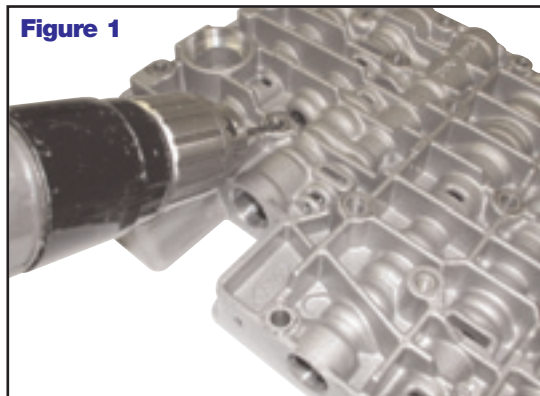


Figure 2

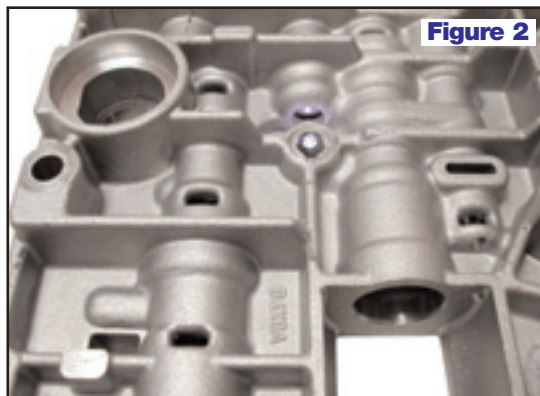


Figure 3

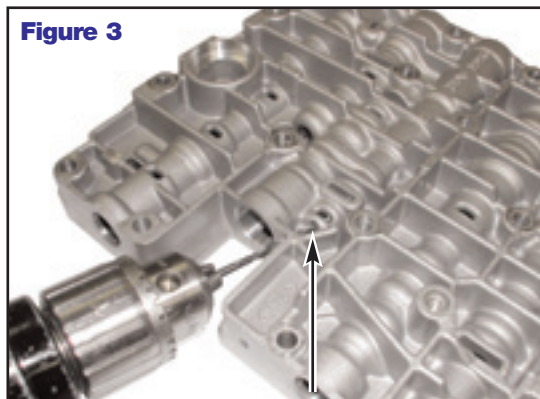
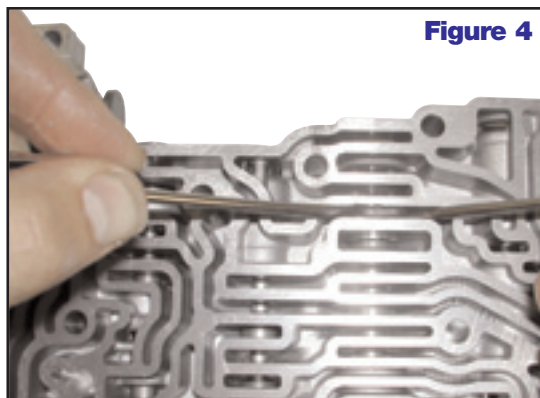


Figure 4



General Disassembly Instructions

8. Remove the L retainer from the line-up if not previously done. To drive out the valves from the pre-drilled hole outlined in Step 7, insert a .110" OD x 3" wire into each pre-drilled hole and drive the valves out the bore into a rag (see Figure 5).

9. At **Bore #3**, using a flat blade screwdriver, go through the spring and pry the EPC booster valve away from the spring. Pry the valve inward as far as possible. Insert the screwdriver between the spring coils and slinky it out and off of the EPC booster valve stem, one coil at a time (see Figure 6). Once the spring is removed, continue to pry the valve stem inward. Once the booster valve stem is below flush, place checkballs over the stem one at a time, pressing them toward the stem, until the entire forward modulator and EPC boost assembly comes out. It may take as many as five checkballs. (See Figure 7).

Note: If the center plug is very worn or has L retainer damage, you may have to re-center the plug by driving it back into place. When worn, the plug wants to turn sideways, preventing straight travel. Both OE plugs will be discarded.

10. At **Bores #5** and **7**, the valves will be pushed out from the opposite side using **Bores #13** and **#15**. (Refer to the exploded view on pages 4 and 5.)

Caution: If the manual valve is to be removed, inspect for burrs where the lever rides on the valve. Carefully file off the burrs and clean before pulling the manual valve back out through the valve body bore to prevent bore damage. Manual valve removal is NOT REQUIRED for installation of any parts contained in these instructions (see Figure 7).

Figure 5

A rod or stiff wire is inserted through the hole, and shows the spring resting against the end of the valve.



Figure 6

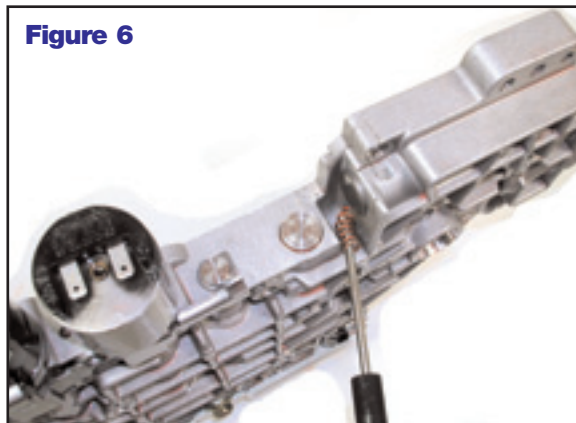
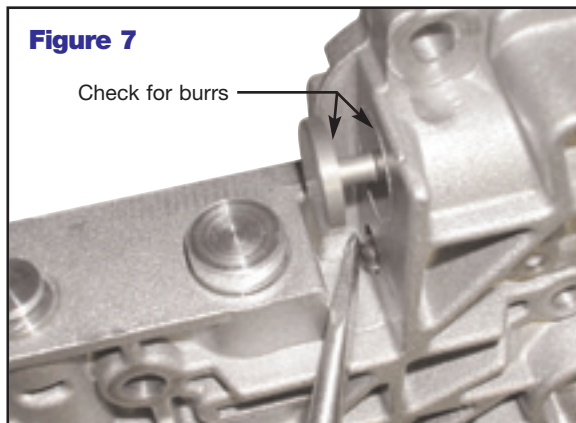


Figure 7

Check for burrs



Separator Plate & Relief Valve Information

Notes:

- New domed relief tee **10000-02** is available for this location.
- With EPC hole in plate as shown, use the relief tee.
- If there is no EPC hole in plate, you **MUST HAVE** an OE end plug relief.

If hole here, use relief tee and spring. No hole here, must use blow-off end plug.

End plug installs here.

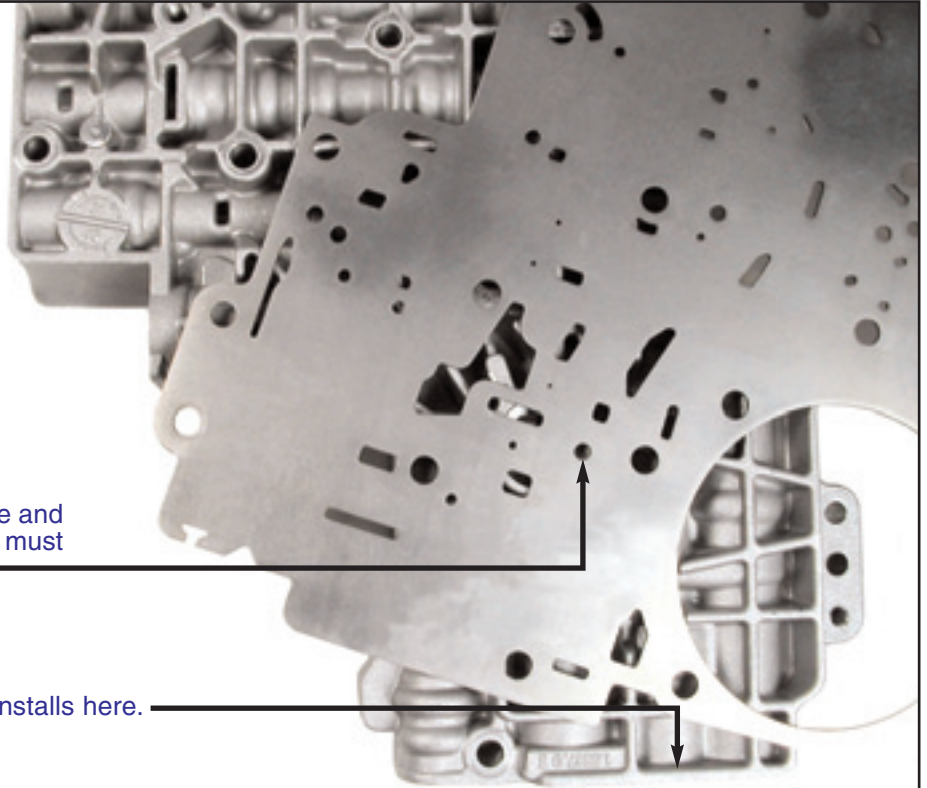


Plate Note:

This plate and part number does not have an EPC relief hole and must be used with OE part # 3L5Z-7M203-JA end plug relief.

Illustration below shows differences between the 4R44E & 5R55E plates.

