INTRODUCTION

AISIN WARNER 50-42LE

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The Aisin Warner 50-42LE transmission first appeared in the Volvo 850, in model year 1992. Saab and Daewoo also implemented the 50-42LE in some of their models. This manual was produced using a 1995 model Volvo transmission for the photos. There are a few subtle differences between the Volvo, Saab and Daewoo versions and these differences are mentioned in the rebuilding process. Overall, the transmissions in all of these vehicle applications operate exactly the same. This manual will cover much needed information for diagnosis, service, repair and rebuild, including electrical information and hydraulic passage identification.

We wish to thank Lory's transmission parts for supplying the transmission to make this book possible

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DALE ENGLAND
FIELD SERVICE CONSULTANT

WAYNE COLONNA
TECHNICAL SUPERVISOR

PETER LUBAN
TECHNICAL CONSULTANT

JON GLATSTEIN
TECHNICAL CONSULTANT

JERRY GOTT
TECHNICAL CONSULTANT

GERALD CAMPBELL
TECHNICAL CONSULTANT

JIM DIAL
TECHNICAL CONSULTANT

ED KRUSE
TECHNICAL CONSULTANT

GREGORY LIPNICK
TECHNICAL CONSULTANT

DAVID CHALKER
TECHNICAL CONSULTANT

STANTON ANDERSON
TECHNICAL CONSULTANT

ROLAND ALVAREZ
TECHNICAL CONSULTANT

MIKE SOUZA
TECHNICAL CONSULTANT

AUTOMATIC TRANSMISSION SERVICE GROUP
9200 S. DADELAND BLVD. SUITE 720
MIAMI, FLORIDA 33156
(305) 670-4161

AISIN WARNER 50-42LE

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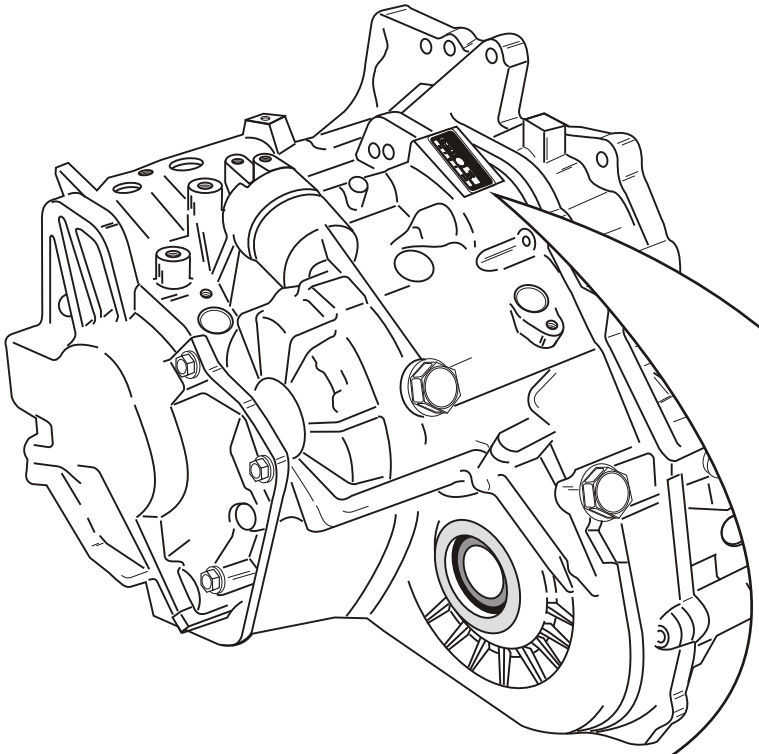
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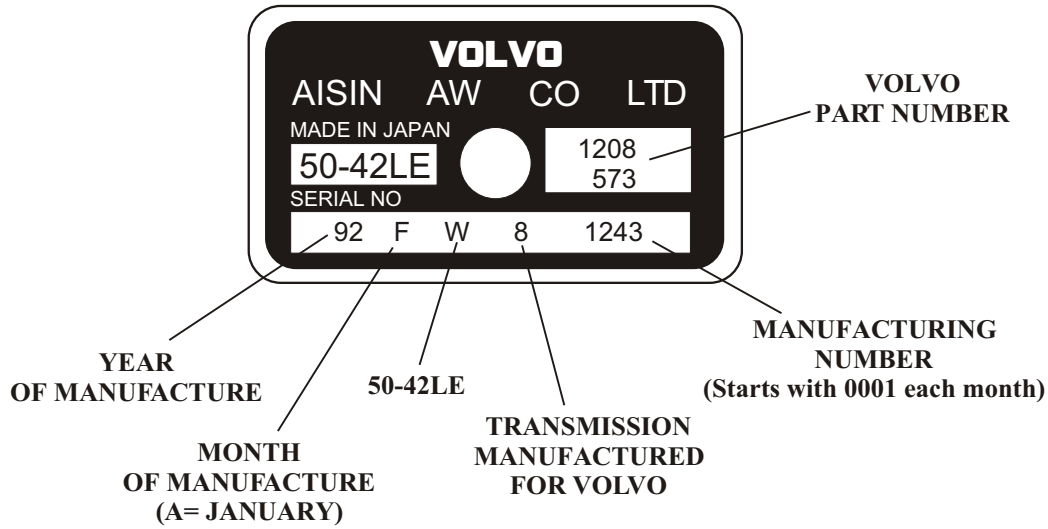
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TRANSMISSION IDENTIFICATION



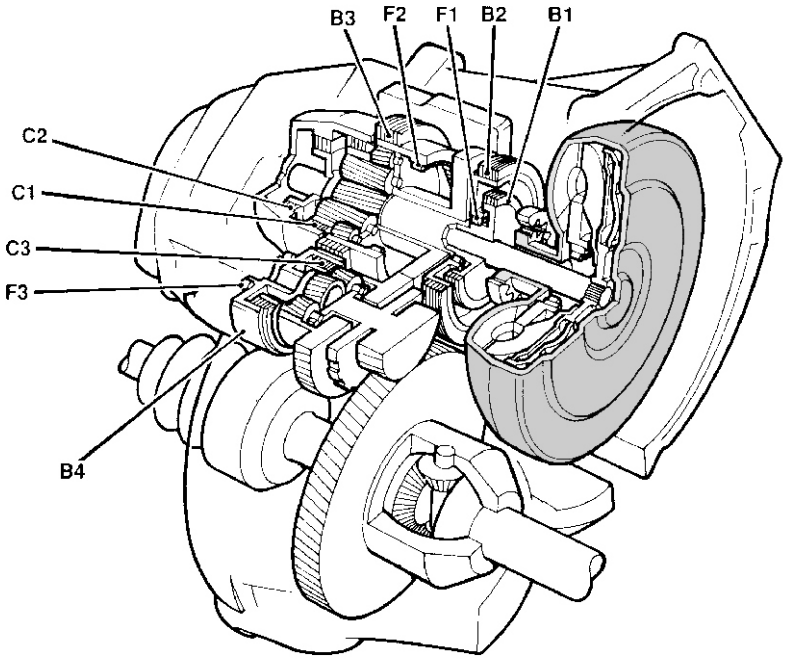
I.D. TAG



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Figure 1

CLUTCH/BAND AND SOLENOID APPLICATION CHART



S1 = SHIFT SOLENOID "A"
S2 = SHIFT SOLENOID "B"

C1 = FORWARD CLUTCH
C2 = DIRECT CLUTCH
C3 = UNDERDRIVE CLUTCH

B1 = OVERRUN CLUTCH
B2 = INTERMEDIATE CLUTCH
B3 = LOW & REVERSE CLUTCH
B4 = UNDERDRIVE BRAKE BAND

F1 = INTERMEDIATE SPRAG
F2 = LOW SPRAG
F3 = UNDERDRIVE SPRAG

	SHIFT POSITION	S1	S2	C1	C2	C3	B1	B2	B3	B4	F1	F2	F3
P	PARK	OFF	ON							ON			
R	REVERSE (UNDER 4 MPH ▶)	OFF	ON		ON				ON	ON			
	REVERSE (REVERSE INHIBIT VSS OVER 4 MPH ▶)	ON	ON		ON					ON			
N	NEUTRAL	OFF	ON							ON			
D	FIRST	OFF	ON	ON						ON			ON
	SECOND	ON	ON	ON			ON	ON		ON	ON		ON
	THIRD	ON	OFF	ON		ON	ON	ON			ON		
	FOURTH	OFF	OFF	ON	ON	ON		ON					
3	FIRST	OFF	ON	ON						ON		ON	ON
	SECOND	ON	ON	ON			ON	ON		ON	ON		ON
	THIRD	ON	OFF	ON		ON	ON	ON			ON		
*2	SECOND	ON	ON	ON			ON	ON		ON	ON		ON
	THIRD	ON	OFF	ON		ON	ON	ON			ON		
1	FIRST	OFF	ON	ON					ON	ON		ON	ON
	SECOND	ON	ON	ON			ON	ON		ON	ON		ON

***SAAB ONLY**

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Figure 2

SPECIFICATIONS

GEAR RATIOS:

GEAR	VOLVO	DAEWOO
1st Gear	3.61 : 1	3.900 : 1
2nd Gear	2.06 : 1	2.228 : 1
3rd Gear	1.37 : 1	1.477 : 1
4th Gear	0.98 : 1	1.062 : 1
Reverse	3.95 : 1	4.271 : 1

FLUID TYPE :

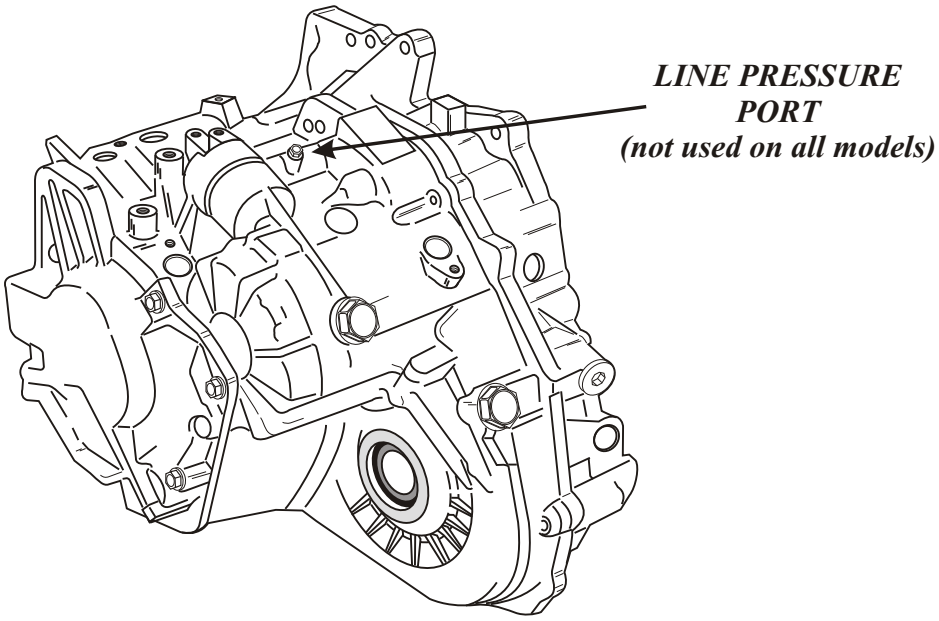
ATF - Type.....Dexron ll E
ATF - Type.....Volvo part number 1381166-6

FLUID CAPACITY:

Dry Fill.....5.1 liters (5.4 US qts)
Torque converter.....2.5 liters (2.6 US qts)

LINE PRESSURE SPECIFICATIONS:

Base line pressure in Drive.....57-65 psi.
Stall line pressure in Drive.....150-190psi.
Base line pressure in Reverse.....85-100psi.
Stall line pressure in Reverse.....280-290psi.



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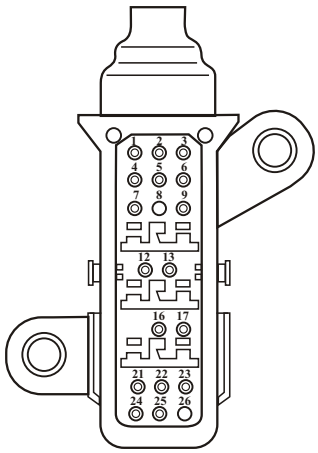
Figure 3

COMPONENT RESISTANCE CHARTS

VOLVO

COMPONENT	*OHMS*	*TERMINALS*
SOLENOID 1	11-15	21 & GND
SOLENOID 2	11-15	22 & GND
LOCK UP SOLENOID	11-15	23 & GND
STH SOLENOID (*Line Pressure*)	2-6	24 & 25
OIL TEMP SENSOR	900 @ 68°F (20°C) 75 @ 212°F (100°C)	12 & 13
TURBINE SENSOR	300-600	16 & 17
OUTPUT SENSOR	300-600	*NOT ROUTED THRU CONNECTOR*

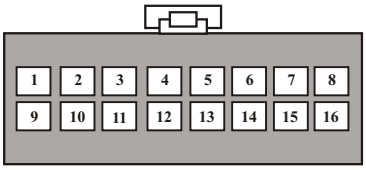
VOLVO CONNECTOR NUMBER 3/71



SAAB

COMPONENT	*OHMS*	*TERMINALS*
SOLENOID 1	11-15	1 & GND
SOLENOID 2	11-15	9 & GND
LOCK UP SOLENOID	11-15	10 & GND
ST SOLENOID (*Line Pressure*)	2-6	11 & 3
OIL TEMP SENSOR	900 @ 68°F (20°C) 75 @ 212°F (100°C)	12 & 4
TURBINE SENSOR	300-600	5 & 13
OUTPUT SENSOR	300-600	14 & 6

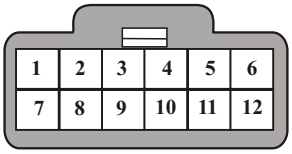
SAAB CONNECTOR NUMBER H16-3



DAEWOO

COMPONENT	*OHMS*	*TERMINALS*
SOLENOID 1	11-15	6 & GND
SOLENOID 2	11-15	12 & GND
LOCK UP SOLENOID	11-15	11 & GND
STH SOLENOID (*Line Pressure*)	2-6	4 & 10
OIL TEMP SENSOR	900 @ 68°F (20°C) 75 @ 212°F (100°C)	3 & 9
TURBINE SENSOR	300-600	5 & 13
OUTPUT SENSOR	300-600	14 & 6

DAEWOO CONNECTOR NUMBER C110



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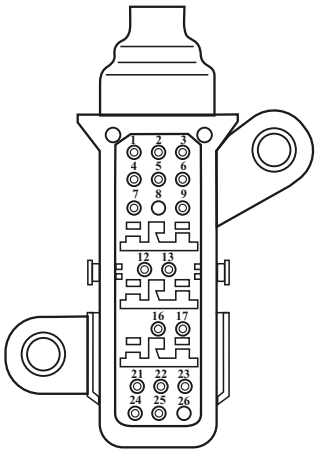
Figure 4

TRANSMISSION RANGE SWITCH OR GEAR POSITION SENSOR CHECK

VOLVO	PIN/SWITCH COMBINATIONS			
RANGE	PIN 1 (A)	PIN 2 (B)	PIN 3 (C)	PIN 4 (PA)
PARK	CLOSED	OPEN	OPEN	CLOSED
REVERSE	CLOSED	CLOSED	OPEN	OPEN
NEUTRAL	OPEN	CLOSED	OPEN	CLOSED
D	OPEN	CLOSED	CLOSED	OPEN
3	CLOSED	CLOSED	CLOSED	CLOSED
L	CLOSED	OPEN	CLOSED	OPEN

CONNECT POSITIVE LEAD TO THE SPECIFIED PIN
AND THE GROUND LEAD TO THE CASE.
OPEN = O.L. CLOSED = CONTINUITY

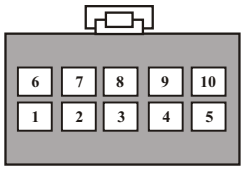
VOLVO CONNECTOR NUMBER 3/71



SAAB	PIN/SWITCH COMBINATIONS			
RANGE	PIN 1 (A)	PIN 3 (B)	PIN 2 (C)	PIN 4 (PA)
PARK	CLOSED	OPEN	OPEN	CLOSED
REVERSE	CLOSED	CLOSED	OPEN	OPEN
NEUTRAL	OPEN	CLOSED	OPEN	CLOSED
D	OPEN	CLOSED	CLOSED	OPEN
3	CLOSED	CLOSED	CLOSED	CLOSED
2	CLOSED	OPEN	CLOSED	OPEN
1	OPEN	OPEN	CLOSED	CLOSED

CONNECT POSITIVE LEAD TO THE PIN 8
AND THE GROUND LEAD TO THE SPECIFIED PIN
OPEN = O.L. CLOSED = CONTINUITY

SAAB CONNECTOR NUMBER H10-1

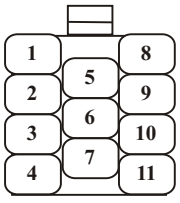


DAEWOO

RANGE	PIN 4	PIN 8	PIN 9	PIN 10	PIN 11	PIN 1	PIN 2
PARK	●	●					
REVERSE	●		●				
NEUTRAL	●			●			
D	●				●		
3	●					●	
L	●						●

CONNECT POSITIVE LEAD TO PIN 4
AND THE GROUND LEAD TO THE SPECIFIED PIN.
CONTINUITY MUST BE PRESENT BETWEEN THE
PINS CONNECTED IN THE CHART ABOVE.

DAEWOO CONNECTOR



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Figure 5

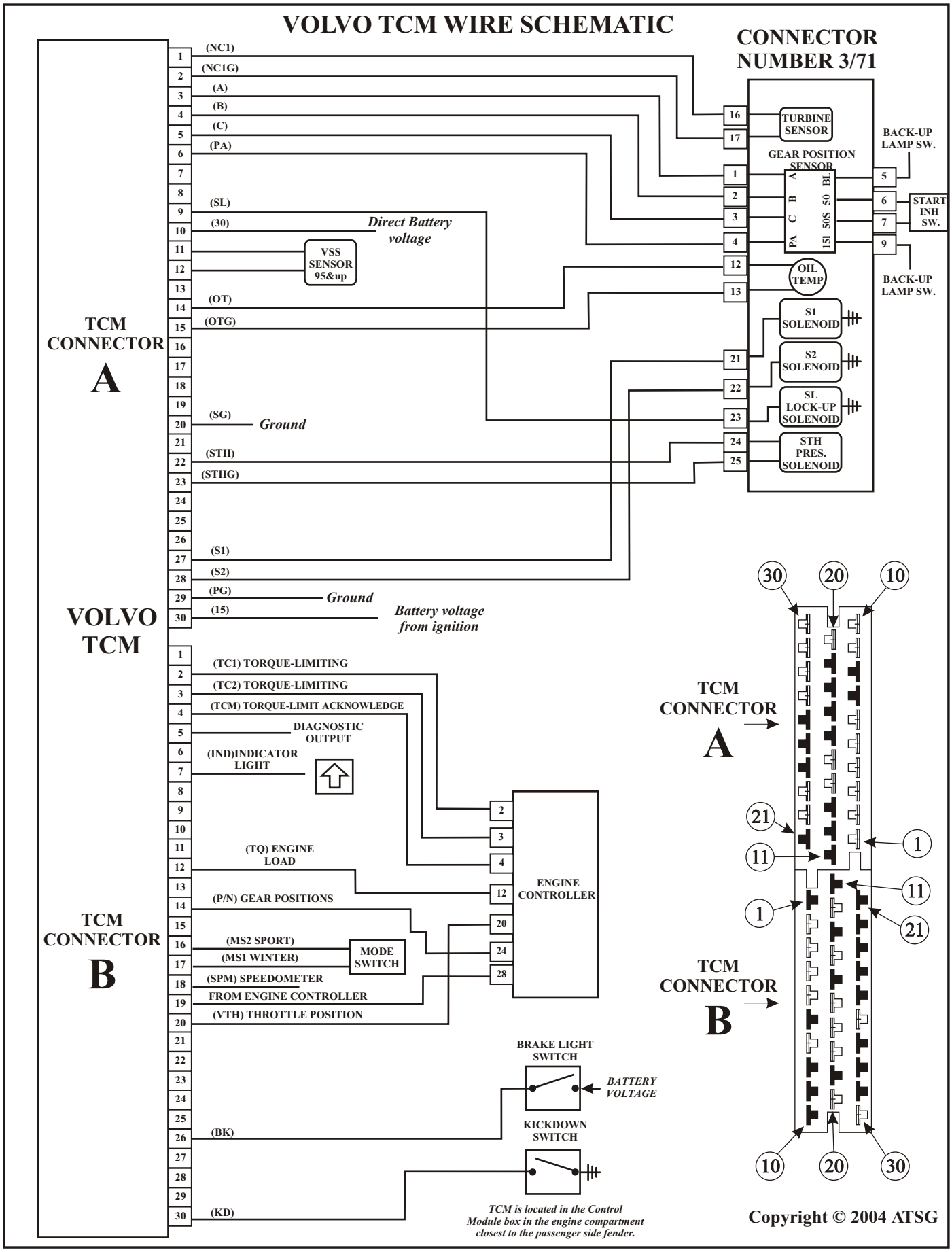

VOLVO TCM WIRE SCHEMATIC
CONNECTOR NUMBER 3/71
TCM CONNECTOR A
VOLVO TCM
TCM CONNECTOR B
(NC1)
(NC1G)
(A)
(B)
(C)
(PA)
(SL)
(30)
Direct Battery voltage
VSS SENSOR 95&up
(OT)
(OTG)
(SG)
Ground
(STH)
(STHG)
(S1)
(S2)
(PG)
Ground
(15)
Battery voltage from ignition
TURBINE SENSOR
GEAR POSITION SENSOR
A B C PA BL 50 50S 15I
BACK-UP LAMP SW.
START INH SW.
BACK-UP LAMP SW.
OIL TEMP
S1 SOLENOID
S2 SOLENOID
SL LOCK-UP SOLENOID
STH PRES. SOLENOID
(TC1) TORQUE-LIMITING
(TC2) TORQUE-LIMITING
(TCM) TORQUE-LIMIT ACKNOWLEDGE
DIAGNOSTIC OUTPUT
(IND)INDICATOR LIGHT
(TQ) ENGINE LOAD
(P/N) GEAR POSITIONS
(MS2 SPORT)
(MS1 WINTER)
MODE SWITCH
(SPM) SPEEDOMETER
FROM ENGINE CONTROLLER
(VTH) THROTTLE POSITION
ENGINE CONTROLLER
BRAKE LIGHT SWITCH
BATTERY VOLTAGE
KICKDOWN SWITCH
(BK)
(KD)
TCM is located in the Control Module box in the engine compartment closest to the passenger side fender.
TCM CONNECTOR A
TCM CONNECTOR B
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Figure 6

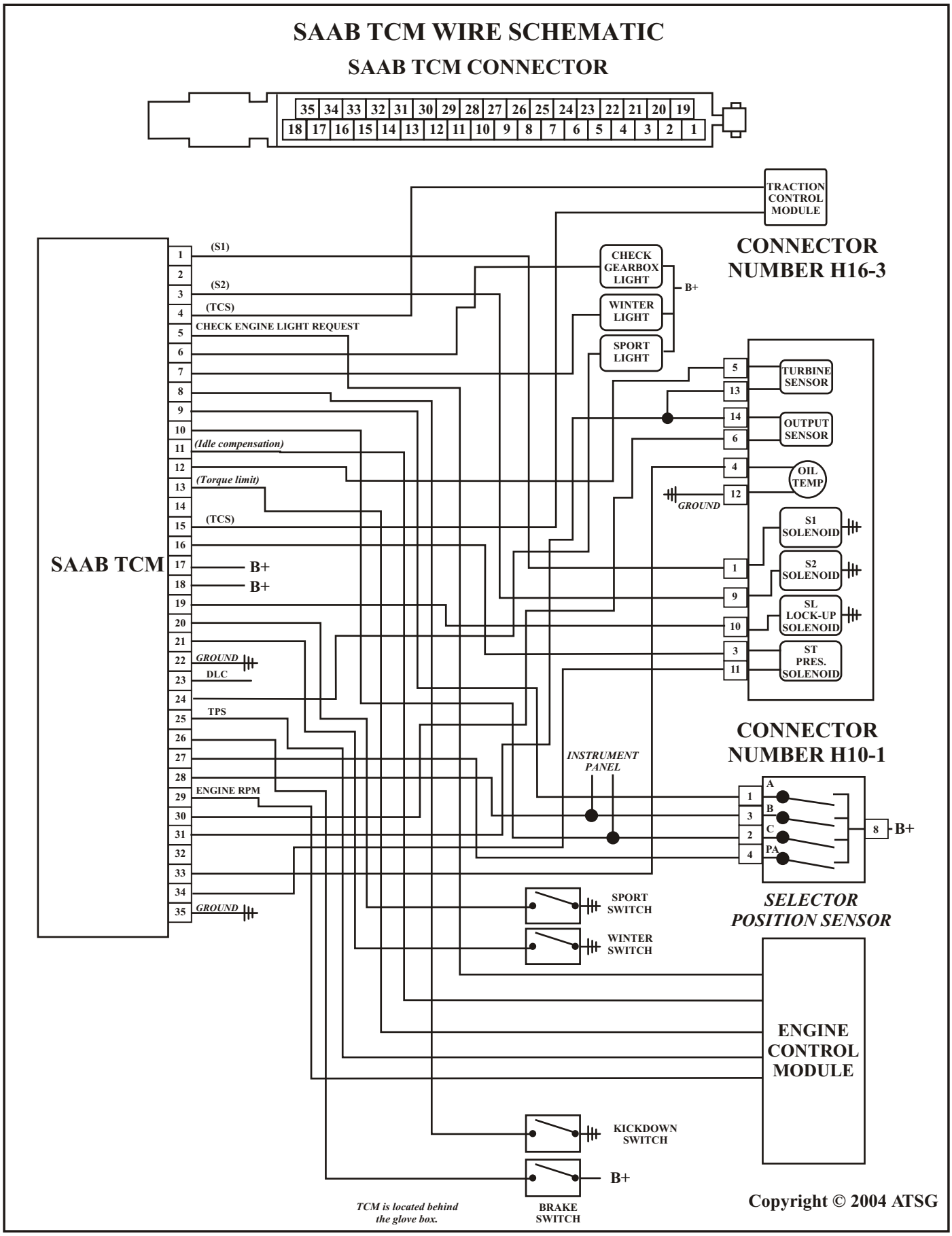

SAAB TCM WIRE SCHEMATIC
SAAB TCM CONNECTOR
35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
TRACTION CONTROL MODULE
CONNECTOR NUMBER H16-3
SAAB TCM
(S1)
(S2)
(TCS)
CHECK ENGINE LIGHT REQUEST
(Idle compensation)
(Torque limit)
(TCS)
B+
B+
GROUND
DLC
TPS
ENGINE RPM
GROUND
CHECK GEARBOX LIGHT
WINTER LIGHT
SPORT LIGHT
B+
TURBINE SENSOR
OUTPUT SENSOR
OIL TEMP
GROUND
S1 SOLENOID
S2 SOLENOID
SL LOCK-UP SOLENOID
ST PRES. SOLENOID
CONNECTOR NUMBER H10-1
INSTRUMENT PANEL
A
B
C
PA
B+
SELECTOR POSITION SENSOR
SPORT SWITCH
WINTER SWITCH
ENGINE CONTROL MODULE
KICKDOWN SWITCH
B+
BRAKE SWITCH
TCM is located behind the glove box.
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Figure 7

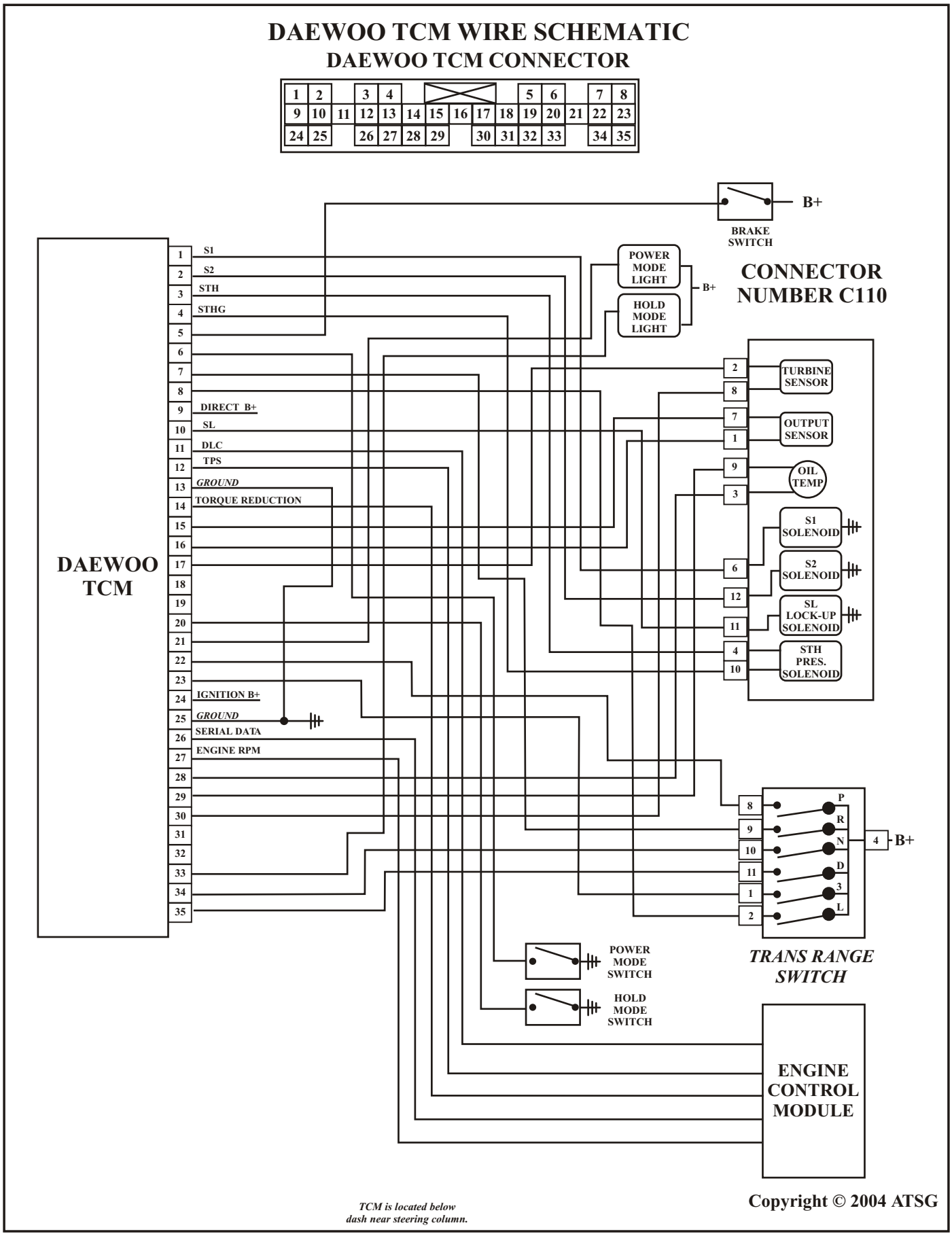

DAEWOO TCM WIRE SCHEMATIC
DAEWOO TCM CONNECTOR
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31 32 33 34 35
B+
BRAKE SWITCH
CONNECTOR NUMBER C110
POWER MODE LIGHT
HOLD MODE LIGHT
B+
DAEWOO TCM
1 S1
2 S2
3 STH
4 STHG
5
6
7
8
9 DIRECT B+
10 SL
11 DLC
12 TPS
13 GROUND
14 TORQUE REDUCTION
15
16
17
18
19
20
21
22
23
24 IGNITION B+
25 GROUND
26 SERIAL DATA
27 ENGINE RPM
28
29
30
31
32
33
34
35
2 TURBINE SENSOR
8
7 OUTPUT SENSOR
1
9 OIL TEMP
3
6 S1 SOLENOID
12 S2 SOLENOID
11 SL LOCK-UP SOLENOID
4 STH PRES. SOLENOID
10
8 P
9 R
10 N
11 D
1 3
2 L
4 B+
TRANS RANGE SWITCH
POWER MODE SWITCH
HOLD MODE SWITCH
ENGINE CONTROL MODULE
TCM is located below dash near steering column.
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Figure 8

VOLVO "850" 50-40LE

DIAGNOSTIC TROUBLE CODE RETRIEVAL
1992-1995 MODELS ONLY

TROUBLE CODE RETRIEVAL

Faults are recorded in the Transmission Control Module (TCM) memory, in the form of Diagnostic Trouble Codes (DTC). Codes can be displayed manually using the LED Indicator on the Volvo diagnostic unit. The diagnostic unit is located at the right front of the engine compartment, as shown in Figure 9. The diagnostic unit is equipped with an LED Indicator, Function Selector Cable and Activation Button, as shown in Figure 10. Diagnostic unit output socket number 1 is used to retrieve TCM diagnostic codes, as shown in Figure 10. Use the following procedure to retrieve (DTC's).

(1) Turn the ignition switch to the "OFF" position.

(2) Remove the Function Selector Cable from it's storage cavity, and install it into diagnostic unit output socket number 1, as shown in Figure 10.

(3) Turn the ignition switch to the "ON" position.

(4) Depress the Activation Button and keep depressed for more than one second, but not more than three seconds. Refer to Figure 10.

(5) Observe the LED Indicator on the diagnostic unit, and count the number of flashes to determine the ***first*** Diagnostic Trouble Code stored in the TCM memory. All codes contain three digits (Example: 2-1-3). Since all codes have three digits, each code requires three series of flashes on the LED Indicator. Example is shown in Figure 10.

(6) Since only one DTC can be retrieved with one push of the button, depress the Activation Button again to determine if any additional DTC's have been stored in the TCM memory.

(7) Read and record all Diagnostic Trouble Codes, pushing the activation button as many times as necessary, until the first code returns to the display.
Note: The Transmission Control Module is capable of storing a maximum of five DTC's, so these faults must be corrected and their DTC's cleared before any additional DTC's can be displayed. Refer to Figure 11 for a Diagnostic Trouble Code description and interpretation.

CLEARING TROUBLE CODES

All Diagnostic Trouble Codes must be displayed at least once ***before*** it is possible to clear the codes from the TCM memory. Only after the first DTC has returned to the display, will it be possible to clear the codes. Use the following procedure:

(1) Ensure that the Function Selector Cable is still located in diagnostic unit output socket number 1, as shown in Figure 10, and the ignition switch is in the "ON" position.

(2) Depress the activation button, and hold down for at least ten seconds, and watch for LED indicator response. The LED indicator should go out three seconds after the button is released.

Depress the activation button, and hold down for at least an additional ten seconds, and watch for LED indicator response. The LED indicator should go out when the button is released.

(4) Ensure that the Diagnostic Trouble Codes have been cleared by pressing once on the activation button again for more than one second, but less than three seconds, and observe LED indicator. If the code 1-1-1 is displayed on the LED indicator, the DTC's have been cleared.

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DIAGNOSTIC UNIT LOCATION

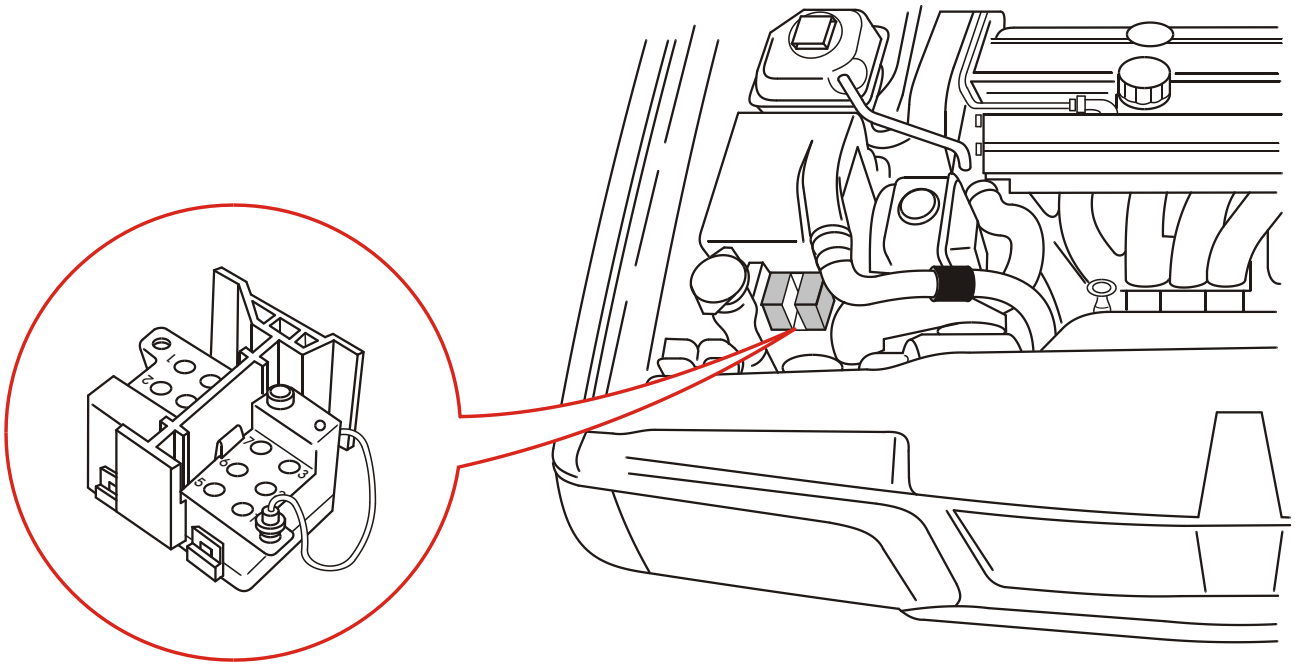
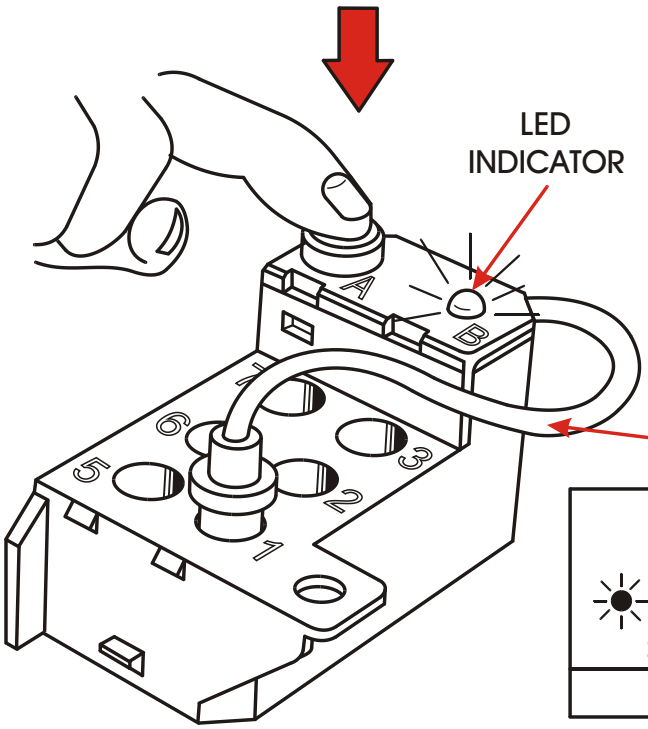


Figure 9

RETRIEVING TROUBLE CODES



Once the Function Selector Cable has been inserted in correct socket, depress button once and keep depressed for more than one second, but not more than three seconds. Diagnostic Trouble Codes are read by observing and counting LED flashes to determine the Diagnostic Trouble Code.

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Figure 10

DTC	DESCRIPTION	WARNING LAMP **
1-1-1	NO FAULTS RECORDED	NO
1-1-2	SHORT CIRCUIT TO BATTERY VOLTAGE IN SHIFT SOLENOID S1 CIRCUIT	YES
1-1-3	FAULT IN TRANSMISSION CONTROL MODULE	YES
1-1-4	BREAK IN MODE SELECTOR CIRCUIT	NO
1-2-1	SHORT CIRCUIT TO GROUND IN SHIFT SOLENOID S1 CIRCUIT	YES
1-2-2	BREAK (OPEN) IN SHIFT SOLENOID S1 CIRCUIT	YES
1-2-3	SHORT CIRCUIT TO BATTERY VOLTAGE IN EPC SOLENOID CIRCUIT	YES
1-2-4	SHORT CIRCUIT TO GROUND IN MODE SELECTOR CIRCUIT	NO
1-3-1	BREAK OR SHORT CIRCUIT TO GROUND IN EPC SOLENOID CIRCUIT	YES
1-3-2	FAULT IN TRANSMISSION CONTROL MODULE	YES
1-3-4	INCORRECT LOAD SIGNAL	NO
1-4-1	SHORT CIRCUIT IN TRANSMISSION TEMPERATURE SENSOR CIRCUIT	NO
1-4-2	BREAK (OPEN) IN TRANSMISSION TEMPERATURE SENSOR CIRCUIT	NO
1-4-3	SHORT CIRCUIT TO GROUND IN KICKDOWN SWITCH CIRCUIT	NO
2-1-1	FAULT IN TRANSMISSION CONTROL MODULE	YES
2-1-2	SHORT CIRCUIT TO BATTERY VOLTAGE IN SHIFT SOLENOID S2 CIRCUIT	YES
2-1-3	THROTTLE POSITION SENSOR SIGNAL TOO HIGH	YES
2-2-1	SHORT CIRCUIT TO GROUND IN SHIFT SOLENOID S2 CIRCUIT	YES
2-2-2	BREAK (OPEN) IN SHIFT SOLENOID S2 CIRCUIT	YES
2-2-3	THROTTLE POSITION SENSOR SIGNAL TOO LOW	YES
2-3-1	IRREGULAR THROTTLE POSITION SENSOR SIGNAL	YES
2-3-2	SPEEDOMETER SIGNAL ABSENT	YES
2-3-3	INCORRECT SPEEDOMETER SIGNAL	YES
2-3-5	HIGH TRANSMISSION OIL TEMPERATURE	YES *
2-4-5	BREAK OR SHORT IN TORQUE LIMITING CIRCUIT	YES
3-1-1	RPM SIGNAL ABSENT	YES
3-1-2	RPM SIGNAL FAULTY	YES
3-1-3	INCORRECT SIGNAL FROM GEAR POSITION SENSOR	YES
3-2-2	INCORRECT GEAR RATIO	YES
3-2-3	LOCK-UP SLIPS OR IS NOT ENGAGED	YES
3-3-1	SHORT CIRCUIT TO BATTERY VOLTAGE IN LOCK-UP SOLENOID CIRCUIT	NO
3-3-2	BREAK (OPEN) IN LOCK-UP SOLENOID CIRCUIT	NO
3-3-3	SHORT CIRCUIT TO GROUND IN LOCK-UP SOLENOID CIRCUIT	NO

** When a fault occurs the code is stored and the "WARNING" lamp in the instrument panel comes on. If the fault is intermittent and ceases, the warning lamp will go out, but the DTC will remain.

* Only for as long as the temperature remains high.

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Figure 11

VOLVO 96 & UP OBD-ll CODE DEFINITIONS

OBD-ll CONNECTOR



OBD-ll Connector Location: In front of shifter or in front of console by gas pedal

VOLVO DTC	OBD-ll DTC	CODE DESCRIPTION
1-2-1	P0750	SHORT CIRCUIT TO GROUND IN SHIFT SOLENOID S1 CIRCUIT
1-2-2	P0750	BREAK (OPEN) IN SHIFT SOLENOID S1 CIRCUIT
1-2-3	P0745	SHORT CIRCUIT TO BATTERY VOLTAGE IN EPC SOLENOID CIRCUIT
1-3-2	P0745	FAULT IN TRANSMISSION CONTROL MODULE (STH SHORT CIRCUIT)
2-2-1	P0755	SHORT CIRCUIT TO GROUND IN SHIFT SOLENOID S2 CIRCUIT
2-2-2	P0755	BREAK (OPEN) IN SHIFT SOLENOID S2 CIRCUIT
2-1-3	P0120	THROTTLE POSITION SENSOR SIGNAL TOO HIGH
2-2-3	P0120	THROTTLE POSITION SENSOR SIGNAL TOO LOW
2-3-2	P0500	SPEEDOMETER SIGNAL ABSENT
3-1-1	P0715	RPM SIGNAL ABSENT
3-1-3	P0705	INCORRECT SIGNAL FROM GEAR POSITION SENSOR
3-2-1	P0731	INCORRECT 1st GEAR RATIO
3-2-2	P0732	INCORRECT 2nd GEAR RATIO
3-2-3	P0733	INCORRECT 3rd GEAR RATIO
3-2-4	P0734	INCORRECT 4th GEAR RATIO

NOTE: Codes may be retrieved in OBD-ll Generic mode

Figure 12

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SAAB OBD-ll CODE DEFINITIONS

OBD-ll CONNECTOR



OBD-ll Connector Location: Below dash at base of steering column

OBD-ll DTC	CODE DESCRIPTION
P0705	GEAR SELECTOR POSITION SENSOR, SIGNAL INCORRECT
P1500	BATTERY VOLTAGE TOO LOW OR TO HIGH
P1785/6	TPS SIGNAL FROM ENGINE / TCS INCORRECT
P1787/8	TPS SIGNAL FROM ENGINE / TCS SHORT
P1789	DRIVE SIGNAL TO ENGINE MANAGEMENT SHORT OR OPEN
P1790	KICKDOWN SWITCH SHORT TO GROUND
P1812	OIL TEMPERATURE SHORT TO GROUND
P1813	OIL TEMPERATURE SHORT TO B+ OR OPEN
P1813	OIL TEMPERATURE SHORT TO B+ OR OPEN
P1817	TURBINE SHAFT SPEED SENSOR NO SIGNAL
P1822	OUTPUT SHAFT SPEED SENSOR NO SIGNAL
P1830	GEAR RATIO ERROR (SLIP CODE)
P1831	DOWNSHIFTING MECHANICAL FAULT
P1832	SHIFTING TIME MECHANICAL FAULT
P1832	SHIFTING TIME MECHANICAL FAULT
P1842	TORQUE LIMIT SIGNAL TO ECM SHORT OR OPEN
P1847	PRESSURE CONTROL SOLENOID CIRCUIT (ST) SHORT OR OPEN
P1848	PRESSURE CONTROL SOLENOID CIRCUIT (ST) SHORT TO B+
P1849	PRESSURE CONTROL SOLENOID (ST) SHORT
P1852	SOLENOID S1 SHORT TO GROUND
P1853	SOLENOID S1 SHORT TO B+ OR OPEN
P1857	SOLENOID S2 SHORT TO GROUND
P1858	SOLENOID S2 SHORT TO B+ OR OPEN
P1862	SOLENOID SL SHORT TO GROUND
P1863	SOLENOID SL SHORT TO B+ OR OPEN

NOTE: Codes may be retrieved in OBD-ll Generic mode

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Figure 13

DAEWOO OBD-ll CODE DEFINITIONS

OBD-ll CONNECTOR



OBD-ll Connector Location: Below dash at the right of steering column

OBD-ll DTC	CODE DESCRIPTION
P0604	INTERNAL CONTROL MODULE FAILURE (RAM FAILURE)
P0705	TRANS RANGE SENSOR CIRCUIT MALFUNCTION
P0712	TRANS FLUID TEMP SENSOR CIRCUIT - LOW INPUT
P0713	TRANS FLUID TEMP SENSOR CIRCUIT - HIGH INPUT
P0717	TURBINE SPEED SENSOR CIRCUIT - NO SIGNAL
P0722	OUTPUT SPEED SENSOR CIRCUIT - NO SIGNAL
P0727	ENGINE SPEED SENSOR CIRCUIT - NO SIGNAL
P0741	TORQUE CONVERTER CLUTCH (SL) STUCK OFF
P0742	TORQUE CONVERTER CLUTCH (SL) STUCK ON
P0743	TORQUE CONVERTER CLUTCH (SL) CIRCUIT ELECTRICAL
P0748	PRESSURE CONTROL SOLENOID (STH) CIRCUIT ELECTRICAL
P0751	S1 SOLENOID PERFORMANCE
P0753	S1 SOLENOID CIRCUIT ELECTRICAL
P0756	S2 SOLENOID PERFORMANCE
P0758	S2 SOLENOID CIRCUIT ELECTRICAL
P1701	ENGINE COOLANT TEMP SIGNAL MALFUNCTION
P1702	TORQUE CONTROL SIGNAL MALFUNCTION
P1790	INTERNAL CONTROL MODULE FAILURE (CHECK SUM FAILURE)
P1791	THROTTLE POSITION SENSOR SIGNAL MALFUNCTION

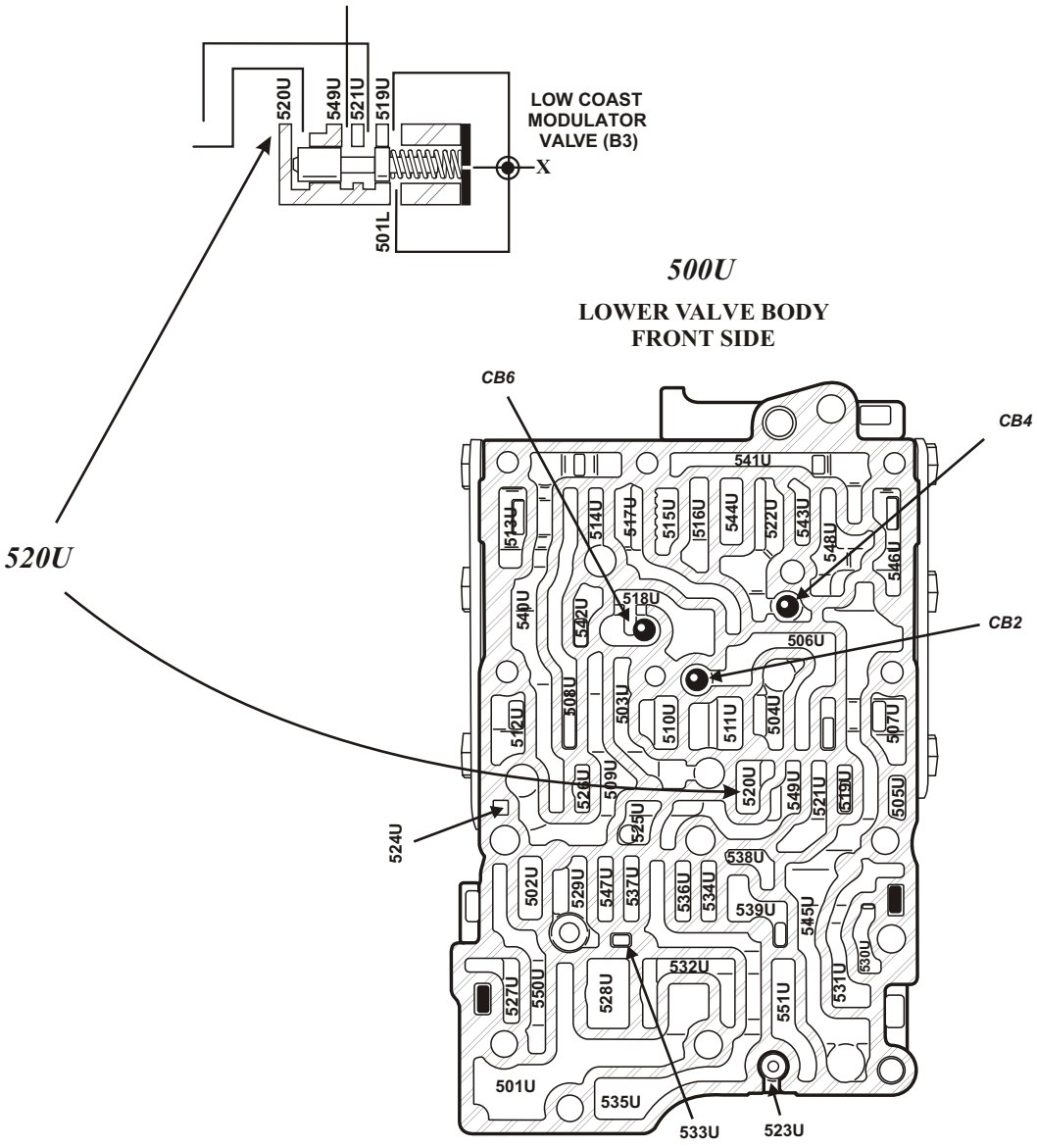
NOTE: Codes may be retrieved in OBD-ll Generic mode

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Figure 14

VALVE BODY MAPPING AND PASSAGE IDENTIFICATION

PARTIAL HYDRAULIC SCHEMATIC FOR THE LOW COAST MODULATOR VALVE



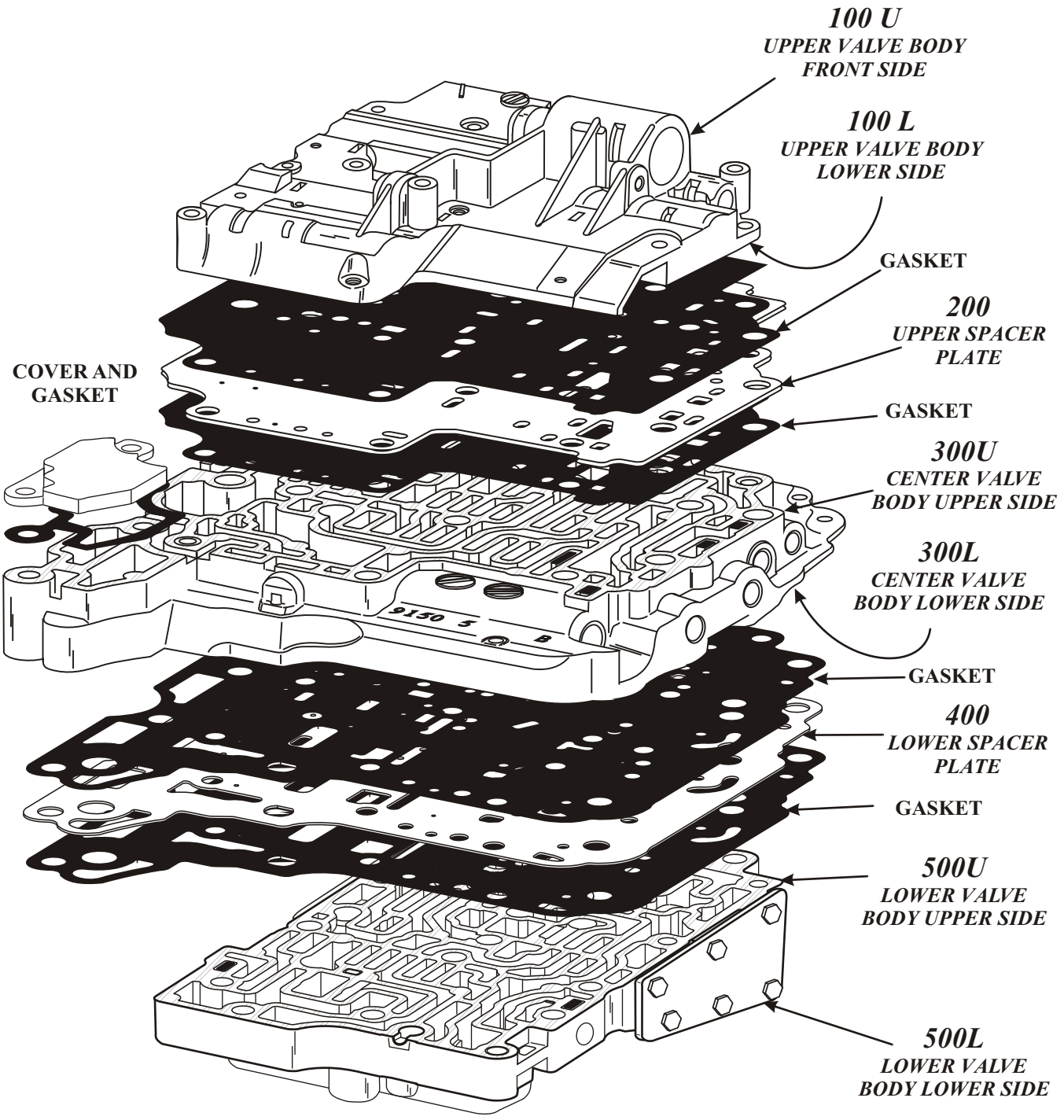
HOW TO USE THIS MANUAL:

All castings and spacer plates have been numbered so they can be identified in the Valve Body Mapping oil circuit diagram. ***Example:* 520U** passage is located in the Lower Valve Body Upper side (500U series). This passage can now be located in the partial oil circuit diagram and matched up to the passage in the Lower Valve Body Upper side as shown above.

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Figure 15

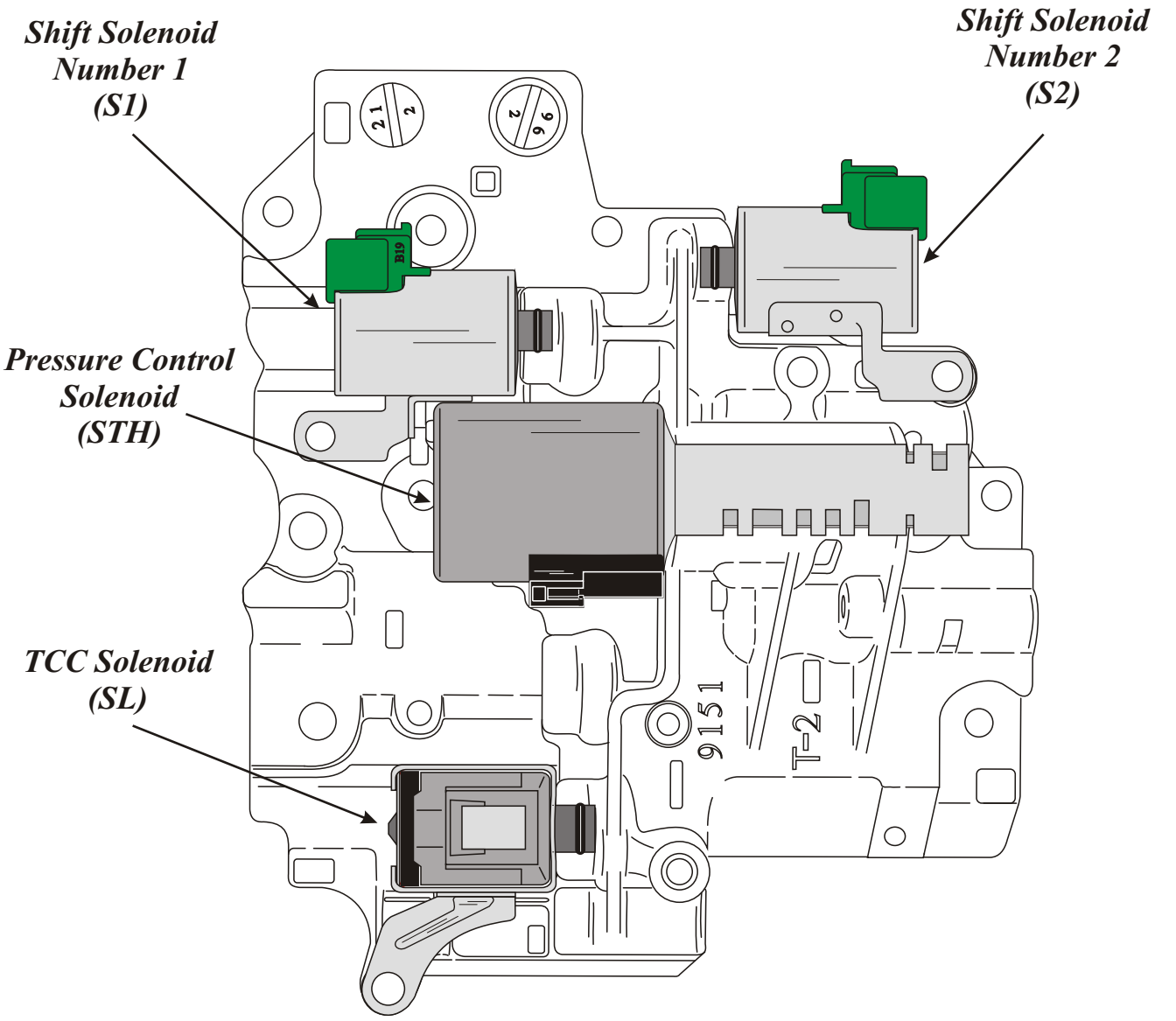
50-40 SERIES VALVE BODY COMPONENTS FOR PASSAGE I.D.



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Figure 16

50-40 SERIES SOLENOID LOCATION AND I.D.

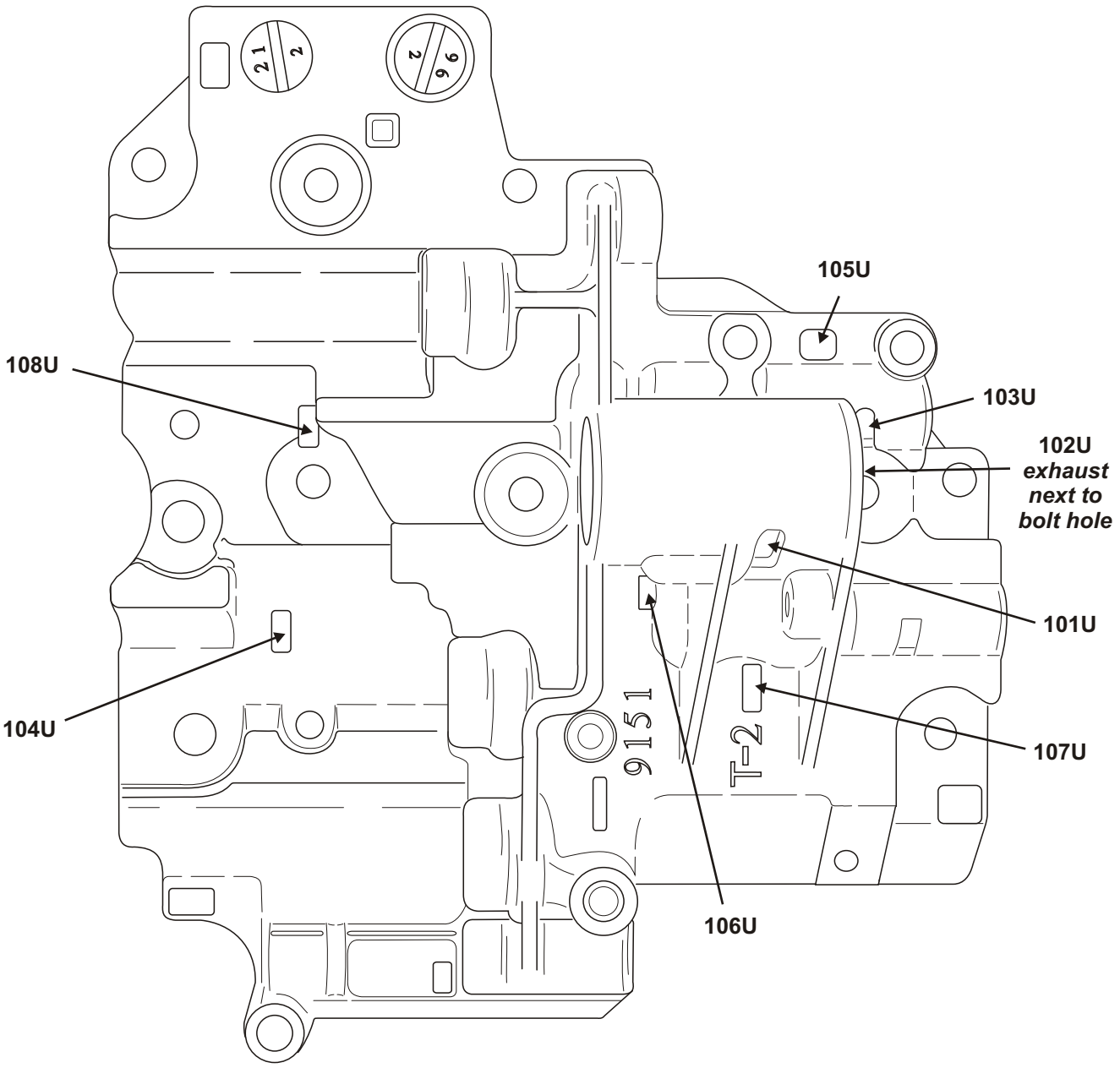


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Figure 17

100 U

UPPER VALVE BODY
FRONT SIDE

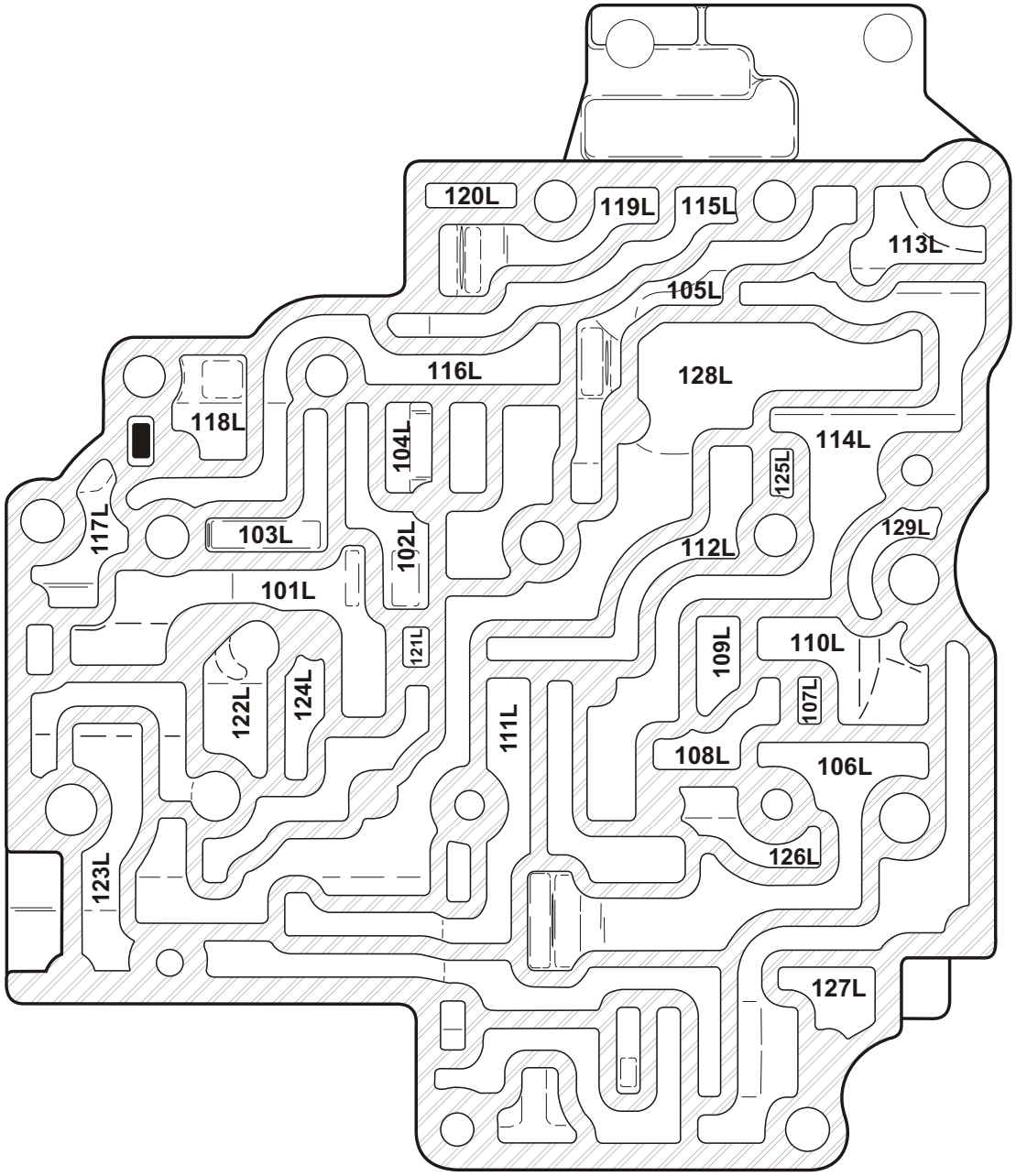


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Figure 18

100 L

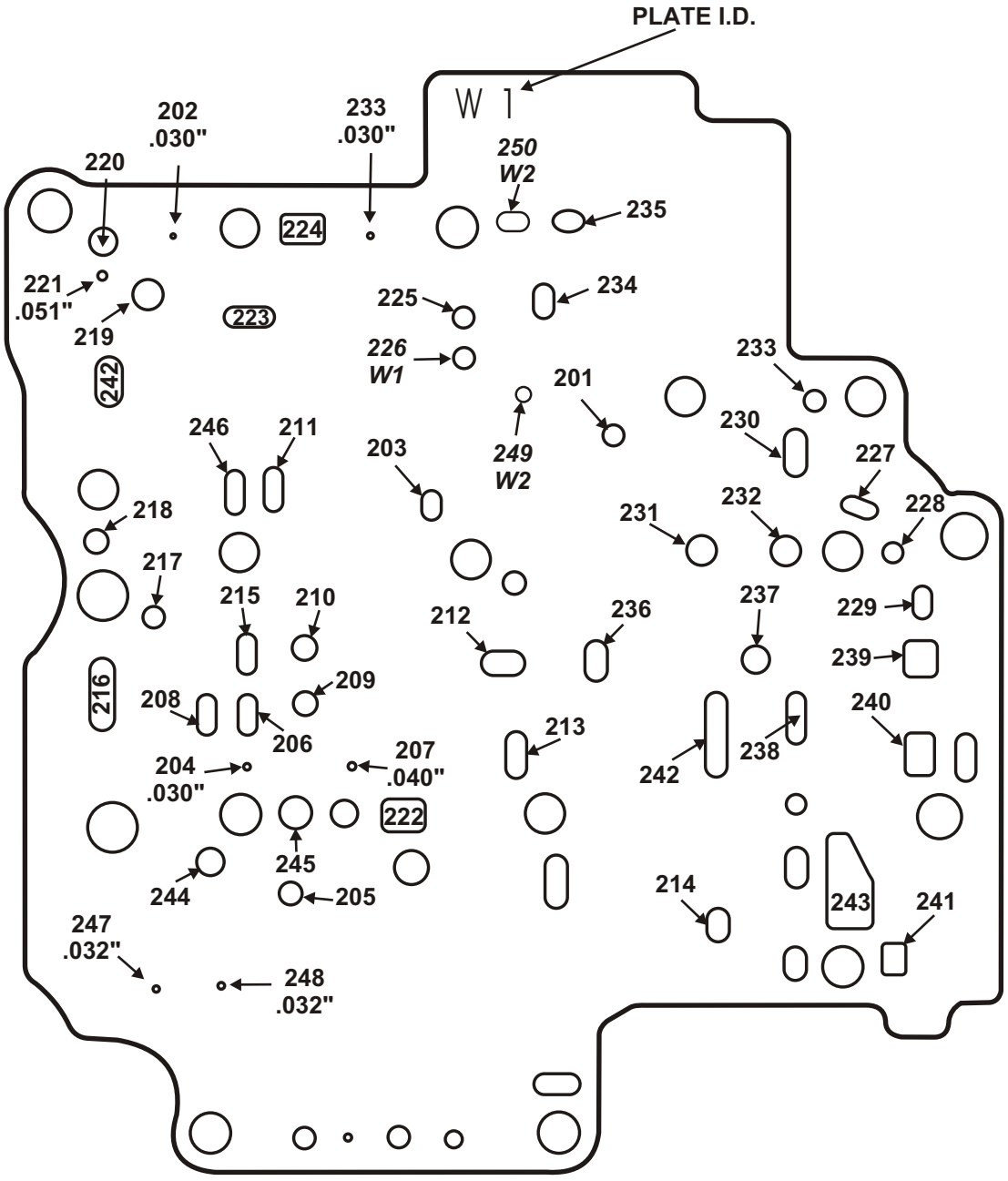
UPPER VALVE BODY
LOWER SIDE



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Figure 19

200
UPPER SPACER PLATE



W1 & W2 are two different spacer plate configurations

226 W1 ***= This hole used on W1 spacer plates only***

249 W2 ***= This hole used on W2 spacer plates only***

250 W2 ***= This hole used on W2 spacer plates only***

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Figure 20

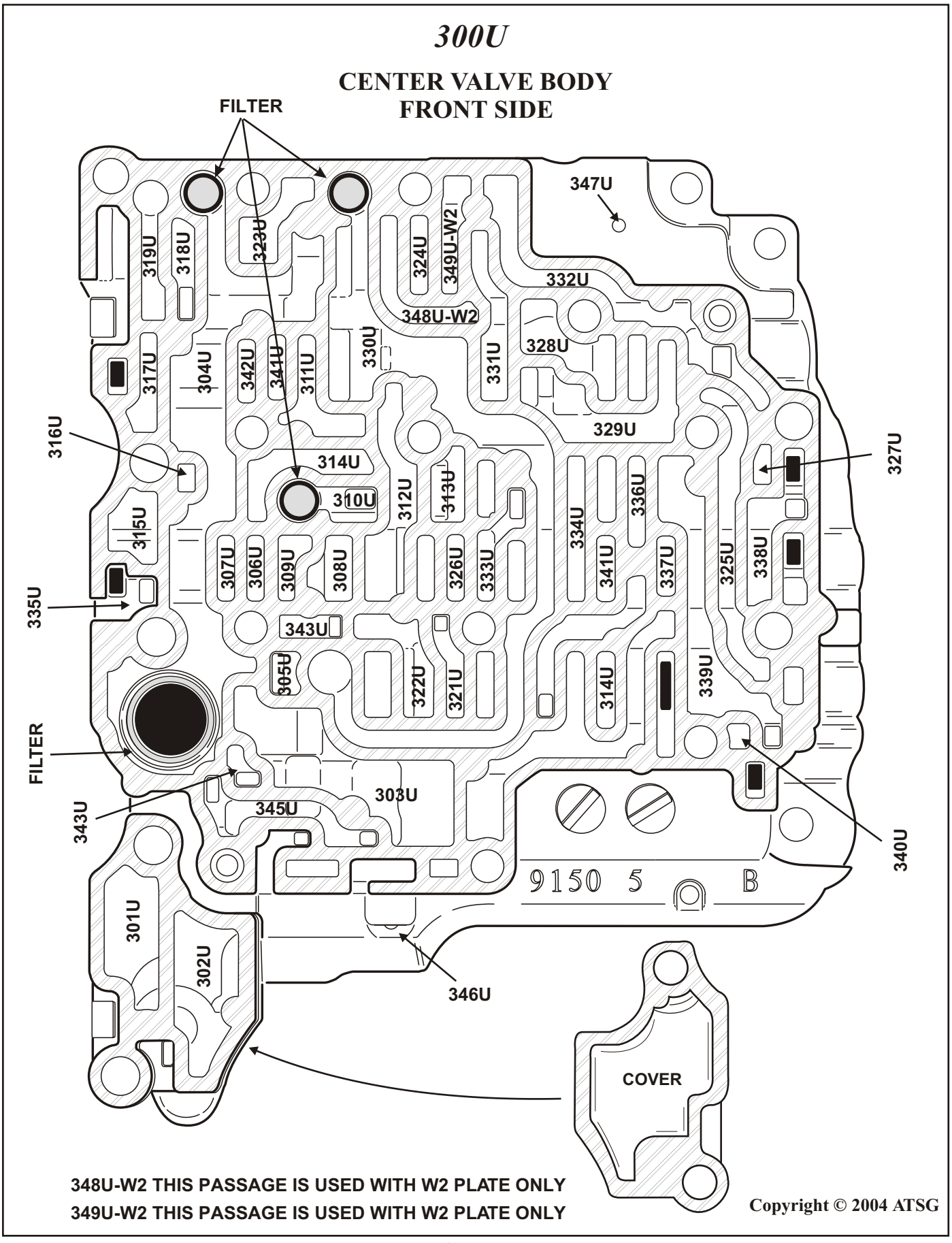

300U
CENTER VALVE BODY
FRONT SIDE
FILTER
347U
319U
318U
323U
324U
349U-W2
332U
348U-W2
330U
328U
317U
304U
342U
344U
311U
331U
329U
316U
314U
327U
310U
312U
313U
315U
334U
336U
307U
306U
309U
308U
326U
333U
341U
337U
325U
338U
335U
343U
305U
322U
321U
314U
339U
FILTER
303U
343U
345U
340U
9150 5 B
301U
302U
346U
COVER
348U-W2 THIS PASSAGE IS USED WITH W2 PLATE ONLY
349U-W2 THIS PASSAGE IS USED WITH W2 PLATE ONLY
Copyright © 2004 ATSG

Figure 21

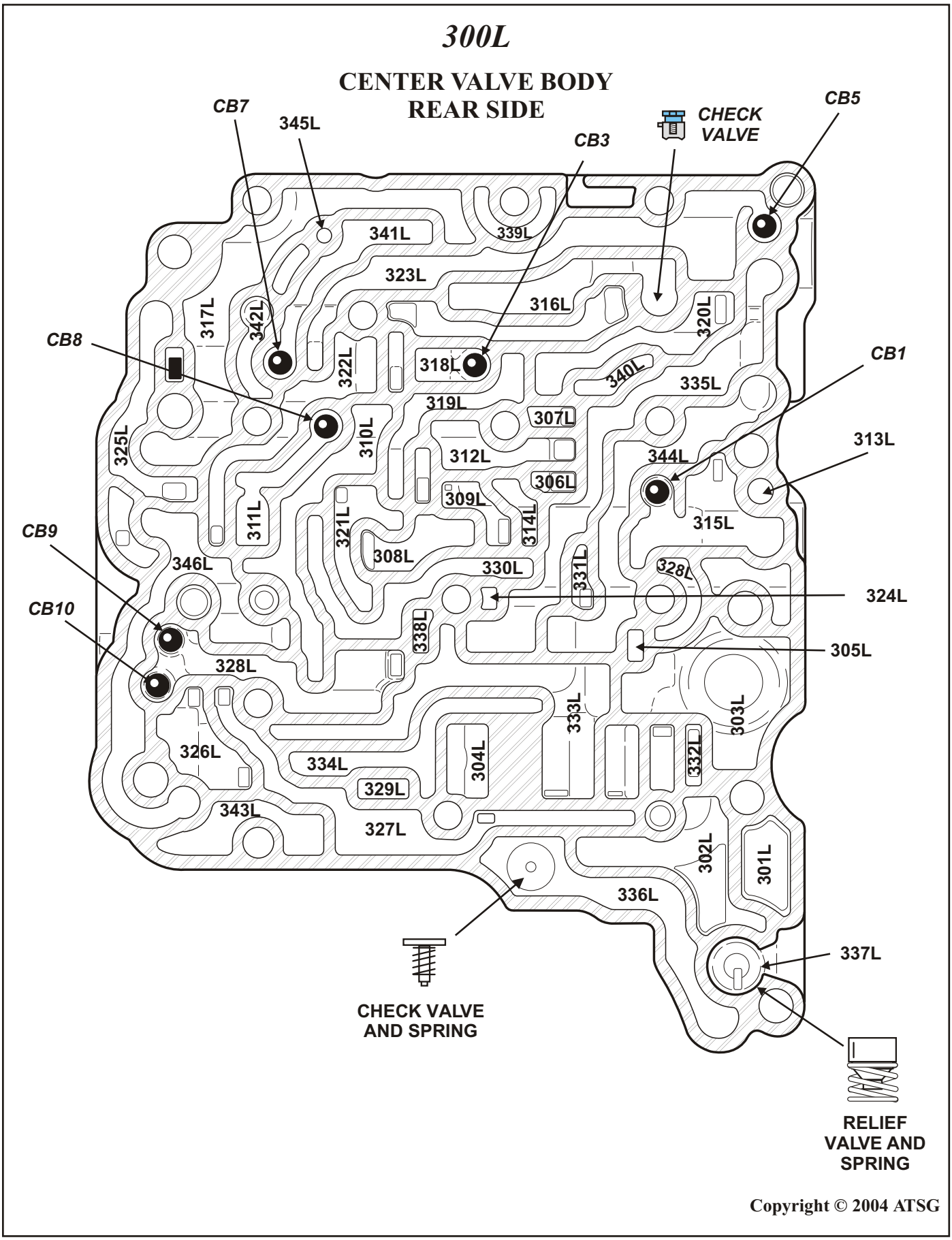
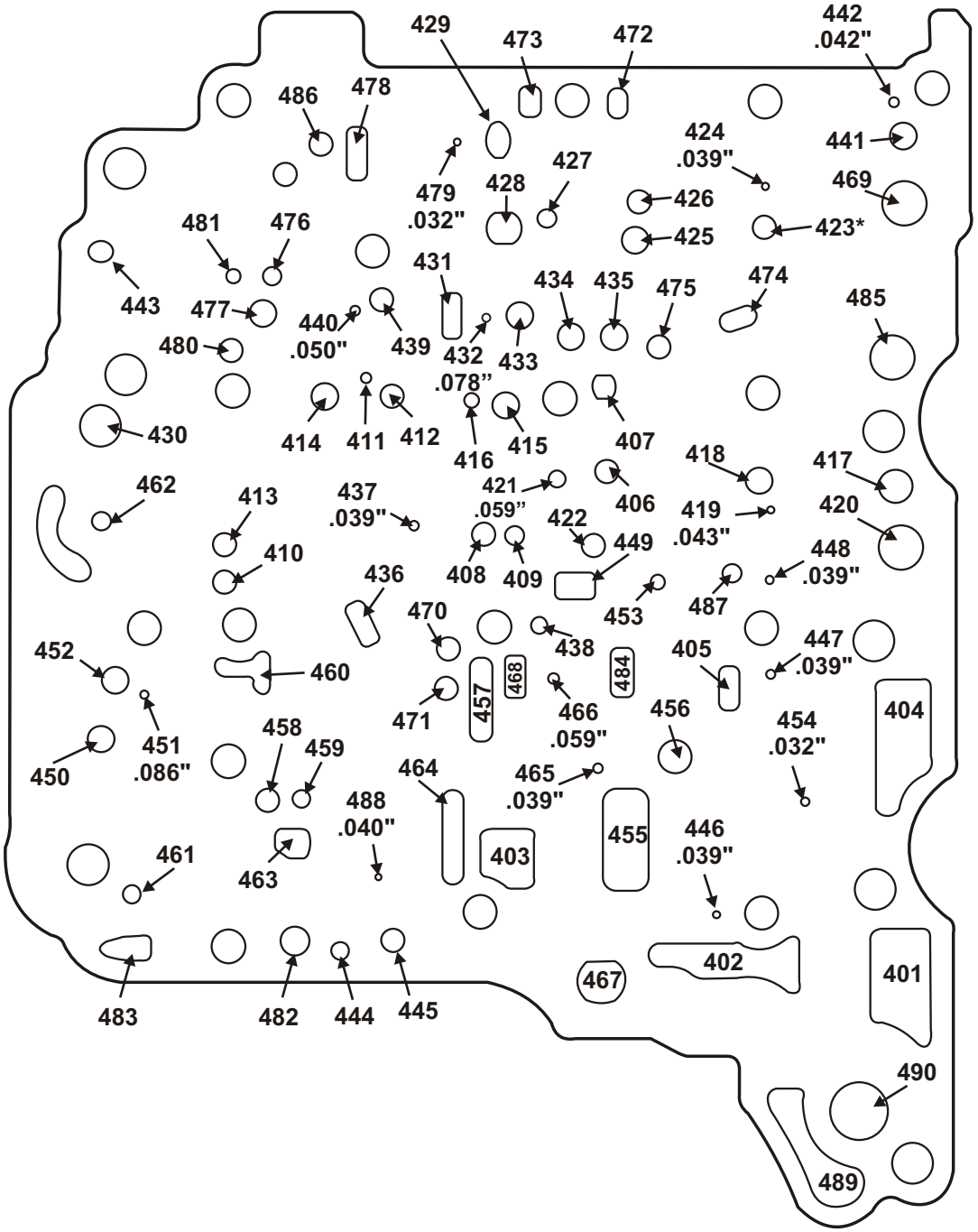

300L
CENTER VALVE BODY
REAR SIDE
CB7
345L
CB3
CHECK VALVE
CB5
341L
339L
323L
316L
317L
342L
320L
CB8
322L
318L
340L
CB1
335L
319L
307L
325L
310L
312L
313L
344L
306L
309L
311L
321L
314L
315L
CB9
308L
346L
330L
331L
328L
324L
CB10
338L
305L
328L
333L
303L
326L
334L
304L
332L
329L
343L
327L
302L
301L
336L
337L
CHECK VALVE
AND SPRING
RELIEF
VALVE AND
SPRING
Copyright © 2004 ATSG

Figure 22

400

LOWER SPACER PLATE



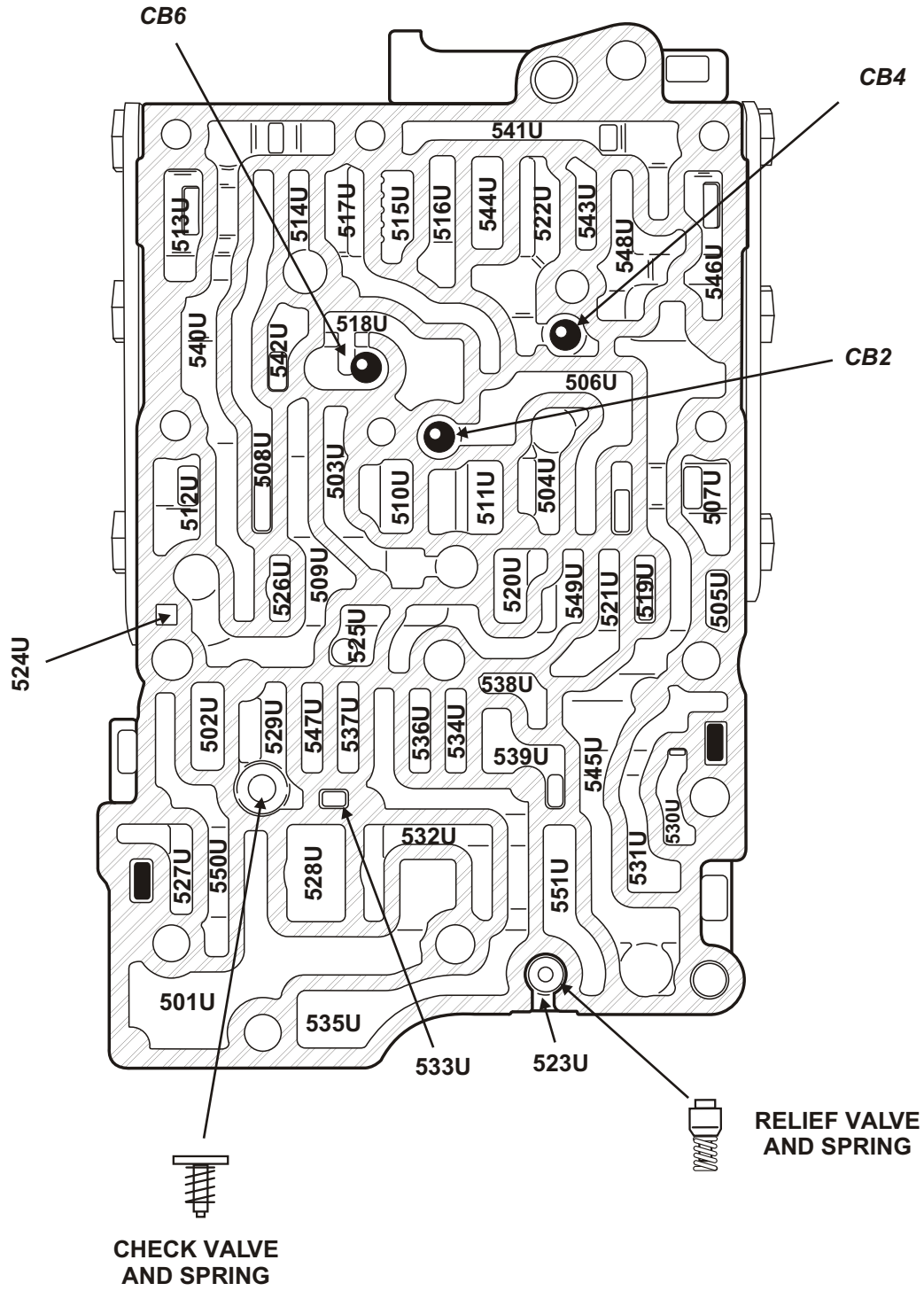
423* = USED ON CHECK VALVE VERSIONS ONLY

Copyright © 2004 ATSG

Figure 23

500U

LOWER VALVE BODY
FRONT SIDE

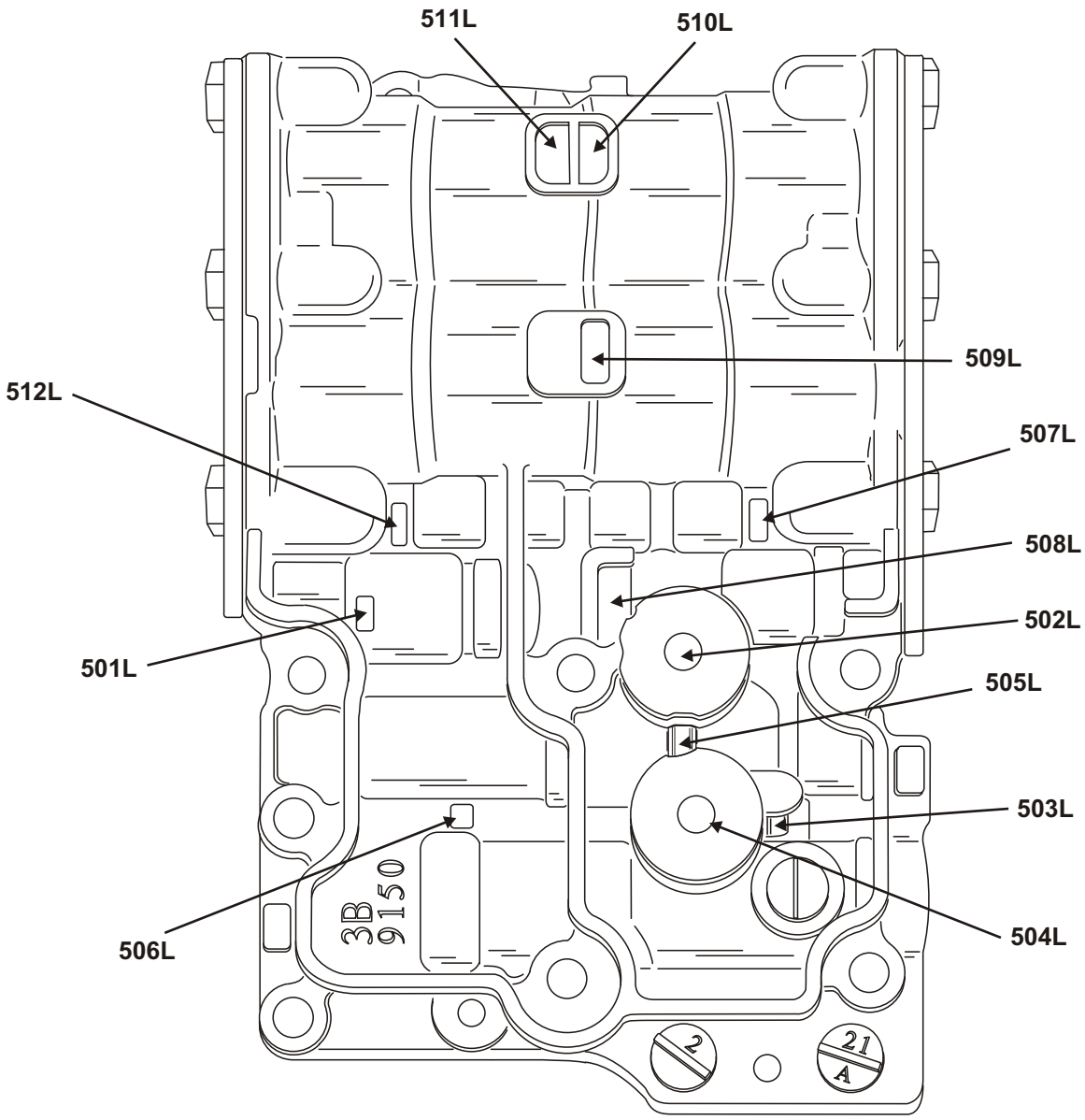


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Figure 24

500L

LOWER VALVE BODY
LOWER SIDE

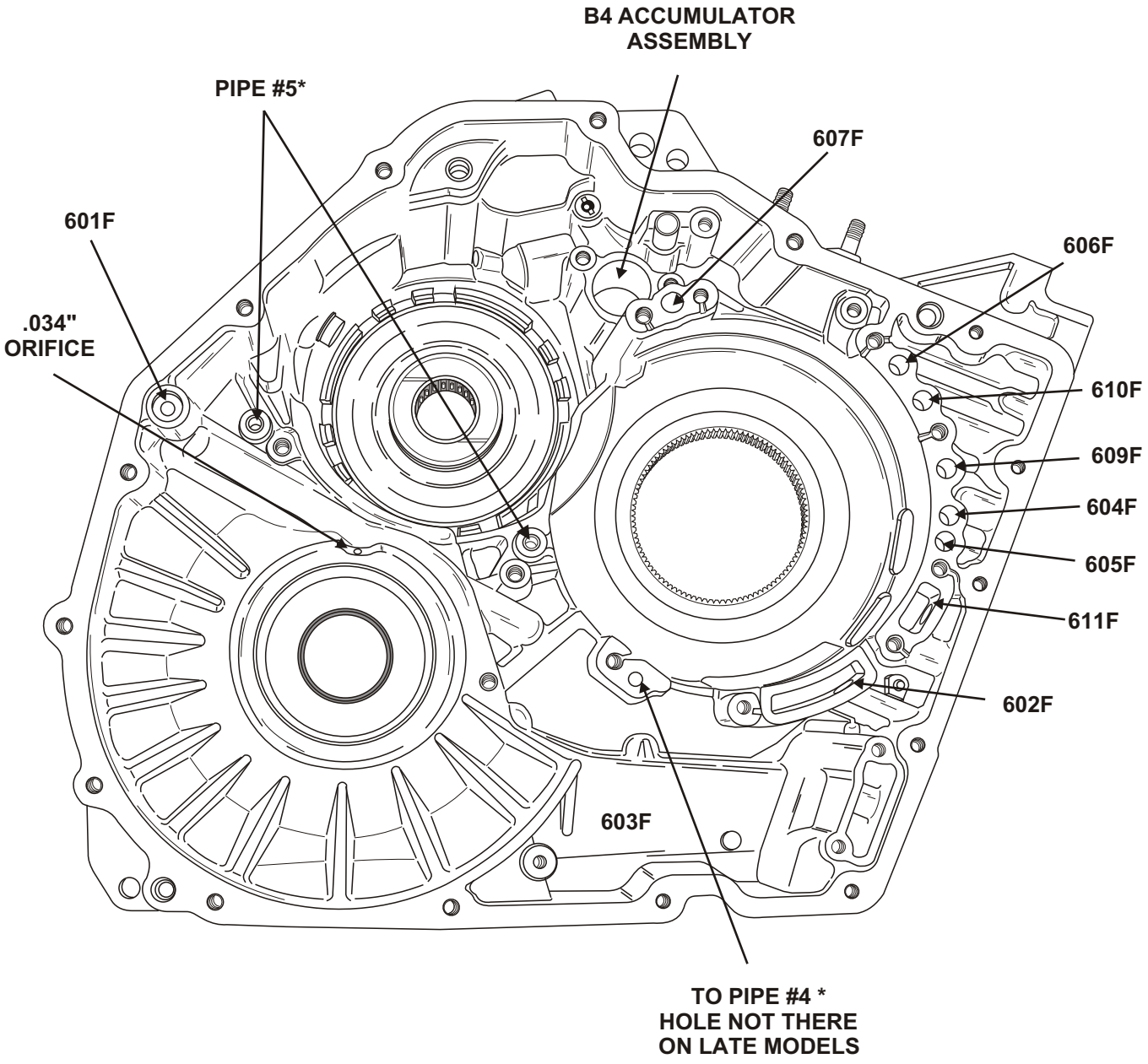


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Figure 25

600F

MID-CASE FRONT SIDE



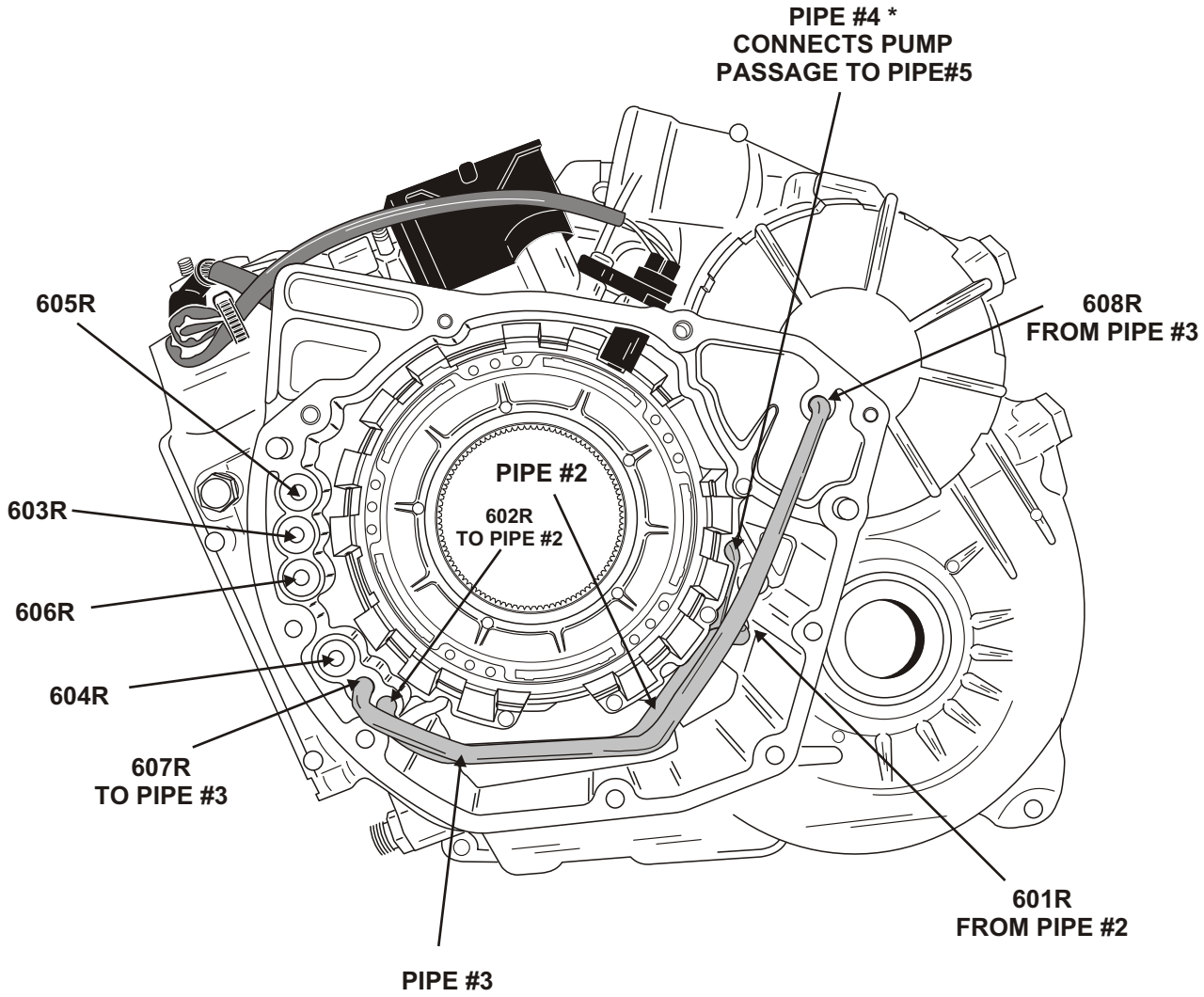
PIPE #4 IS ONLY USED ON EARLY MODELS WITH LINE PRESSURE TAP
PIPE #5 IS ONLY USED ON EARLY MODELS WITH LINE PRESSURE TAP

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Figure 26

600R

MID-CASE REAR SIDE



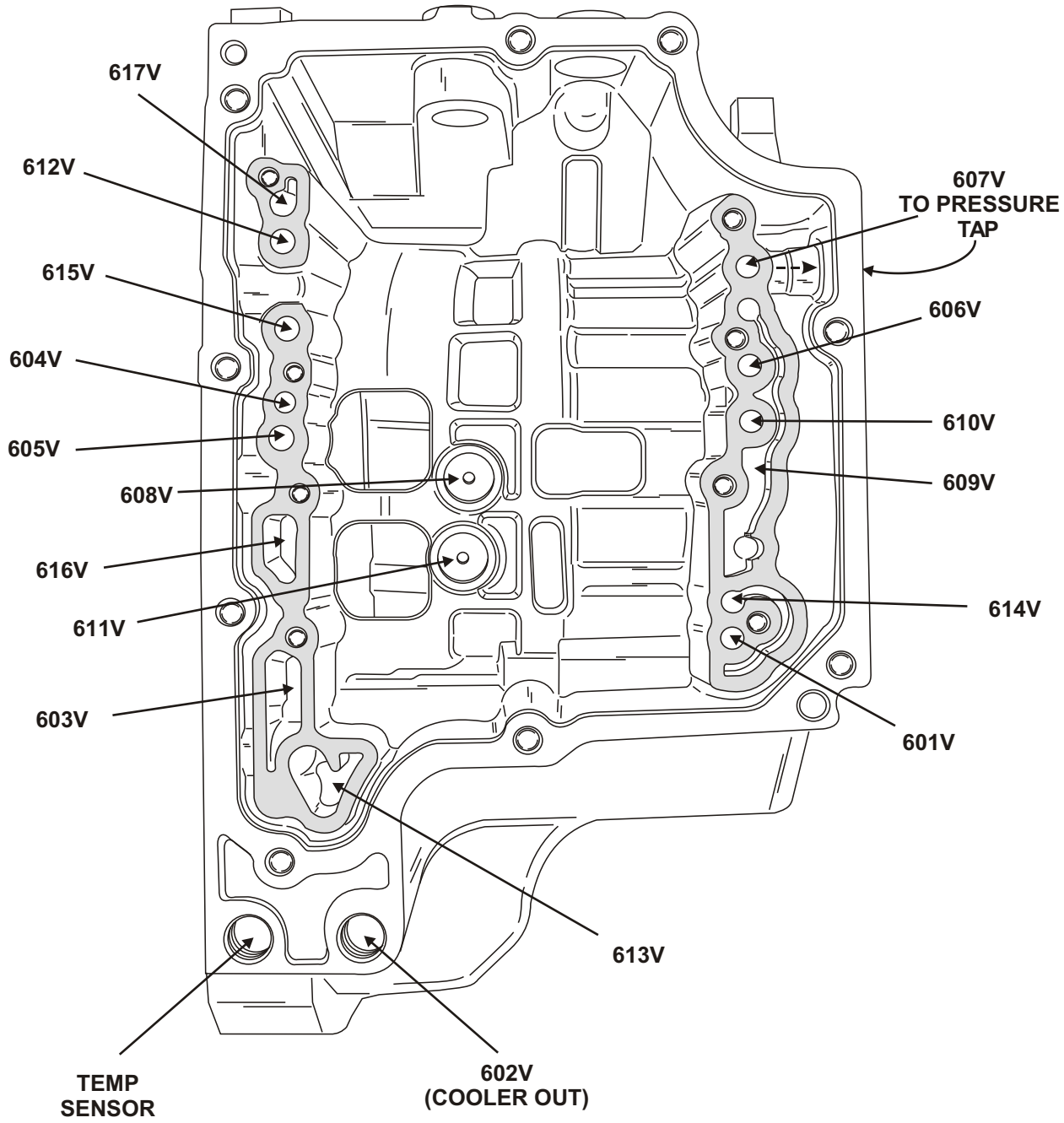
PIPE #4 AND 5 ARE USED FOR EARLY MODELS WITH LINE PRESSURE TEST PORT ONLY

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Figure 27

600V

MID-CASE
VALVE BODY SIDE

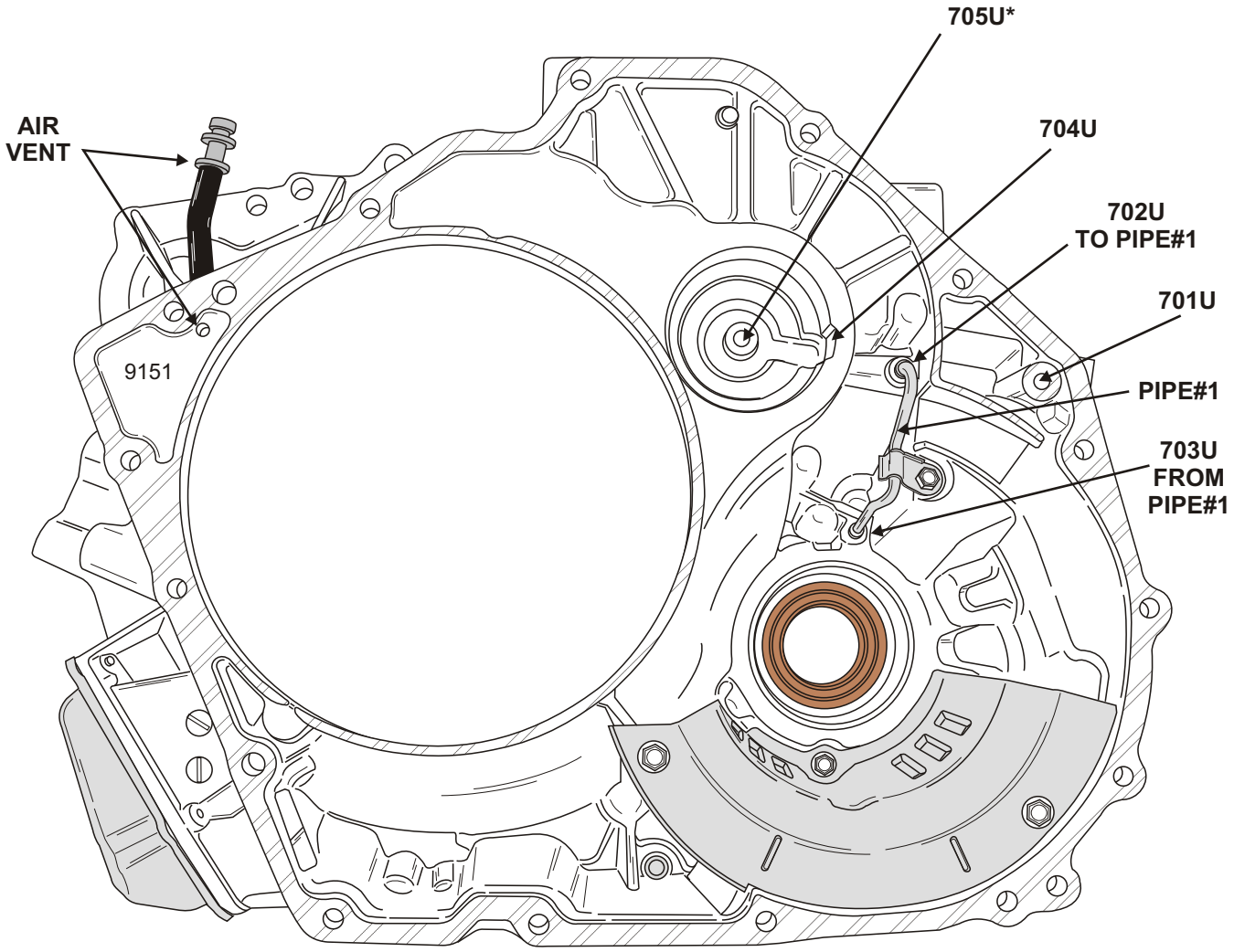


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Figure 28

700U

BELLHOUSING
REAR VIEW

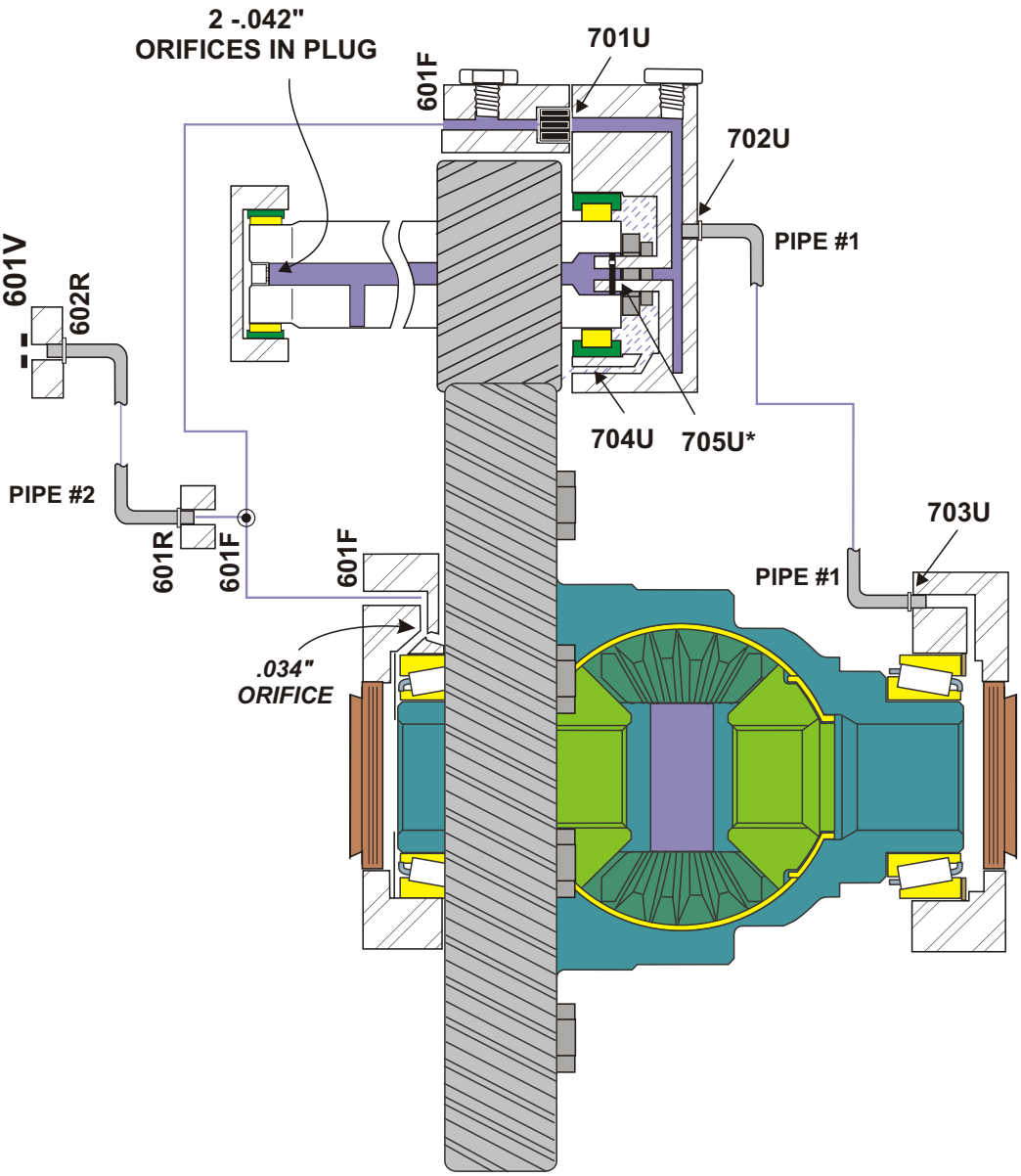


705U* THERE IS A SEALING RING IN THIS LOCATION THAT HAS A .055" GAP THAT PROVIDES A CONTROLLED LEAK INTO THE BEARING

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Figure 29

DIFFERENTIAL LUBE



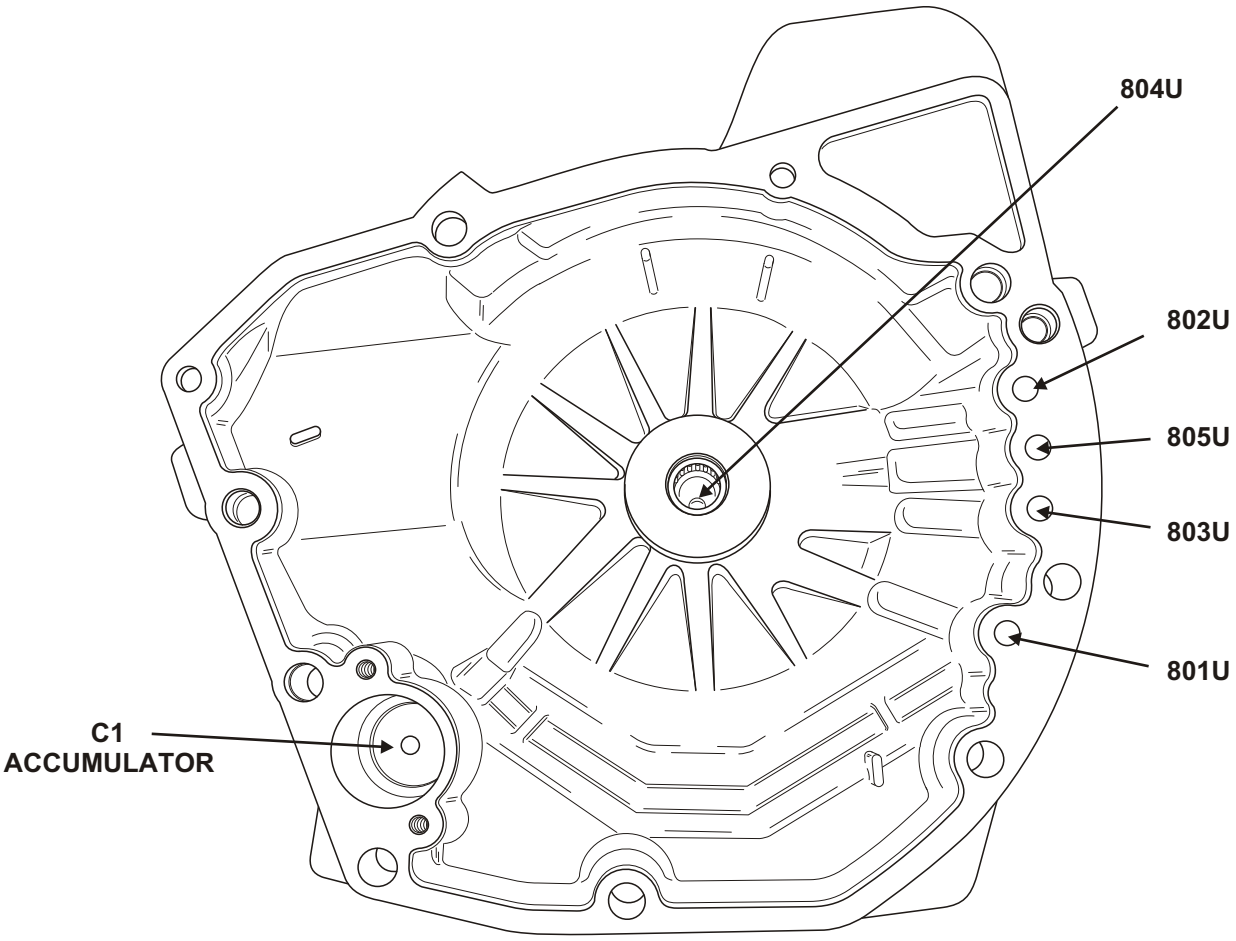
705U* THERE IS A SEALING RING IN THIS LOCATION THAT HAS A .055" GAP THAT PROVIDES A CONTROLLED LEAK INTO THE BEARING

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Figure 30

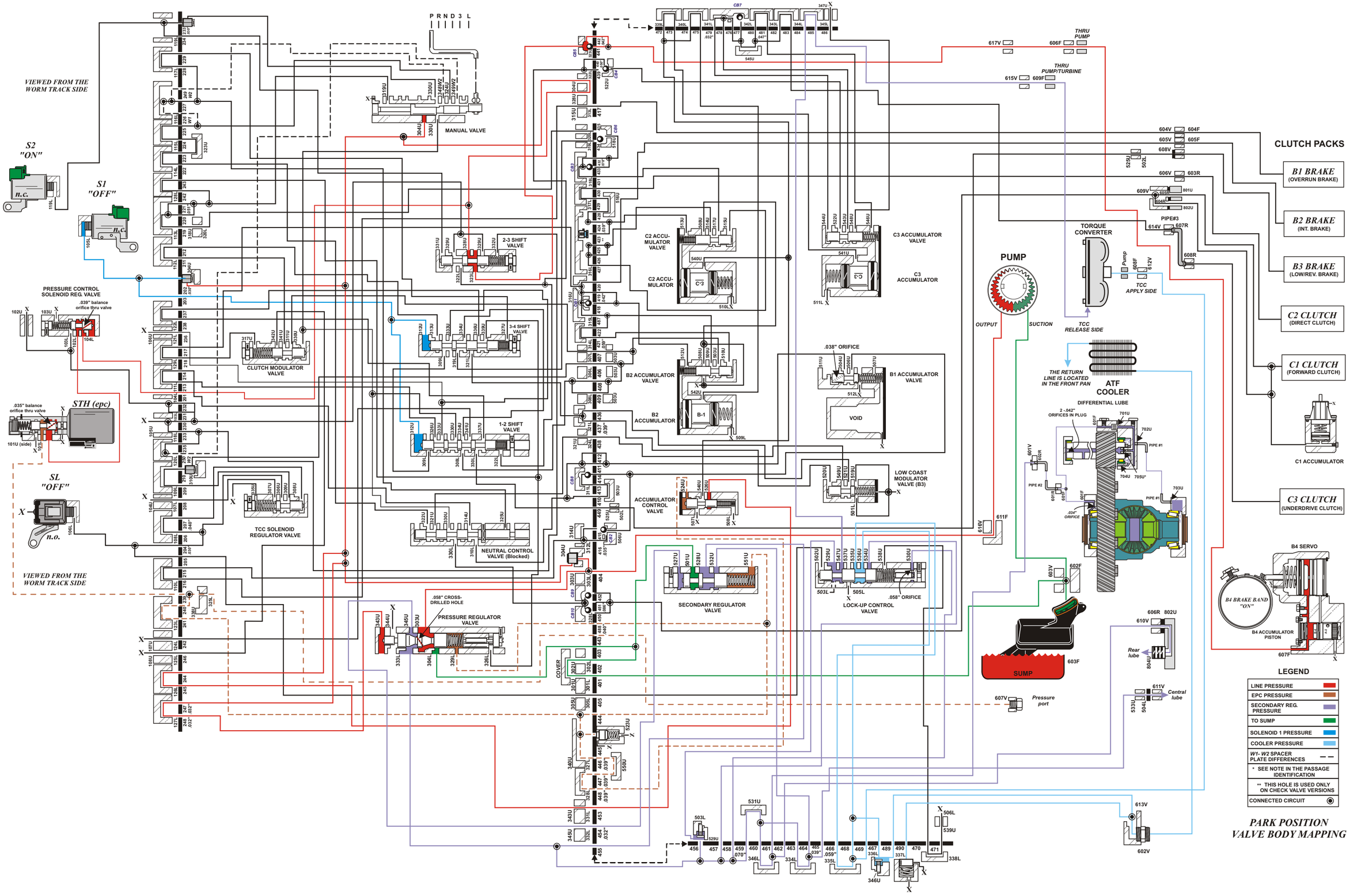
800U

REAR COVER
FRONT VIEW



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Figure 31


VIEWED FROM THE WORM TRACK SIDE
S2 "ON"
n.c.
S1 "OFF"
n.c.
PRESSURE CONTROL SOLENOID REG. VALVE
.039" balance orifice thru valve
STH (epc)
.035" balance orifice thru valve
SL "OFF"
n.o.
VIEWED FROM THE WORM TRACK SIDE
P R N D 3 L
MANUAL VALVE
2-3 SHIFT VALVE
3-4 SHIFT VALVE
CLUTCH MODULATOR VALVE
1-2 SHIFT VALVE
TCC SOLENOID REGULATOR VALVE
NEUTRAL CONTROL VALVE (Blocked)
.058" CROSS-DRILLED HOLE
PRESSURE REGULATOR VALVE
C2 ACCU-MULATOR VALVE
C2 ACCU-MULATOR
B2 ACCUMULATOR VALVE
B2 ACCUMULATOR
ACCUMULATOR CONTROL VALVE
SECONDARY REGULATOR VALVE
COVER
C3 ACCUMULATOR VALVE
C3 ACCUMULATOR
.038" ORIFICE
B1 ACCUMULATOR VALVE
VOID
LOW COAST MODULATOR VALVE (B3)
LOCK-UP CONTROL VALVE
.058" ORIFICE
THRU PUMP
THRU PUMP/TURBINE
PUMP
OUTPUT
SUCTION
TORQUE CONVERTER
TCC APPLY SIDE
TCC RELEASE SIDE
THE RETURN LINE IS LOCATED IN THE FRONT PAN
ATF COOLER
DIFFERENTIAL LUBE
2 -.042" ORIFICES IN PLUG
PIPE #1
PIPE #2
PIPE#3
.034" ORIFICE
SUMP
Rear lube
Central lube
Pressure port
CLUTCH PACKS
B1 BRAKE (OVERRUN BRAKE)
B2 BRAKE (INT. BRAKE)
B3 BRAKE (LOW/REV. BRAKE)
C2 CLUTCH (DIRECT CLUTCH)
C1 CLUTCH (FORWARD CLUTCH)
C1 ACCUMULATOR
C3 CLUTCH (UNDERDRIVE CLUTCH)
B4 SERVO
B4 BRAKE BAND "ON"
B4 ACCUMULATOR PISTON
LEGEND
LINE PRESSURE
EPC PRESSURE
SECONDARY REG. PRESSURE
TO SUMP
SOLENOID 1 PRESSURE
COOLER PRESSURE
W1- W2 SPACER PLATE DIFFERENCES
* SEE NOTE IN THE PASSAGE IDENTIFICATION
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS
CONNECTED CIRCUIT
PARK POSITION VALVE BODY MAPPING

P R N D 3 L

MANUAL VALVE

S2 "ON" n.c.

S1 "OFF" n.c.

SL "OFF" n.o.

VIEWED FROM THE WORM TRACK SIDE

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

STH (epc)

.035" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

.058" CROSS-DRILLED HOLE

PRESSURE REGULATOR VALVE

Pressure port

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

ACCUMULATOR CONTROL VALVE

SECONDARY REGULATOR VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

Differential lube

Rear lube

Central lube

CLUTCH PACKS

- B1 BRAKE (OVERRUN BRAKE)
- B2 BRAKE (INT. BRAKE)
- B3 BRAKE (LOW/REV. BRAKE)
- C2 CLUTCH (DIRECT CLUTCH)
- C1 CLUTCH (FORWARD CLUTCH)
- C3 CLUTCH (UNDERDRIVE CLUTCH)

C1 ACCUMULATOR

B4 SERVO

B4 BRAKE BAND "ON"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE PARK/NEUTRAL POSITION

P R N D 3 L

MANUAL VALVE

S2 "ON" n.c.

S1 "OFF" n.c.

SL "OFF" n.o.

VIEWED FROM THE WORM TRACK SIDE

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

STH (epc)

.035" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

PRESSURE REGULATOR VALVE

.058" CROSS-DRILLED HOLE

SECONDARY REGULATOR VALVE

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

ACCUMULATOR CONTROL VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

C-3

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

Pressure port

Differential lube

Rear lube

Central lube

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

CLUTCH PACKS

- B1 BRAKE (OVERRUN BRAKE)
- B2 BRAKE (INT. BRAKE)
- B3 BRAKE (LOW/REV. BRAKE)
- C2 CLUTCH (DIRECT CLUTCH)
- C1 CLUTCH (FORWARD CLUTCH)
- C3 CLUTCH (UNDERDRIVE CLUTCH)

C1 ACCUMULATOR

B4 SERVO

B4 BRAKE BAND "ON"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID 1AND 2 PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE REVERSE

P R N D 3 L

MANUAL VALVE

S2 "ON"

n.c.

S1 "OFF"

n.c.

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

STH (epc)

.035" balance orifice thru valve

SL "OFF"

n.o.

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

ACCUMULATOR CONTROL VALVE

LOW COAST MODULATOR VALVE (B3)

.058" CROSS-DRILLED HOLE

PRESSURE REGULATOR VALVE

SECONDARY REGULATOR VALVE

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

COOLER RELIEF

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

Pressure port

Differential lube

Rear lube

Central lube

VIEWED FROM THE WORM TRACK SIDE

CLUTCH PACKS

- B1 BRAKE (OVERRUN BRAKE)
- B2 BRAKE (INT. BRAKE)
- B3 BRAKE (LOW/REV. BRAKE)
- C2 CLUTCH (DIRECT CLUTCH)
- C1 CLUTCH (FORWARD CLUTCH)
- C3 CLUTCH (UNDERDRIVE CLUTCH)

C1 ACCUMULATOR

B4 SERVO

B4 BRAKE BAND "ON"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE DRIVE POSITION 1st GEAR

P R N D 3 L

MANUAL VALVE

S2 "ON"

n.c.

S1 "ON"

n.c.

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

STH (epc)

.035" balance orifice thru valve

SL "OFF"

n.o.

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

VIEWED FROM THE WORM TRACK SIDE

Pressure port

.058" CROSS-DRILLED HOLE

PRESSURE REGULATOR VALVE

SECONDARY REGULATOR VALVE

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

ACCUMULATOR CONTROL VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

Differential lube

Rear lube

Central lube

CLUTCH PACKS

B1 BRAKE (OVERRUN BRAKE)

B2 BRAKE (INT. BRAKE)

B3 BRAKE (LOW/REV. BRAKE)

C2 CLUTCH (DIRECT CLUTCH)

C1 CLUTCH (FORWARD CLUTCH)

C1 ACCUMULATOR

C3 CLUTCH (UNDERDRIVE CLUTCH)

B4 SERVO

B4 BRAKE BAND "ON"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE DRIVE POSITION 2nd GEAR

P R N D 3 L

MANUAL VALVE

S2 "OFF" n.c.

S1 "ON" n.c.

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

STH (epc)

.035" balance orifice thru valve

SL "OFF" n.o.

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

.058" CROSS-DRILLED HOLE

PRESSURE REGULATOR VALVE

SECONDARY REGULATOR VALVE

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

ACCUMULATOR CONTROL VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

Differential lube

Rear lube

Central lube

CLUTCH PACKS

B1 BRAKE (OVERRUN BRAKE)

B2 BRAKE (INT. BRAKE)

B3 BRAKE (LOW/REV. BRAKE)

C2 CLUTCH (DIRECT CLUTCH)

C1 CLUTCH (FORWARD CLUTCH)

C1 ACCUMULATOR

C3 CLUTCH (UNDERDRIVE CLUTCH)

B4 SERVO

B4 BRAKE BAND "OFF"

B4 ACCUMULATOR PISTON

VIEWED FROM THE WORM TRACK SIDE

Pressure port

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE
DRIVE POSITION
3rd GEAR

P R N D 3 L

MANUAL VALVE

S2 "OFF"

n.c.

S1 "OFF"

n.c.

.030"

.035"

.040" W2

.037" W1

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

STH (epc)

.035" balance orifice thru valve

SL "OFF"

n.o.

.030"

.040"

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

VIEWED FROM THE WORM TRACK SIDE

Pressure port

CB7

CB5 .042"

.050" CB4

CB6

.070" CB3

.035" CB2

.042" CB1

.059"

.039"

C2 ACCUMULATOR VALVE

C2 ACCUMULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

.032"

.047"

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

C-3

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

CB8

ACCUMULATOR CONTROL VALVE

.035" CB2

CB9

CB10 .085"

.058" CROSS-DRILLED HOLE

.032"

PRESSURE REGULATOR VALVE

SECONDARY REGULATOR VALVE

.058" ORIFICE

503L

LOCK-UP CONTROL VALVE

503L

.059"

.032"

.039"

.039"

.039"

.070"

.039"

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

Differential lube

Rear lube

Central lube

CLUTCH PACKS

B1 BRAKE (OVERRUN BRAKE)

B2 BRAKE (INT. BRAKE)

B3 BRAKE (LOW/REV. BRAKE)

C2 CLUTCH (DIRECT CLUTCH)

C1 CLUTCH (FORWARD CLUTCH)

C1 ACCUMULATOR

C3 CLUTCH (UNDERDRIVE CLUTCH)

B4 SERVO

B4 BRAKE BAND "OFF"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESS.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE
DRIVE POSITION
4th GEAR

P R N D 3 L

MANUAL VALVE

S2 "OFF" n.c.

S1 "OFF" n.c.

.030"

.051"

.249 W2

.255 W1

W2

W1

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

STH (epc)

.035" balance orifice thru valve

SL "ON" n.o.

TCC SOLENOID REGULATOR VALVE

.040"

NEUTRAL CONTROL VALVE (Blocked)

VIEWED FROM THE WORM TRACK SIDE

Pressure port

.058" CROSS-DRILLED HOLE

.032"

PRESSURE REGULATOR VALVE

CB7

CB5

.042"

.050"

CB4

CB6

.072"

CB3

.039"

**

CB1

.059"

C2 ACCUMULATOR VALVE

C2 ACCUMULATOR

C-3

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

.039"

CB8

ACCUMULATOR CONTROL VALVE

CB2

.037"

CB9

CB10

.080"

SECONDARY REGULATOR VALVE

.032"

.047"

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

503L

LOCK-UP CONTROL VALVE

.059"

.032"

.039"

.039"

.039"

.070"

.039"

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

Differential lube

Rear lube

Central lube

CLUTCH PACKS

B1 BRAKE (OVERRUN BRAKE)

B2 BRAKE (INT. BRAKE)

B3 BRAKE (LOW/REV. BRAKE)

C2 CLUTCH (DIRECT CLUTCH)

C1 CLUTCH (FORWARD CLUTCH)

C1 ACCUMULATOR

C3 CLUTCH (UNDERDRIVE CLUTCH)

B4 SERVO

B4 BRAKE BAND "OFF"

B4 ACCUMULATOR PISTON

A-1

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESS.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE
DRIVE POSITION
4th GEAR TCC "ON"

P R N D 3 L

MANUAL VALVE

S2 "OFF" n.c.

S1 "ON" n.c.

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

CLUTCH MODULATOR VALVE

STH (epc)

.035" balance orifice thru valve

SL "OFF" n.o.

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

ACCUMULATOR CONTROL VALVE

PRESSURE REGULATOR VALVE

.058" CROSS-DRILLED HOLE

SECONDARY REGULATOR VALVE

LOCK-UP CONTROL VALVE

.058" ORIFICE

LOW COAST MODULATOR VALVE (B3)

C2 ACCUMULATOR VALVE

C2 ACCUMULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

VOID

.038" ORIFICE

B1 ACCUMULATOR VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

C-3

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

SUMP

COOLER RELIEF

C1 ACCUMULATOR

B4 SERVO

B4 BRAKE BAND "OFF"

B4 ACCUMULATOR PISTON

VIEWED FROM THE WORM TRACK SIDE

Pressure port

Differential lube

Rear lube

Central lube

CLUTCH PACKS

- B1 BRAKE (OVERRUN BRAKE)
- B2 BRAKE (INT. BRAKE)
- B3 BRAKE (LOW/REV. BRAKE)
- C2 CLUTCH (DIRECT CLUTCH)
- C1 CLUTCH (FORWARD CLUTCH)
- C3 CLUTCH (UNDERDRIVE CLUTCH)

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
LOW COAST MOD. PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	
** THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE
MANUAL "3" POSITION
3rd GEAR

P R N D 3 L

MANUAL VALVE

S2 "ON" n.c.

S1 "OFF" n.c.

SL "OFF" n.o.

VIEWED FROM THE WORM TRACK SIDE

PRESSURE CONTROL SOLENOID REG. VALVE

.039" balance orifice thru valve

STH (epc)

.035" balance orifice thru valve

CLUTCH MODULATOR VALVE

2-3 SHIFT VALVE

3-4 SHIFT VALVE

1-2 SHIFT VALVE

TCC SOLENOID REGULATOR VALVE

NEUTRAL CONTROL VALVE (Blocked)

PRESSURE REGULATOR VALVE

.058" CROSS-DRILLED HOLE

Pressure port

C2 ACCU-MULATOR VALVE

C2 ACCU-MULATOR

B2 ACCUMULATOR VALVE

B2 ACCUMULATOR

B-1

ACCUMULATOR CONTROL VALVE

SECONDARY REGULATOR VALVE

C3 ACCUMULATOR VALVE

C3 ACCUMULATOR

C-3

.038" ORIFICE

B1 ACCUMULATOR VALVE

VOID

LOW COAST MODULATOR VALVE (B3)

.058" ORIFICE

LOCK-UP CONTROL VALVE

503L

PUMP

TORQUE CONVERTER

TCC APPLY SIDE

TCC RELEASE SIDE

OUTPUT

SUCTION

THE RETURN LINE IS LOCATED IN THE FRONT PAN

ATF COOLER

COOLER RELIEF

SUMP

Differential lube

Rear lube

Central lube

CLUTCH PACKS

B1 BRAKE (OVERRUN BRAKE)

B2 BRAKE (INT. BRAKE)

B3 BRAKE (LOW/REV. BRAKE)

C2 CLUTCH (DIRECT CLUTCH)

C1 CLUTCH (FORWARD CLUTCH)

C1 ACCUMULATOR

C3 CLUTCH (UNDERDRIVE CLUTCH)

B4 SERVO

B4 BRAKE BAND "ON"

B4 ACCUMULATOR PISTON

LEGEND

LINE PRESSURE	
EPC PRESSURE	
SECONDARY REG. PRESSURE	
TO SUMP	
SOLENOID PRESSURE	
COOLER PRESSURE	
ACCUMULATOR BACK PRESH.	
LOW COAST MOD. PRESH.	
W1- W2 SPACER PLATE DIFFERENCES	- - -
↔ THIS HOLE IS USED ONLY ON CHECK VALVE VERSIONS	
CONNECTED CIRCUIT	

50-42LE
MANUAL "1" POSITION
1st GEAR

TRANSMISSION DISASSEMBLY

1. Place the transmission on a suitable work bench.
2. Remove the 8, 12 mm headed pump to case retaining bolts as shown in Figure 42 .
3. Using a suitable pump puller, remove the pump from the bellhousing as shown in Figure 43 and set it aside for further disassembly.
4. Once the pump is removed, remove the B2-Second Coast Brake Hub assembly as shown in Figure 44.
5. Remove the 5, 12 mm headed bellhousing to main case bolts as shown in Figure 45.
   NOTE: See Figure 45 for bolt lengths.

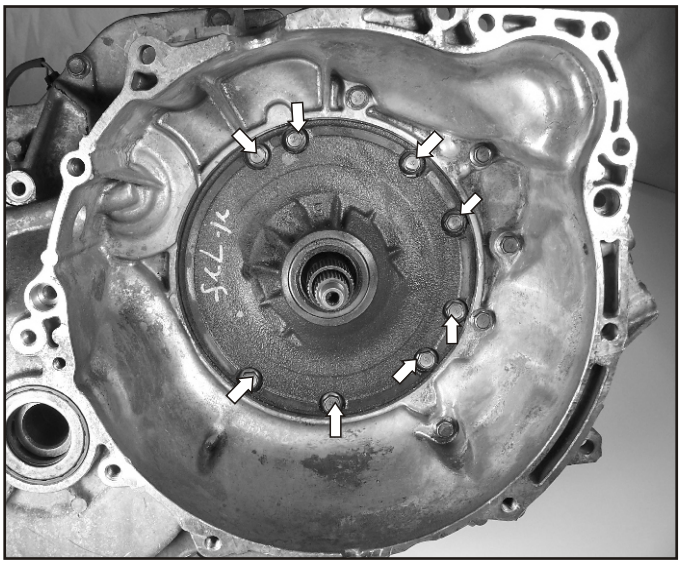


Figure 42

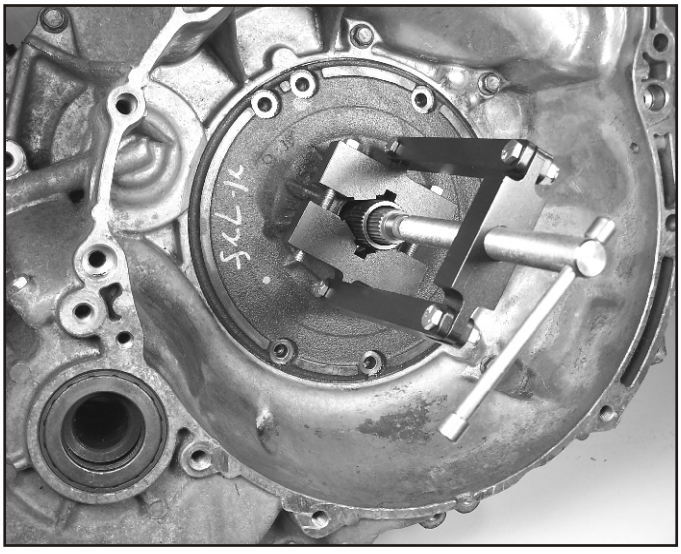


Figure 43

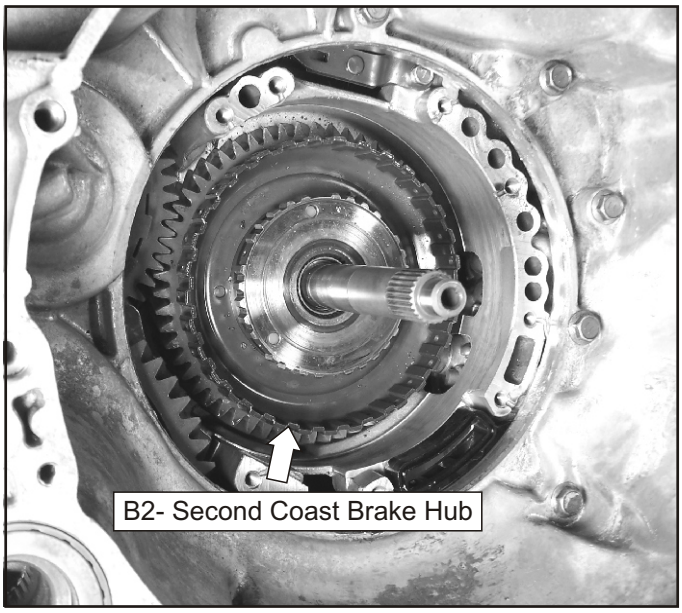
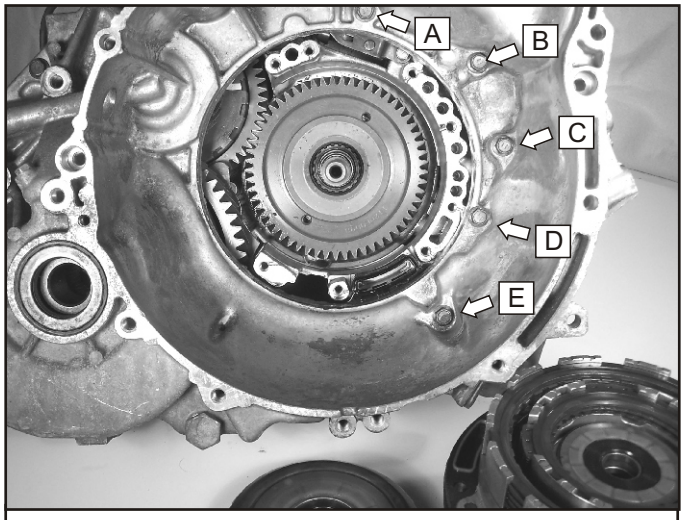


Figure 44



Bolt lengths

8 Pump to case retaining bolts 28mm long

5 bellhousing to case retaining bolts
A = 30mm long
B = 35mm long
C = 35mm long
D = 30mm long
E = 45mm long

Figure 45

Continued on Page 45

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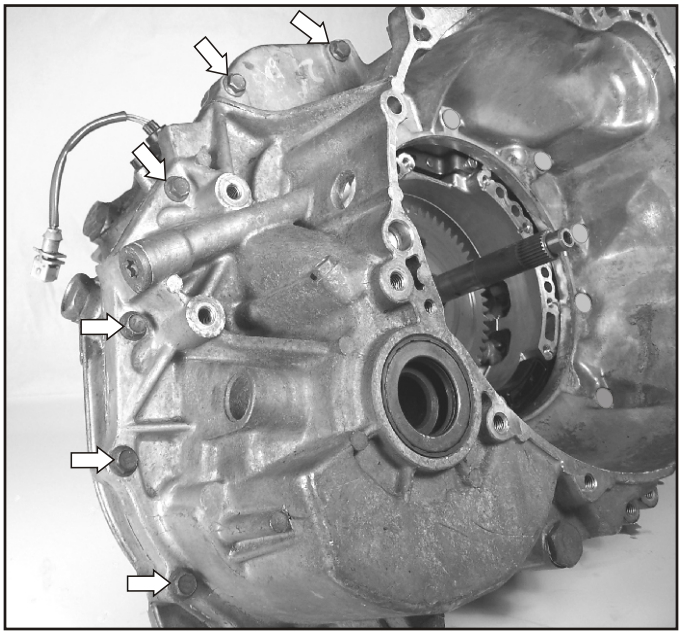


Figure 46

TRANSMISSION DISASSEMBLY CONTINUED

6. Remove the 6 , 12mm headed bellhousing to main case bolts as shown in figure 46. ***Note: Bolts are 30mm long.***
7. Stand the transmission up on its back cover and remove the remaining 5, 12mm headed bellhousing to main case bolts as shown in Figure 47. ***Note: Bolts are 30mm long.***
8. Using a rubber mallet, tap the bellhousing evenly in the direction of the arrows shown in Figure 48 and set it off to the side.
9. Remove the differential carrier shown in Figure 49.

Continued on Page 46

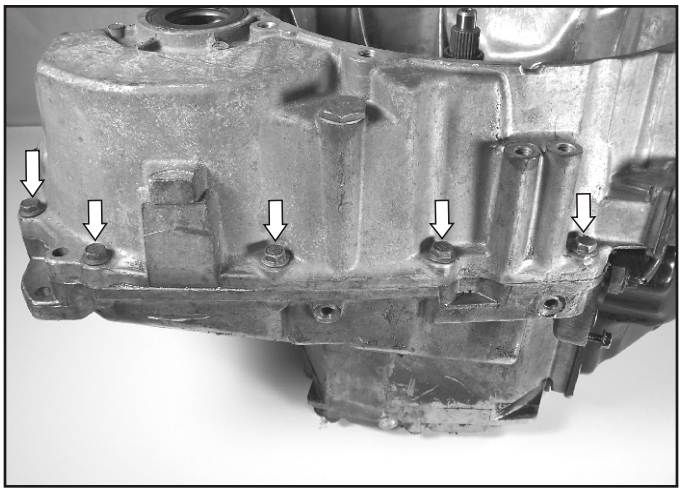
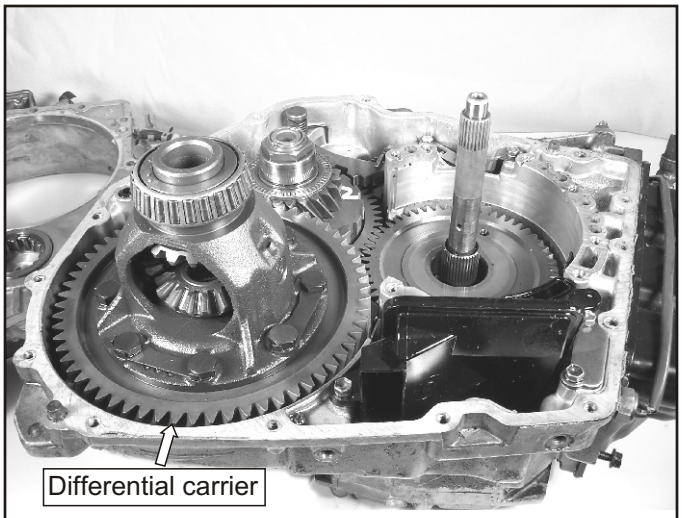


Figure 47



Figure 48





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Figure 49

TRANSMISSION DISASSEMBLY CONTINUED

10. Remove the 10 mm headed filter retaining bolt, shown in Figure 50, and discard the filter. ***Note: The bolt length is 13mm.***
11. Remove the 27 torx headed output shaft speed sensor bolt and remove the sensor as shown in Figure 51. ***Note: The bolt length is 13mm long.***
12. Remove the 2, 10mm headed oil deflector plate retaining bolts and the 2, 10mm headed case plate retaining bolts as shown in Figure 52. ***Note the bolt lengths are 13mm long.***
13. Remove the 2, 10mm headed detent spring retaining bolts, detent spring and park rod guide as shown in Figure 53. Refer to Figure 54 to see this assembly removed from the Case. ***Note the bolt lengths are 15.5mm long.***

Continued on Page 47

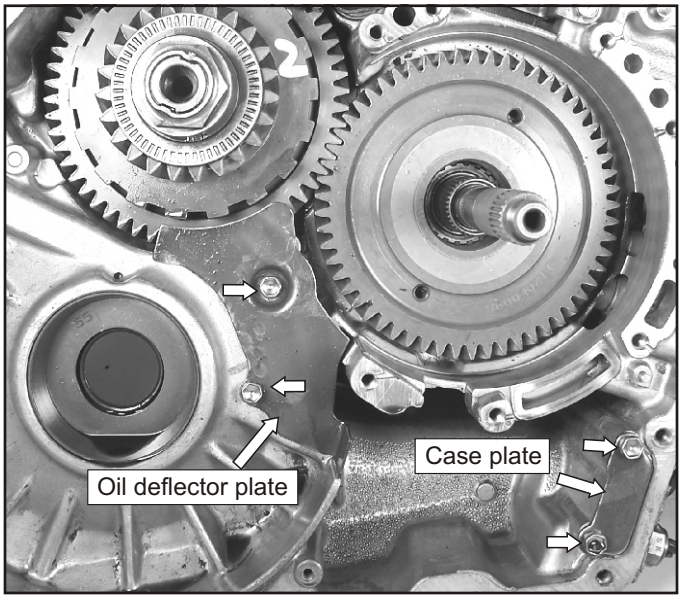


Figure 52

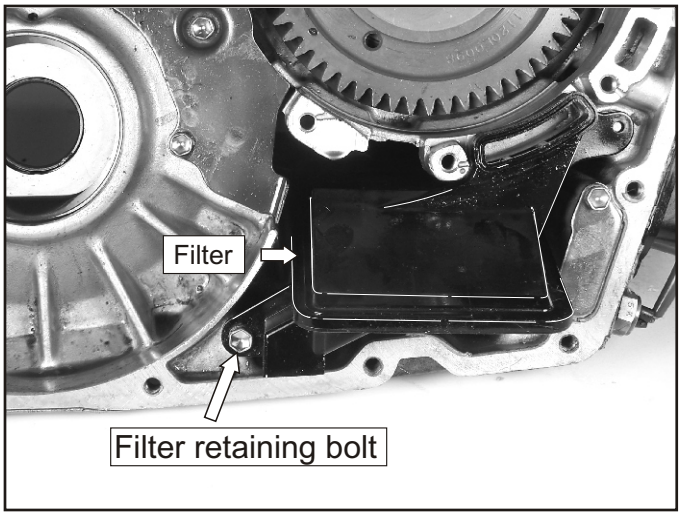


Figure 50

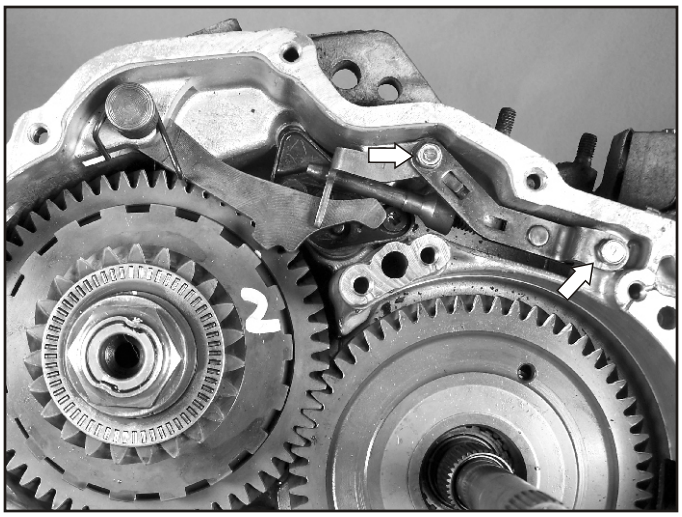


Figure 53

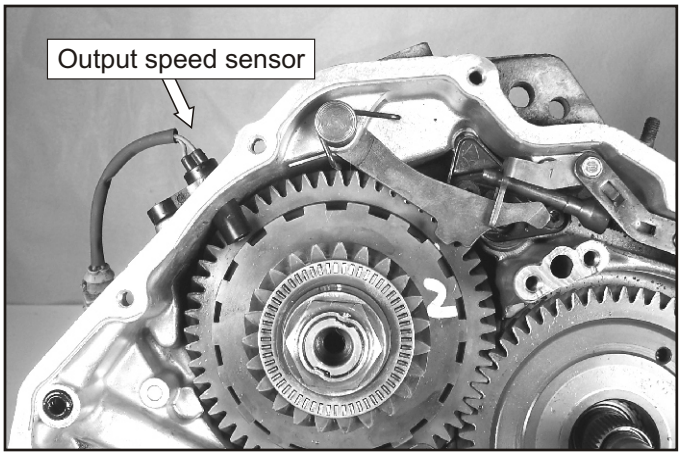


Figure 51

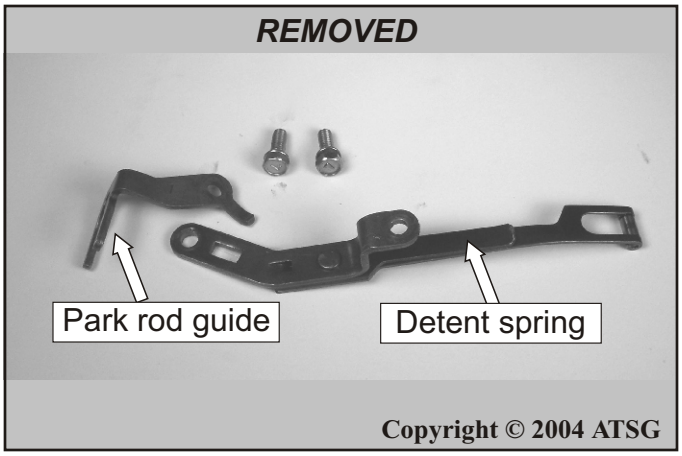


Figure 54

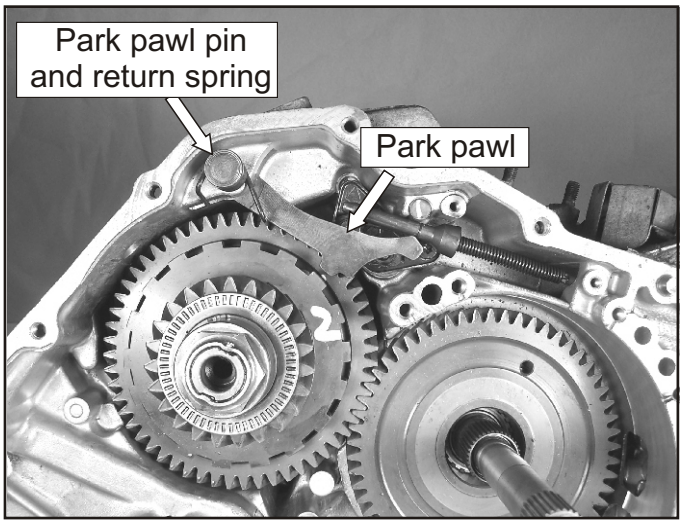


Figure 55

TRANSMISSION DISASSEMBLY CONTINUED

14. Remove the park pawl pin and return spring. Remove the park pawl as shown in Figure 55. Refer to Figure 56 to see this assembly removed from the case.
15. Remove the two B4 accumulator retaining plate bolts and plate, using a 30 torx bit, as shown in Figure 57.
    The bolt on the left anchors the sleeve and parking rod return spring, as shown in the close-up in Figure 58. ***Note: The bolt on the left is 22mm long. The bolt on the right is 13.5mm long. CAUTION: B4 accumulator is spring loaded in your direction.***
16. Remove the B4 accumulator cap, as shown in Figure 59.

Continued on Page 48

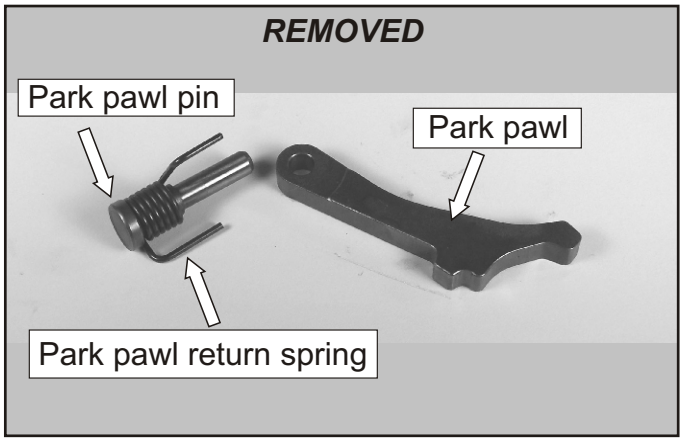


Figure 56

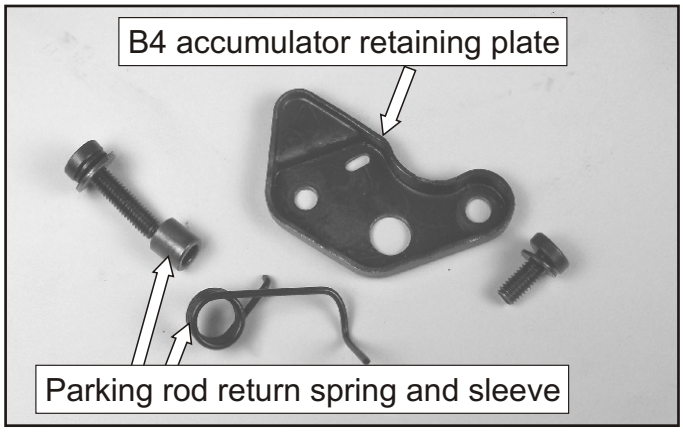


Figure 58

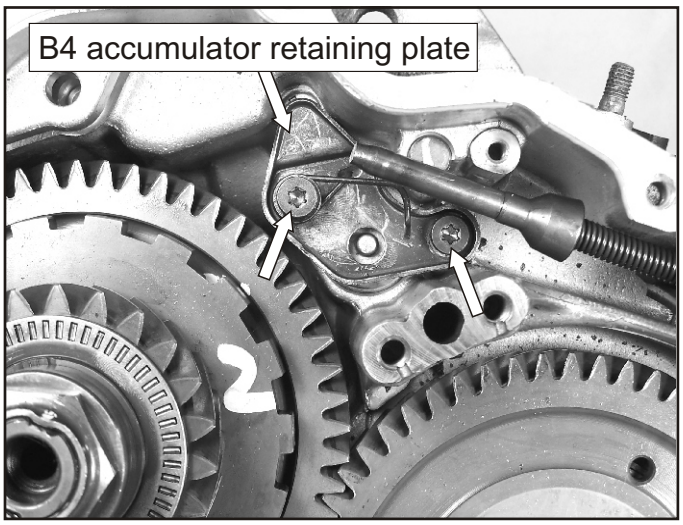


Figure 57

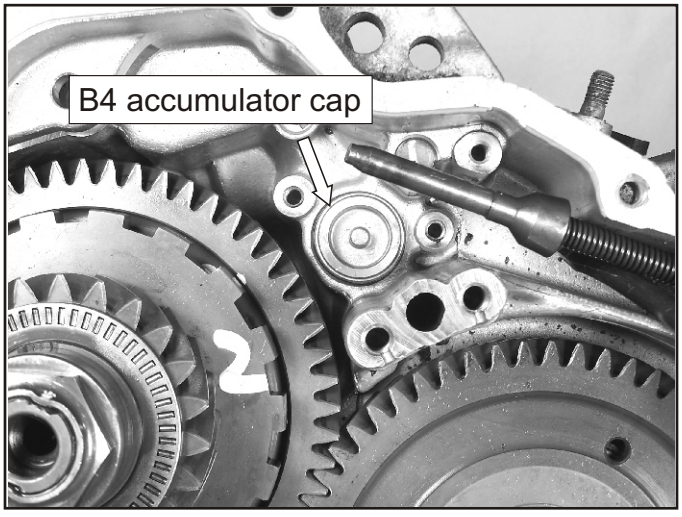


Figure 59

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TRANSMISSION DISASSEMBLY CONTINUED

17. Remove the B4 accumulator piston and spring as shown in Figure 60.
    Refer to Figure 61 to see this assembly removed from the case.
18. Remove the park lock pin from the case. Remove the Underdrive planetary thrust washer and bearing as shown in Figure 62 and Figure 63.
19. Remove the Underdrive planetary geartrain, by pulling it straight forward, and set it aside for later disassembly, as shown in Figure 64.

Continued on Page 49

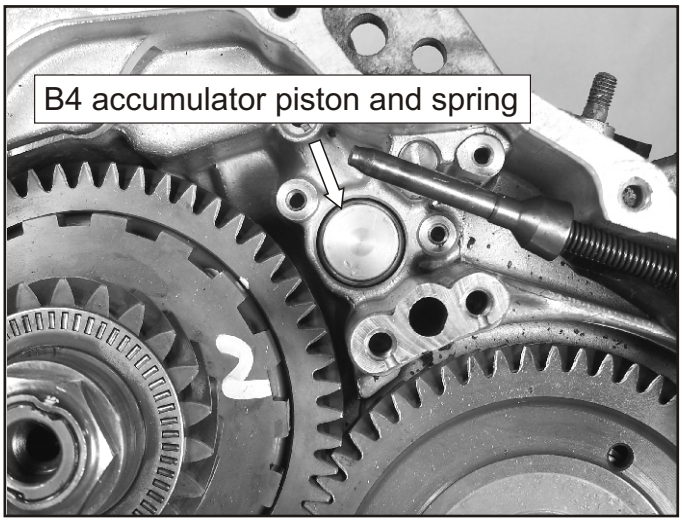


Figure 60



Figure 61

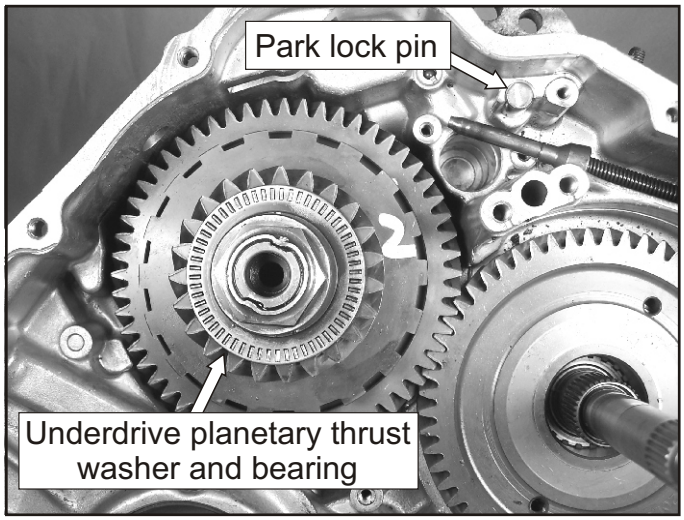


Figure 62

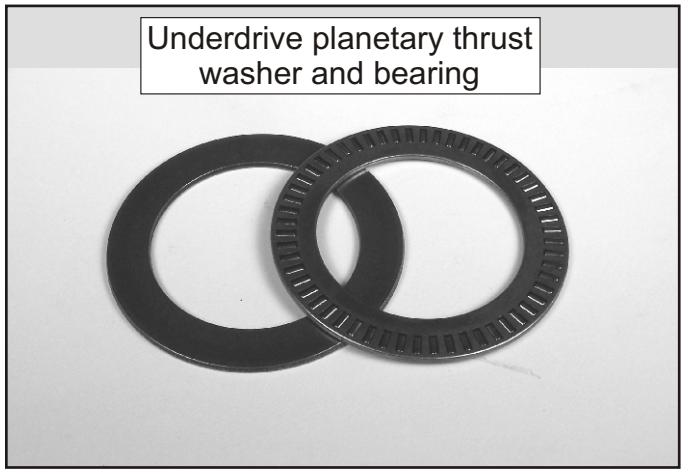


Figure 63

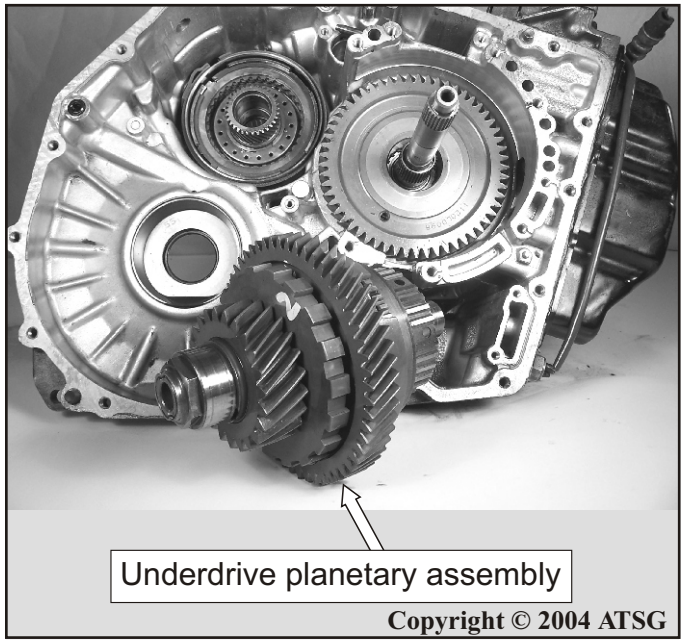


Figure 64

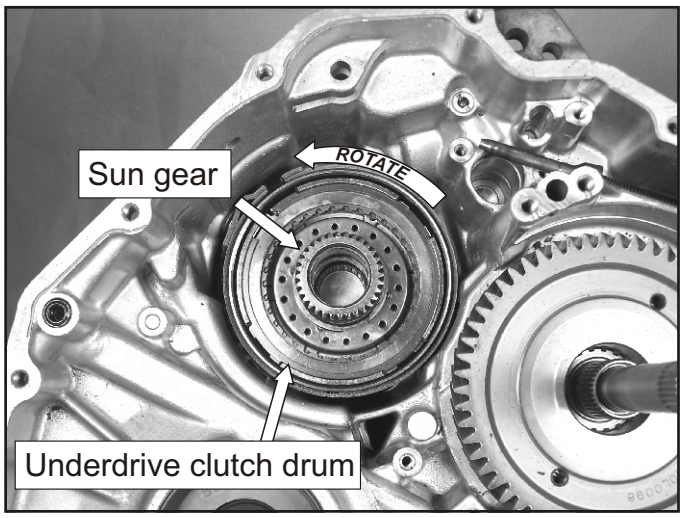


Figure 65

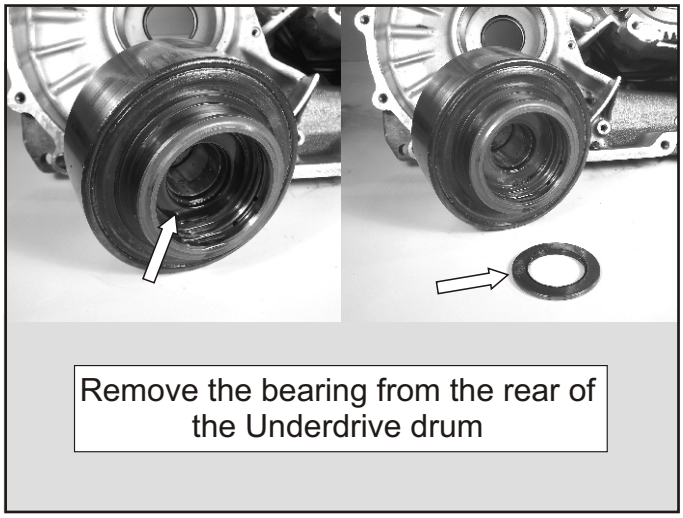


Figure 66

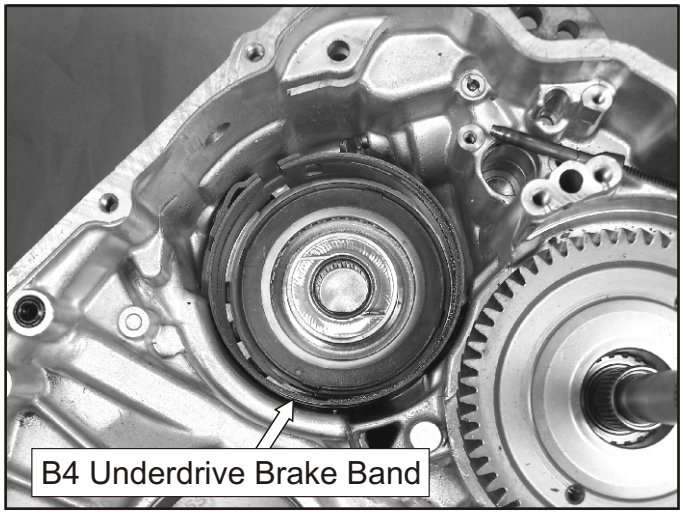


Figure 67

TRANSMISSION DISASSEMBLY CONTINUED

14. Remove the Underdrive clutch drum by grasping the sun gear and turning it counter clockwise while pulling it forward as shown in Figure 65.
15. Place the Underdrive drum on the bench and remove the bearing from the rear of the drum as shown in Figure 66.
16. Grasp the B4 Underdrive Brake Band, in the area of the arrow as shown in Figure 67, and pull it forward to remove it from the case.
17. Remove the snap ring and pull the F3 freewheel forward as shown in Figure 68.
18. Remove the Anti-rattle clip as shown in Figure 69.

Continued on Page 50

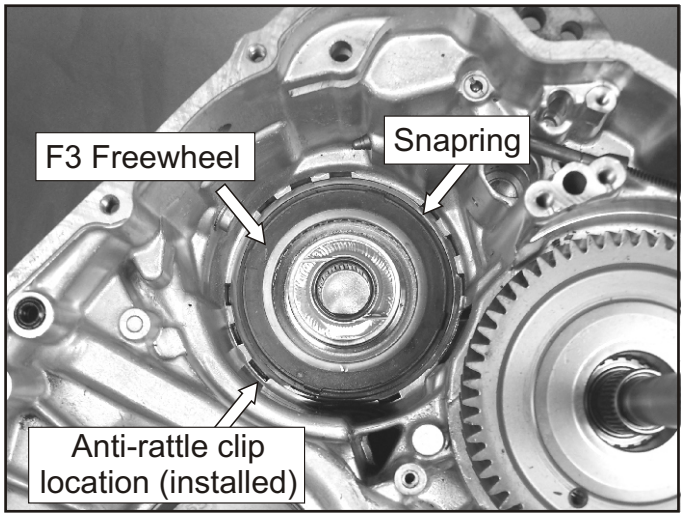


Figure 68

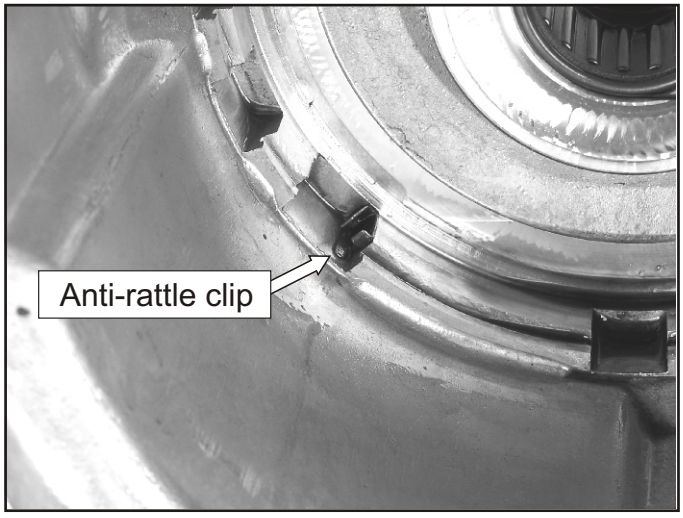


Figure 69

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TRANSMISSION DISASSEMBLY CONTINUED

19. Remove the two 10mm headed bolts that are identified with an "A", shown in Figure 70. ***Note: the bolt lengths are 16mm.***
20. Remove the remaining seven 12 mm headed bolts as shown in Figure 70. ***Note: the bolt lengths are as follows: B= 25mm, C= 48mm and D= 45mm.*** Using a hammer gently tap the rear cover off of the case.
21. Remove the 27 torx headed turbine sensor bolt and sensor. ***Note: the bolt length is 13mm***. Remove the C1-C2 drum thrust bearing and washer. Remove the C1-C2 drum as shown in Figure 71. Refer to Figure 72 to see a closeup of the C1-C2 washer and bearing.
22. Remove the C2 hub and sun gear assembly as shown in Figure 73.
23. Refer to Figure 74 for a view of the C2 hub with the front and rear bearings.

Continued on Page 51

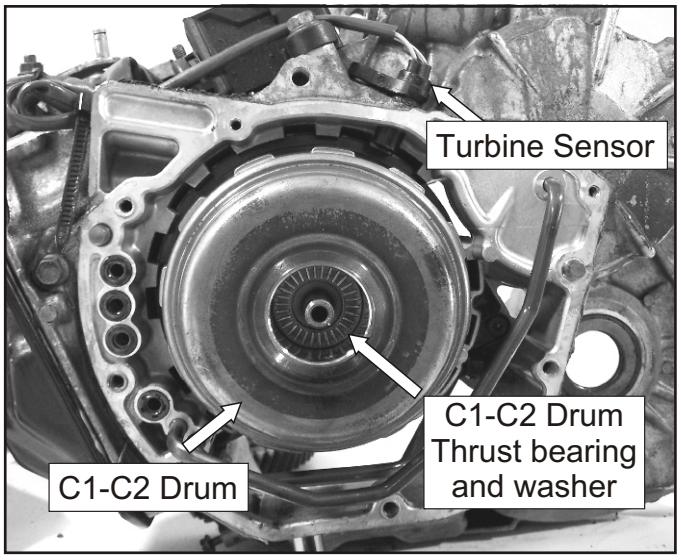


Figure 71

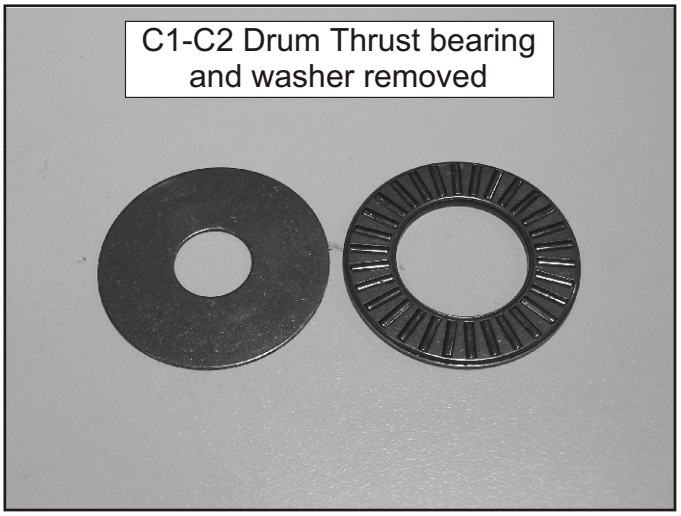


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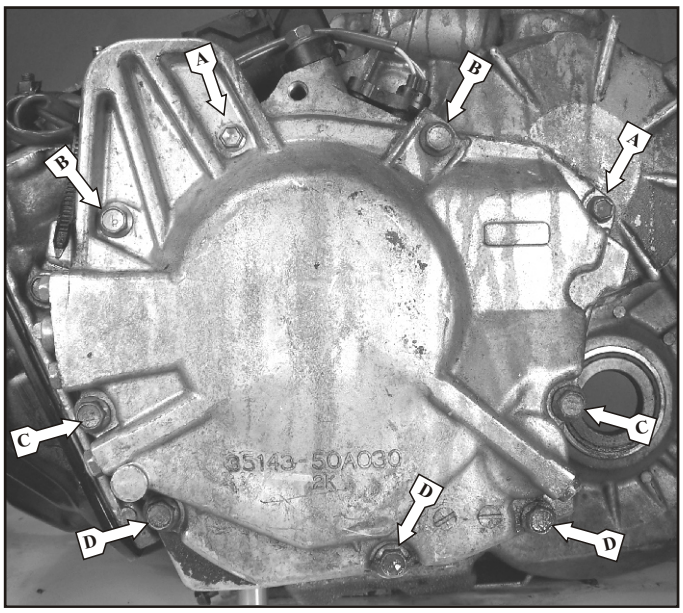


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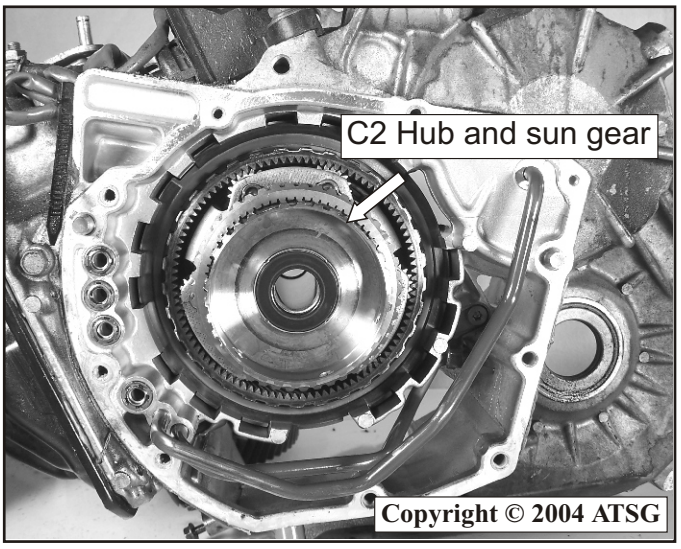


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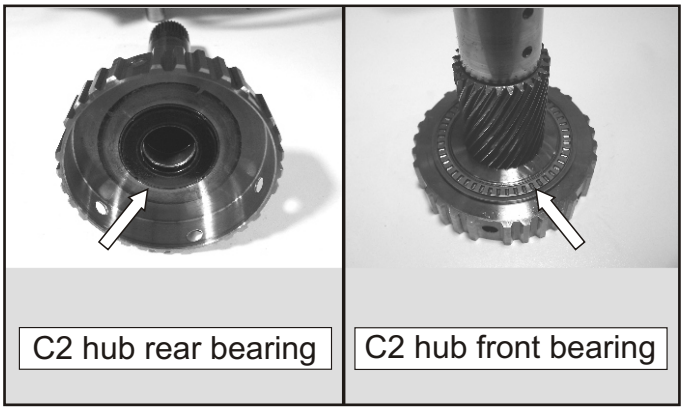


Figure 74

TRANSMISSION DISASSEMBLY CONTINUED

24. Refer to Figure 74 for the bearing placements on the C2 hub. Remove the C1 hub as shown in Figure 75.
25. Remove the front and rear bearings from the C1 hub as shown in Figure 76.
26. Remove the rear planetary thrust washer and planetary assembly as shown in Figure 77.
27. Remove the rear ring gear bearing as shown in Figure 78.

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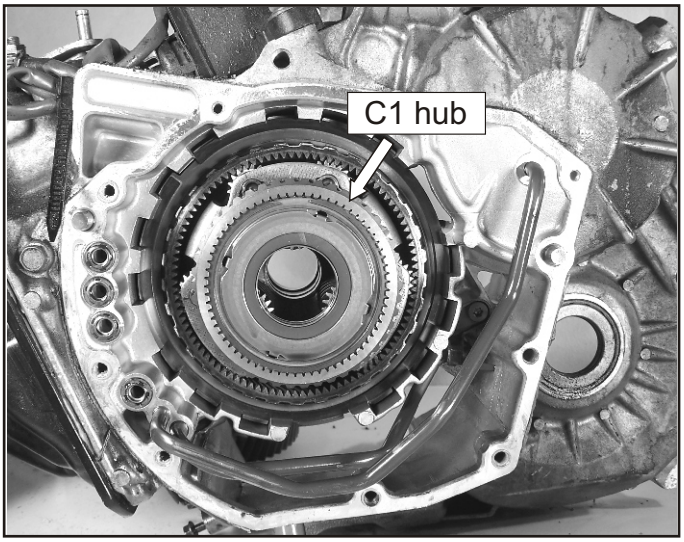


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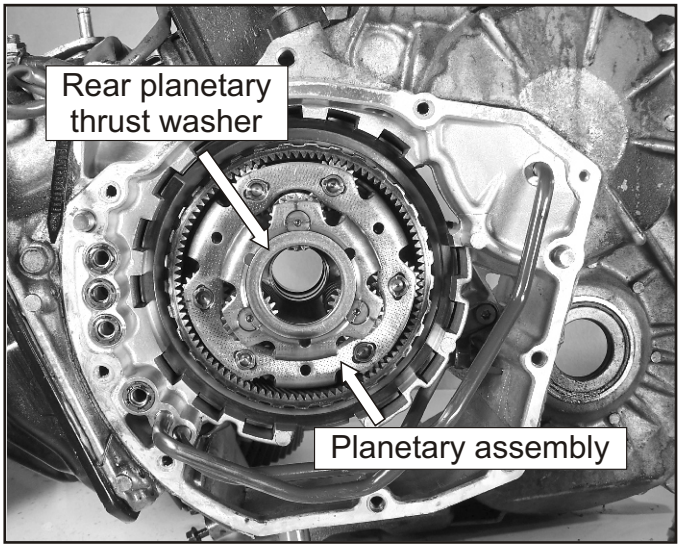


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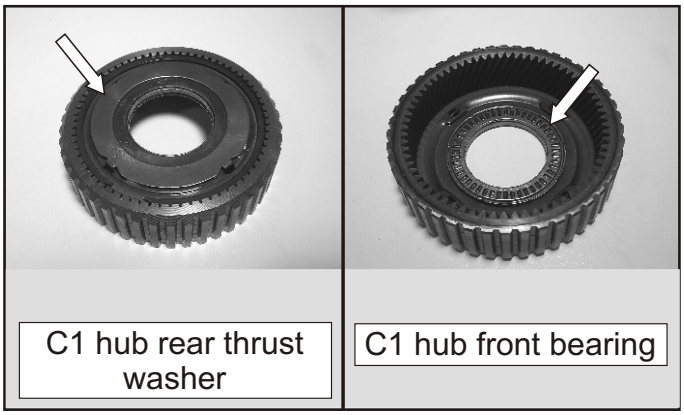


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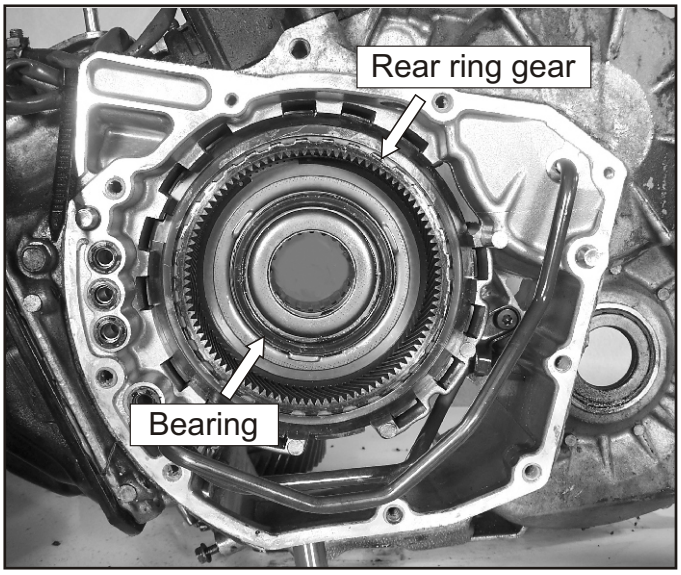


Figure 78

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TRANSMISSION DISASSEMBLY CONTINUED

28. Remove the snap ring retaining the B3 brake in the case. Pull the ring gear forward to remove the B3 brake assembly, as shown in Figure 79.
29. Place the ring gear on the bench and remove the B3 brake frictions and steels up off of the ring gear as shown in Figure 80.
30. Turn the ring gear over and remove the inner thrust washer and bearing shown in Figure 81.
31. Remove the B3 brake lower pressure plate from the case as shown in Figure 82.
32. Remove the retaining snap ring and B3 piston return spring as shown in Figure 83.

Continued on Page 53

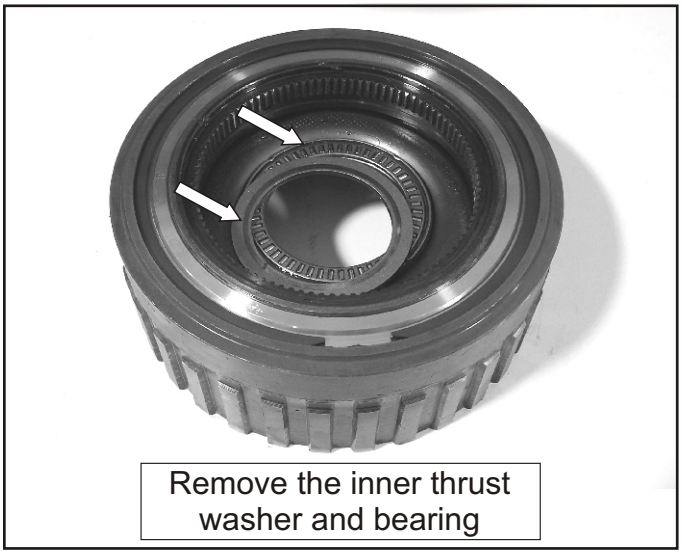


Figure 81

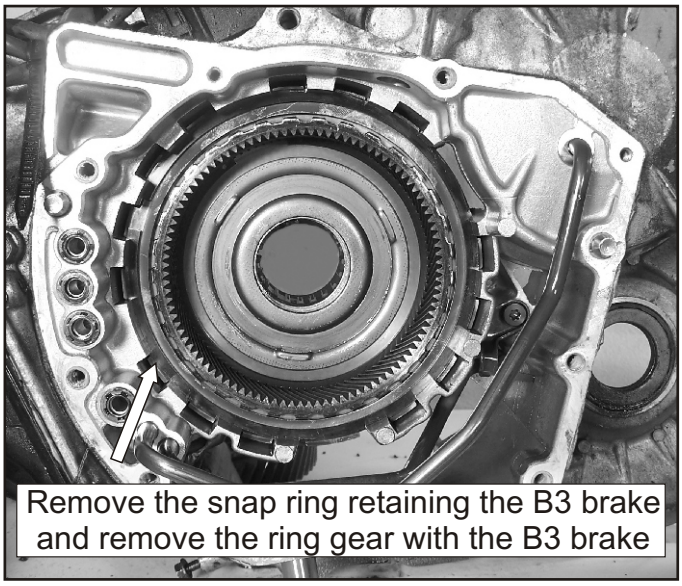


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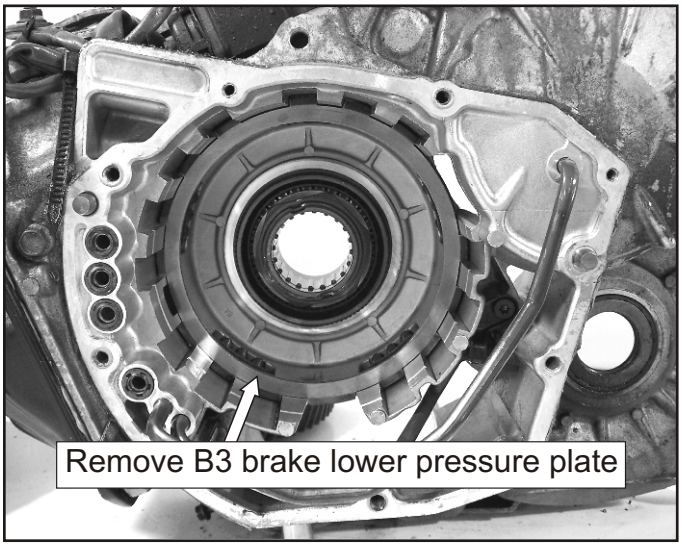


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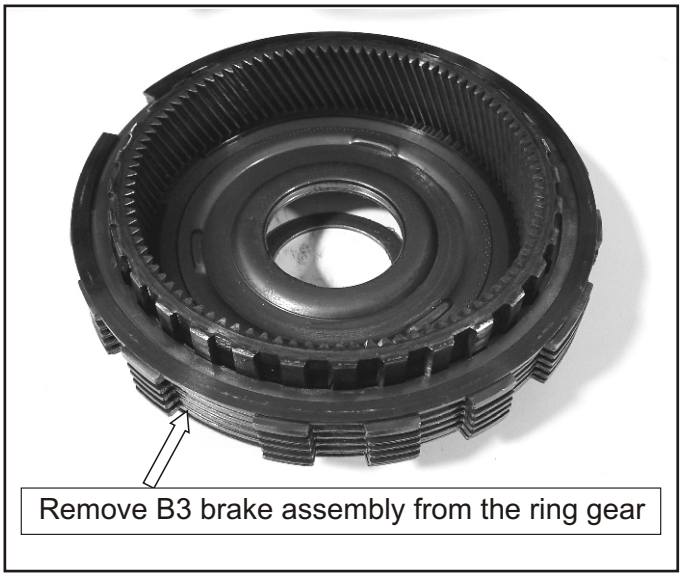


Figure 80

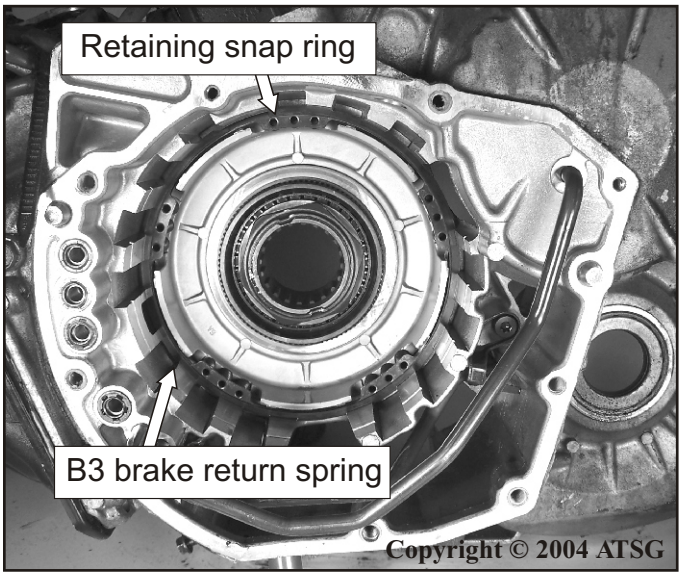


Figure 83

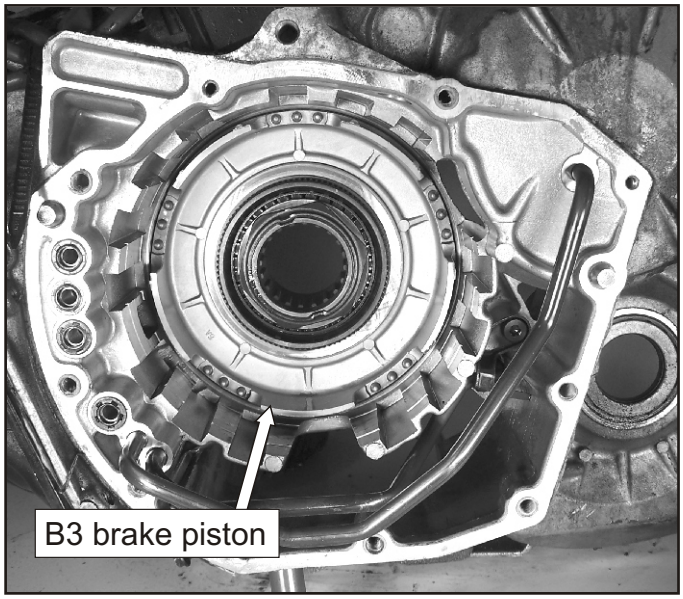


Figure 84

TRANSMISSION DISASSEMBLY CONTINUED

33. Remove the B3 piston from the case as shown in Figure 84.
34. Remove the snap ring retaining the Counter drive gear into the case as shown in Figure 85. Refer to Figure 86 to see the Counter drive gear removed from the case.
35. Turn the transaxle to the side and remove the temperature sensor with a 19mm wrench.
36. Using a 40 torx bit, remove the 9 pan retaining bolts as shown in Figure 87. ***Note: the bolts are 15mm long.***
37. Remove the four solenoid connectors shown in Figure 88 and move the internal wire harness away from the valve body retaining bolts. ***Note: The wire colors are listed below each solenoid.***

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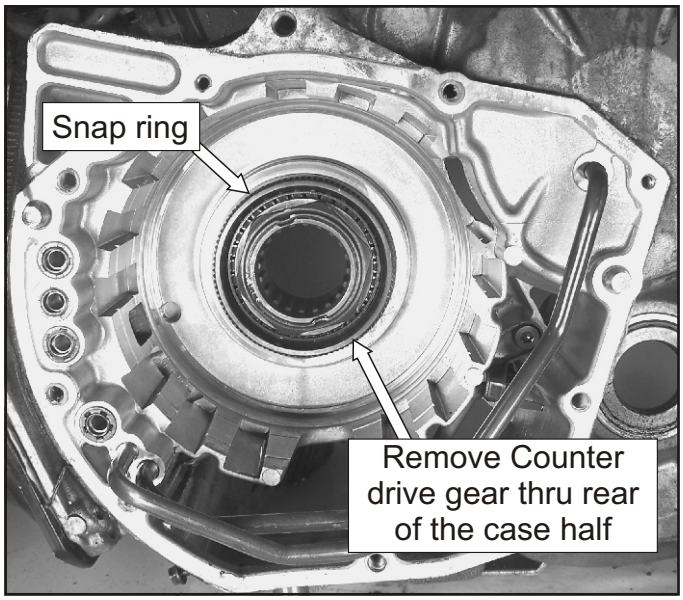


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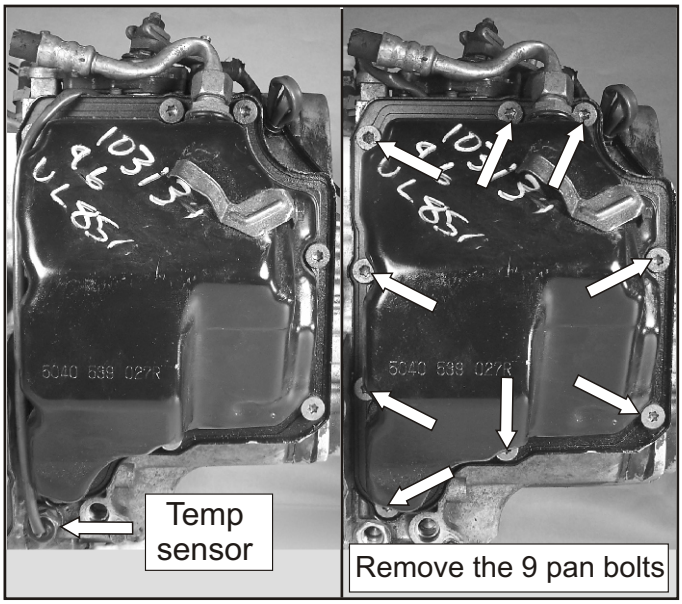


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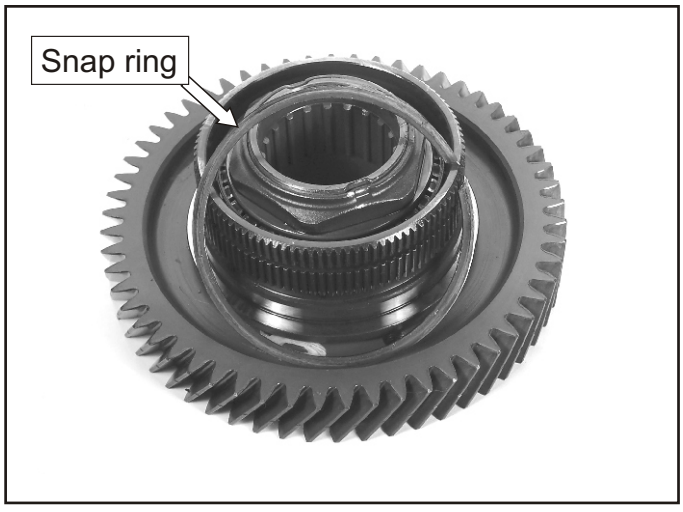


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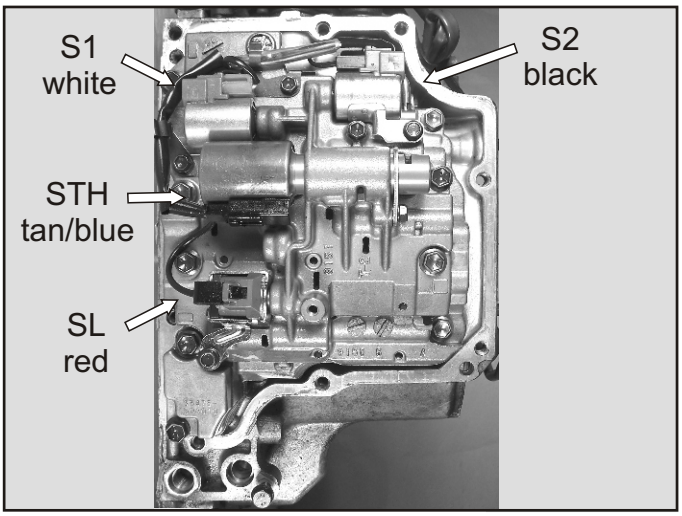


Figure 88

TRANSMISSION DISASSEMBLY CONTINUED

38. Remove the 10 mm headed valve body to case retaining bolts as shown in Figure 89. ***Note: bolt lengths are as follows, A = 16mm long, 50mm long and C = 55mm long.***
39. Remove the 13mm headed nut retaining the manual lever and remove the lever. Remove the two 17mm headed transmission range switch to case retaining bolts. ***Note: the bolt lengths are as follows, A = 21mm long and B = 32mm long***. Remove the two 14mm headed connector retaining bolts. ***Note : the bolt lengths are 20 mm long***. See Figure 90.
40. Lift the transmission range switch up off of the manual shaft and remove the internal wire harness to case connector retainer, as shown in Figure 91. Once the retainer is removed push the internal wire harness thru the case and set the entire assembly to the side.
41. Refer to Figure 92 for a close- up view of the internal wire harness to case retainer.

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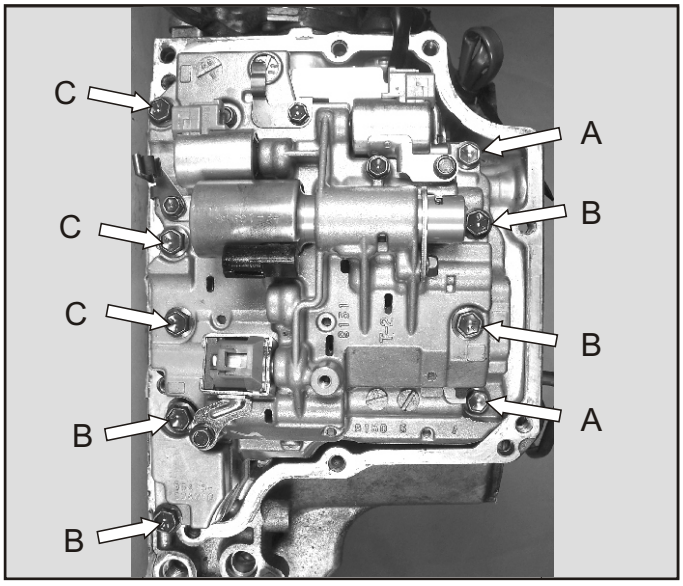


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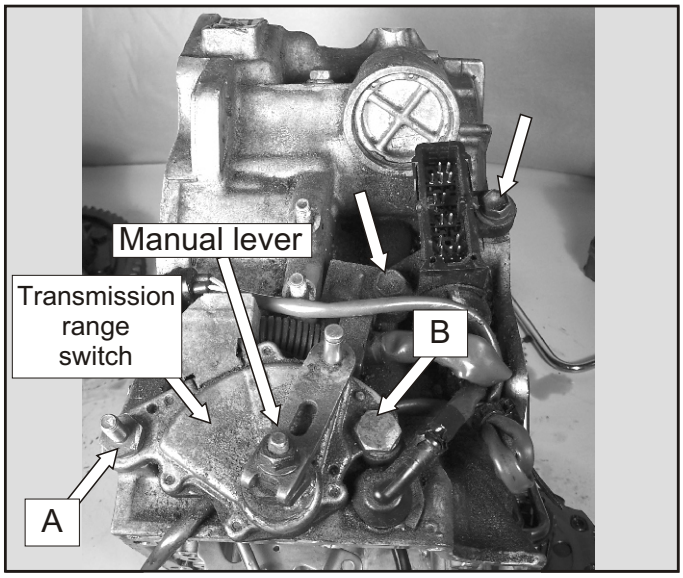


Figure 90

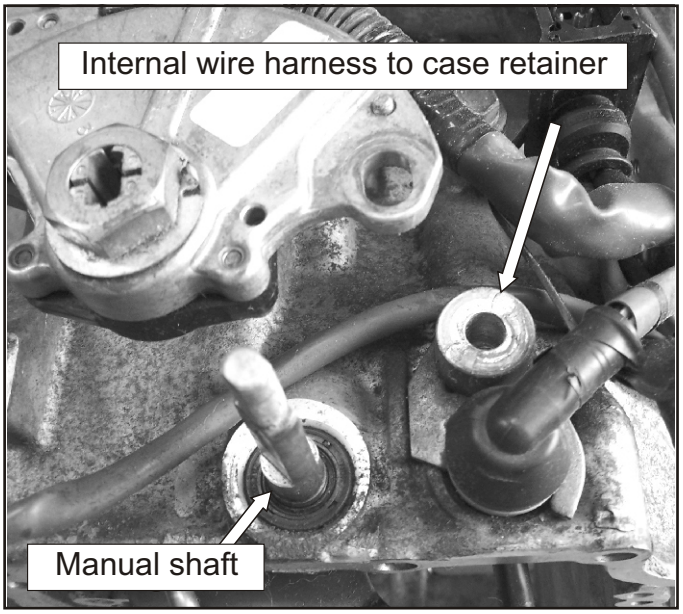


Figure 91

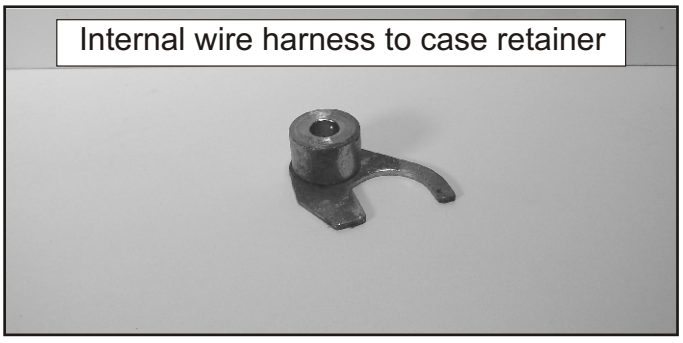


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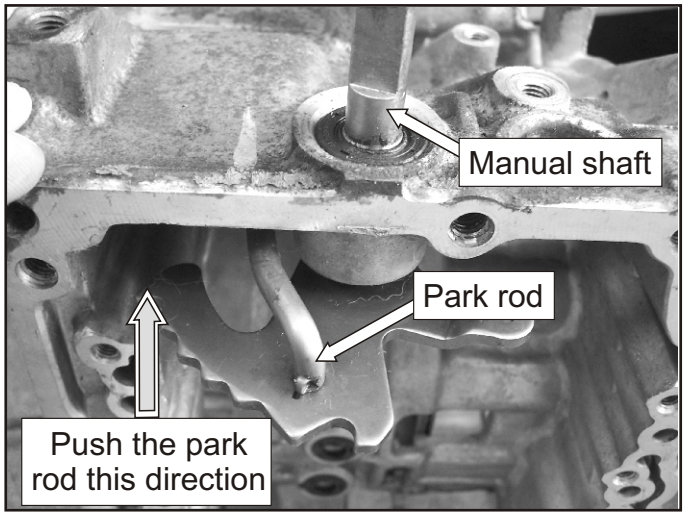


Figure 93

TRANSMISSION DISASSEMBLY CONTINUED

42. Rotate the Manual shaft until the tab on the park rod aligns with the slot in the in the manual shaft. Lift the park rod up and pull it forward to remove it from the case as shown in Figure 93.
43. Push the manual shaft down thru the case to remove it as shown in Figure 94.
44. Refer to Figure 95 to view the manual shaft and the park rod removed from the case.
45. Remove the snap ring retaining the B4 servo assembly into the case, as shown in Figure 96.
46. Refer to Figure 97, to view the B4 servo and it's related parts.

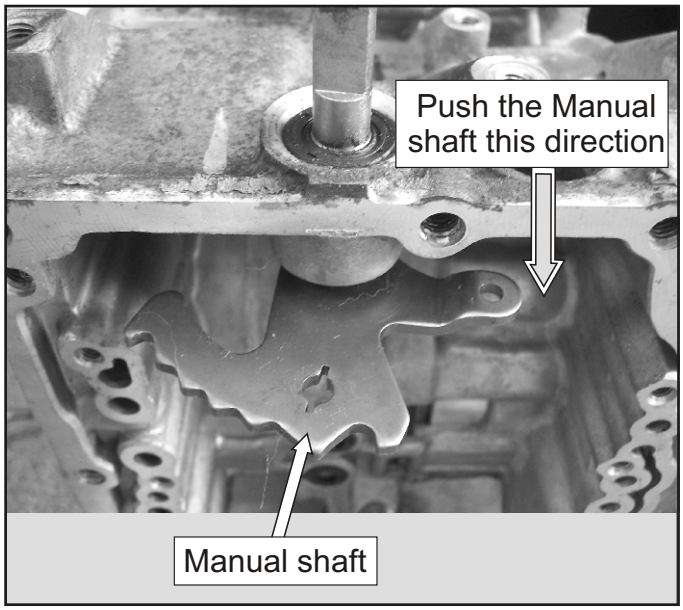


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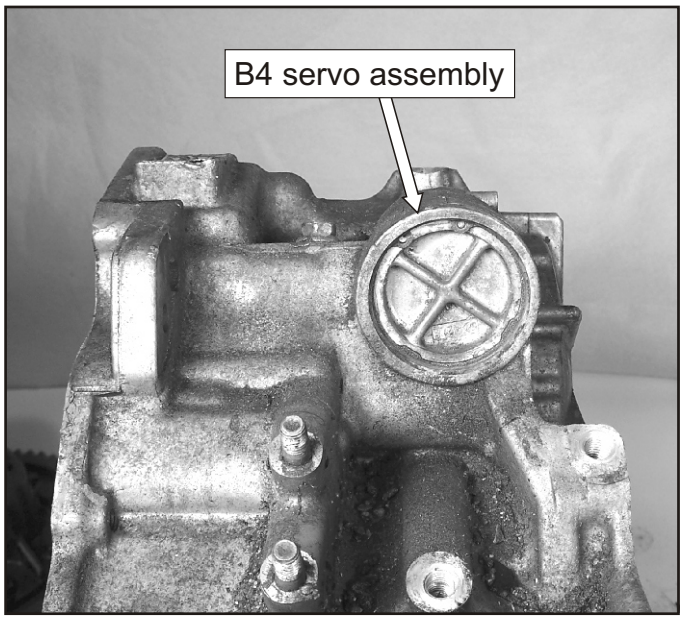


Figure 96

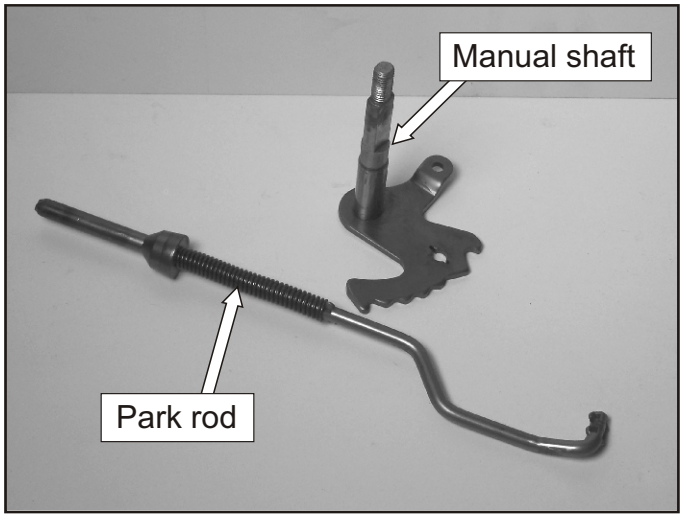


Figure 95



Figure 97

SUB-ASSEMBLIES
"PUMP"

47. Remove the snap ring and B2 clutch assembly as shown in Figure 98.
48. Remove the snap ring and pressure plate above the B1 clutch as shown in Figure 99. ***Caution: The pressure plate is spring loaded in the direction facing you.***
49. Remove the return spring assembly as shown in Figure 100.
50. Remove the remaining B1 clutch assembly as shown in Figure 101.
51. Remove the pump to B2 second coast brake hub thrust washer as shown in Figure 102.

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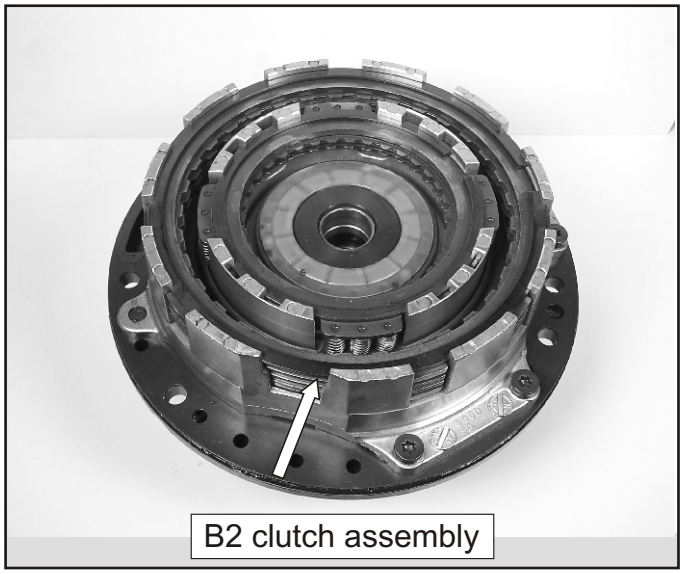


Figure 98

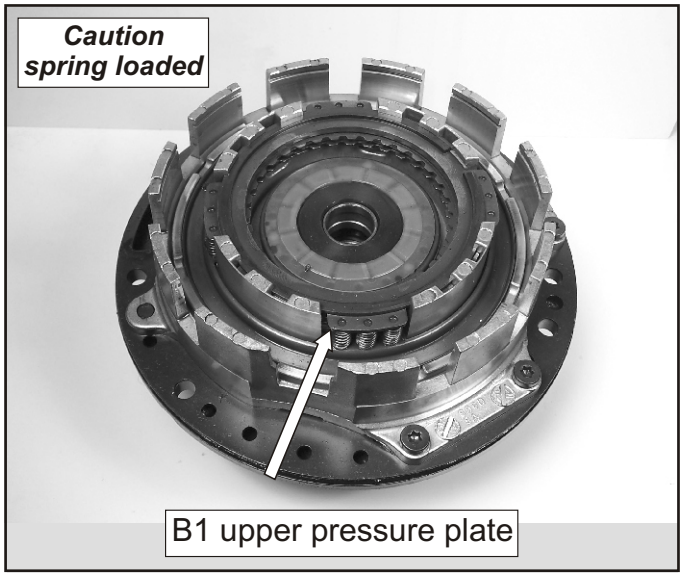


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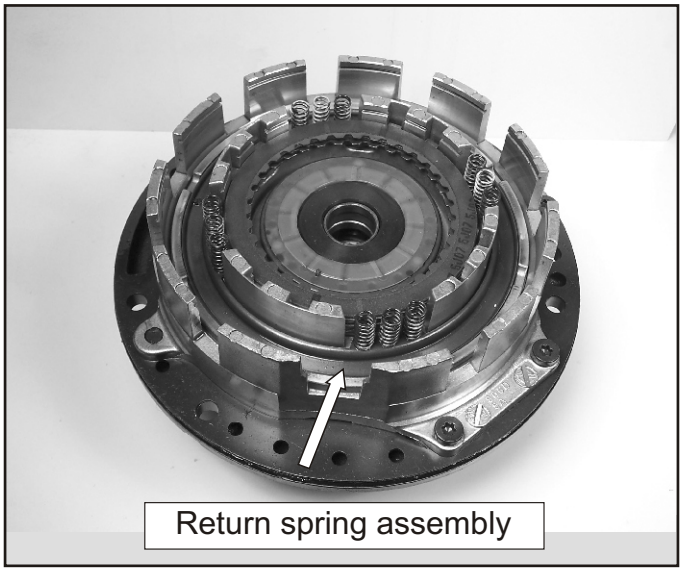


Figure 100

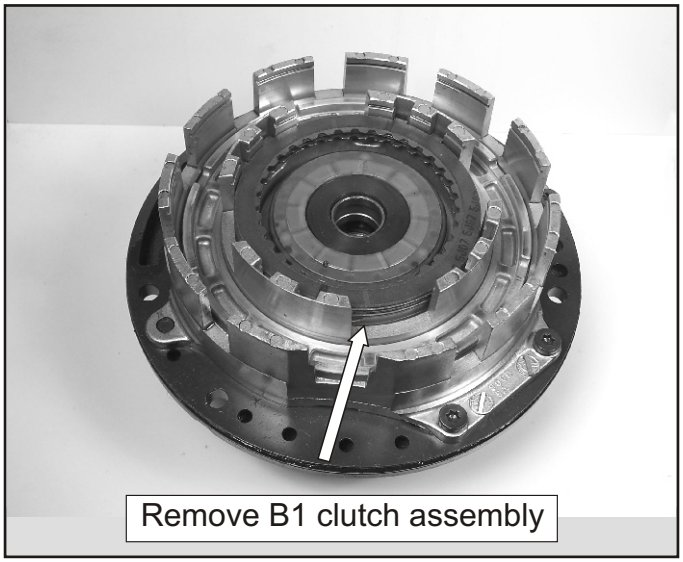


Figure 101



Figure 102

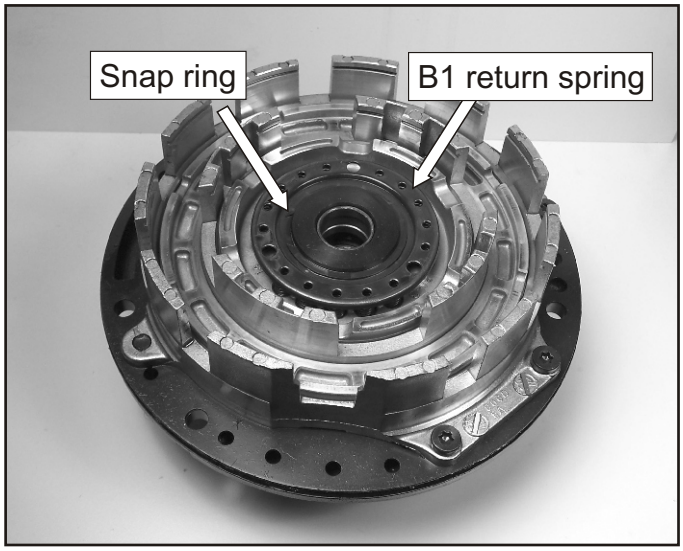


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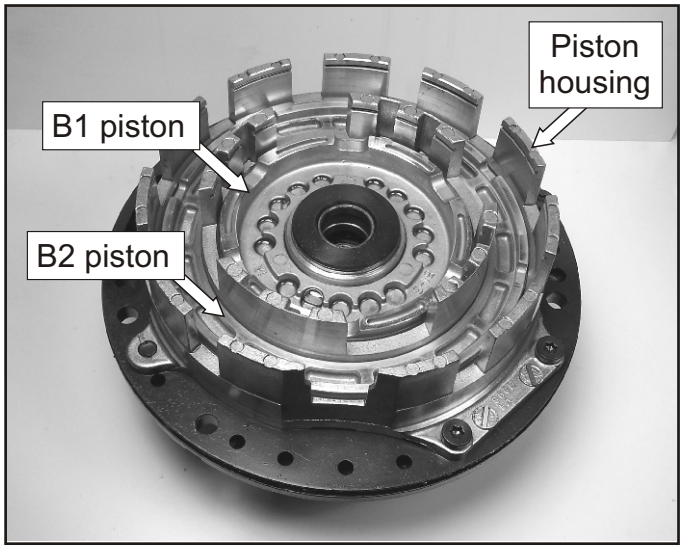


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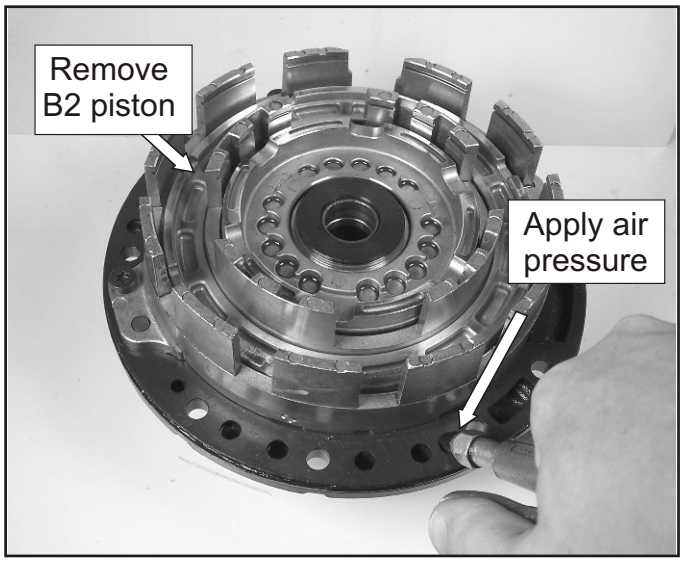


Figure 105

SUB-ASSEMBLIES
"PUMP" CONTINUED

52. Using a suitable press, remove the snap ring and B1 return spring assembly, as shown in Figure 103.
53. Refer to Figure 104 for piston identification.
54. Apply compressed air to the passage shown in Figure 105 and remove the B2 piston. ***Caution: Using compressed air may cause the piston to jump out of the housing***.
55. Apply compressed air to the passage shown in Figure 106 and remove the B1 piston.
56. Using a 30 torx bit, remove the 14 bolts that retain the piston housing to the pump. ***Note: The bolt length for the smaller diameter bolt is 16mm long. The remaining bolts are 13mm long.*** Inspect stator bushings and replace as necessary. See Figure 107.

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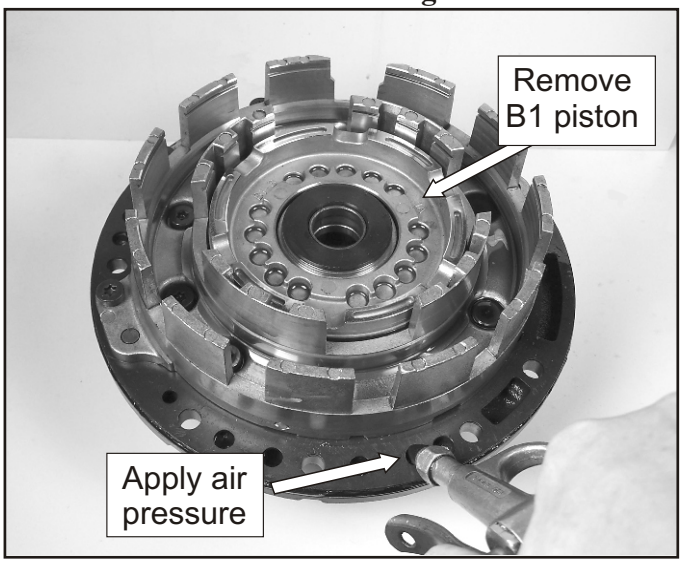


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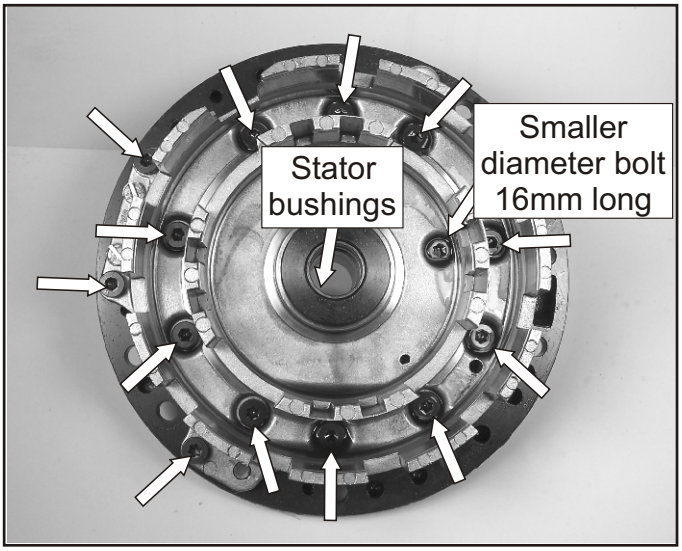


Figure 107

SUB-ASSEMBLIES
"PUMP" CONTINUED

57. Remove the pump plate as shown, in Figure 108, and check for wear or scoring.
58. Using a straight edge, check the pump gear to pump face clearance, as shown in Figure 109. Clearance must be between .001"-.003." The maximum clearance is .004." Using a feeler gage check the outer pump gear to pump body clearance. Clearance must be between .003" and .006." The maximum is .008."
59. Inspect the outer pump gear and the torque converter lug area for wear, as shown in Figure 110.
60. Inspect the pump body for wear, and remove the pump o-ring as shown in Figure 111.
61. Check the pump bushing for wear and replace the front seal, as shown in Figure 112.

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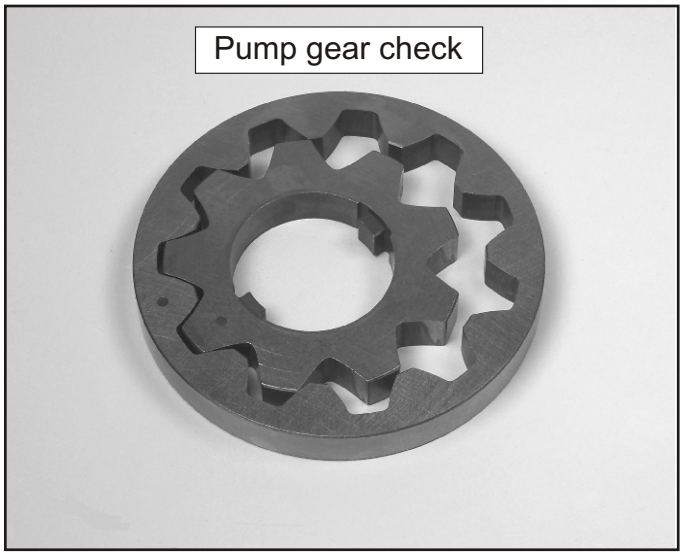


Figure 110

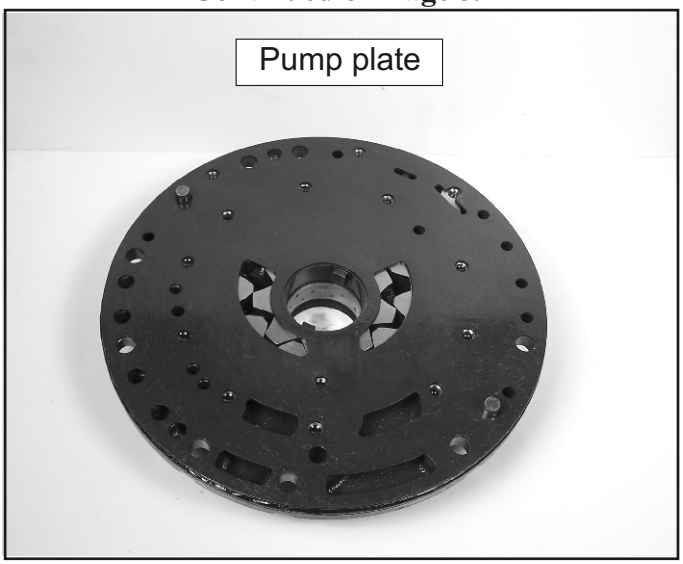


Figure 108

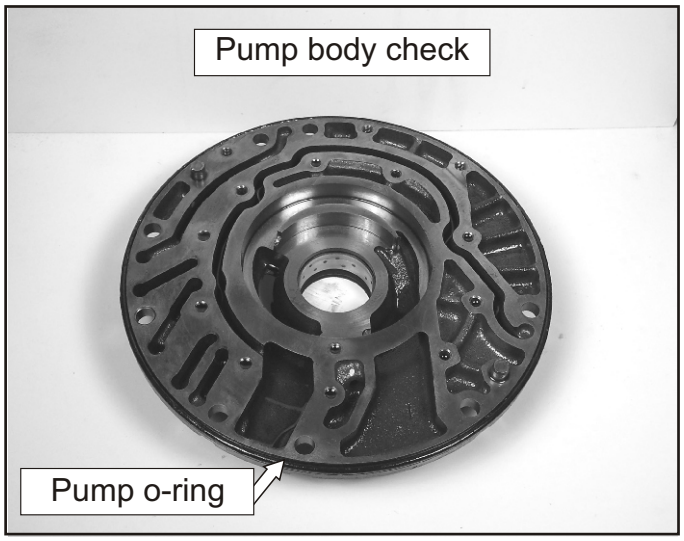


Figure 111

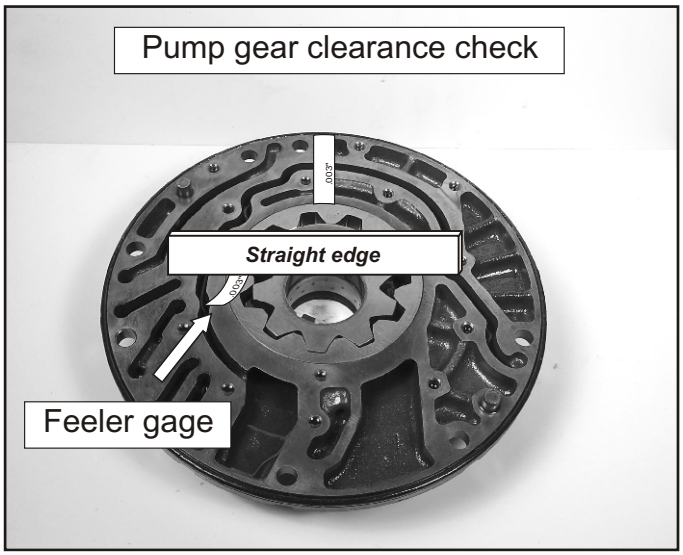


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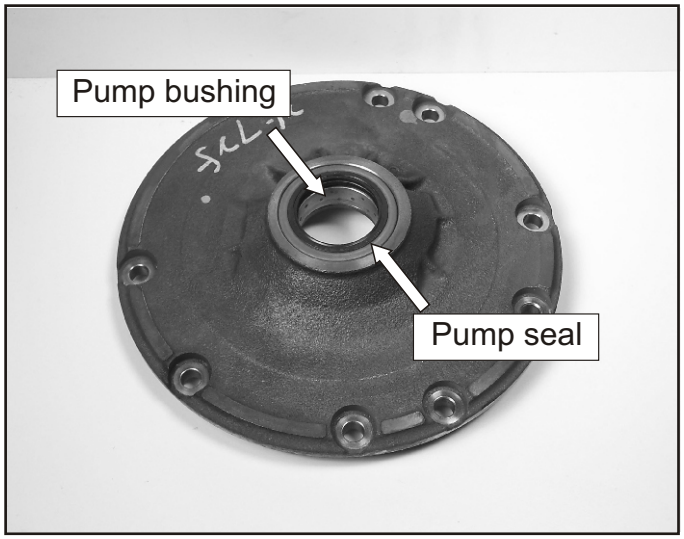


Figure 112

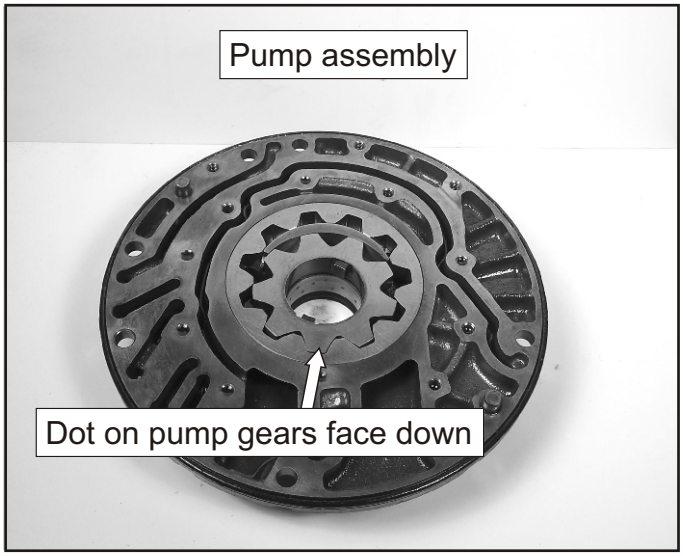


Figure 113

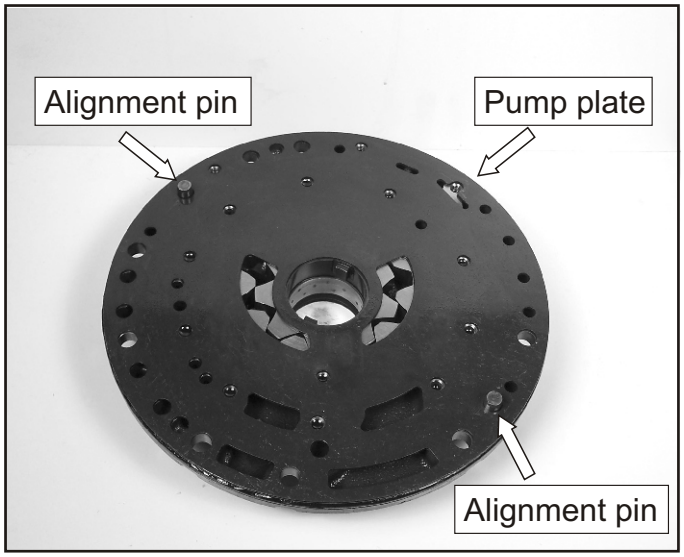


Figure 114

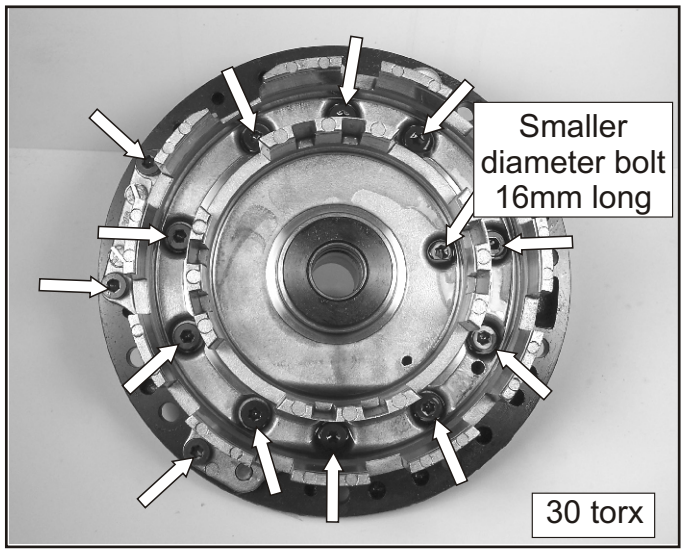


Figure 115

SUB-ASSEMBLIES
"PUMP" CONTINUED

62. Assemble the pump gears into the pump body with the dot on the pump gears facing down, as shown in Figure 113. Lubricate the gears with a small amount of ATF.
62. Assemble the pump plate on over the two alignment pins shown in Figure 114.
63. Assemble the piston housing / stator shaft thru the pump body over the alignment pins as shown in Figure 115. Using a 30 torx bit, install the thirteen 13mm long retaining bolts and torque to 89-124 in.lb. Torque the 16mm long bolt to 53-62 in.lb.
64. Replace the inner and outer B1 and B2 piston o-rings as shown in Figure 116.
65. Lubricate the piston o-rings and install the pistons into the housing shown in Figure 117.

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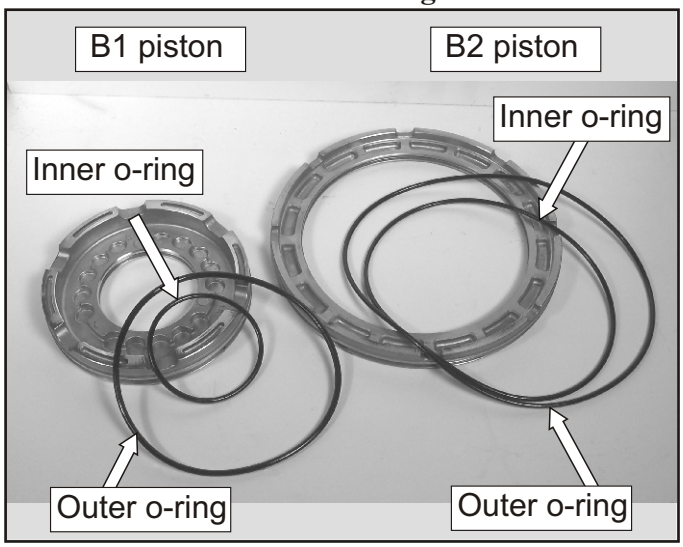


Figure 116

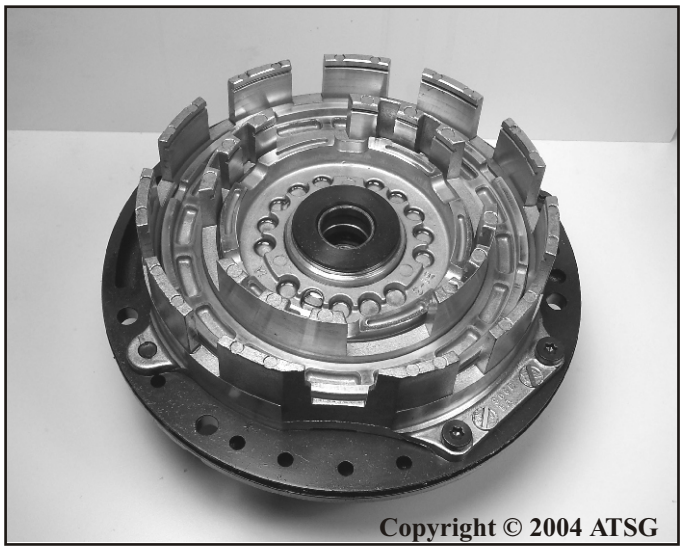

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Figure 117

SUB-ASSEMBLIES
"PUMP" CONTINUED

66. Using a suitable press, depress the B1 return spring and assemble the retaining snap ring, as shown in Figure 118.
67. Assemble the B2 second coast brake hub thrust washer as shown in Figure 119.
68. Assemble the two B1 steel plates and two B1 clutch plates into the housing as shown in Figure 121. Refer to the exploded view in Figure 120 for assembly purposes.
69. Assemble the return spring assembly into the housing as shown in Figure 122.

Continued on Page 61

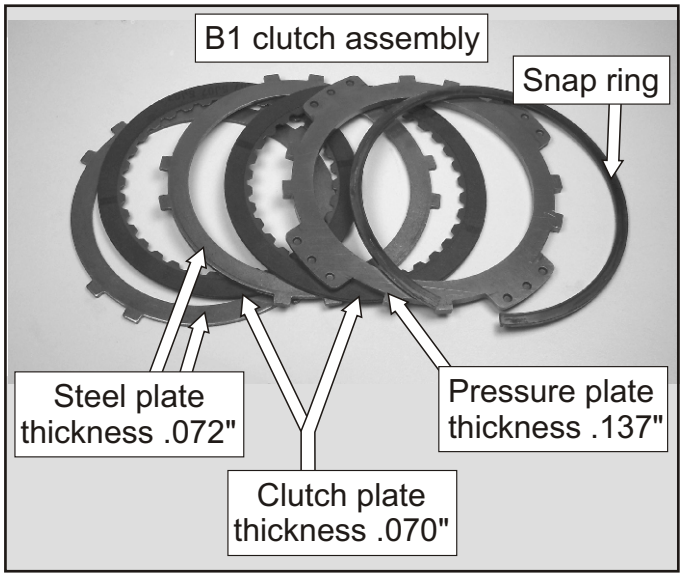


Figure 120

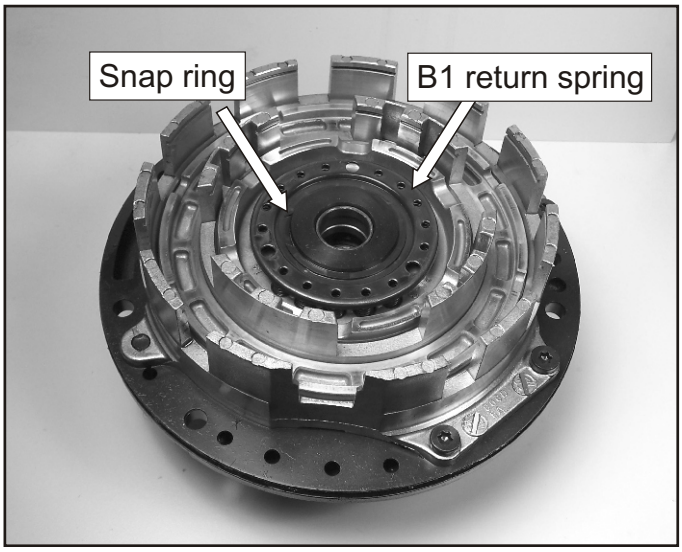


Figure 118

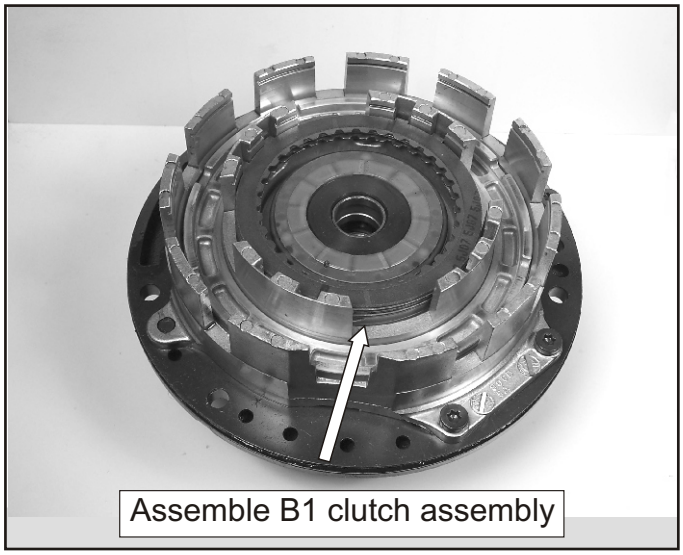


Figure 121

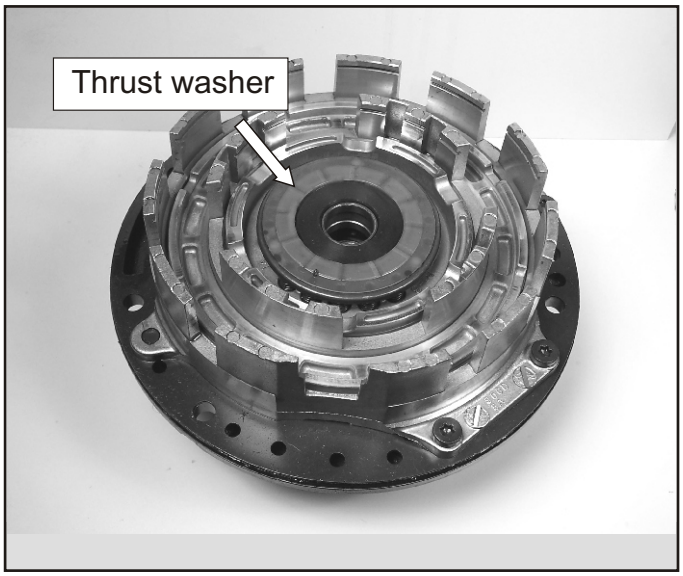


Figure 119

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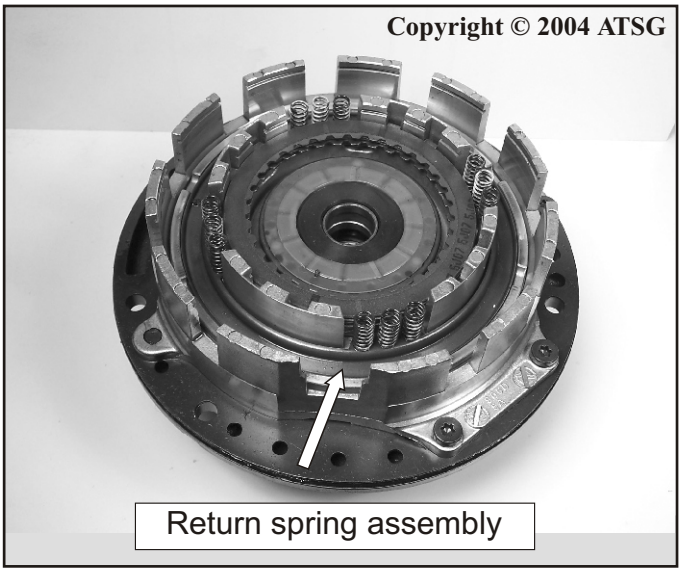


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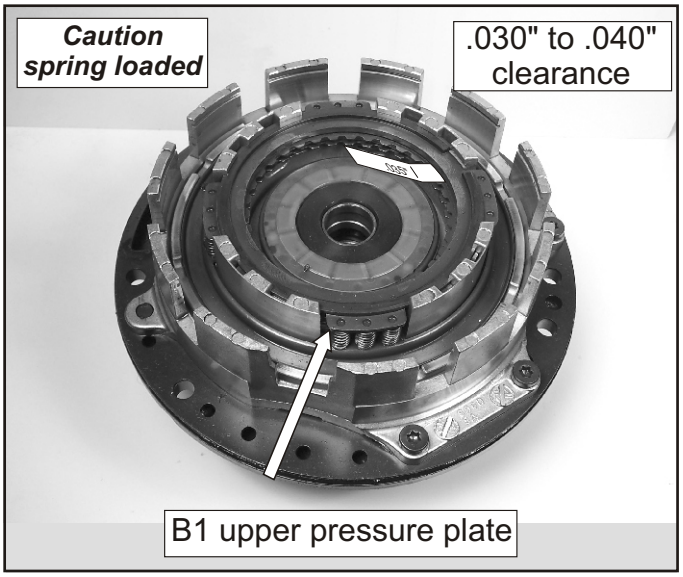


Figure 123

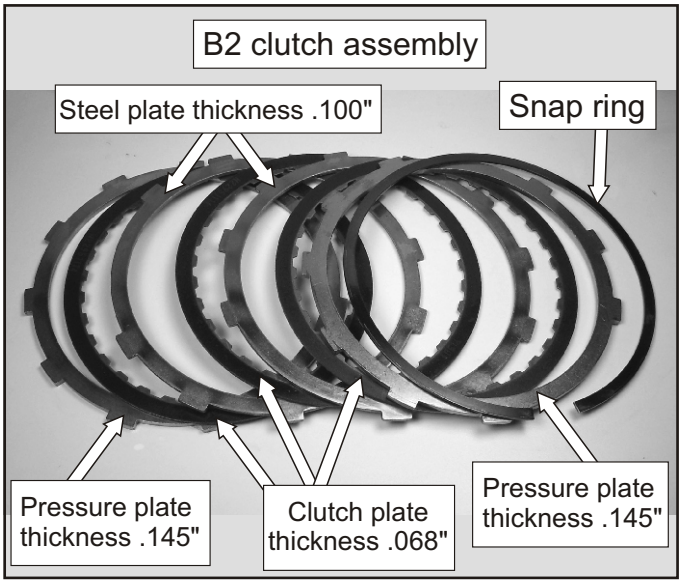


Figure 124

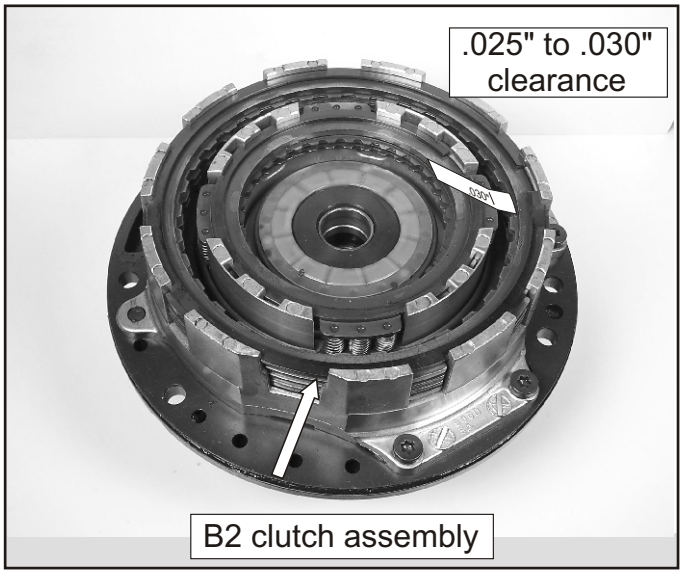


Figure 125

SUB-ASSEMBLIES
"PUMP" CONTINUED

70. Assemble the B1 upper pressure plate on top of the spring retainer as shown in Figure 123. Press it down and assemble the retaining snap ring. Check B1 clutch clearance using a feeler gage. Clearance should be between .030"-.040."
71. Assemble the B2 clutch assembly into the housing starting with the .145" thick pressure plate, as shown in Figure 124, ending with the snap ring. Check the clearance between the top pressure plate and the top B2 clutch plate. The clearance should be between .025"- .030."
72. Using a rubber tip blow gun, air check the B1 and B2 clutch assemblies , thru the two ports, as shown in Figure 126.
73. Install pump o-ring as shown in Figure 127.

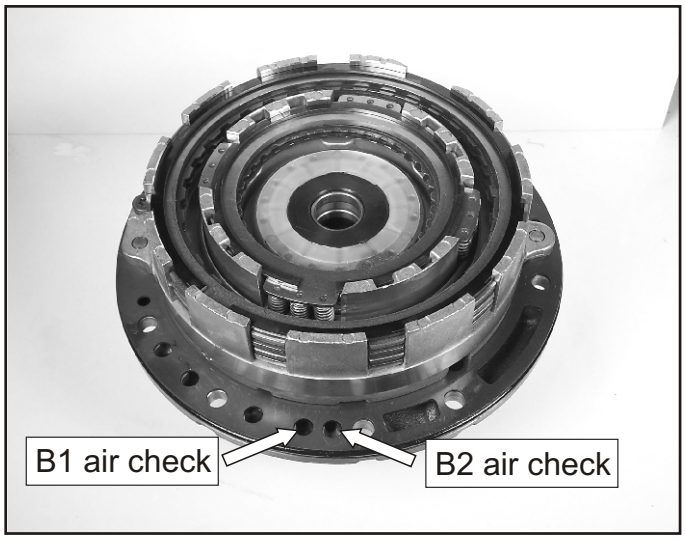


Figure 126

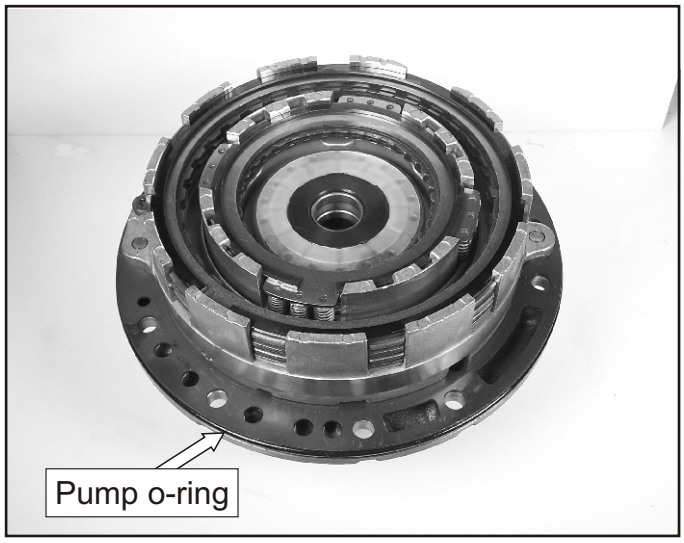


Figure 127

SUB-ASSEMBLIES
"B2 COAST BRAKE HUB AND SPRAG"

74. Remove the inner race rotating it clockwise as shown in Figure 128.
75. Turn the inner race upside down to check for wear in the area where the sprag rides. Replace as necessary. See Figure 129.
76. Remove the sprag and end bearings from the outer race, as shown in Figure 130, and check for wear in the area where the sprag rides. Replace as necessary.
78. Inspect the sprag elements for wear as shown in Figure 131. Replace as necessary.
79. Refer to Figure 132 for a view of the complete assembly disassembled.

Continued on Page 63

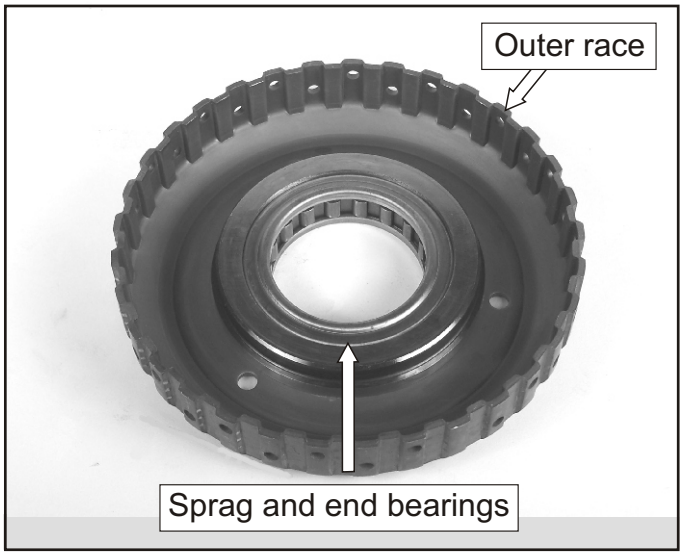


Figure 130

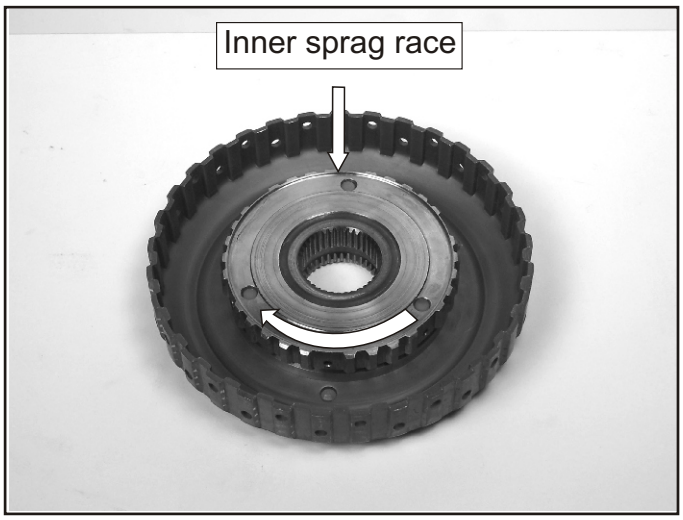


Figure 128

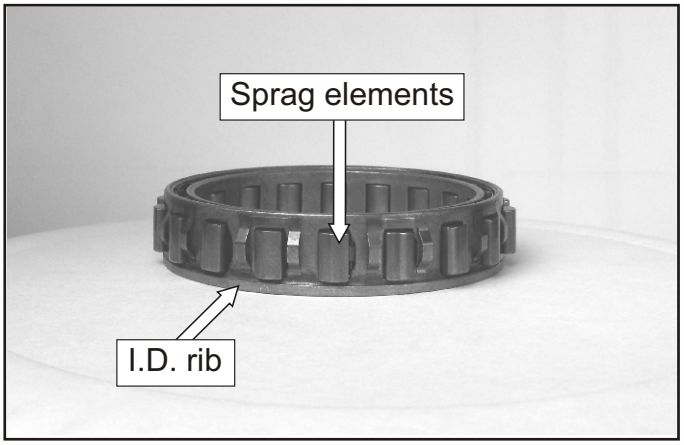


Figure 131

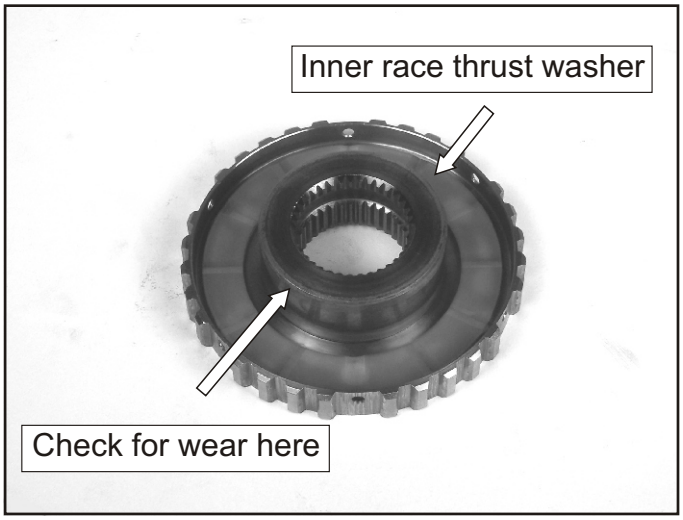


Figure 129

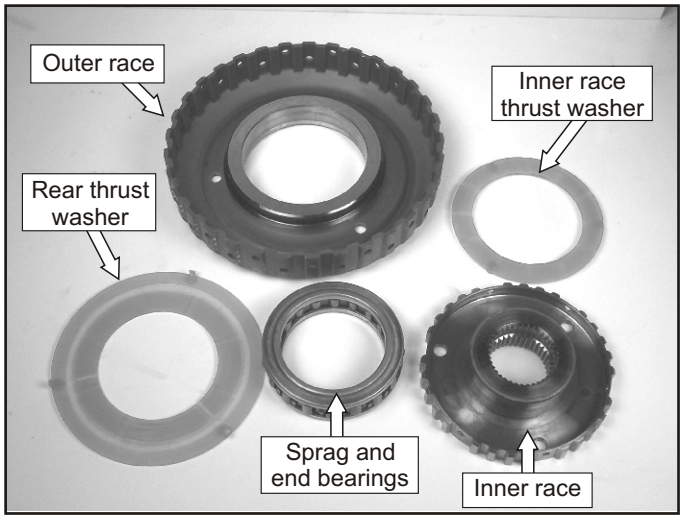


Figure 132

SUB-ASSEMBLIES
"B2 COAST BRAKE HUB AND SPRAG Contd."

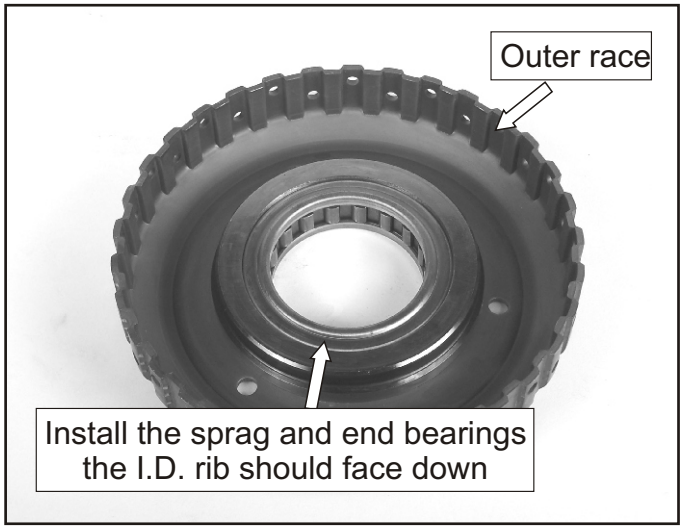


Figure 133

80. Assemble the sprag, I.D. rib facing down, and end bearings into the outer race, as shown in Figure 133. Use the illustration in Figure 131 to identify the I.D. rib.
81. Assemble the inner thrust washer into the inner sprag race as shown in Figure 134.
82. Assemble the inner sprag race into the sprag and outer race. The inner race must freewheel clockwise and lock counterclockwise when holding the outer race. See Figure 135.
83. Turn the complete assembly over and assemble the rear thrust washer into the outer race shown in Figure 136.
84. Assemble the complete B2 coast brake hub assembly into the already completed pump assembly and set aside for final assembly into the case. See Figure 137.

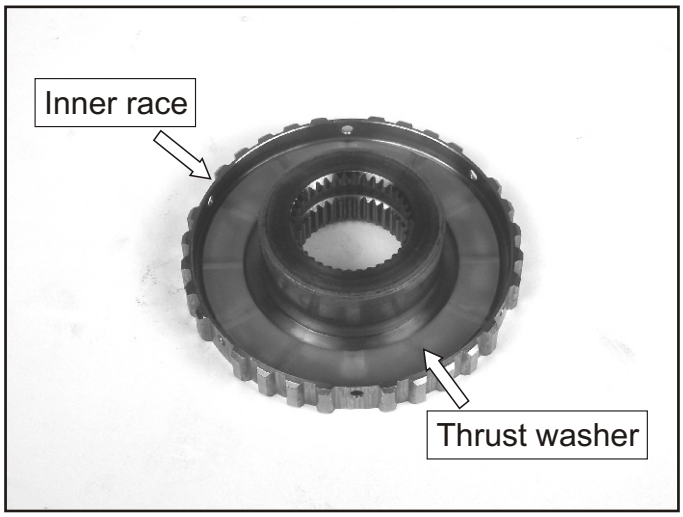


Figure 134

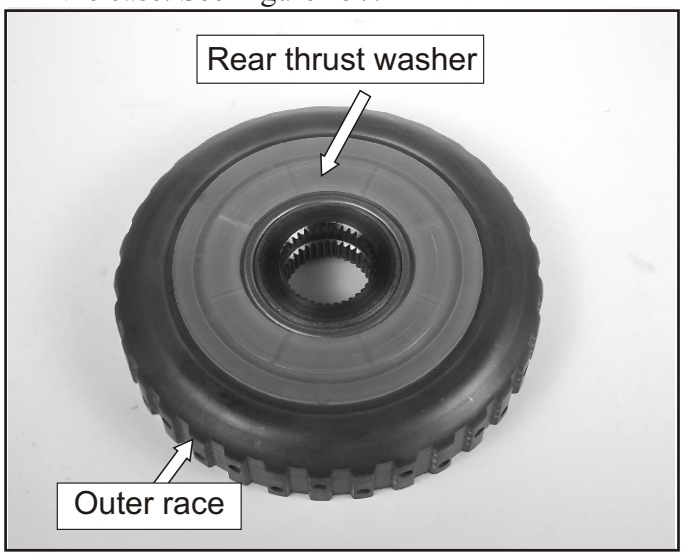


Figure 136

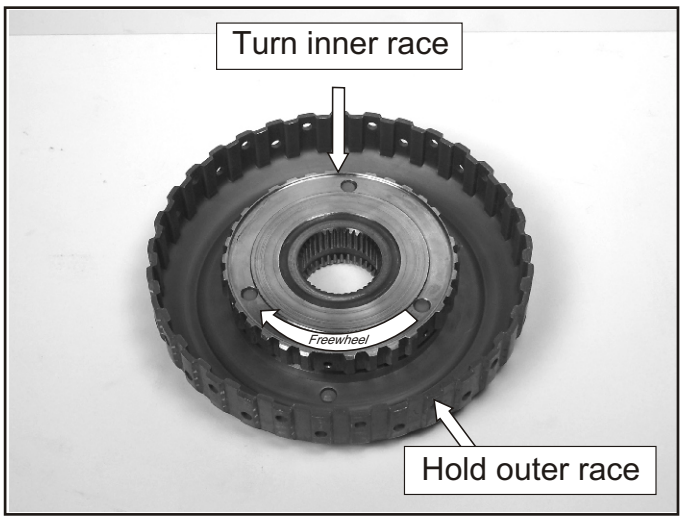


Figure 135



Figure 137

SUB-ASSEMBLIES
"C3 UNDERDRIVE CLUTCH DRUM"

85. Remove the snap ring and the C3 clutch assembly from the C3 drum as shown below in Figure 138.
86. Remove the snap ring, C3 return spring assy. and C3 piston as shown in Figure 139.
87. Inspect the bushing in the front of the C3 drum and replace as necessary. See Figure 140.
88. Turn the C3 drum over and inspect the rear bushing in the drum. Inspect the sprag race as shown in Figure 141. Replace as necessary.
89. Inspect the check ball assembly for debris and replace the inner and outer o-rings on the C3 piston. See Figure 142.

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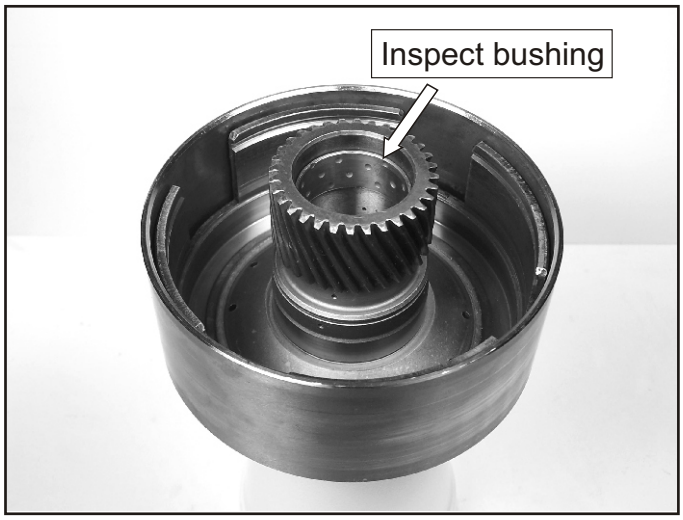


Figure 140

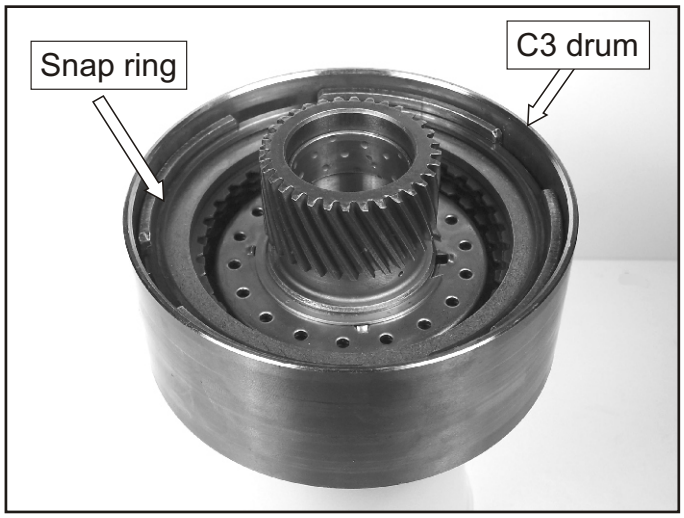


Figure 138

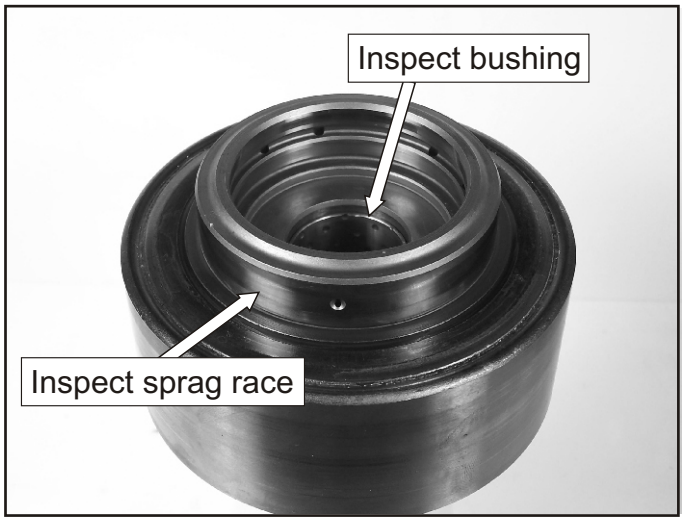


Figure 141

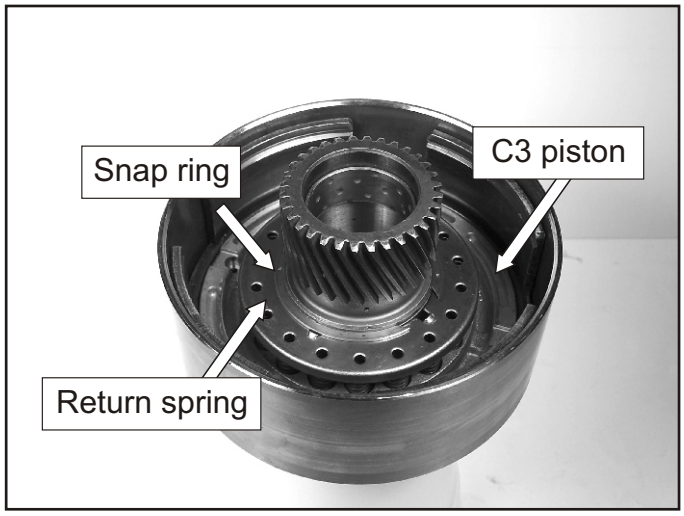


Figure 139

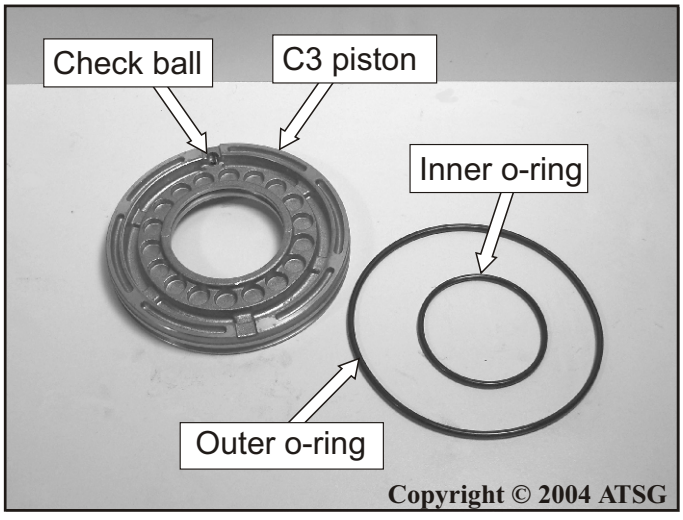


Figure 142

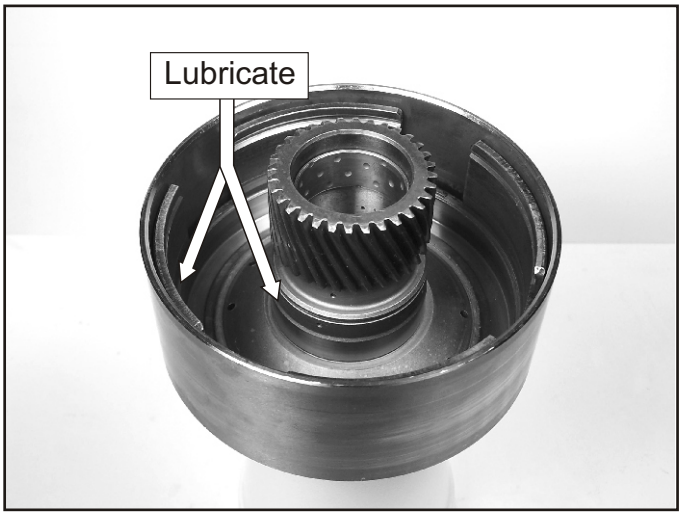


Figure 143

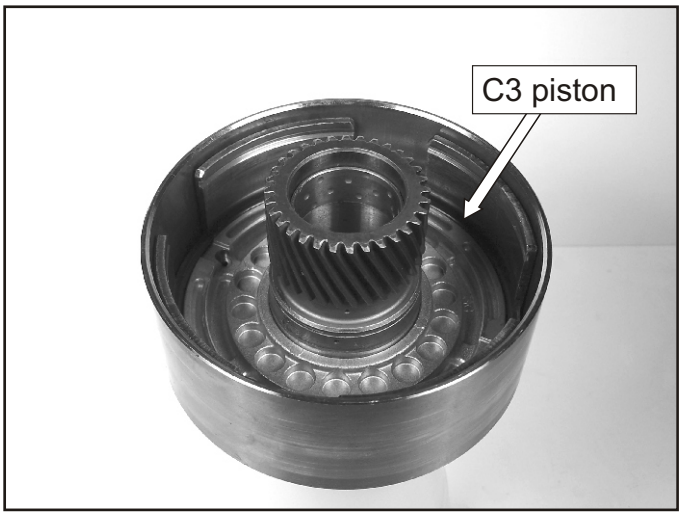


Figure 144

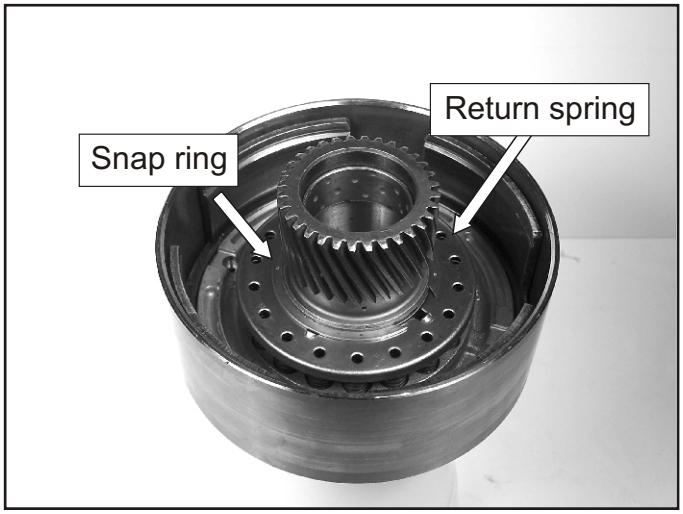


Figure 145

SUB-ASSEMBLIES
"C3 UNDERDRIVE CLUTCH DRUM Contd."

90. Lubricate the inside of the C3 drum in the areas shown in Figure 143.
91. Install the C3 piston into the C3 drum as shown in Figure 144.
92. Install the return spring into the C3 piston and install the retaining snap ring as shown in Figure 145.
93. Install the C3 clutch assembly into the C3 drum as shown in Figure 147, using Figure 146 as a guide. Install the .020" bottom steel first, then install the cushion plate in the direction shown in Figure 146. Install the remaining clutch plates, steel plates, pressure plate and snap ring. Using a feeler gage check clutch clearance between the pressure plate and the top clutch plate. The clearance should be .032" - .038."

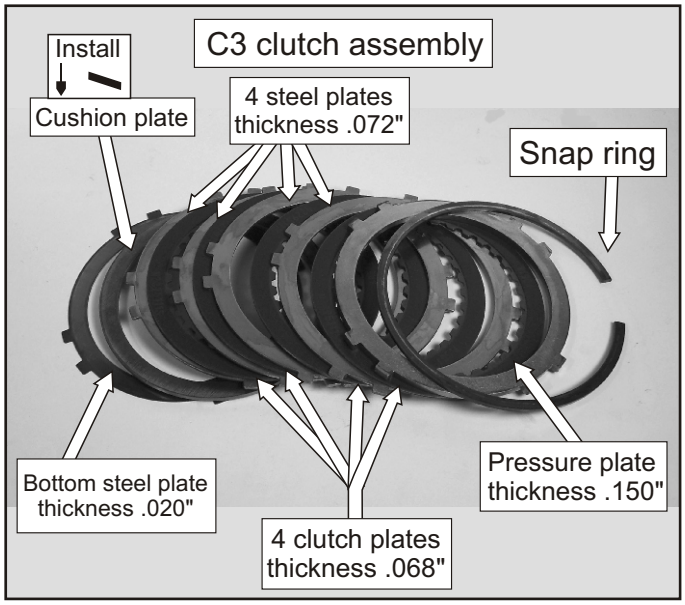


Figure 146



Figure 147

SUB-ASSEMBLIES
"F3 UNDER DRIVE SPRAG"

94. Remove the retainer from the top of the outer sprag race as shown in Figure 148.
95. Remove the F3 sprag and end bearings from the outer race as shown in Figure 149.
96. Inspect the end bearings for wear as shown in Figure 150. Replace as necessary.
97. Inspect the sprag elements for wear as shown in Figure 151, and replace as necessary.
98. Inspect the area where the sprag rides, in the outer race, for wear or scoring. Replace as necessary. See Figure 152.

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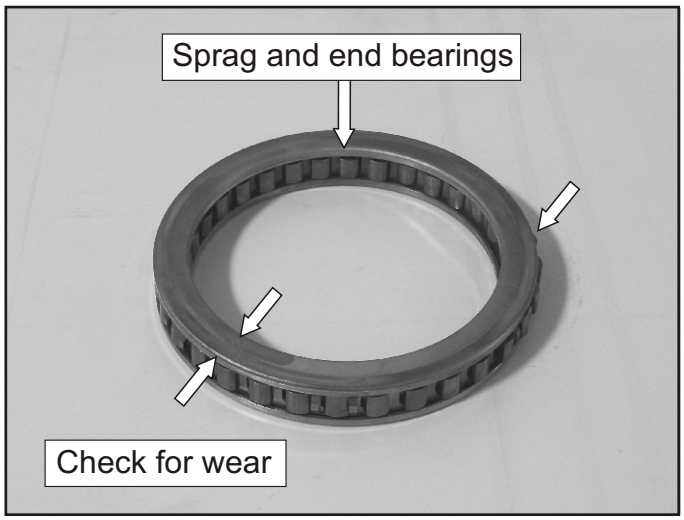


Figure 150

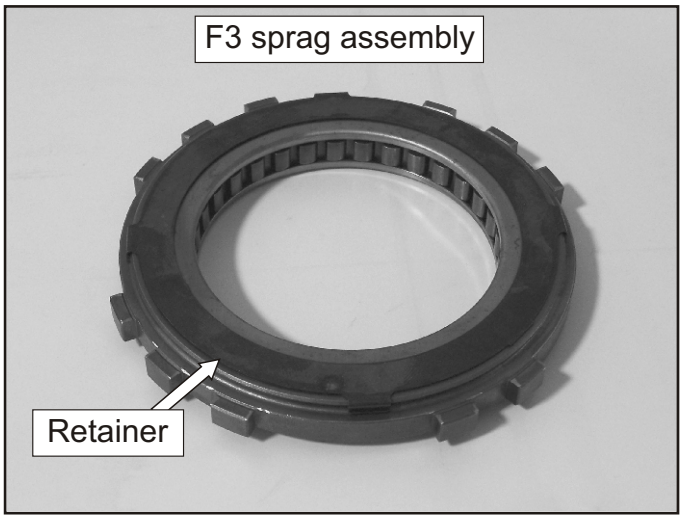


Figure 148

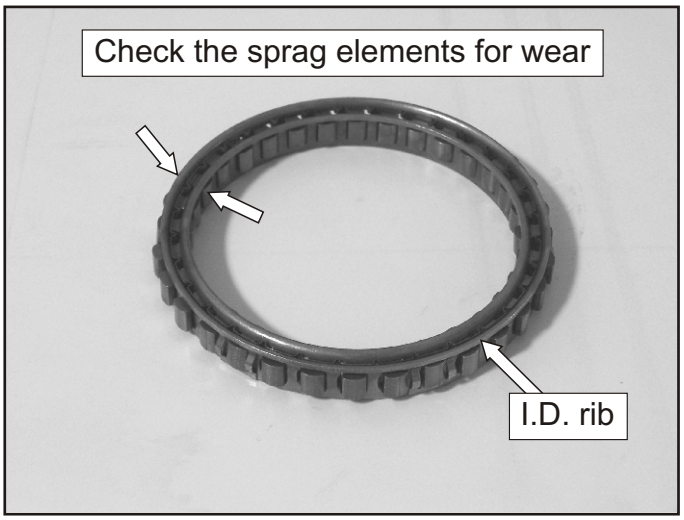


Figure 151

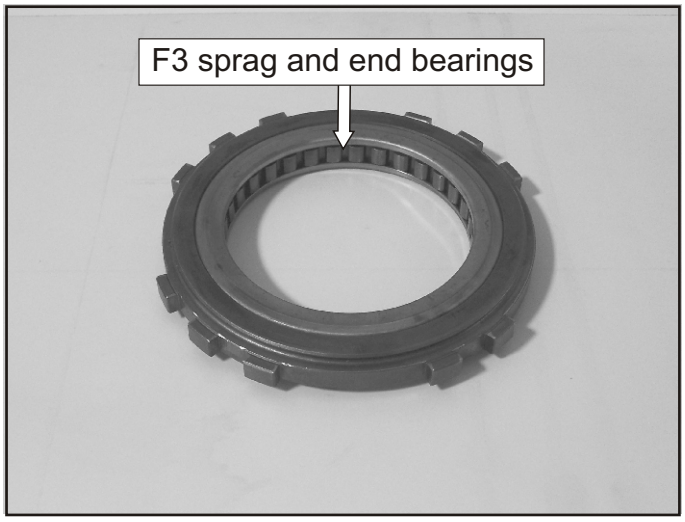


Figure 149

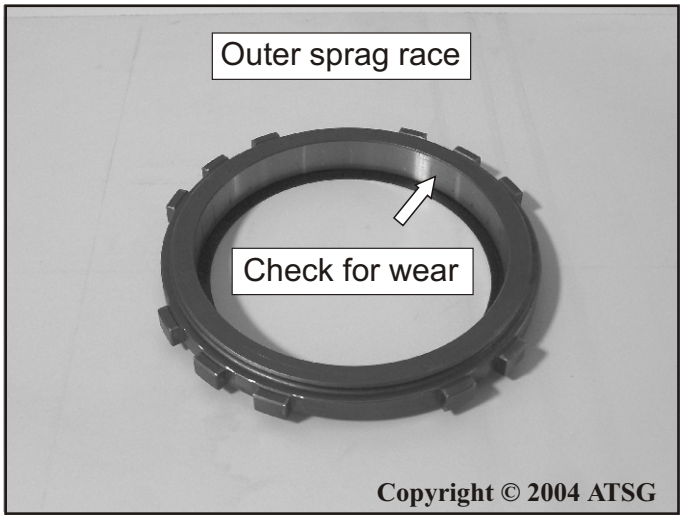


Figure 152

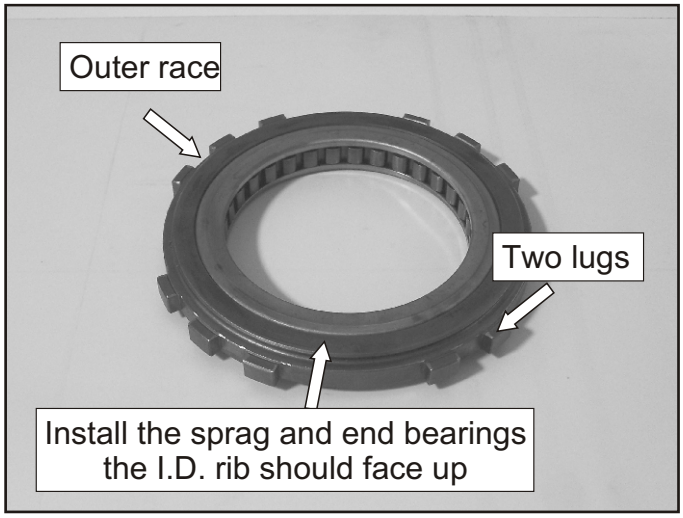


Figure 153

SUB-ASSEMBLIES
"F3 UNDERDRIVE SPRAG"

99. Install the F3 sprag and end bearings into the outer race as shown in. Refer to Figure 151 for the orientation of the I.D. rib. Ensure that the two lugs on the outer race are in the 5 o'clock position, as shown in Figure 153.
100. Snap the retainer back into the groove shown in Figure 154.
101. Assemble the F3 sprag onto the C3 drum and verify the proper rotation. Rotate the outer race while holding the C3 drum. The outer race should freewheel in the counter clockwise direction, as shown in Figure 155.

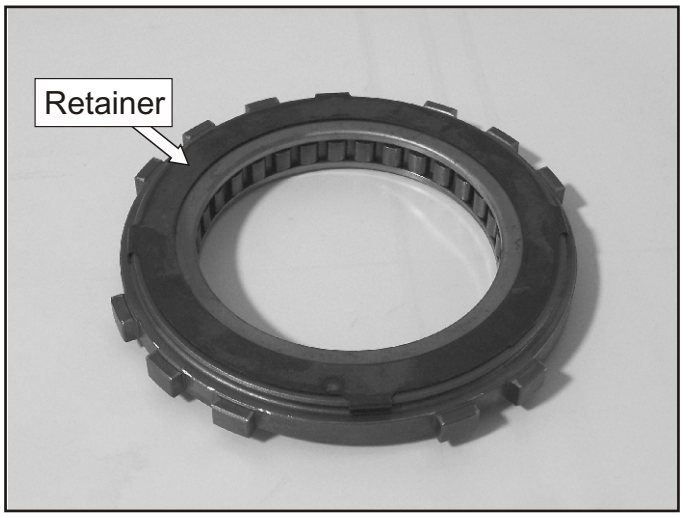


Figure 154

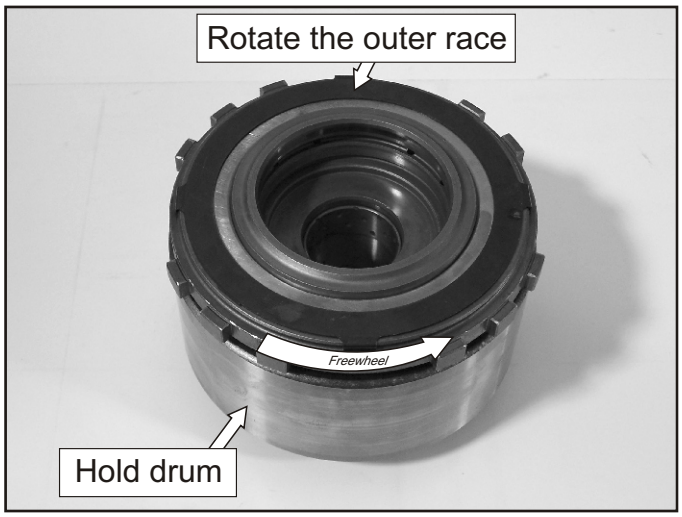


Figure 155

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SUB-ASSEMBLIES
"UNDERDRIVE PLANETARY AND
DIFFERENTIAL PINION GEAR ASSY."

102. Using a hammer and punch, remove the stakes from the lock nut. Place the park gear into a vice and remove the lock nut with a 36mm socket. See Figure 156.
103. Compress the two tabs inward and pull the ring gear rearward to remove it from the back of the counter driven gear. Refer to Figures 157 and 158.
104. Support the counter driven gear in a suitable press and push the C3 underdrive planetary thru the counter driven gear. See Figure 159.
105. Refer to Figure 160 for a view of the complete assembly dis-assembled and for assembly purposes.

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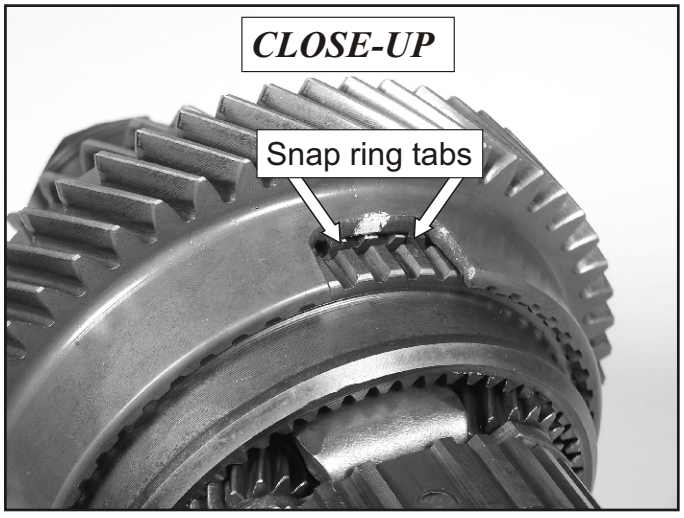


Figure 158

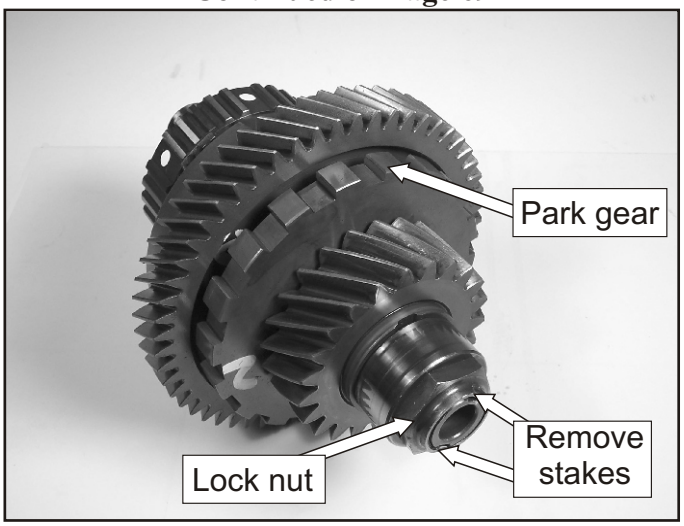


Figure 156

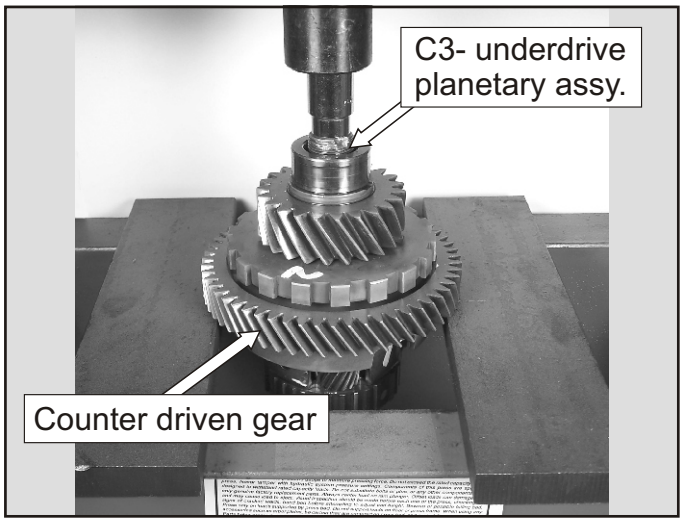


Figure 159

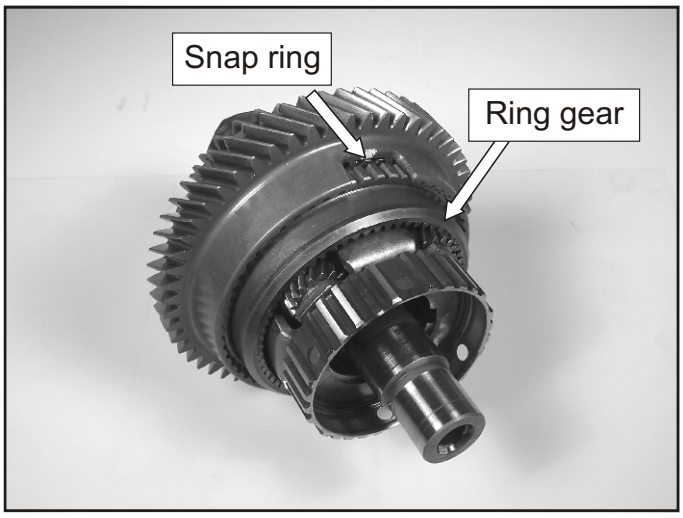


Figure 157

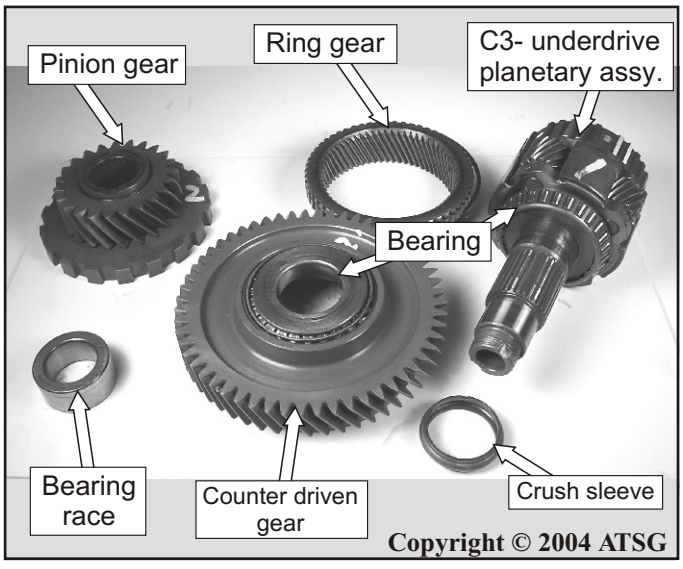


Figure 160

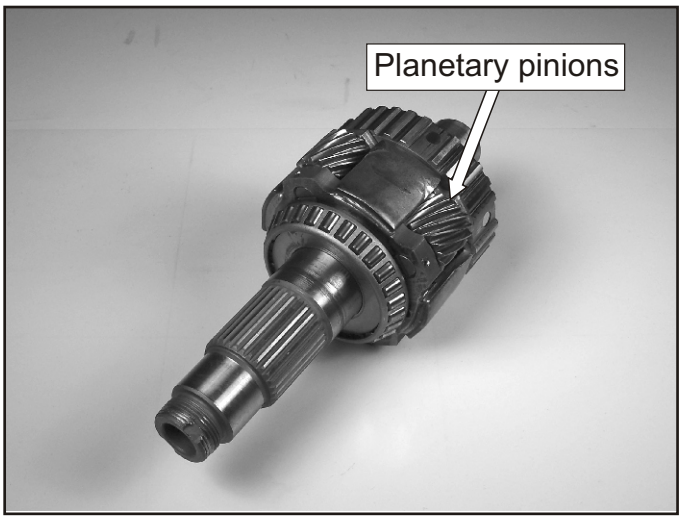


Figure 161

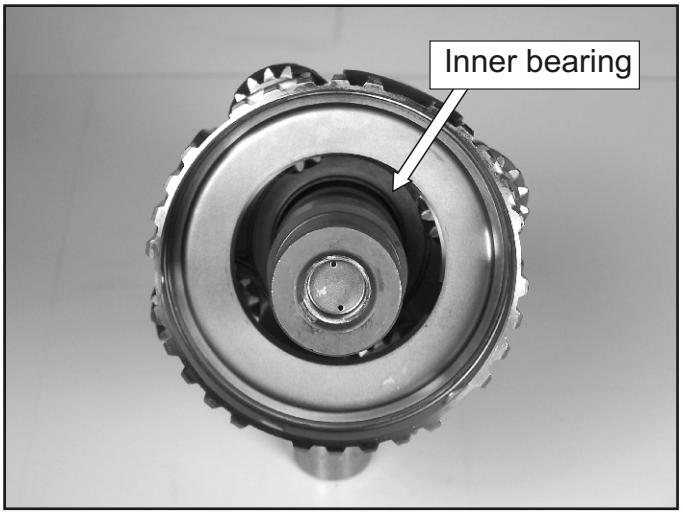


Figure 162

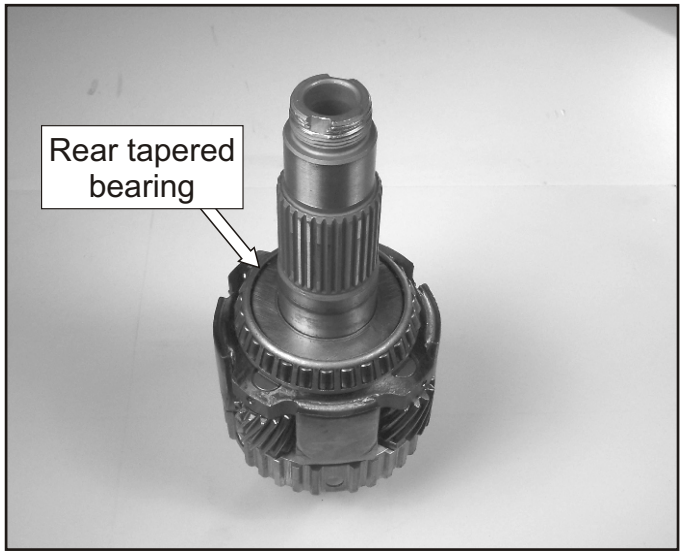


Figure 163

SUB-ASSEMBLIES
"UNDERDRIVE PLANETARY AND DIFFERENTIAL PINION GEAR ASSY. Contd."

106. Inspect the C3 underdrive planetary pinions and check the planetary washers for wear, replace as necessary. See Figure 161.
107. Inspect the inner planetary bearing as shown in Figure 162.
108. Inspect the rear tapered bearing as shown in Figure 163 and replace as necessary. ***Note: To remove the bearing assy., remove the cage and individual rollers. Remove the race with a two jaw bearing puller. Press a new bearing onto the planetary shaft.***
109. Install a new crush sleeve onto the shaft. See Figure 164.
110. Inspect the counter driven gear races and front bearing as shown in Figure 165, and replace as necessary.

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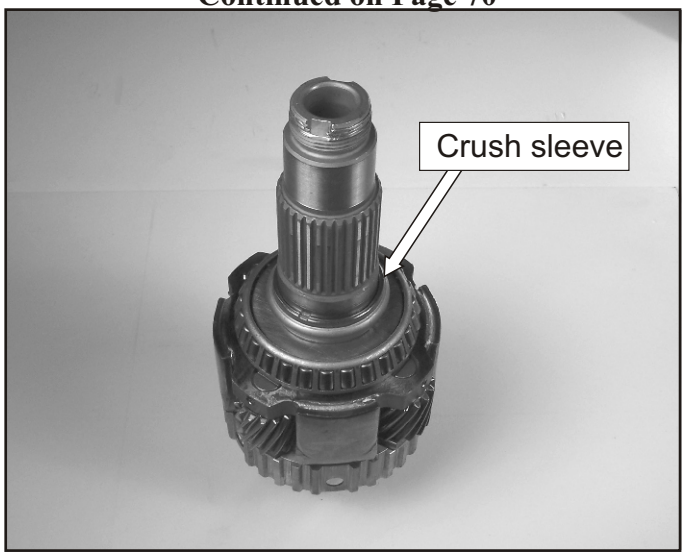


Figure 164

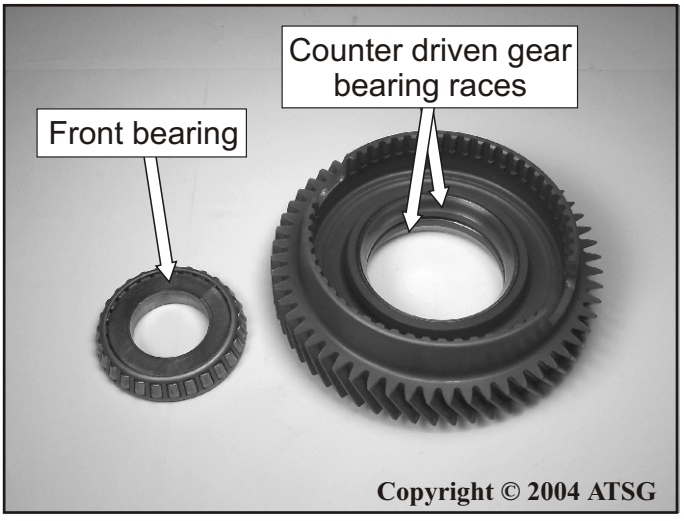


Figure 165

SUB-ASSEMBLIES
"UNDERDRIVE PLANETARY AND
DIFFERENTIAL PINION GEAR ASSY."

111. Install the counter driven gear onto the C3 planetary shaft as shown in Figure 166.
112. Using a suitable press, install the front tapered bearing as shown in Figure 167.
113. Install the pinion gear as shown in Figure 168.
114. Using a suitable press, install the bearing race as shown in Figure 169.
115. Assemble the park gear into a vise or suitable holding fixture and snug down a new lock nut with a 36mm socket. See Figure 170. ***Note: Do not tighten until the next step!***

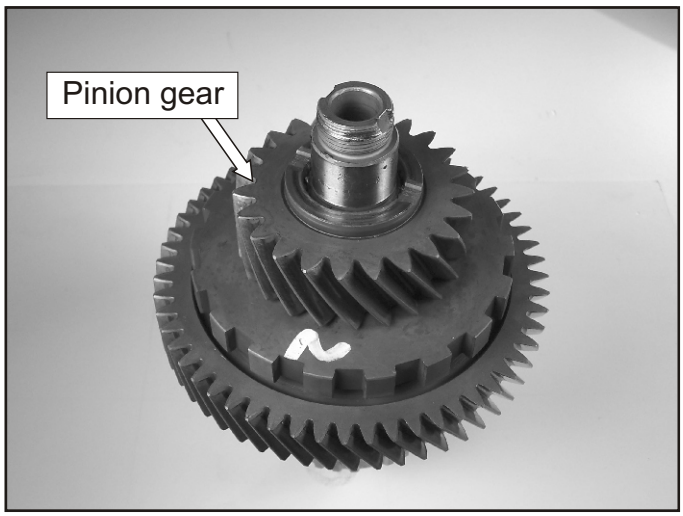


Figure 168

Continued on Page 71

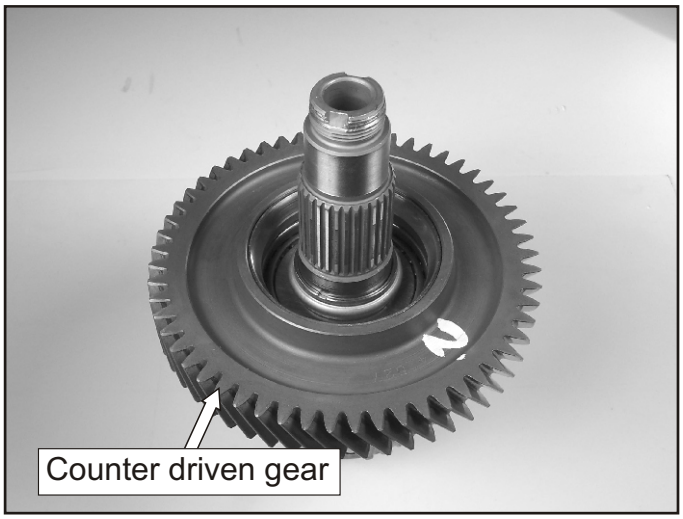


Figure 166

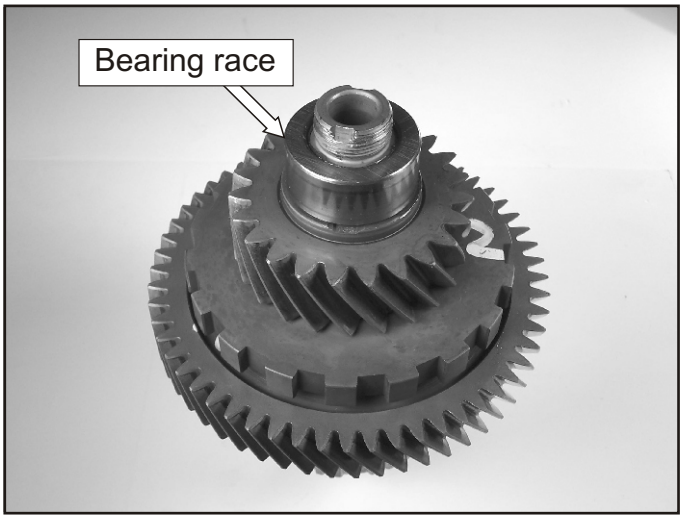


Figure 169

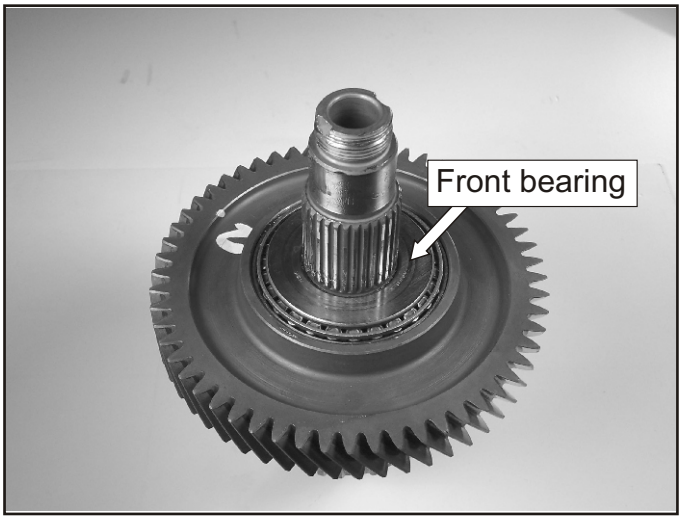


Figure 167

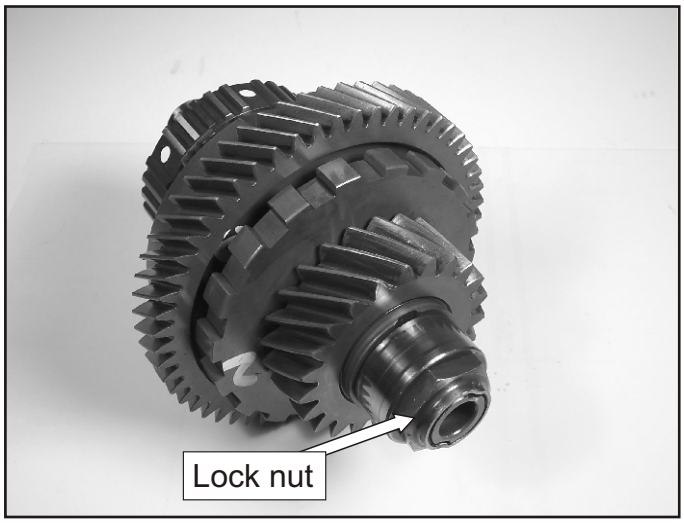


Figure 170

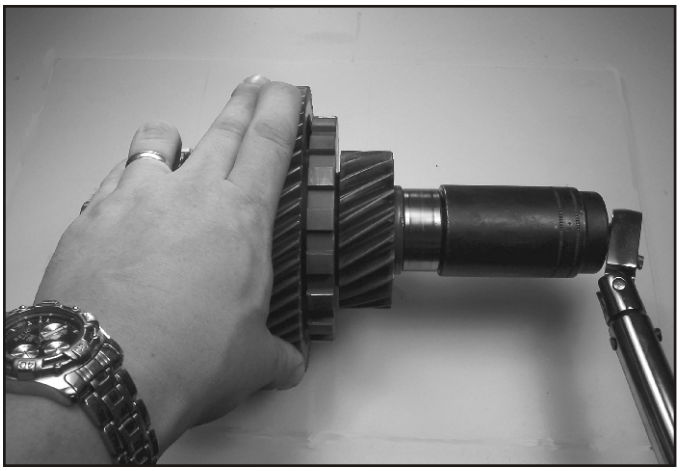


Figure 171

SUB-ASSEMBLIES
"UNDERDRIVE PLANETARY AND DIFFERENTIAL PINION GEAR ASSY. Contd."

116. Tighten the lock nut until the turning torque is between 5-12 in.lb. See Figure 171. ***Note: To check turning torque, hold the counter driven gear with the left hand and check the turning torque with an inch pound torque wrench with the right hand.***
117. Using a punch, stake the nut on both sides of the shaft, as shown in Figure 172.
118. Using needle nose pliers, compress the tabs of the snap ring towards the ring gear and push it into the back of the counter driven gear shown in Figure 173.
119. Push the ring gear into the counter driven gear until it snaps into it's groove. See Figure 174 and the close-up in Figure 175.

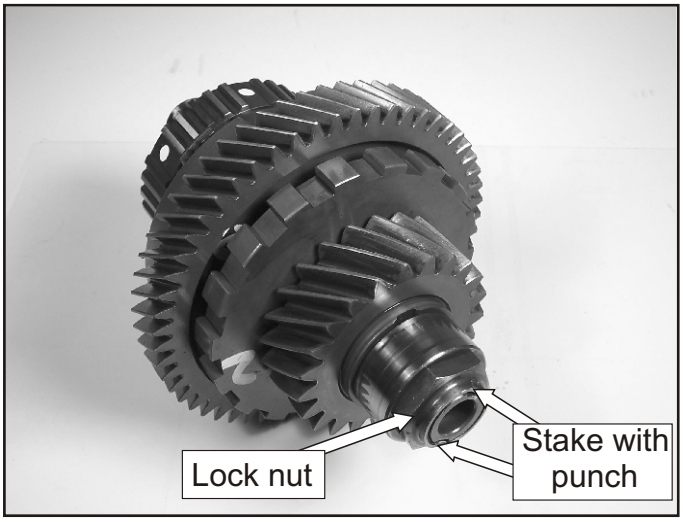


Figure 172

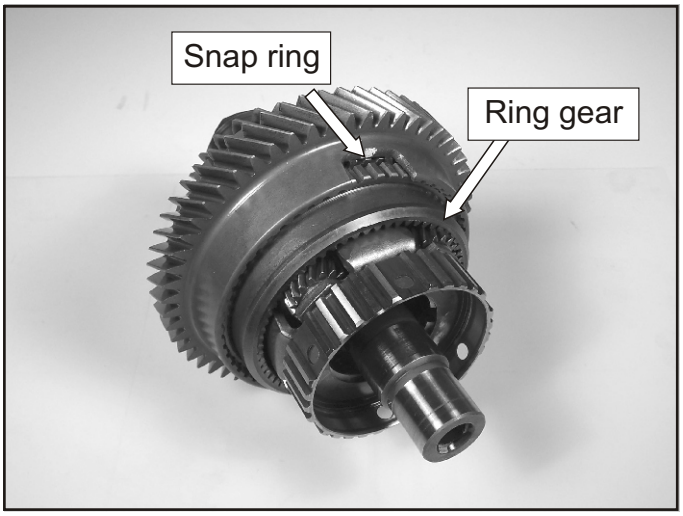


Figure 174

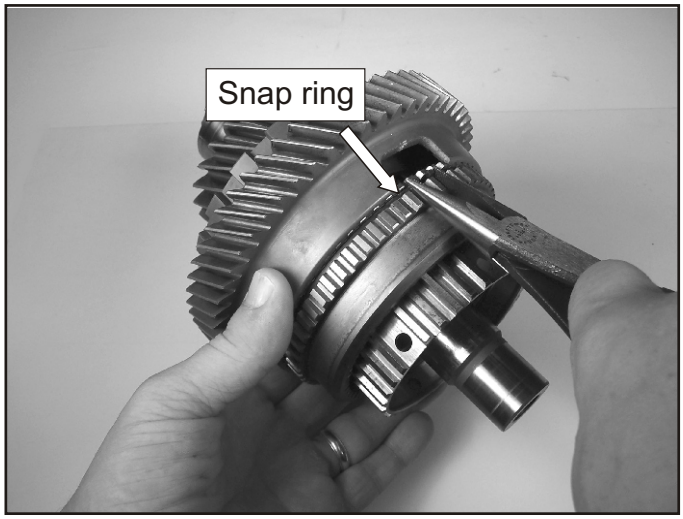


Figure 173

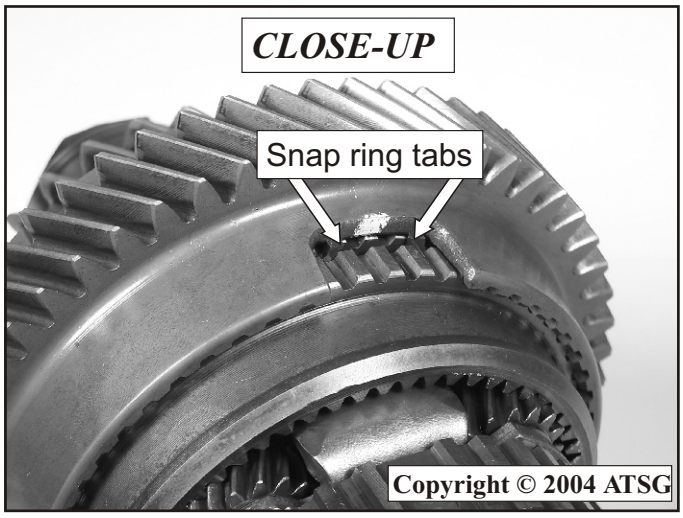


Figure 175

SUB-ASSEMBLIES
F2 FREEWHEEL (LOW SPRAG)

120. Remove the inner race from the F2 freewheel assembly as shown in Figure 176.
121. Remove the snap ring and upper end bearing as shown in Figure 177.
122. Lift the sprag and lower end bearing from the outer race as shown in Figure 178.
123. Remove the thrust washer from the outer race. See Figure 179.
124. See Figure 180 for a view of the complete assy. dis-assembled.

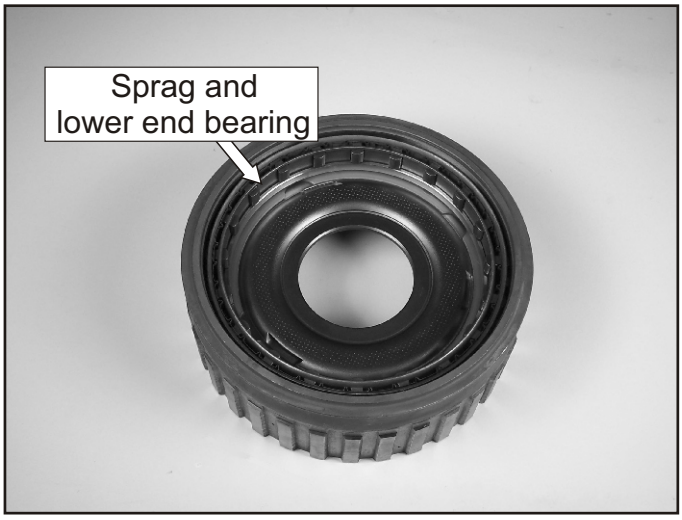


Figure 178

Continued on Page 73

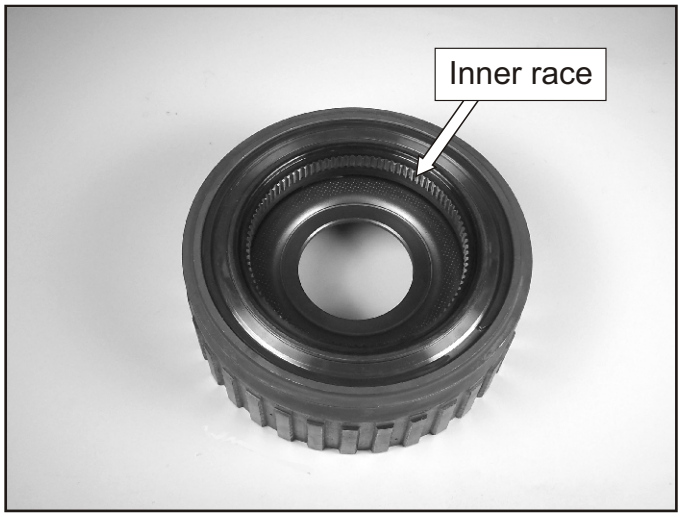


Figure 176

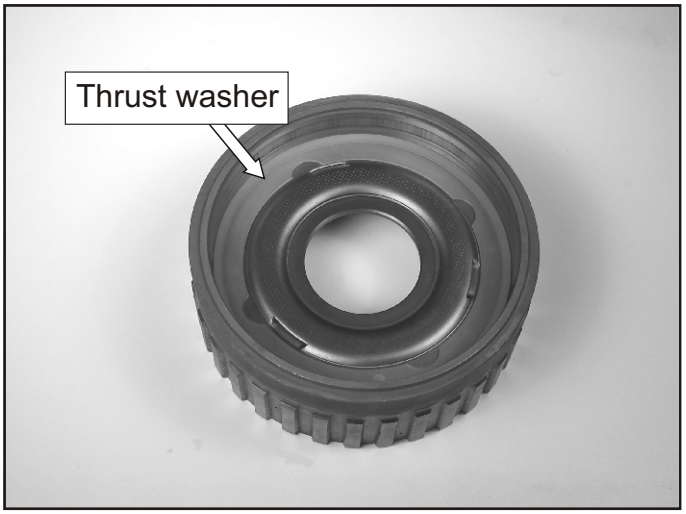


Figure 179

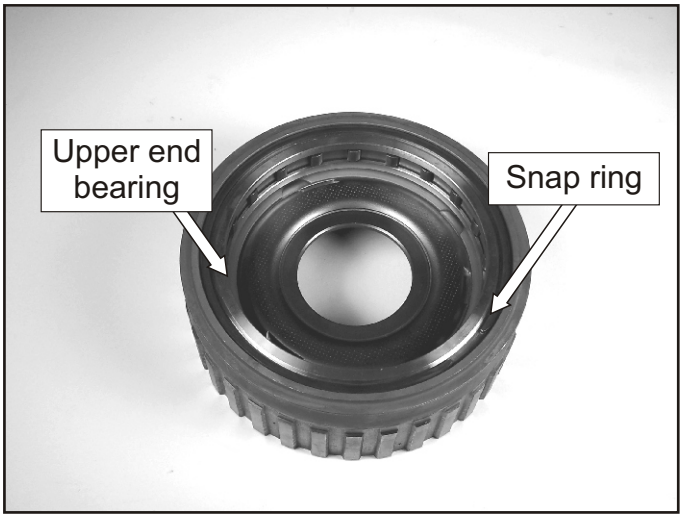


Figure 177

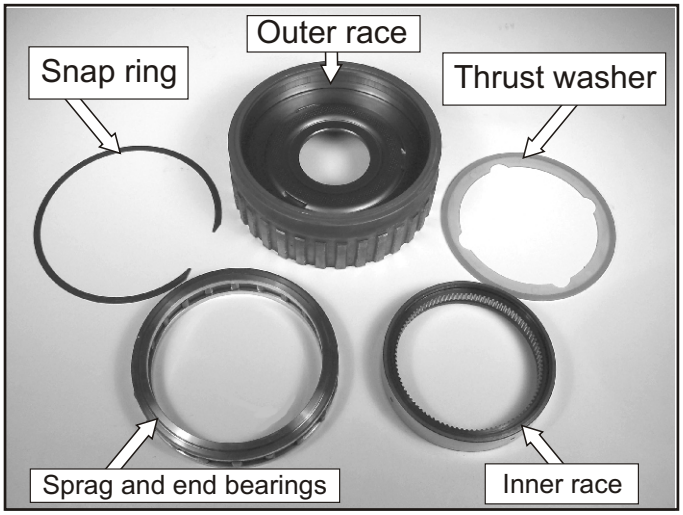


Figure 180

SUB-ASSEMBLIES

F2 FREEWHEEL (LOW SPRAG) Contd.

125. Inspect the outer race for wear or scoring, in the area where the sprag rides and replace as as necessary. See Figure 181.
126. Assemble the thrust washer and the lower end bearing as shown in Figure 182.
127. Inspect the sprag elements and replace as necessary. See Figure 183.
128. Assemble the sprag, using Figure 183 for assy. purposes. ***Note: I.D. rib faces up***. Assemble the upper end bearing and snap ring as shown in Figure 184.
129. Inspect the inner race for wear, and assemble the inner race into the F2 freewheel assembly and check for proper rotation. ***Note: The inner race freewheels counter clockwise and locks clockwise when holding the outer race*** .See Figure 185.

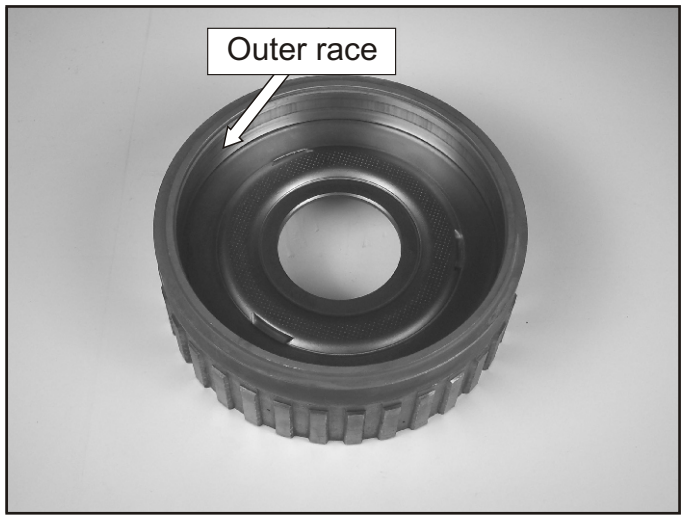


Figure 181

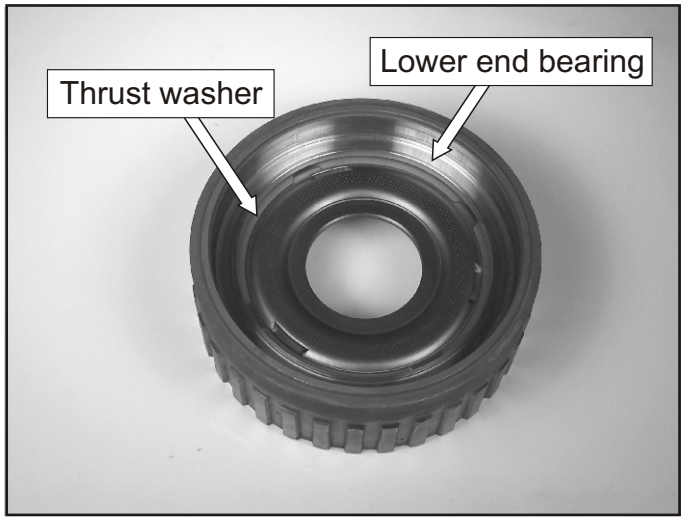


Figure 182

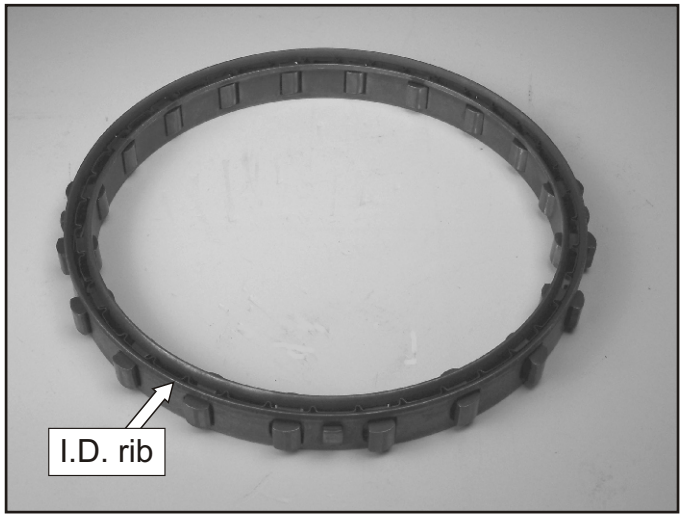


Figure 183

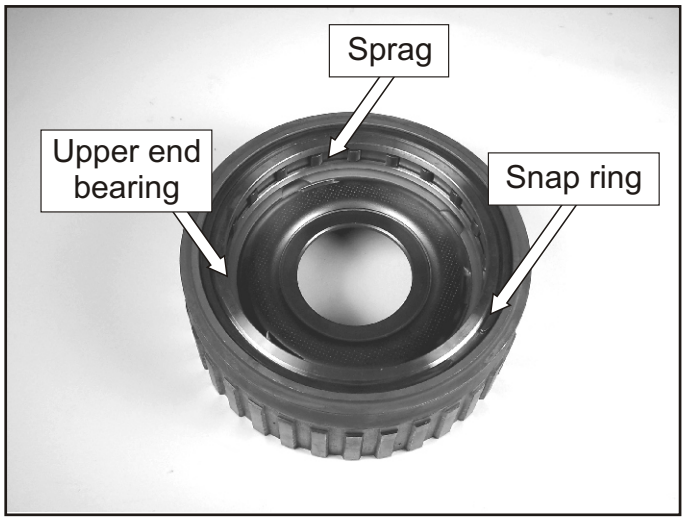


Figure 184

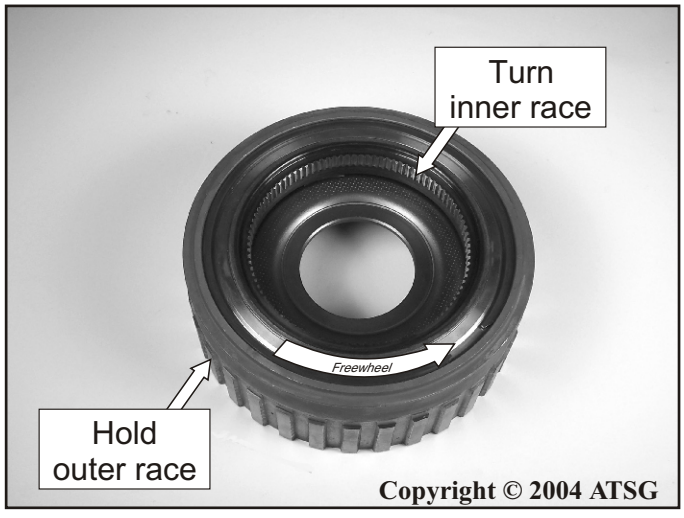


Figure 185

SUB-ASSEMBLIES
"COUNTER DRIVE GEAR"

130. Using a hammer and punch remove the stakes on the lock nut. Place the Counter drive gear in a suitable holding fixture or vice and remove the 60mm nut. See Figure 186.
131. Remove the bearing race using a suitable two jaw puller. This will remove the front bearing along with the race. See Figure 187.
132. Remove the crush sleeve shown in Figure 188.
133. Using a suitable two jaw bearing puller, remove the rear bearing shown in Figure 189.
134. Refer to Figure 190 for a view of the complete assembly dis-assembled.

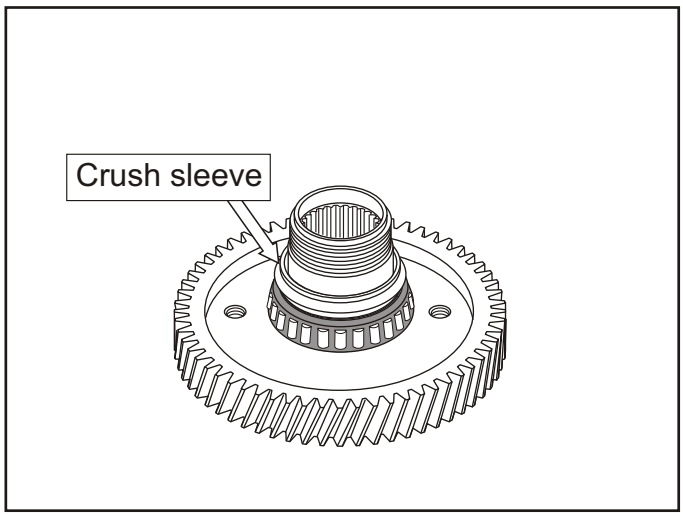


Figure 188

Continued on Page 75

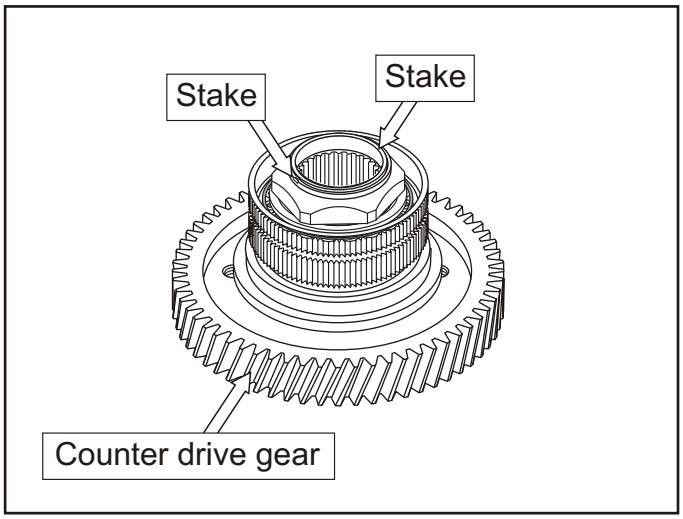


Figure 186

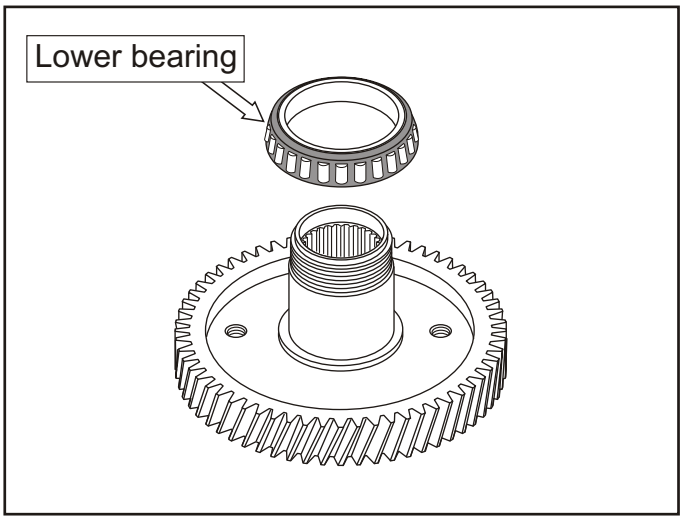


Figure 189

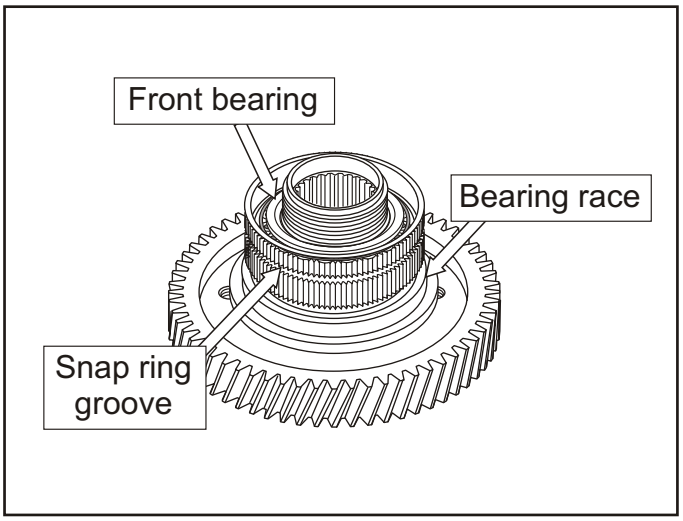
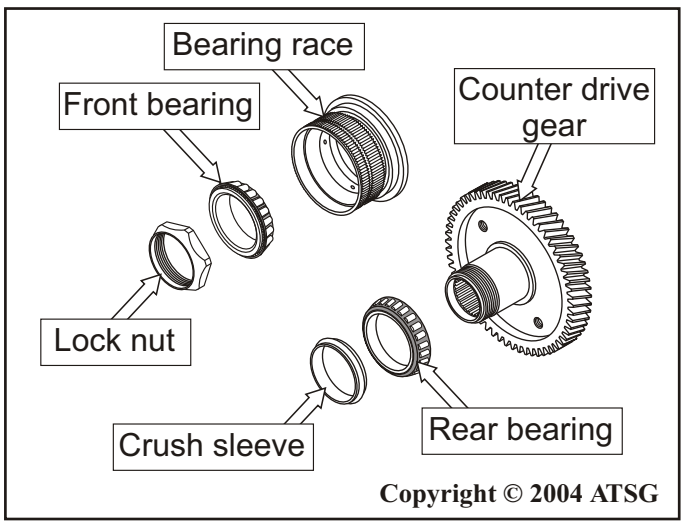


Figure 187



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Figure 190

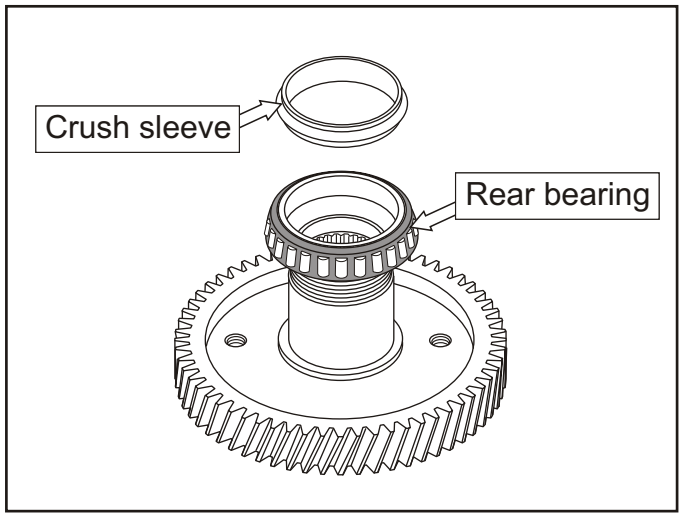


Figure 191

SUB-ASSEMBLIES
"COUNTER DRIVE GEAR Contd."

135. Press the rear bearing onto the counter drive gear and place a new crush sleeve on the top of the rear bearing as shown in Figure 191.
136. Assemble the bearing race on top of the rear bearing as shown in Figure 192.
137. Press the Front bearing onto the counter drive gear shaft as shown in Figure 193.
138. Place a new lock nut on to the counter drive gear and snug it down. See Figure 194.
139. Place the counter drive gear into a suitable holding fixture or vice and tighten the lock nut down until turning torque is approximately 3-7 in.lb. See Figure 195. Refer to Figure 186 and stake the lock nut in two places.

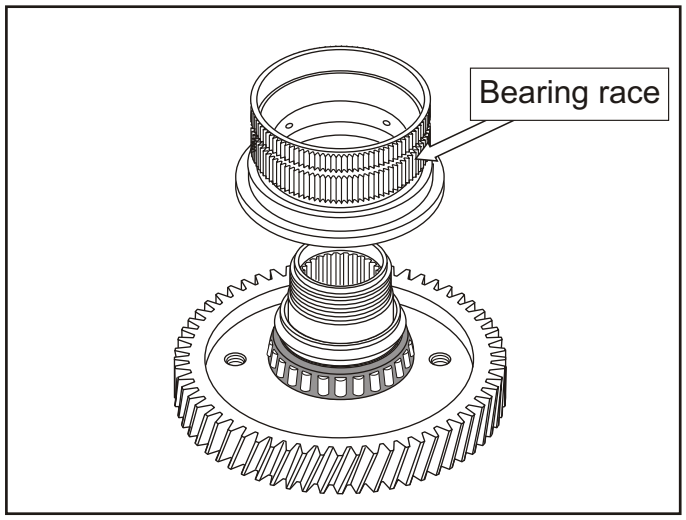


Figure 192

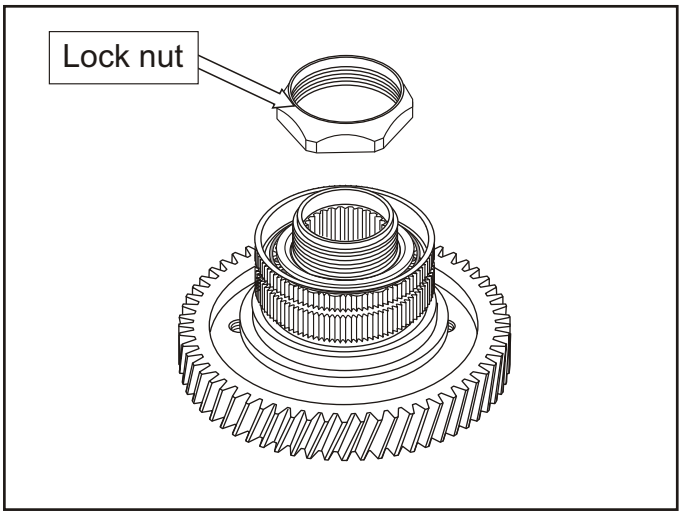


Figure 194

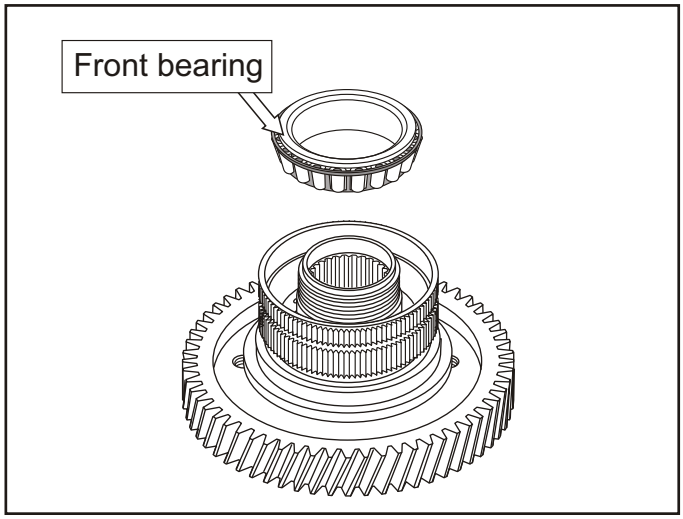
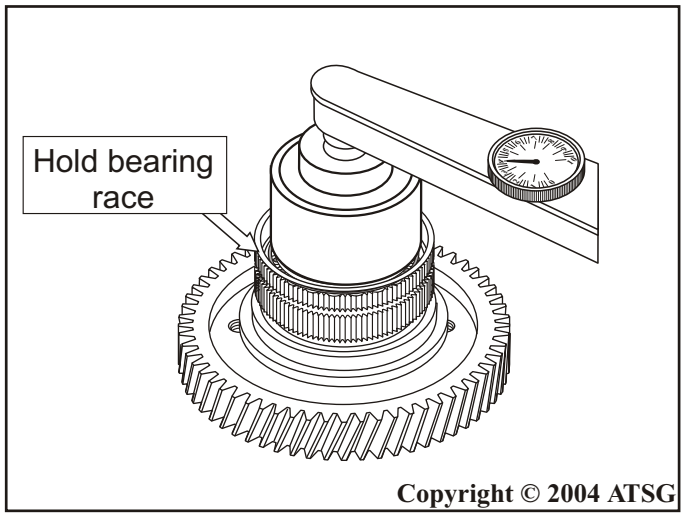


Figure 193



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Figure 195

SUB-ASSEMBLIES
"C1 / C2 DRUM"

140. Remove the snap ring and C1 clutch assembly as shown in Figure 196.
141. Remove the snap ring and C2 clutch assembly as shown in Figure 197.
142. Using a suitable press, remove the snap ring and return spring as shown in Figure 198.
143. Remove the C1 and C2 pistons from the drum as shown in Figure 199.
144. Refer to Figure 200 for a view of the complete assembly dis-assembled.

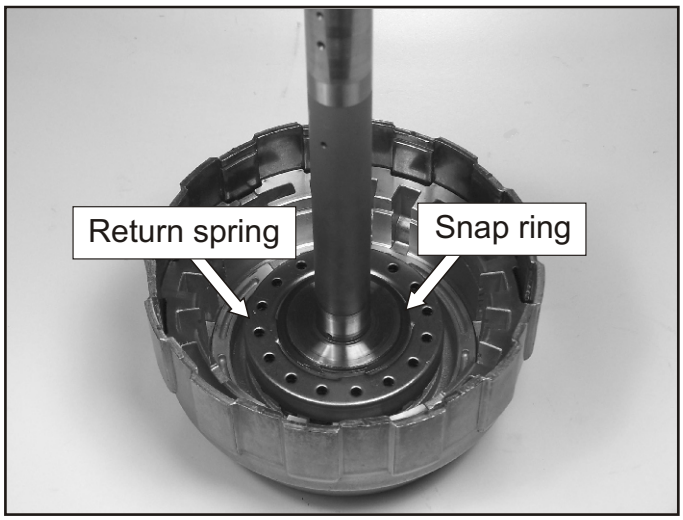


Figure 198

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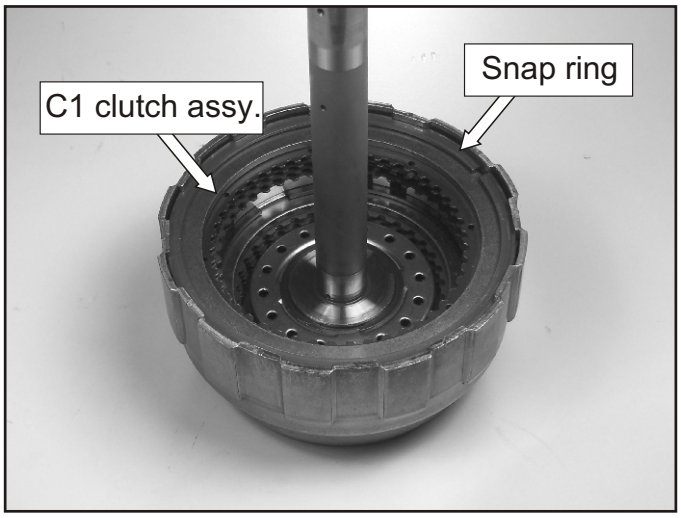


Figure 196

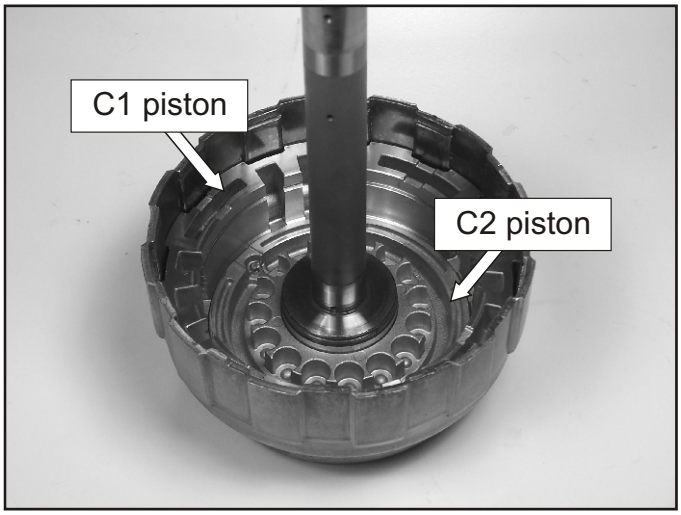


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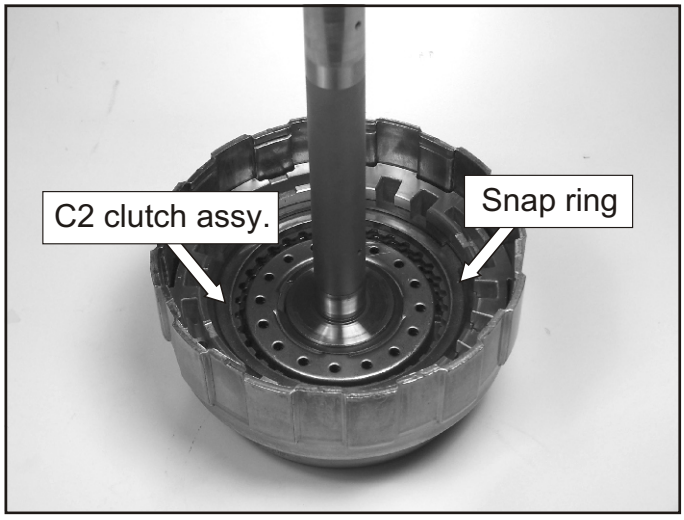


Figure 197

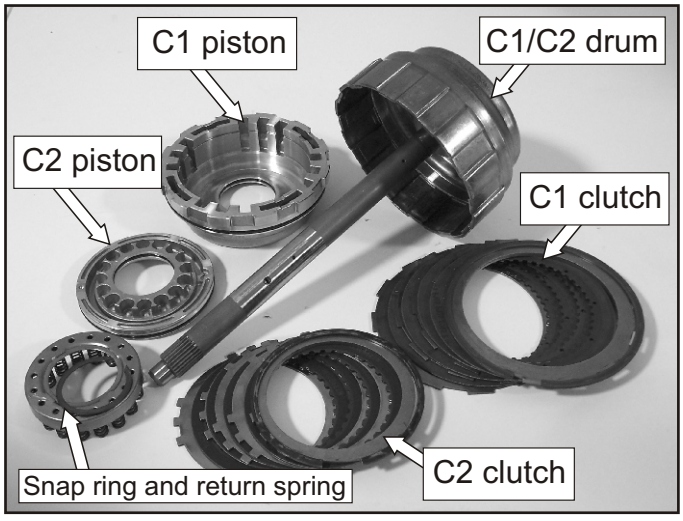


Figure 200

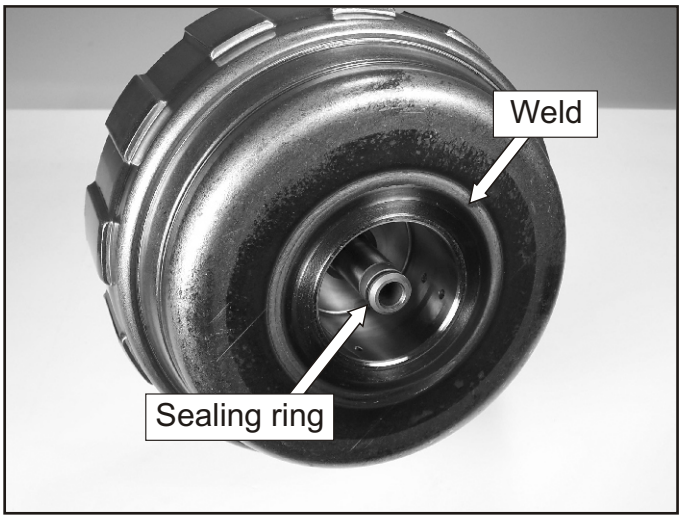


Figure 201

SUB-ASSEMBLIES
"C1 / C2 DRUM Contd."

145. Inspect the rear of the C1/C2 drum where the weld is to ensure there are no visible cracks. Replace the sealing ring shown in Figure 201. ***Note: This drum is notorious for cracking.***
146. Inspect the check ball in the C1 piston for debris and replace the inner and outer piston o-rings as shown in Figure 202.
147. Lubricate the inner and outer o-rings, and the area where they ride in the drum, and install the C1 piston. See Figure 203.
148. Inspect the check ball in the C2 piston for debris and replace the inner and outer piston o-rings as shown in Figure 204.
149. Lubricate the inner and outer o-rings, and the area where they ride in the drum, and install the C2 piston. See Figure 205.

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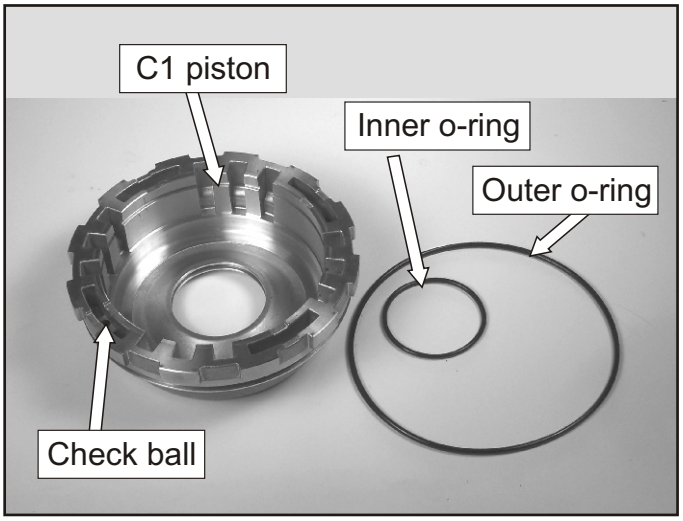


Figure 202

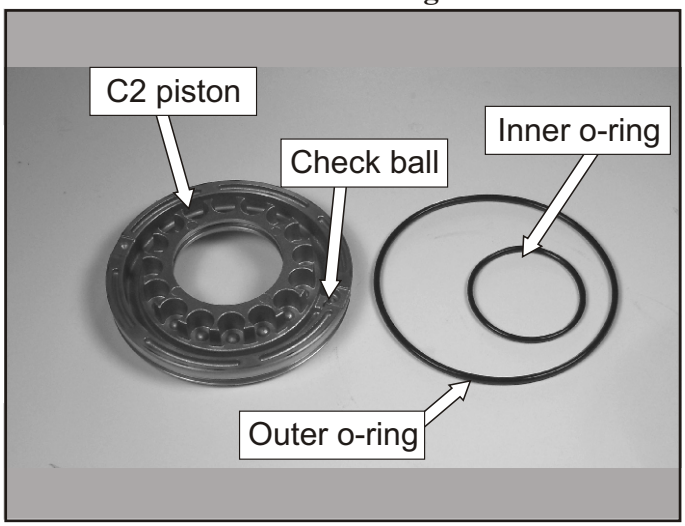


Figure 204

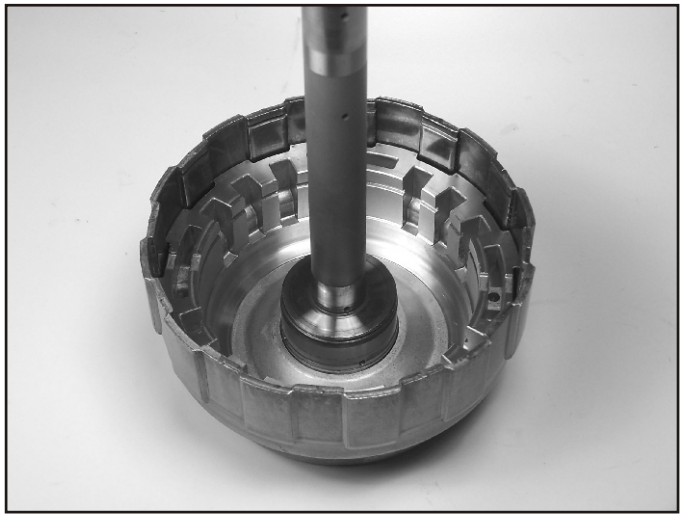


Figure 203

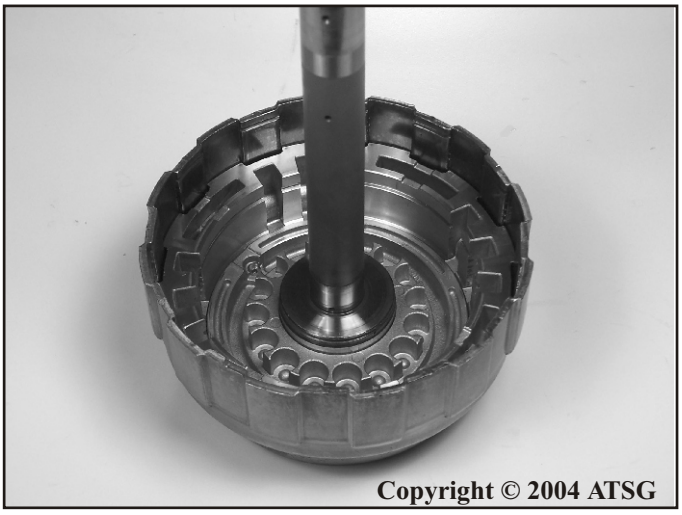


Figure 205

SUB-ASSEMBLIES
"C1 / C2 DRUM Contd."

150. Install the return spring and snap ring as shown in Figure 206.
151. Install the C2 clutch assembly into the drum as shown in Figure 208. Use Figure 207 as an assembly guide. Install a .072" steel plate into drum first, then install the remaining C2 clutch plates and steels ending with the pressure plate and snap ring. Clutch clearance should be between .025" to .035."
152. Install the C1 clutch assembly into the drum as shown in Figure 210. Use Figure 209 as an assembly guide. Install a .072" steel plate into drum first, then install the remaining C1 clutch plates and steels ending with the pressure plate and snap ring. Clutch clearance should be between .035" to .045."
Note: The C1 and C2 clutch plates are slightly waved.

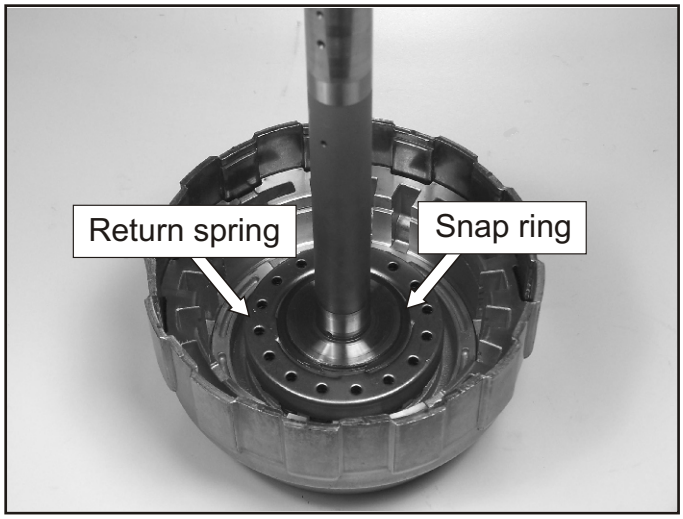


Figure 206

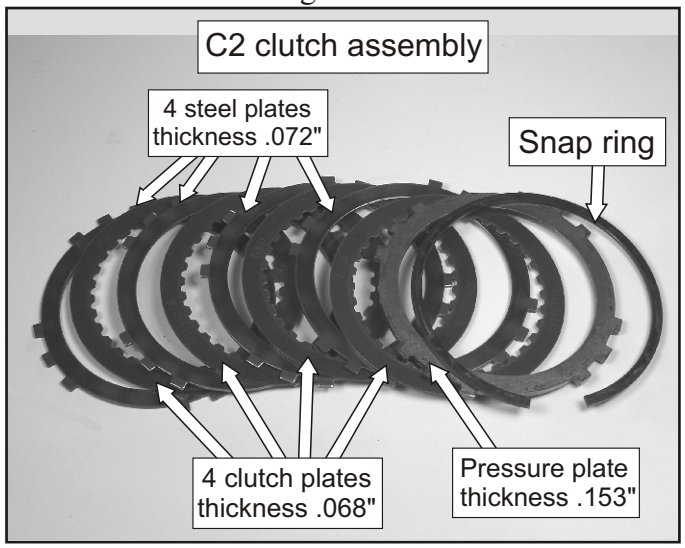


Figure 207

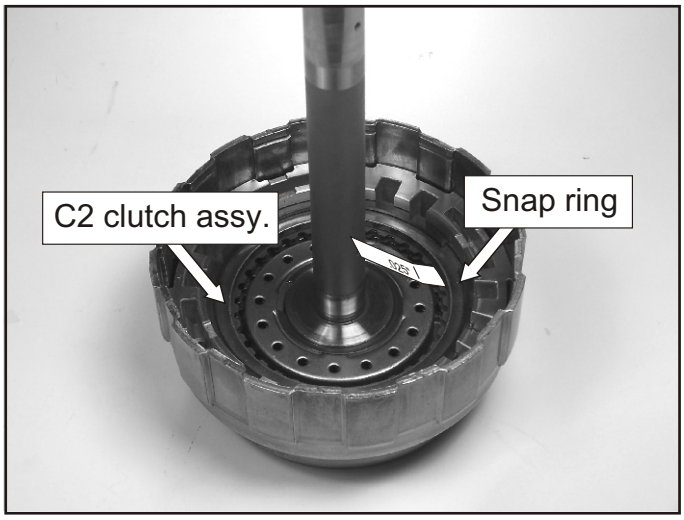


Figure 208

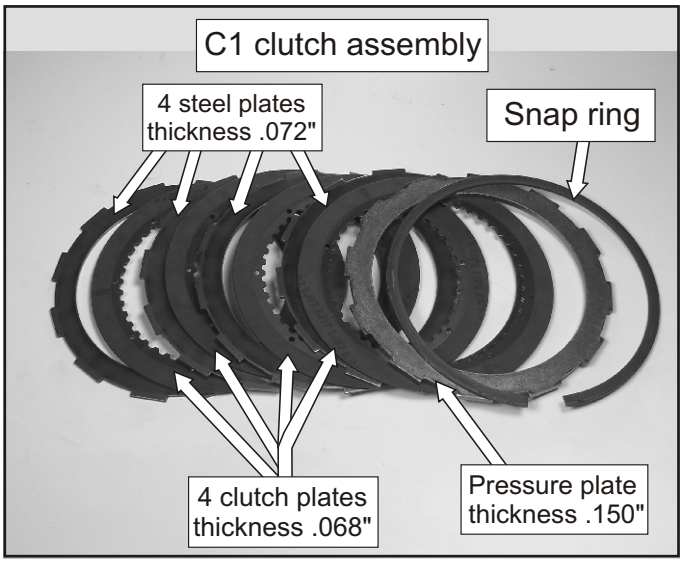


Figure 209

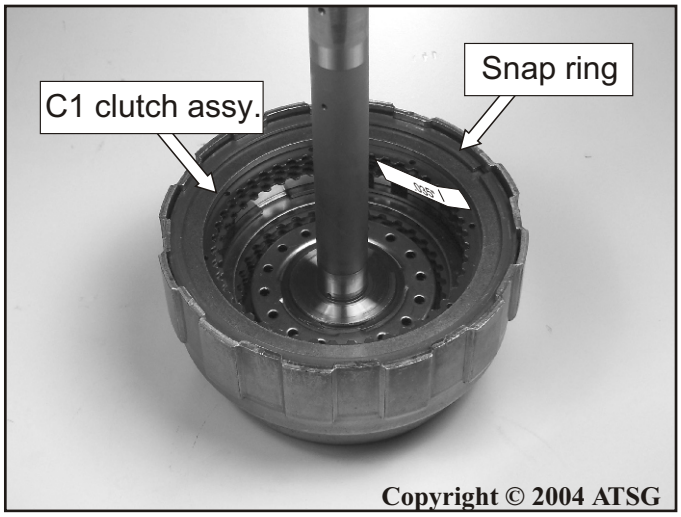


Figure 210

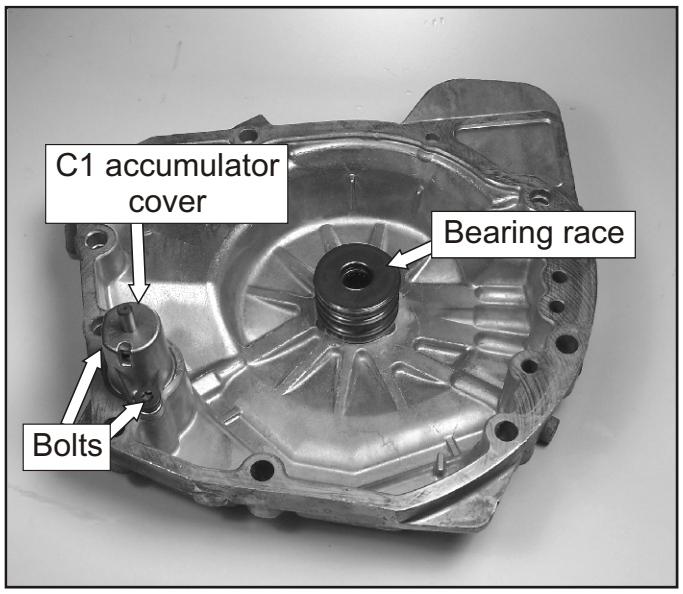


Figure 211

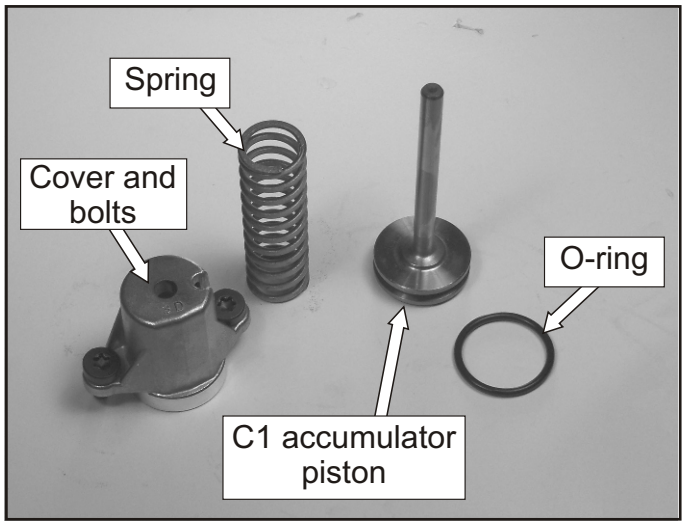


Figure 212

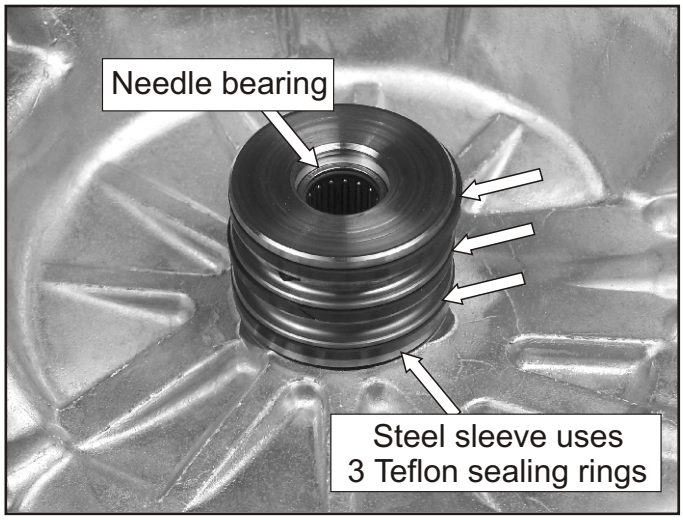


Figure 213

SUB-ASSEMBLIES
"REAR COVER"

153. Remove the bearing race and the two 30 torx bolts retaining the C1 accumulator cover. **Caution: The cover is spring loaded.** ***Note: The bolt lengths are 14mm.*** Once the cover is off, remove the spring and piston from the cover. See Figure 211.
154. See Figure 212 for a view of the accumulator assembly completely dis-assembled.
155. Inspect the needle bearing in the rear cover and replace the three sealing rings as shown in Figure 213. ***Note: The early design rear cover has an aluminum sleeve which requires steel sealing rings. ATSG recommends the late design, which is the steel sleeve.***
156. Lubricate the rear cover shown in Figure 214, replace the C1 accumulator piston o-ring and install it into the rear cover. See Figure 215.

Continued on Page 80

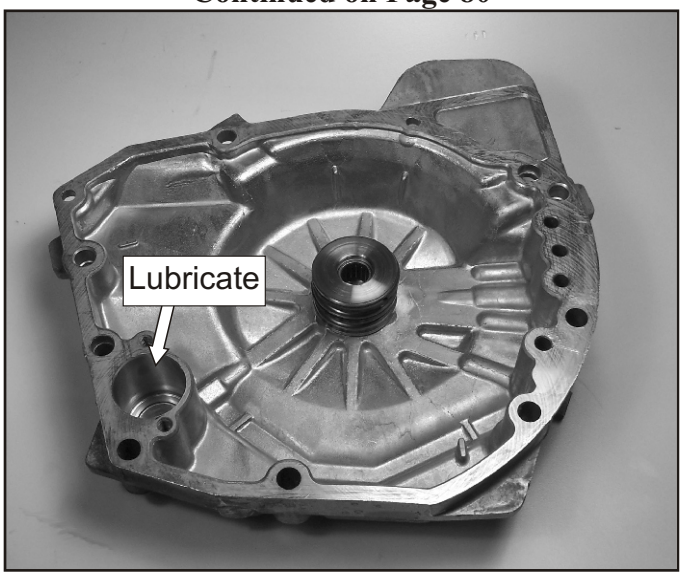


Figure 214

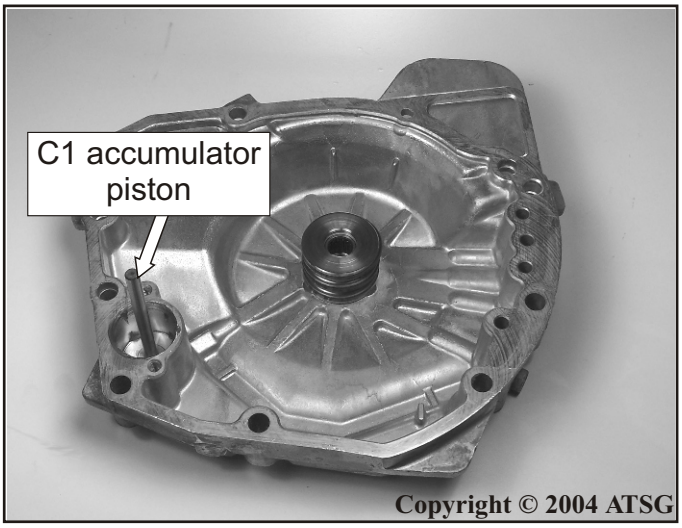


Figure 215

SUB-ASSEMBLIES
"REAR COVER Contd."

157. Install the C1 accumulator spring over the accumulator piston as shown in Figure 216.
158. Assemble the C1 accumulator cover into the rear cover and torque the 30 torx bit bolts to 70-100 in. lb. See Figure 217.
159. Install the Bearing race, using some assembly grease. See Figure 218.
160. Place the C1 / C2 drum onto the rear cover and air check the clutches using 80-100psi. of air pressure. See Figure 219. Refer to Figure 220 to identify the air check ports.

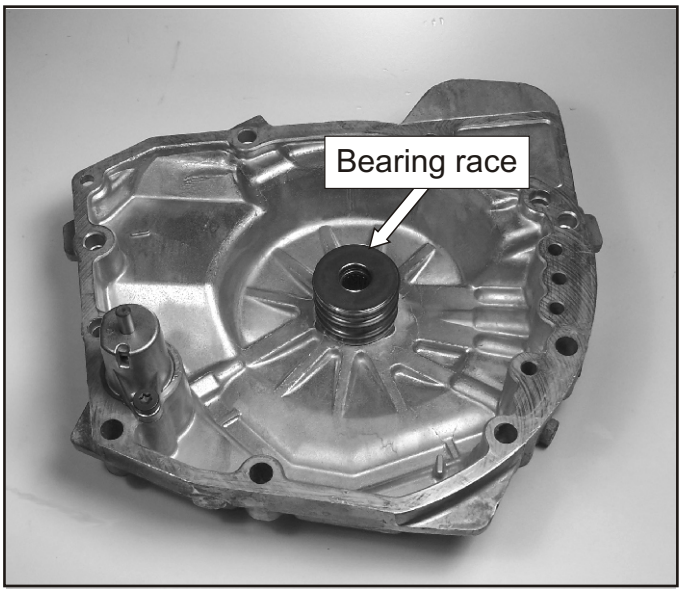


Figure 218

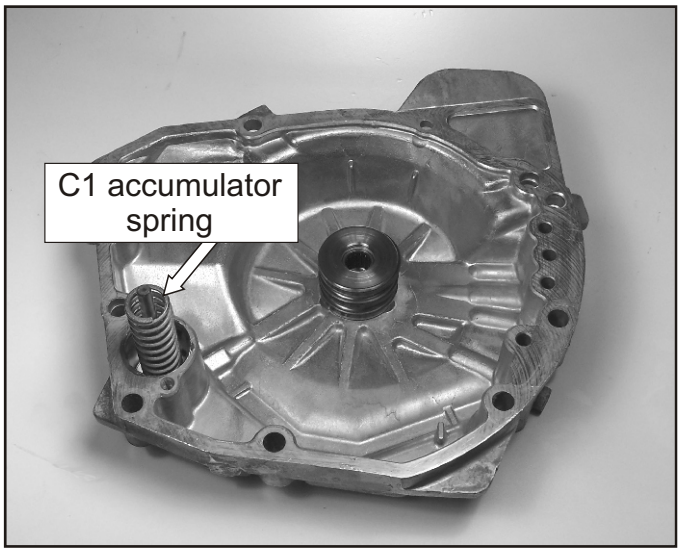


Figure 216

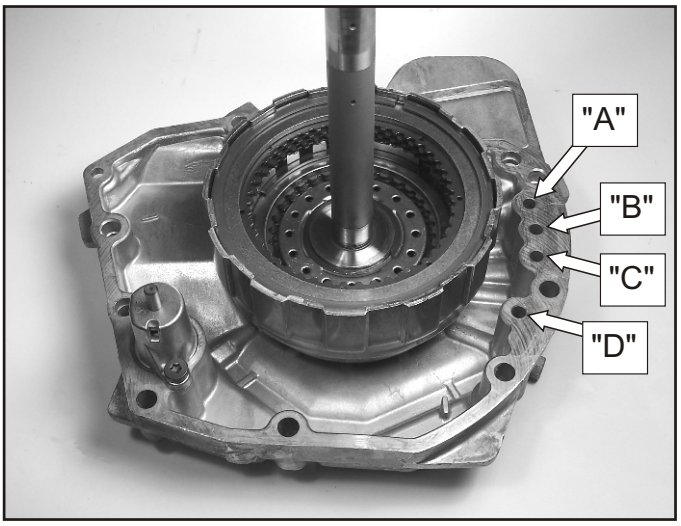


Figure 219

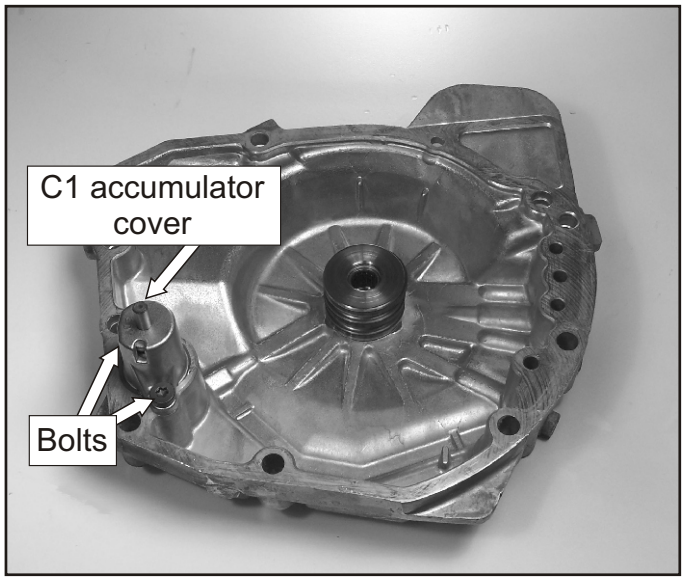


Figure 217

C1/C2 AIR CHECKS

"A"= C1 clutch
"B"= C2 clutch
"C"= lube
"D"= C1 clutch

Note: When air checking the C1 clutch thru the D port, you must cover the A port and vice-versa. The C1 accumulator will stroke when the C1 clutch is applied.

Figure 220

SUB-ASSEMBLIES

VALVE BODY EXPLODED VIEWS AND IDENTIFICATION OF COMPONENTS

Refer to Figure 221 for Solenoid identification and locations on the valve body.

Refer to Figure 222 for valve identification and locations in the "Upper" valve body.

Refer to Figure 223 for valve identification and locations in the "Center" valve body, "Front" side.

Refer to Figure 224 for valve identification and locations in the "Center" valve body, "Rear" side.

Refer to Figure 225 for valve identification and locations in the "Lower" valve body, "Front" side.

Refer to Figure 226 for valve identification and locations in the "Lower" valve body, "Rear" side.

Refer to Figure 227 for illustrations of the typical spacer plates.

Refer to Figure 228 for the check valve and check ball locations in the "Lower" valve body.

Refer to Figure 229 for the screen locations in the "Center" valve body, "Upper" valve body side.

Refer to Figure 230 for the check valve and check ball locations in the "Center" valve body, "Lower" valve body side.

Refer to Figure 231 for bolt identification and locations for the "Lower" valve body.

SOLENOID IDENTIFICATION AND BOLT LOCATIONS

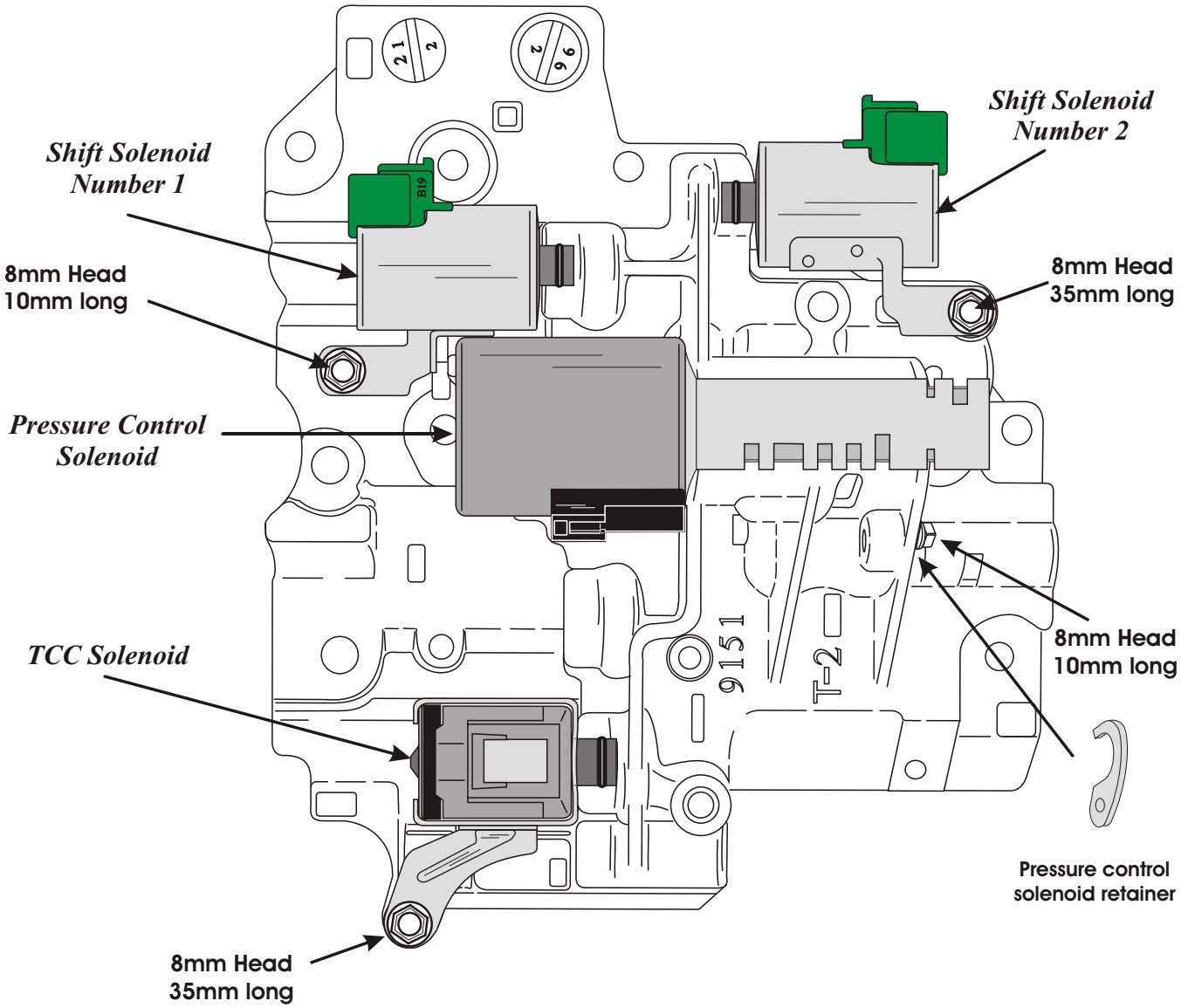
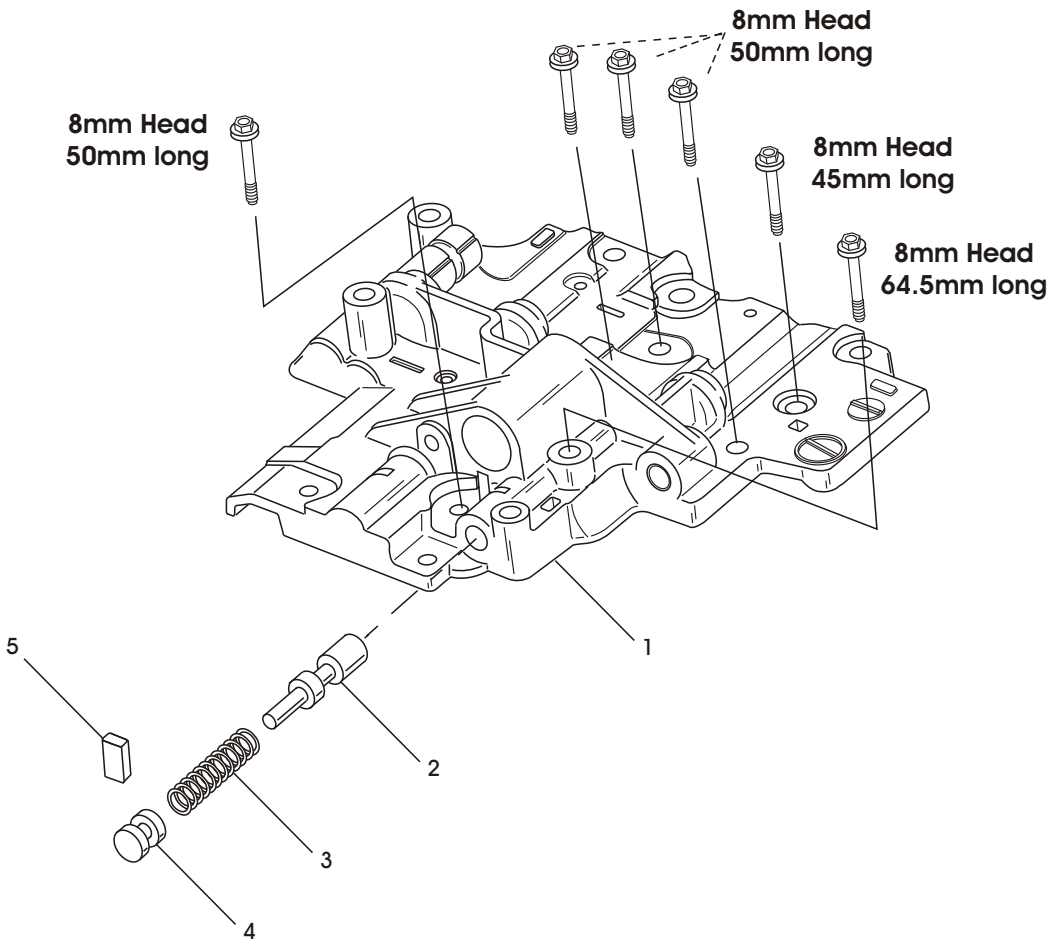


Figure 221

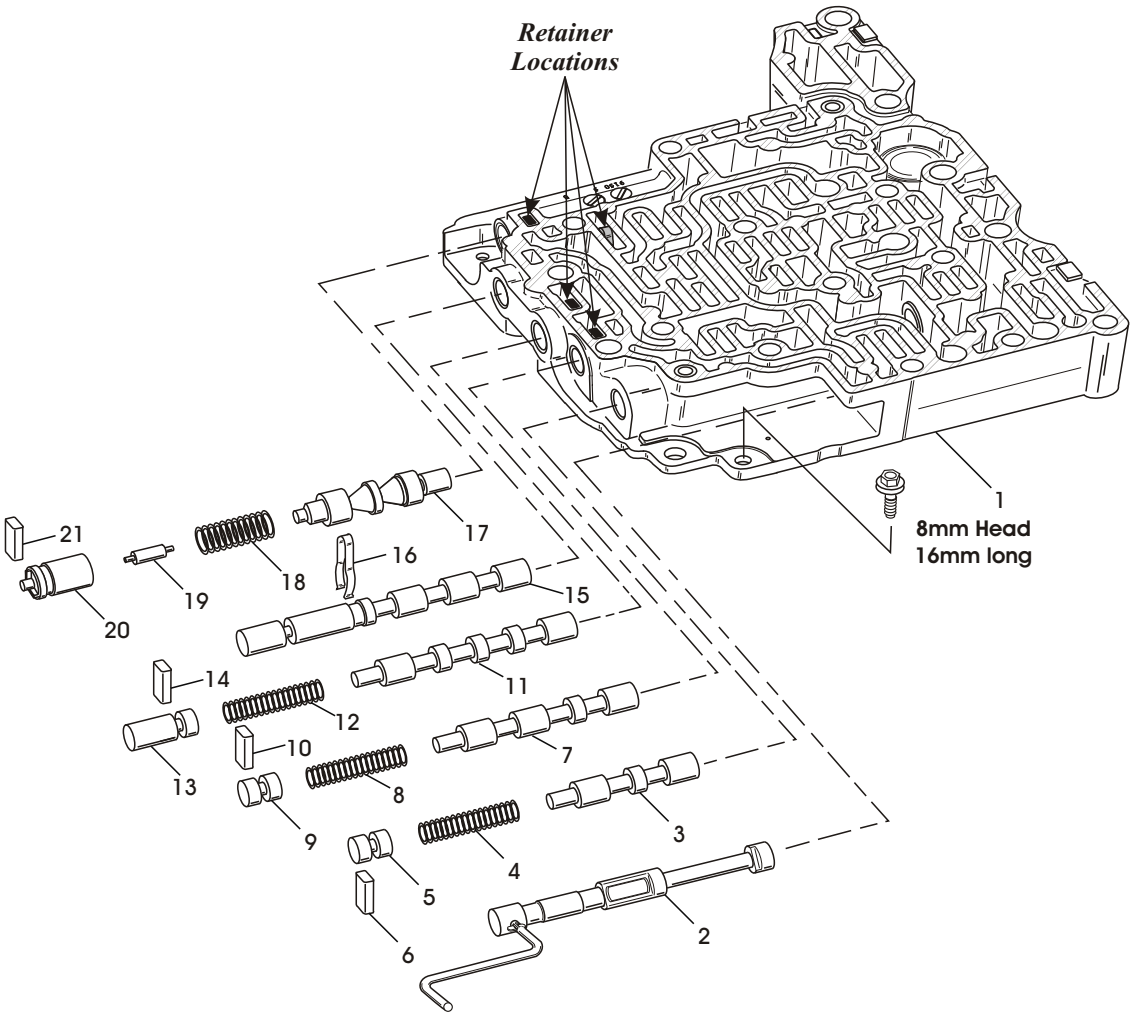
UPPER VALVE BODY
VALVE IDENTIFICATION AND BOLT LOCATIONS



1. UPPER VALVE BODY CASTING
2. PRESSURE CONTROL SOLENOID REGULATOR VALVE
3. PRESSURE CONTROL SOLENOID REGULATOR VALVE SPRING
4. PRESSURE CONTROL SOLENOID REGULATOR VALVE BORE PLUG
5. PRESSURE CONTROL SOLENOID REGULATOR VALVE BORE PLUG RETAINER

Figure 222

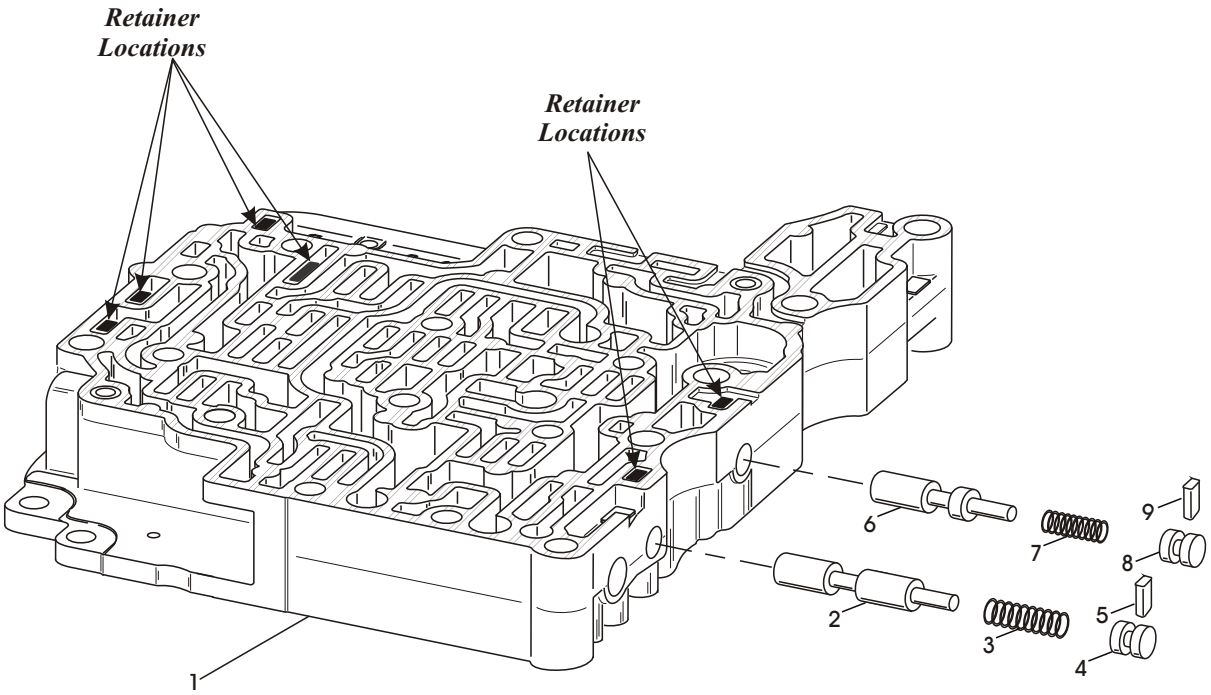
CENTER VALVE BODY "FRONT" SIDE
VALVE IDENTIFICATION AND LOCATIONS



1. CENTER VALVE BODY CASTING
2. MANUAL VALVE
3. 2-3 SHIFT VALVE
4. 2-3 SHIFT VALVE SPRING
5. 2-3 SHIFT VALVE BORE PLUG
6. 2-3 SHIFT VALVE RETAINER
7. 3-4 SHIFT VALVE
8. 3-4 SHIFT VALVE SPRING
9. 3-4 SHIFT VALVE BORE PLUG
10. 3-4 SHIFT VALVE RETAINER
11. 1-2 SHIFT VALVE
12. 1-2 SHIFT VALVE SPRING
13. 1-2 SHIFT VALVE BORE PLUG
14. 1-2 SHIFT VALVE RETAINER
15. NEUTRAL CONTROL VALVE
16. NEUTRAL CONTROL VALVE RETAINER
17. PRIMARY REGULATOR VALVE
18. PRIMARY REGULATOR VALVE SPRING
19. PLUNGER
20. PLUNGER SLEEVE
21. PLUNGER SLEEVE RETAINER

Figure 223

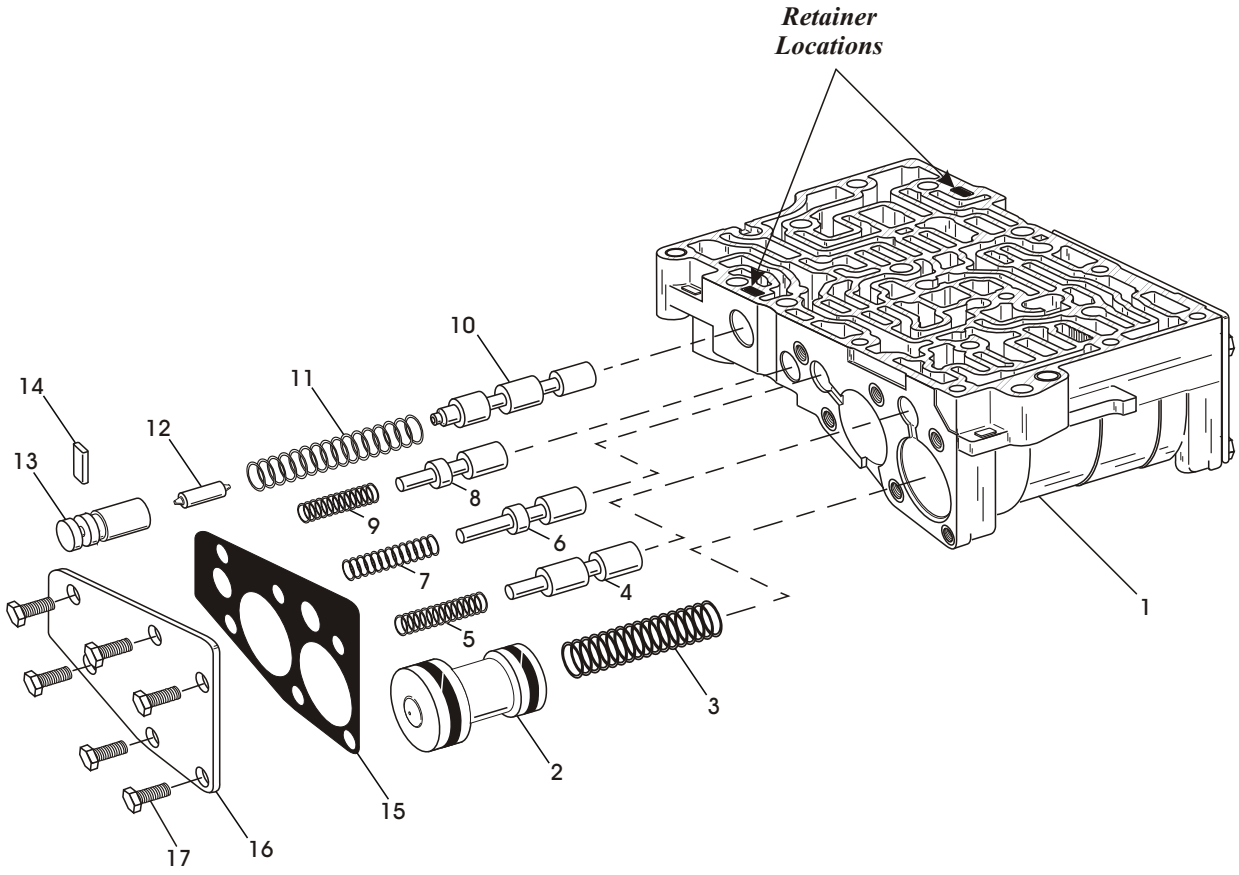
CENTER VALVE BODY "REAR" SIDE
VALVE IDENTIFICATION AND LOCATIONS



1. CENTER VALVE BODY CASTING
2. CLUTCH MODULATOR VALVE
3. CLUTCH MODULATOR VALVE SPRING
4. CLUTCH MODULATOR VALVE BORE PLUG
5. CLUTCH MODULATOR VALVE RETAINER
6. TCC SOLENOID REGULATOR VALVE
7. TCC SOLENOID REGULATOR VALVE SPRING
8. TCC SOLENOID REGULATOR VALVE BORE PLUG
9. TCC SOLENOID REGULATOR VALVE RETAINER

Figure 224

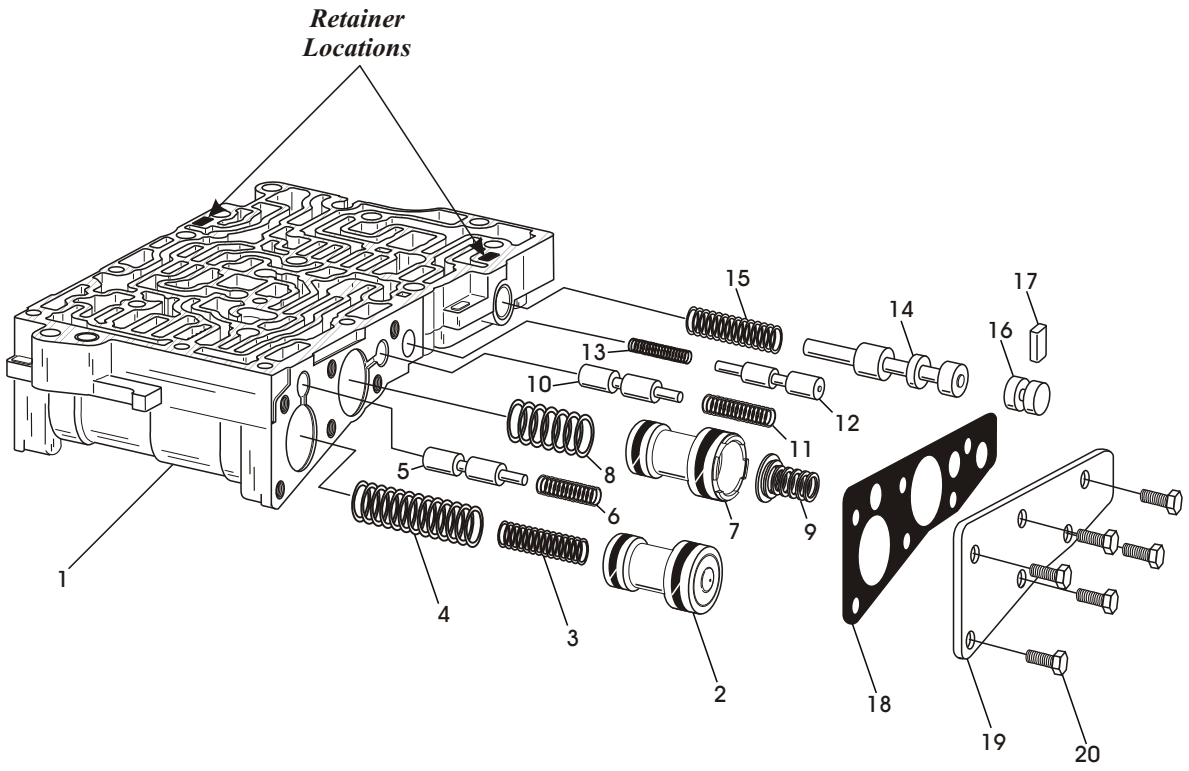
LOWER VALVE BODY "FRONT" SIDE
VALVE IDENTIFICATION AND LOCATIONS



1. LOWER VALVE BODY
2. C3 ACCUMULATOR PISTON
3. C3 ACCUMULATOR PISTON SPRING
4. C3 ACCUMULATOR VALVE
5. C3 ACCUMULATOR VALVE SPRING
6. B1 ACCUMULATOR VALVE
7. B1 ACCUMULATOR VALVE SPRING
8. LOW COAST MODULATOR VALVE (B3)
9. LOW COAST MODULATOR VALVE SPRING (B3)
10. LOCK-UP CONTROL VALVE
11. LOCK-UP CONTROL VALVE SPRING
12. PLUNGER
13. PLUNGER SLEEVE
14. LOCK-UP CONTROL VALVE RETAINER
15. COVER PLATE GASKET
16. COVER PLATE
17. COVER PLATE BOLTS (7)

Figure 225

LOWER VALVE BODY "REAR" SIDE
VALVE IDENTIFICATION AND LOCATIONS

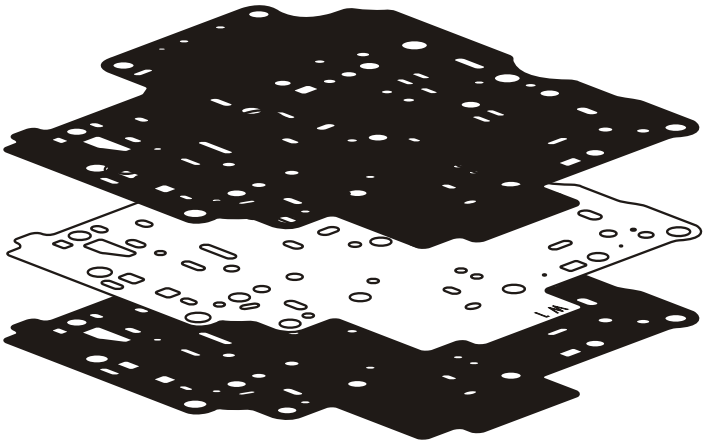


1. LOWER VALVE BODY
2. C2 ACCUMULATOR PISTON
3. C2 ACCUMULATOR SPRING (INNER)
4. C2 ACCUMULATOR SPRING (OUTER)
5. C2 ACCUMULATOR VALVE
6. C2 ACCUMULATOR VALVE SPRING
7. B2 ACCUMULATOR PISTON
8. B2 ACCUMULATOR SPRING (INBOARD)
9. B2 ACCUMULATOR SPRING (OUTBOARD)
10. B2 ACCUMULATOR VALVE
11. B2 ACCUMULATOR SPRING
12. ACCUMULATOR CONTROL VALVE
13. ACCUMULATOR CONTROL VALVE SPRING
14. SECONDARY REGULATOR VALVE
15. SECONDARY REGULATOR VALVE SPRING
16. SECONDARY REGULATOR VALVE BORE PLUG
17. SECONDARY REGULATOR VALVE RETAINER
18. COVER PLATE GASKET
19. COVER PLATE
20. COVER PLATE BOLTS (7)

Figure 226

"TYPICAL" SPACER PLATES AND GASKETS

CENTER VALVE BODY
TO UPPER VALVE BODY
SPACER PLATE AND GASKETS



LOWER VALVE BODY
TO CASE SPACER PLATE AND GASKETS

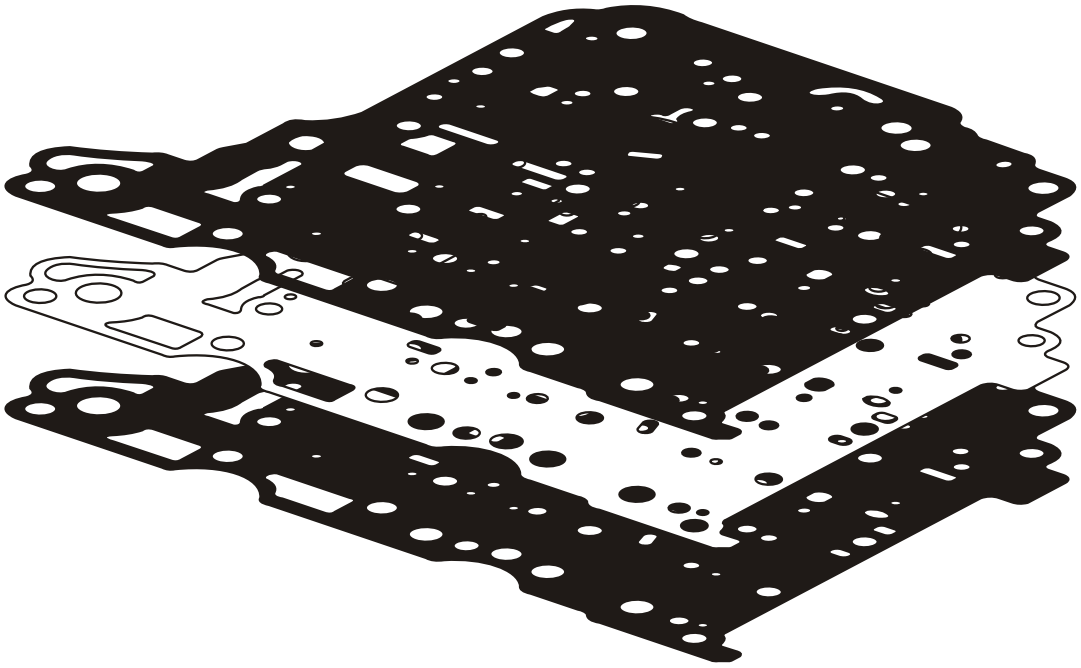


Figure 227

"LOWER" VALVE BODY

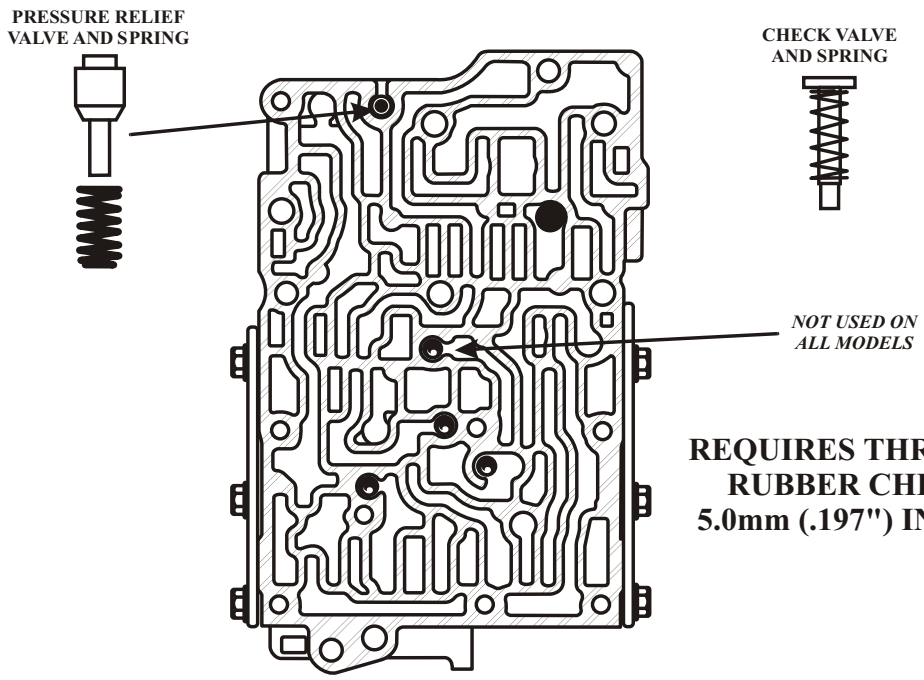


Figure 228

VOLVO/SAAB AW50-42LE
"CENTER" VALVE BODY, "UPPER" VALVE BODY SIDE

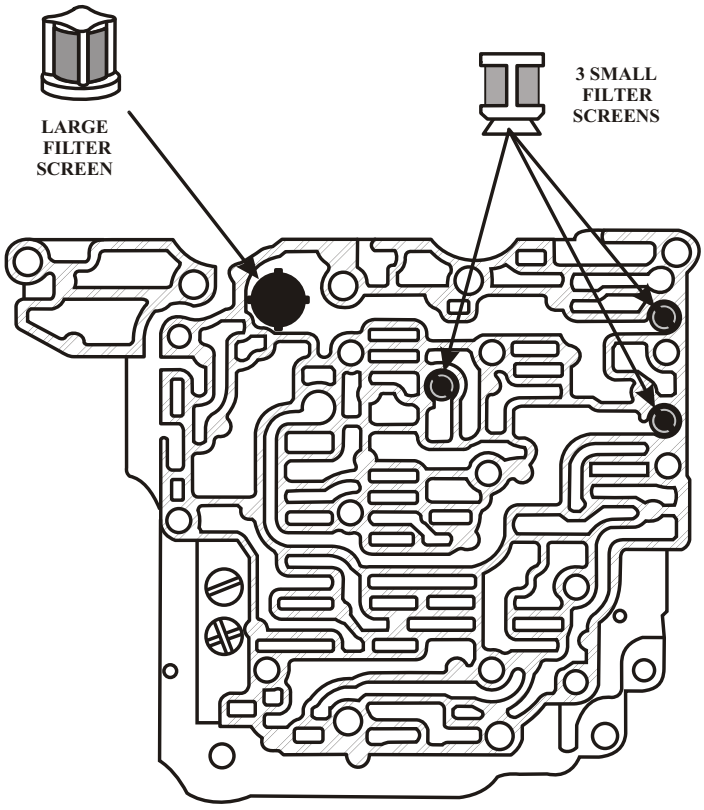


Figure 229

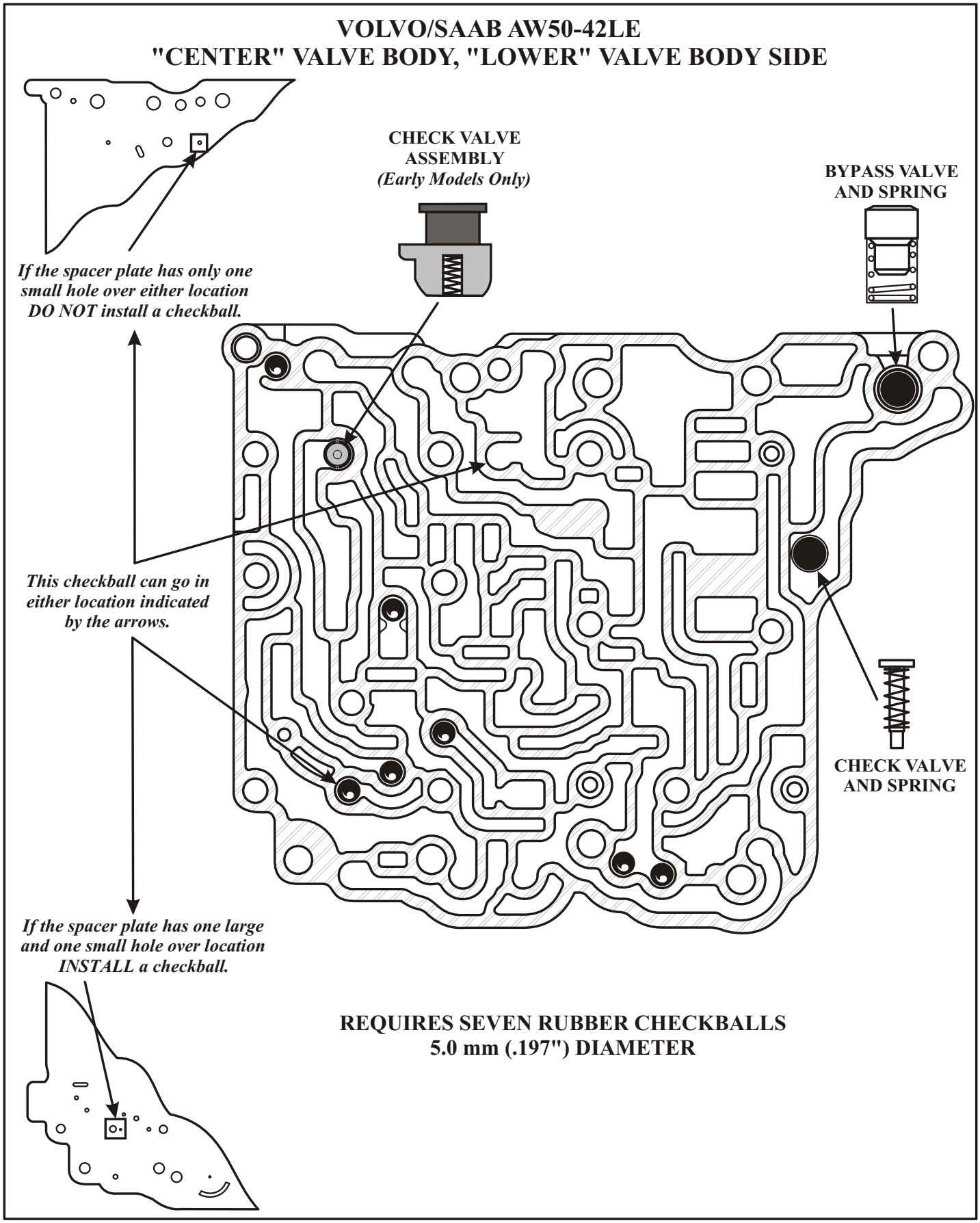

VOLVO/SAAB AW50-42LE
"CENTER" VALVE BODY, "LOWER" VALVE BODY SIDE
CHECK VALVE ASSEMBLY (Early Models Only)
BYPASS VALVE AND SPRING
If the spacer plate has only one small hole over either location DO NOT install a checkball.
This checkball can go in either location indicated by the arrows.
CHECK VALVE AND SPRING
If the spacer plate has one large and one small hole over location INSTALL a checkball.
REQUIRES SEVEN RUBBER CHECKBALLS
5.0 mm (.197") DIAMETER

Figure 230

LOWER VALVE BODY
LOWER SIDE BOLT LOCATIONS

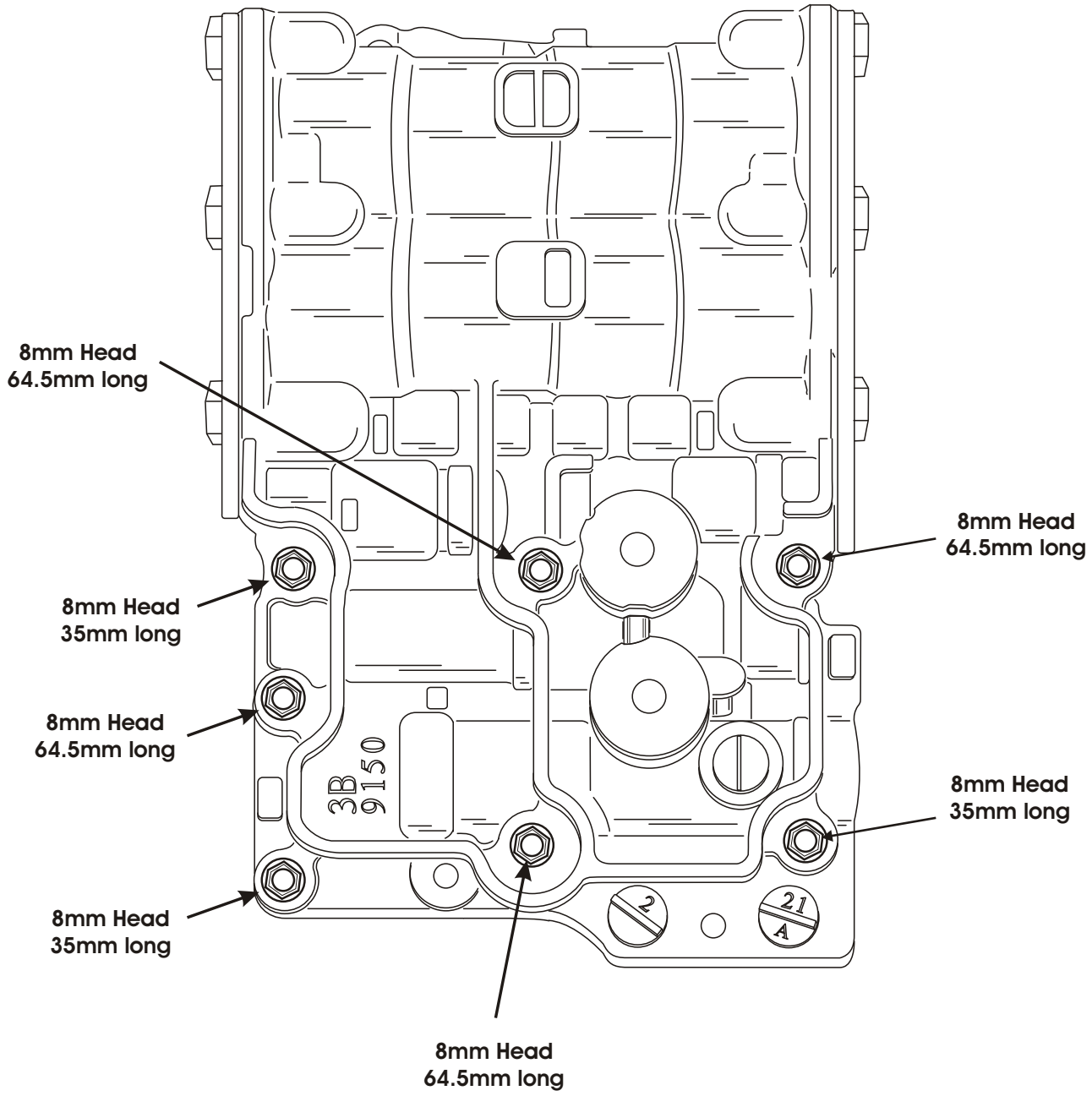


Figure 231

TRANSMISSION REASSEMBLY

161. Refer to Figure 232 to see a view of the completed counter drive gear assembly.
162. Assemble the counter drive gear thru the rear of the mid case and assemble the snap ring with the taper facing up. Replace the axle seal as shown in Figure 233.
163. Lubricate the inside of the mid case where the B3 brake piston rides , replace the inner and outer o-rings, and assemble the piston into the case as shown in Figure 234.
164. Assemble the B3 return spring into the case over the B3 piston and install the retaining snap ring as shown in Figure 235.
165. Install the B3 brake lower pressure plate as shown in Figure 236.

Continued on Page 93

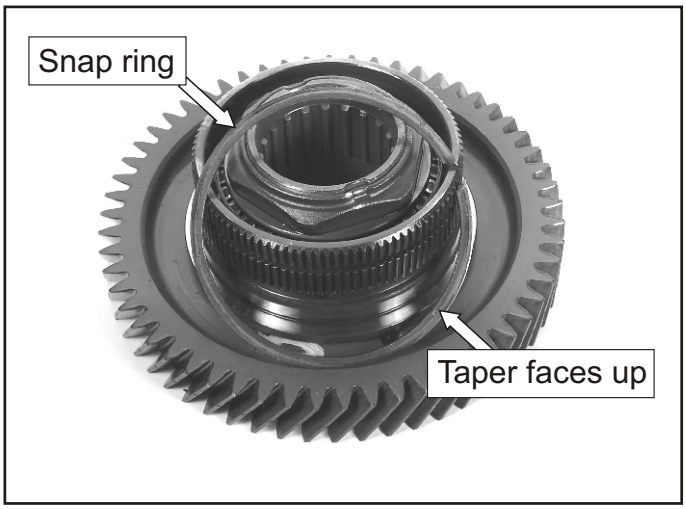


Figure 232

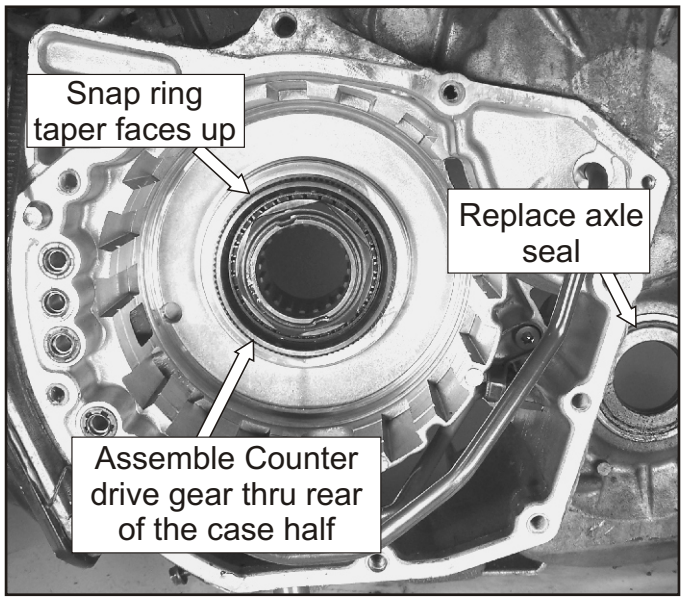


Figure 233

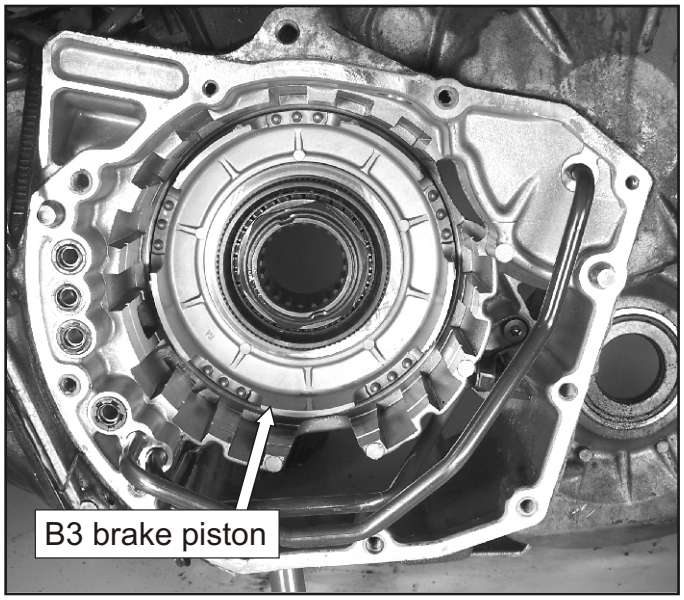


Figure 234

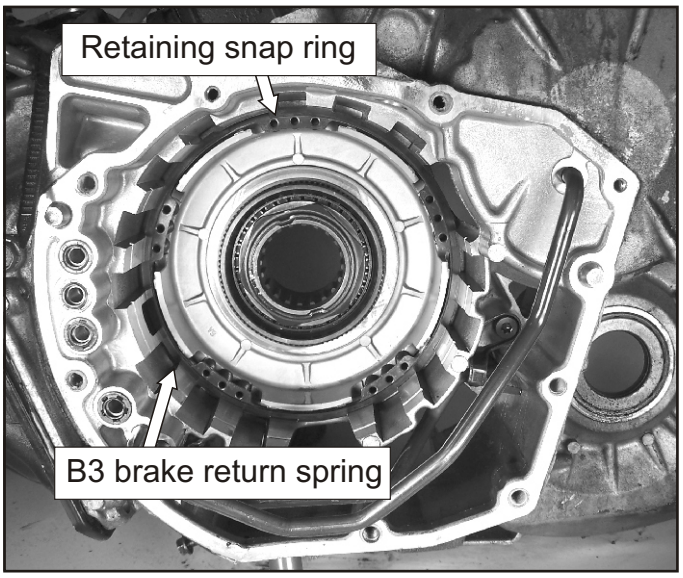


Figure 235

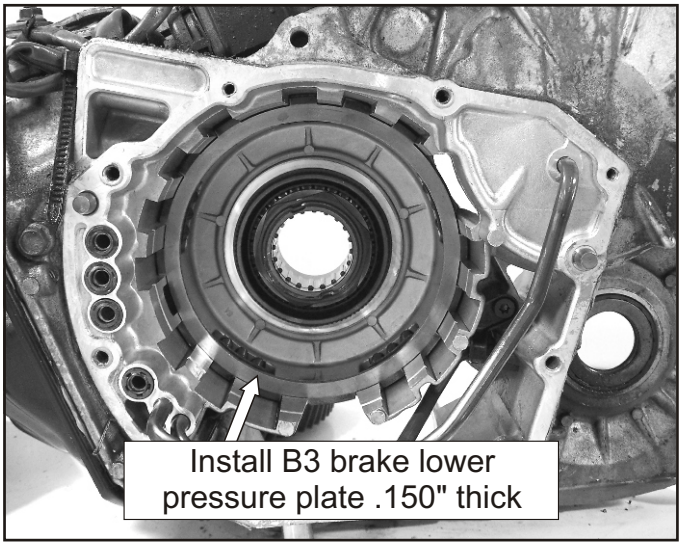


Figure 236

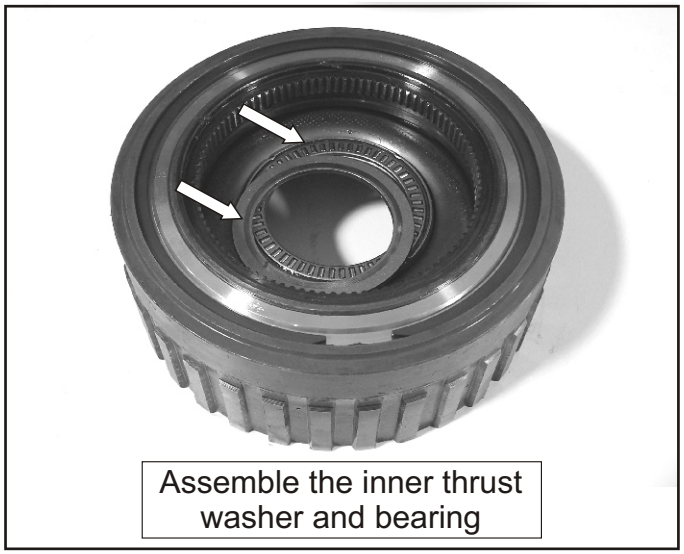


Figure 237



Figure 238

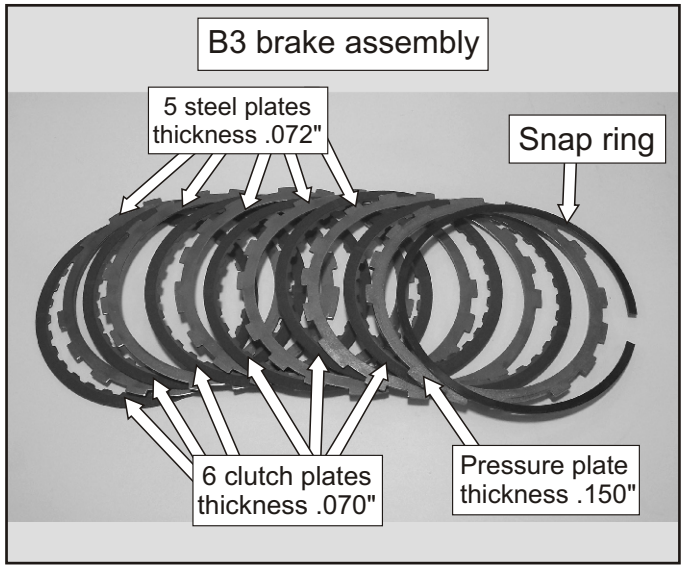


Figure 239

TRANSMISSION REASSEMBLY CONTINUED

166. Assemble the inner thrust washer and bearing into the rear ring gear assembly with assembly lube to hold them in place. See Figure 237.
167. Assemble the rear ring gear into the case half over the splines of the counter drive gear as shown in Figure 238.
168. Install the B3 brake assembly into the case half starting with a .070" clutch plate and ending with the .150" pressure plate and the snap ring. Check the clutch clearance using a feeler gage as shown in Figure 240. Clutch clearance should be between .040"-.050."Refer to Figure 239 as an assembly guide for the B3 brake. Install the rear ring gear internal bearing black side up.
169. Inspect the planetary pinion washers as shown in Figure 241. Replace as necessary.

Continued on Page 94

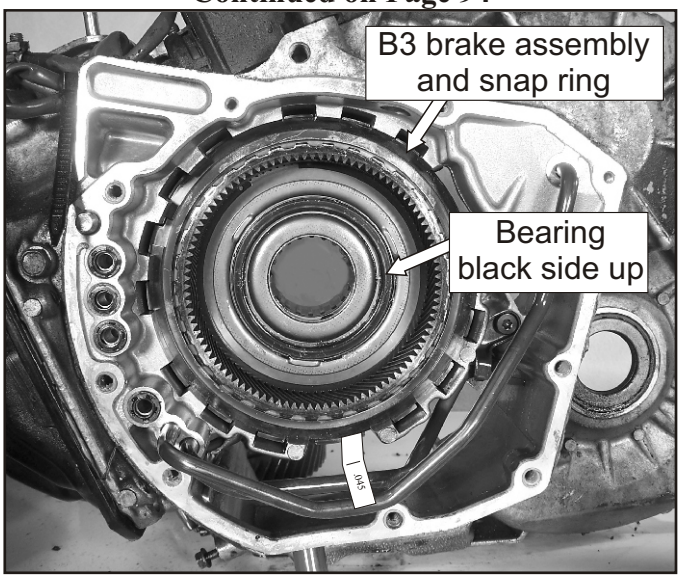


Figure 240



Figure 241

TRANSMISSION REASSEMBLY CONTINUED

170. Inspect the bushings in the planetary as shown in Figure 242. Replace as necessary.
171. Install the planetary assembly into the rear ring gear as shown in Figure 243. Install the rear planetary thrust washer.
172. Install the C1 hub rear thrust washer and the C1 hub front bearing with assembly lube to hold them in place. See Figure 244.
173. Install the C2 hub rear and front bearing with assembly lube to hold them in place as shown in Figure 245.
174. Index the C2 hub into the C2 clutch plates as shown in Figure 246.

Continued on Page 95

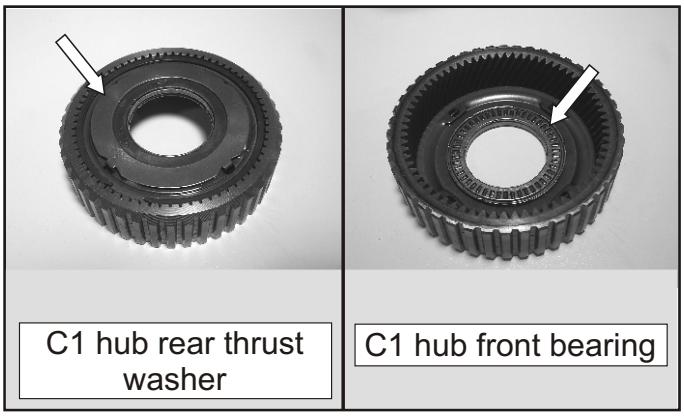


Figure 244

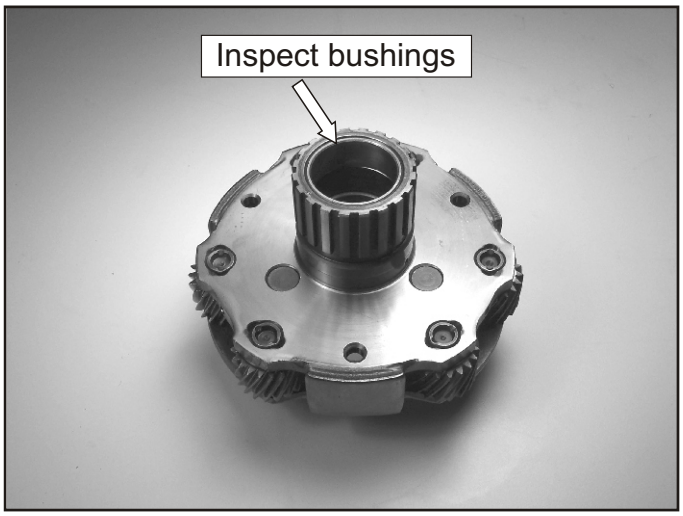


Figure 242

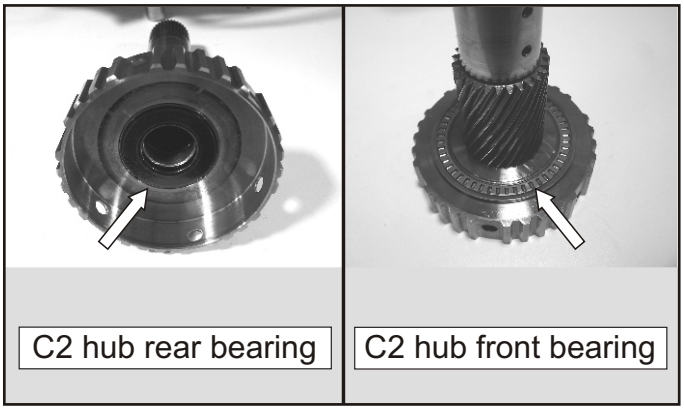


Figure 245

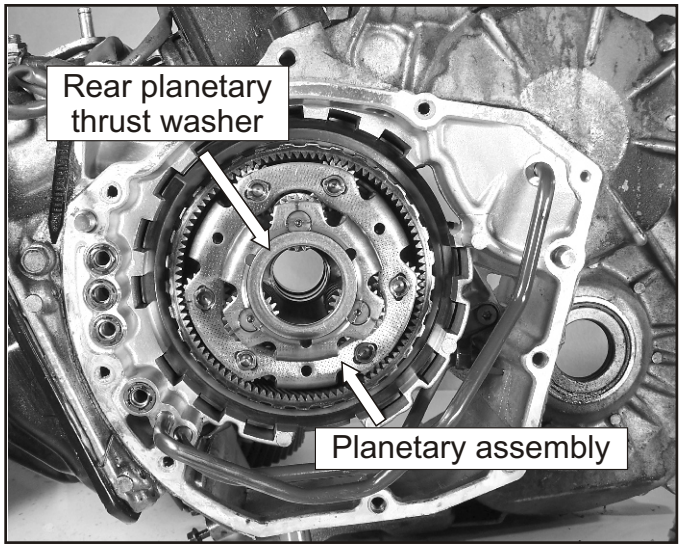


Figure 243

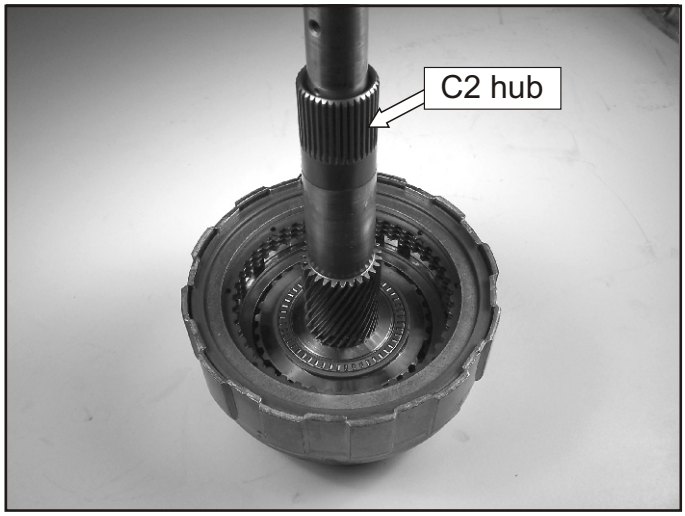


Figure 246

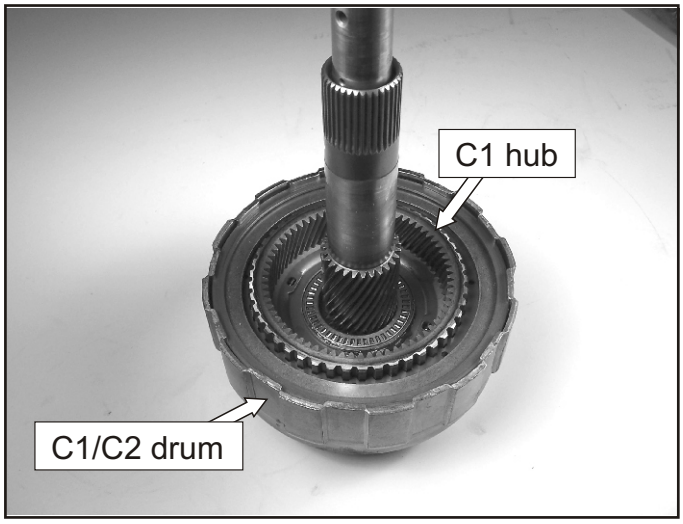


Figure 247

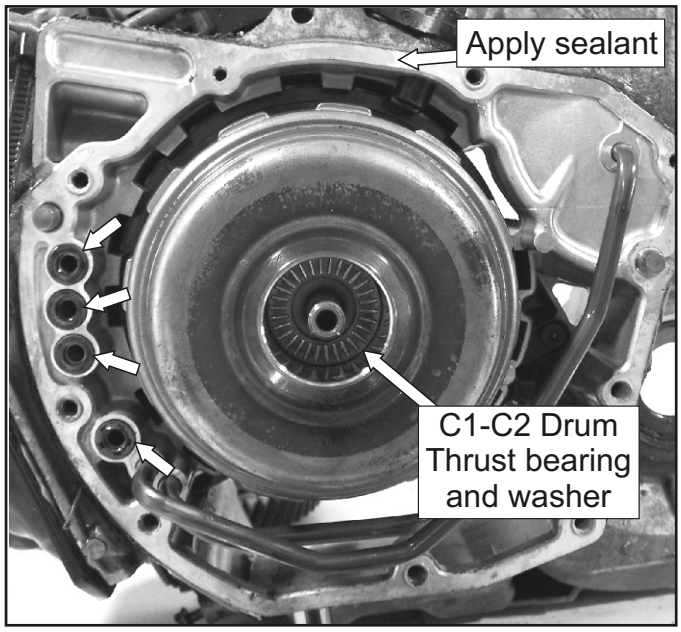


Figure 248

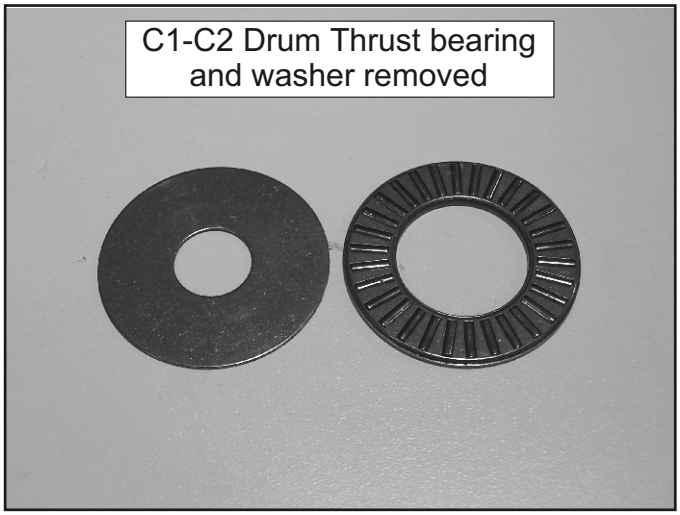
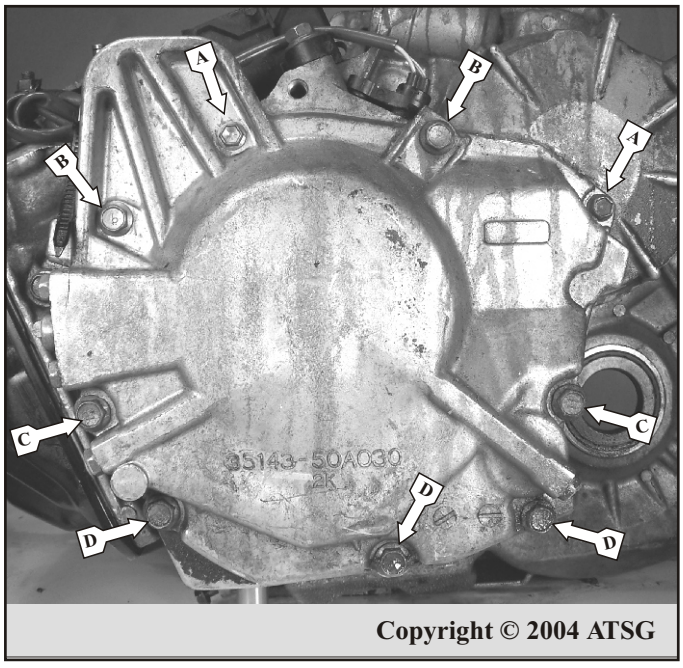


Figure 249

TRANSMISSION REASSEMBLY CONTINUED

175. Index the C1 hub into the C1 clutches shown in Figure 247.
176. Carefully, take the C1/C2 drum and slide it into the planetary assembly turning it slightly. ***Note: Do this with the case half standing up on the bench.*** Install the C1/C2 thrust washer and bearing into the rear of the drum. Apply a thin coat of sealant to the surface where the rear cover mating surface is. Replace the four rubber seals in the case half. See Figure 248.
177. Refer to Figure 249 for a close up view of the C1/C2 thrust bearing and race.
178. Assemble the rear cover onto the case half and install and torque the bolts into the correct locations using the chart listed below. See Figure 250.
    A= 16mm long. Torque to 70-100 in.lb.
    B= 25mm long. Torque to 15-22 ft.lb.
    C= 48mm long. Torque to 15-22ft.lb.
    D= 45mm long. Torque to 15-22 ft.lb.

Continued on Page 96



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Figure 250

TRANSMISSION REASSEMBLY CONTINUED

179. Turn the case over to where it is resting on the rear cover, and replace the two C3 underdrive sealing rings as shown in Figure 251.
180. Install the anti-rattle clip into the case half as shown in Figure 252.
181. Install the F3 freewheel and snap ring into the case. Install a new rubber seal into the case. See Figure 253.
182. Replace the o-rings on the cap and B4 servo assembly as shown in Figure 254.
183. Lubricate and install the servo piston, cap and retaining snap ring. See Figure 255.

Continued on Page 97

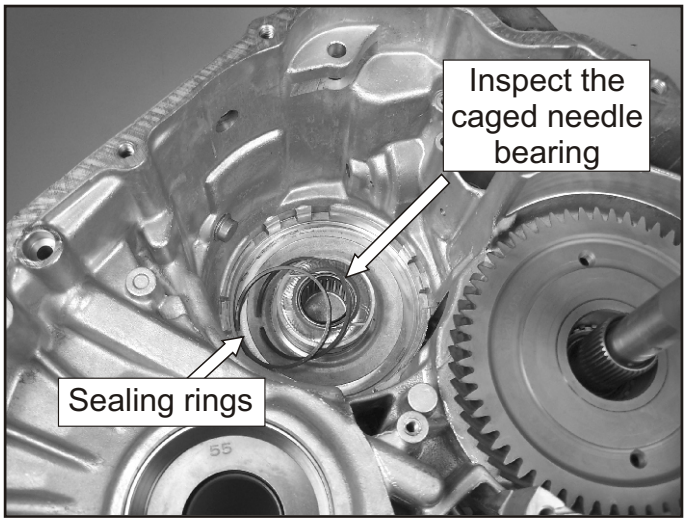


Figure 251

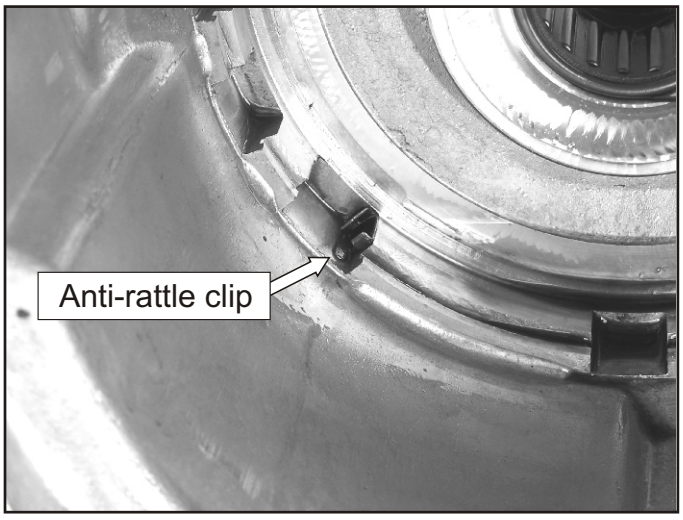


Figure 252

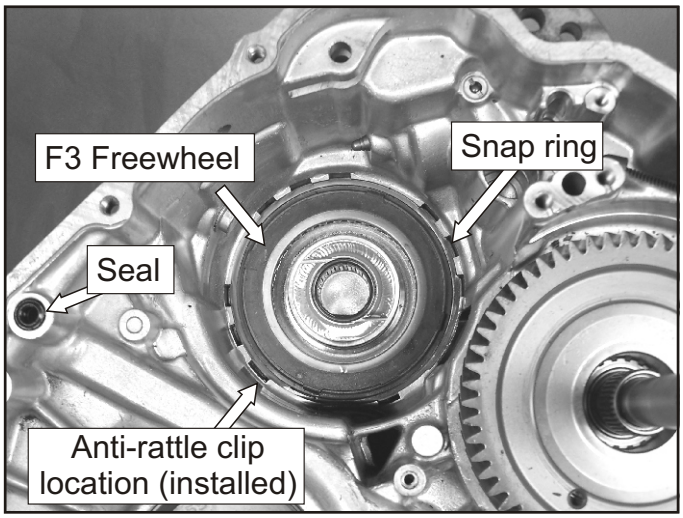


Figure 253

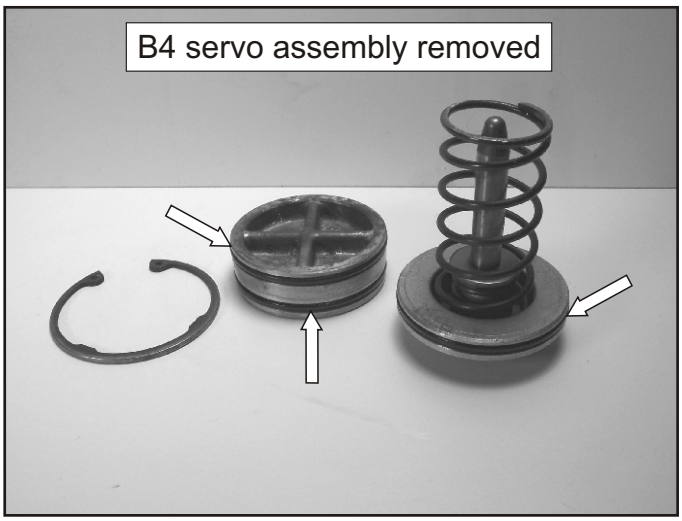


Figure 254

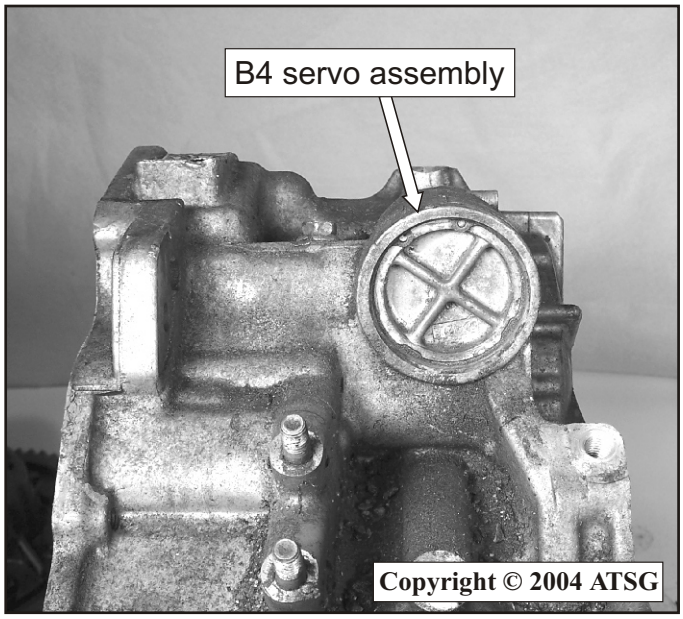


Figure 255

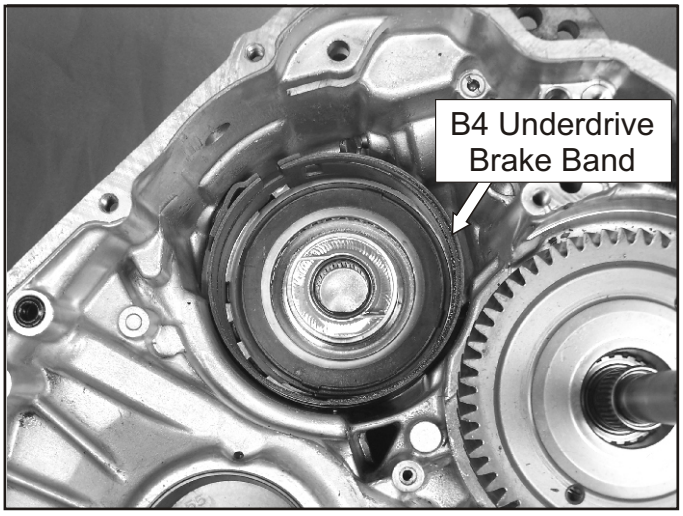


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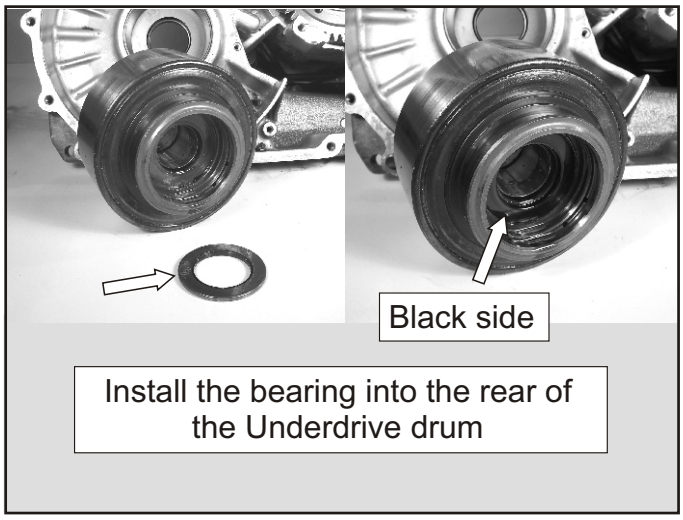


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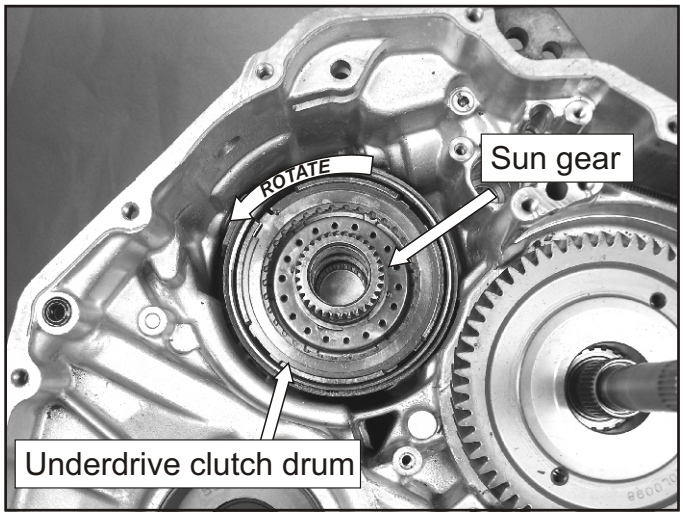


Figure 258

TRANSMISSION REASSEMBLY CONTINUED

184. Install the B4 underdrive brake band as shown in Figure 256.
185. Install the bearing into the rear of the C3 underdrive drum with the black side facing out. See Figure 257.
186. Grasp the underdrive clutch drum by the sun gear and install it into the F3 freewheel and over the sealing rings by turning it counter-clockwise. See Figure 258.
187. Grasp the underdrive planetary assembly by the pinion gear and assemble it into the underdrive clutch, by turning it to the left and right to index it into the underdrive clutches. See Figure 259.
188. Install the underdrive planetary thrust washer and bearing as shown in Figure 260.

Continued on Page 98

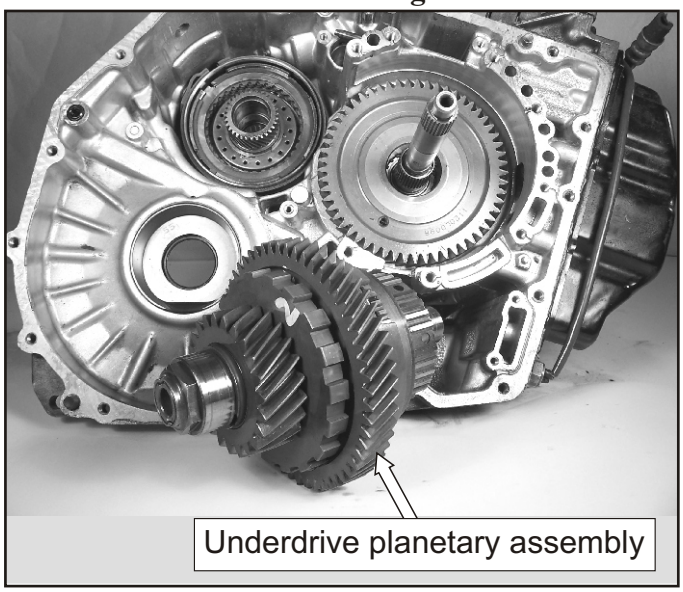


Figure 259



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Figure 260

TRANSMISSION REASSEMBLY CONTINUED

189. Install a new linkage seal and assemble the manual shaft into the case as shown below in Figure 262.Use Figure 261 as an assembly guide.
190. Slide the parking rod into the case and rotate the manual shaft until the slot lines up with the park rod. See Figure 263.
191. Install new o-rings on the B4 accumulator cap and piston as shown in Figure 264.
192. Lubricate and install the B4 accumulator piston and spring (spring first). Install the park lock pin into the case. See Figure 265.

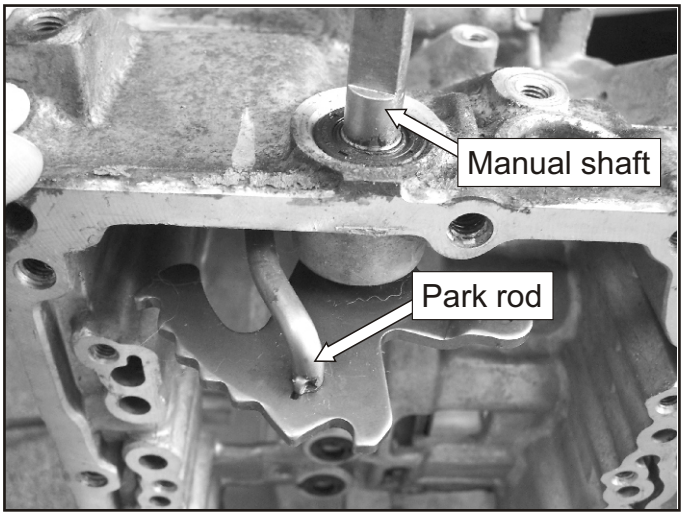


Figure 263

Continued on Page 99

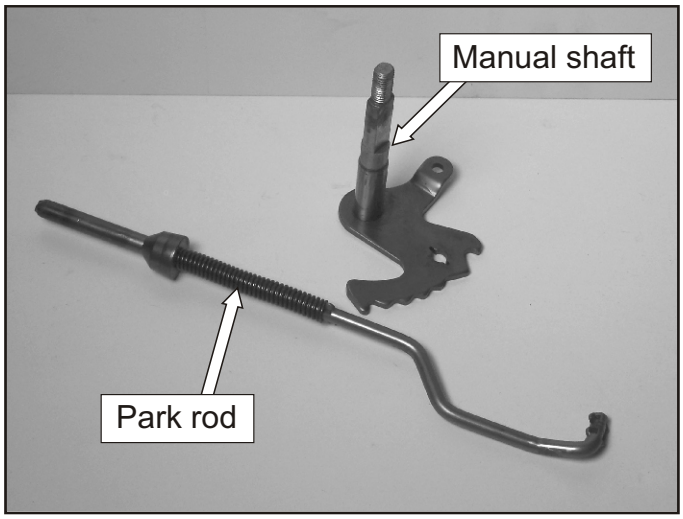


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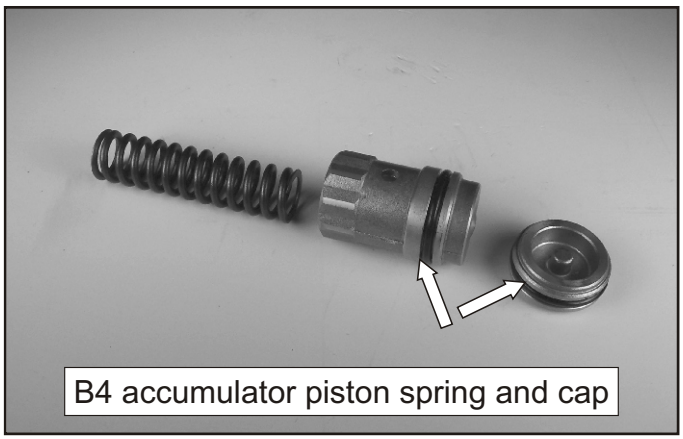


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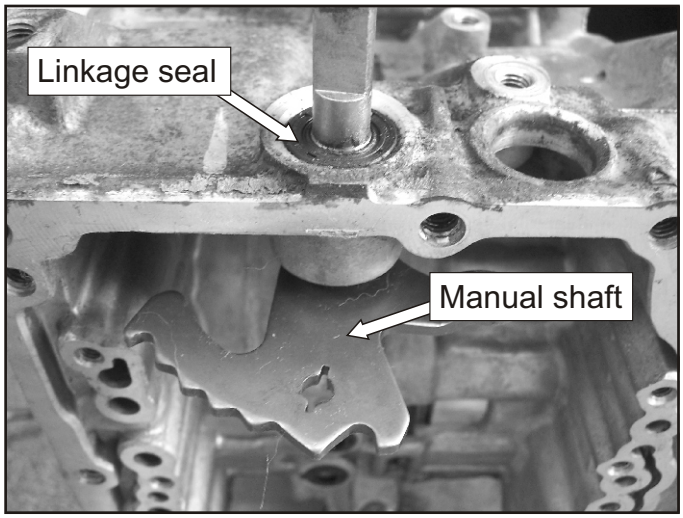


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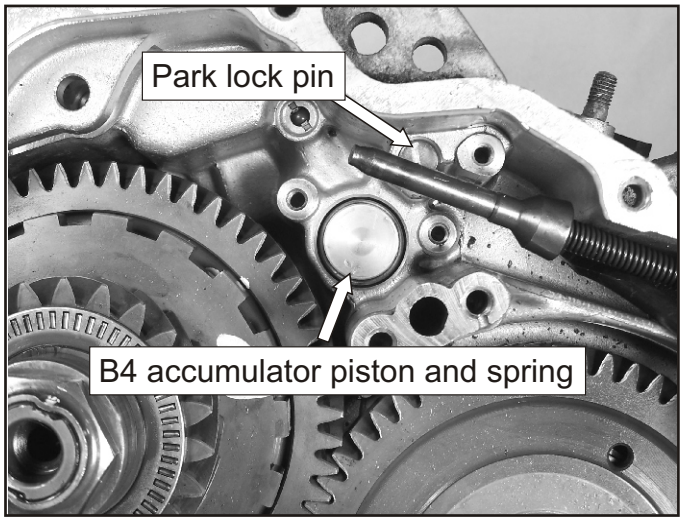


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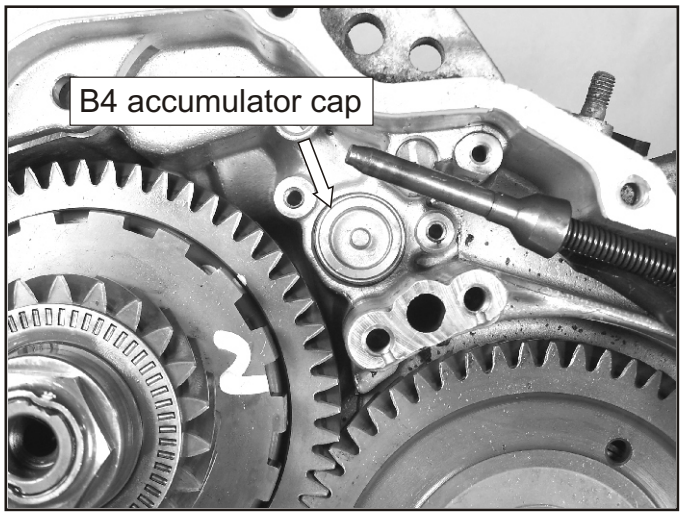


Figure 266

TRANSMISSION REASSEMBLY CONTINUED

193. Lubricate the o-ring on the B4 accumulator cap and install it into the case. See Figure 266.
194. Install the B4 accumulator retaining plate, parking rod return spring, sleeve and bolts as shown in Figure 268. Use Figure 267 as an assembly guide. ***Caution: the B4 accumulator piston is spring loaded. Tighten down the bolts evenly so the cap does not get cocked. Note: The bolt on the left is 22mm long and the bolt on the left is 13.5mm long. Torque both bolts to 71-106 in.lb.***
195. Assemble the park pawl, return spring and park pawl pin into the case as shown in Figure 270. Use Figure 269 as an assembly guide.

Continued on Page 100

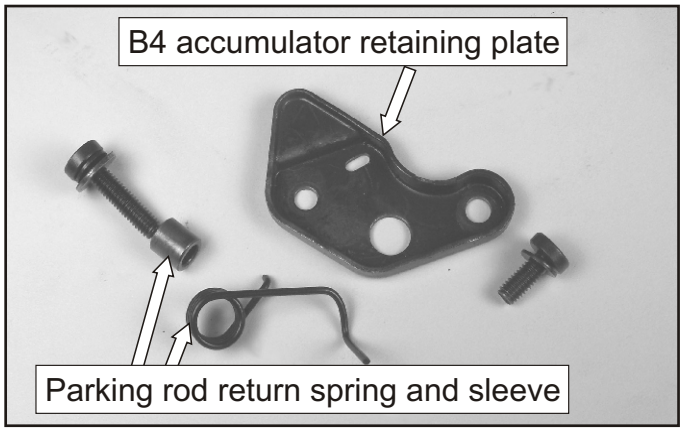


Figure 267

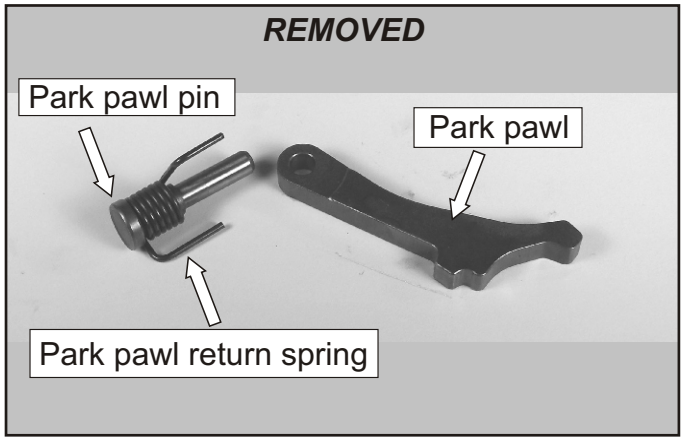


Figure 269

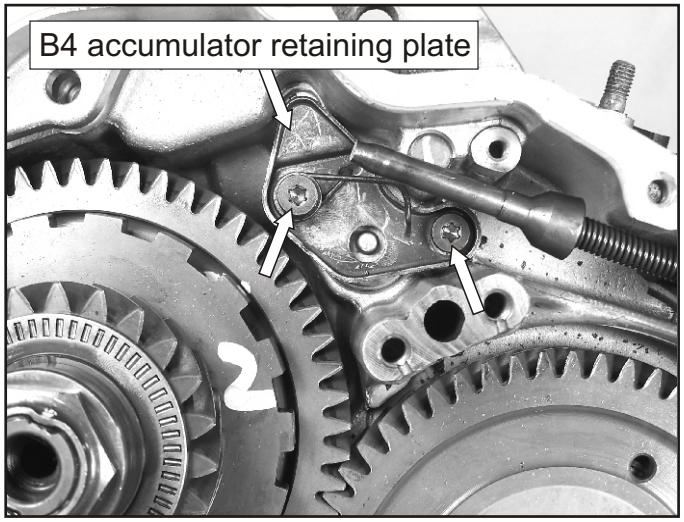


Figure 268

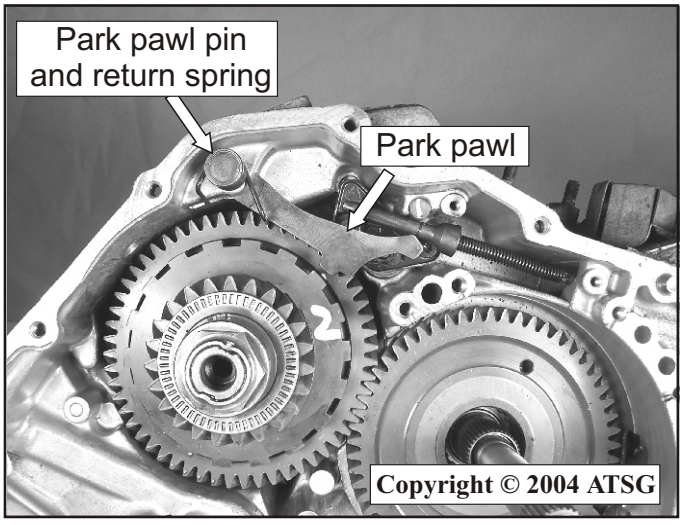


Figure 270

TRANSMISSION REASSEMBLY CONTINUED

196. Install the detent spring and park rod guide as shown in Figure 272. Use Figure 271 as an assembly guide . Install the two retaining bolts and torque to 71-106 in. lb. ***Note: the bolt lengths are 15.5mm long.***
197. Install the oil deflector plate, case plate and the four retaining bolts. Torque to 71-106ft.lb. See Figure 273. ***Note: the bolt lengths are 13mm long.***
198. Install a new gasket on both sides of the filter as shown in Figure 274.
199. Install the new filter onto the case as shown in Figure 275. Install the filter retaining bolt and torque to 71-106 in. lb. ***Note the bolt length is 13mm long***.

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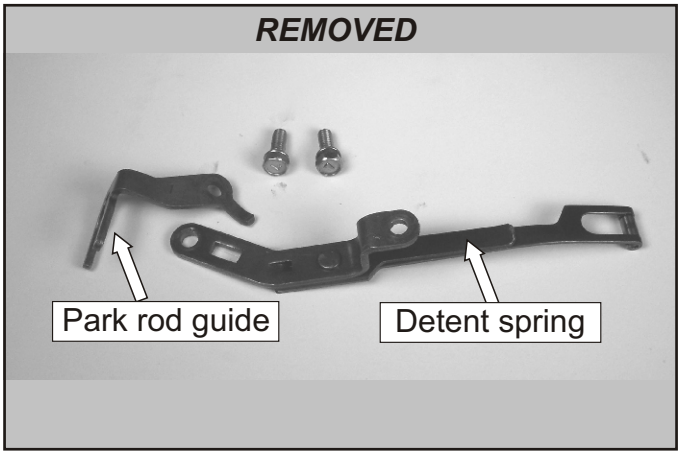


Figure 271

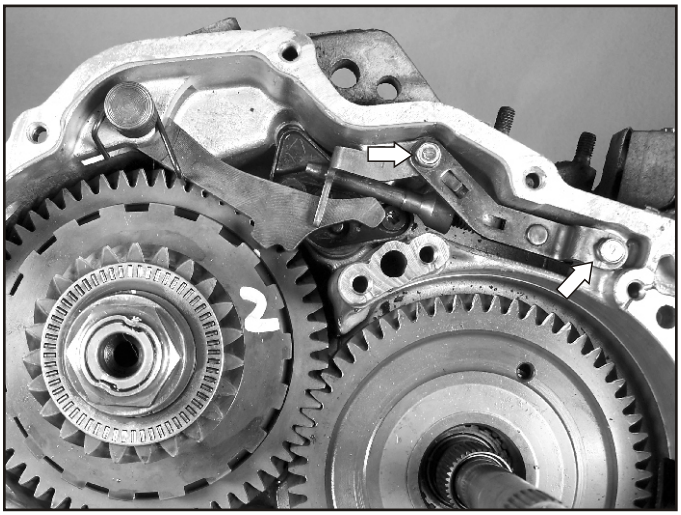


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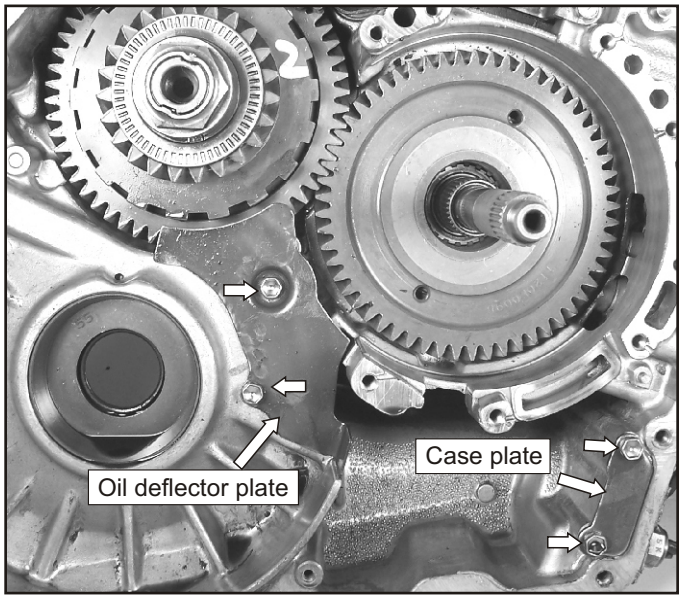


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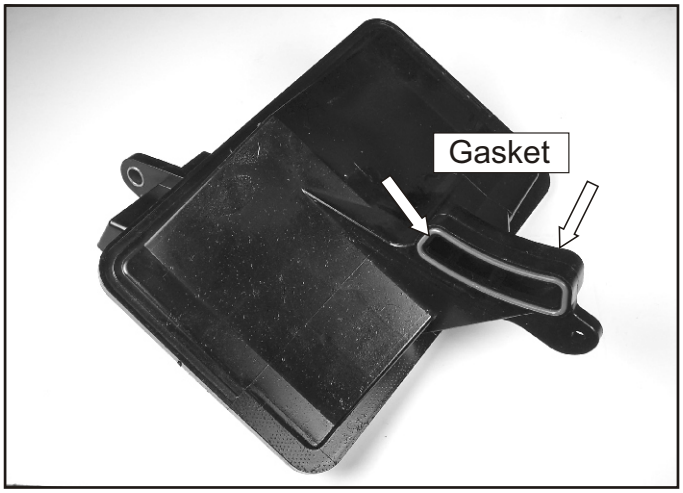


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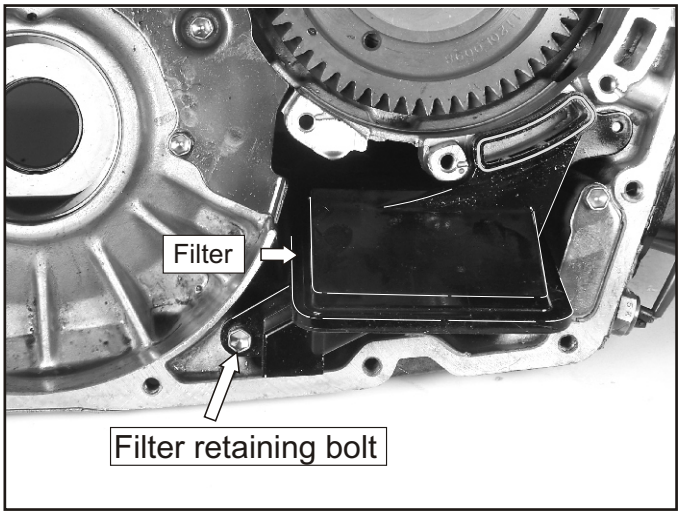


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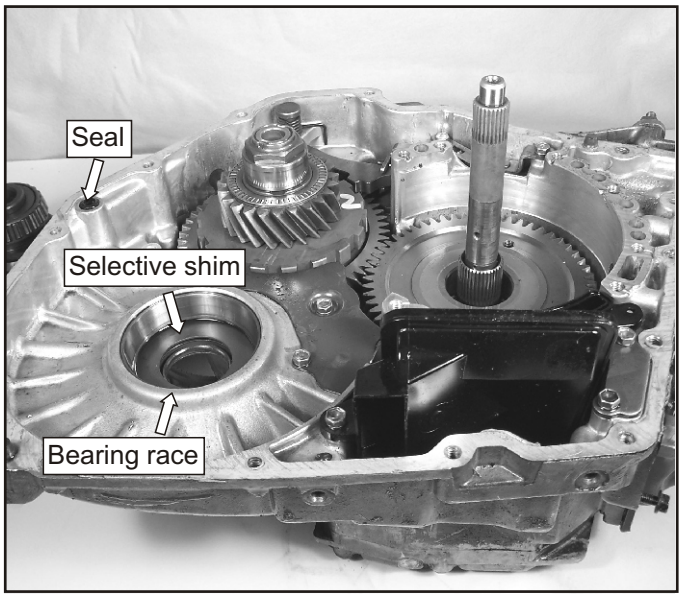


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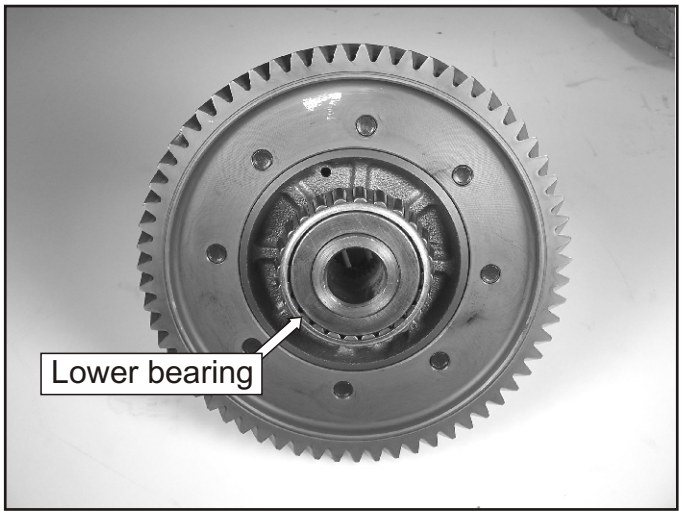


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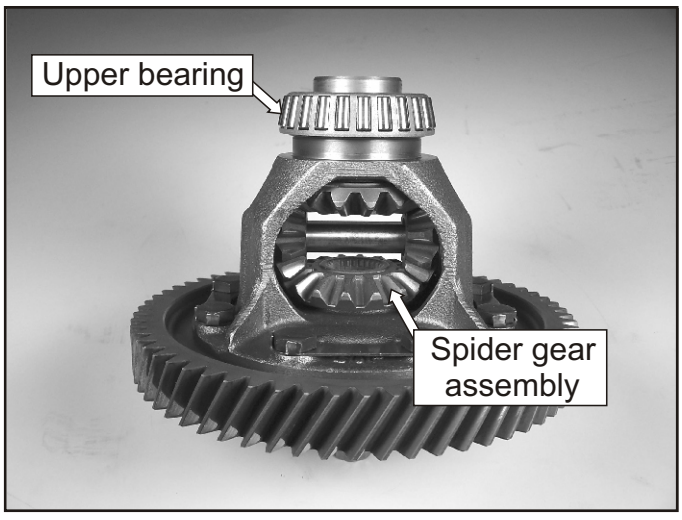


Figure 278

TRANSMISSION REASSEMBLY CONTINUED

200. Inspect the bearing race shown in Figure 276. Replace as necessary. Install new seal in case. ***Note: Below the bearing race is the selective shim which sets the pre-load for the differential bearings.***
201. Inspect the lower differential bearing as shown in Figure 277. Replace as necessary.
202. Inspect the upper differential bearing and the spider gear assembly as shown in Figure 278. Replace as necessary.
203. Lubricate bearings and install the differential assembly into the case half as shown below in Figure 279.
204. Remove the four 10mm headed bolts retaining the side cover, reseal and re-install the bolts. Remove the three 10mm headed oil deflector retaining bolts as shown in Figure 280.

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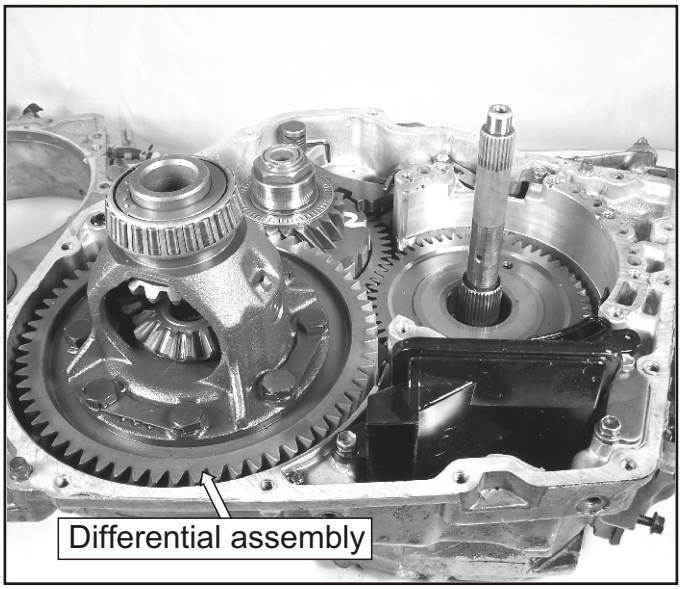


Figure 279



Figure 280

TRANSMISSION REASSEMBLY CONTINUED

205. Turn the oil deflector upside down and clean the three magnets. See Figure 281.
206. Install the oil deflector back into the case. Apply a small amount of loctite to the three 12mm long retaining bolts and torque to 71-106 in.lb. See Figure 282.
207. Inspect the upper bearing race and the roller bearing as shown in Figure 283. Replace as necessary.
208. Replace the sealing ring shown in Figure 284. ***Note: There is a .055" gap in between the sealing ring ends, this is normal.***
209. Replace the axle seal as shown in Figure 285.

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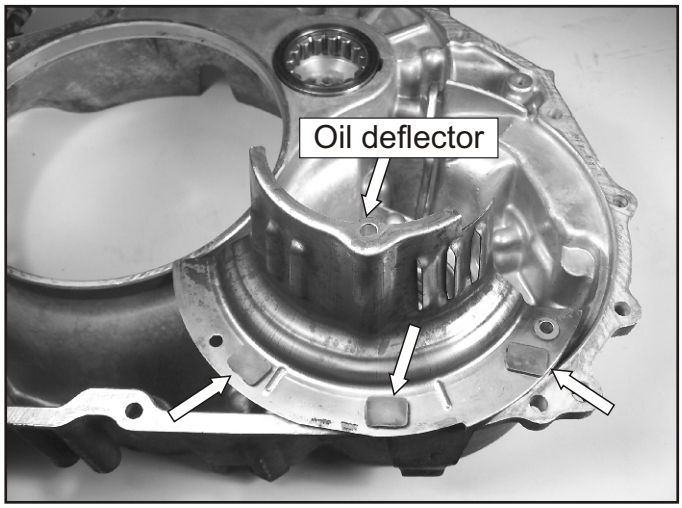


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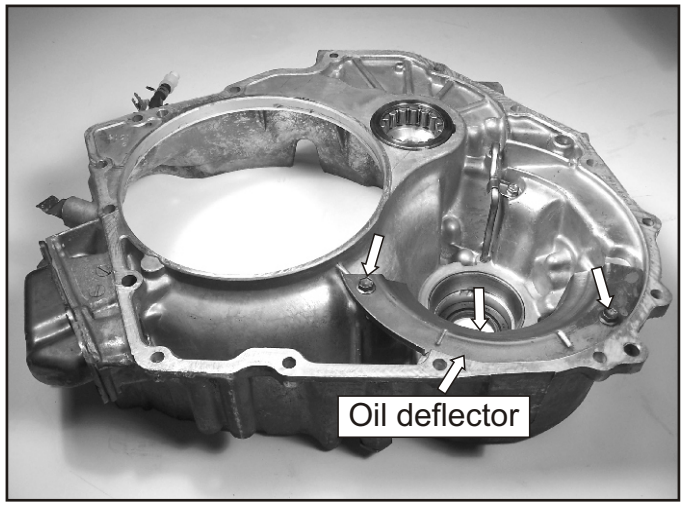


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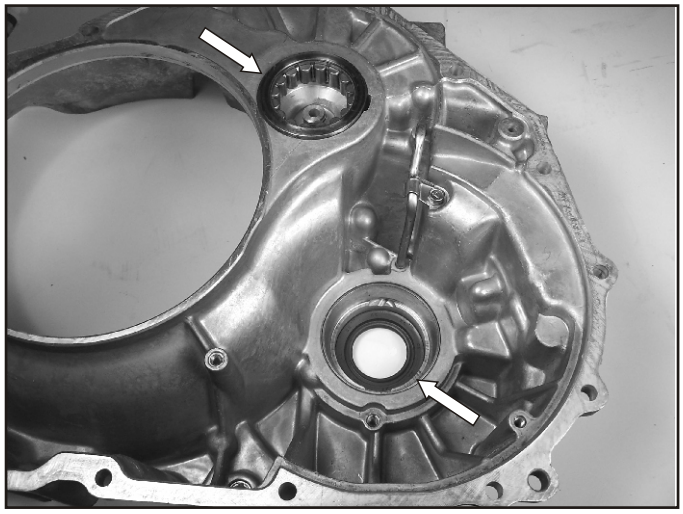


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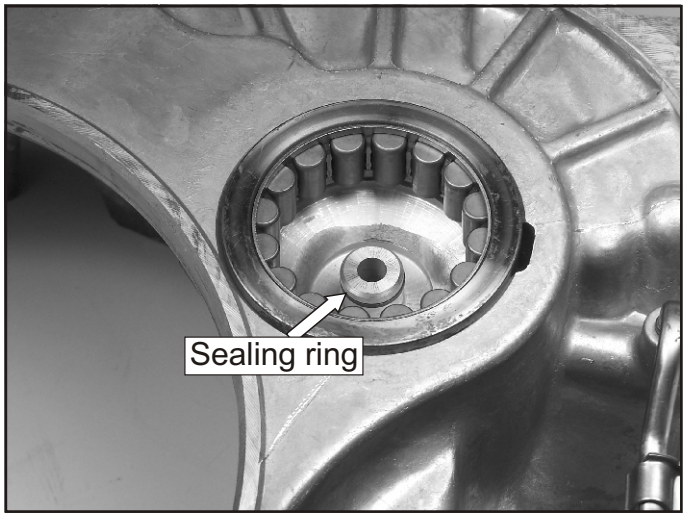


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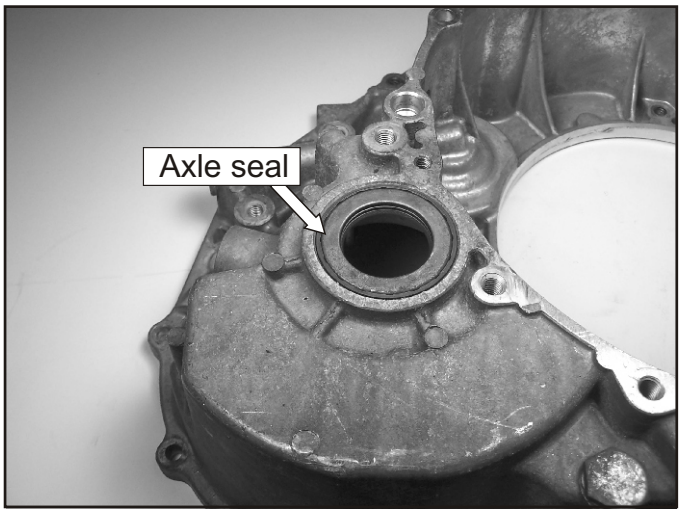


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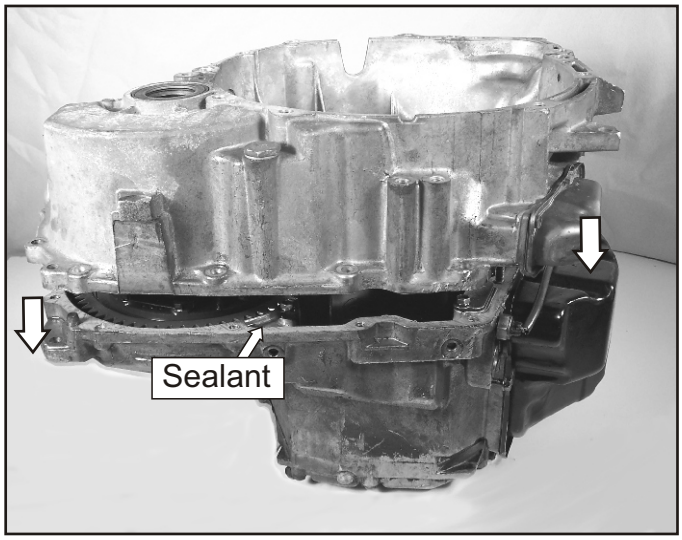


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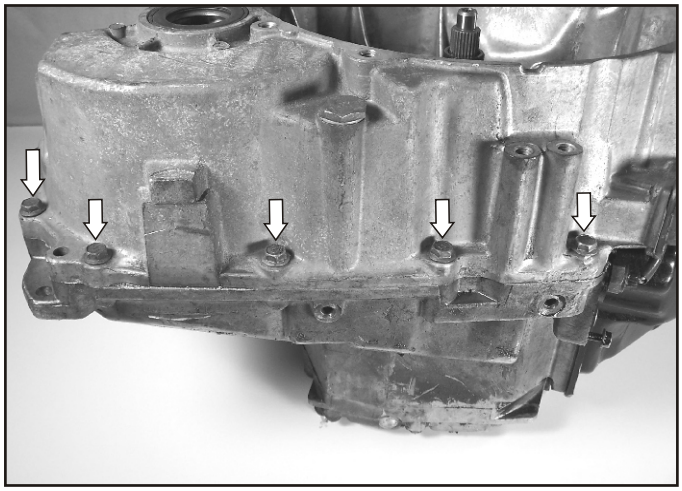


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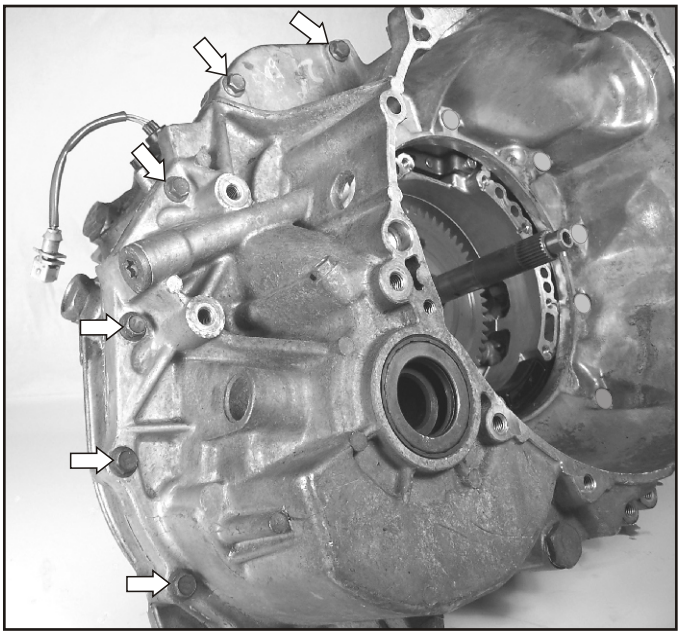
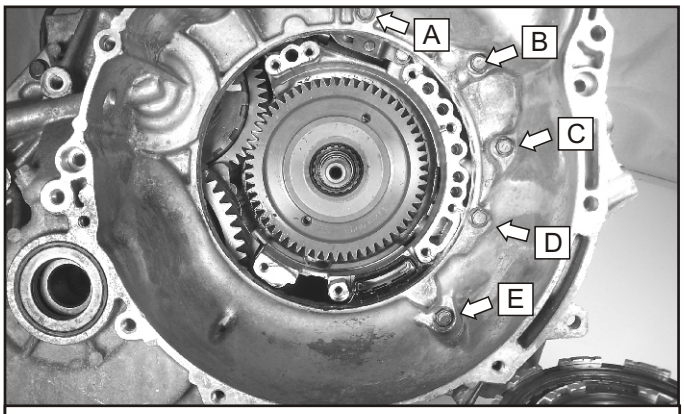


Figure 288

TRANSMISSION REASSEMBLY CONTINUED

210. Apply a thin coat of sealant between the case half and the bell housing and assemble the bell housing onto the case half. See Figure 286.
211. Install the five bolts shown in Figure 287.
Note: The bolt lengths are 30mm long.
Torque to 17-26 ft.lb.
212. Install the six bolts shown in Figure 288.
Note: The bolt lengths are 30mm long.
Torque to 17-26 ft.lb.
213. Install the five bolts as shown in Figure 289. Refer to the chart for the correct bolt lengths and torque the bolts to 17-26 ft.lb.

Continued on Page 104



Bolt lengths

5 bellhousing to case retaining bolts
A = 30mm long
B = 35mm long
C = 35mm long
D = 30mm long
E = 45mm long

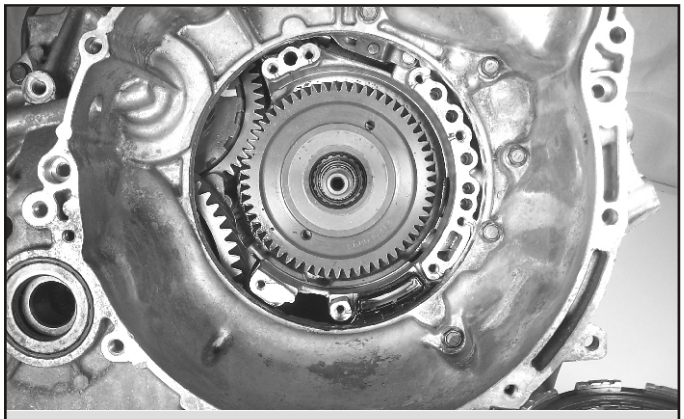
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Figure 289

TRANSMISSION REASSEMBLY CONTINUED

214. Stand the transmission horizontally on the bench as shown in Figure 290.
215. Ensure that the B2 second coast brake hub is fully indexed into the clutch plates on the back of the pump as shown in Figure 291. Lubricate the pump o-ring.
216. Install the pump assembly into the case and gently tap it into the case. Once the pump is seated into the case, install the eight pump to case retaining bolts and torque to 15-22ft.lb. ***Note: The bolt lengths are 28mm long.*** See Figure 292.
217. Turn the transmission to the side and air check each clutch and brake to ensure proper apply. Install two new apply seals. See Figure 293.

Continued on Page 105



Transmission in horizontal position on the bench

Figure 290

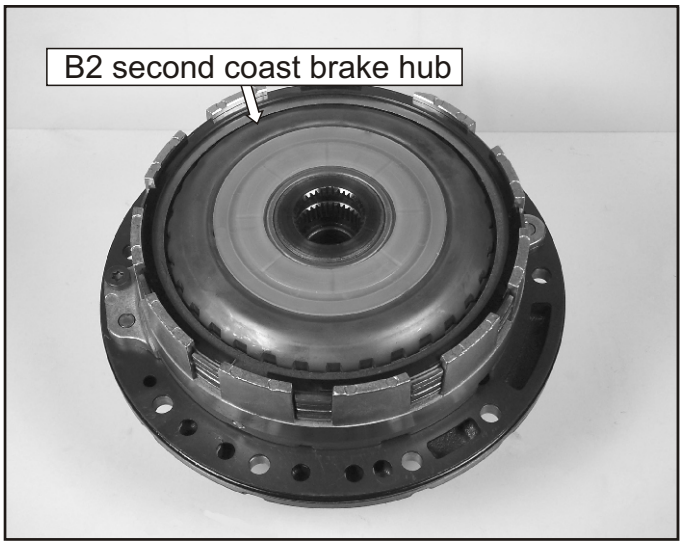


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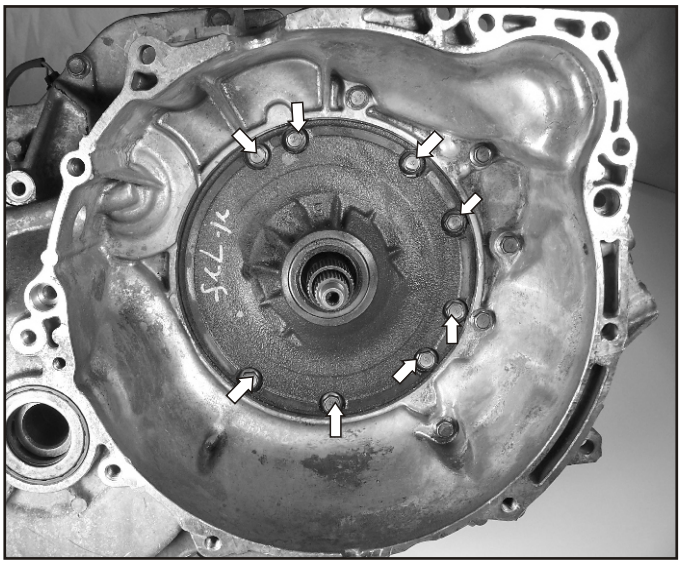


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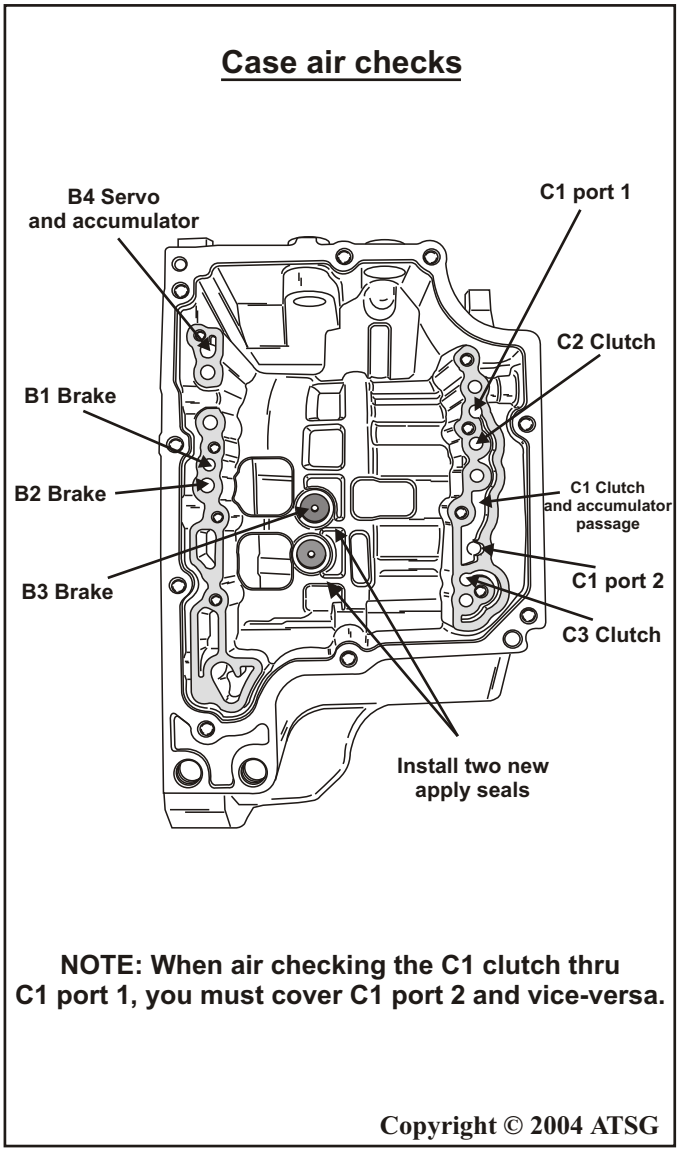


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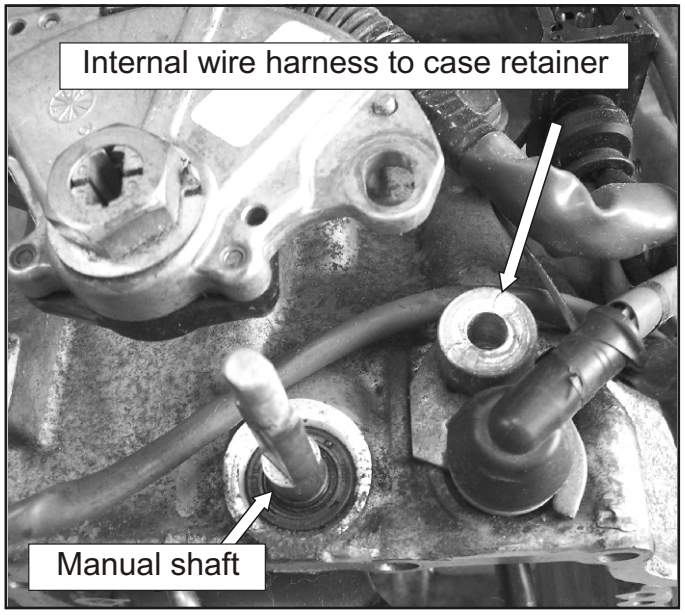


Figure 294

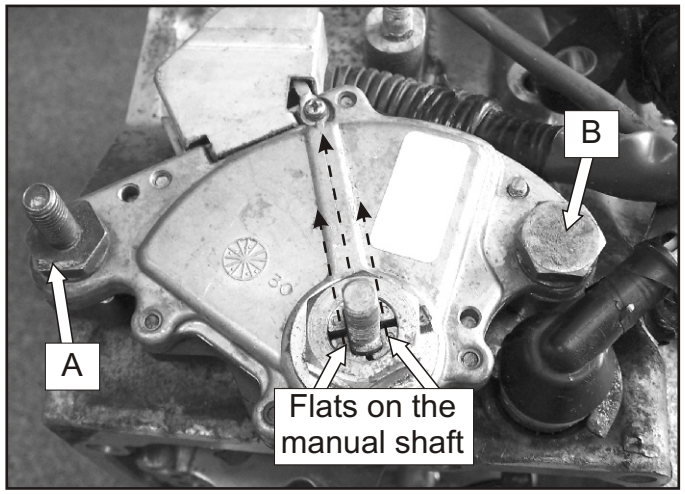


Figure 295

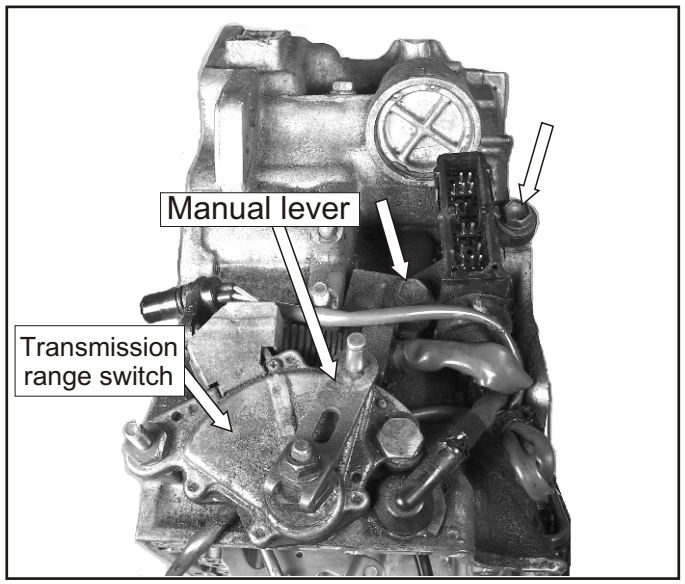


Figure 296

TRANSMISSION REASSEMBLY CONTINUED

218. Install a new o-ring on the plastic part of the wiring harness, install it back thru the case, and place the retainer in the groove as shown in Figure 294.
219. Install the transmission range switch over the manual shaft and align the flats on the shaft with the dotted line on the transmission range switch as shown in Figure 295. Torque bolts A and B to 14-22ft.lb. ***Note: the bolt lengths are as follows, A = 21mm long and B = 32mm long***.
220. Install the two connector retaining bolts and torque to 14-22 ft.lb. ***Note: the bolt lengths are 20mm long.*** Install the manual lever and the retaining nut and torque to 7-10 ft.lb. See Figure 296.
221. Install the valve body on to the case and align the manual valve link into the manual shaft as shown in Figure 297.

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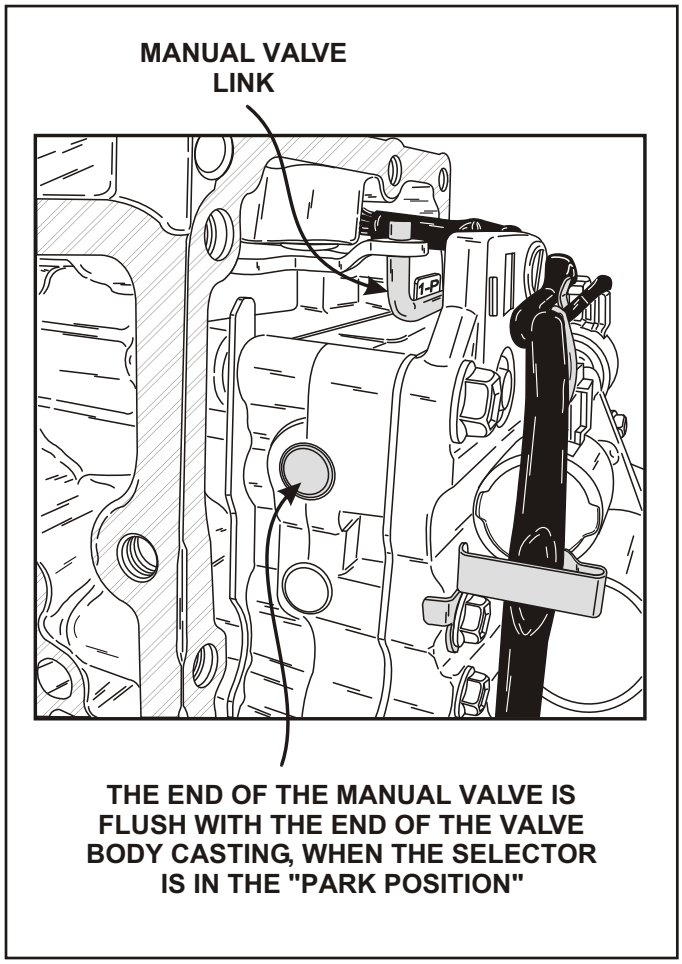


Figure 297

TRANSMISSION REASSEMBLY CONTINUED

222. Install the 10 mm headed valve body to case retaining bolts as shown in Figure 298.Torque to 7-11 ft.lb. ***Note: bolt lengths are as follows, A = 16mm long, 50mm long and C = 55mm long.***
223. Install the four solenoid connectors shown in Figure 299. ***Note: The internal wire colors are listed below each solenoid.***
224. Apply a thin coat of sealant to the case half and install the side pan. Install the nine pan bolts and torque to 7-11ft.lb. ***Note: the bolt lengths are 15mm long.*** Install the temperature sensor. See Figure 300.

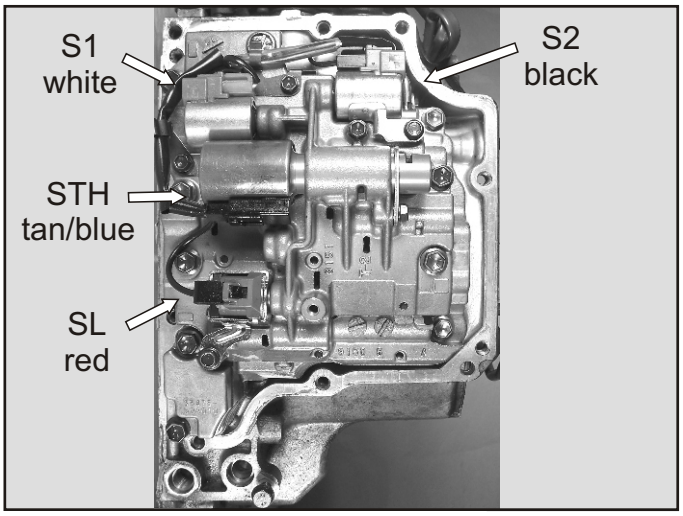


Figure 299

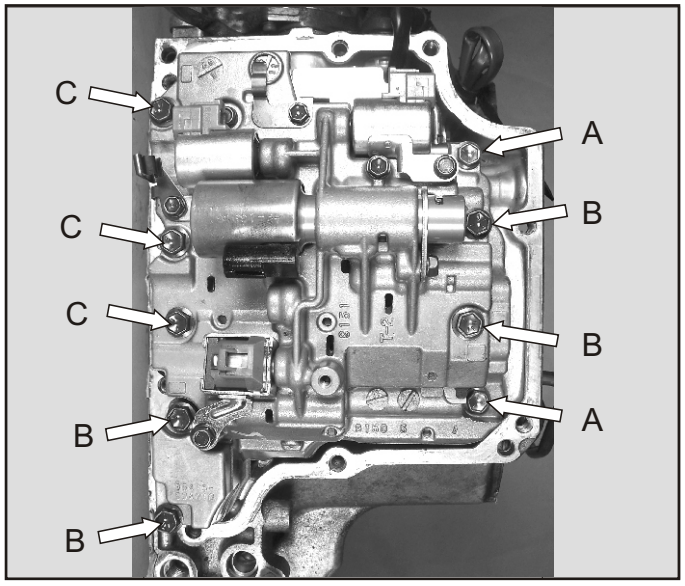


Figure 298

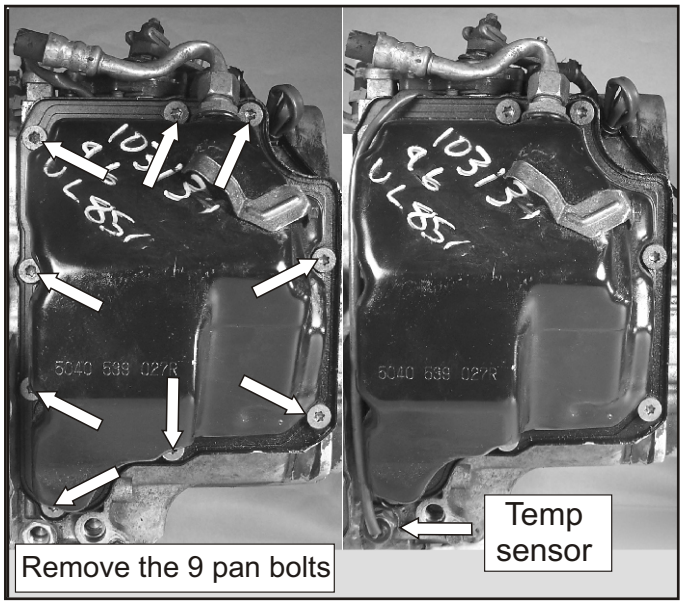


Figure 300