Original Printing
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INTRODUCTION

MITSUBISHI F4A41, F4A42, F4A51

This is a four speed, Front Wheel Drive transaxle, with fully electronic controls for the upshifts and downshifts, with 4th gear being overdrive. The individual gear ratios are achieved through two planetary gear sets connected one behind the other. The components of the planetary gear sets are driven or held by means of five multiple plate clutch packs, and some of the later models are equipped with a low sprag.

To minimize fuel consumption, the torque converter clutch is applied by the TCM/PCM, depending on throttle position and vehicle speed. This unit operates very much like the Chrysler 41TE transaxle.

These units are currently found in several Mitsubishi models as shown in Figure 1, Dodge Stratus, some Hyundai models and some Kia models.

We wish to thank Mitsubishi Motor Company for the information and illustrations that have made this booklet possible. A special thanks also to Bob Nuttall for information and suggestions that has made this a very accurate booklet.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

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MITSUBISHI
F4A41, F4A42, F4A51

INDEX

AUTOMATIC TRANSMISSION SERVICE GROUP
9200 S. DADELAND BLVD. SUITE 720
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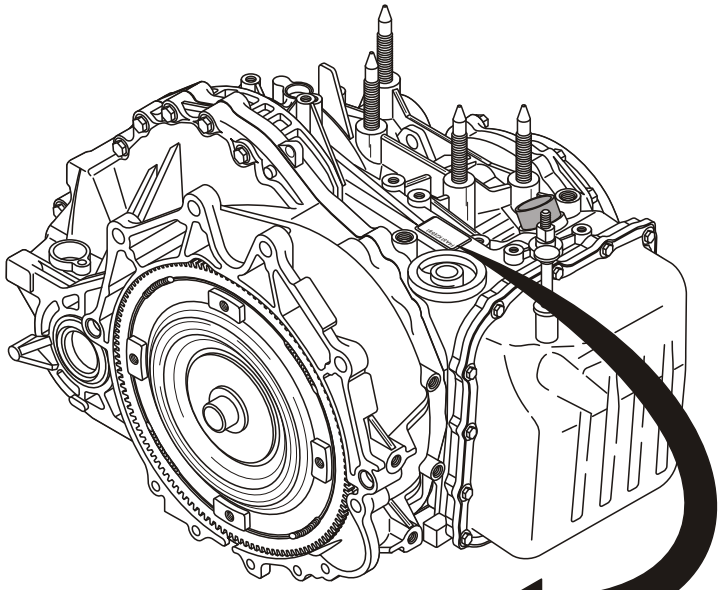
IDENTIFICATION CODE STAMPING LOCATION



F 4 A 51 K 2 E 5 B 1

Drive Axle
F = Front Wheel Drive
R = Rear Wheel Drive

Forward Speeds
4 = Four Speeds
5 = Five Speeds

Transmission Type
A = Automatic
M = Manual

Trans Capacity
41 = Light Duty
42 = Standard Duty
51 = Heavy Duty

Manufacturing Plant
K = Kyoto Works

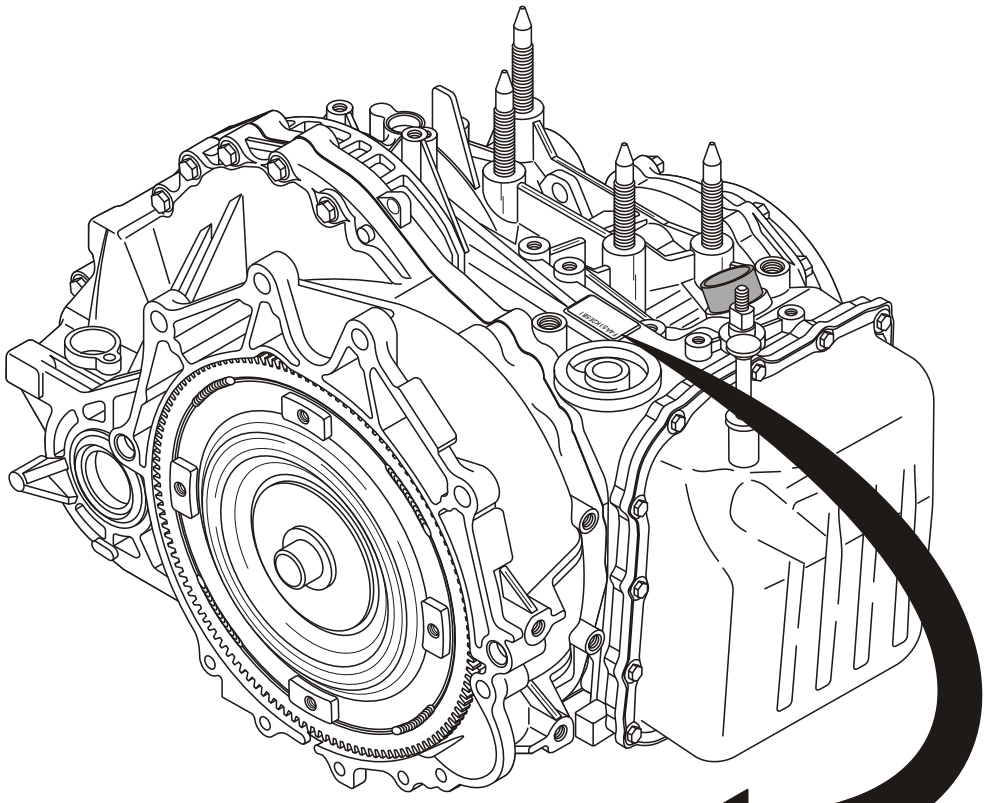
NOTE: The "K" is not always stamped into all transmission codes.

VEHICLE AND TRANSMISSION APPLICATION CHART

YEAR	MODEL	ENGINE	TRANSMISSION	SPRAG
1997	Diamante	3.5L SOHC	F4A51-2-D5A	No
1998-01	Diamante	3.5L SOHC	F4A51-2-D5B	Yes
2000-01	Eclipse	2.4L SOHC	F4A42-2-M6B	Yes
2000	Eclipse	3.0L SOHC	F4A51-2-E6B	Yes
2001	Eclipse	3.0L SOHC	F4A51-2-E5B	Yes
1999-01	Galant	2.4L SOHC	F4A42-2-M6B	Yes
1999	Galant	3.0L SOHC	F4A51-2-D6B	Yes
2000	Galant	3.0L SOHC	F4A51-2-E6B	Yes
1997-99	Mirage	1.5L SOHC	F4A41-1-M8A	No
1997-98	Mirage	1.8L SOHC	F4A42-1-M8A	No
2000	Mirage	1.5L SOHC	F4A41-2-M8B	Yes
1999-01	Mirage	1.8L SOHC	F4A42-2-M8B	Yes

Figure 1

GEAR RATIO IDENTIFICATION



F 4 A 51 K 2 E 5 B 1

MANUFACTURING USE ONLY
When the "K" is stamped into the code, this digit will be dropped off.

DESIGN LEVEL
1 = 1st Design
2 = 2nd Design

SPRAG I.D.
A = No Sprag
B = Has Low Sprag

Note: Refer to Page 117 for Important Sprag Information.

FINAL DRIVE RATIO *

F4A41/42	F4A51
A = N/A	A = 3.269
B = N/A	B = 3.274
C = N/A	C = 3.491
D = N/A	D = 3.497
E = 3.770	E = N/A
F = 3.769	F = N/A
J = 4.041	J = N/A
L = 4.212	L = 4.011
M = 4.042	M = 4.018
N = 4.406	N = N/A
R = 4.625	R = 4.520
T = N/A	T = 4.316
U = 4.407	U = 4.324
W = 4.626	W = N/A

SPEEDO GEAR RATIO **

4 & M = 27/36	5 & N = 28/36
6 & P = 29/36	7 & Q = 30/36
8 & R = 31/36	9 & S = 32/36

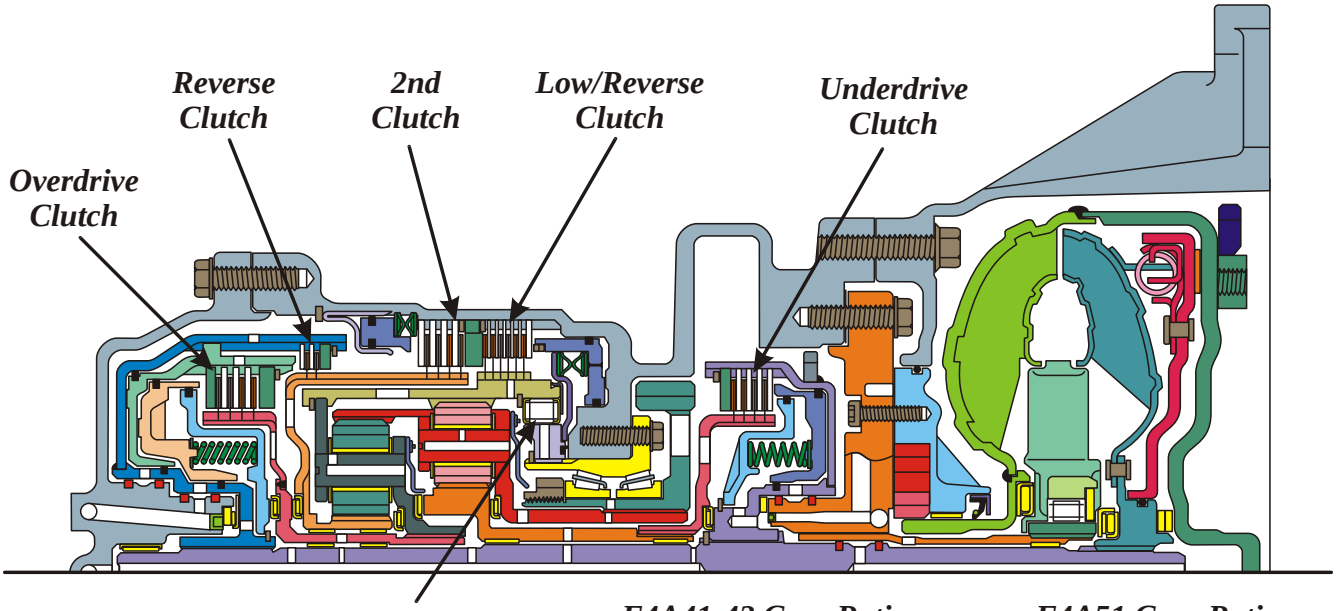
Note: Drive gear is 36 tooth.

** The final drive ratios include the primary transfer gear reduction ratio of 1.196 for the F4A41-42, and 1.119 for the F4A51.*

*** The letter "Z" in the speedo gear position tells us that it is an electronic calculation done by the computer.*

Figure 2

MITSUBISHI F4A41, F4A42, F4A51 COMPONENT AND SOLENOID APPLICATION CHART



F4A41-42 Gear Ratios	F4A51 Gear Ratios
1st = 2.842	1st = 2.842
2nd = 1.529	2nd = 1.495
3rd = 1.000	3rd = 1.000
4th = 0.712	4th = 0.731
Rev = 2.480	Rev = 2.720

FLUID REQUIREMENTS
Mitsubishi Diamond SP III

INTERNAL COMPONENT AND SOLENOID APPLICATION CHART

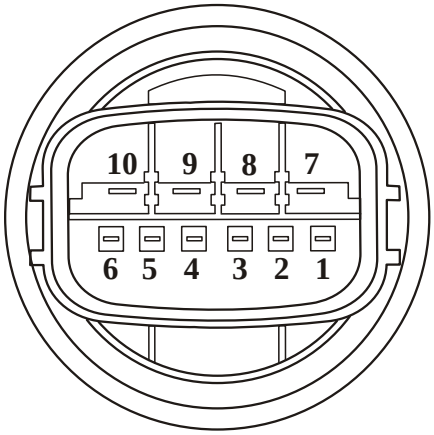
Gear Range	Reverse Clutch	Underdrive Clutch	2nd Clutch	Overdrive Clutch	Low/Rev Clutch	Low Sprag	U.D. Sol	2nd Sol	O.D. Sol	L/R Sol	TCC Sol
Park					ON		ON	ON	ON	OFF	
Reverse	ON				ON		ON	ON	ON	OFF	
Neutral							ON	ON	ON	ON	
Dr-1st		ON			ON*	HOLD	OFF	ON	ON	OFF	
Dr-2nd		ON	ON				OFF	OFF	ON	ON	
Dr-3rd		ON		ON			OFF	ON	OFF	ON	
Dr-4th			ON	ON			ON	OFF	OFF	ON	ON**
M-3rd		ON		ON			OFF	ON	OFF	ON	
M-2nd		ON	ON				OFF	OFF	ON	ON	
M-1st		ON			ON		OFF	ON	ON	OFF	

* Low/Reverse clutch is applied below 6 mph on units equipped with low sprag.
** TCC dependant on throttle position, temperature and vehicle speed.
Solenoid ON = Energized
Solenoid OFF = De-Energized
Failsafe: Two failsafe strategies are available, 2nd gear and 3rd gear.
Should all solenoids be turned Off (i.e. electrical failure), 3rd gear will be the result.
2nd gear failsafe can be commanded by the TCM, energizing the appropriate solenoids.

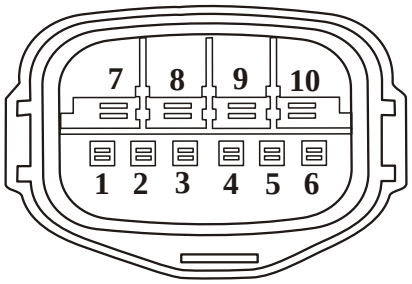
Figure 3

CASE CONNECTOR TERMINAL IDENTIFICATION AND INTERNAL COMPONENT RESISTANCE CHART

"Mitsubishi and Stratus Only"



View Looking Into Transaxle Case Connector



View Looking Into Transaxle Harness Connector

INTERNAL COMPONENT RESISTANCE CHART

COMPONENT	*TERMINALS*	*RESISTANCE*
Underdrive Solenoid	*Terminals 9 and 3*	*Approximately 3.6 Ohms @ 72 °F*
2nd Solenoid	*Terminals 9 and 4*	*Approximately 3.6 Ohms @ 72 °F*
Overdrive Solenoid	*Terminals 9 and 5*	*Approximately 3.6 Ohms @ 72 °F*
Low/Rev Solenoid	*Terminals 10 and 6*	*Approximately 3.6 Ohms @ 72 °F*
TCC Solenoid	*Terminals 10 and 7*	*Approximately 3.6 Ohms @ 72 °F*
TFT Sensor	*Terminals 1 and 2*	*Approximately 9.05 k. Ohms @ 72°F*

TERMINAL NUMBER	INTERNAL WIRE COLOR	CIRCUIT DESCRIPTION
1	*Red*	*5 Volt Power to TFT Sensor*
2	*Black*	*Ground to TFT Sensor*
3	*White*	*Ground to Underdrive Solenoid*
4	*Green*	*Ground to 2nd Clutch Solenoid*
5	*Orange*	*Ground to Overdrive Solenoid*
6	*Brown*	*Ground to Low/Reverse Solenoid*
7	*Blue*	*Ground to TCC Solenoid*
8		*Not Used*
9	*Red*	*Power to Underdrive, 2nd, and Overdrive Solenoids*
10	*Yellow*	*Power to TCC and Low/Reverse Solenoids*

NOTE: Wire colors may vary.

Figure 4

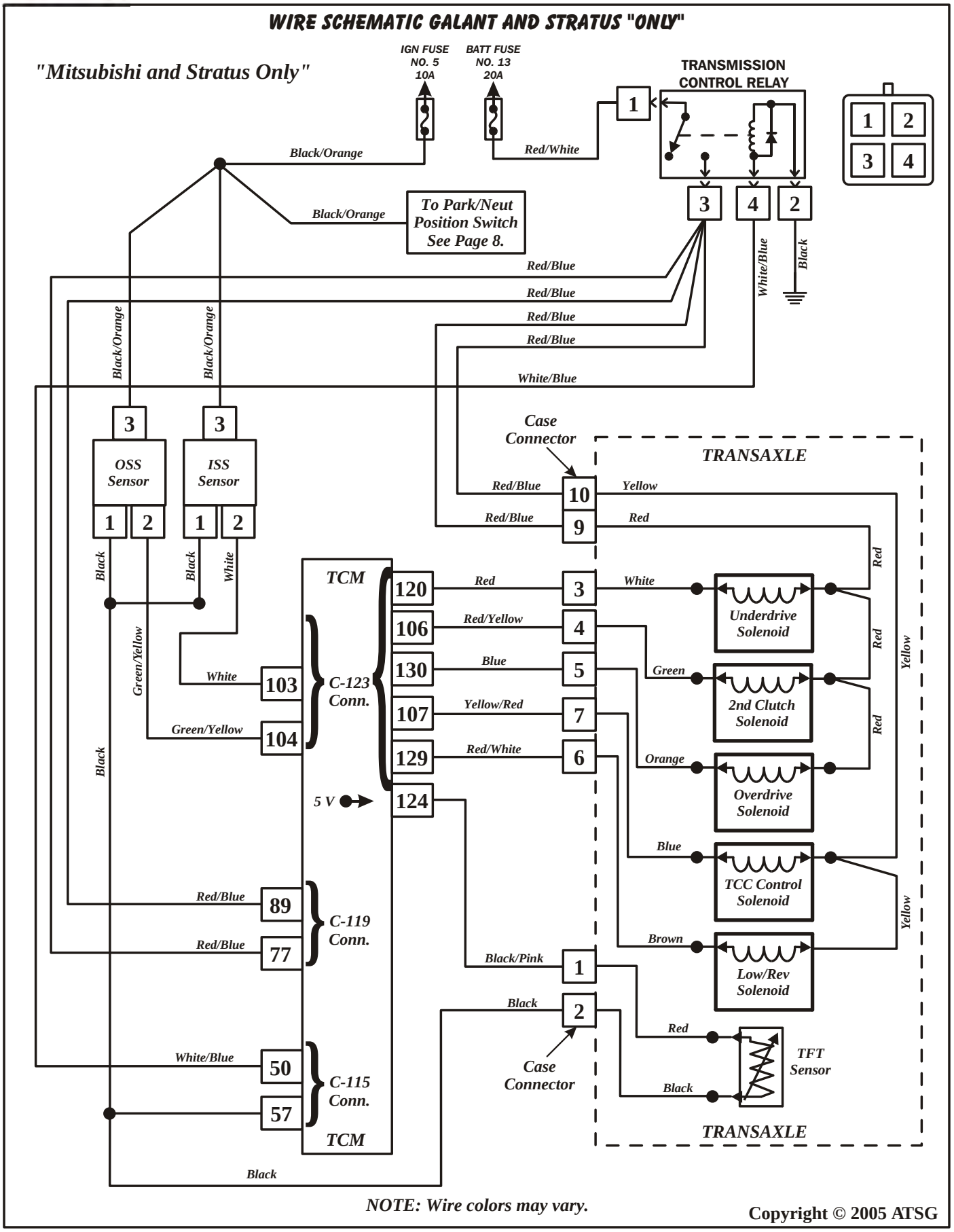


Figure 5

TCM CONNECTOR AND TERMINAL IDENTIFICATION
"MITSUBISHI AND STRATUS" ONLY

Connector C-115

41	42	43					44	45	46	
47	48	49	50	51	52	53	54	55	56	57
58	59		60	61	62	63		64	65	66

Connector C-119

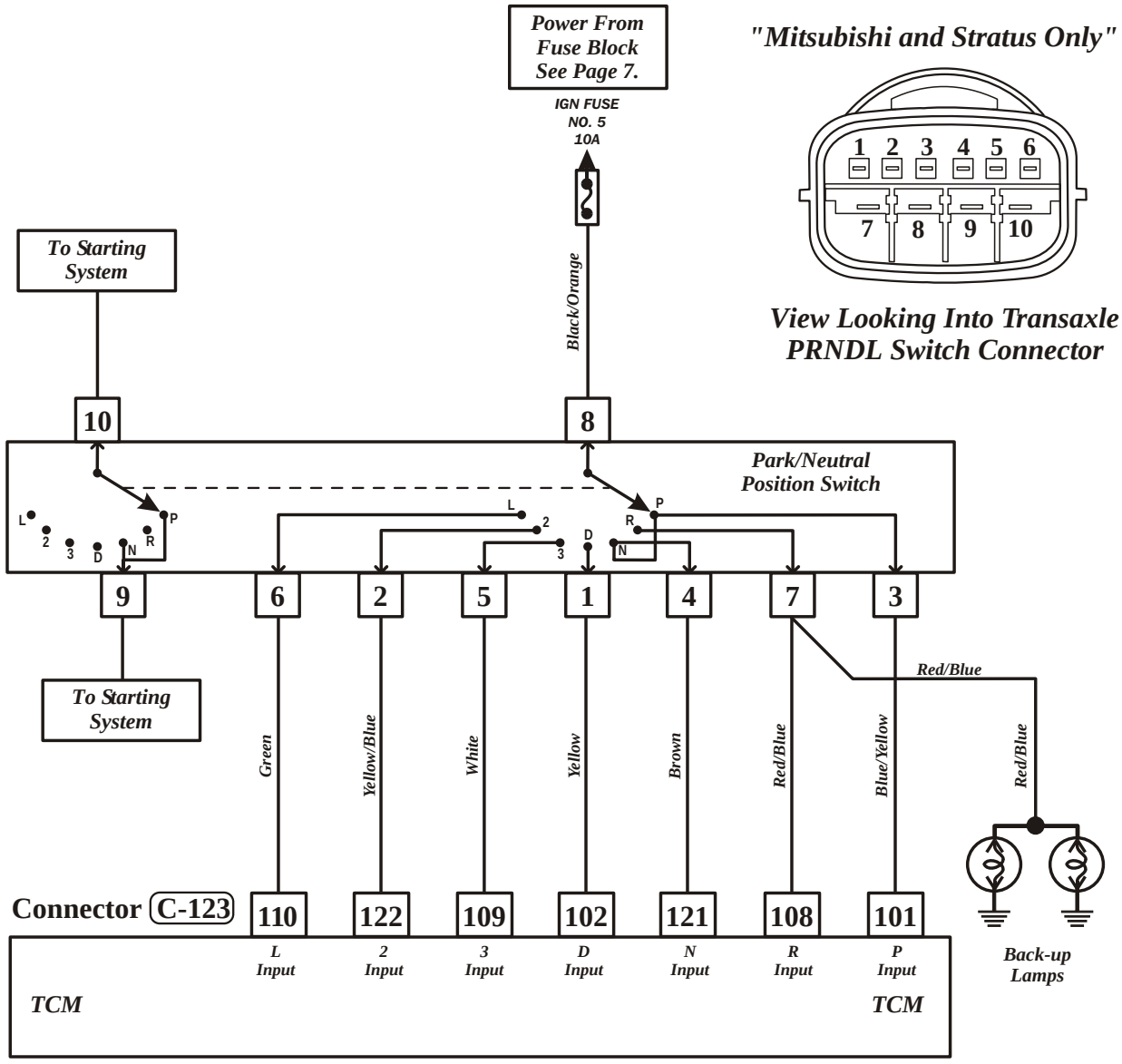
71	72	73	74					75	76	77	
78	79	80	81	82	83	84	85	86	87	88	89
90	91		92	93	94		95	96		97	98

Connector C-123

101	102		103	104					105	106	107	
108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123		124	125		126	127	128		129	130

Figure 6

PARK/NEUT SWITCH CONNECTOR AND TERMINAL IDENTIFICATION



NOTE: Wire colors may vary.

Figure 7

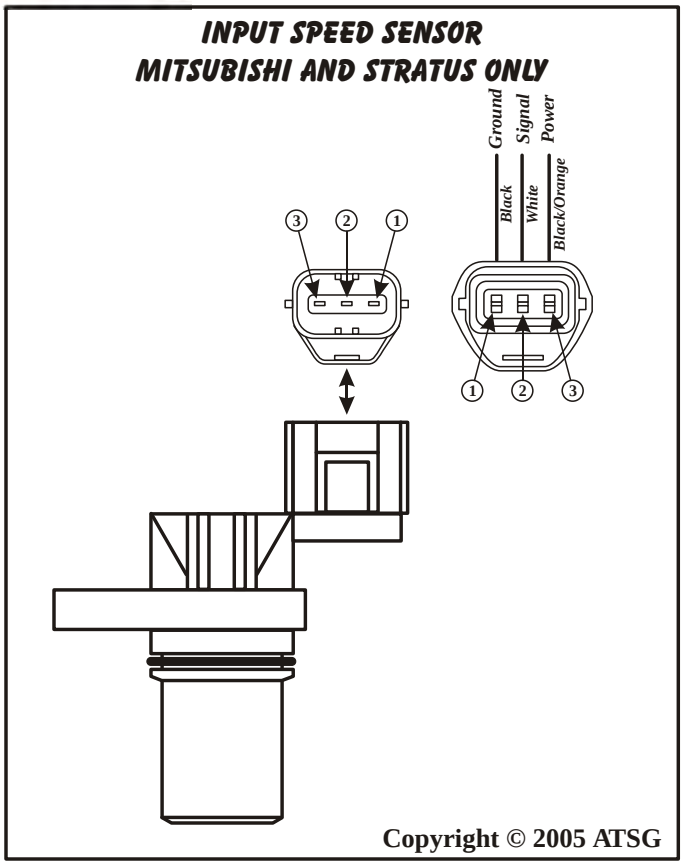


Figure 8

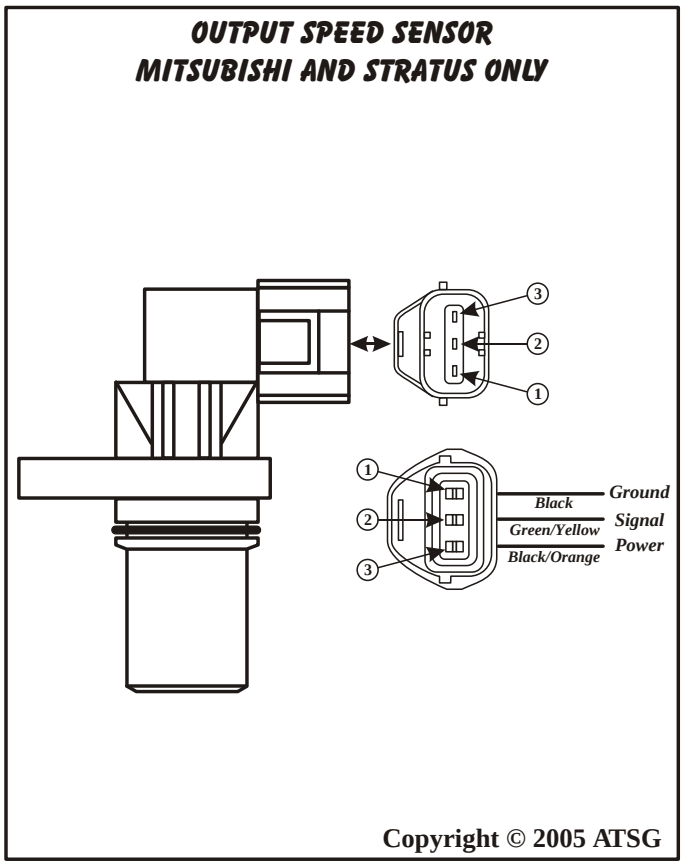


Figure 9

INPUT SPEED SENSOR CIRCUIT OPERATION MITSUBISHI AND STRATUS ONLY

When the key is turned on, you should see battery voltage at input speed sensor terminal 3. A coil built into the input shaft speed sensor generates a 0 - 5 volt pulse signal at both ends of this coil when the input shaft rotates. The pulse signal frequency increases with a rise in input shaft speed. Both ends of the coil are connected to the TCM (terminals 57 and 103) via the input shaft speed sensor connector (terminals 1 and 2), as shown in Figure 5. The TCM detects the input shaft speed by the signal input to terminal 103. The input shaft speed sensor generates the pulse signal as the teeth on the underdrive clutch housing pass the magnetic tip of the sensor.

CONDITIONS TO SET DTC

If no output pulse is detected from the input shaft speed sensor for one second or more, while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, there is an open or short in the input shaft speed sensor circuit, and a DTC is set. When a DTC is output four times, the transaxle is locked into 2nd as a failsafe measure.

OUTPUT SPEED SENSOR CIRCUIT OPERATION MITSUBISHI AND STRATUS ONLY

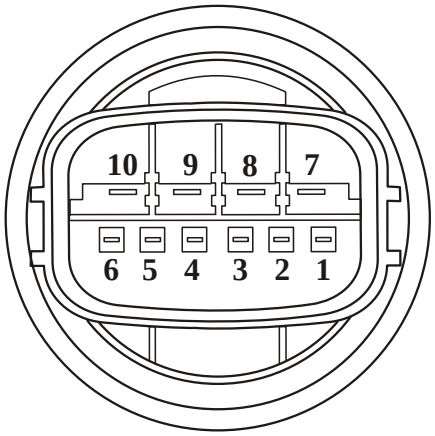
When the key is turned on, you should see battery voltage at output speed sensor terminal 3. A coil built into the output speed sensor generates a 0 - 5 volt pulse signal at both ends of this coil when the output shaft rotates. The pulse signal frequency increases with a rise in output shaft speed. Both ends of the coil are connected to the TCM (terminals 57 and 104) via the output shaft speed sensor connector (terminals 1 and 2), as shown in Figure 5. The TCM detects the output shaft speed by the signal input to terminal 104. The output shaft speed sensor generates the pulse signal as the teeth of the transfer drive gear pass the magnetic tip of the sensor.

CONDITIONS TO SET DTC

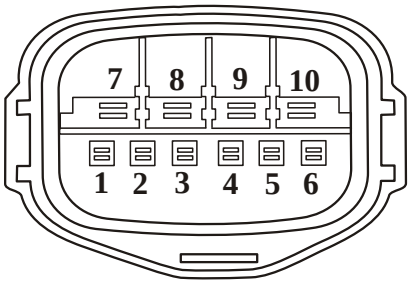
If the output from the output speed sensor is continuously 50% lower than vehicle speed for one second or more, while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, there is an open or short in the output speed sensor circuit, and a DTC is set. When a DTC is output four times, the transaxle is locked into 2nd as a failsafe measure.

CASE CONNECTOR TERMINAL IDENTIFICATION AND INTERNAL COMPONENT RESISTANCE CHART

"Hyundai Only"



View Looking Into Transaxle Case Connector



View Looking Into Transaxle Harness Connector

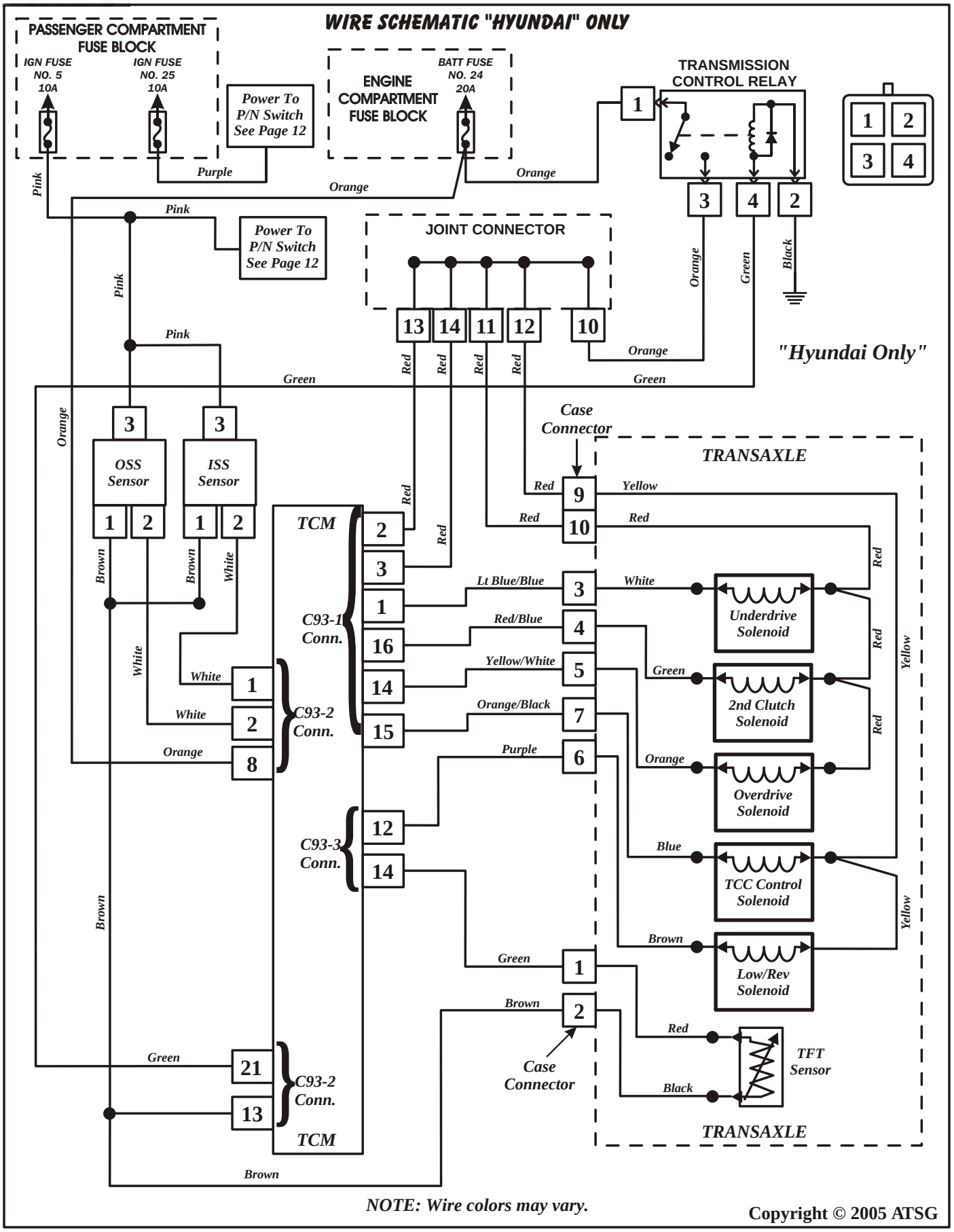
INTERNAL COMPONENT RESISTANCE CHART

COMPONENT	*TERMINALS*	*RESISTANCE*
Underdrive Solenoid	*Terminals 10 and 3*	*Approximately 3.6 Ohms @ 72 °F*
2nd Solenoid	*Terminals 10 and 4*	*Approximately 3.6 Ohms @ 72 °F*
Overdrive Solenoid	*Terminals 10 and 5*	*Approximately 3.6 Ohms @ 72 °F*
Low/Rev Solenoid	*Terminals 9 and 6*	*Approximately 3.6 Ohms @ 72 °F*
TCC Solenoid	*Terminals 9 and 7*	*Approximately 3.6 Ohms @ 72 °F*
TFT Sensor	*Terminals 1 and 2*	*Approximately 9.05 k. Ohms @ 72°F*

TERMINAL NUMBER	INTERNAL WIRE COLOR	CIRCUIT DESCRIPTION
1	*Red*	*5 Volt Power to TFT Sensor*
2	*Black*	*Ground to TFT Sensor*
3	*White*	*Ground to Underdrive Solenoid*
4	*Green*	*Ground to 2nd Clutch Solenoid*
5	*Orange*	*Ground to Overdrive Solenoid*
6	*Brown*	*Ground to Low/Reverse Solenoid*
7	*Blue*	*Ground to TCC Solenoid*
8		*Not Used*
9	*Red*	*Power to TCC and Low/Reverse Solenoids*
10	*Yellow*	*Power to Underdrive, 2nd, and Overdrive Solenoids*

NOTE: Wire colors may vary.

Figure 10



NOTE: Wire colors may vary.

Figure 11

TCM CONNECTOR AND TERMINAL IDENTIFICATION
"HYUNDAI" ONLY

Connector C93-3

11	10	9	8	7	6	5	4	3	2	1
22	21	20	19	18	17	16	15	14	13	12

Connector C93-2

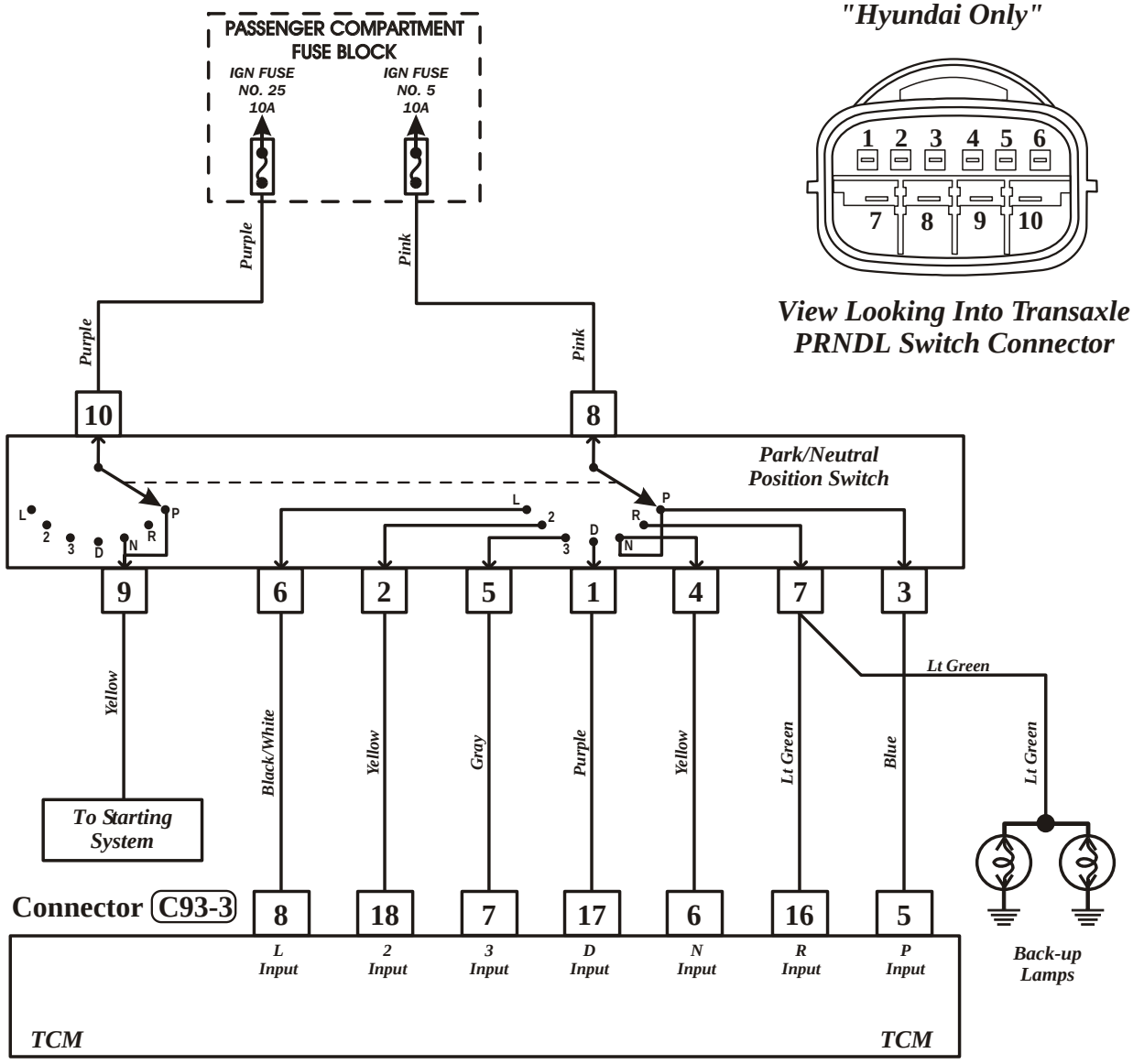
8	7	6	5	4	3	2	1
16	15	14	13	12	11	10	9

Connector C93-1

13	12	11	10	9	8	7	6	5	4	3	2	1
26	25	24	23	22	21	20	19	18	17	16	15	14

Figure 12

PARK/NEUT SWITCH CONNECTOR AND TERMINAL IDENTIFICATION



NOTE: Wire colors may vary.

Figure 13

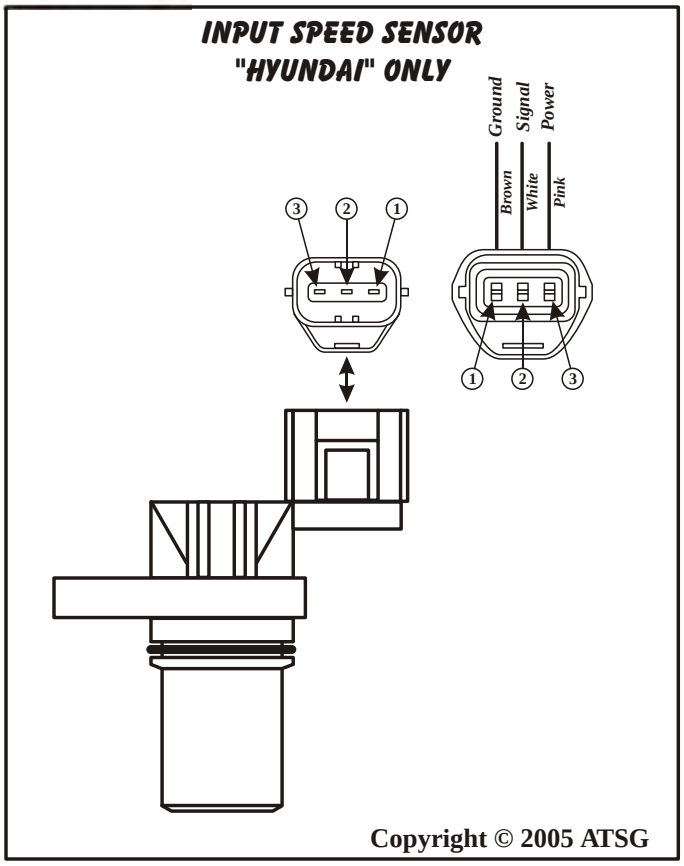


Figure 14

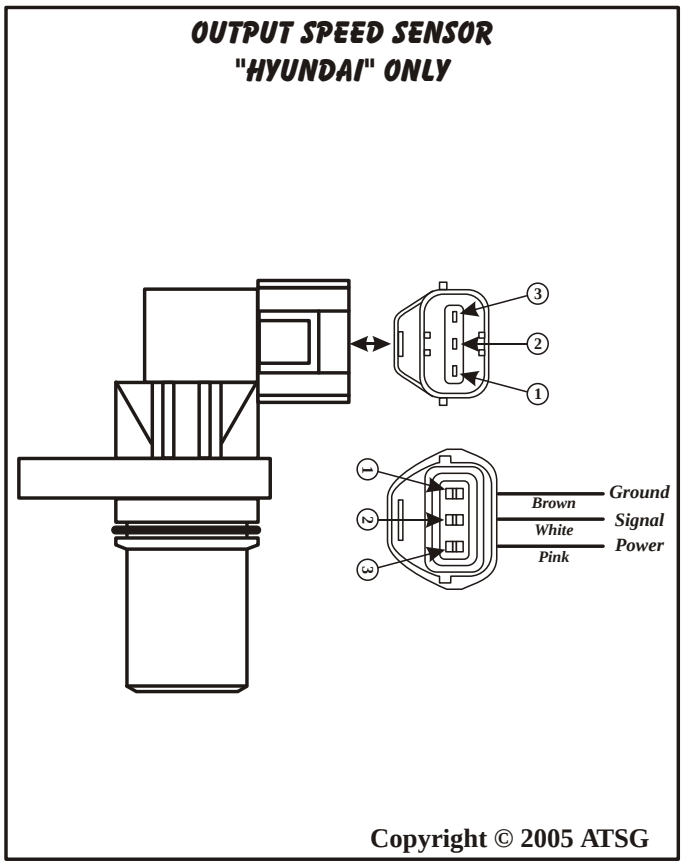


Figure 15

"HYUNDAI" INPUT SENSOR CIRCUIT OPERATION

When the key is turned on, you should see battery voltage at input speed sensor terminal 3. A coil built into the input shaft speed sensor generates a 0 - 5 volt pulse signal at both ends of this coil when the input shaft rotates. The pulse signal frequency increases with a rise in input shaft speed. Both ends of the coil are connected to the TCM (terminals 1 and 13) via the input shaft speed sensor connector (terminals 1 and 2), as shown in Figure 11. The TCM detects the input shaft speed by the signal input to terminal 1. The input shaft speed sensor generates the pulse signal as the teeth on the underdrive clutch housing pass the magnetic tip of the sensor.

CONDITIONS TO SET DTC

If no output pulse is detected from the input shaft speed sensor for one second or more, while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, there is an open or short in the input shaft speed sensor circuit, and a DTC is set. When a DTC is output four times, the transaxle is locked into 2nd as a failsafe measure.

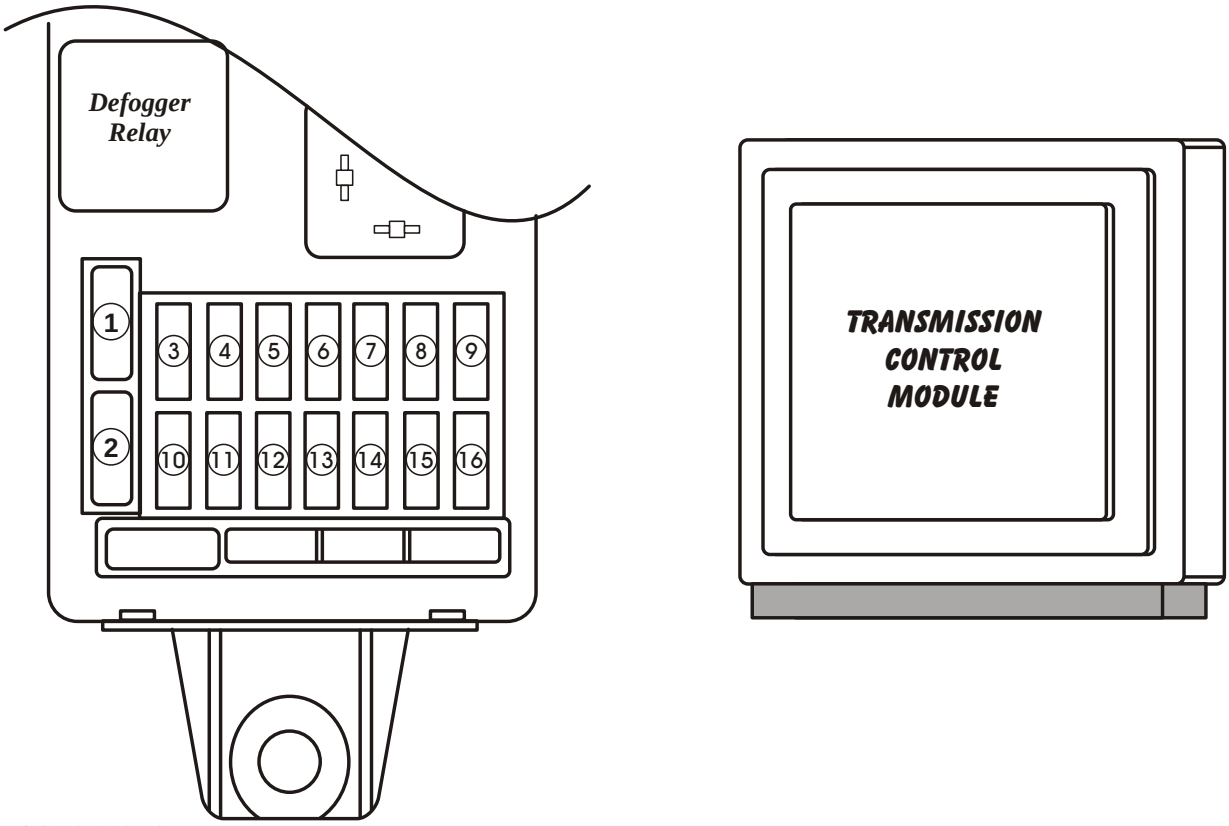
"HYUNDAI" OUTPUT SENSOR CIRCUIT OPERATION

When the key is turned on, you should see battery voltage at output speed sensor terminal 3. A coil built into the output speed sensor generates a 0 - 5 volt pulse signal at both ends of this coil when the output shaft rotates. The pulse signal frequency increases with a rise in output shaft speed. Both ends of the coil are connected to the TCM (terminals 2 and 13) via the output shaft speed sensor connector (terminals 1 and 2), as shown in Figure 11. The TCM detects the output shaft speed by the signal input to terminal 2. The output shaft speed sensor generates the pulse signal as the teeth of the transfer drive gear pass the magnetic tip of the sensor.

CONDITIONS TO SET DTC

If the output from the output speed sensor is continuously 50% lower than vehicle speed for one second or more, while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, there is an open or short in the output speed sensor circuit, and a DTC is set. When a DTC is output four times, the transaxle is locked into 2nd as a failsafe measure.

FUSE BLOCK AND TCM LOCATIONS
"MITSUBISHI" AND "DODGE" ONLY



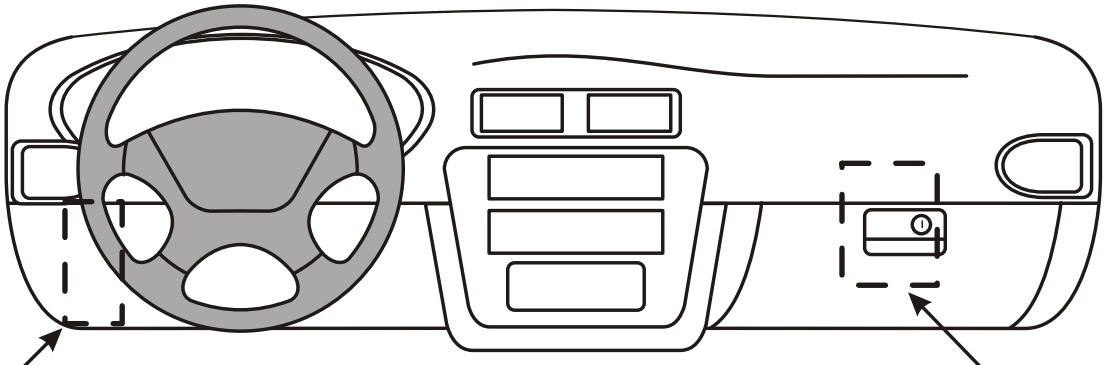
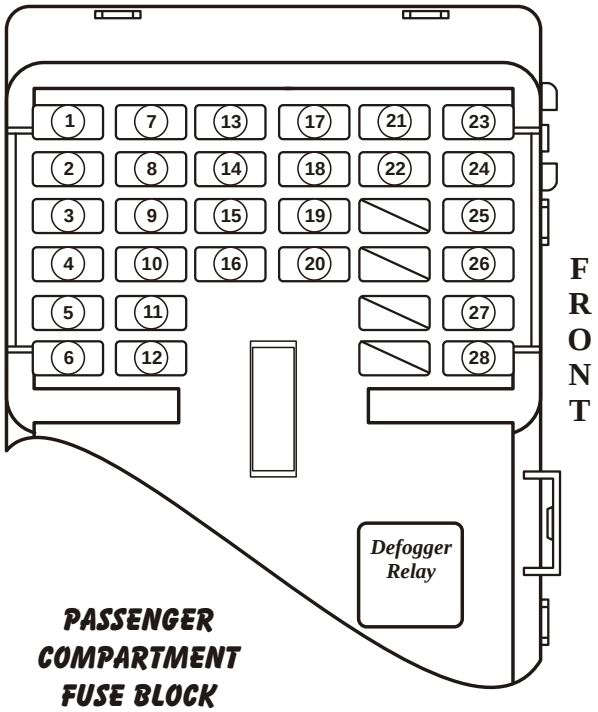
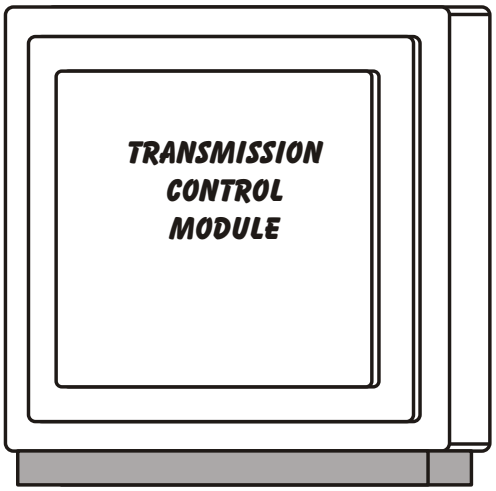


Figure 16

FUSE BLOCK AND TCM LOCATIONS
"HYUNDAI" ONLY





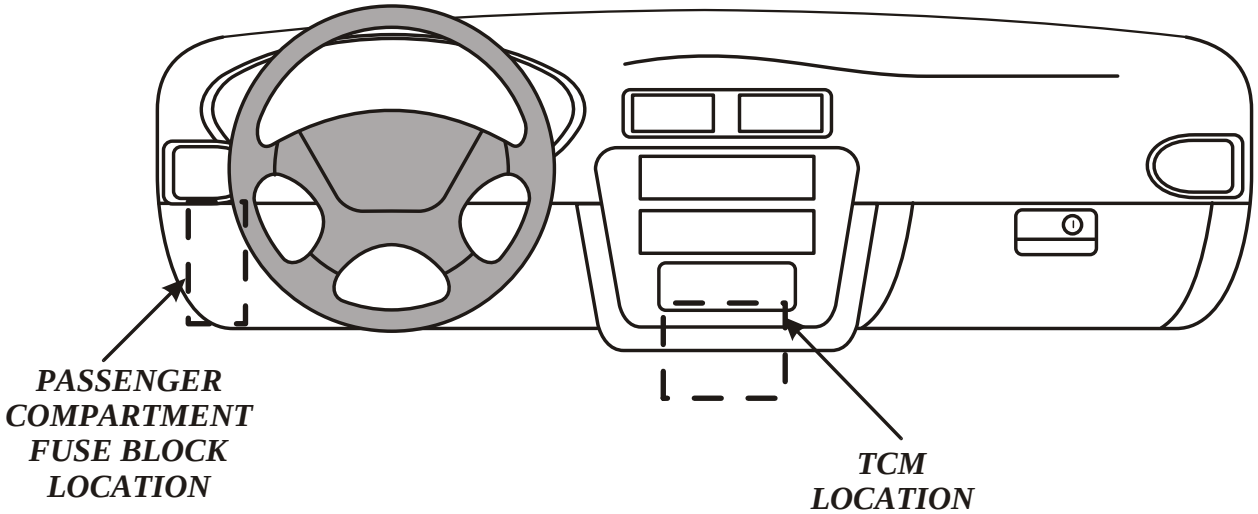


Figure 17

"STRATUS" DIAGNOSTIC TROUBLE CODE DESCRIPTION	
Code	*Description*
P0705	*Transaxle Range Sensor, Circuit Malfunction*
P0712	*Transaxle Fluid Temperature Sensor, Short Circuit*
P0713	*Transaxle Fluid Temperature Sensor, Open Circuit*
P0715	*Input Speed Sensor, Open Circuit/Short Circuit*
P0720	*Output Speed Sensor, Open Circuit/Short Circuit*
P0731	*1st Gear Ratio Error*
P0732	*2nd Gear Ratio Error*
P0733	*3rd Gear Ratio Error*
P0734	*4th Gear Ratio Error*
P0736	*Reverse Gear Ratio Error*
P0741	*Torque Converter Clutch, Circuit Performance or Stuck Off*
P0742	*Torque Converter Clutch, Circuit Performance or Stuck On*
P0743	*Torque Converter Clutch Solenoid, Open Circuit/Short Circuit*
P0753	*Low/Reverse Solenoid, Open Circuit/Short Circuit*
P0758	*Underdrive Solenoid, Open Circuit/Short Circuit*
P0763	*Second Clutch Solenoid, Open Circuit/Short Circuit*
P0768	*Overdrive Solenoid, Open Circuit/Short Circuit*
P1400	*Manifold Differential Pressure Sensor, Circuit Malfunction*
P1500	*Generator FR Terminal, Circuit Malfunction*
P1751	*Transaxle Control Relay, Open Circuit/Short To Ground*

CODE RETRIEVAL REQUIRES SCANNER

OBD-II Connector located on drivers side under dash.

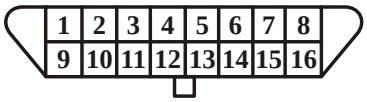


Figure 18

"HYUNDAI" DIAGNOSTIC TROUBLE CODE DESCRIPTION	
Code	*Description*
P0703	*Stop Lamp Switch, Short Circuit/Open Circuit*
P0707	*Transaxle Range Switch, Open Circuit*
P0708	*Transaxle Range Switch, Short Circuit*
P0712	*Transaxle Fluid Temperature Sensor, Short Circuit*
P0713	*Transaxle Fluid Temperature Sensor, Open Circuit*
P0715	*Input Speed Sensor, Open Circuit/Short Circuit*
P0720	*Output Speed Sensor, Open Circuit/Short Circuit*
P0725	*Crank Position Sensor, Open Circuit*
P0731	*1st Gear Ratio Error*
P0732	*2nd Gear Ratio Error*
P0733	*3rd Gear Ratio Error*
P0734	*4th Gear Ratio Error*
P0736	*Reverse Gear Ratio Error*
P0740	*Torque Converter Clutch, Defective System*
P0743	*Torque Converter Clutch Solenoid, Open Circuit/Short Circuit*
P0750	*Low/Reverse Solenoid, Open Circuit/Short Circuit*
P0755	*Underdrive Solenoid, Open Circuit/Short Circuit*
P0760	*Second Clutch Solenoid, Open Circuit/Short Circuit*
P0765	*Overdrive Solenoid, Open Circuit/Short Circuit*
P1630	*CAN-BUS OFF, TCM Failure Open/Short*
P1631	*CAN-TIME OUT ECU, ECM Failure Open/Short*
P1702	*Throttle Position Sensor, Misadjusted*
P1703	*Throttle Position Sensor, Open Circuit*
P1704	*Throttle Position Sensor, Short Circuit*
P1723	*Transaxle Control Relay, Open Circuit/Short To Ground*
P1749	*Serial Comunication Error, Connector, ECM, TCM*
P1764	*CAN CONTROLLER CIRCUIT, TCM Failure Internal Malfunction*

CODE RETRIEVAL REQUIRES SCANNER

OBD-II Connector located on drivers side under dash.

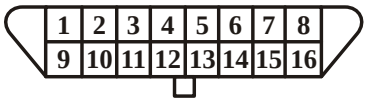


Figure 19

"KIA" DIAGNOSTIC TROUBLE CODE DESCRIPTION	
Code	*Description*
P0500	*Vehicle Speed Sensor, Open/Short*
P0703	*Stop Lamp Switch, Short Circuit/Open Circuit*
P0707	*Transaxle Range Switch, Open Circuit*
P0708	*Transaxle Range Switch, Short Circuit*
P0712	*Transaxle Fluid Temperature Sensor, Short Circuit*
P0713	*Transaxle Fluid Temperature Sensor, Open Circuit*
P0715	*Input Speed Sensor, Open Circuit/Short Circuit*
P0720	*Output Speed Sensor, Open Circuit/Short Circuit*
P0731	*1st Gear Ratio Error*
P0732	*2nd Gear Ratio Error*
P0733	*3rd Gear Ratio Error*
P0734	*4th Gear Ratio Error*
P0736	*Reverse Gear Ratio Error*
P0740	*Torque Converter Clutch, Stuck On*
P0743	*Torque Converter Clutch Solenoid, Open Circuit/Short Circuit*
P0750	*Low/Reverse Solenoid, Open Circuit/Short Circuit*
P0755	*Underdrive Solenoid, Open Circuit/Short Circuit*
P0760	*Second Clutch Solenoid, Open Circuit/Short Circuit*
P0765	*Overdrive Solenoid, Open Circuit/Short Circuit*
P1630	*CAN-BUS OFF, TCM Failure Open/Short*
P1631	*CAN-TIME OUT ECU, ECM Failure Open/Short*
P1723	*Transaxle Control Relay, Open Circuit/Short To Ground*
P1764	*CAN CONTROLLER CIRCUIT, TCM Failure Internal Malfunction*

CODE RETRIEVAL REQUIRES SCANNER

OBD-II Connector located on drivers side under dash.

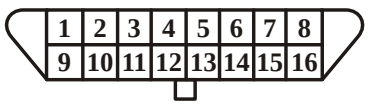
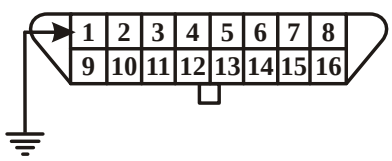


Figure 20

"MITSUBISHI" DIAGNOSTIC TROUBLE CODE DESCRIPTION	
Code	*Description*
11	*Throttle Position Sensor, Short Circuit*
12	*Throttle Position Sensor, Open Circuit*
14	*Throttle Position Sensor, Misadjusted*
15	*Transaxle Fluid Temperature Sensor, Open Circuit*
16	*Transaxle Fluid Temperature Sensor, Short Circuit*
21	*Crankshaft Position Sensor, Open Circuit*
22	*Input Speed Sensor, Open Circuit/Short Circuit*
23	*Output Speed Sensor, Open Circuit/Short Circuit*
27	*Transaxle Range Sensor, Open Circuit*
28	*Transaxle Range Sensor, Short Circuit*
31	*Low/Reverse Solenoid, Open Circuit/Short Circuit*
32	*Underdrive Solenoid, Open Circuit/Short Circuit*
33	*Second Clutch Solenoid, Open Circuit/Short Circuit*
34	*Overdrive Solenoid, Open Circuit/Short Circuit*
36	*Torque Converter Clutch Solenoid, Open Circuit/Short Circuit*
41	*1st Gear Ratio Error*
42	*2nd Gear Ratio Error*
43	*3rd Gear Ratio Error*
44	*4th Gear Ratio Error*
46	*Reverse Gear Ratio Error*
51	*Comunication Error With The Engine Control System*
52	*Torque Converter Clutch, Circuit Performance*
53	*Torque Converter Clutch, Circuit Performance or Stuck On*
54	*Transaxle Control Relay, Open Circuit/Short To Ground*
56	*N Range Light System, Short to Ground*
71	*Malfunction of Transaxle Control System*

SCANNER FOR CODE RETRIEVAL, OR "N" RANGE INDICATOR LIGHT ON INSTRUMENT CLUSTER

OBD-II Connector located on drivers side under dash.



"N" Range Indicator Light Method:

Turn ignition off. Using jumper wire, ground terminal 1 of the Data Link Connector as shown at left. Turn ignition on. Read DTC's by observing flash pattern of "N" range indicator light located on instrument cluster. First series of flashes indicates first digit of DTC. Second series of flashes indicates second digit of DTC.
Example: 2 flashes followed by a pause, and then 6 flashes indicates DTC 26.

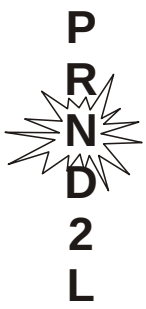


Figure 21

SAFETY PRECAUTIONS

Service information provided in this manual by ATSG is intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools and equipment could cause injury to you or others.

The service procedures we recommend and describe in this manual are effective methods of performing service and repair on this unit. Some of the procedures require the use of special tools that are designed for specific purposes.

This manual contains CAUTIONS that you must observe carefully in order to reduce the risk of injury to yourself or others. This manual also contains NOTES that must be carefully followed in order to avoid improper service that may damage the vehicle, tools and/or equipment.

TRANSAXLE DISASSEMBLY

EXTERNAL COMPONENTS

1. The transaxle should be steam cleaned on the outside, to remove any dirt or grease before disassembly begins.
2. This transaxle can be disassembled very easily on a work bench without the benefit of any holding fixture for rotation.
3. Remove the torque converter from transaxle, as shown in Figure 22.
   Caution: Use care when removing the torque converter, to avoid personal injury and/or damage to converter, as it is heavy.

Continued on Page 21

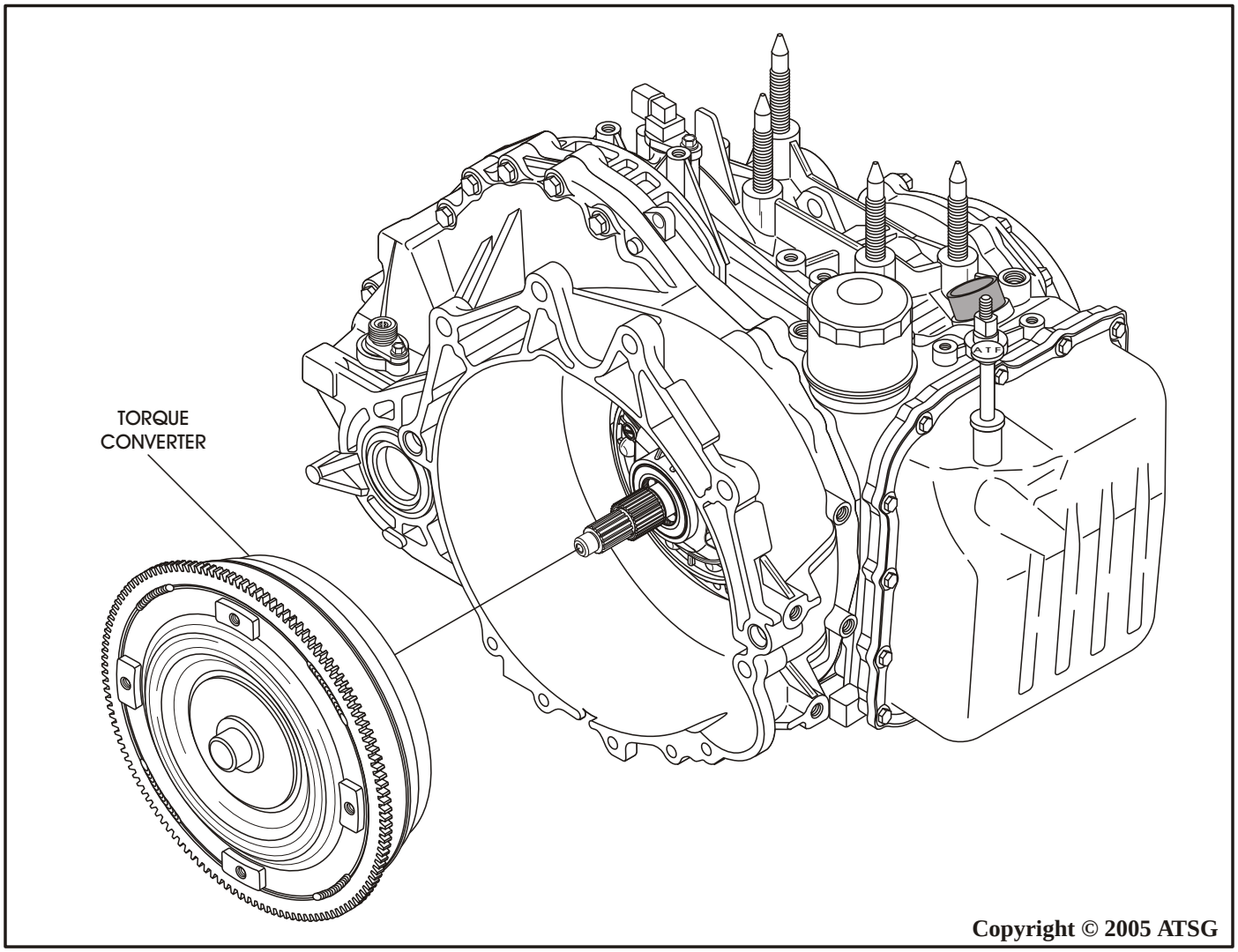


Figure 22

TRANSAXLE DISASSEMBLY

EXTERNAL COMPONENTS (CONT'D)

4. Remove the fluid level indicator from transaxle as shown in Figure 23.
5. Remove and discard the external oil filter from transaxle, as shown in Figure 23.
   Note: The external oil filter is not used on all model transaxles.
6. Remove the input shaft speed sensor retaining bolt and the input shaft speed sensor, as shown in Figure 23.
7. Remove and discard the "O" ring.
8. Remove the output shaft speed sensor retaining bolt and the output shaft speed sensor, as shown in Figure 23.
9. Remove and discard the "O" ring.

Continued on Page 22

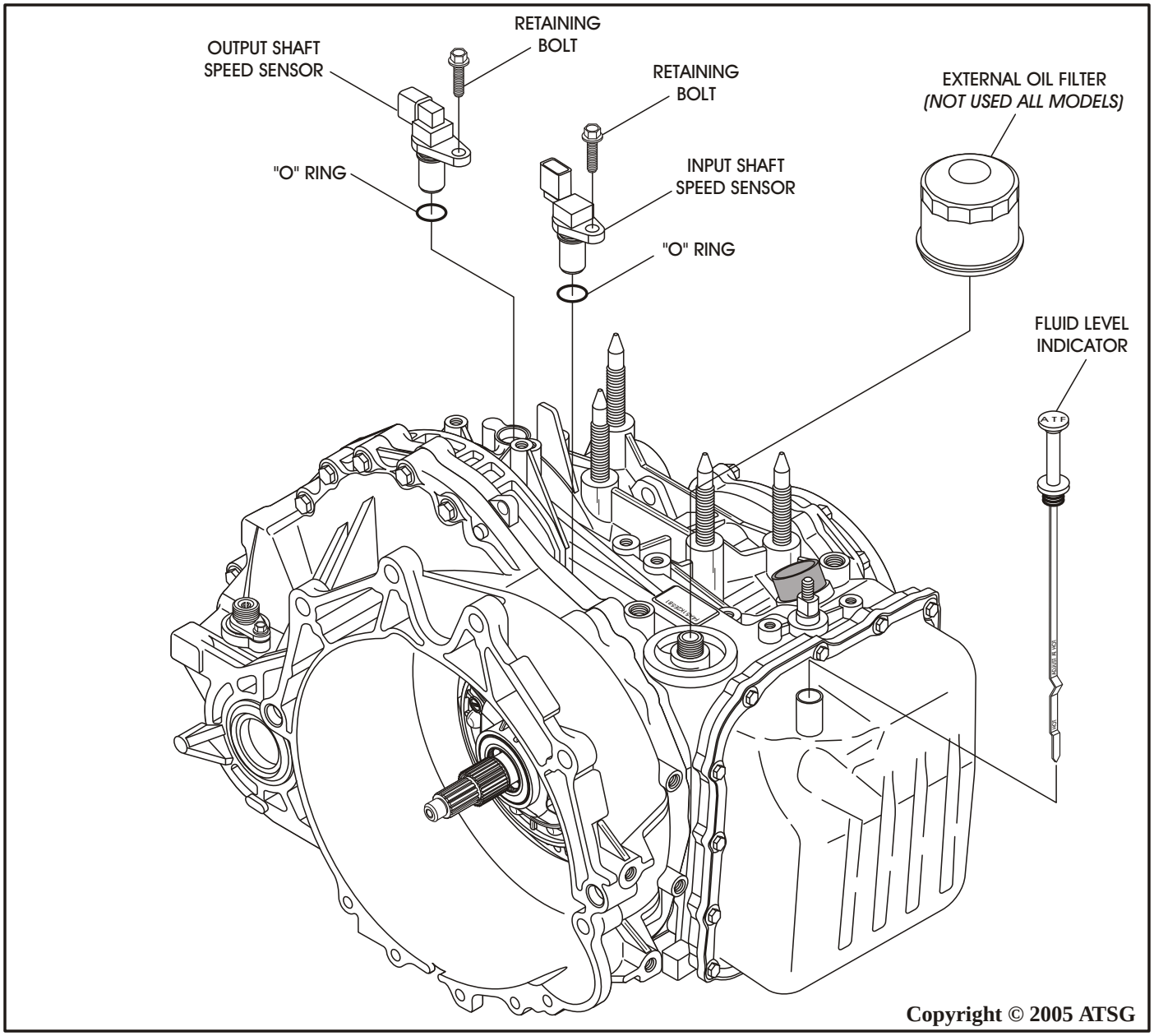


Figure 23

TRANSAXLE DISASSEMBLY

EXTERNAL COMPONENTS (CONT'D)

10. Remove the speedometer adapter, the pulse generator, or the sealing cap, depending on which the transaxle is equipped with. Refer to Figure 25.
11. As a diagnostic aid, install dial indicator, as shown in Figure 24, measure and record the input shaft end play.
12. Remove the manual control lever nut, manual control lever and P/N position switch from the transaxle case, as shown in Figure 25.
    Caution: This must be done "Before" attempting to remove valve body.

Continued on Page 23

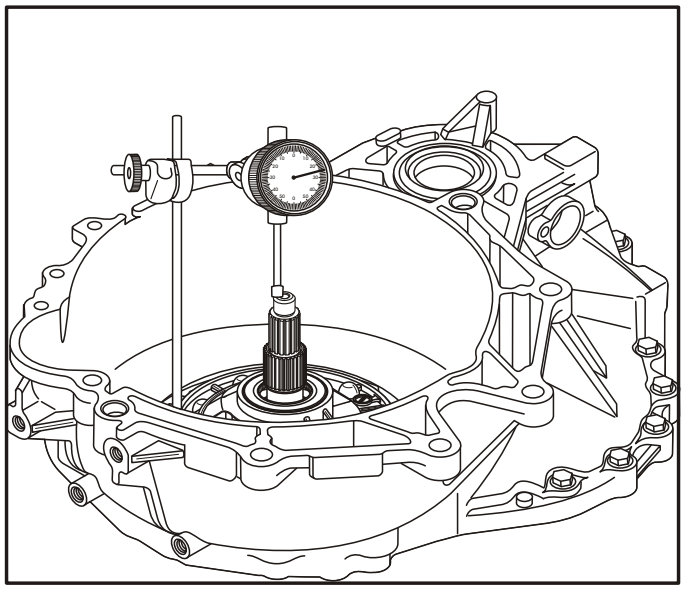


Figure 24

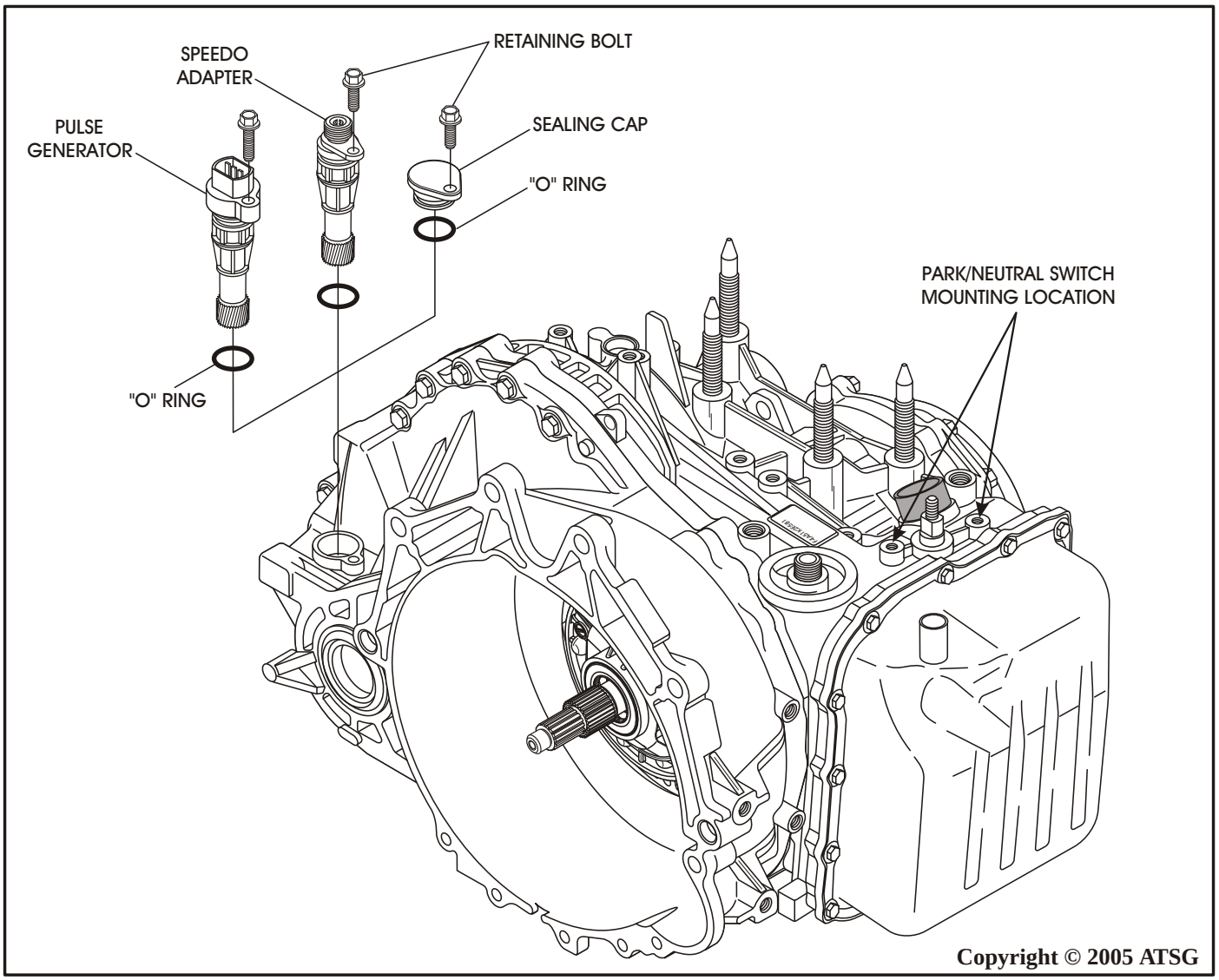


Figure 25

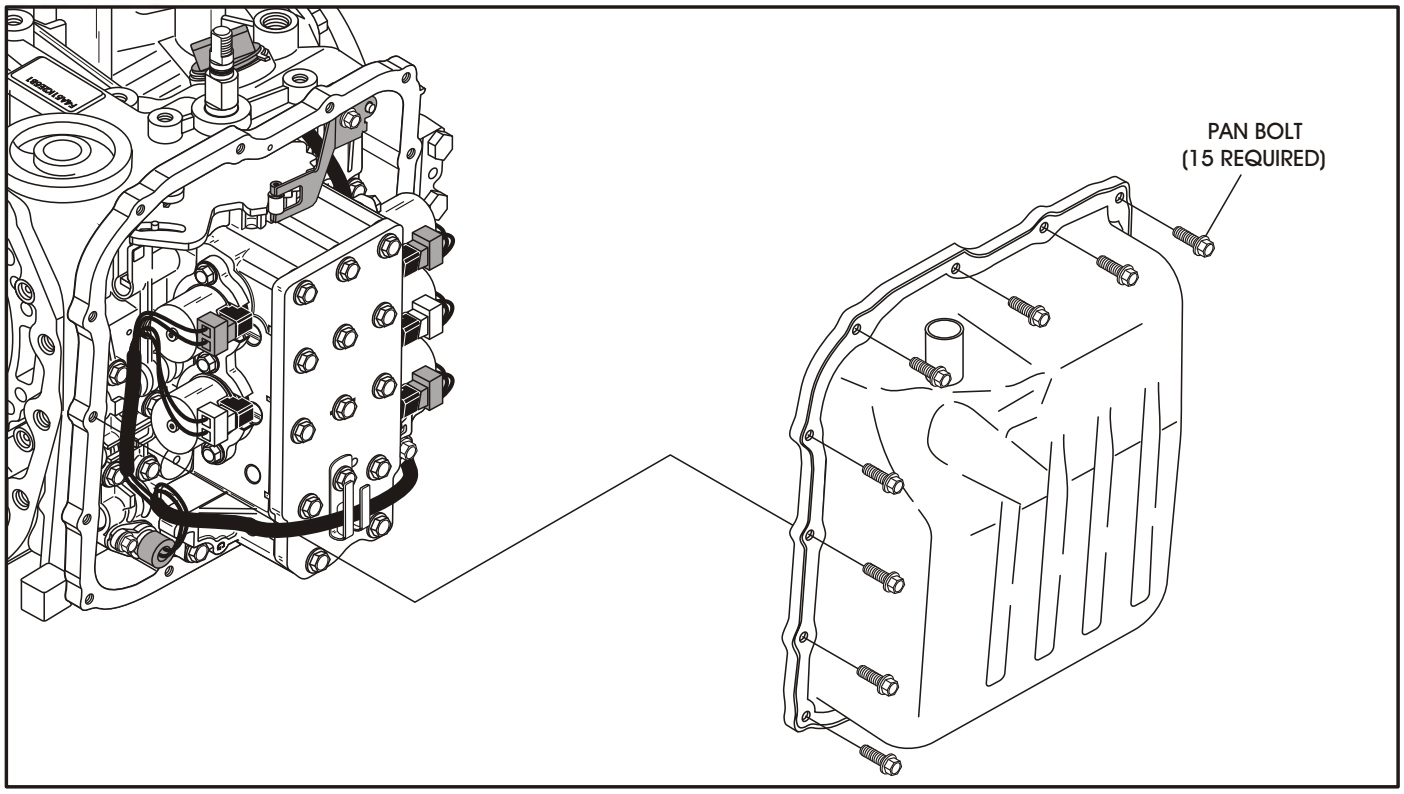


Figure 26

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS

1. Remove the 15 pan bolts and remove the oil pan, as shown in Figure 26.
2. Disconnect the shift solenoid connectors and the fluid temperature sensor connector, as shown in Figure 27.
   Note: Some of the shift solenoids can be cross-connected. We have provided you with color of the wires that we observed. If yours are different, label them now to prevent you from cross-connecting on assembly.
3. Remove the connectors and drape the wire harness up and over the top of pan rail.

Continued on Page 24

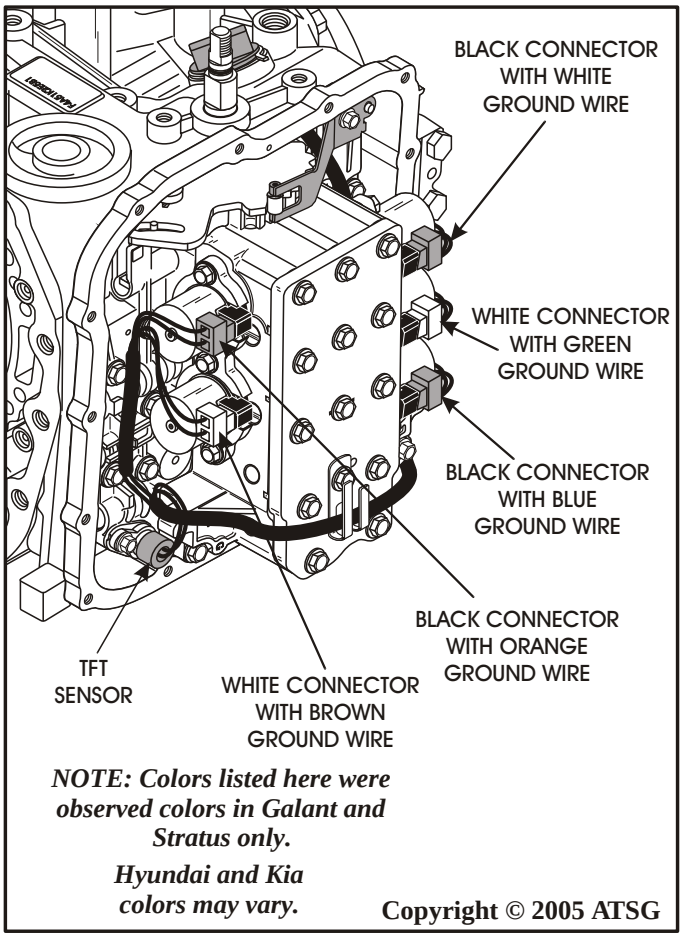


Figure 27

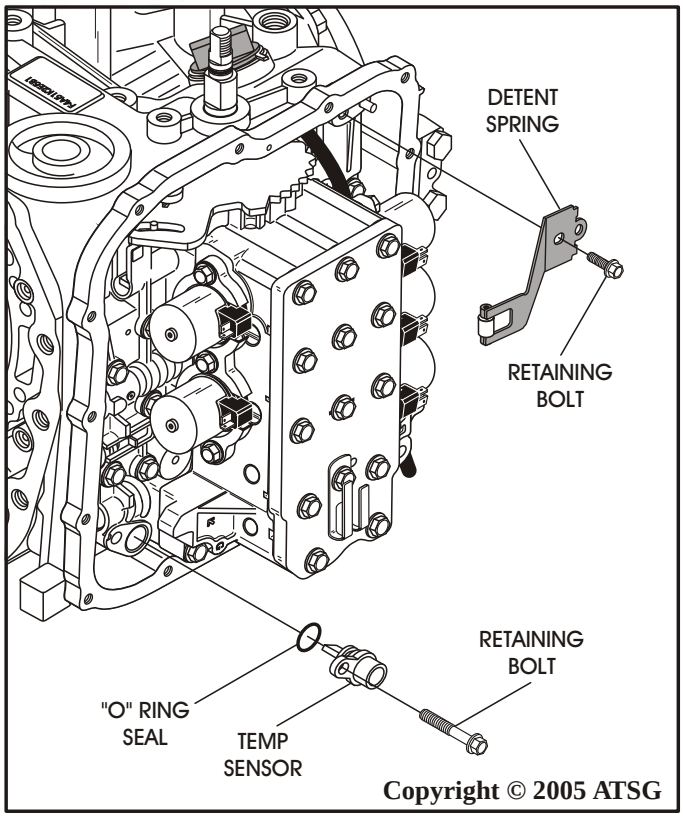


Figure 28

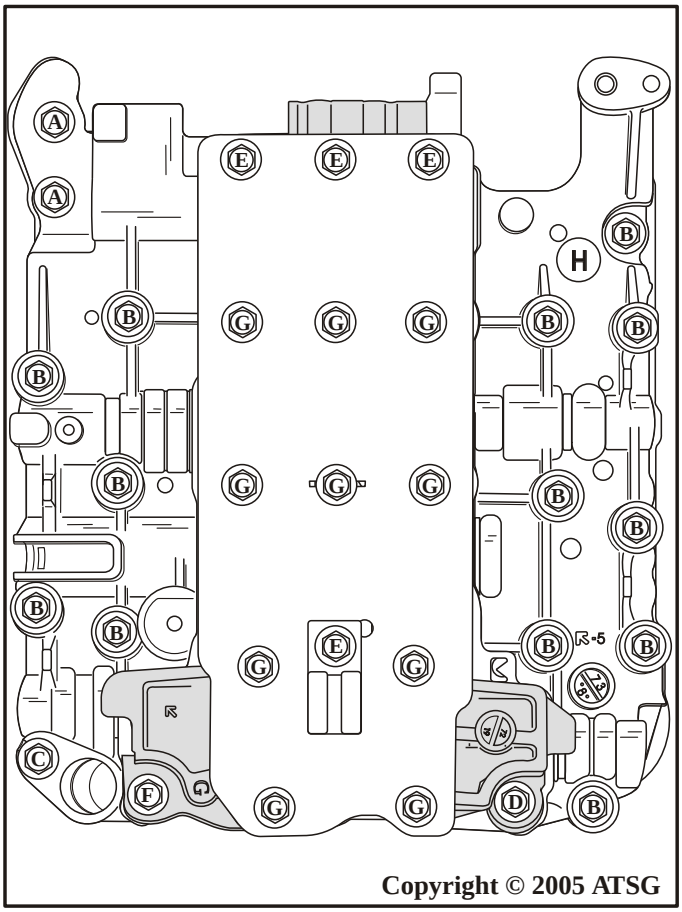


Figure 29

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

4. Remove the internal detent spring, as shown in Figure 28.
5. Remove the TFT sensor from transaxle, as shown in Figure 28.
6. Remove and discard the TFT sensor "O" ring, as shown in Figure 28.
   Note: "Before" removing the valve body to case bolts, ensure that the external manual control lever and P/N position switch have been removed.
7. Remove the valve body to case mounting bolts as shown in Figure 29.
   Note: Remove all valve body bolts "Except" the bolts that we labeled with "E", as shown in Figure 29. The bolts labeled with "E" are solenoid body to main valve body bolts.

Continued on Page 25

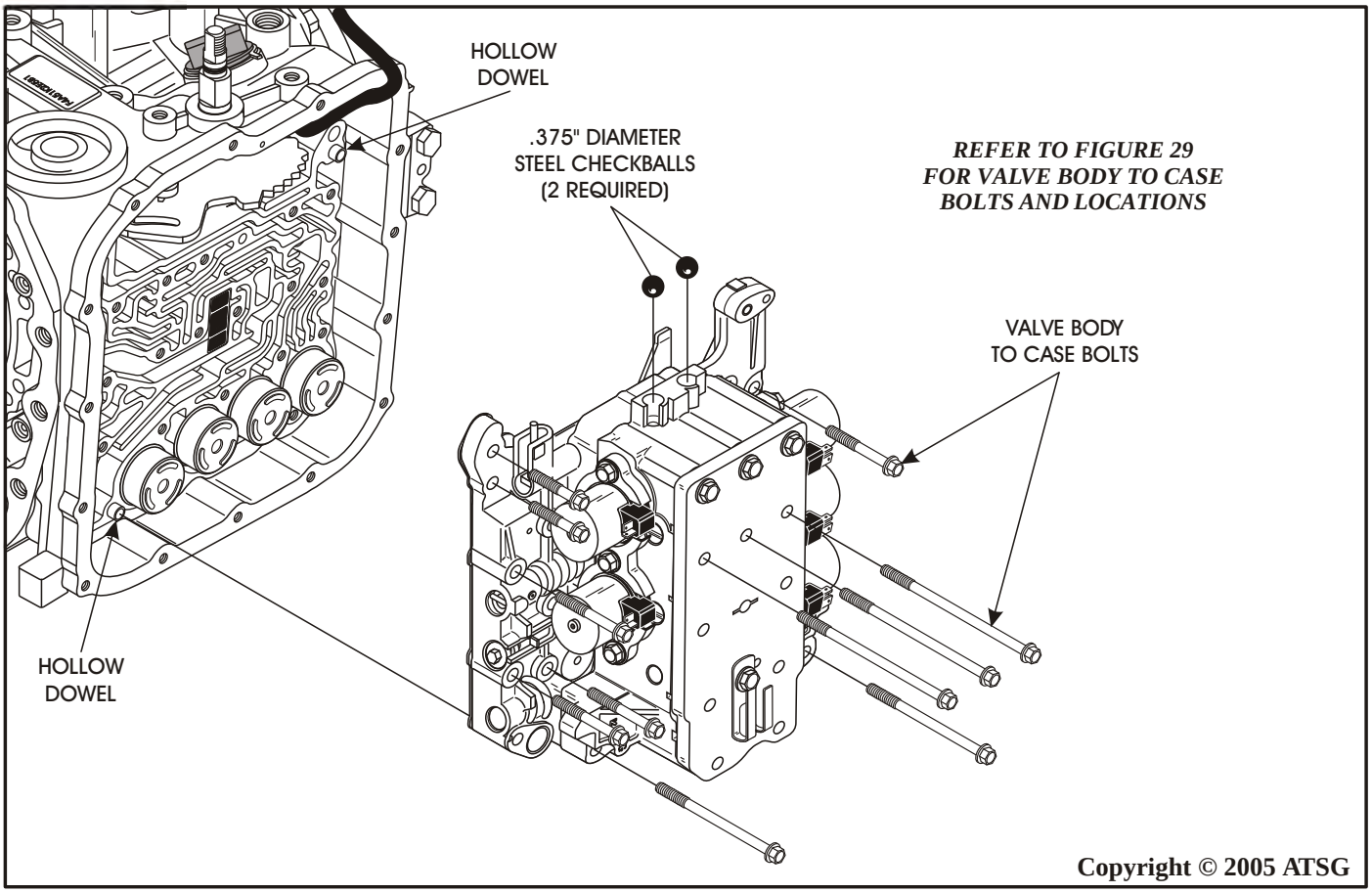


Figure 30

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

8. Remove the valve body to case bolts and the valve body assembly, as shown in Figure 30.
9. Notice the two steel balls in the top of valve body, as shown in Figure 30.
   Note: Place steel balls and hollow dowels in a safe location for reassembly.
10. Set the valve body assembly aside for the component rebuild section.
11. Remove the manual shaft retaining pin from pan rail, as shown in Figure 31.
12. Remove and discard the 2nd clutch case seal, as shown in Figure 31.
13. Remove the case worm track oil screen, as shown in Figure 31.
    Note: Replace case screen as necessary.

Continued on Page 26

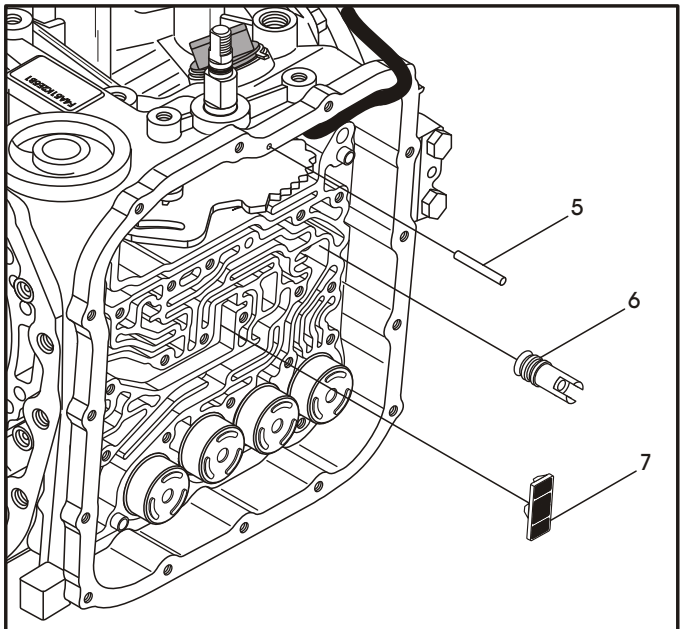


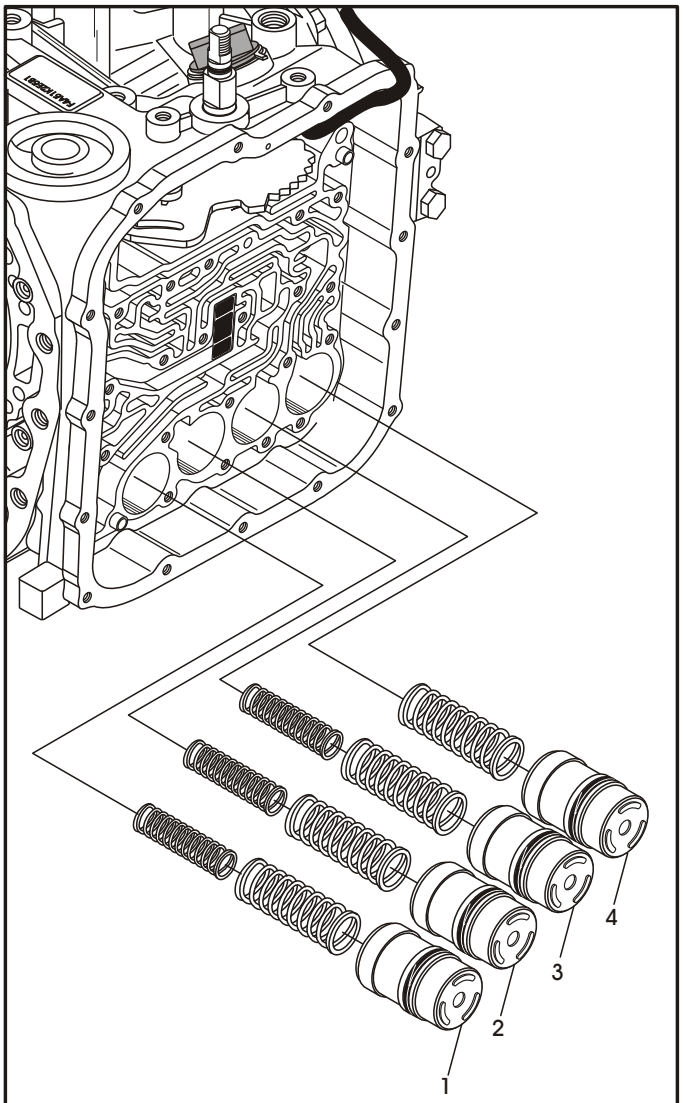
Figure 31

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

14. Remove each accumulator piston and springs, as shown in Figure 32.
    Note: The accumulator springs we observed were identified with blue dye, as shown in Figure 34. If your springs are not identified, label them now as you remove them, so that you have no confusion for assembly.
15. Remove and discard all accumulator piston seals, as shown in Figure 33.

Continued on Page 27



1 LOW/REVERSE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
2 UNDERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
3 SECOND CLUTCH ACCUMULATOR PISTON AND SPRINGS.
4 OVERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRING.

Figure 32

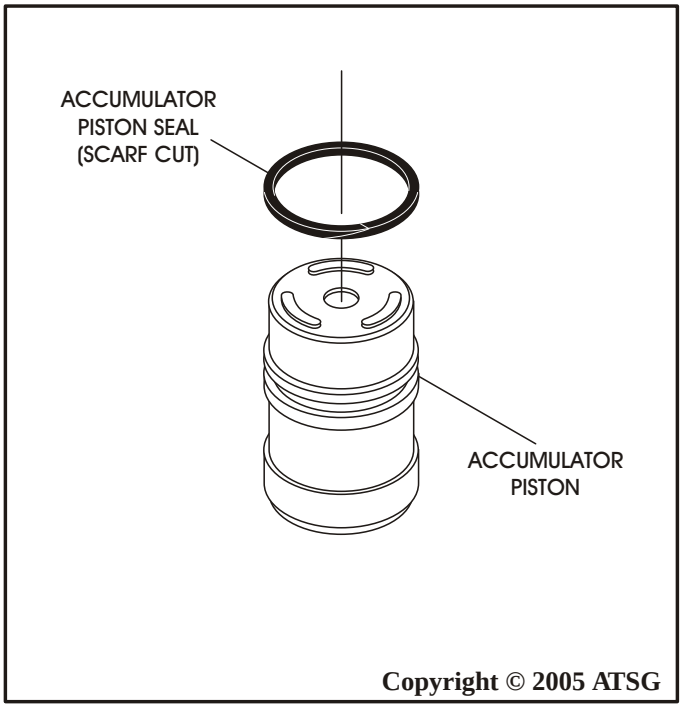
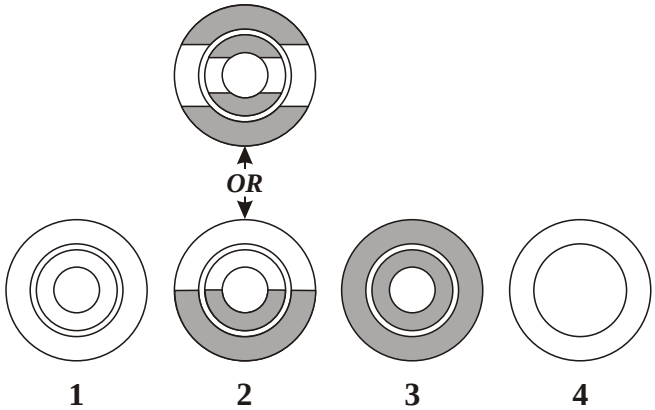


Figure 33

ACCUMULATOR SPRING IDENTIFICATION

NOTE: The shaded areas are the identification "Bluing".



NO.	ACCUMULATOR	I.D. "Bluing"
1	*Low/Reverse Clutch*	*None*
2	*Underdrive Clutch*	*Half or 2/3rds*
3	*Second Clutch*	*Full Surface*
4	*Overdrive Clutch*	*None*

Figure 34

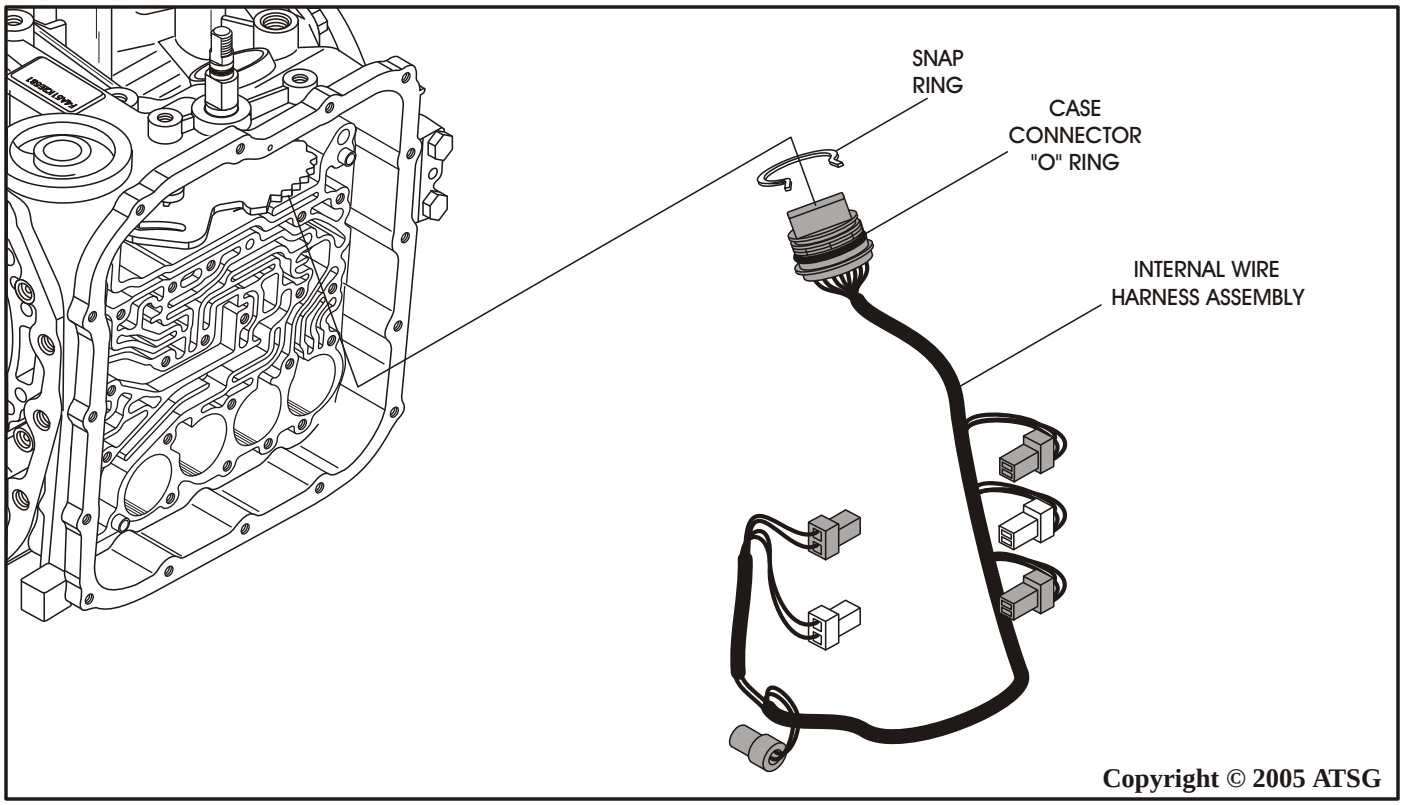


Figure 35

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

16. Remove the case connector snap ring and remove the internal wire harness through the inside of the case, as shown in Figure 35.
17. Remove and discard the case connector "O" ring, as shown in Figure 35.
18. With the manual shaft retaining pin removed, rotate back and forth and remove the inside detent lever and parking rod through the inside of the case, as shown in Figure 36.

Continued on Page 28

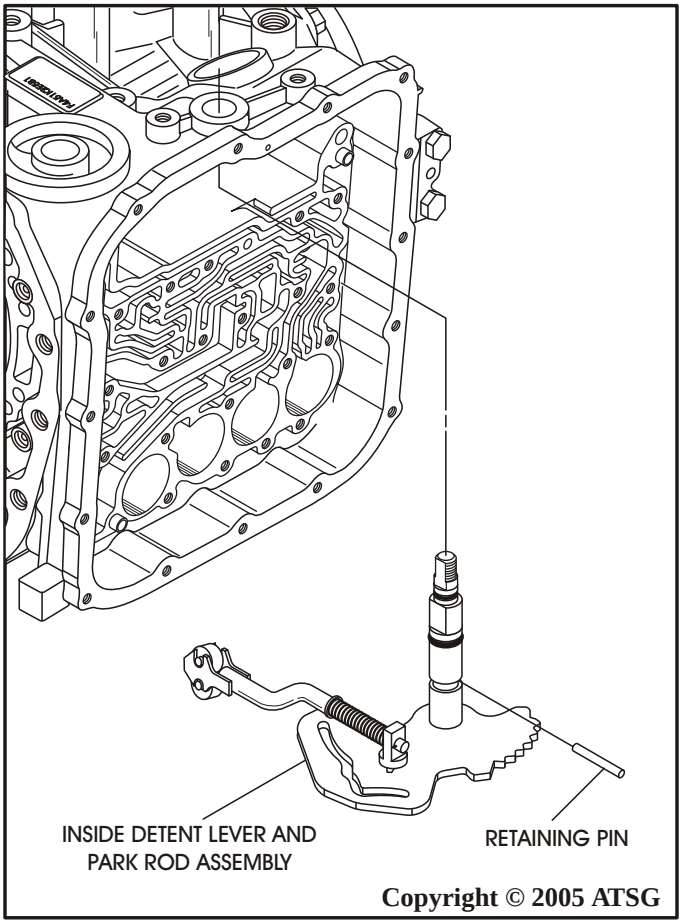


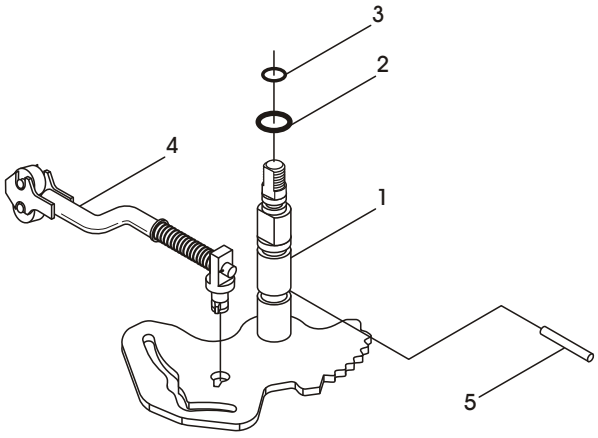
Figure 36

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

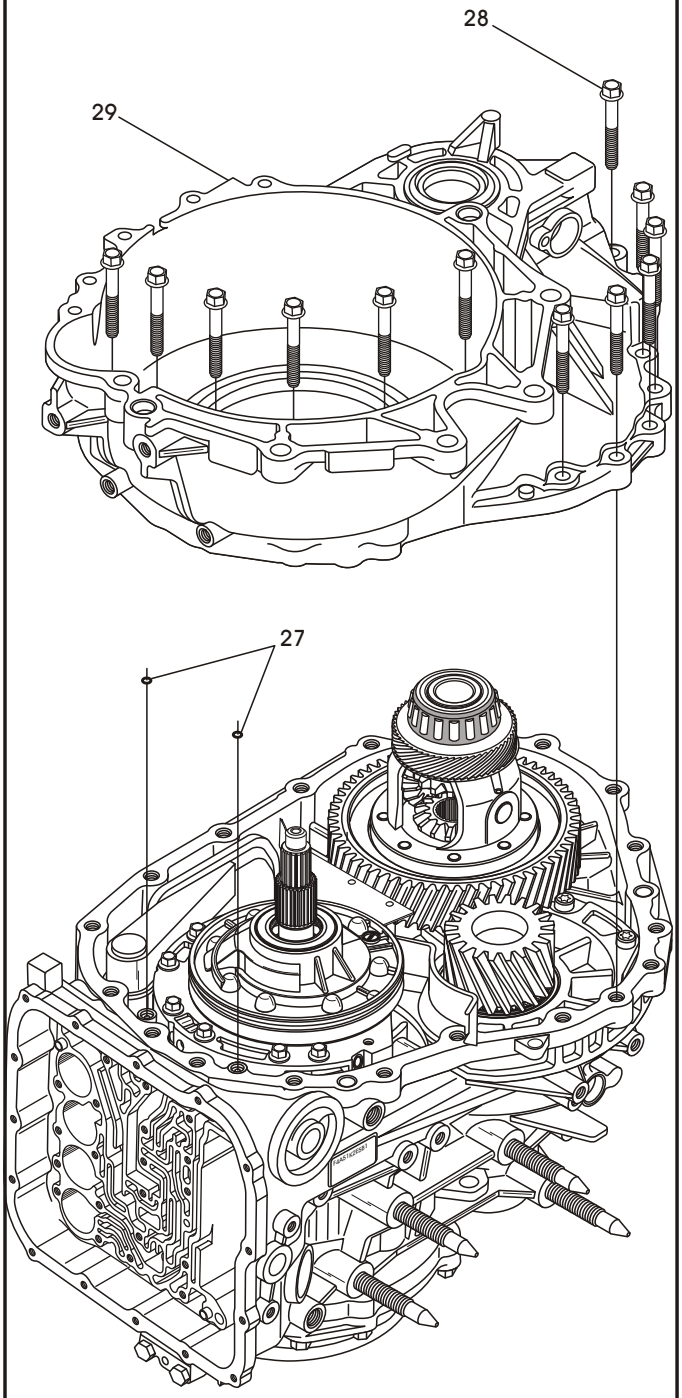
19. Remove and discard the two "O" ring seals on the manual shaft, as shown in Figure 37.
20. Rotate the case on the work bench so that the converter housing is facing up, as shown in Figure 38.
21. Remove the 18 torque converter housing bolts, as shown in Figure 38.
    Note: Six of these bolts are inside of the converter housing, as shown in Figure 38.
22. Remove and discard the two small "O" rings between the converter housing and the case, as shown in Figure 38.
    Note: The "O" rings may be stuck to the torque converter housing.

Continued on Page 29



1 MANUAL LINKAGE SHAFT AND INSIDE DETENT LEVER ASSEMBLY.
2 MANUAL SHAFT LARGE "O" RING.
3 MANUAL SHAFT SMALL "O" RING.
4 PARK ACTUATING ROD ASSEMBLY.
5 MANUAL SHAFT RETAINING PIN.

Figure 37



27 CONVERTER COVER TO CASE "O" RINGS (2 REQUIRED).
28 CONVERTER COVER TO CASE RETAINING BOLTS (18 REQ.).
29 TORQUE CONVERTER HOUSING.

Figure 38

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

23. Remove and discard the oil filter and "O" ring, as shown in Figure 39.
24. Remove the differential assembly from case, as shown in Figure 39.
25. Set complete differential assembly aside for the component rebuild section.
26. Remove the six oil pump retaining bolts, as shown in Figure 40, and remove the oil pump assembly.
27. Set complete oil pump assembly aside for the component rebuild section.
28. Remove and discard the oil pump to case gasket, as shown in Figure 40.
    Note: Gasket may be stuck to oil pump.

Continued on Page 30

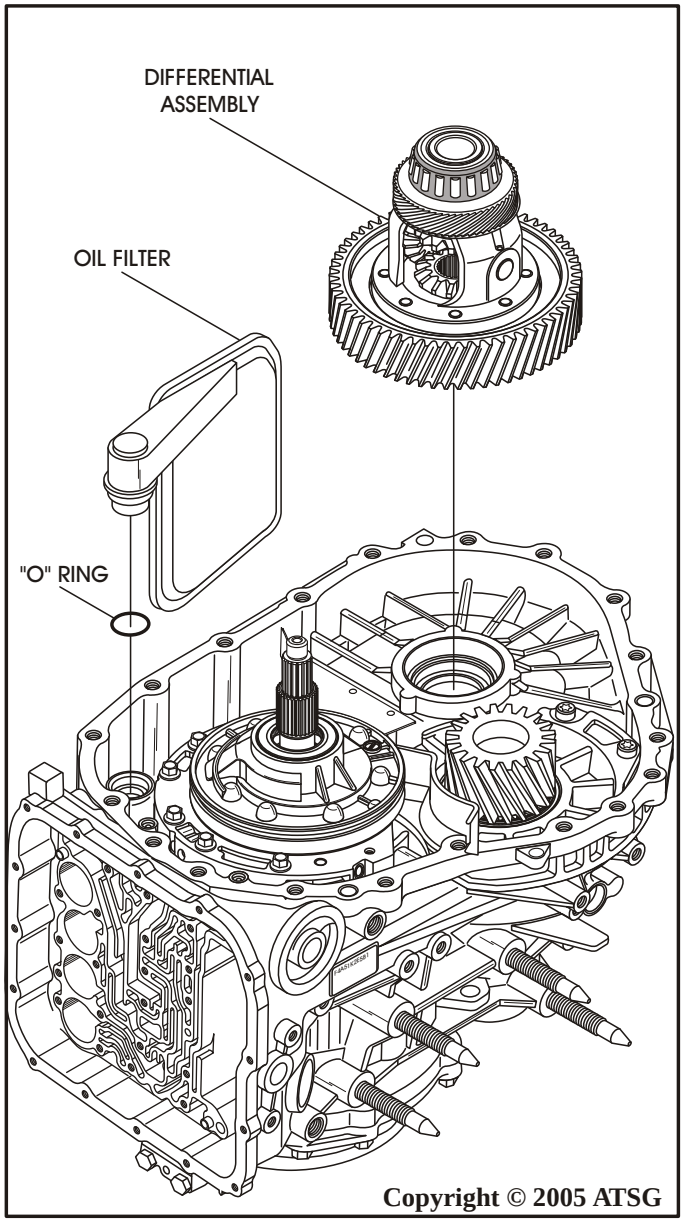


Figure 39

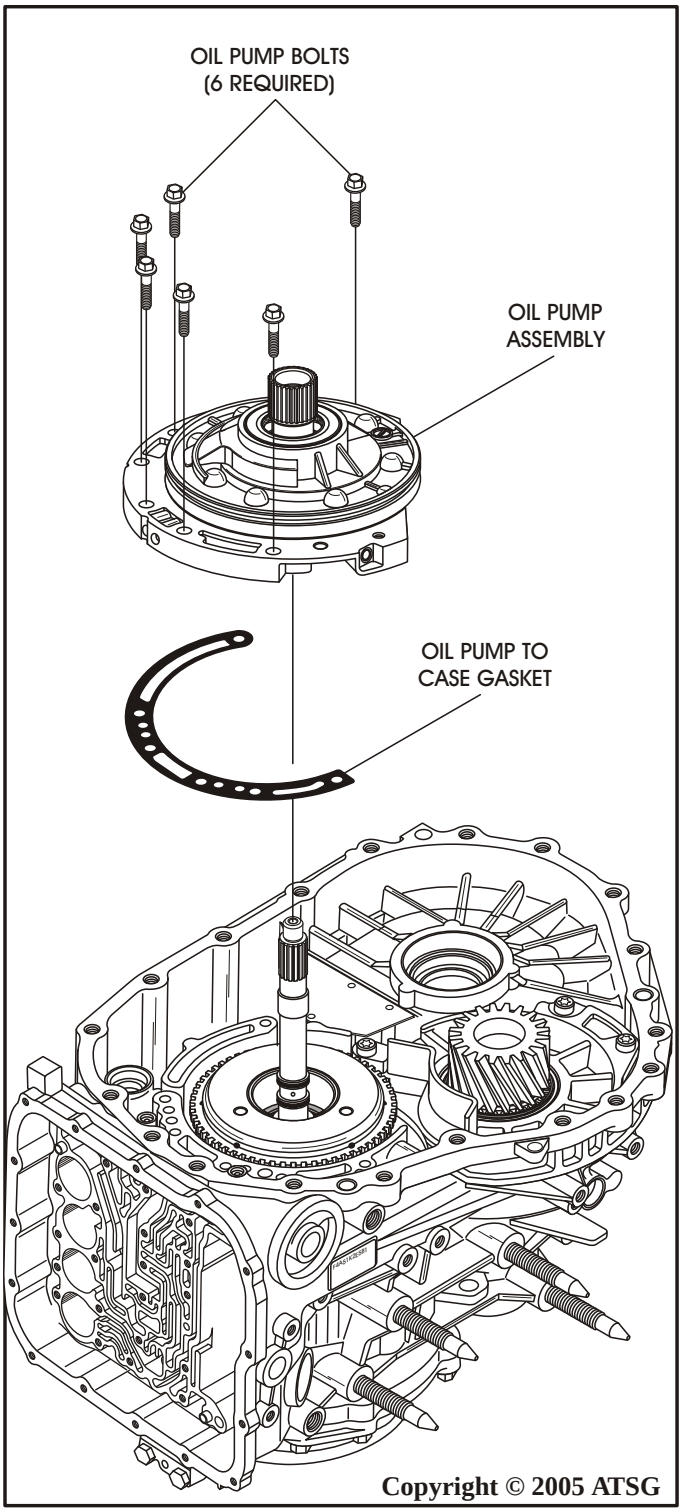


Figure 40

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

29. Remove the underdrive clutch housing by lifting straight up, as shown in Figure 41.
30. Remove the number 1 selective thrust washer, as shown in Figure 41.
31. Set the complete underdrive clutch housing aside for the component rebuild section.
32. Remove underdrive clutch hub and number 2 thrust bearing, as shown in Figure 42.
33. ***Note:*** Transfer drive gear removal ***requires*** first removing low/reverse clutch piston, on models that are equipped with low sprag. Refer to Sprag Information on Page 117.
34. Rotate transaxle on bench so that rear cover is facing up, as shown in Figure 43.

Continued on Page 31

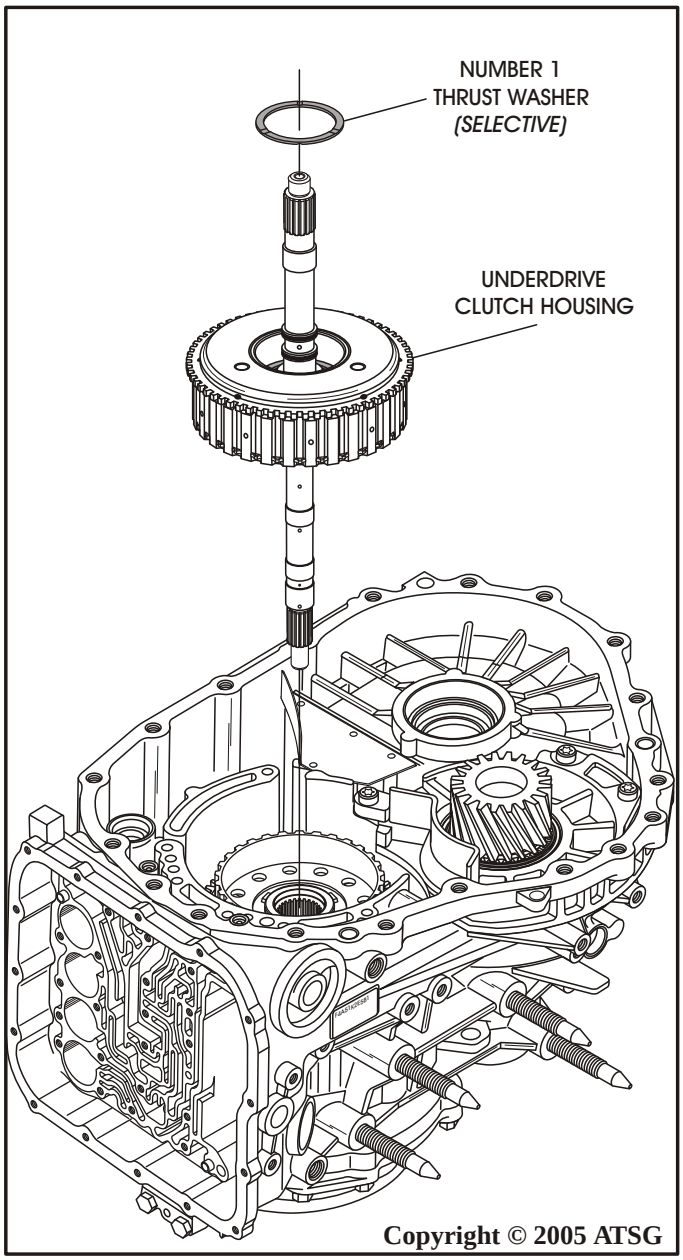


Figure 41

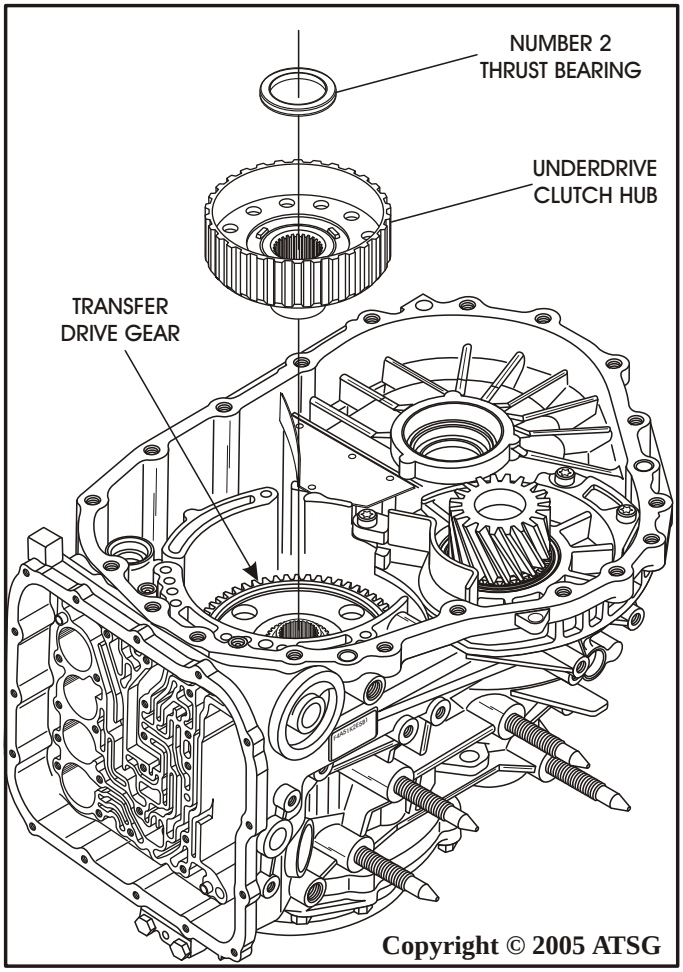


Figure 42

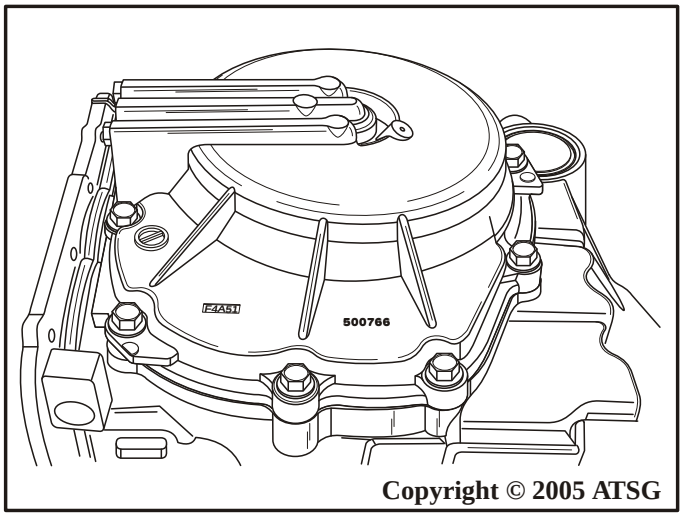


Figure 43

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

35. Remove the ten rear cover retaining bolts, as shown in Figure 44, and remove the rear cover.
36. Set rear cover aside for the component rebuild section.
37. Remove and discard the 3 rear cover to case "O" ring seals, as shown in Figure 44.
38. Remove number 8 ***selective*** thrust plate and the number 7 thrust bearing assembly, as shown in Figure 45.
39. Remove the overdrive/reverse clutch housing assembly, as shown in Figure 45.
40. Set the overdrive/reverse clutch housing aside for the component rebuild section.

Continued on Page 32

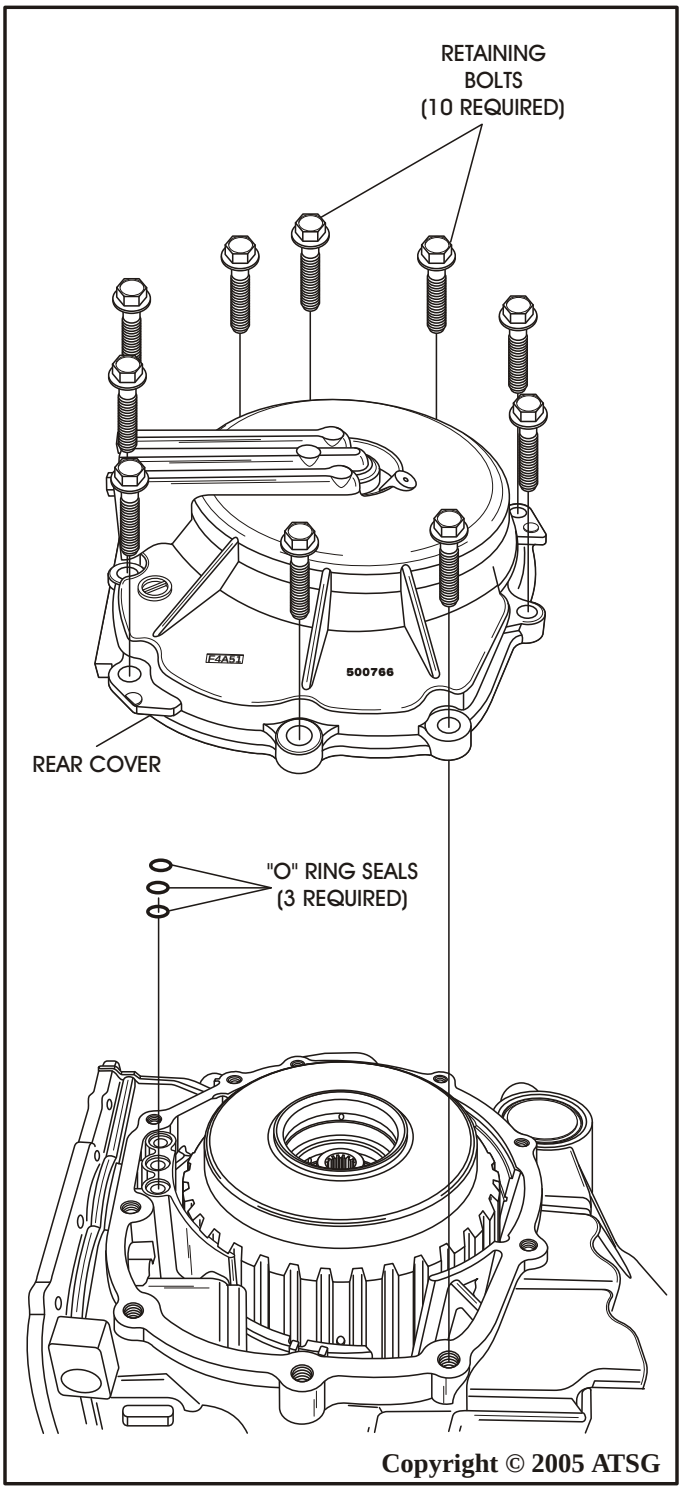
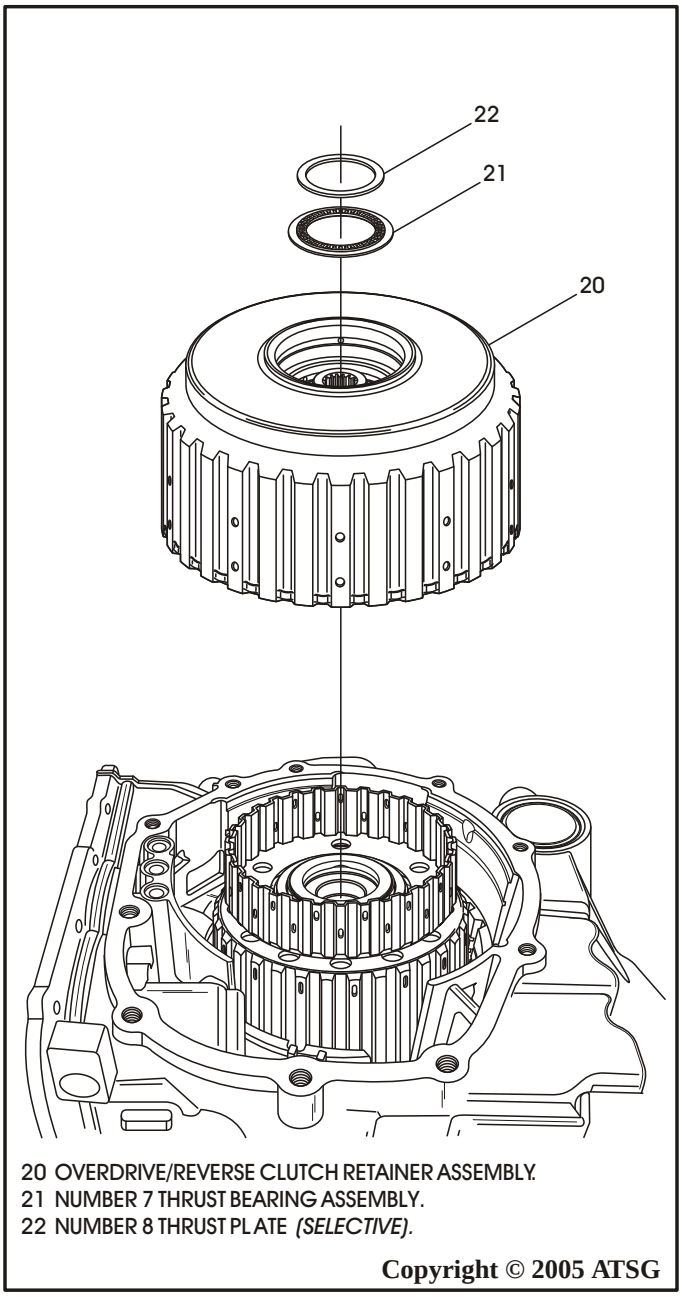


Figure 44



20 OVERDRIVE/REVERSE CLUTCH RETAINER ASSEMBLY.
21 NUMBER 7 THRUST BEARING ASSEMBLY.
22 NUMBER 8 THRUST PLATE *(SELECTIVE)*.

Figure 45

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

41. Remove the number 6 thrust bearing and the overdrive clutch hub, as shown in Figure 46.
42. Set the overdrive clutch hub and the number 6 bearing aside for component rebuild section.
43. Remove the number 5 thrust bearing and the sun gear and shell assembly (See Figure 47).
44. Set the number 5 thrust bearing and the sun gear and shell assembly aside for component rebuild section.

Continued on Page 33

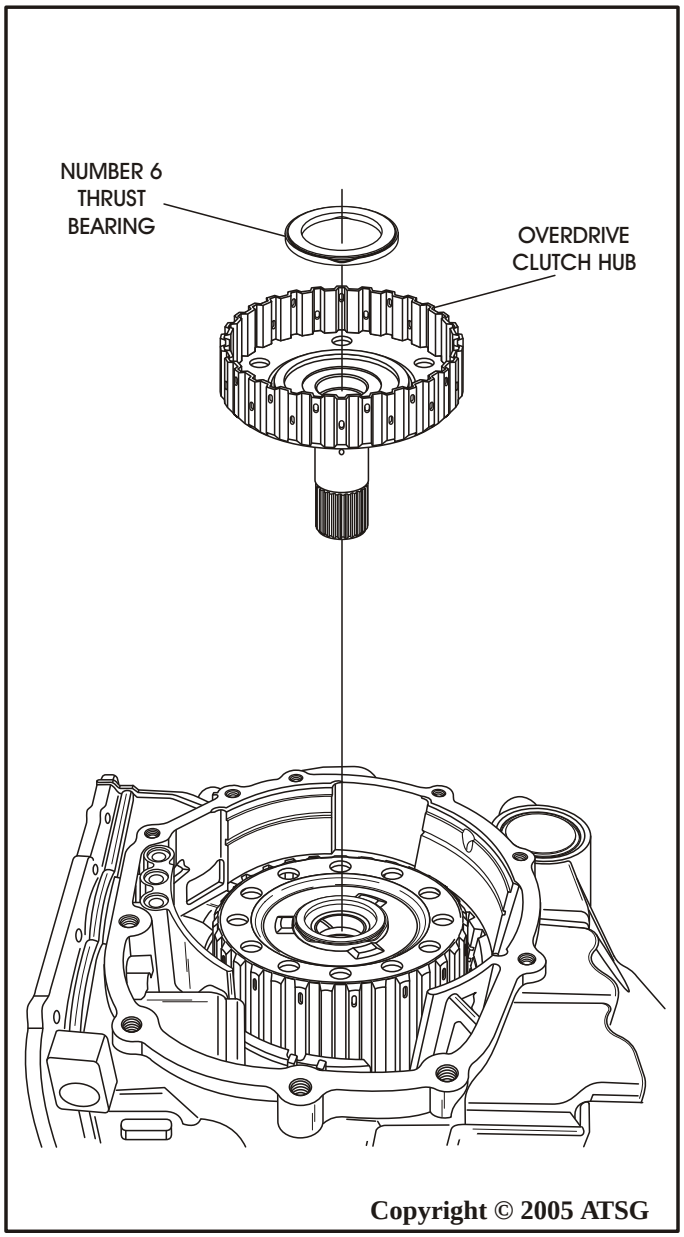


Figure 46

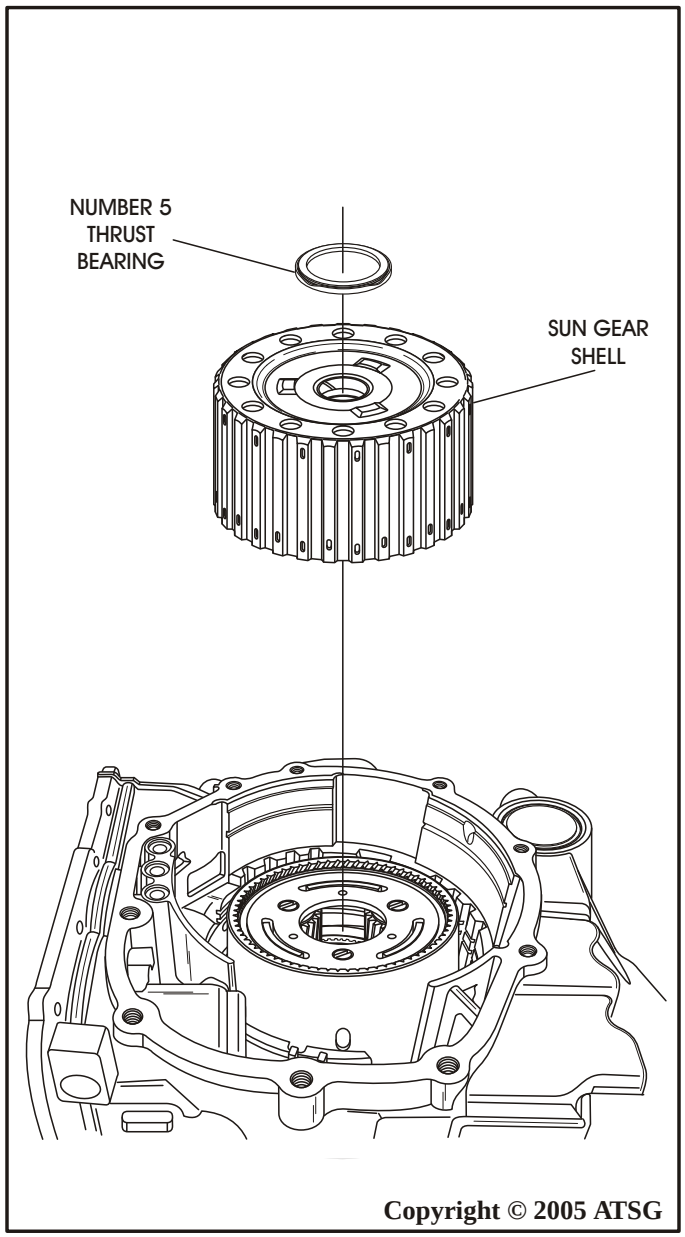
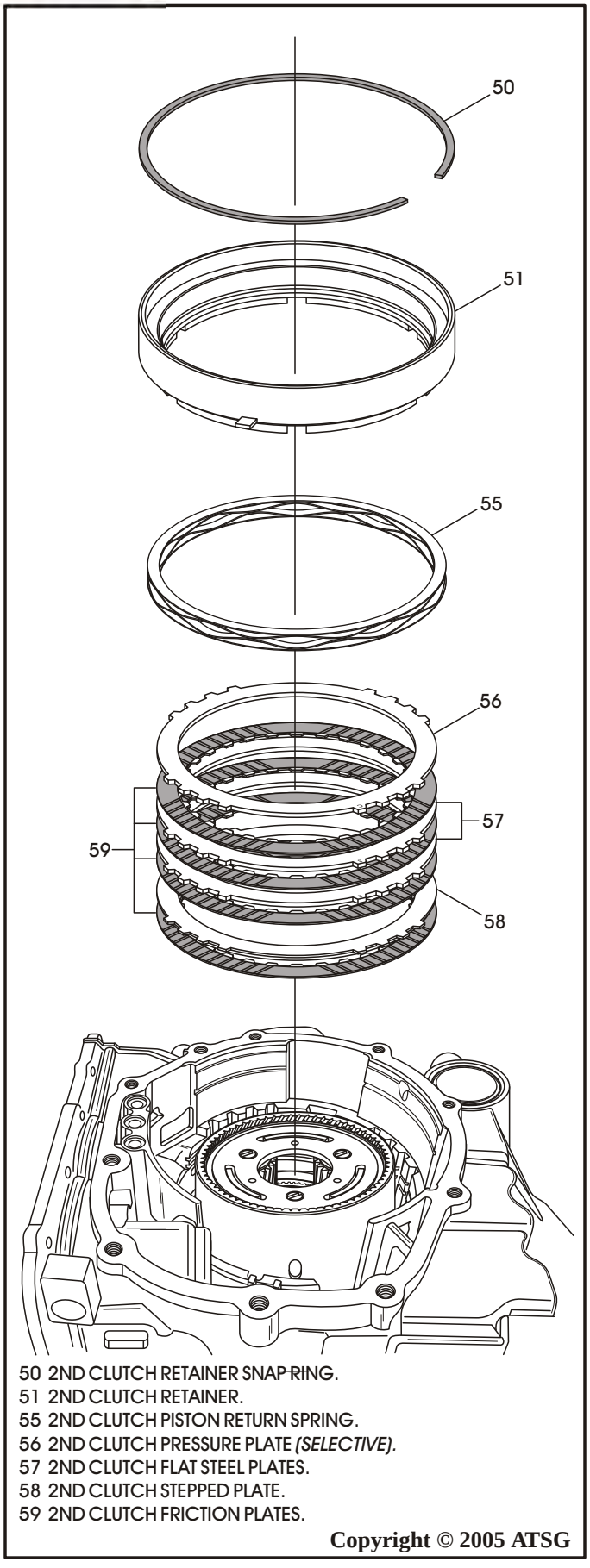


Figure 47



50 2ND CLUTCH RETAINER SNAP RING.
51 2ND CLUTCH RETAINER.
55 2ND CLUTCH PISTON RETURN SPRING.
56 2ND CLUTCH PRESSURE PLATE *(SELECTIVE)*.
57 2ND CLUTCH FLAT STEEL PLATES.
58 2ND CLUTCH STEPPED PLATE.
59 2ND CLUTCH FRICTION PLATES.

Figure 48

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

45. Remove snap ring retaining the 2nd clutch piston retainer, as shown in Figure 48.
46. Remove the 2nd clutch retainer and piston assembly, as shown in Figure 48.
47. Set the 2nd clutch retainer and piston assembly aside for component rebuild.
48. Remove the 2nd clutch piston return spring, as shown in Figure 48.
49. Remove the 2nd clutch pack from the transaxle case, as shown in Figure 48.
    Note: Keep the 2nd clutches in the order you removed them and set aside for reference during reassembly.
50. Remove the planetary gear set and low sprag assembly from transaxle case, as shown in Figure 49.
    Note: F4A51 unit with sprag illustrated in Figure 49, sprag not used in all models.
51. Set the planetary gear set assembly aside for the component rebuild section.

Continued on Page 34

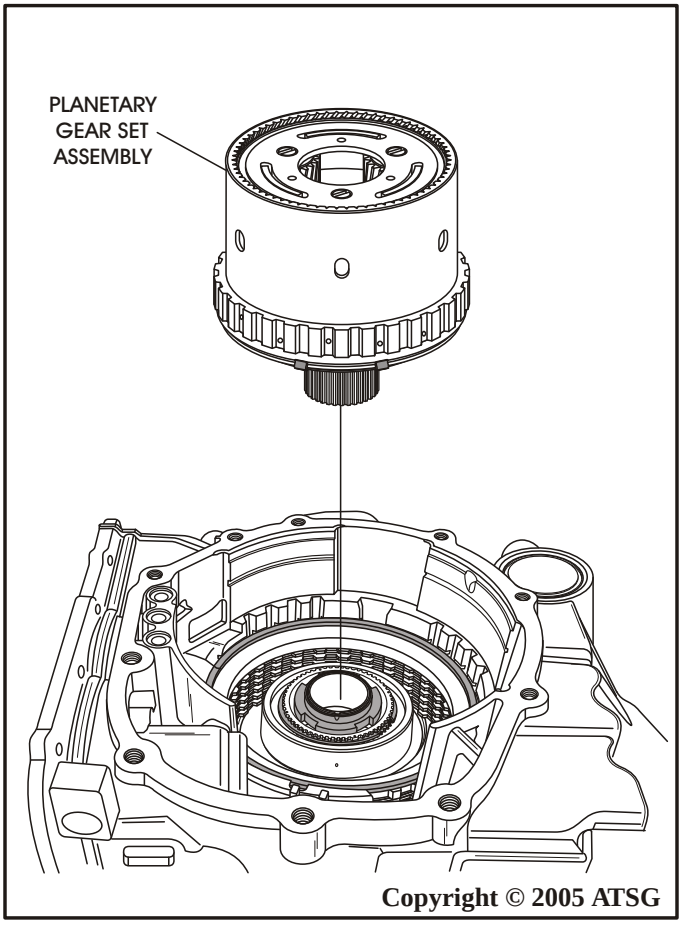
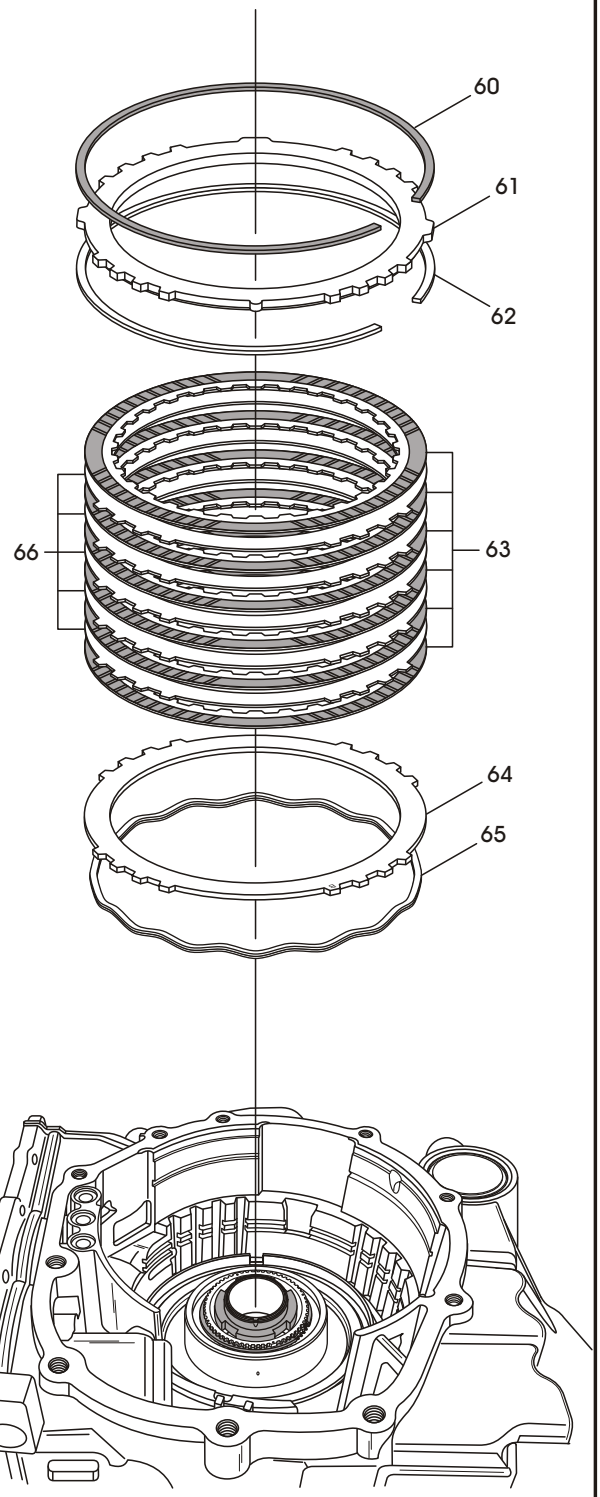


Figure 49



60 LOW/REVERSE PRESSURE PLATE SNAP RING *(SELECTIVE).*
61 LOW/REVERSE STEPPED PRESSURE PLATE.
62 LOW/REVERSE PRESSURE PLATE SNAP RING (.099" THICK).
63 LOW/REVERSE FRICTION PLATES.
64 LOW/REVERSE APPLY PLATE *(SELECTIVE).*
65 LOW/REVERSE "WAVED" CUSHION PLATE.
66 LOW/REVERSE STEEL PLATES

Figure 50

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

52. Remove the low/reverse clutch pressure plate snap ring, as shown in Figure 50.
Note: This snap ring is selective and may be close to the same thickness as the next one out, so label it now.
53. Remove low/reverse clutch "stepped" pressure plate, as shown in Figure 50.
Note: The first lined plate should be removed before the second snap ring to eliminate any potential damage to the plate.
54. Remove the first low/reverse clutch friction plate, as shown in Figure 50.
55. Remove the second snap ring from the groove in case, as shown in Figure 50.
56. Remove the remaining low/reverse clutch steel and friction plates, as shown in Figure 50.
57. Remove the low/reverse apply plate from case, as shown in Figure 50.
Note: The apply plate is also selective and should be labeled at this time.
58. Remove the low/reverse clutch "Waved" plate, as shown in Figure 50.
Note: This "Waved" plate is used to cushion the apply of low/reverse clutch, and is prone to breakage.
59. ATSG recommends replacement of the cushion plate on all rebuilds.

Continued on Page 35

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

60. Using the special tools shown in Figure 51, or substitute, compress low/reverse clutch piston return spring.
61. Remove low/reverse clutch piston snap ring, as shown in Figure 52.
62. Slowly release compression tool and remove the tool from the case.
63. Remove the low sprag inner race, as shown in Figure 52, remove and discard the "Lip Type" seal on the back side of inner race.
64. Remove the low/reverse clutch return spring retainer, as shown in Figure 52.
65. Remove the low/reverse clutch piston return spring, as shown in Figure 52.
66. Remove the low/reverse clutch piston, as shown in Figure 52.
67. Remove and discard the low/reverse clutch piston "D" ring seals.

Continued on Page 36

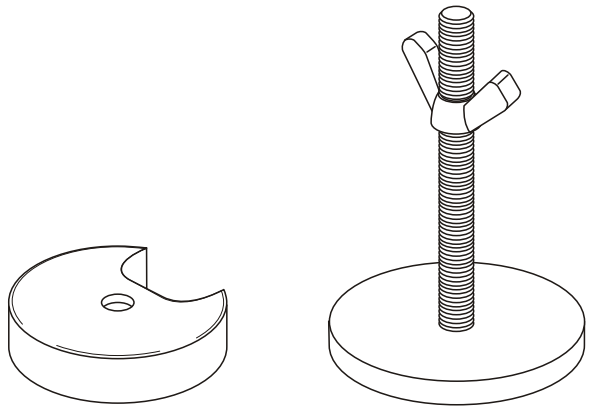
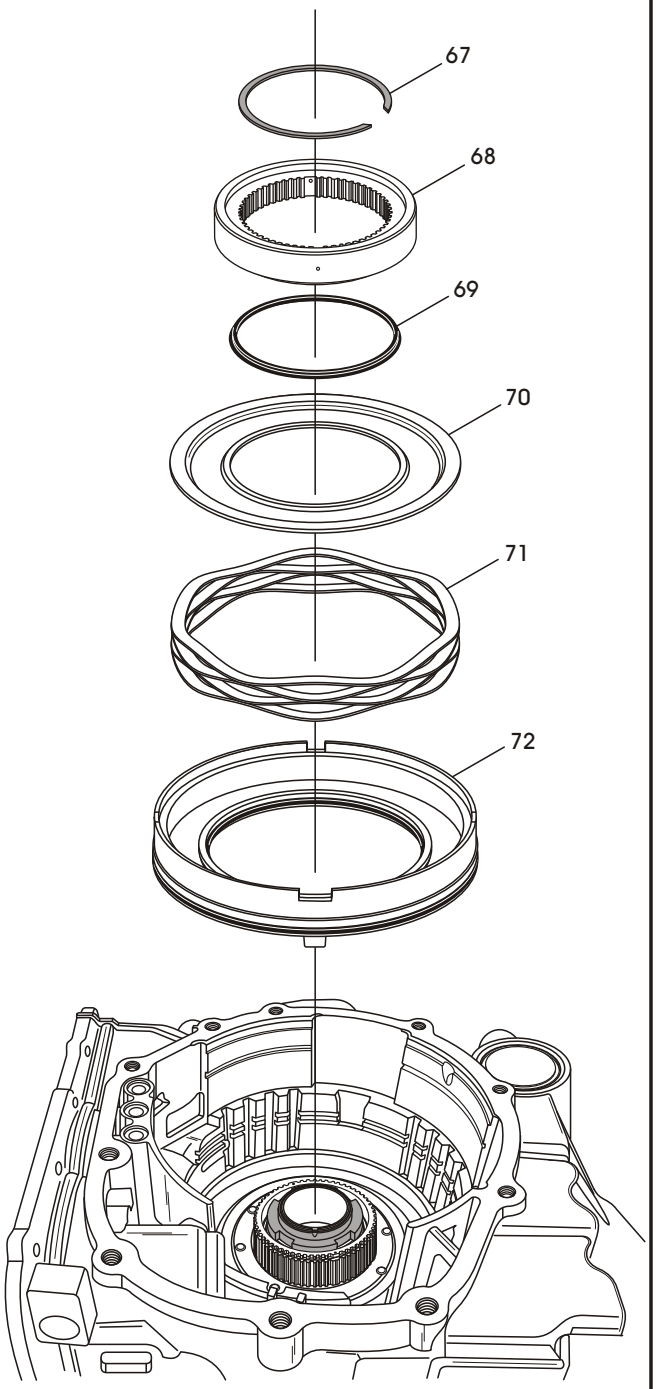


Figure 51



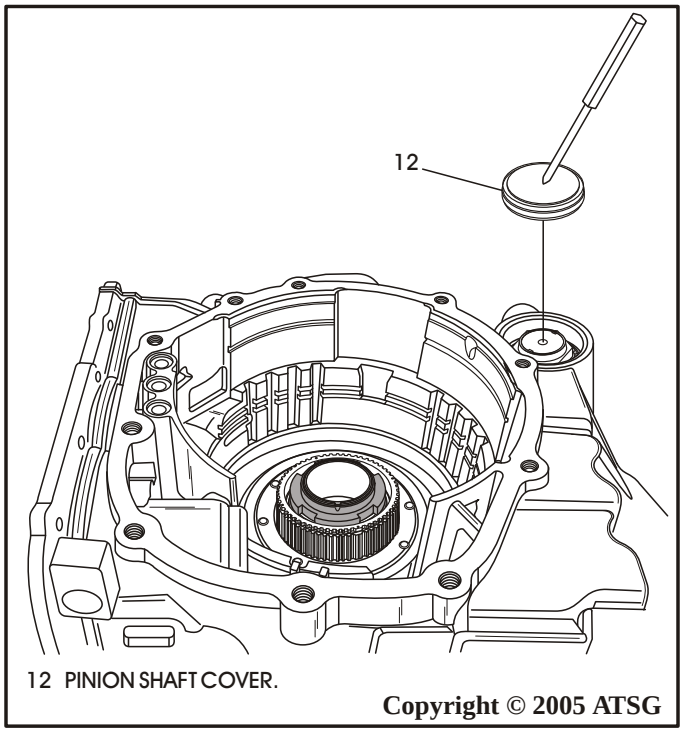
67 LOW SPRAG INNER RACE RETAINING SNAP RING.
68 LOW SPRAG INNER RACE.
69 LOW SPRAG INNER RACE LIP TYPE LUBE SEAL.
70 LOW/REVERSE CLUTCH RETURN SPRING RETAINER.
71 LOW/REVERSE CLUTCH RETURN SPRING.
72 LOW/REVERSE CLUTCH APPLY PISTON ASSEMBLY.

Figure 52

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

68. If bearing service is necessary for the pinion shaft, the transfer driven gear and pinion shaft must be removed as an assembly.
69. Using a screw driver or punch, drive it through the cap, as shown in Figure 53, and pry out the cap and discard.



12 PINION SHAFT COVER.

Figure 53

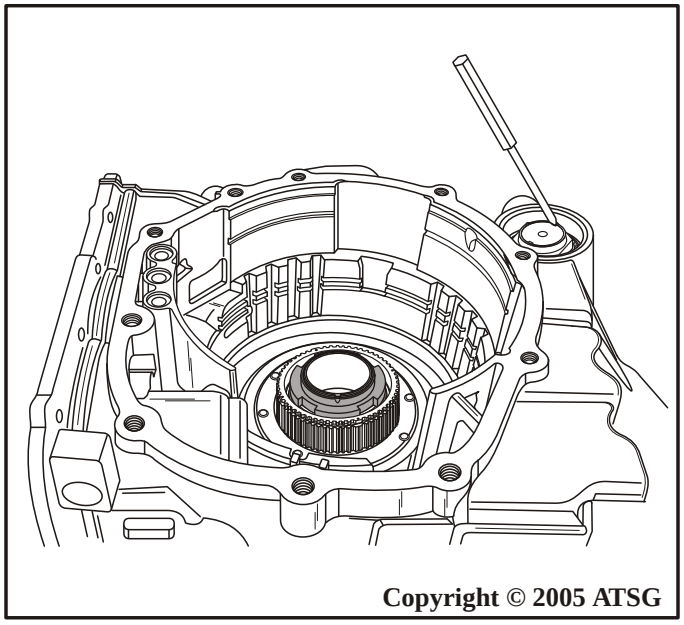
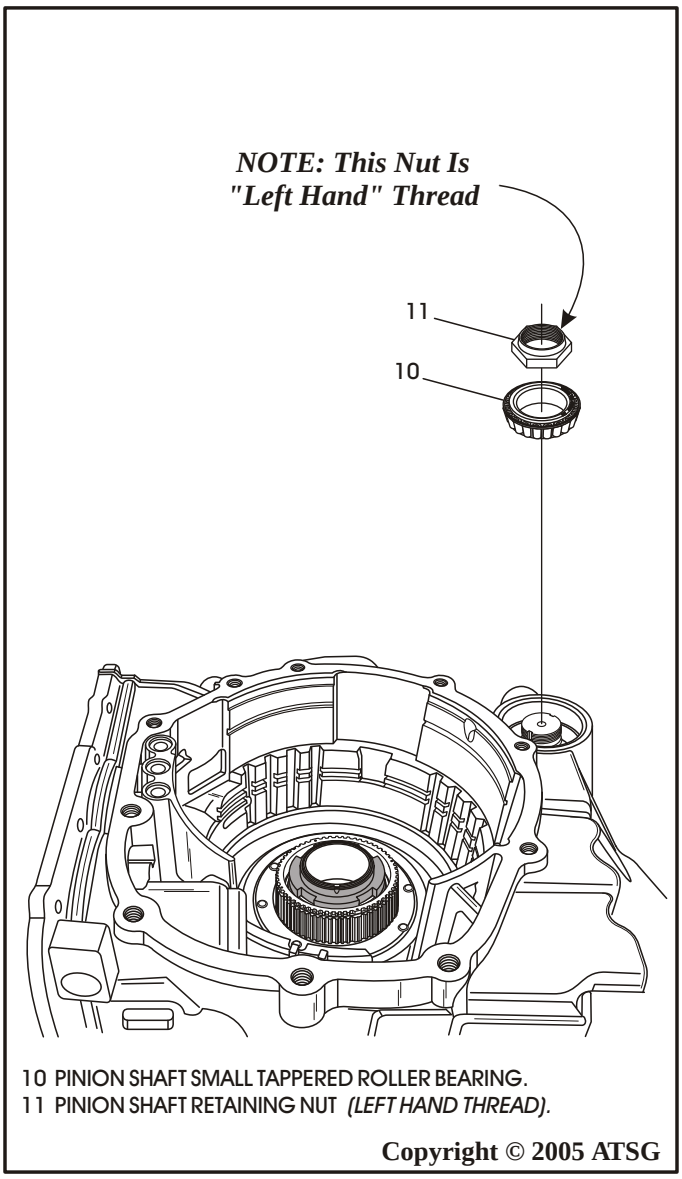


Figure 54

70. Using a suitable punch, straighten the locking tabs of the pinion shaft lock nut, as shown in Figure 54.
71. Remove pinion shaft lock nut using a 41 mm socket, as shown in Figure 55.
    Note: This nut is "Left Hand Thread", and must be turned clockwise to remove, and the pinion shaft must be held from the opposite side using the appropriate size allen head socket, as shown in Figure 56.
72. Remove the pinion shaft and the small tapered roller bearing, as shown in Figure 55.

Continued on Page 37



10 PINION SHAFT SMALL TAPPERED ROLLER BEARING.
11 PINION SHAFT RETAINING NUT *(LEFT HAND THREAD).*

Figure 55

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

73. Rotate the transaxle so the front side is facing up, as shown in Figure 56, and remove allen head socket.
74. Remove the two shafts retaining the parking roller support, as shown in Figure 57.
    Note: The parking pawl pivot pin and park roller support shafts are soft and will bend or burr easily, so use care when removing.
75. Remove the two shafts and the parking rod roller support, as shown in Figure 58.

Continued on Page 38

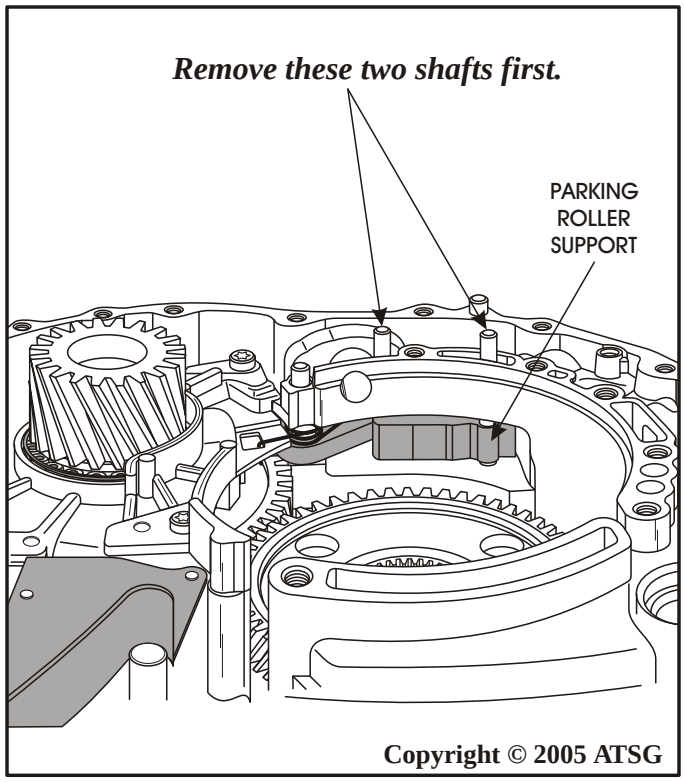


Figure 57

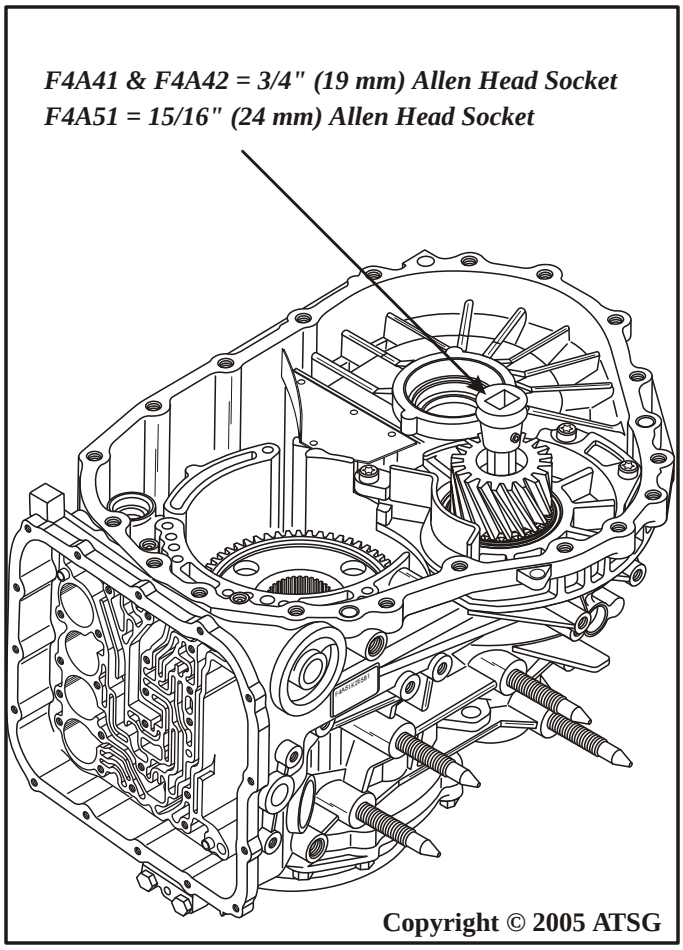


Figure 56

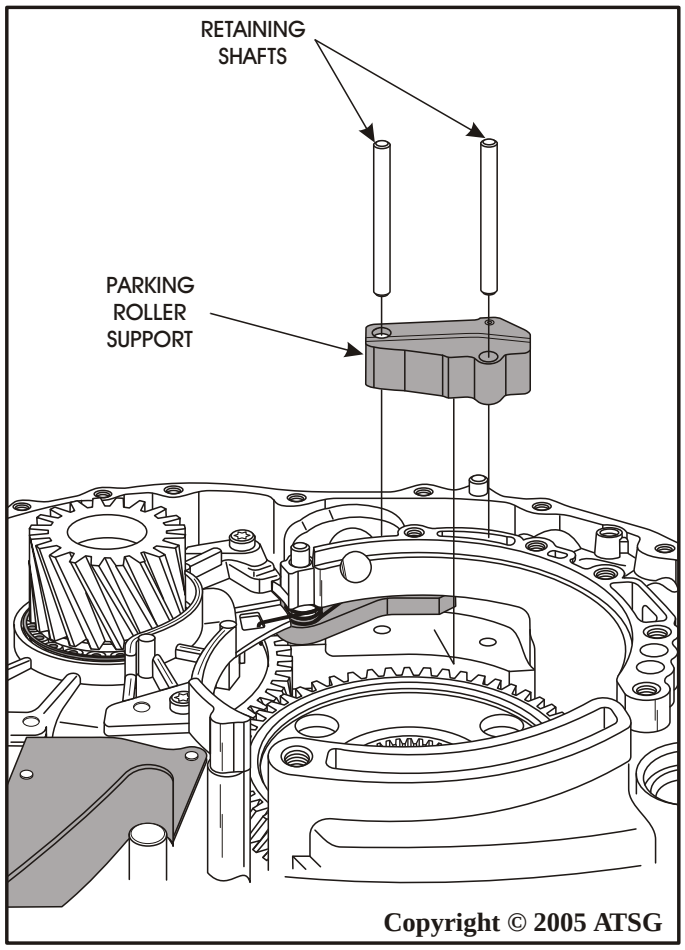


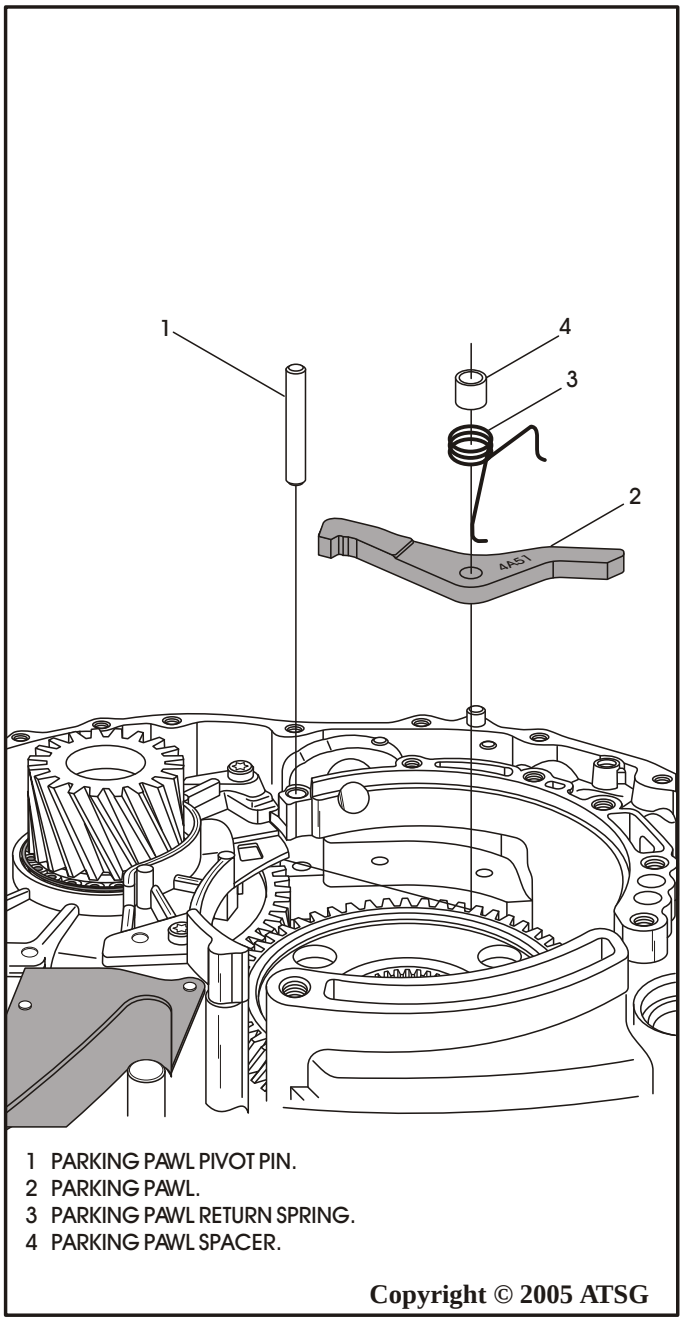
Figure 58

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

76. Unhook the parking pawl return spring and remove the parking pawl pivot shaft, as shown in Figure 59.
    Note: The park pawl pivot pin and park roller support shafts are soft and will bend or burr easily, so use care when removing.
77. Remove the parking pawl, parking pawl spring and bushing, as shown in Figure 59.
78. Remove the four pinion shaft support to case retaining bolts, as shown in Figure 60.
79. Remove the pinion shaft and transfer gear as assembly, as shown in Figure 60, by tapping on the rear of pinion shaft with hammer and punch.
80. Set the complete pinion shaft, support, and transfer driven gear assembly aside for the component rebuild section.

Continued on Page 39



1 PARKING PAWL PIVOT PIN.
2 PARKING PAWL.
3 PARKING PAWL RETURN SPRING.
4 PARKING PAWL SPACER.

Figure 59

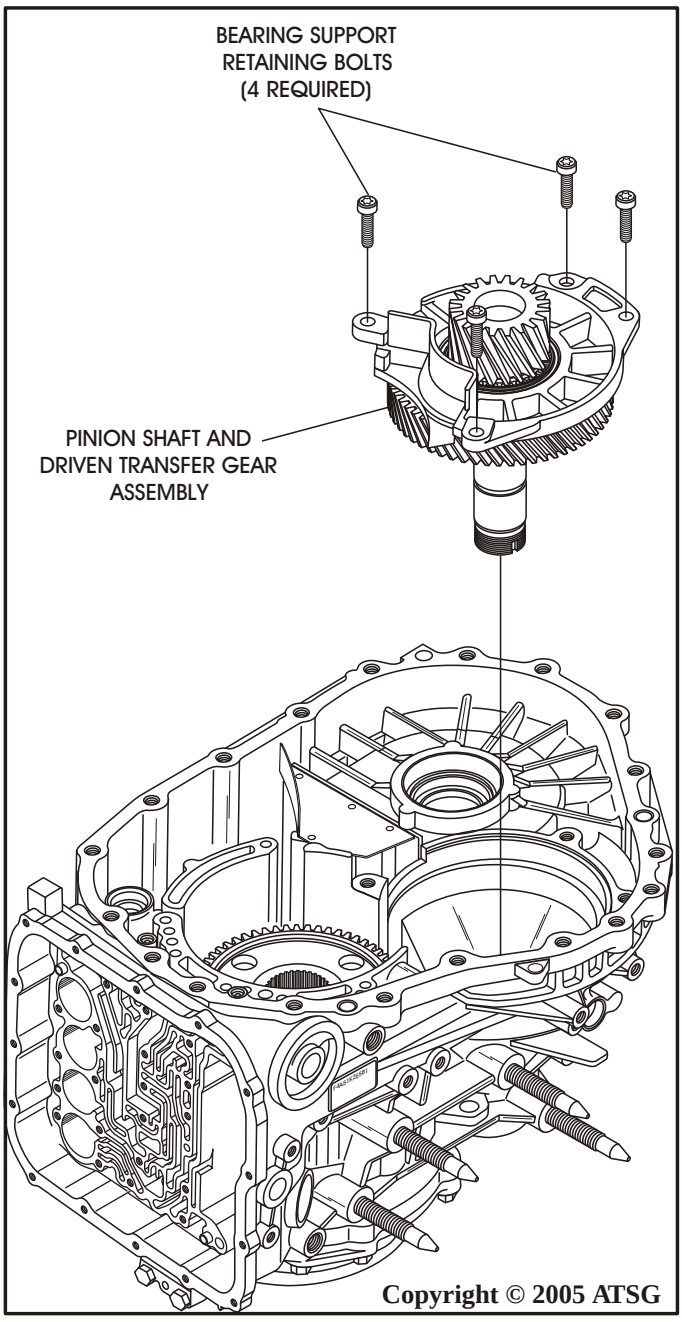


Figure 60

TRANSAXLE DISASSEMBLY

INTERNAL COMPONENTS (CONT'D)

81. Remove the transfer drive gear by accessing the retaining bolts through the access holes provided, as shown in Figure 61.
    Note: The tapered roller bearing models will have 7 or 8 retaining bolts. The ball bearing models will have only 4 retaining bolts.
82. Rotate the transfer gear as necessary so the access holes are over the bolts for removal.
    Note: Reference marks must be placed on case and bearing housing (See Figure 61). Housing bolts in case in 1 direction only.
83. Remove the transfer drive gear assembly, as shown in Figure 62.
    Note: If bearing service is not necessary, the transfer drive gear does not need to be removed from the case.
84. Set the complete transfer drive gear assembly aside for the component rebuild section.

SPECIAL NOTE:

Mitsubishi services the transfer drive gear and bearings only as an assembly, on the models equipped with the tapered roller style bearings. The exploded views provided in this manual of the transfer drive gear and bearings are for reference only.

If bearing service is necessary you must purchase the complete assembly from Mitsubishi.

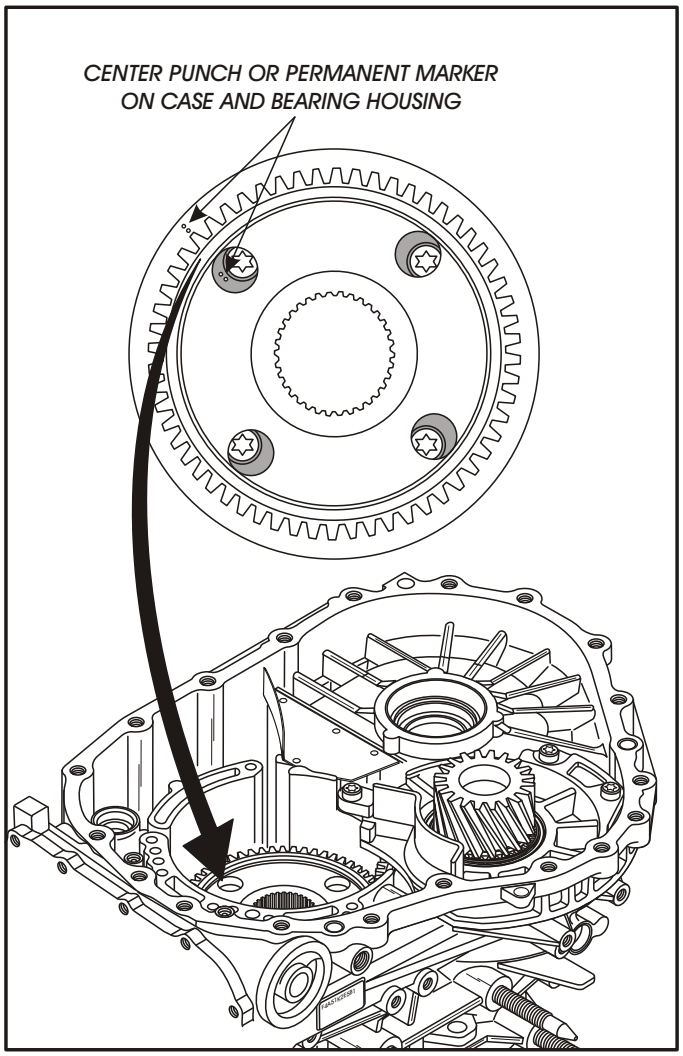


Figure 61

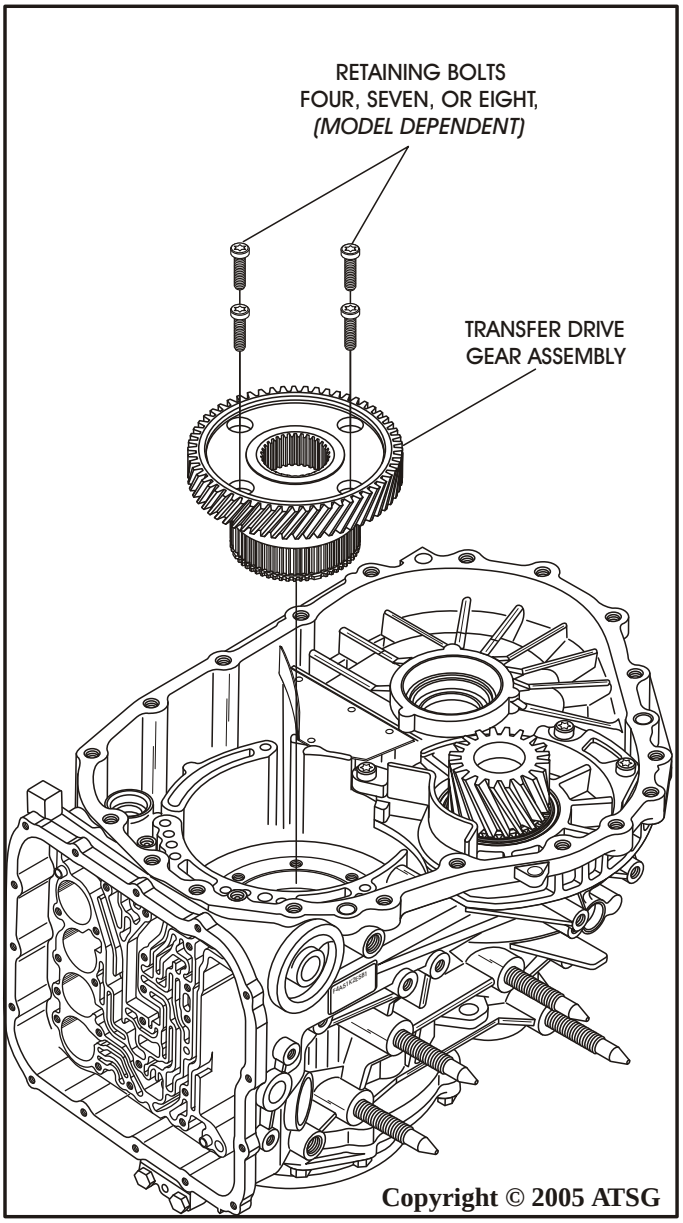


Figure 62

COMPONENT REBUILD SECTION

TRANSFER DRIVE GEAR ASSEMBLY

1. If you are servicing ball bearing style, install the ball bearings and torque the lock nut to 191 N·m (141 ft.lb.), as shown in Figure 63.
2. Set the completed transfer drive gear assembly aside for the final assembly process.

Mitsubishi services the transfer drive gear and bearings only as an assembly, on the models equipped with the tapered roller style bearings.

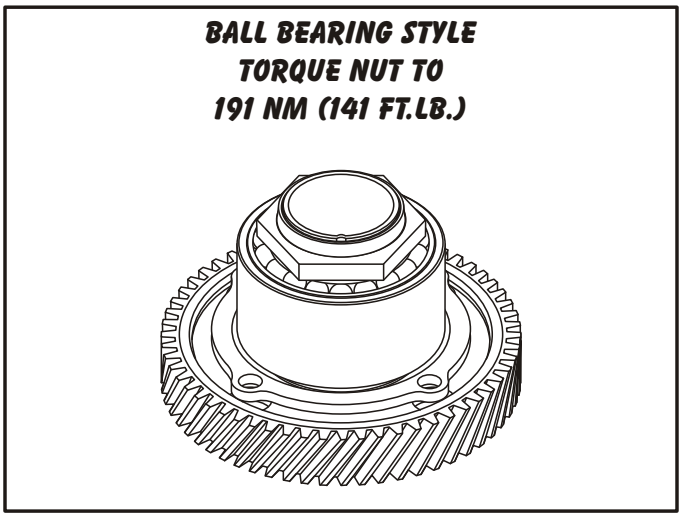


Figure 63

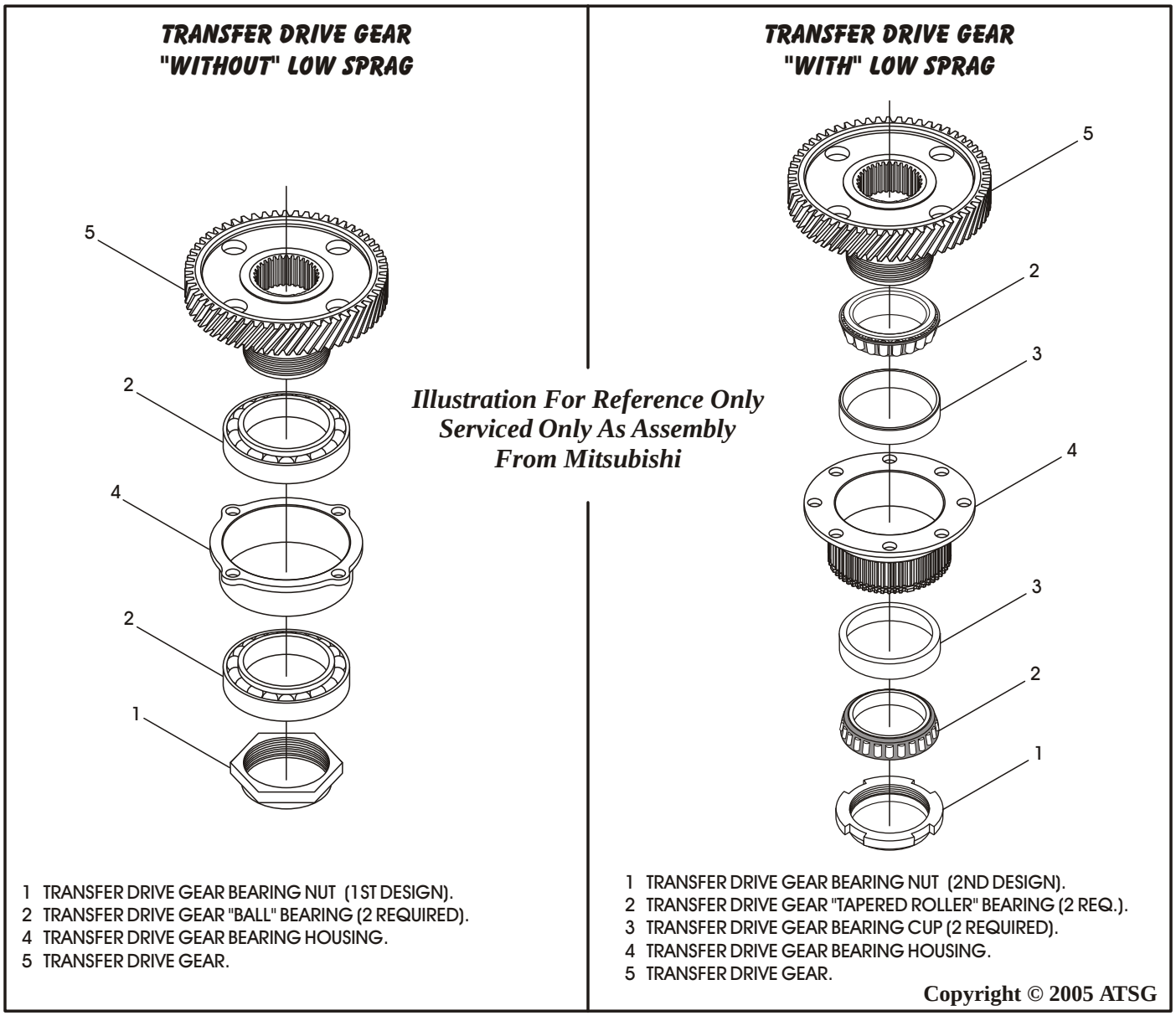


Figure 64

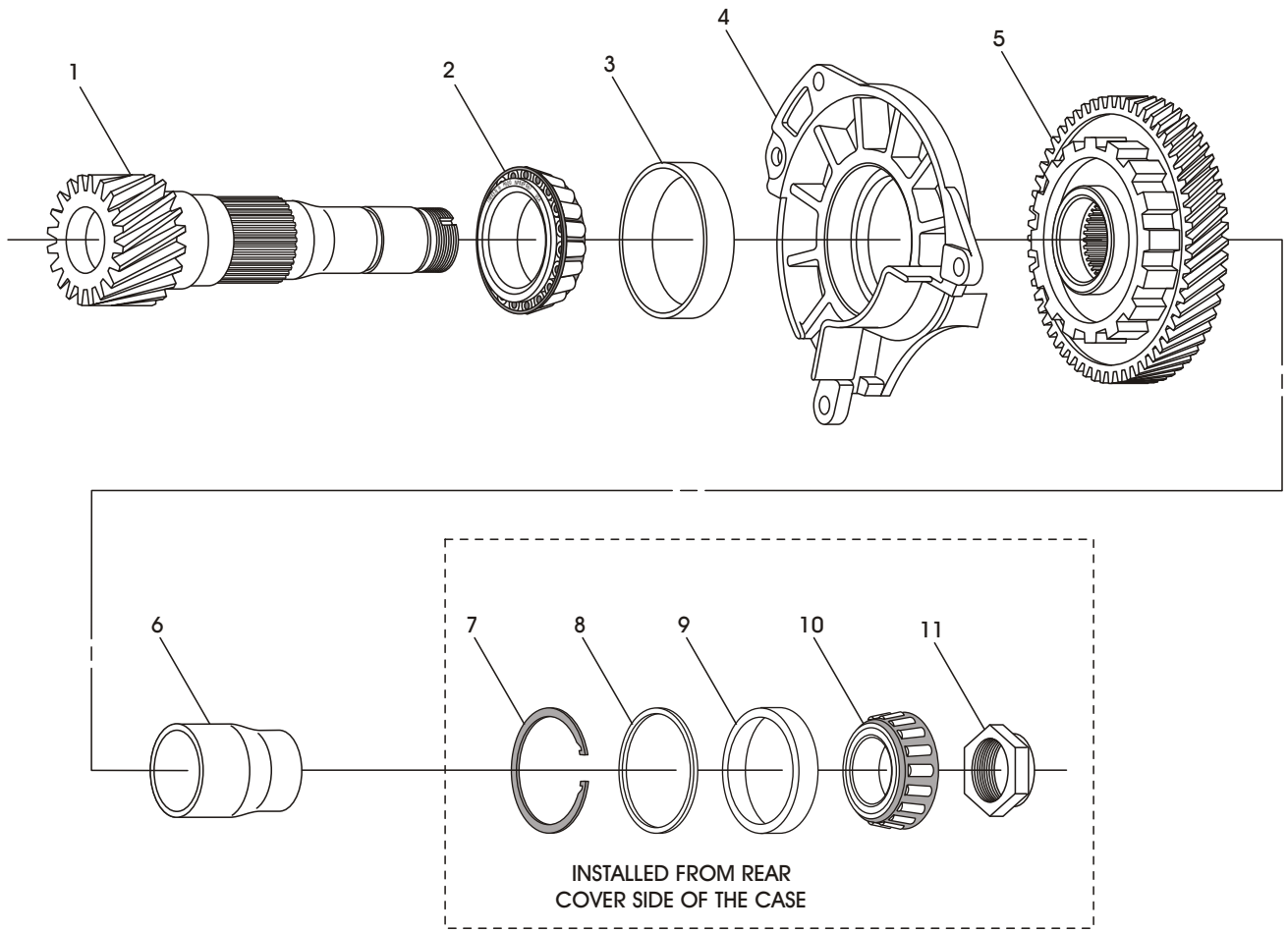
COMPONENT REBUILD SECTION

TRANSFER DRIVEN GEAR ASSEMBLY

1. Disassemble the transfer driven gear and the pinion shaft assembly using Figure 65 as a guide.
   Note: Pinion shaft must be pressed out of the transfer driven gear, using hydraulic press.
2. Clean all parts with cleaning solution and dry with compressed air.
3. Inspect all pinion shaft parts thoroughly for any wear and/or damage, and replace as necessary.

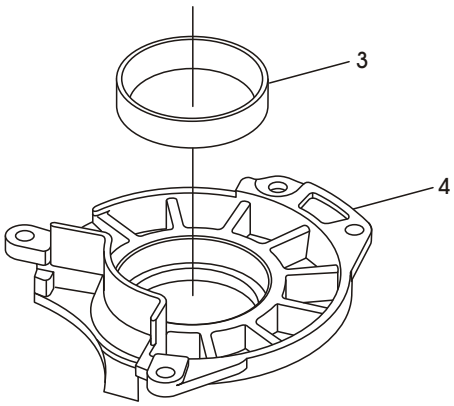
Continued on Page 42

TRANSFER DRIVEN GEAR AND PINION SHAFT EXPLODED VIEW



1 PINION SHAFT ASSEMBLY.
2 PINION SHAFT LARGE TAPERED ROLLER BEARING.
3 PINION SHAFT LARGE ROLLER BEARING CUP.
4 PINION SHAFT BEARING SUPPORT.
5 TRANSFER DRIVEN GEAR ASSEMBLY.
6 BEARING COLLAR.
7 SNAP RING FOR CASE BORE.
8 BEARING SHIM *(SELECTIVE).*
9 PINION SHAFT SMALL ROLLER BEARING CUP.
10 PINION SHAFT SMALL TAPERED ROLLER BEARING.
11 PINION SHAFT RETAINING NUT *(LEFT HAND THREAD).*

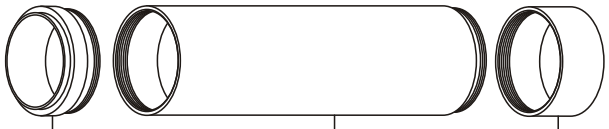
Figure 65



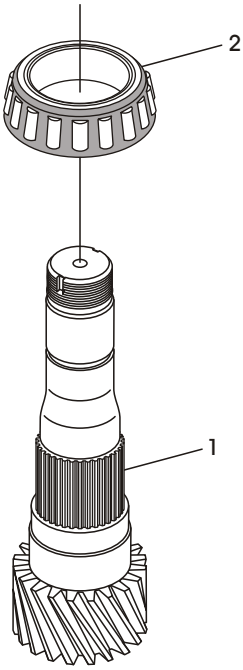
3 PINION SHAFT LARGE ROLLER BEARING CUP.
4 PINION SHAFT BEARING SUPPORT.

Figure 66

INSTALLATION TOOLS REQUIRED



F4A42 = MD998823
F4A51 = MD998827
MD998814
MD998812



1 PINION SHAFT ASSEMBLY.
2 PINION SHAFT LARGE TAPERED ROLLER BEARING.

Figure 67

COMPONENT REBUILD SECTION
TRANSFER DRIVEN GEAR ASSEMBLY (CONT'D)

4. Press new pinion shaft large roller bearing cup into the bearing support, as shown in Figure 66 using proper adapters and hydraulic press.
5. Install new pinion shaft large roller bearing on pinion shaft, as shown in Figure 67, using the proper adapters and hydraulic press.
6. Install the completed bearing support assembly onto pinion shaft and roller bearing assembly, as shown in Figure 68.
7. Install the driven transfer gear onto the pinion shaft, as shown in Figure 69, and start onto the splines.
   Note: The driven transfer gear must be pressed onto pinion shaft with hydraulic press, until fully seated.
8. Install the bearing collar over pinion shaft and onto installed driven transfer gear, as shown in Figure 69, and retain with a liberal amount of Trans-Jel®.
9. Set the completed pinion shaft assembly aside for the final assembly process (See Figure 70).

Continued on Page 43

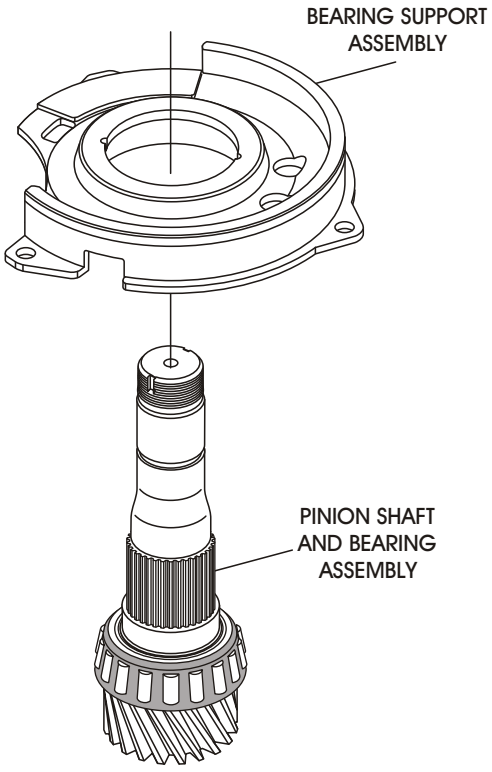


Figure 68

INSTALL DRIVEN TRANSFER GEAR WITH HYDRAULIC PRESS

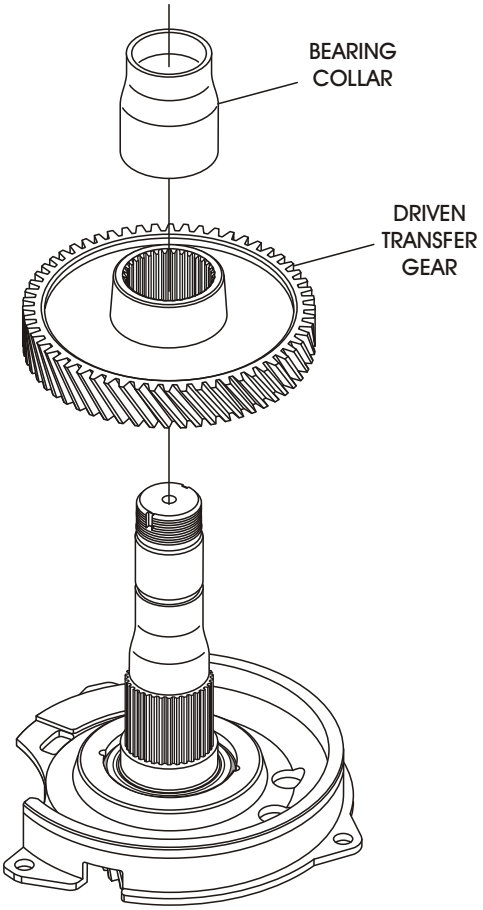


Figure 69

COMPLETED PINION SHAFT ASSEMBLY

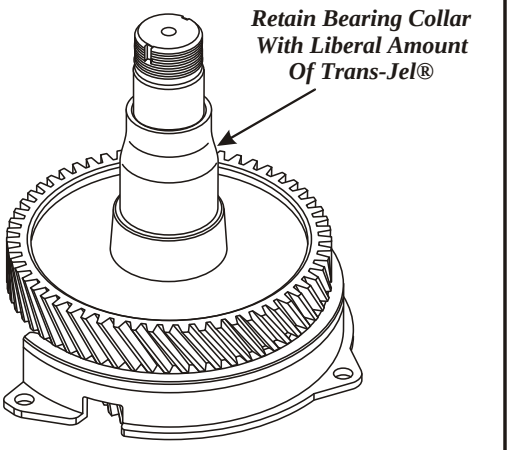


Figure 70

COMPONENT REBUILD SECTION

TRANSAXLE CASE ASSEMBLY

1. Clean transaxle case thoroughly with solution and dry with compressed air.
2. Inspect the transaxle case thoroughly for any wear and/or damage.
3. Install new differential bearing cup into case, as shown in Figure 71, using the proper driver. ***Note: We will cover pre-load for differential during the final assembly procedure.***

Continued on Page 44

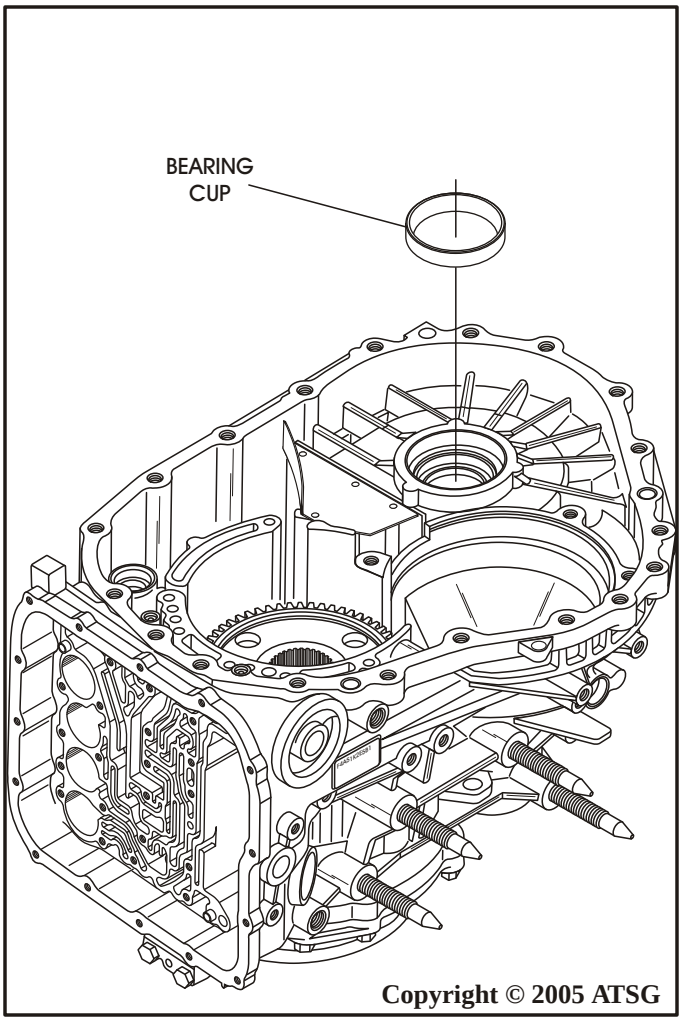
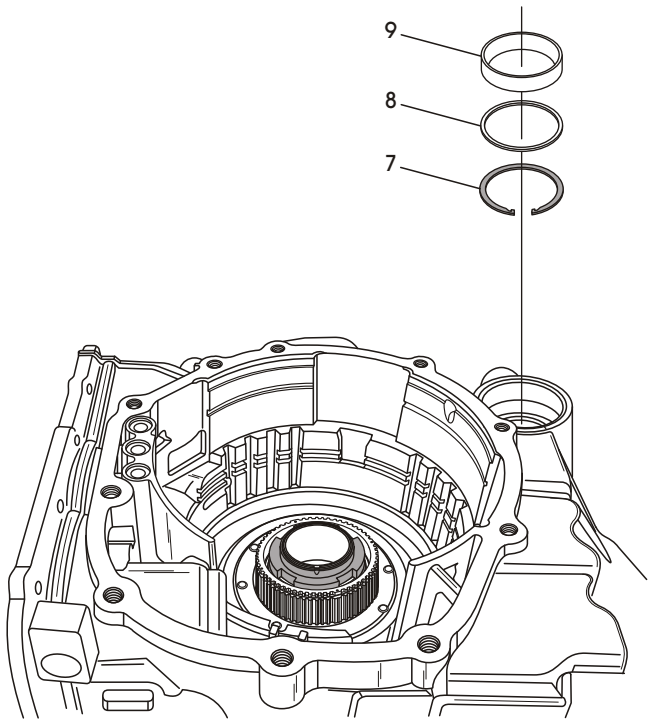


Figure 71

COMPONENT REBUILD SECTION

TRANSAXLE CASE ASSEMBLY (CONT'D)

4. If case snap ring was removed, re-install the snap ring into case, as shown in Figure 72.
5. If bearing service was necessary, install new small bearing cup into the case, as shown in Figure 72, using the original selective spacer. ***Note: We will cover the pre-load for pinion shaft during the final assembly procedure.***
6. Set the completed case assembly aside for the final assembly process.



7 SNAP RING FOR CASE BORE.
8 BEARING SHIM*(SELECTIVE)*.
9 PINION SHAFT SMALL ROLLER BEARING CUP.

Figure 72

COMPONENT REBUILD SECTION

REAR COVER ASSEMBLY

Before proceeding with the rear cover component rebuild section, it is imperative that the journal and seal ring area of the rear cover be inspected ***very closely*** for any wear and/or damage, as shown in Figure 73. Ensure that sealing ring groove clearance is within specification using feeler gage.

Mitsubishi recommends thorough flushing of the transaxle cooler on all rebuilds.

Continued on Page 45

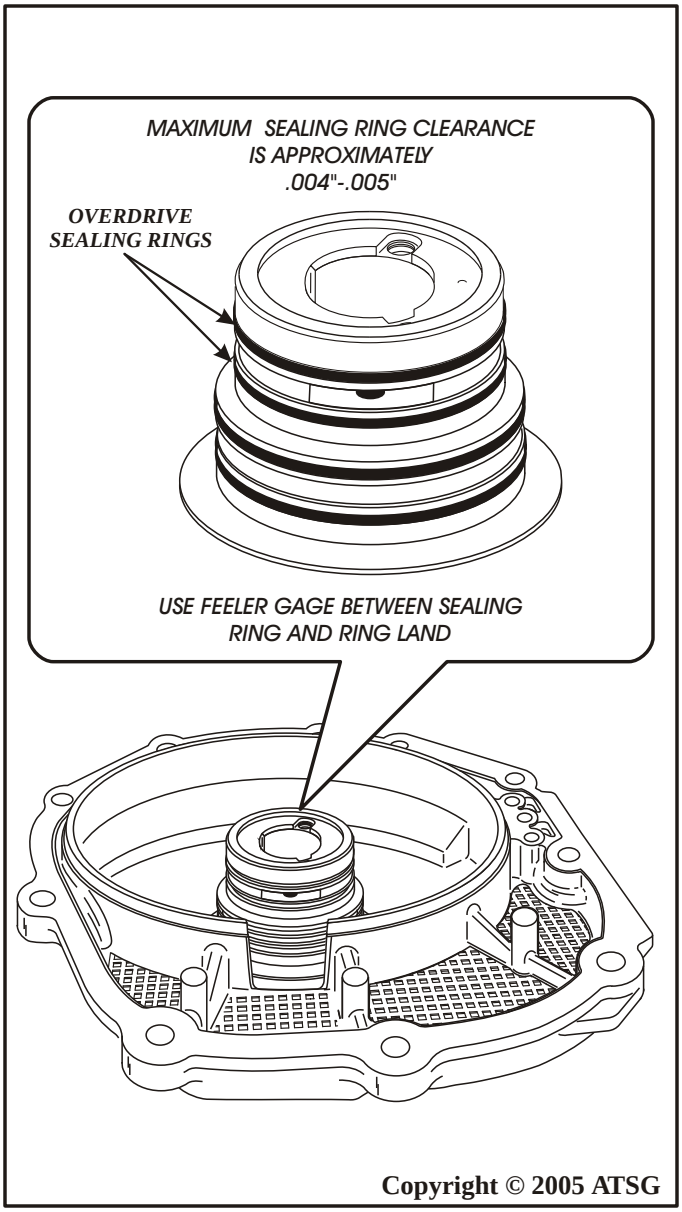


Figure 73

COMPONENT REBUILD SECTION

REAR COVER ASSEMBLY

1. Remove and discard the overdrive clutch seal rings and the reverse clutch seal rings.
2. Inspect the end cover journal and sealing ring area for any wear and/or damage and check seal ring groove clearance with a feeler gage, as described in Figure 73.
3. Clean the end cover thoroughly and dry with compressed air.
4. Install new reverse clutch sealing rings into the grooves, as shown in Figure 74, and ensure that they are properly hooked and seated.
5. Install new overdrive clutch sealing rings into grooves, as shown in Figure 74, and ensure that they are properly hooked and seated.
6. Install the selective number 8 thrust plate, as shown in Figure 74, and retain with a small amount of Trans-Jel®.
7. Set the completed rear cover assembly aside for the final assembly process (See Figure 75).

SPECIAL NOTE:

All Friction Plates Should Be Soaked In The Recommended ATF For One Hour Before Installation. Lets Start Now.

COMPONENT REBUILD SECTION
Continued on Page 47

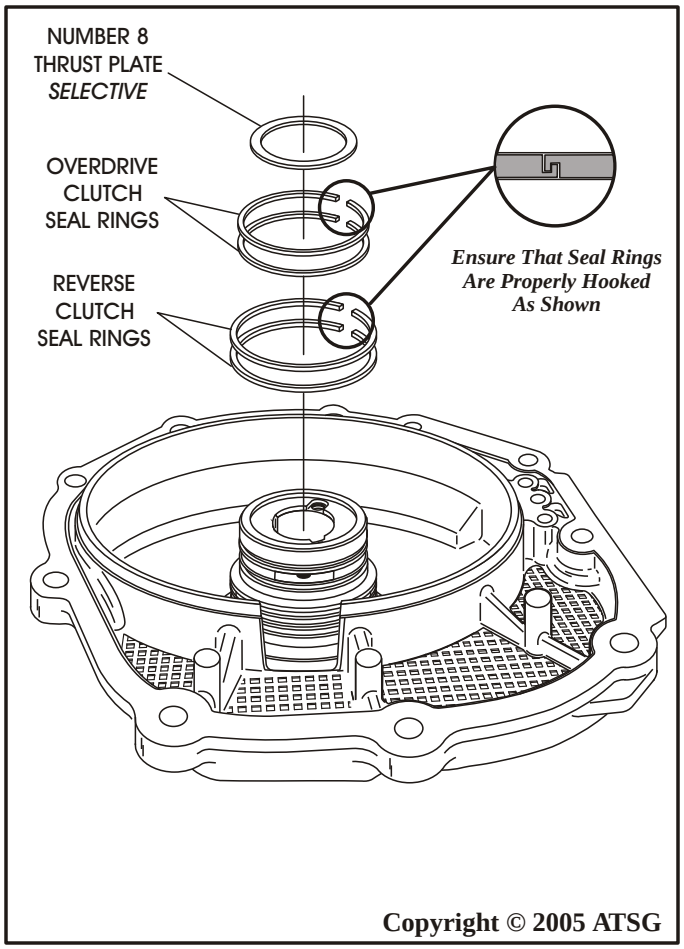


Figure 74

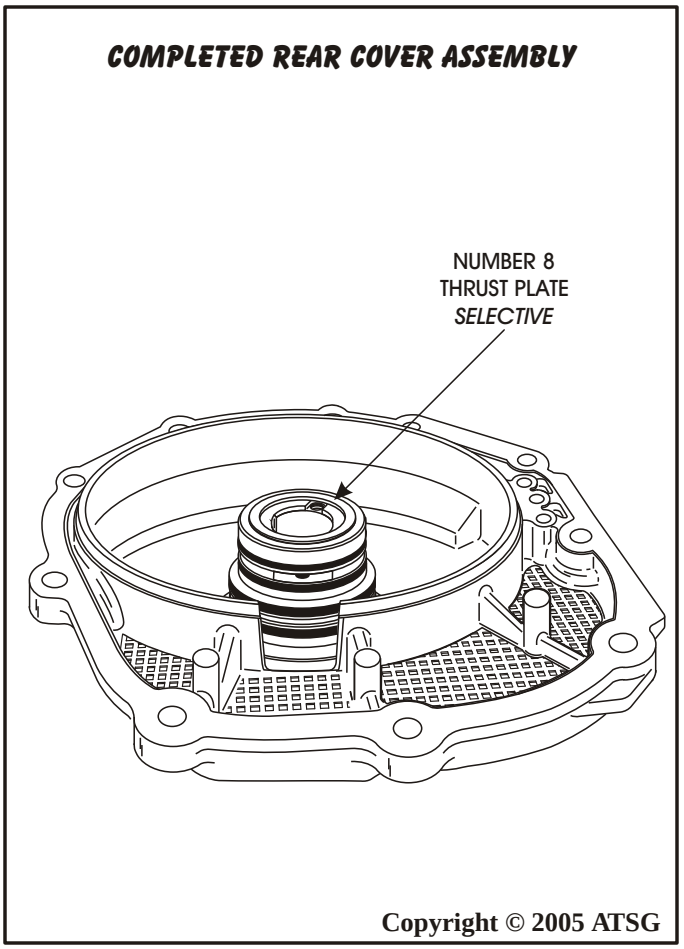
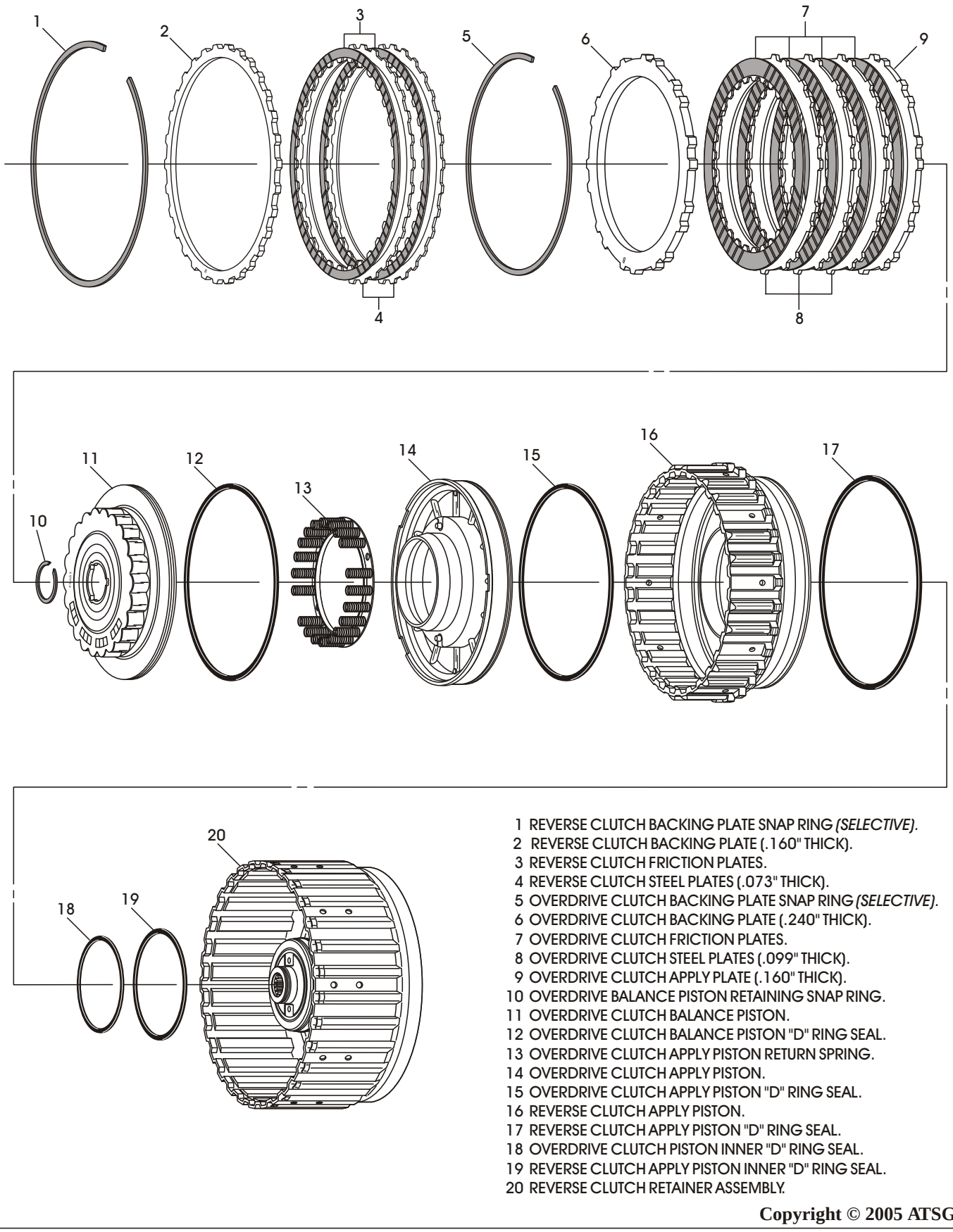


Figure 75

REVERSE/OVERDRIVE CLUTCH HOUSING EXPLODED VIEW



1 REVERSE CLUTCH BACKING PLATE SNAP RING *(SELECTIVE).*
2 REVERSE CLUTCH BACKING PLATE (.160" THICK).
3 REVERSE CLUTCH FRICTION PLATES.
4 REVERSE CLUTCH STEEL PLATES (.073" THICK).
5 OVERDRIVE CLUTCH BACKING PLATE SNAP RING *(SELECTIVE).*
6 OVERDRIVE CLUTCH BACKING PLATE (.240" THICK).
7 OVERDRIVE CLUTCH FRICTION PLATES.
8 OVERDRIVE CLUTCH STEEL PLATES (.099" THICK).
9 OVERDRIVE CLUTCH APPLY PLATE (.160" THICK).
10 OVERDRIVE BALANCE PISTON RETAINING SNAP RING.
11 OVERDRIVE CLUTCH BALANCE PISTON.
12 OVERDRIVE CLUTCH BALANCE PISTON "D" RING SEAL.
13 OVERDRIVE CLUTCH APPLY PISTON RETURN SPRING.
14 OVERDRIVE CLUTCH APPLY PISTON.
15 OVERDRIVE CLUTCH APPLY PISTON "D" RING SEAL.
16 REVERSE CLUTCH APPLY PISTON.
17 REVERSE CLUTCH APPLY PISTON "D" RING SEAL.
18 OVERDRIVE CLUTCH PISTON INNER "D" RING SEAL.
19 REVERSE CLUTCH APPLY PISTON INNER "D" RING SEAL.
20 REVERSE CLUTCH RETAINER ASSEMBLY.

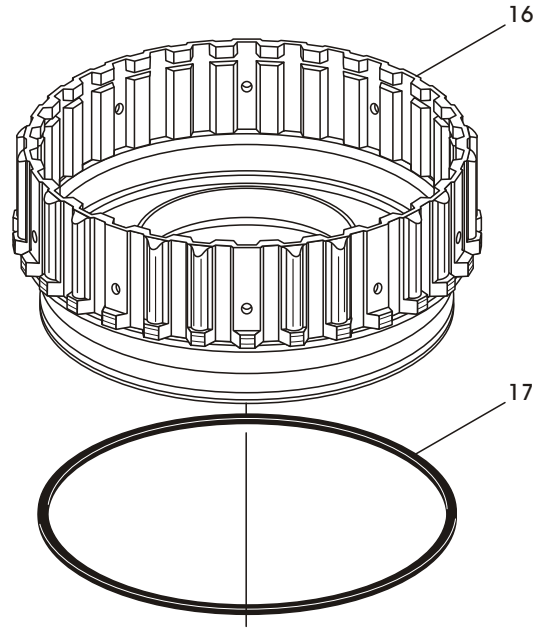
Figure 76

COMPONENT REBUILD SECTION

OVERDRIVE/REVERSE HOUSING ASSEMBLY

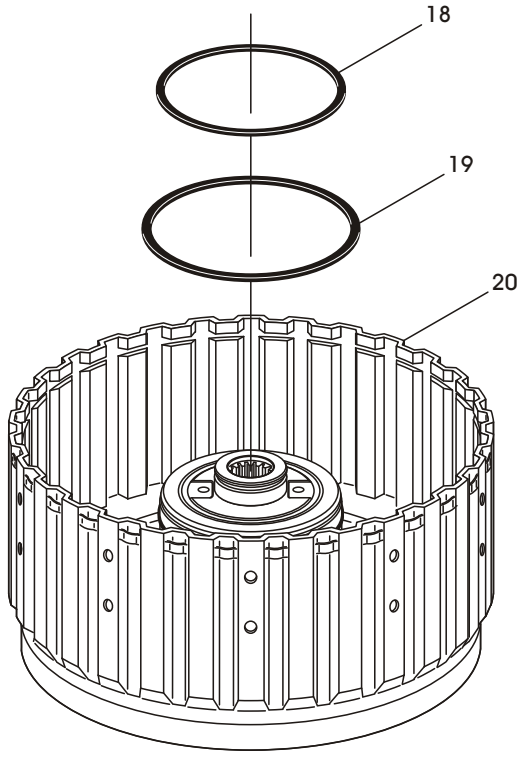
1. Disassemble overdrive/reverse clutch housing using Figure 76 as a guide.
2. Clean all overdrive/reverse parts thoroughly with a good cleaning solution and dry with compressed air.
3. Inspect all overdrive/reverse parts thoroughly for any wear and/or damage.
4. Install new inner piston "D" ring seals into the grooves in reverse clutch retainer assembly, as shown in Figure 77, and lube with a small amount of Trans-Jel®.
5. Install new outer "D" ring seal onto reverse clutch apply piston, as shown in Figure 78, and lube with small amount of Trans-Jel®.
6. Install new outer "D" ring seal onto overdrive clutch apply piston, as shown in Figure 79, and lube with small amount of Trans-Jel®.

Continued on Page 48



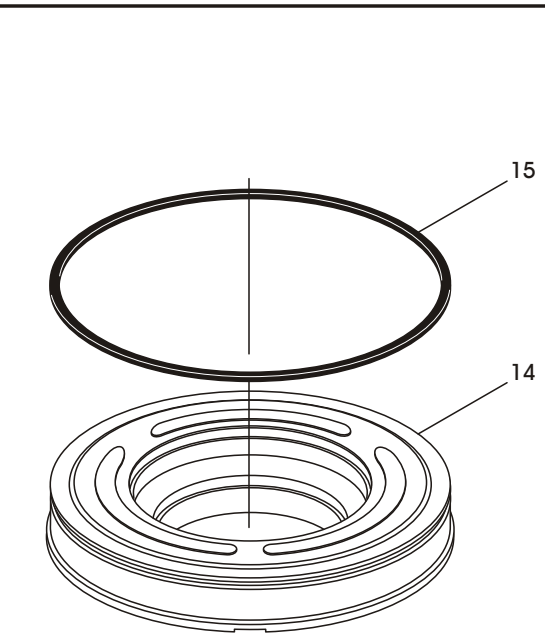
16 REVERSE CLUTCH APPLY PISTON.
17 REVERSE CLUTCH APPLY PISTON "D" RING SEAL.

Figure 78



18 OVERDRIVE CLUTCH PISTON INNER "D" RING SEAL.
19 REVERSE CLUTCH APPLY PISTON INNER "D" RING SEAL.
20 REVERSE CLUTCH RETAINER ASSEMBLY.

Figure 77



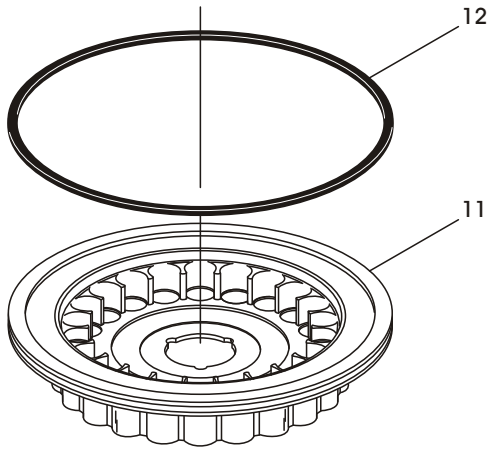
14 OVERDRIVE CLUTCH APPLY PISTON.
15 OVERDRIVE CLUTCH APPLY PISTON "D" RING SEAL.

Figure 79

COMPONENT REBUILD SECTION
OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

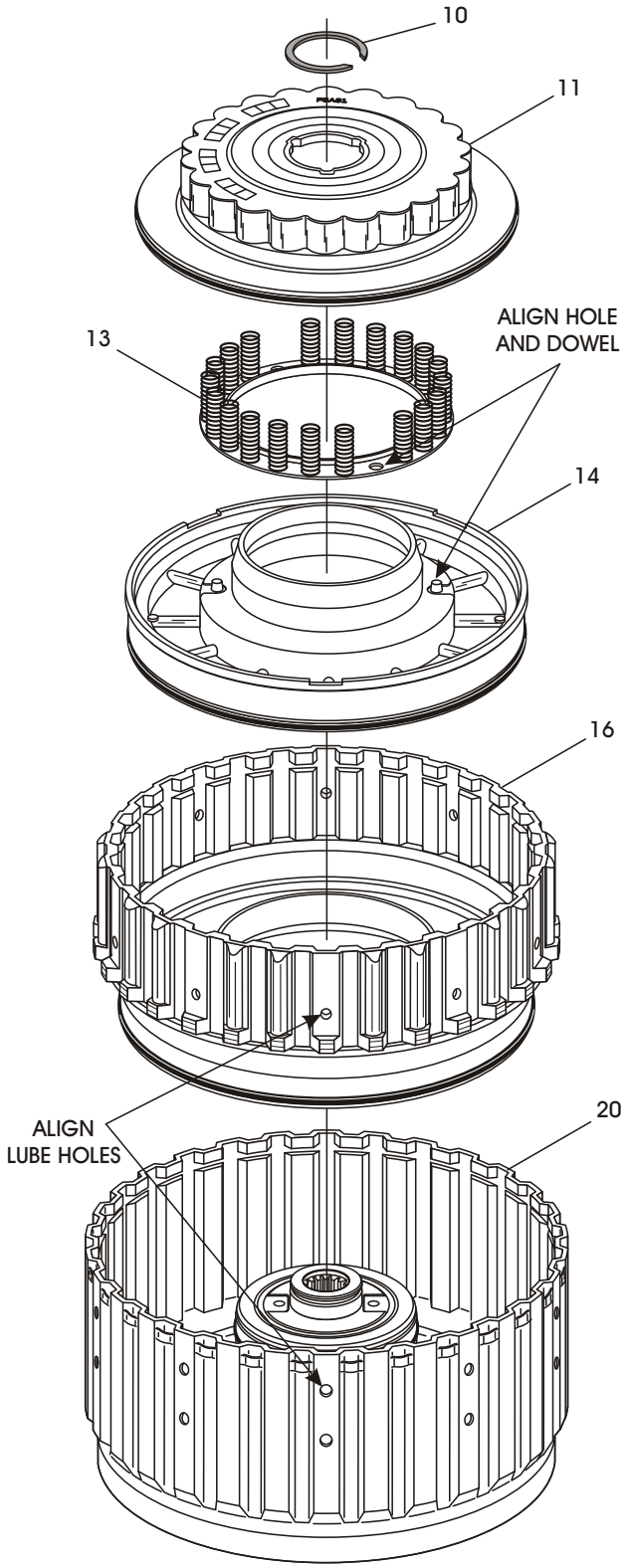
7. Install new "D" ring seal onto overdrive clutch balance piston, as shown in Figure 80, and lube with a small amount of Trans-Jel®.
8. Install the completed reverse apply piston into the retainer, aligning the lube holes, as shown in Figure 81, and ensure that it is fully seated.
9. Install the completed overdrive apply piston into the reverse apply piston, as shown in Figure 81, and ensure that it is fully seated.
10. Install the overdrive clutch piston return spring as shown in Figure 81.
    Note: Ensure alignment holes are seated over the dowels on piston (See Figure 81).
11. Install the overdrive clutch balance piston over return spring assembly, as shown in Figure 81, and lay snap ring on top of piston.
12. Compress the return spring assembly with a spring compressor, install the snap ring into groove with snap ring pliers, and remove the spring compressor.

Continued on Page 49



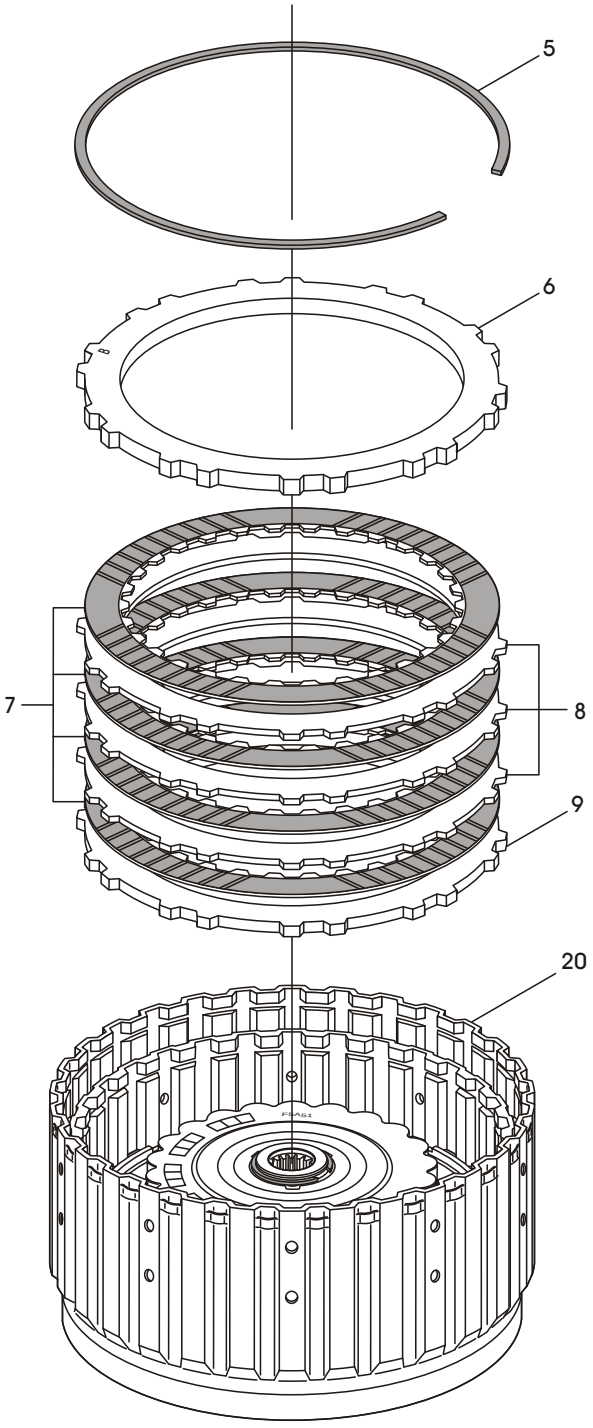
11 OVERDRIVE CLUTCH BALANCE PISTON.
12 OVERDRIVE CLUTCH BALANCE PISTON "D" RING SEAL.

Figure 80



10 OVERDRIVE BALANCE PISTON RETAINING SNAP RING.
11 OVERDRIVE CLUTCH BALANCE PISTON.
13 OVERDRIVE CLUTCH APPLY PISTON RETURN SPRING.
14 OVERDRIVE CLUTCH APPLY PISTON AND SEAL ASSEMBLY
16 REVERSE CLUTCH APPLY PISTON AND SEAL ASSEMBLY
20 REVERSE CLUTCH RETAINER ASSEMBLY.

Figure 81



5 OVERDRIVE CLUTCH BACKING PLATE SNAP RING *(SELECTIVE).*
6 OVERDRIVE CLUTCH BACKING PLATE (.240" THICK).
7 OVERDRIVE CLUTCH FRICTION PLATES.
8 OVERDRIVE CLUTCH STEEL PLATES (.099" THICK).
9 OVERDRIVE CLUTCH APPLY PLATE (.160" THICK).
20 REVERSE CLUTCH RETAINER ASSEMBLY.

Figure 82

OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

13. Install the overdrive clutch plates beginning with a normal steel plate or a thicker apply plate depending on the model.
Note: The F4A51 unit has an apply plate that is .160" thick and has a rounded edge that goes toward lined plate (See Figure 83).
14. Install the apply plate so that the places with no teeth are aligned with the lube holes in the retainer, as shown in Figure 83.
15. Alternate with friction and normal steel plates, as shown in Figure 82, until you have installed 4 frictions and three steel plates.
Note: Align the steel plates so that the places with no teeth are aligned with the lube holes in the retainer (See Figure 83). Friction plates should be soaked in ATF for 1 hour.
16. Install the overdrive clutch backing plate, as shown in Figure 82, with the rounded edge toward friction plate.
Note: Align the backing plate with the lube holes in retainer as you did the steel plates.
17. Install the selective backing plate snap ring, as shown in Figure 82

Continued on Page 50

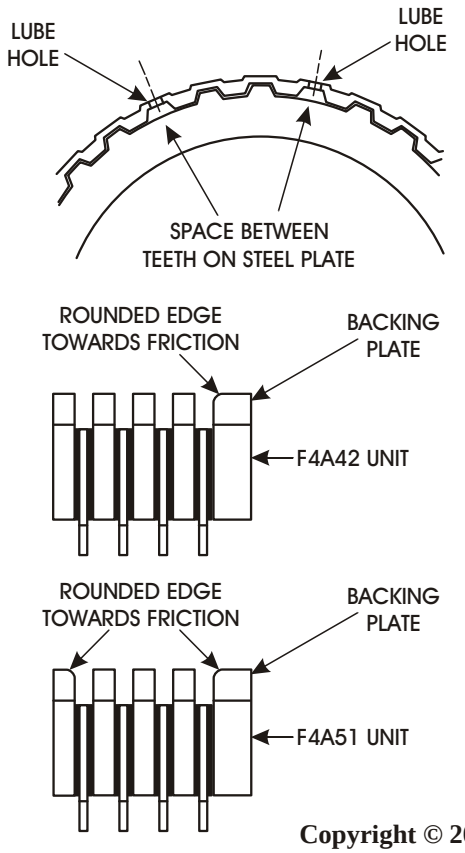


Figure 83

UNDERDRIVE AND OVERDRIVE SELECTIVE SNAP RING CHART					
40 SERIES			50 SERIES		
Thickness	I.D. Color	Part Number	Thickness	I.D. Color	Part Number
1.6 mm (.063")	None	MD759666	1.6 mm (.063")	Brown	MD759960
1.7 mm (.067")	Blue	MD759667	1.7 mm (.067")	None	MD759961
1.8 mm (.071")	Brown	MD759668	1.8 mm (.071")	Blue	MD759962
1.9 mm (.075")	None	MD752124	1.9 mm (.075")	Brown	MD759963
2.0 mm (.079")	Blue	MD752125	2.0 mm (.079")	None	MD750841
2.1 mm (.083")	Brown	MD752126	2.1 mm (.083")	Blue	MD750842
2.2 mm (.087")	None	MD752127	2.2 mm (.087")	Brown	MD750843
2.3 mm (.091")	Blue	MD752128	2.3 mm (.091")	None	MD750844
2.4 mm (.094")	Brown	MD752129	2.4 mm (.094")	Blue	MD750845
2.5 mm (.098")	None	MD752130	2.5 mm (.098")	Brown	MD750846
2.6 mm (.102")	Blue	MD752131	2.6 mm (.102")	None	MD750847
2.7 mm (.106")	Brown	MD752132	2.7 mm (.106")	Blue	MD750848
2.8 mm (.110")	None	MD752133	2.8 mm (.110")	Brown	MD750849
2.9 mm (.114")	Blue	MD752134	2.9 mm (.114")	None	MD750850
3.0 mm (.118")	Brown	MD754680	3.0 mm (.118")	Blue	MD750851

Figure 84

COMPONENT REBUILD SECTION
OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

18. Install the clutch compressing tools as shown in Figure 85 and 86.
    Note: The overdrive lined plates are "Waved" and must be compressed as shown to achieve the proper clutch clearance reading.
19. Compress the plates and measure with feeler gage between snap ring and backing plate, as shown in Figure 86.
20. With the plates compressed clutch clearance should be 1.6-1.8 mm (.063"-.071").
21. Change the selective snap ring as necessary using the chart in Figure 84, to obtain proper overdrive clutch clearance.

Continued on Page 51

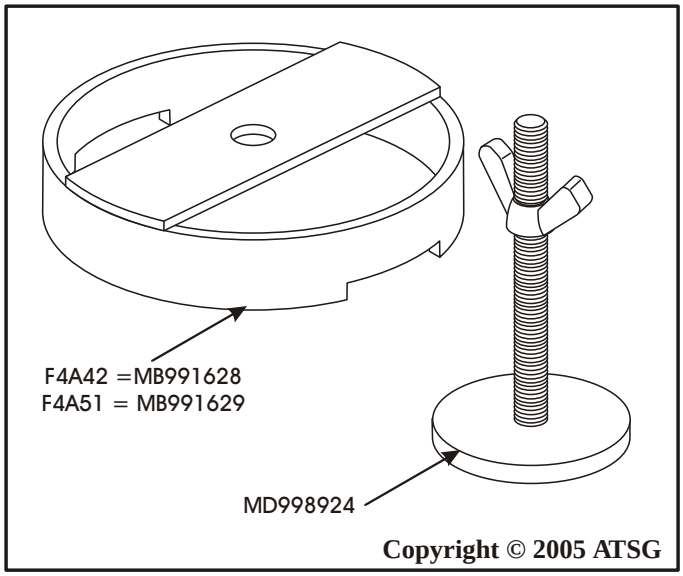


Figure 85

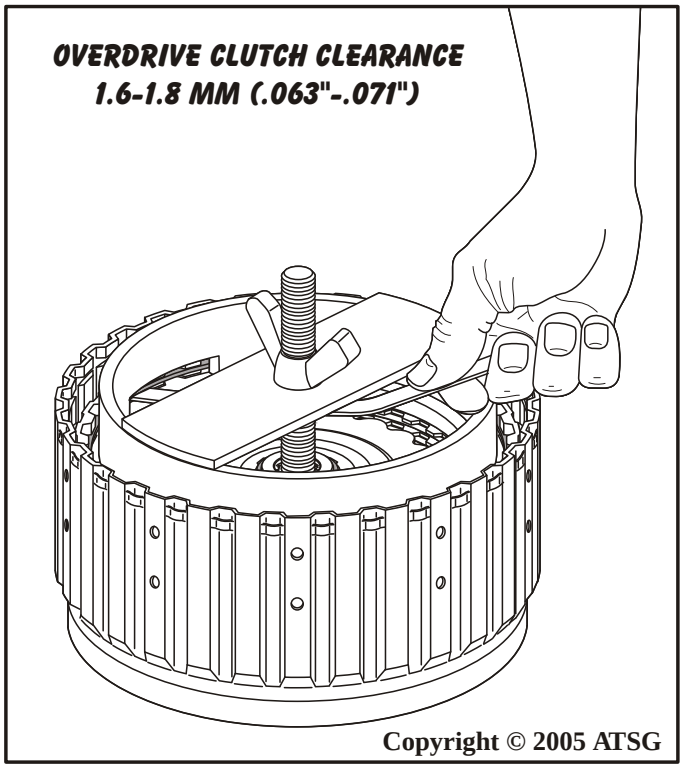
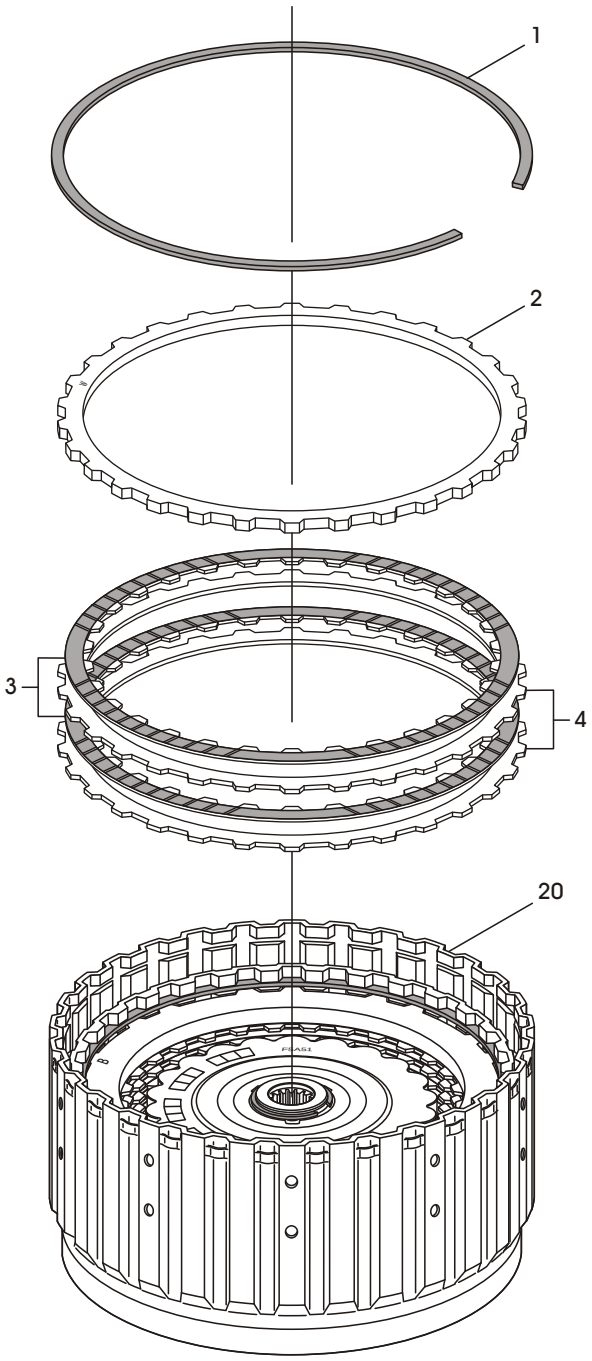


Figure 86

COMPONENT REBUILD SECTION
OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

22. Install the reverse clutch plates beginning with a steel plate and alternating with friction plates until you have installed two of each, as shown in Figure 87.
    Note: Friction plates should be soaked in ATF for 1 hour, prior to installation.
23. Install the reverse clutch backing plate with the rounded edge towards friction plate, as shown in Figure 87 and 88.
24. Install the reverse clutch backing plate snap ring, as shown in Figure 87.

Continued on Page 52



1 REVERSE CLUTCH BACKING PLATE SNAP RING *(SELECTIVE)*.
2 REVERSE CLUTCH BACKING PLATE (.160" THICK).
3 REVERSE CLUTCH FRICTION PLATES.
4 REVERSE CLUTCH STEEL PLATES (.073" THICK).
20 REVERSE CLUTCH RETAINER ASSEMBLY.

Figure 87

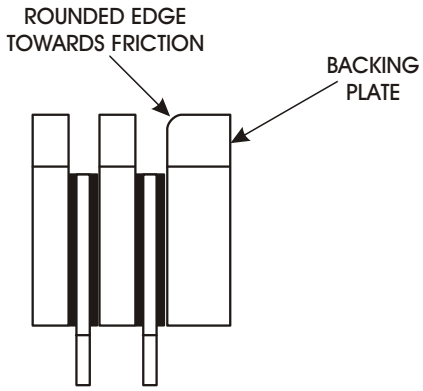


Figure 88

REVERSE CLUTCH SELECTIVE SNAP RING CHART					
40 SERIES			50 SERIES		
Thickness	I.D. Color	Part Number	Thickness	I.D. Color	Part Number
1.6 mm (.063")	None	MD761085	1.6 mm (.063")	None	MD761088
1.7 mm (.067")	Blue	MD761086	1.7 mm (.067")	Blue	MD761089
1.8 mm (.071")	Brown	MD761087	1.8 mm (.071")	Brown	MD761090
1.9 mm (.075")	None	MD752137	1.9 mm (.075")	None	MD758947
2.0 mm (.079")	Blue	MD752138	2.0 mm (.079")	Blue	MD756690
2.1 mm (.083")	Brown	MD752139	2.1 mm (.083")	Brown	MD756691
2.2 mm (.087")	None	MD752140	2.2 mm (.087")	None	MD756692
2.3 mm (.091")	Blue	MD752141	2.3 mm (.091")	Blue	MD756693
2.4 mm (.094")	Brown	MD752142	2.4 mm (.094")	Brown	MD756694
2.5 mm (.098")	None	MD752143	2.5 mm (.098")	None	MD756695
2.6 mm (.102")	Blue	MD752144	2.6 mm (.102")	Blue	MD756696
2.7 mm (.106")	Brown	MD752145	2.7 mm (.106")	Brown	MD756697
2.8 mm (.110")	None	MD752146	2.8 mm (.110")	None	MD756698

Figure 89

COMPONENT REBUILD SECTION
OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

25. Install the clutch compressing tools that are shown in Figure 91.
    Note: The reverse lined plates are "Waved" and must be compressed as shown to achieve the proper clutch clearance reading.

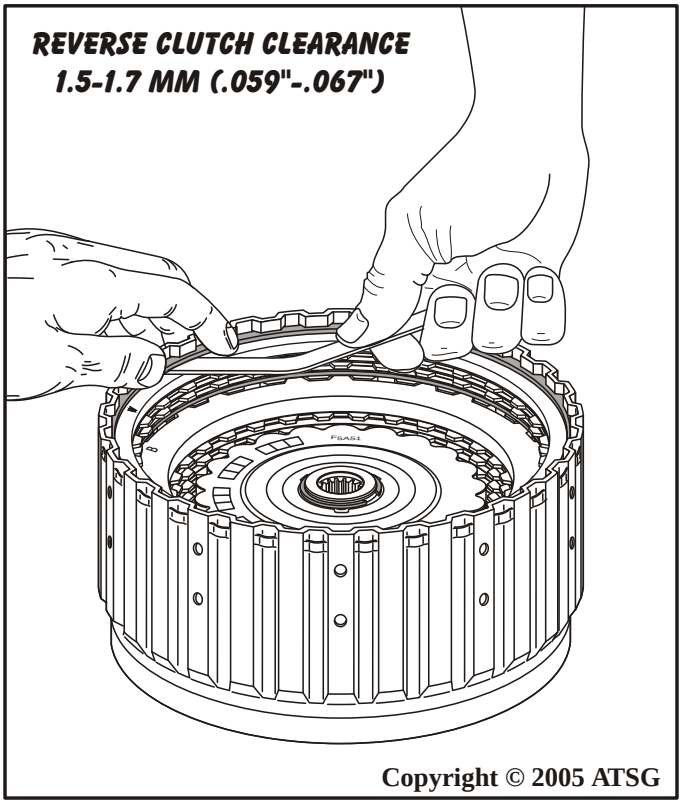


Figure 90

26. Compress the plates and measure with feeler gage between snap ring and backing plate, as shown in Figure 90.
    Note: Proper compression can at times be achieved by hand, as shown in Figure 90, as there are only 2 friction plates.
27. With the plates compressed clutch clearance should be 1.5-1.7 mm (.059"-.067").
28. Change the selective snap ring as necessary using the chart in Figure 89, to obtain proper reverse clutch clearance.

Continued on Page 53

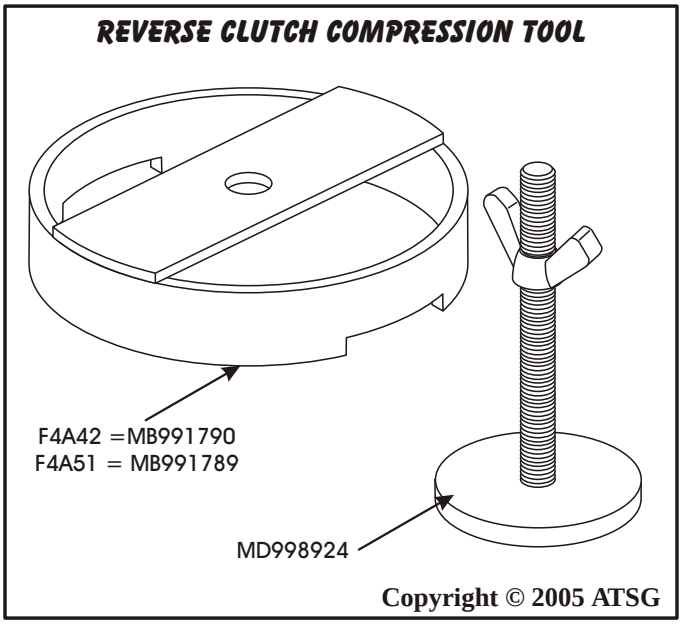


Figure 91

COMPONENT REBUILD SECTION
OVERDRIVE/REVERSE HOUSING ASSEMBLY (CONT'D)

29. Turn the overdrive/reverse clutch housing over as shown in Figure 92.
30. Install the number 7 thrust bearing in direction shown in Figure 92, and retain with a small of Trans-Jel®.
31. Set the completed overdrive/reverse clutch housing aside for the final assembly process.

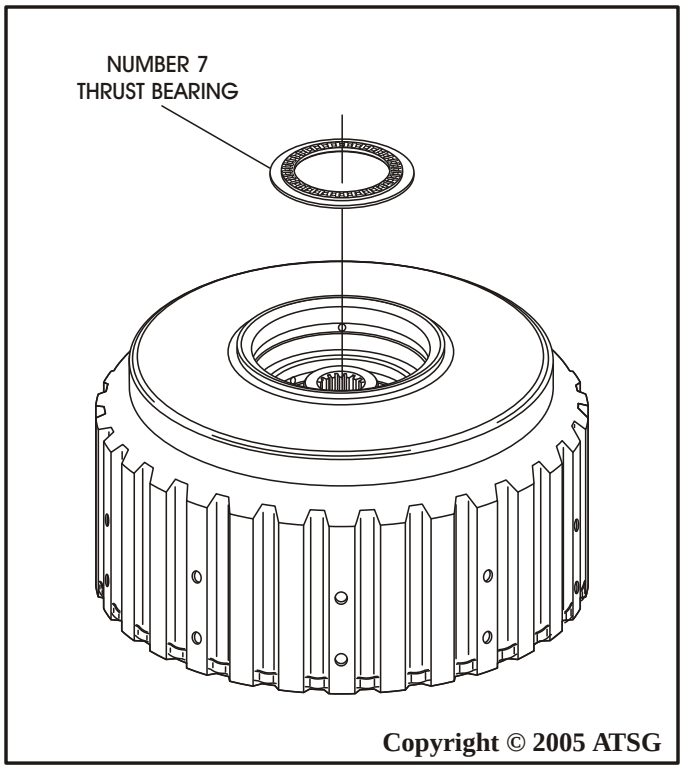


Figure 92

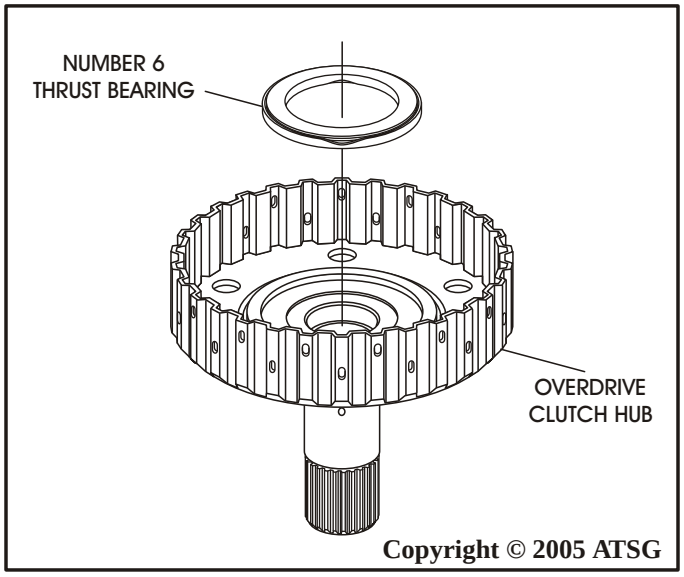


Figure 93

COMPONENT REBUILD SECTION
OVERDRIVE CLUTCH HUB

1. Clean the overdrive clutch hub thoroughly in cleaning solution and dry with compressed air.
2. Inspect the overdrive clutch hub thoroughly for any wear and/or damage.
3. Install the number 6 thrust bearing in direction shown in Figure 93, and retain with a small amount of Trans-Jel®.
4. Set the completed overdrive clutch hub aside for the final assembly process (See Figure 94).

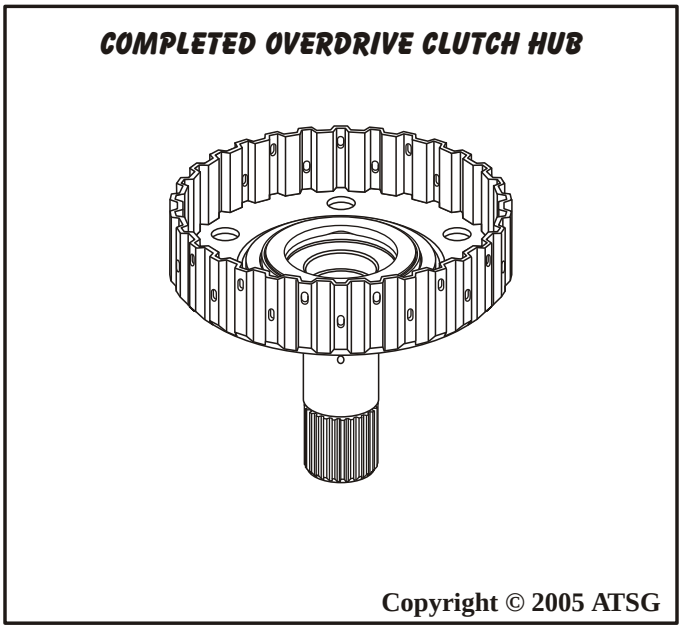
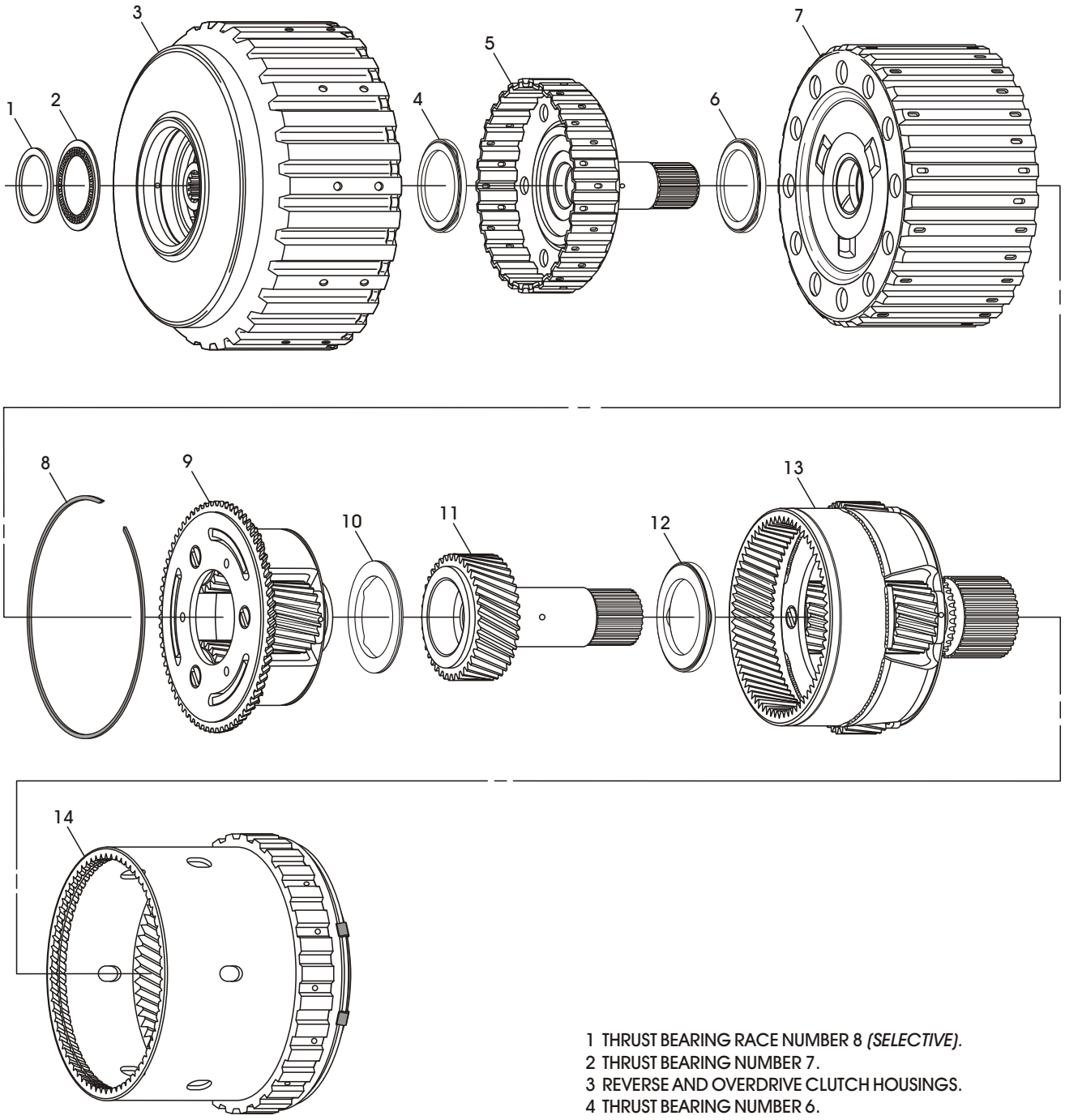


Figure 94

COMPONENT REBUILD SECTION
Continued on Page 55

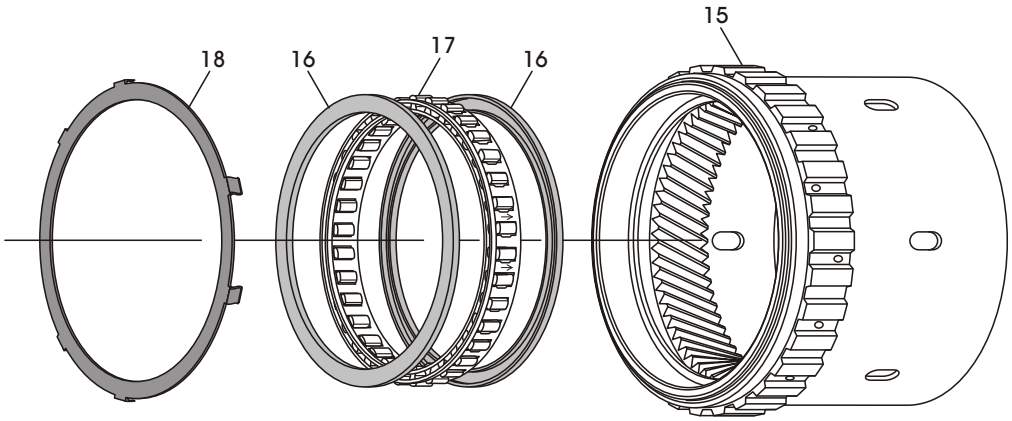
GEAR TRAIN EXPLODED VIEW



1 THRUST BEARING RACE NUMBER 8 *(SELECTIVE).*
2 THRUST BEARING NUMBER 7.
3 REVERSE AND OVERDRIVE CLUTCH HOUSINGS.
4 THRUST BEARING NUMBER 6.
5 OVERDRIVE CLUTCH HUB.
6 THRUST BEARING NUMBER 5.
7 REVERSE SUN GEAR AND SHELL ASSEMBLY.
8 PLANETARY RETAINING SNAP RING.
9 OVERDRIVE PLANETARY CARRIER.
10 THRUST BEARING NUMBER 4.
11 UNDERDRIVE SUN GEAR.
12 THRUST BEARING NUMBER 3.
13 OUTPUT PLANETARY CARRIER ASSEMBLY.
14 OUTPUT INTERNAL RING GEAR.

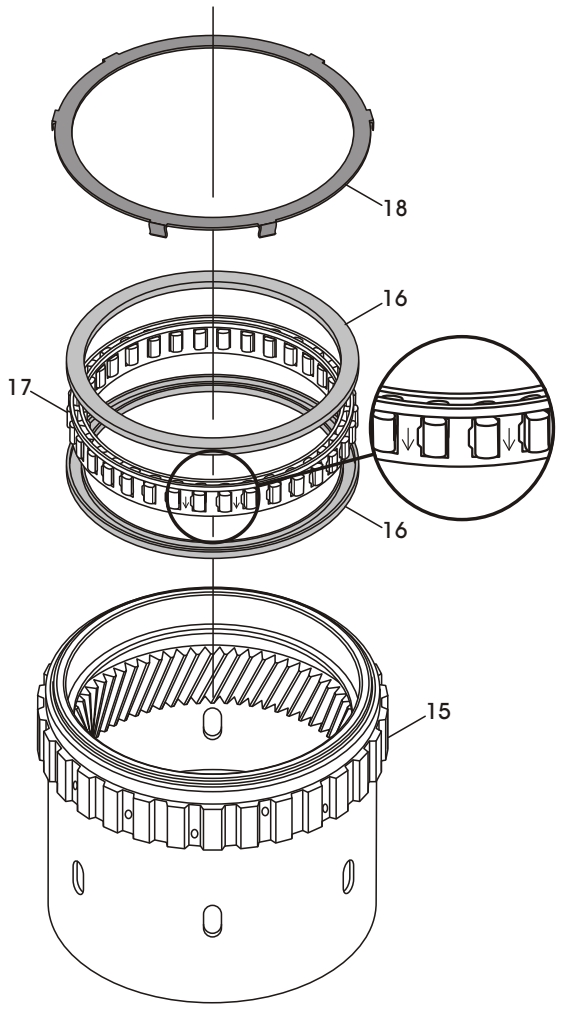
Figure 95

LOW SPRAG ASSEMBLY (SOME MODELS) EXPLODED VIEW



15 OUTPUT INTERNAL RING GEAR.
16 LOW SPRAG END BEARINGS (2 REQUIRED).
17 LOW SPRAG ASSEMBLY.
18 LOW SPRAG ASSEMBLY RETAINER.

Figure 96



15 OUTPUT INTERNAL RING GEAR.
16 LOW SPRAG END BEARINGS (2 REQUIRED).
17 LOW SPRAG ASSEMBLY.

Figure 97

COMPONENT REBUILD SECTION

PLANETARY GEAR TRAIN ASSEMBLY

1. Disassemble the planetary gear train by first removing the snap ring, and using Figure 95 and 96 as a guide.
2. Clean all of the planetary gear train parts using a suitable cleaning solution and dry with compressed air.
3. Inspect all planetary gear train parts for any wear and/or damage, replace as necessary. ***Note: F4A40 Series and F4A50 Series have different planetary gear ratios and will not interchange. Inspect any replacement parts very carefully.***
4. Place output internal ring gear on a flat work surface, as shown in Figure 97.
5. Install one low sprag end bearing in direction shown in Figure 97, until fully seated.
6. Install the low sprag assembly into the ring gear so that the arrows are pointing down, as shown in Figure 97.
7. Install the second low sprag end bearing in the direction shown in Figure 97, until fully seated.
8. Install the low sprag assembly retainer by snapping it over the lip on the ring gear, as shown in Figure 97.
   Special Note: Low Sprag Assembly is not used on all models. Refer to Page 117 for specific details.

Continued on Page 56

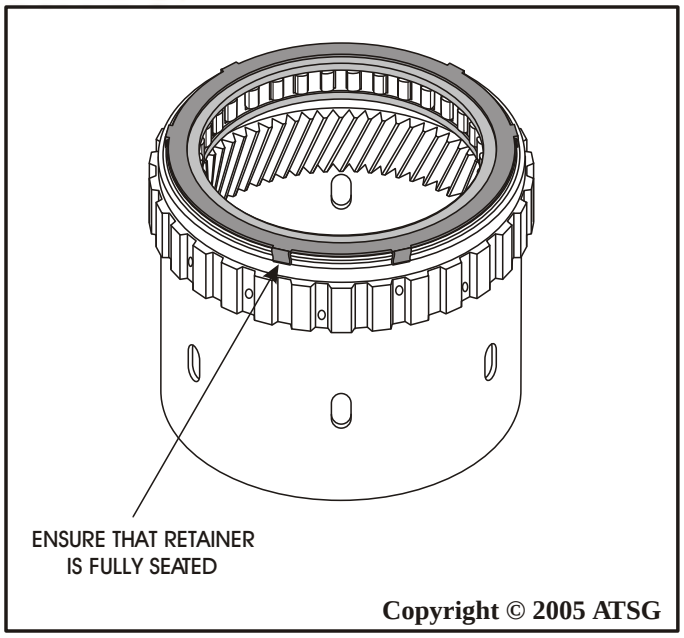


Figure 98

COMPONENT REBUILD SECTION

PLANETARY GEAR TRAIN ASSEMBLY (CONT'D)

9. Ensure that low sprag retainer is fully seated, as shown in Figure 98, and check it the full 360 degrees.
10. Turn the ring gear assembly over and set on device to raise it off of the work surface, as shown in Figure 99.
11. Install the output planetary carrier into output ring gear, as shown in Figure 99, and rotate to engage planetary gears.
12. Install the number 4 thrust bearing onto the overdrive carrier, as shown in Figure 100, and retain with Trans-Jel®.

Continued on Page 57

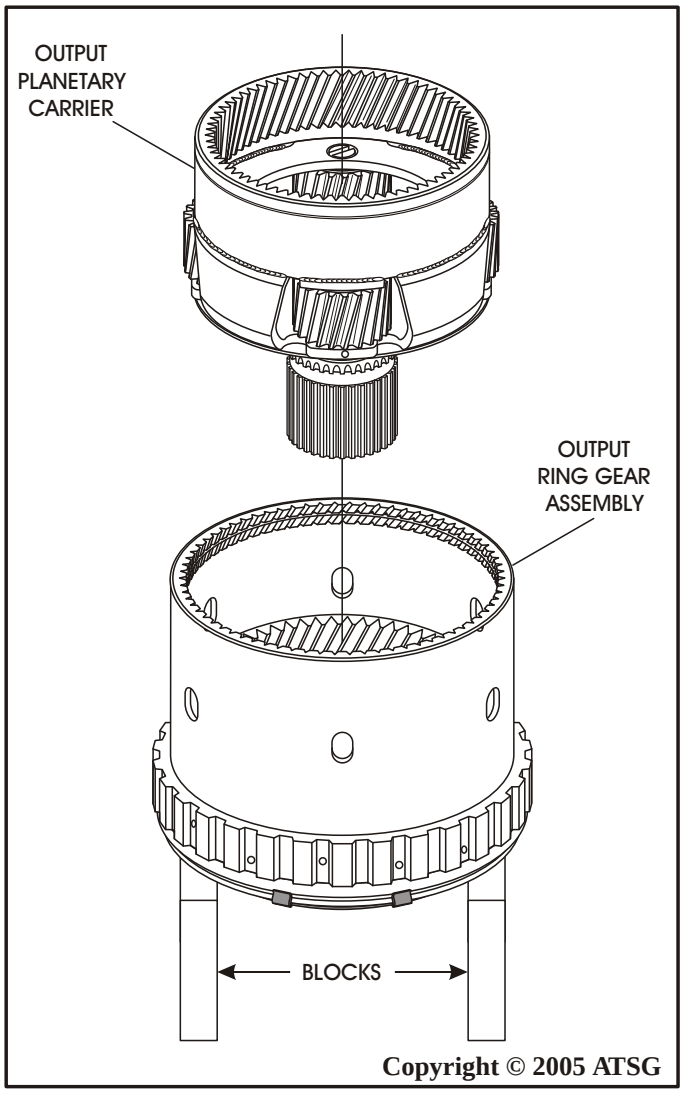


Figure 99

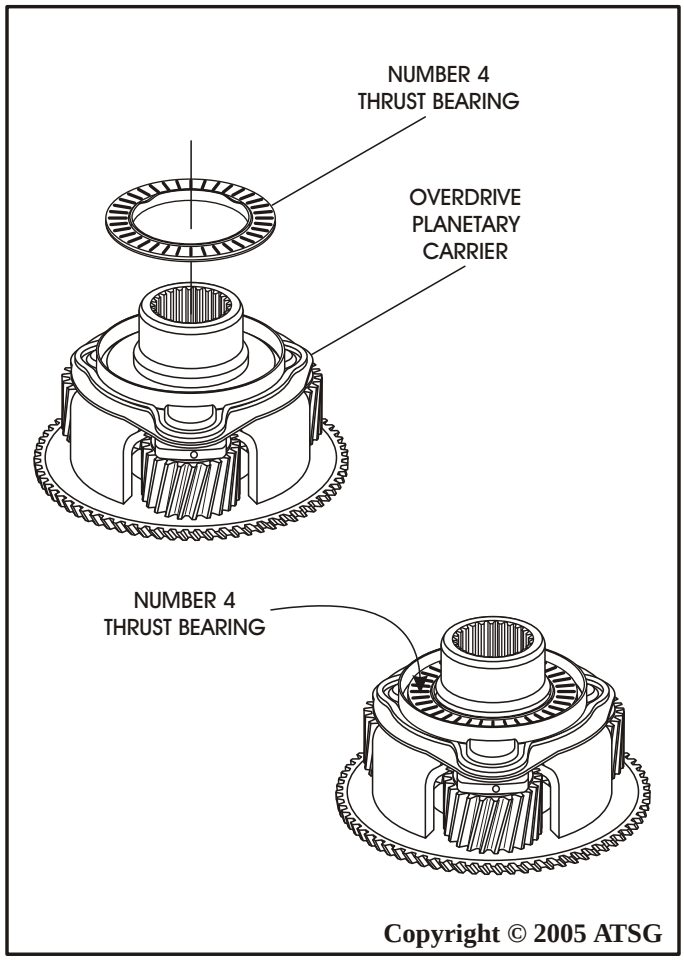
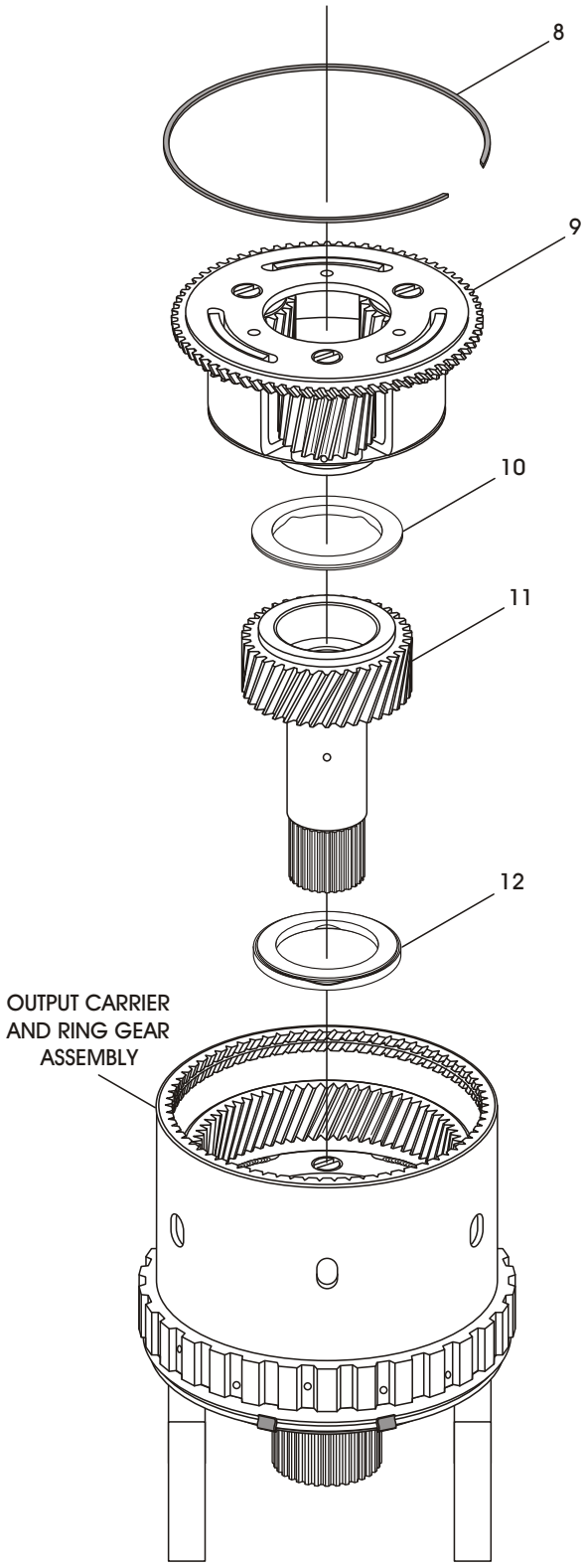


Figure 100



8 PLANETARY RETAINING SNAP RING.
9 OVERDRIVE PLANETARY CARRIER.
10 THRUST BEARING NUMBER 4.
11 UNDERDRIVE SUN GEAR.
12 THRUST BEARING NUMBER 3.

Figure 101

COMPONENT REBUILD SECTION

PLANETARY GEAR TRAIN ASSEMBLY (CONT'D)

13. Install the number 3 thrust bearing into the output planetary carrier in the direction shown in Figure 101.
14. Install the underdrive sun gear into the output planetary carrier in the direction shown in Figure 101, and rotate into position to engage into planetary gears.
15. Ensure the number 4 thrust bearing (10) is still in place in the overdrive carrier (9). Refer to Figure 101.
16. Install the overdrive carrier and the number 4 thrust bearing as an assembly, by rotating into position, as shown in Figure 101.
17. Install the overdrive carrier retaining snap ring, as shown in Figure 101, and ensure that it is fully seated.
18. Set completed planetary gear train assembly aside for the final assembly process, as shown in Figure 102.

COMPONENT REBUILD SECTION
Continued on Page 58

COMPLETED PLANETARY GEAR TRAIN ASSEMBLY

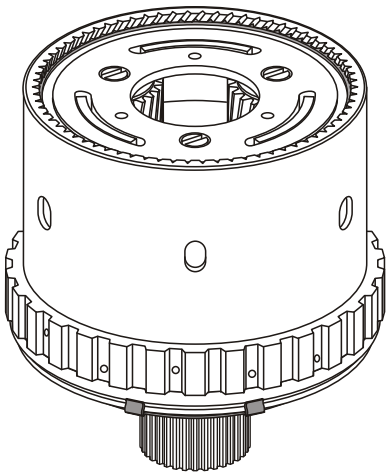


Figure 102

COMPONENT REBUILD SECTION

SUN GEAR DRUM ASSEMBLY

1. Install the number 5 thrust bearing onto the sun gear and shell assembly in the direction shown in Figure 103, and retain with a small amount of Trans-Jel®.
2. Set the completed sun gear and shell assembly aside for the final assembly process, as shown in Figure 104.

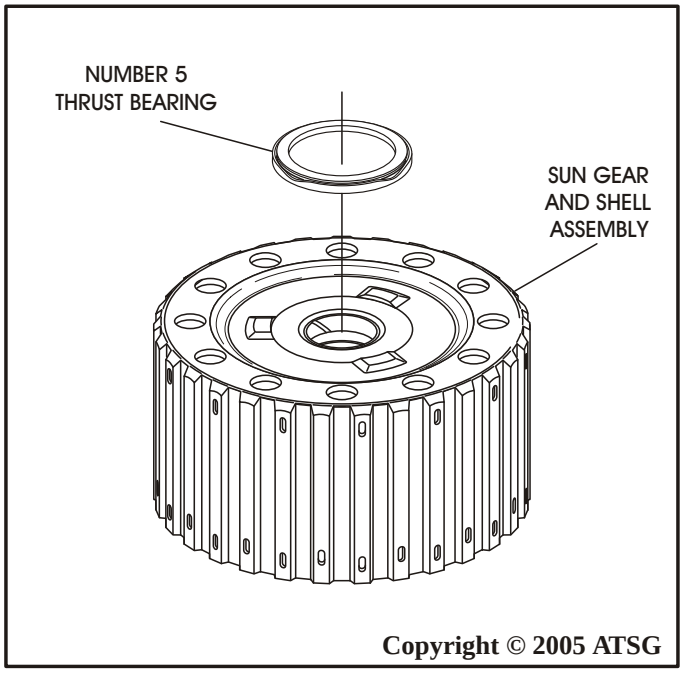


Figure 103

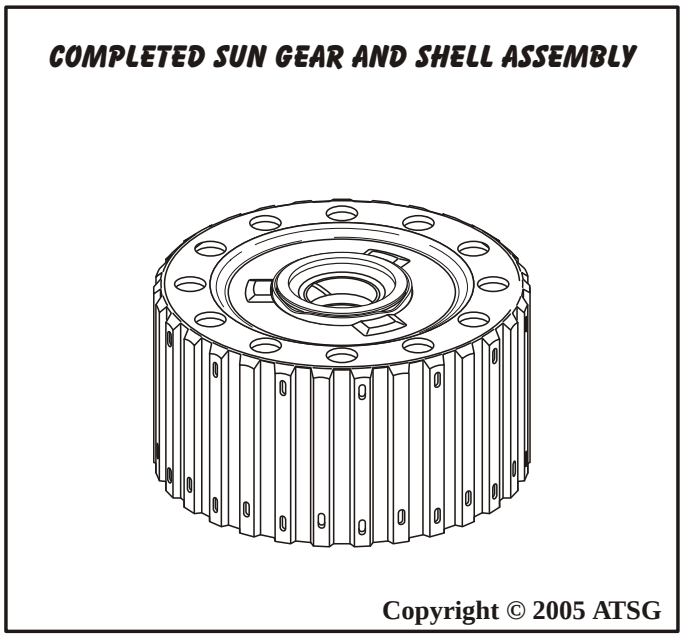


Figure 104

COMPONENT REBUILD SECTION

2ND CLUTCH PISTON AND RETAINER ASSEMBLY

1. Disassemble the 2nd clutch retainer assembly using Figure 105 as a guide.
2. Remove and discard inner and outer "D" ring seal from the piston, as shown in Figure 105.
3. Clean the retainer and piston thoroughly with cleaning solution and dry with compressed air.
4. Inspect the retainer and piston thoroughly for any wear and/or damage. Replace as necessary.

Continued on Page 59

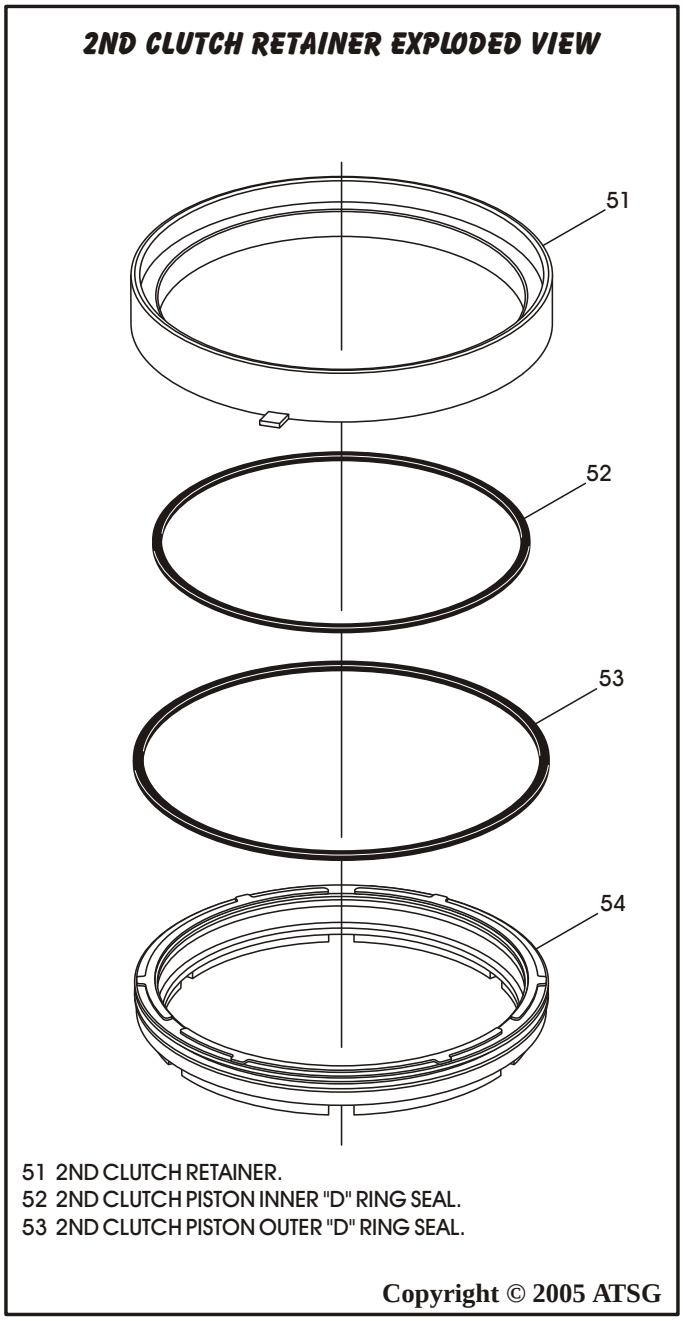
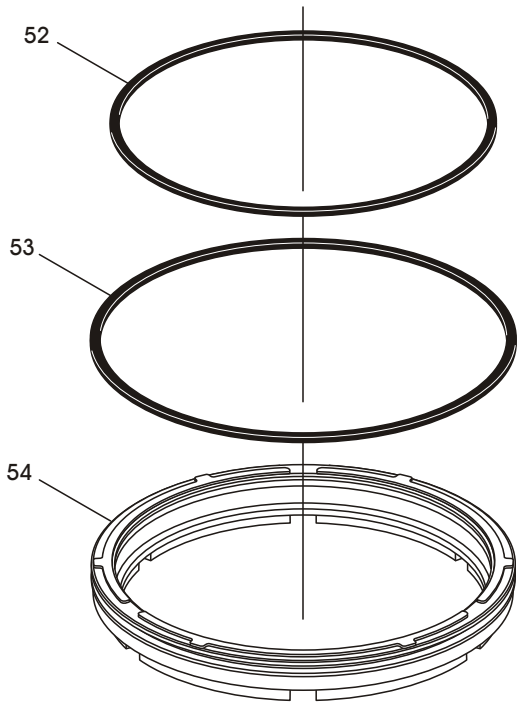
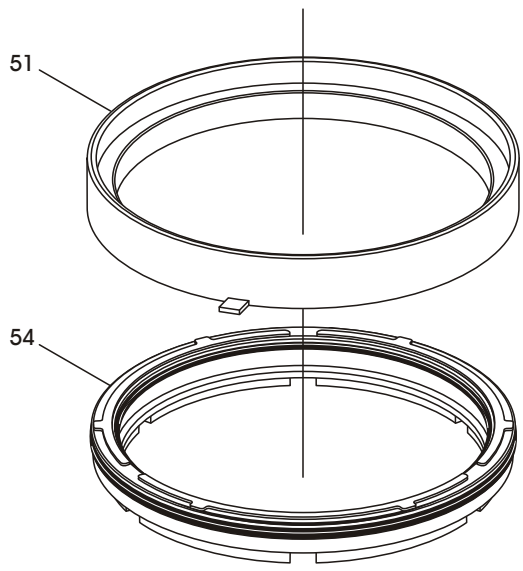


Figure 105



52 2ND CLUTCH PISTON INNER "D" RING SEAL.
53 2ND CLUTCH PISTON OUTER "D" RING SEAL.
54 2ND CLUTCH PISTON.

Figure 106



51 2ND CLUTCH RETAINER.
54 2ND CLUTCH PISTON AND SEALS ASSEMBLY.

Figure 107

COMPONENT REBUILD SECTION
2ND CLUTCH PISTON AND RETAINER (CONT'D)

5. Install new inner and outer "D" ring seals onto the 2nd clutch piston, as shown in Figure 106, and lube with a small amount of Trans-Jel®.
6. Lube the inside seal surfaces of the retainer with a small amount of Trans-Jel® and install the piston assembly into the retainer, as shown in Figure 107.
7. Use care so as not to cut the "D" ring seals during installation.
8. Set completed 2nd clutch piston and retainer assembly aside for the final assembly process, as shown in Figure 108.

COMPLETED 2ND CLUTCH PISTON AND RETAINER ASSEMBLY

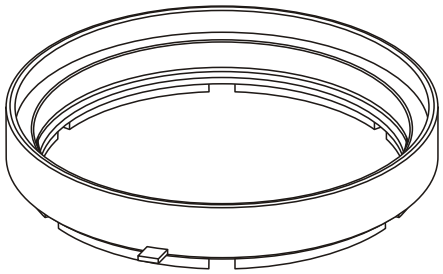
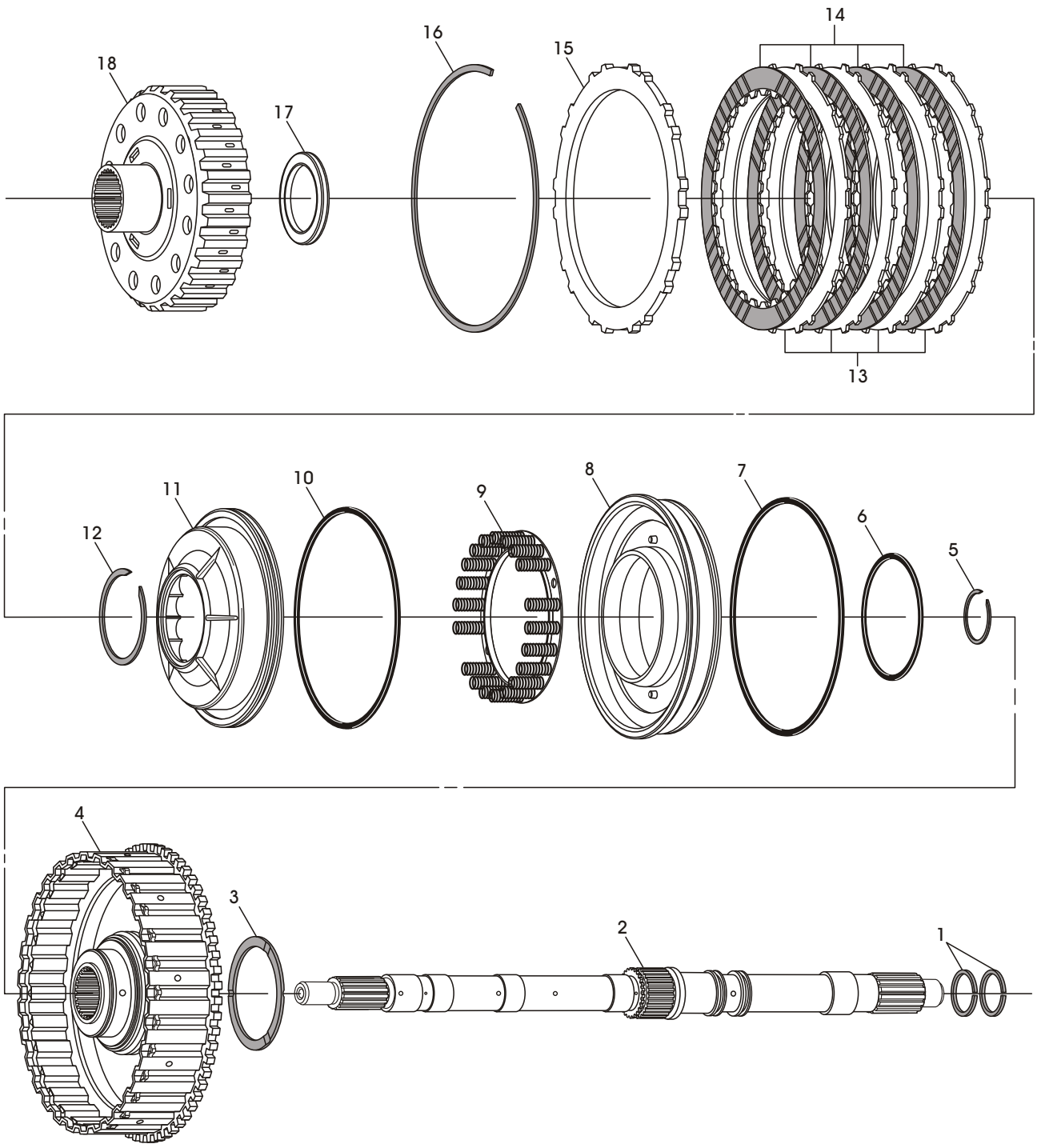


Figure 108

COMPONENT REBUILD SECTION
Continued on Page 61

UNDERDRIVE CLUTCH HOUSING EXPLODED VIEW



1. TURBINE SHAFT SEALING RINGS.
2. TURBINE SHAFT.
3. UNDERDRIVE CLUTCH HOUSING TO PUMP THRUST WASHER.
4. UNDERDRIVE CLUTCH HOUSING.
5. TURBINE SHAFT RETAINING SNAP RING.
6. UNDERDRIVE CLUTCH HOUSING INNER "D" RING SEAL.
7. UNDERDRIVE CLUTCH PISTON OUTER "D" RING SEAL.
8. UNDERDRIVE CLUTCH APPLY PISTON.
9. UNDERDRIVE CLUTCH PISTON RETURN SPRING ASSEMBLY.
10. UNDERDRIVE CLUTCH BALANCE PISTON "D" RING SEAL.
11. UNDERDRIVE CLUTCH BALANCE PISTON.
12. UNDERDRIVE CLUTCH BALANCE PISTON SNAP RING.
13. UNDERDRIVE CLUTCH STEEL PLATES.
14. UNDERDRIVE CLUTCH FRICTION PLATES.
15. UNDERDRIVE CLUTCH BACKING PLATE.
16. UNDERDRIVE CLUTCH BACKING PLATE SNAP RING.
17. UNDERDRIVE CLUTCH HUB TO DRUM THRUST BEARING.
18. UNDERDRIVE CLUTCH HUB.

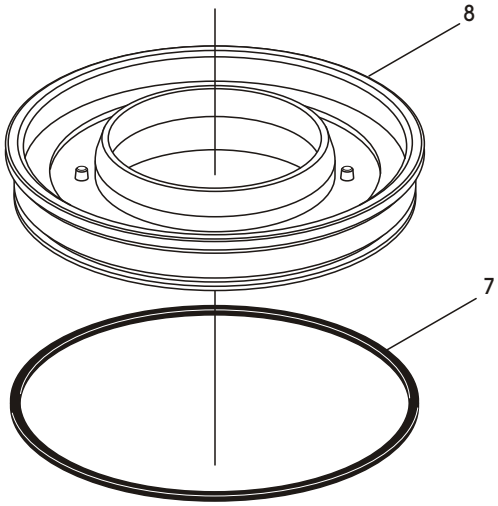
Figure 109

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HOUSING

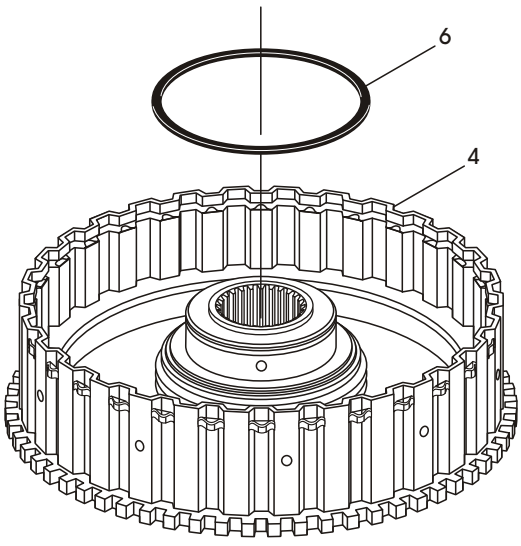
1. Disassemble the underdrive clutch housing using Figure 109 as a guide.
2. Clean all underdrive clutch housing parts with cleaning solution and dry with compressed air.
3. Inspect all underdrive clutch housing parts for any wear and/or damage. Replace as necessary.
4. Install new underdrive clutch inner "D" ring seal in underdrive clutch housing, as shown in Figure 110, and lube with a small amount of Trans-Jel®.
5. Install new underdrive clutch outer "D" ring seal onto underdrive clutch apply piston, as shown in Figure 111, and lube with a small amount of Trans-Jel®.
6. Install new "D" ring seal onto the underdrive clutch balance piston, as shown in Figure 112, and lube with a small amount of Trans-Jel®.

Continued on Page 62



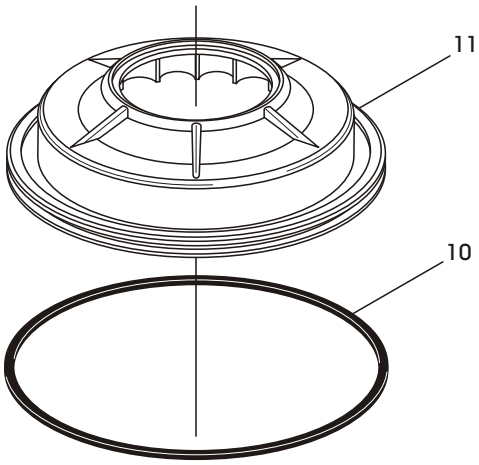
7. UNDERDRIVE CLUTCH PISTON OUTER "D" RING SEAL.
8. UNDERDRIVE CLUTCH APPLY PISTON.

Figure 111



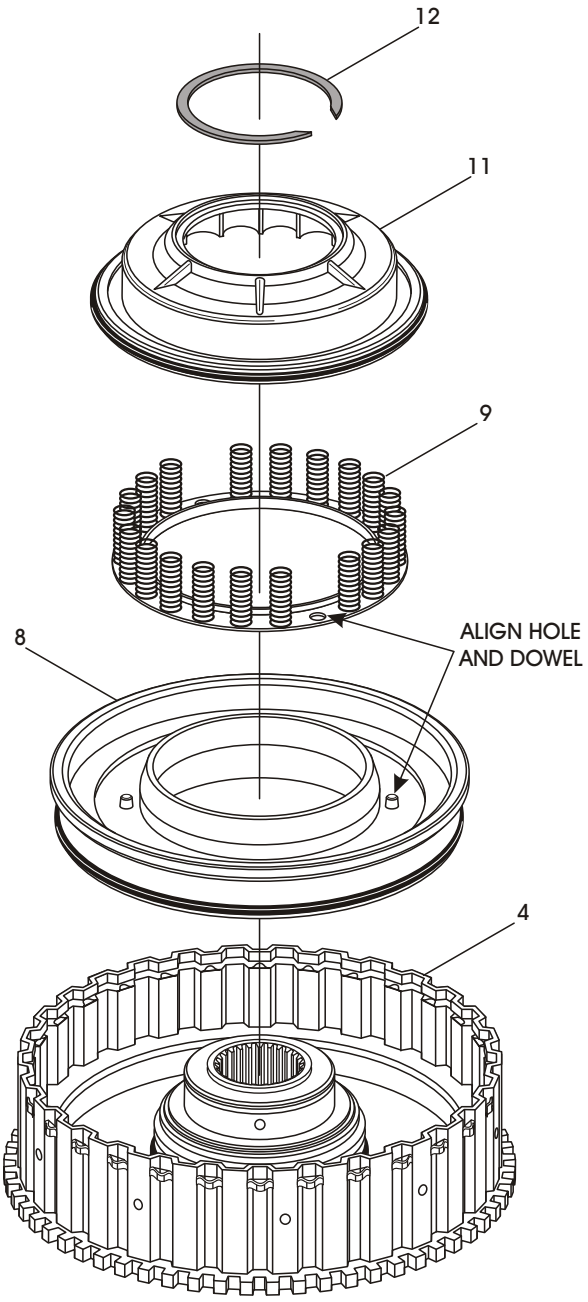
4. UNDERDRIVE CLUTCH HOUSING.
6. UNDERDRIVE CLUTCH HOUSING INNER "D" RING SEAL.

Figure 110



10. UNDERDRIVE CLUTCH BALANCE PISTON "D" RING SEAL.
11. UNDERDRIVE CLUTCH BALANCE PISTON.

Figure 112



4. UNDERDRIVE CLUTCH HOUSING.
8. UNDERDRIVE CLUTCH APPLY PISTON.
9. UNDERDRIVE CLUTCH PISTON RETURN SPRING ASSEMBLY.
11. UNDERDRIVE CLUTCH BALANCE PISTON ASSEMBLY.
12. UNDERDRIVE CLUTCH BALANCE PISTON SNAP RING.

Figure 113

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HOUSING (CONT'D)

7. Install the underdrive clutch piston assembly into the underdrive housing with a twisting motion, as shown in Figure 113.
8. Install the return spring assembly in direction shown in Figure 113, and ensure that holes in retainer are engaged over dowels on piston.
9. Install the underdrive clutch balance piston over the return spring assembly, as shown in Figure 113.
10. Compress the balance piston and return spring using the proper adapters and compressor.
11. Install the snap ring, as shown in Figure 113, and slowly remove the compression tool.

Continued on Page 63

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HOUSING (CONT'D)

12. Install the underdrive clutch plates beginning with a steel plate and alternating with friction plates, as shown in Figure 115, until you have installed four of each.
    Note: When installing the steel plates, align them so that the places with no teeth will be aligned with the lube holes in the housing, as shown in Figure 114.
    Note: Friction plates should be soaked in ATF for 1 hour before installation.
13. Install the underdrive clutch backing plate, as shown in Figure 114 and 115, with the rounded edge towards the friction.
14. Install the underdrive backing plate selective snap ring, as shown in Figure 115.

Continued on Page 64

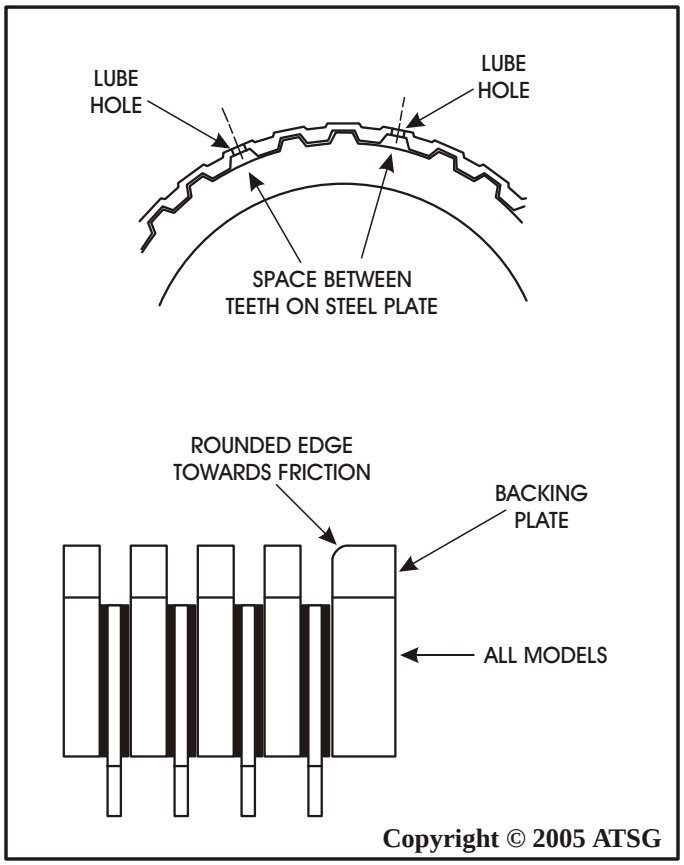
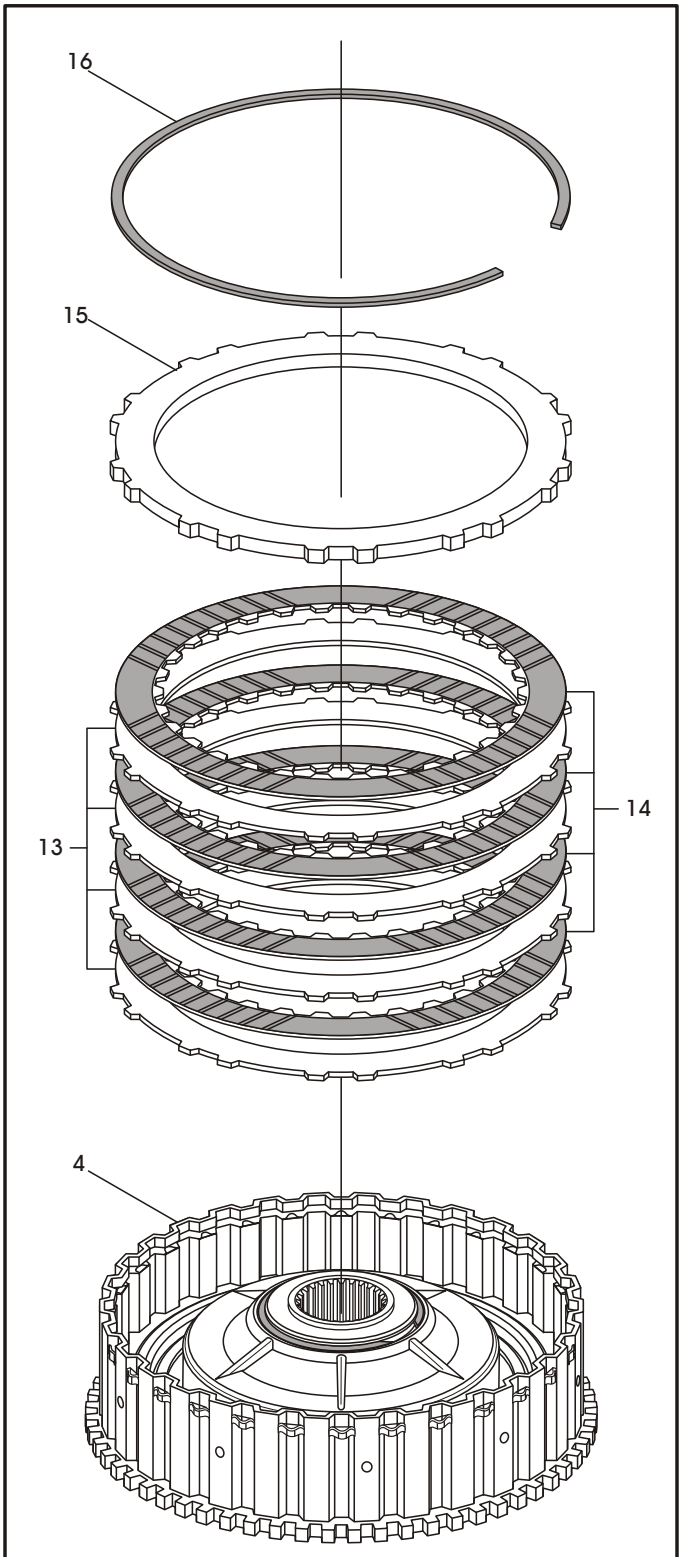


Figure 114



4. UNDERDRIVE CLUTCH HOUSING ASSEMBLY.
13. UNDERDRIVE CLUTCH STEEL PLATES.
14. UNDERDRIVE CLUTCH FRICTION PLATES.
15. UNDERDRIVE CLUTCH BACKING PLATE.
16. UNDERDRIVE CLUTCH BACKING PLATE SNAP RING.

Figure 115

UNDERDRIVE AND OVERDRIVE SELECTIVE SNAP RING CHART					
40 SERIES			50 SERIES		
Thickness	I.D. Color	Part Number	Thickness	I.D. Color	Part Number
1.6 mm (.063")	None	MD759666	1.6 mm (.063")	Brown	MD759960
1.7 mm (.067")	Blue	MD759667	1.7 mm (.067")	None	MD759961
1.8 mm (.071")	Brown	MD759668	1.8 mm (.071")	Blue	MD759962
1.9 mm (.075")	None	MD752124	1.9 mm (.075")	Brown	MD759963
2.0 mm (.079")	Blue	MD752125	2.0 mm (.079")	None	MD750841
2.1 mm (.083")	Brown	MD752126	2.1 mm (.083")	Blue	MD750842
2.2 mm (.087")	None	MD752127	2.2 mm (.087")	Brown	MD750843
2.3 mm (.091")	Blue	MD752128	2.3 mm (.091")	None	MD750844
2.4 mm (.094")	Brown	MD752129	2.4 mm (.094")	Blue	MD750845
2.5 mm (.098")	None	MD752130	2.5 mm (.098")	Brown	MD750846
2.6 mm (.102")	Blue	MD752131	2.6 mm (.102")	None	MD750847
2.7 mm (.106")	Brown	MD752132	2.7 mm (.106")	Blue	MD750848
2.8 mm (.110")	None	MD752133	2.8 mm (.110")	Brown	MD750849
2.9 mm (.114")	Blue	MD752134	2.9 mm (.114")	None	MD750850
3.0 mm (.118")	Brown	MD754680	3.0 mm (.118")	Blue	MD750851

Figure 116

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HOUSING (CONT'D)

15. Install the clutch compressing tools, as shown in Figure 117 and 118.
    Note: Underdrive lined plates are "Waved" on all models and must be compressed as shown in Figure 118 to achieve the proper clutch clearance reading. The underdrive friction plates were changed in May, 2000 to a friction with a less perceptable wave, but must still be compressed.
16. Compress the plates and measure with feeler gage between snap ring and backing plate, as shown in Figure 118.
17. With the plates compressed clutch clearance should be 1.6-1.8 mm (.063"-.071").
18. Change the selective snap ring as necessary, using the chart in Figure 116, to obtain proper underdrive clutch clearance.

Continued on Page 65

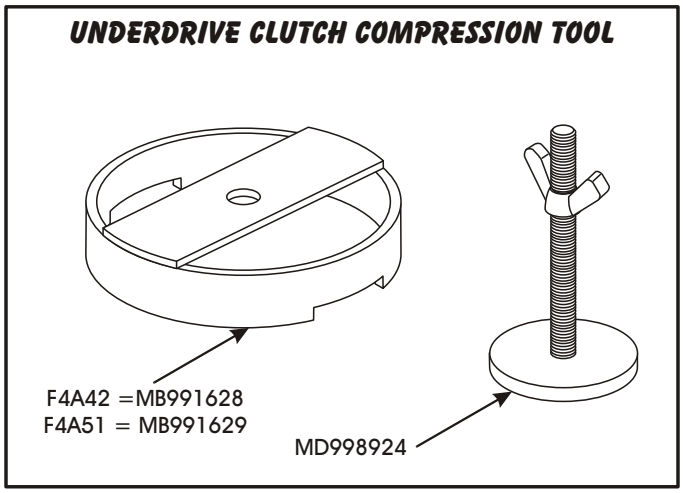


Figure 117

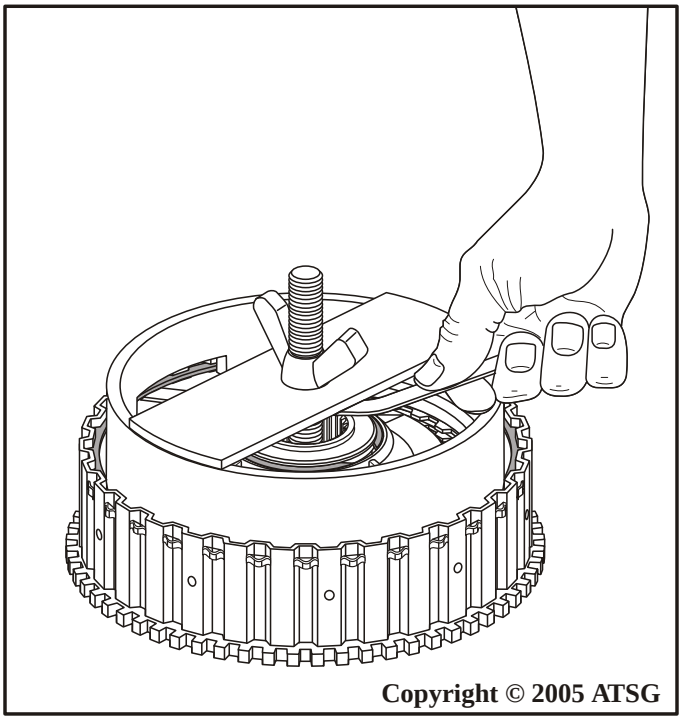


Figure 118

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HOUSING (CONT'D)

19. Install the turbine shaft through the underdrive clutch housing, as shown in Figure 119, install snap ring and ensure that it is fully seated.
20. Install the number 1 thrust washer, as shown in Figure 120, and retain with Trans-Jel®.
21. Install two new turbine shaft sealing rings, as shown in Figure 120, and ensure rotation.
22. Set the completed underdrive clutch housing aside for the final assembly process.

COMPONENT REBUILD SECTION
Continued on Page 66

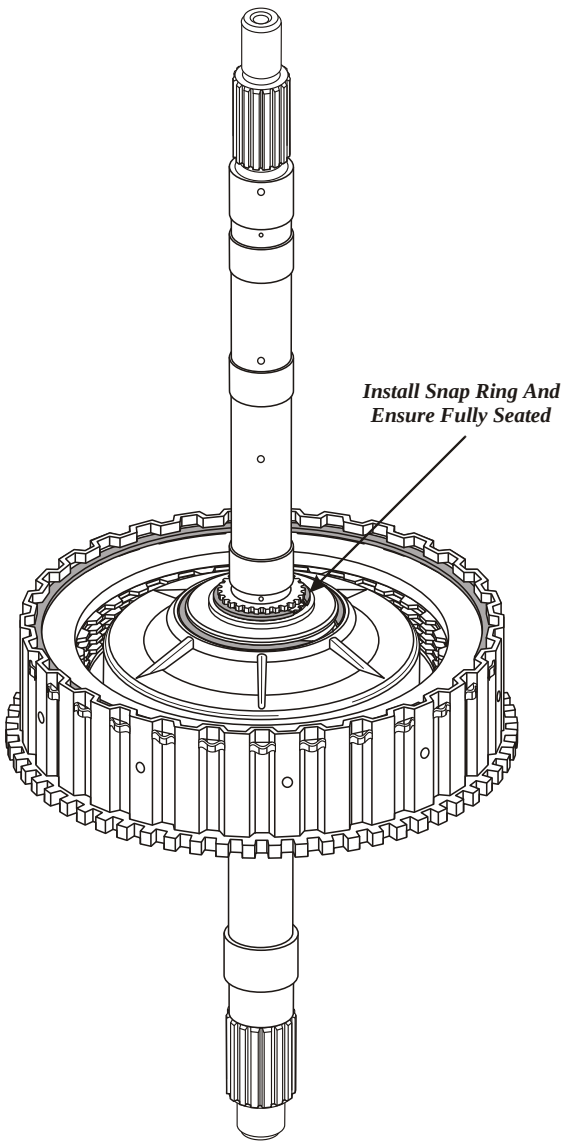
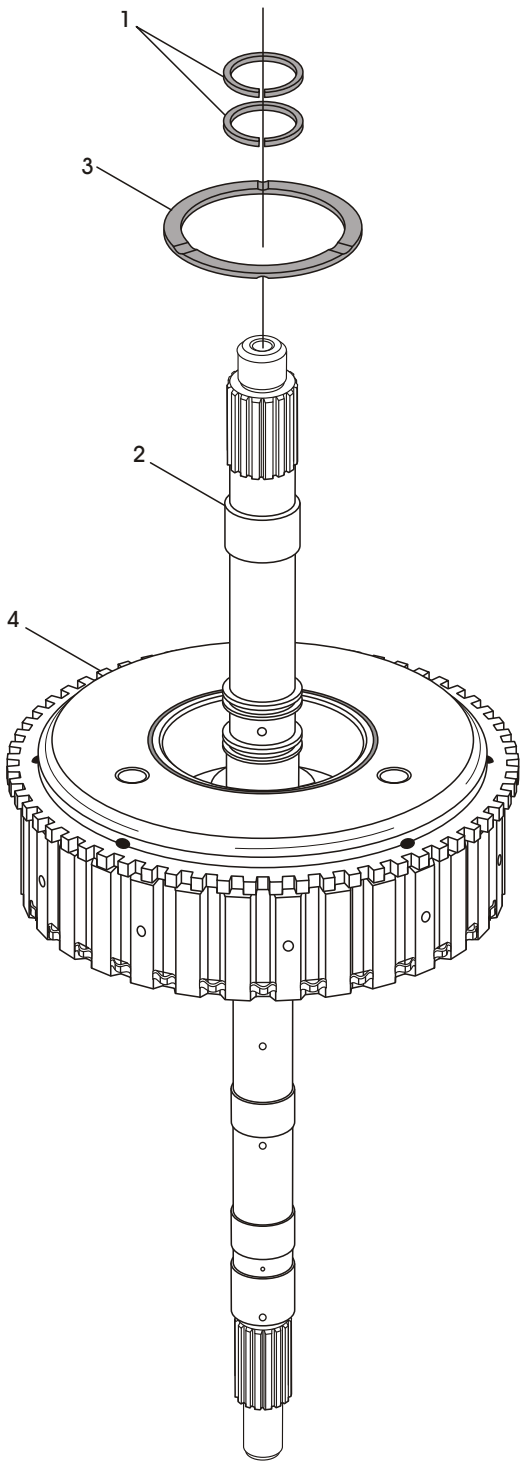


Figure 119



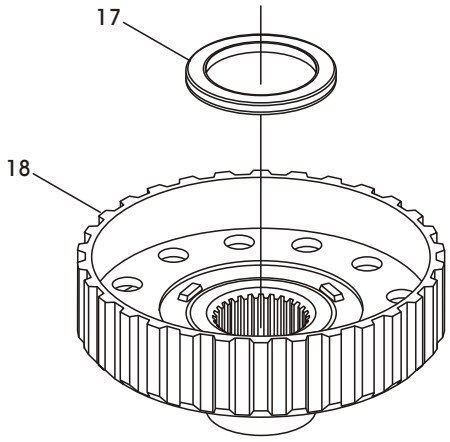
1. TURBINE SHAFT SEALING RINGS.
2. TURBINE SHAFT.
3. UNDERDRIVE CLUTCH HOUSING TO PUMP THRUST WASHER.
4. UNDERDRIVE CLUTCH HOUSING.

Figure 120

COMPONENT REBUILD SECTION

UNDERDRIVE CLUTCH HUB

1. Clean and inspect the underdrive clutch hub thoroughly.
2. Install the number 2 thrust bearing onto the underdrive clutch hub, in the direction shown in Figure 121, and retain with a small amount of Trans-Jel®.
3. Set the completed underdrive clutch hub aside for the final assembly process, as shown in Figure 122.



17. UNDERDRIVE CLUTCH HUB TO DRUM THRUST BEARING.
18. UNDERDRIVE CLUTCH HUB.

Figure 121

COMPLETED UNDERDRIVE CLUTCH HUB

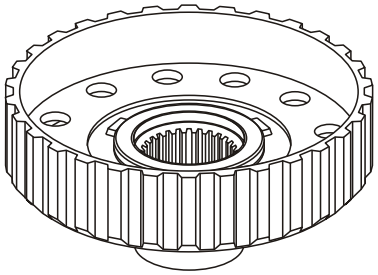


Figure 122

COMPONENT REBUILD SECTION

DIFFERENTIAL ASSEMBLY

1. Disassemble the differential assembly using Figure 124 as a guide.
2. Clean and inspect all of the differential parts thoroughly. Replace as necessary.
3. If bearing service is required, the tools shown in Figure 123, or their equivalant will be necessary.

Continued on Page 68

DIFFERENTIAL REQUIRED SPECIAL TOOLS FOR BEARING SERVICE

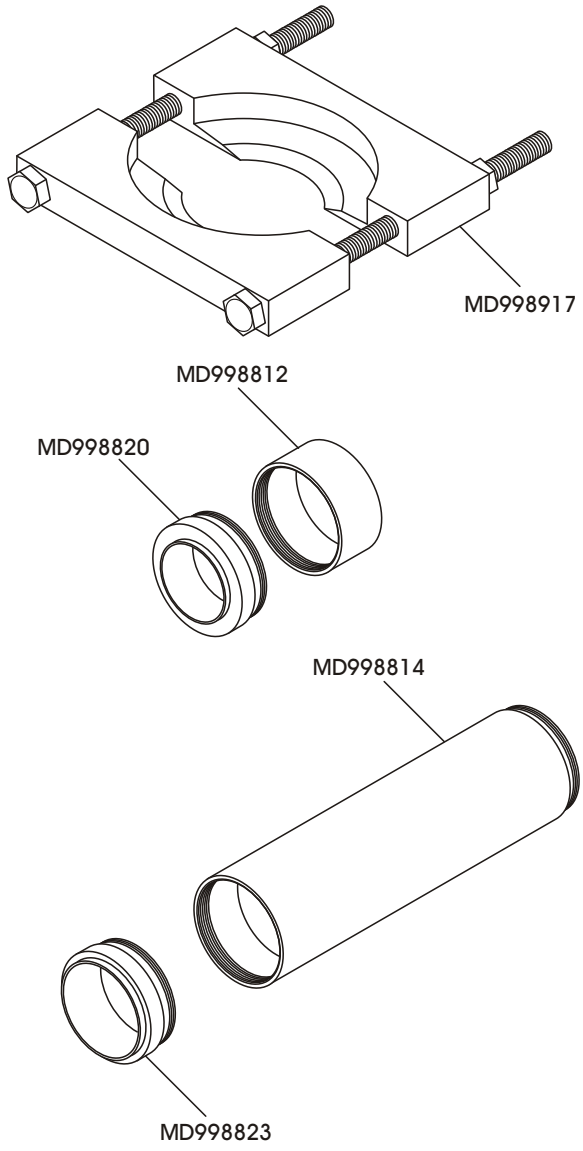
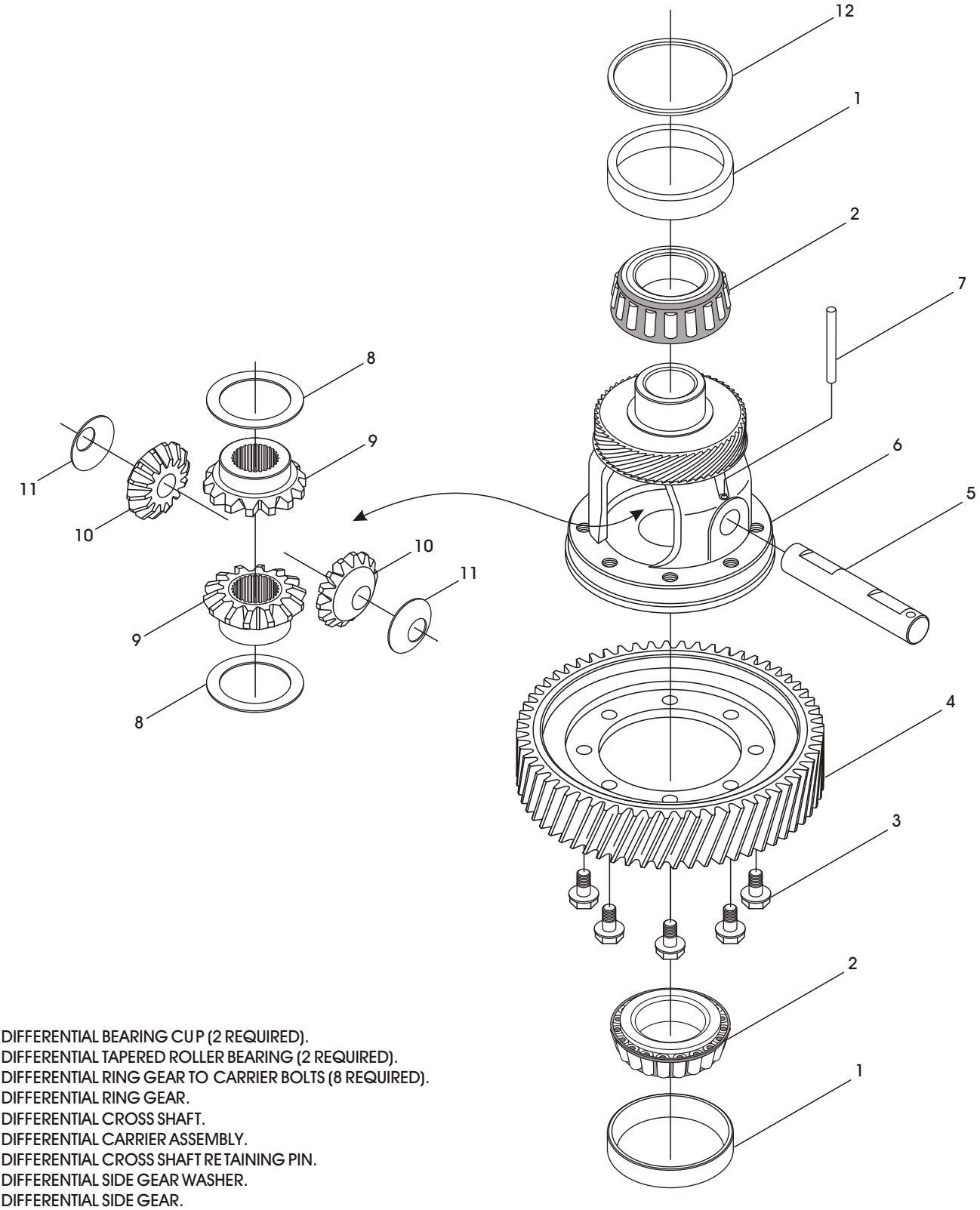


Figure 123

DIFFERENTIAL EXPLODED VIEW



1 DIFFERENTIAL BEARING CUP (2 REQUIRED).
2 DIFFERENTIAL TAPERED ROLLER BEARING (2 REQUIRED).
3 DIFFERENTIAL RING GEAR TO CARRIER BOLTS (8 REQUIRED).
4 DIFFERENTIAL RING GEAR.
5 DIFFERENTIAL CROSS SHAFT.
6 DIFFERENTIAL CARRIER ASSEMBLY.
7 DIFFERENTIAL CROSS SHAFT RETAINING PIN.
8 DIFFERENTIAL SIDE GEAR WASHER.
9 DIFFERENTIAL SIDE GEAR.
10 DIFFERENTIAL PINION GEAR.
11 DIFFERENTIAL PINION GEAR WASHER.
12 SELECTIVE SHIM TO SET PRE-LOAD (CONV HOUSING SIDE)

Figure 124

COMPONENT REBUILD SECTION

DIFFERENTIAL ASSEMBLY

4. Remove the bearings using the split puller and the appropriate size general service gear puller as shown in Figure 125.
5. Install the tapered roller bearings using the special tools, shown in Figure 126 and using a suitable press.
6. Assemble the differential side gears and pinion gears, as shown in Figure 124.

Continued on Page 69

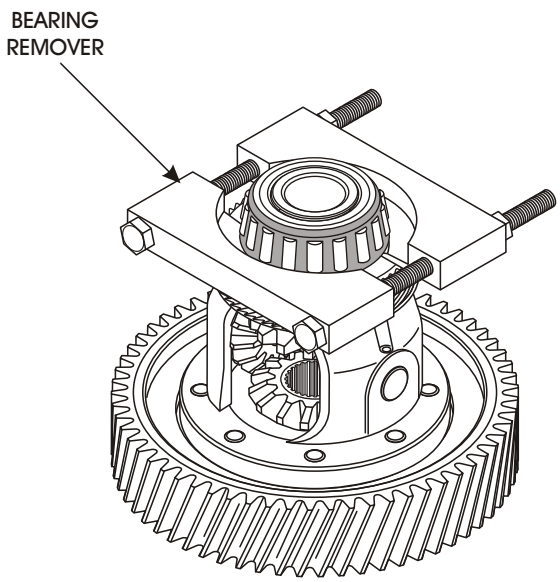


Figure 125

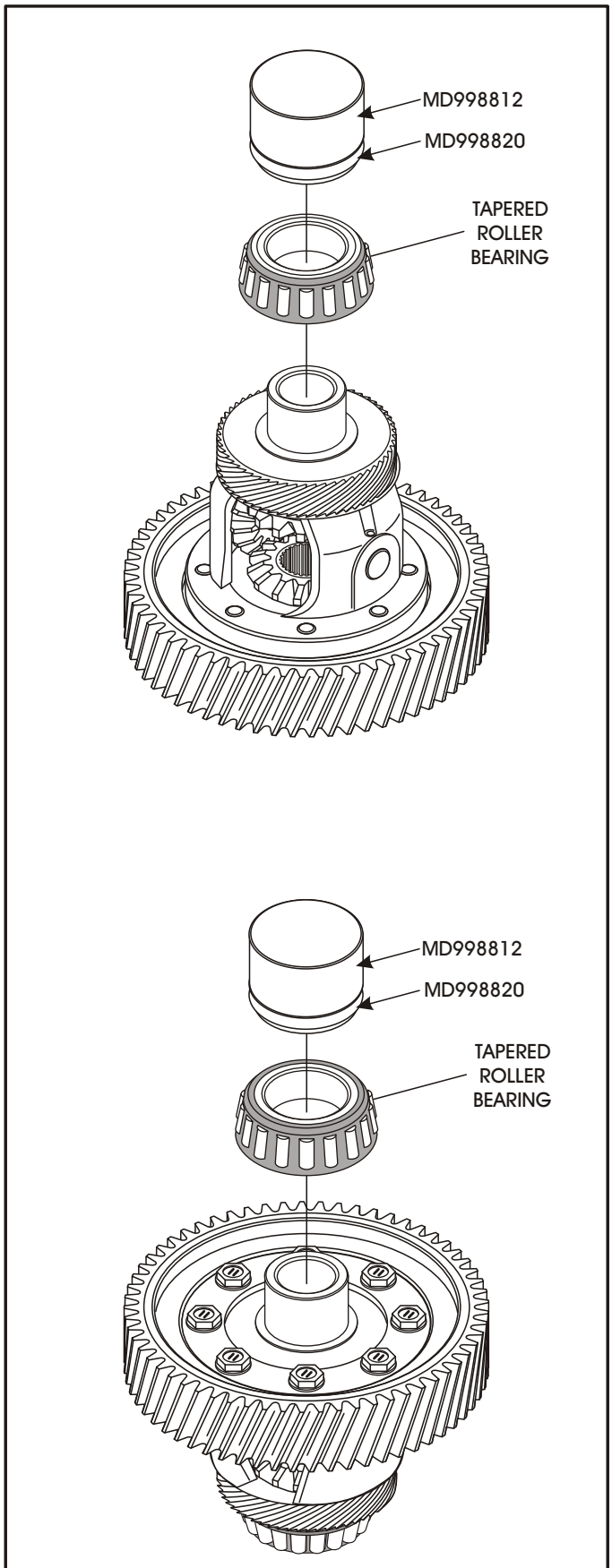


Figure 126

COMPONENT REBUILD SECTION

DIFFERENTIAL ASSEMBLY (CONT'D)

7. Measure the backlash between the side gears and pinion gears, as shown in Figure 127.
8. If backlash is out of specification, as shown in Figure 127, select a spacer from the chart and re-measure the backlash.
   Note: Adjust until the backlash is equal at both side gears.
9. If gear service was necessary, torque the ring gear bolts to 135 N·m (100 ft.lb.), as shown in Figure 128, using a criss-cross pattern.
10. Set the differential assembly aside for the final assembly process (See Figure 129).

COMPONENT REBUILD SECTION
Continued on Page 71

DIFFERENTIAL SIDE GEAR WASHERS	
Thickness	***Part No.***
.75-.82 mm (.029"-.032")	*MD722986*
.83-.92 mm (.033"-.036")	*MD722985*
.93-1.00 mm (.037"-.040")	*MD722984*
1.01-1.08 mm (.040"-.043")	*MD722982*
1.09-1.16 mm (.043"-.046")	*MD722983*

SIDE GEAR BACKLASH
.025-.150 MM (.001"-.006")

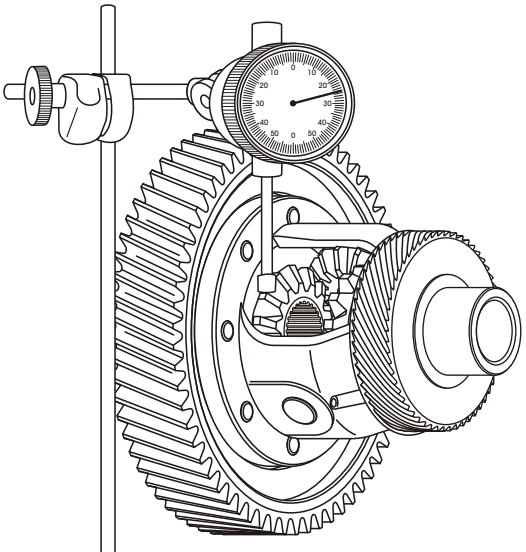


Figure 127

TORQUE TO
135 NM (100 FT.LB.)

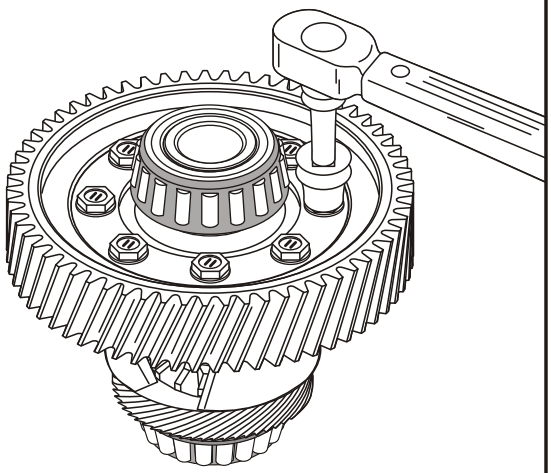


Figure 128

COMPLETED DIFFERENTIAL ASSEMBLY

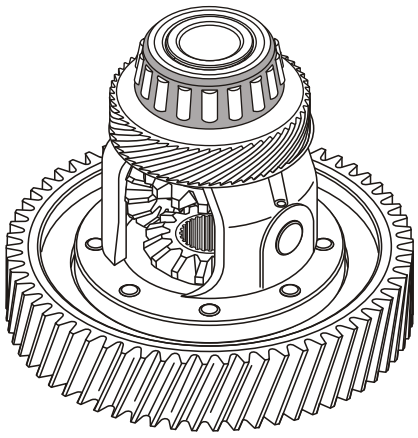
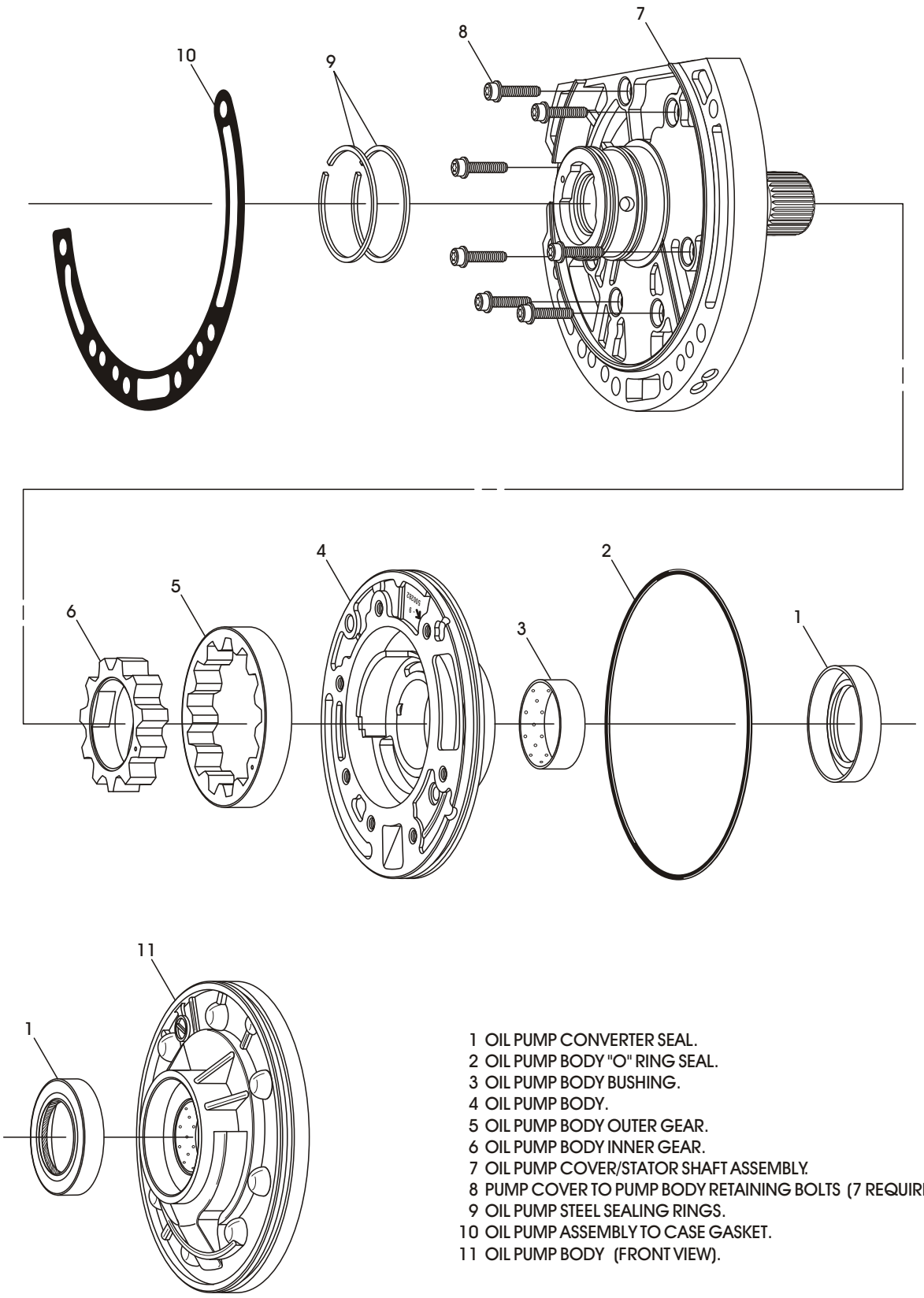
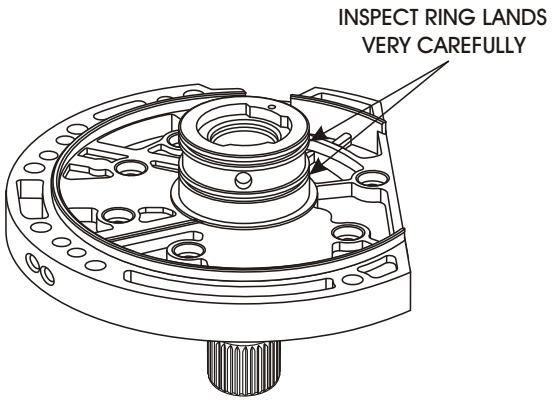


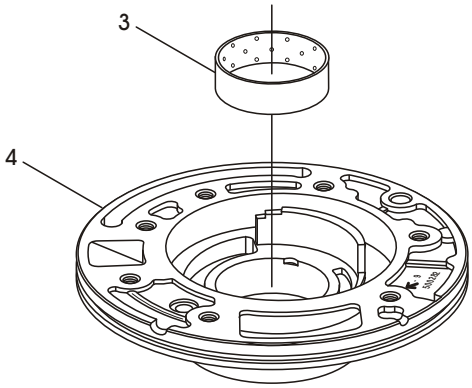
Figure 129



1 OIL PUMP CONVERTER SEAL.
2 OIL PUMP BODY "O" RING SEAL.
3 OIL PUMP BODY BUSHING.
4 OIL PUMP BODY.
5 OIL PUMP BODY OUTER GEAR.
6 OIL PUMP BODY INNER GEAR.
7 OIL PUMP COVER/STATOR SHAFT ASSEMBLY.
8 PUMP COVER TO PUMP BODY RETAINING BOLTS (7 REQUIRED).
9 OIL PUMP STEEL SEALING RINGS.
10 OIL PUMP ASSEMBLY TO CASE GASKET.
11 OIL PUMP BODY (FRONT VIEW).

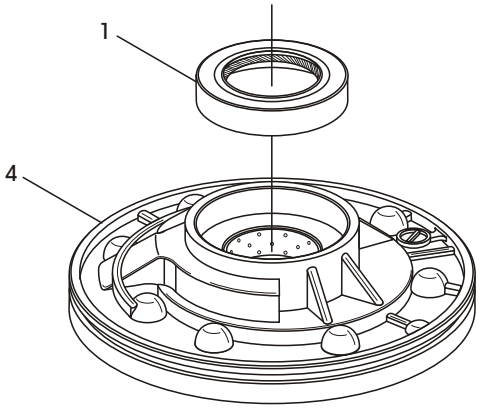
Figure 130





3 OIL PUMP BODY BUSHING.
4 OIL PUMP BODY.

Figure 131



1 OIL PUMP CONVERTER SEAL.
4 OIL PUMP BODY.

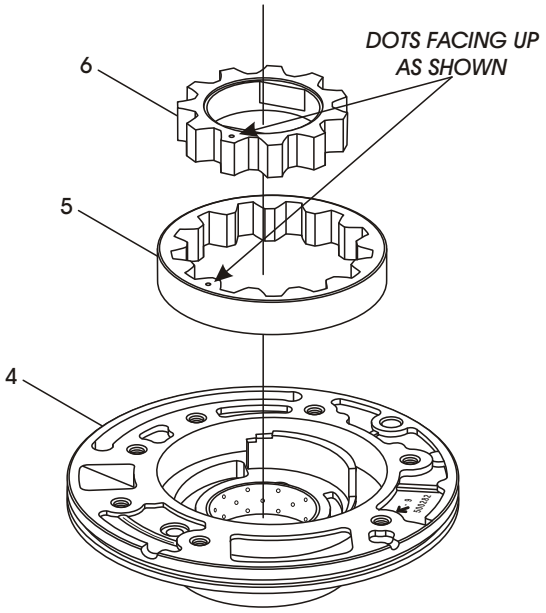
Figure 132

COMPONENT REBUILD SECTION

OIL PUMP ASSEMBLY

1. Disassemble the oil pump assembly using Figure 130 as a guide.
2. Remove and discard oil pump gasket, "O" ring seal and converter seal (See Figure 130).
3. Clean all oil pump parts thoroughly with good cleaning solution and dry with compressed air.
4. Inspect all oil pump parts thoroughly for any wear and/or damage.
   Note: Inspect ring lands on the pump cover very carefully, as shown in Figure 131. It is very common to see wear here.
5. Install new oil pump bushing if necessary, as shown in Figure 131, using the proper bushing driver.
6. Turn oil pump over and install new converter seal, as shown in Figure 132, using the proper seal installer.
7. Turn the oil pump over and install pump gears into the pump pocket, as shown in Figure 133, with the "Dots" facing UP, as shown.
   Note: Lubricate pump gears and pocket with liberal amount of ATF.

Continued on Page 72



4 OIL PUMP BODY.
5 OIL PUMP BODY OUTER GEAR.
6 OIL PUMP BODY INNER GEAR.

Figure 133

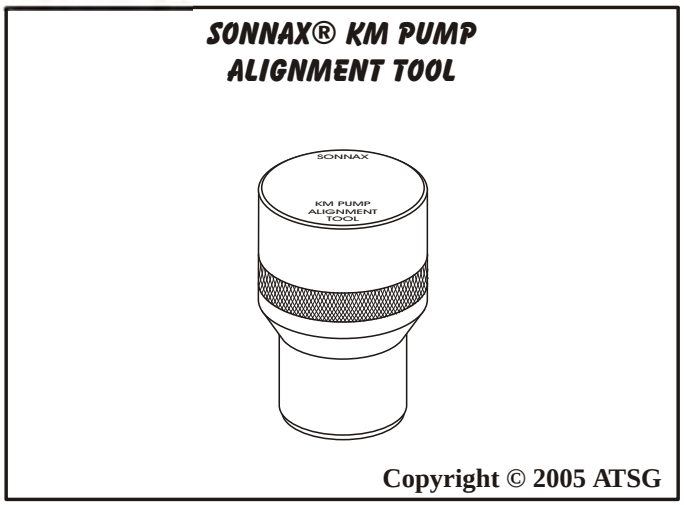


Figure 134

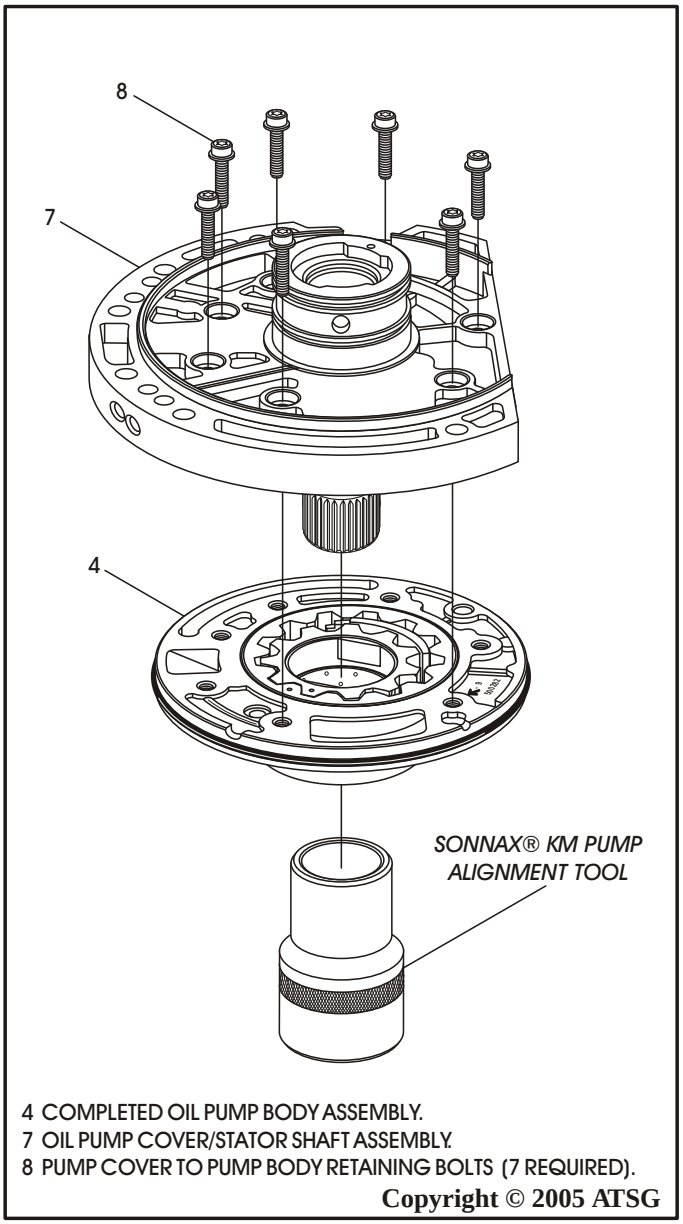


Figure 135

COMPONENT REBUILD SECTION

OIL PUMP ASSEMBLY (CONT'D)

8. There is now available from Sonnax®, a new oil pump alignment tool, that is ***mandatory*** for proper pump to cover alignment, as shown in Figure 134.
9. Install the pump alignment tool through the bushing, as shown in Figure 135, and set the completed oil pump body assembly on flat surface.
10. Install the oil pump cover through and into the pump alignment tool, as shown in Figure 135.
11. Install the oil pump to pump cover retaining bolts, as shown in Figure 135.
12. Torque oil pump to pump cover retaining bolts to 13 N·m (10 ft.lb.), as shown in Figure 136, using a criss-cross pattern.
    Note: The oil pump alignment tool "Must" remain in place until the torque process is completed.

Continued on Page 73

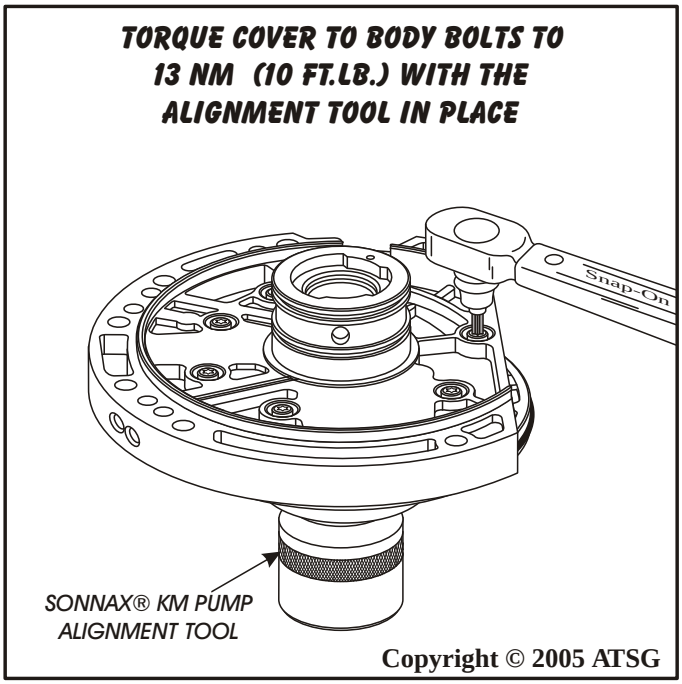


Figure 136

COMPONENT REBUILD SECTION

OIL PUMP ASSEMBLY (CONT'D)

13. Install the underdrive clutch sealing rings, as shown in Figure 137, and ensure that they are properly hooked and have free rotation.
14. Turn the completed assembly over and remove the pump alignment tool.
15. Install the oil pump to case "O" ring seal, as shown in Figure 138, and lubricate with small amount of Trans-Jel®.
16. Set the completed oil pump assembly aside for the final assembly process (See Figure 139).

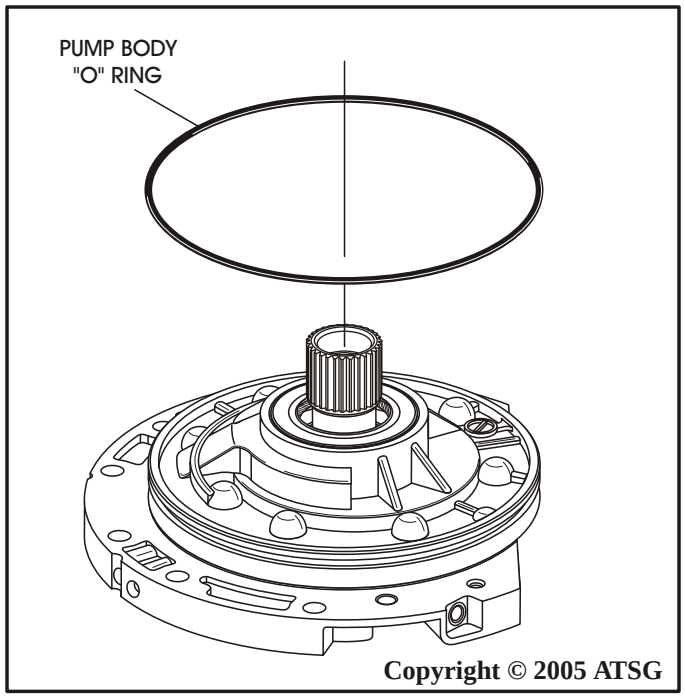


Figure 138

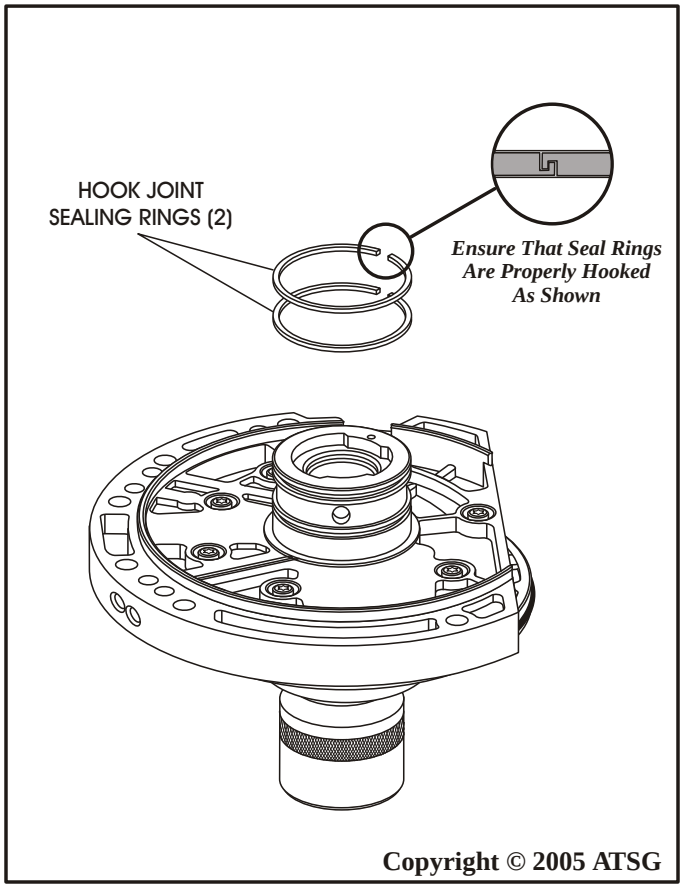


Figure 137

COMPONENT REBUILD SECTION
Continued on Page 74

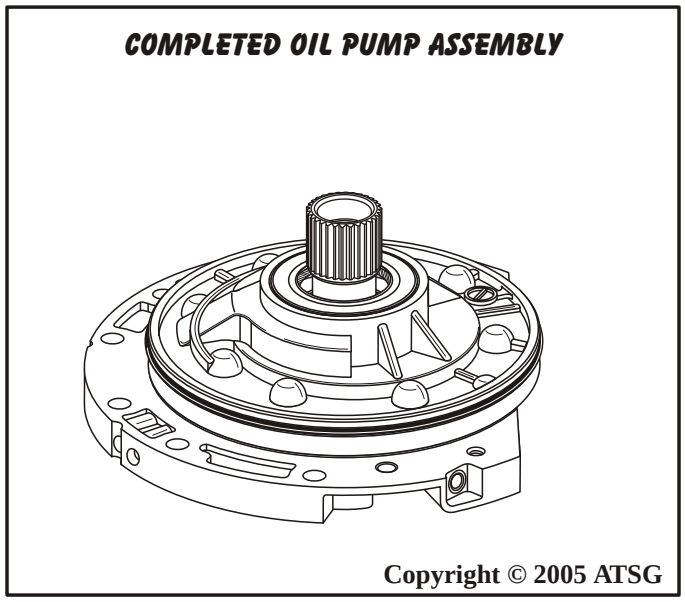


Figure 139

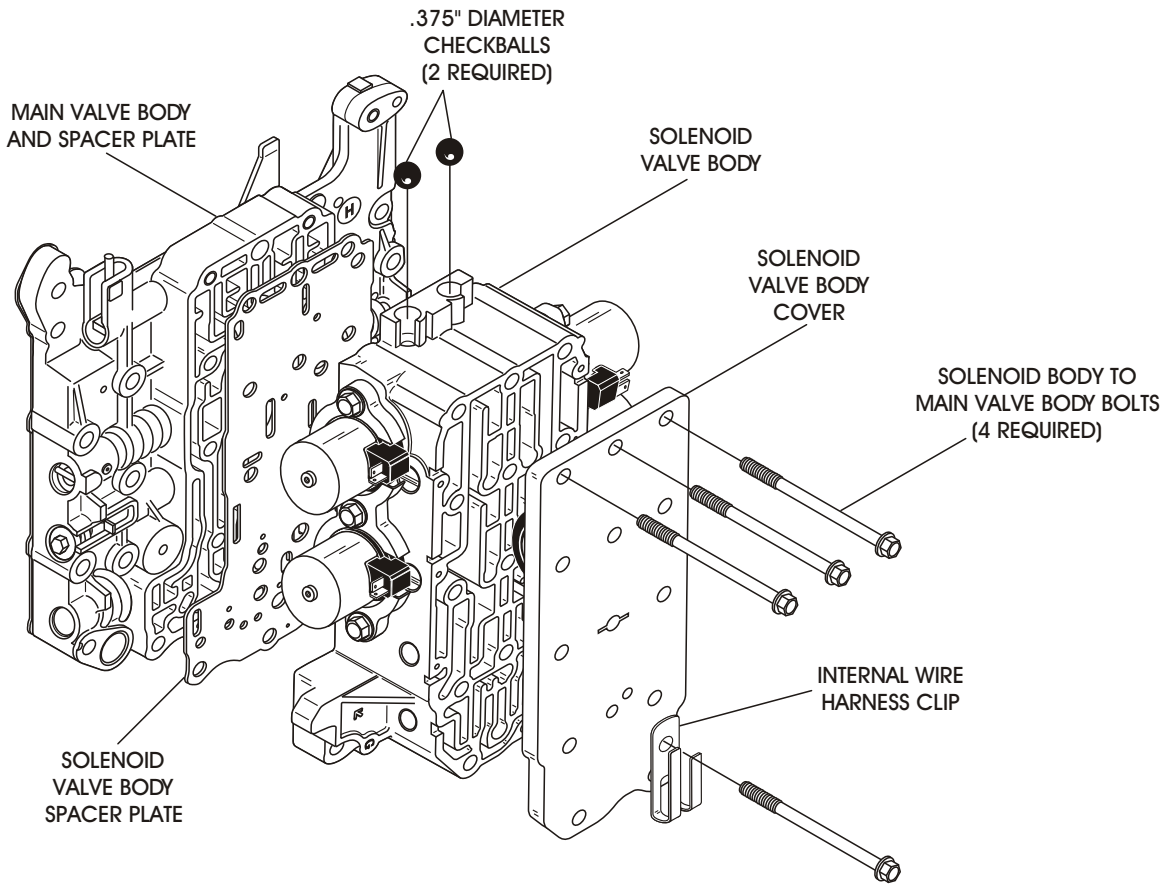


Figure 140

COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY

1. Remove the two exhaust check balls from the top of the solenoid body and place in a safe location, as shown in Figure 140.
2. Remove the four solenoid body to main valve body retaining bolts, as shown in Figure 140.
3. Remove the solenoid body cover, the solenoid valve body, and solenoid body spacer plate, as shown in Figure 140.
4. Remove the two check balls and springs, and the check ball from the bath tub location, and place in a safe location.
5. Turn the main valve body over and remove the two main spacer plate retaining bolts, as shown in Figure 141.
6. Remove the two check balls and springs, and the check valve and spring from this side of the valve body and place in a safe location.

Continued on Page 75

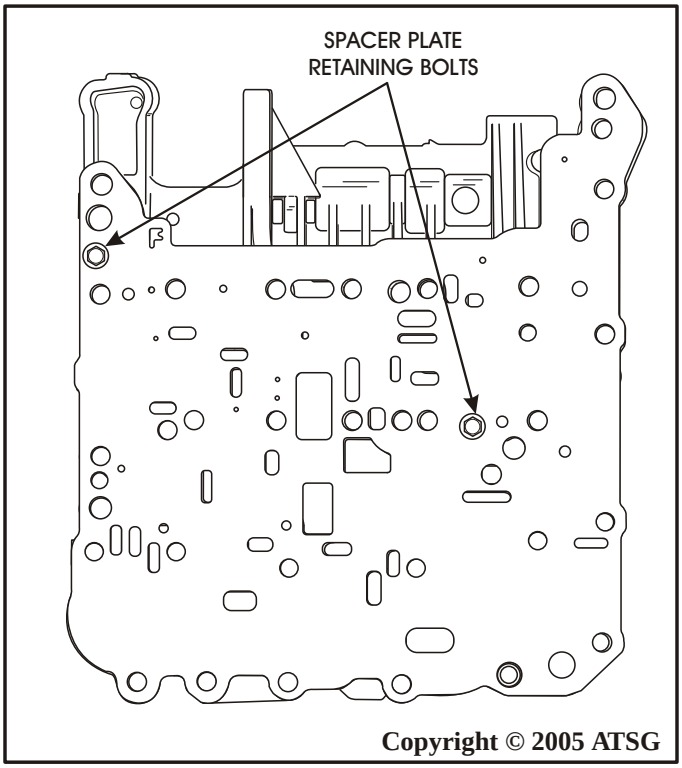


Figure 141

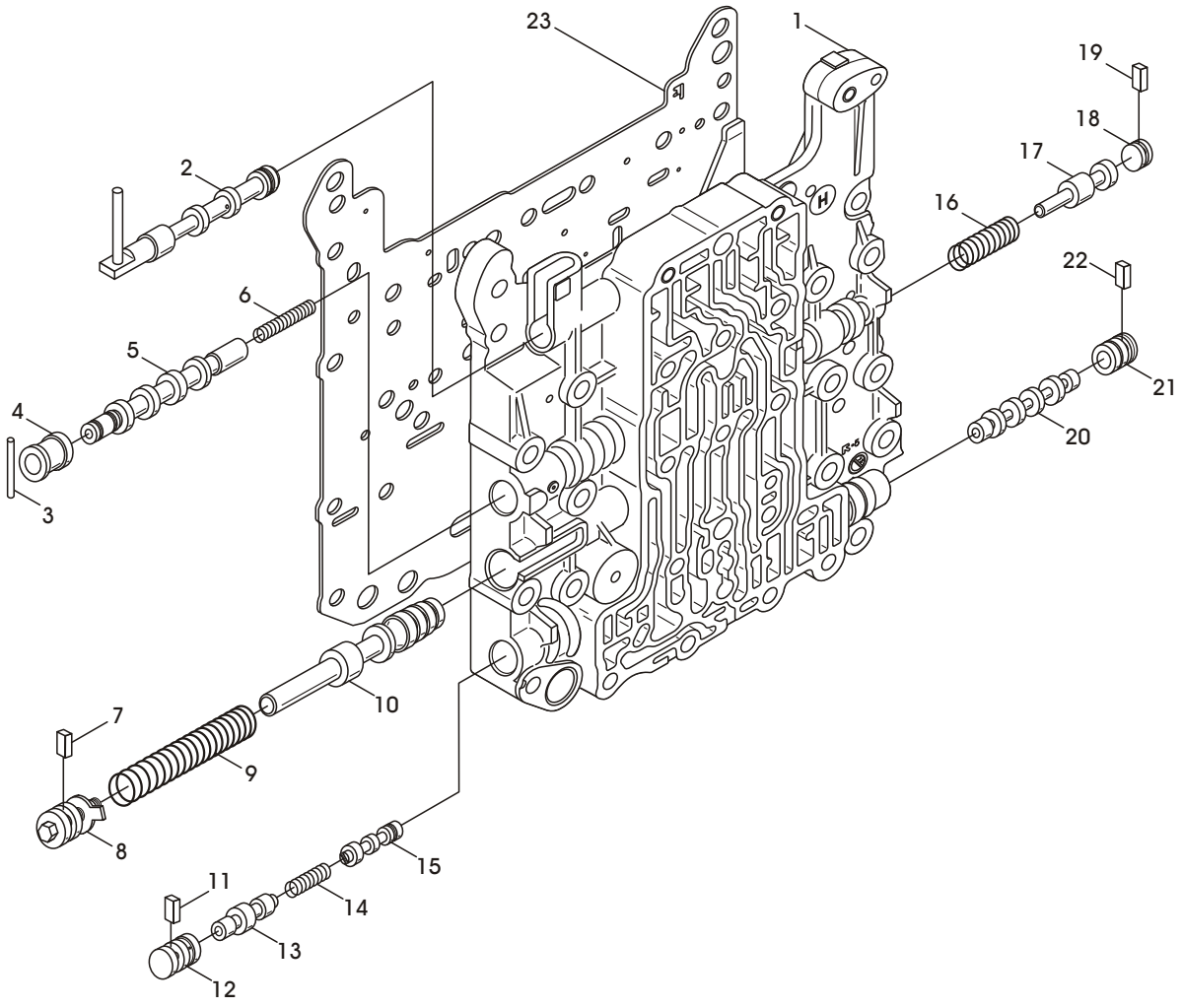
COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

7. Disassemble main valve body and place valves, springs, retainers in appropriate trays exactly as they were removed (See Figure 142).
8. Clean all valve body parts thoroughly and dry with compressed air.
9. Assemble the main valve body parts ***exactly,*** as shown in Figure 142, and lube with ATF as they are installed.

Continued on Page 76

MAIN VALVE BODY EXPLODED VIEW



1 MAIN VALVE BODY CASTING.
2 MANUAL VALVE.
3 ROLL PIN.
4 TORQUE CONVERTER CLUTCH CONTROL VALVE SLEEVE.
5 TORQUE CONVERTER CLUTCH CONTROL VALVE.
6 TORQUE CONVERTER CLUTCH CONTROL VALVE SPRING.
7 PRESSURE REGULATOR VALVE RETAINER.
8 PRESSURE REGULATOR ADJUSTMENT CONTROL.
9 PRESSURE REGULATOR VALVE SPRING.
10 PRESSURE REGULATOR VALVE.
11 FAIL SAFE VALVE "A" SLEEVE RETAINER.
12 FAIL SAFE VALVE "A" SLEEVE.
13 FAIL SAFE VALVE A2.
14 FAIL SAFE VALVE "A" SPRING.
15 FAIL SAFE VALVE A1.
16 TORQUE CONVERTER VALVE SPRING.
17 TORQUE CONVERTER VALVE.
18 TORQUE CONVERTER VALVE BORE PLUG.
19 BORE PLUG RETAINER.
20 FAIL SAFE VALVE "B".
21 FAIL SAFE VALVE "B" SLEEVE.
22 FAIL SAFE VALVE "B" RETAINER.
23 MAIN VALVE BODY TO CASE SPACER PLATE.

Figure 142

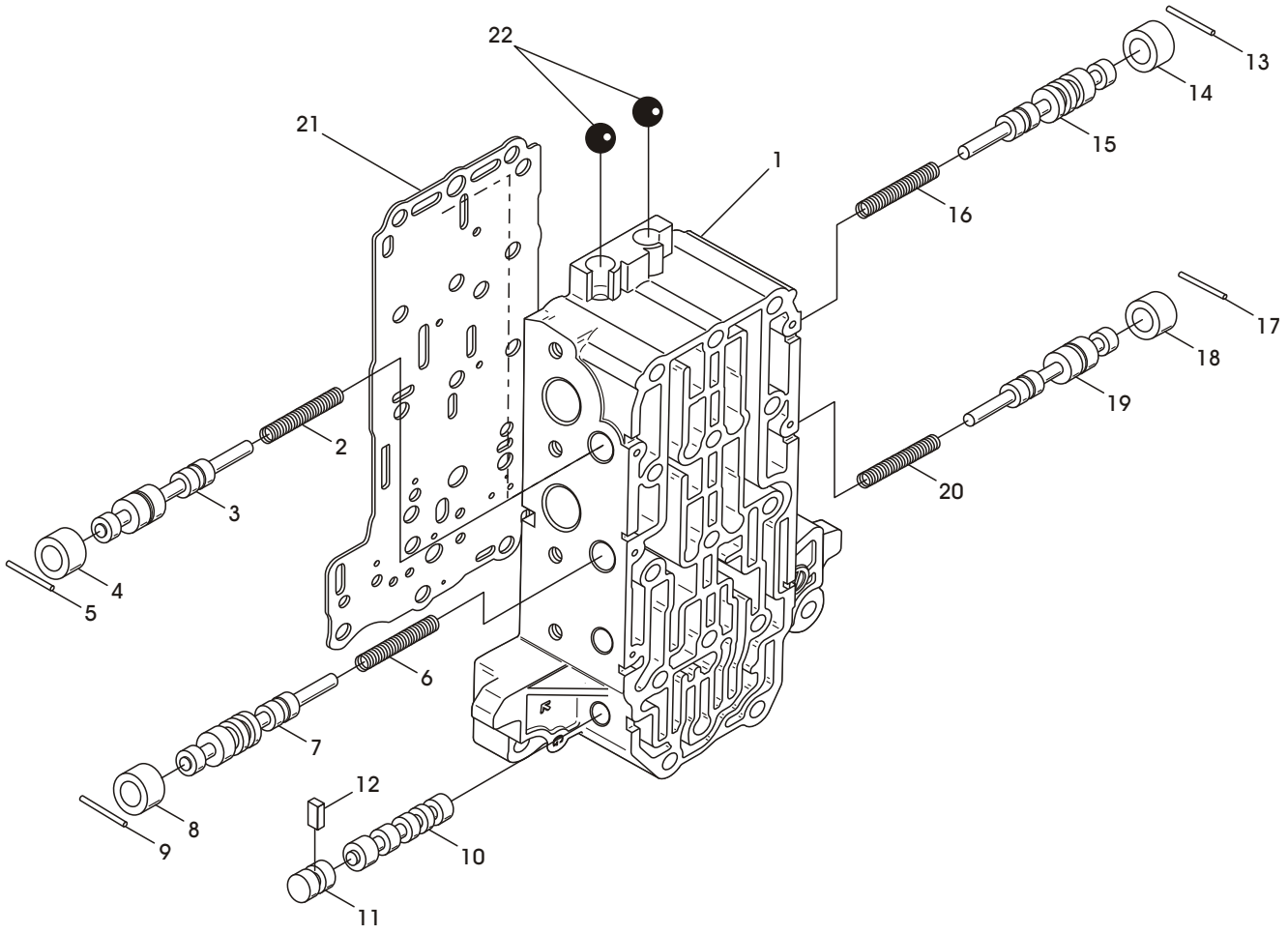
COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

10. Disassemble solenoid valve body and place the valves, springs, retainers in appropriate trays exactly as they were removed (See Figure 143).
11. Clean all solenoid valve body parts thoroughly and dry with compressed air.
12. Assemble solenoid valve body parts ***exactly,*** as shown in Figure 143, and lube with ATF as they are installed.

Continued on Page 77

SOLENOID VALVE BODY EXPLODED VIEW



1 SOLENOID VALVE BODY CASTING.
2 OVERDRIVE PRESSURE CONTROL VALVE SPRING.
3 OVERDRIVE PRESSURE CONTROL VALVE.
4 OVERDRIVE PRESSURE CONTROL VALVE SLEEVE.
5 OVERDRIVE PRESSURE CONTROL VALVE SLEEVE RETAINER.
6 LOW/REVERSE PRESSURE CONTROL VALVE SPRING.
7 LOW/REVERSE PRESSURE CONTROL VALVE.
8 LOW/REVERSE PRESSURE CONTROL VALVE SLEEVE.
9 LOW/REVERSE PRESSURE CONTROL VALVE SLEEVE RETAINER.
10 SWITCHING VALVE.
11 SWITCHING VALVE BORE PLUG.
12 SWITCHING VALVE BORE PLUG RETAINER.
13 UNDERDRIVE PRESSURE CONTROL VALVE SLEEVE RETAINER.
14 UNDERDRIVE PRESSURE CONTROL VALVE SLEEVE.
15 UNDERDRIVE PRESSURE CONTROL VALVE.
16 UNDERDRIVE PRESSURE CONTROL VALVE SPRING.
17 2ND CLUTCH PRESSURE CONTROL VALVE SLEEVE RETAINER.
18 2ND CLUTCH PRESSURE CONTROL VALVE SLEEVE.
19 2ND CLUTCH PRESSURE CONTROL VALVE.
20 2ND CLUTCH PRESSURE CONTROL VALVE SPRING.
21 SOLENOID BODY TO MAIN VALVE BODY SPACER PLATE.
22 EXHAUST CHECK BALLS (.375" DIAMETER).

Figure 143

COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

13. The overdrive solenoid, low/reverse solenoid, 2nd solenoid, underdrive solenoid and the TCC solenoid are all the same, and will interchange in any of their positions (See Figure 144).
14. The OEM part number for all solenoids is MD758981, and is also available from several aftermarket sources.
15. All solenoids can be air checked using the procedure shown in Figure 144.
16. Install new "O" rings onto the solenoids, as shown in Figure 144, and lubricate with small amount of Trans-Jel®.
17. Install all of the solenoid assemblies into the locations shown in Figure 144.
18. Install both solenoid retainers and bolts, and torque the bolts to 6 N·m (55 in.lb.).

Continued on Page 78

SOLENOID IDENTIFICATION AND LOCATIONS

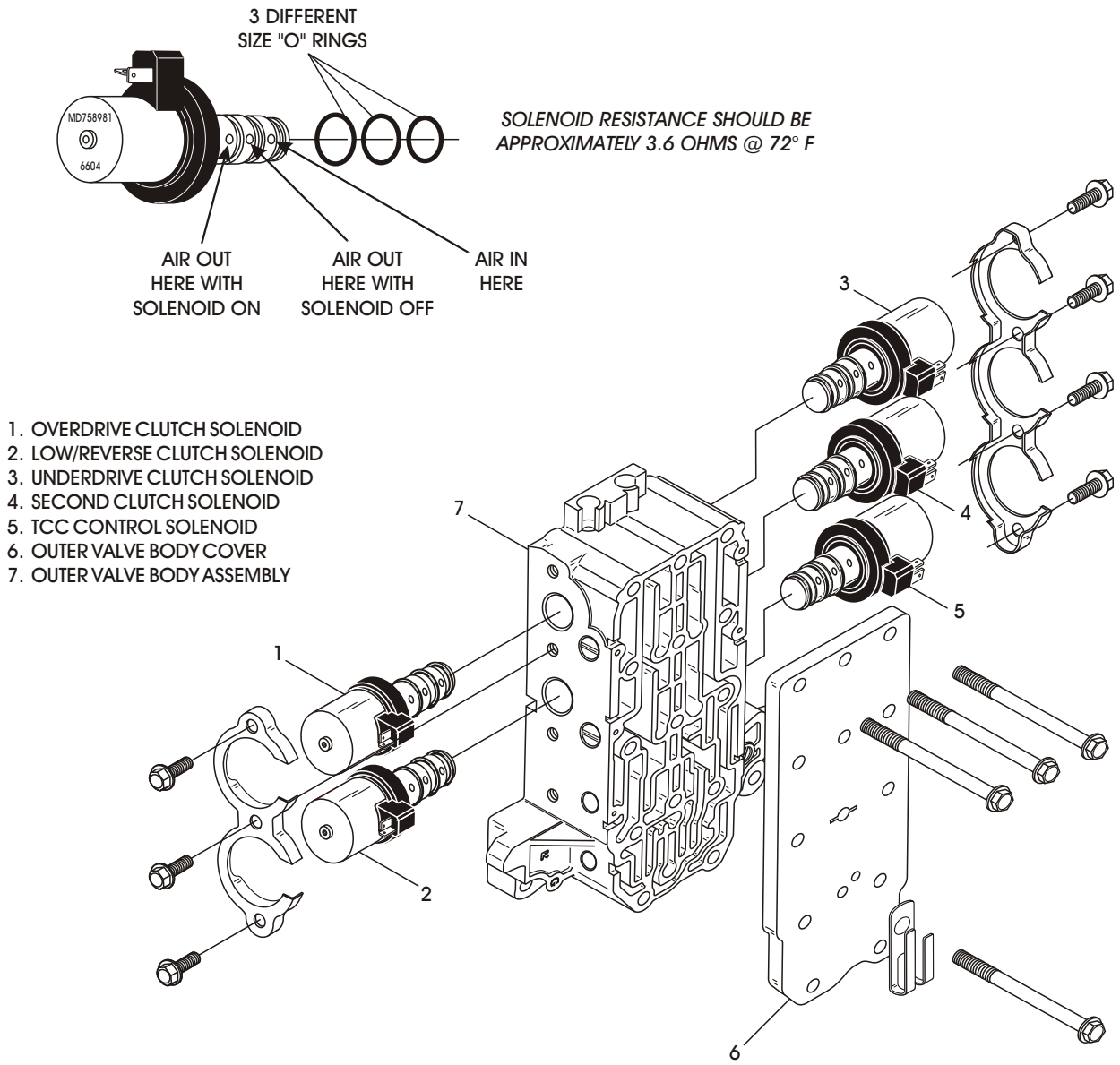


Figure 144

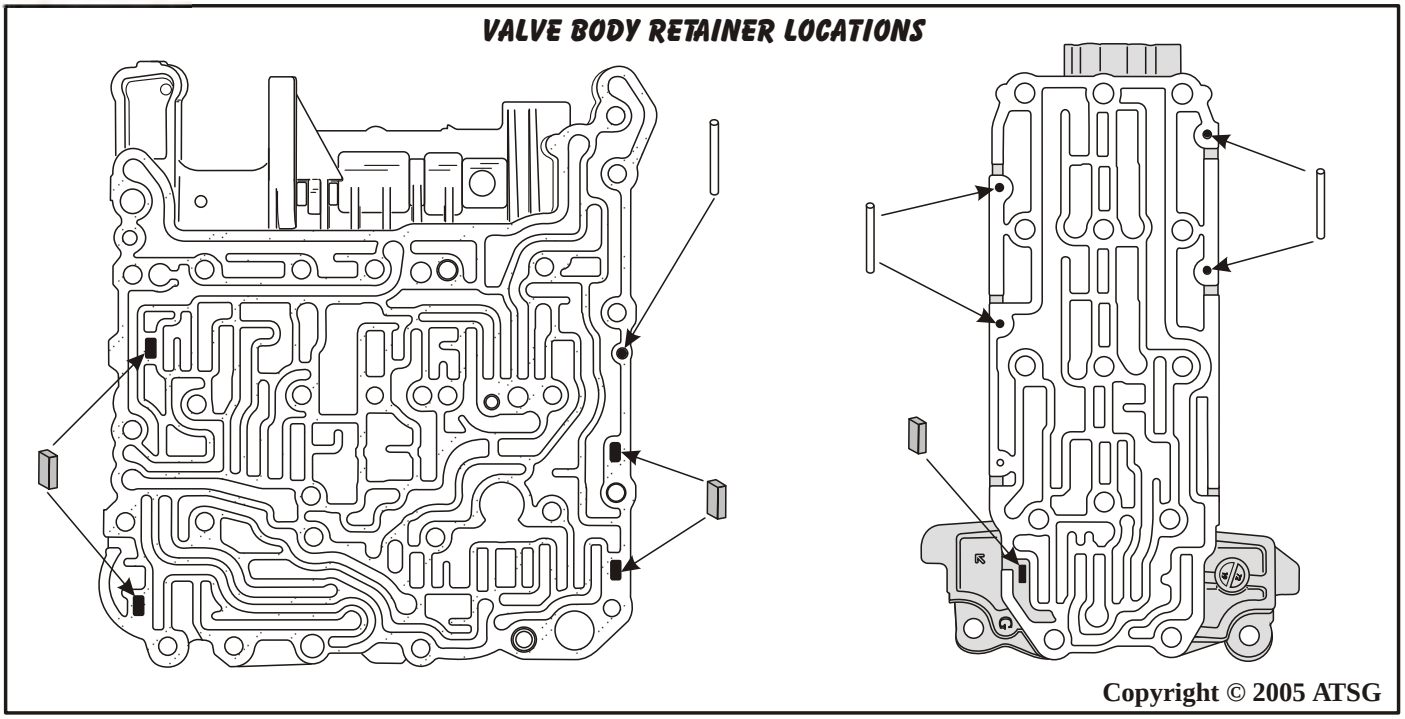


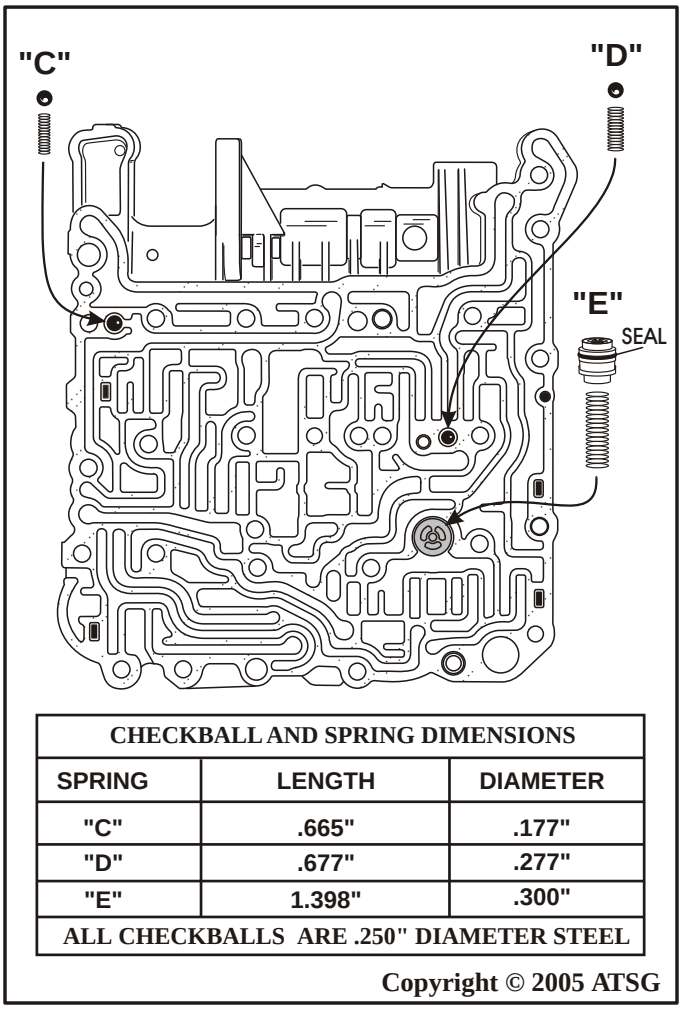
Figure 145

COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

19. The main valve body and solenoid valve body retainer locations have been provided for you in Figure 145.
20. Lay the assembled main valve body on a flat work surface, as shown in Figure 146.
21. Install the "C" check ball and spring with the spring going in first, as shown in Figure 146.
22. Install the "D" check ball and spring with the spring going in first, as shown in Figure 146.
23. Install new seal on the damping valve "E" and install assembly with the spring going in first, as shown in Figure 146.
    Note: Spring and check ball dimensions are shown in Figure 146.

Continued on Page 79



CHECKBALL AND SPRING DIMENSIONS		
SPRING	LENGTH	DIAMETER
"C"	.665"	.177"
"D"	.677"	.277"
"E"	1.398"	.300"
ALL CHECKBALLS ARE .250" DIAMETER STEEL		

Figure 146

COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

24. Install the main valve body spacer plate and bolts, as shown in Figure 147. Torque spacer plate bolts to 6 N·m (55 in.lb.).
    Note: Install the hollow dowels in valve body to align spacer plate before torquing.
25. Turn the valve body over with the spacer plate facing down, as shown in Figure 148.
26. Install the "A" check ball and spring with the spring going in first, as shown in Figure 148.
27. Install the "B" check ball and spring with the spring going in first, as shown in Figure 148.
28. Install the last check ball into the bath tub, as shown in Figure 148.
    Note: Spring and check ball dimensions are shown in Figure 148.

Continued on Page 80

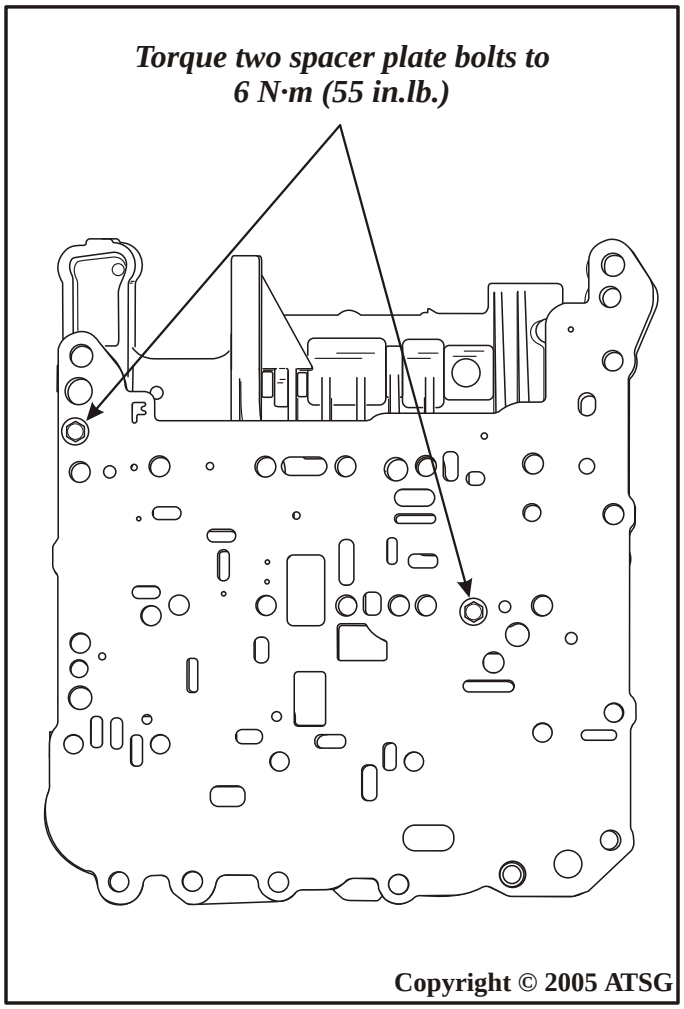
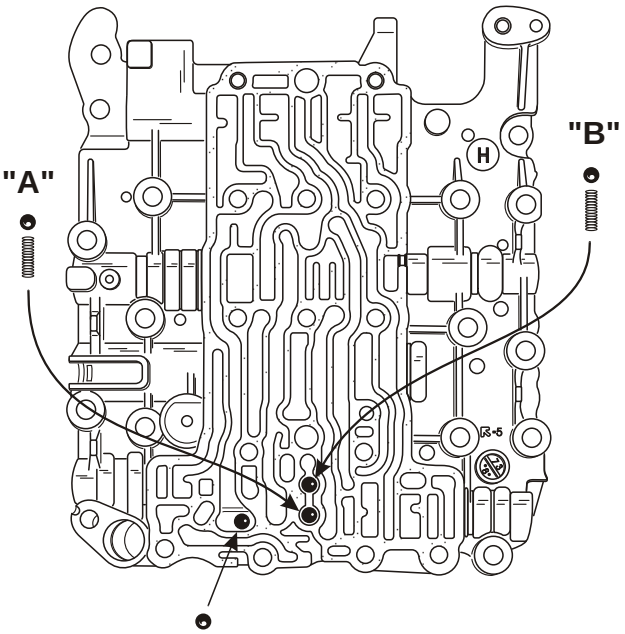


Figure 147



CHECKBALL AND SPRING DIMENSIONS		
SPRING	LENGTH	DIAMETER
"A"	.665"	.177"
"B"	.665"	.177"
ALL CHECKBALLS ARE .250" DIAMETER STEEL		

Figure 148

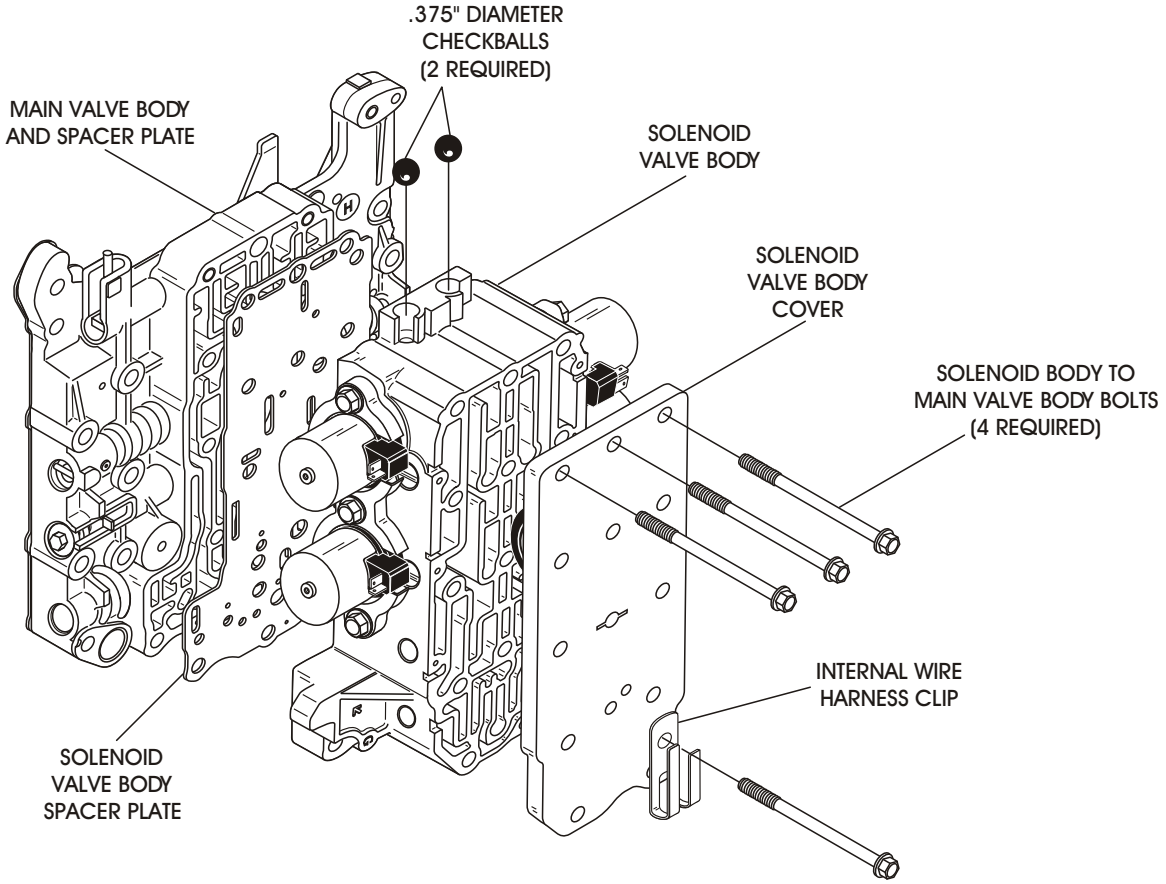


Figure 149

COMPONENT REBUILD SECTION

VALVE BODY ASSEMBLY (CONT'D)

29. Install the solenoid body spacer plate, solenoid body and the solenoid body cover, as shown in Figure 149.
30. Install the four solenoid body to main valve body bolts in locations shown in Figure 149. ***Note: Hand tighten the bolts as the torque process will follow in final assembly.***
31. Set the completed valve body assembly aside for final assembly process (See Figure 150).

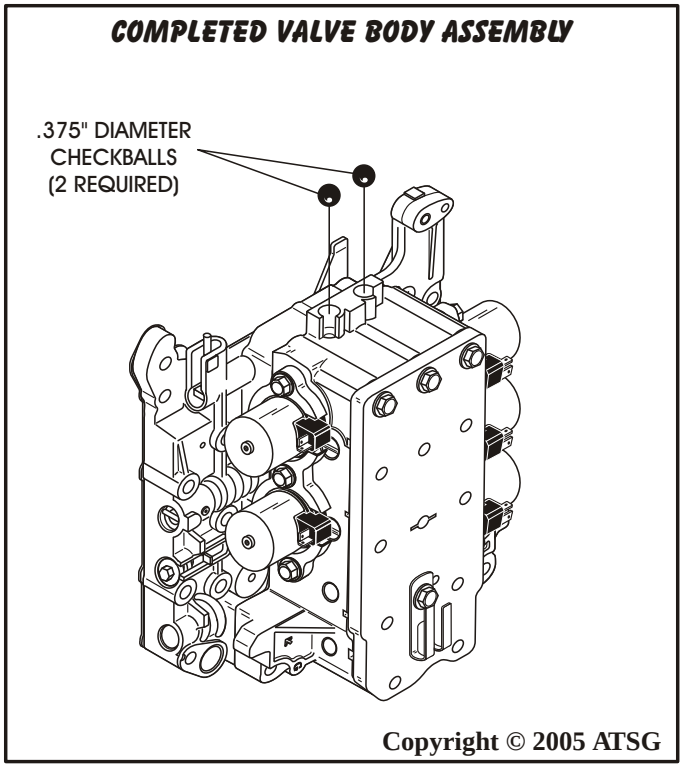


Figure 150

FINAL ASSEMBLY

INTERNAL COMPONENTS

1. If it was removed for bearing service, pinion shaft and driven transfer gear assembly ***must*** be installed first, as shown in Figure 151.
   Note: Pinion shaft and driven transfer gear pre-load must be set and checked while not engaged with any other gears.
2. Install the completed pinion shaft and driven transfer gear assembly into the case, as shown in Figure 151.
   Note: Ensure bearing collar is still in place.
3. Install the four required ***new*** retaining bolts, as shown in Figure 151, and torque the bolts to:
   F4A42 ... 23 N·m (18 ft.lb.)
   F4A51 ... 54 N·m (40 ft.lb.)
   Note: New bolts are required because there is sealer on the threads.
4. Rotate transaxle case so that rear is facing up, as shown in Figure 152, and ensure that small bearing cup and spacer are still in place.
5. Install the small tapered roller bearing onto pinion shaft, as shown in Figure 152.
6. Install a ***new*** pinion shaft nut, as shown in Figure 152.
   Special Note: This nut is "Left Hand" thread.

Continued on Page 82

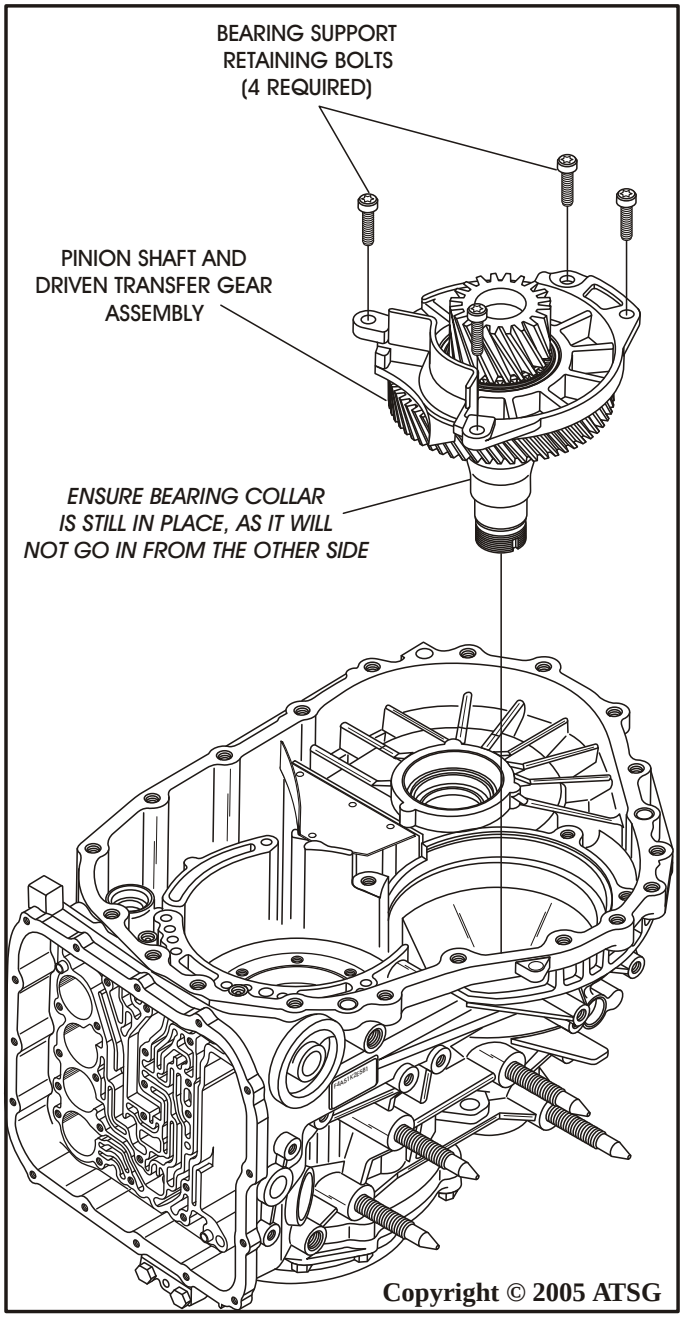


Figure 151

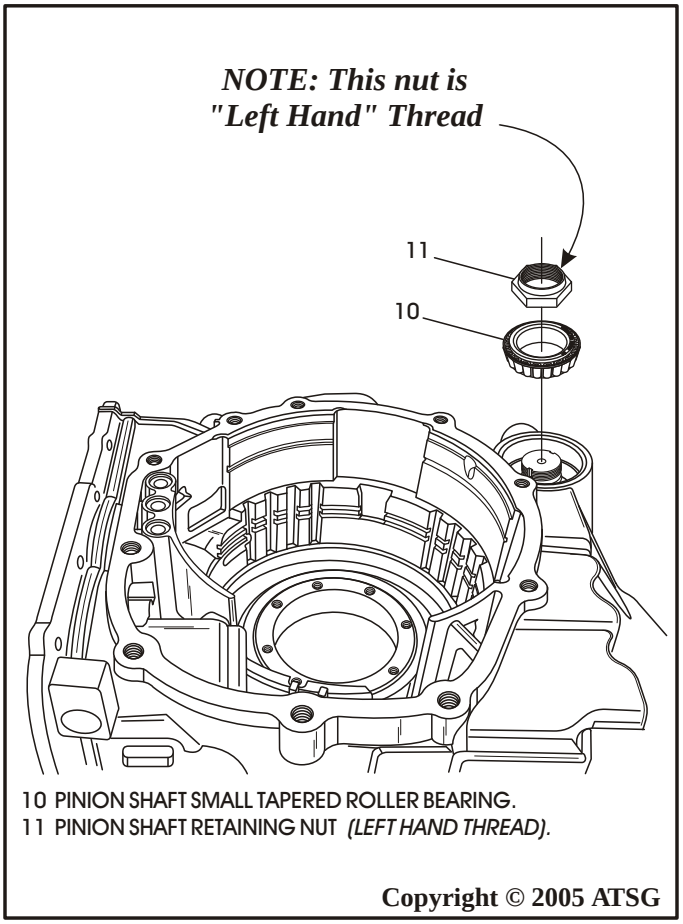


Figure 152

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

7. Tighten the new pinion nut to the specified torque, then back off one turn, and tighten to specified torque again, using a 41 mm socket, as shown in Figure 153.
   Note: This nut is "Left Hand" thread.
8. The front (Gear Side), of the pinion shaft has a hex shaped recess molded into the center of the gear, and ***requires*** a special tool to hold the pinion shaft while tightening the nut, as shown in Figure 153.
   Note: Allen head socket size is shown in Figure 153, for the different models.
9. Torque specification for the new pinion nut is 167 N·m (123 ft.lb.).
10. After the nut is properly torqued, check the turning torque with a gage type, inch pound torque wrench, as shown in Figure 154.
11. Proper turning torque is 1/2 to 3-1/2 in.lb., as shown in Figure 154.

Continued on Page 83

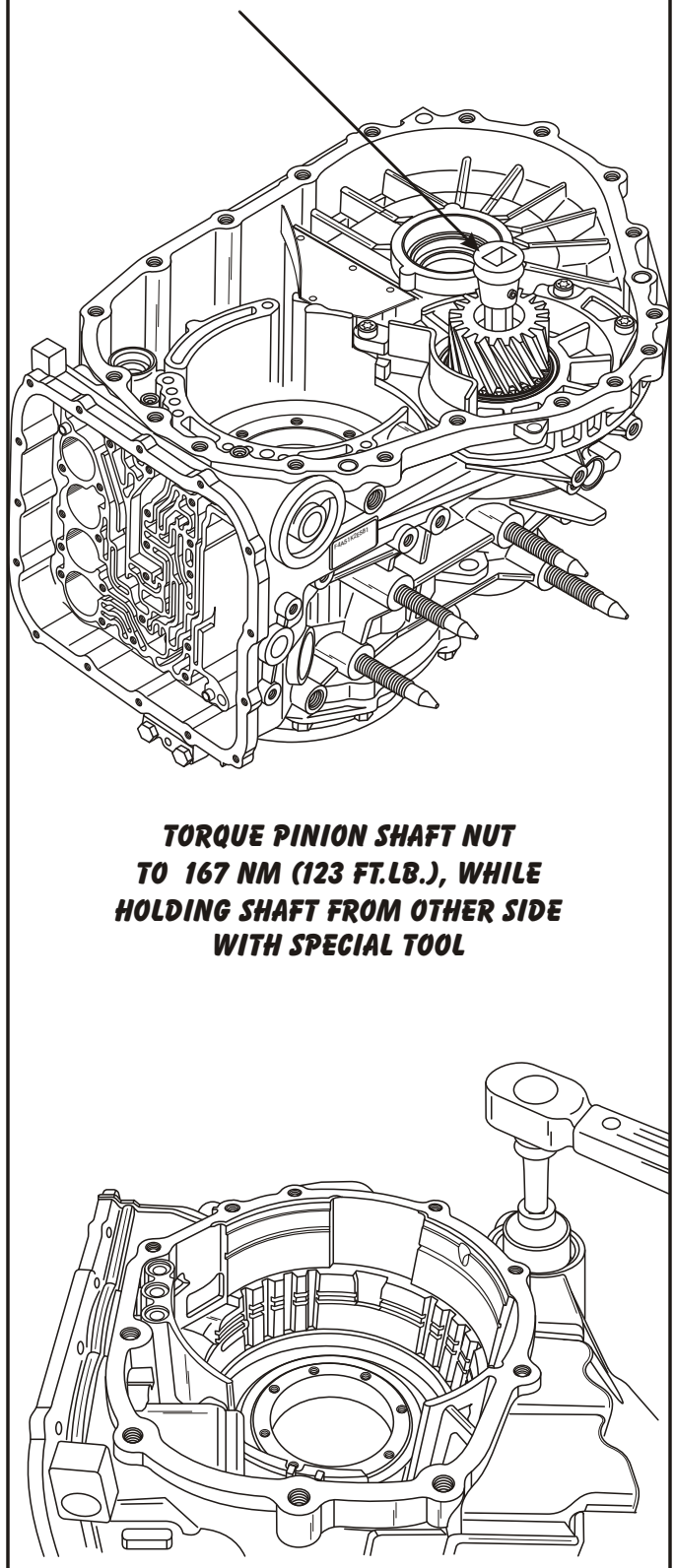


Figure 153

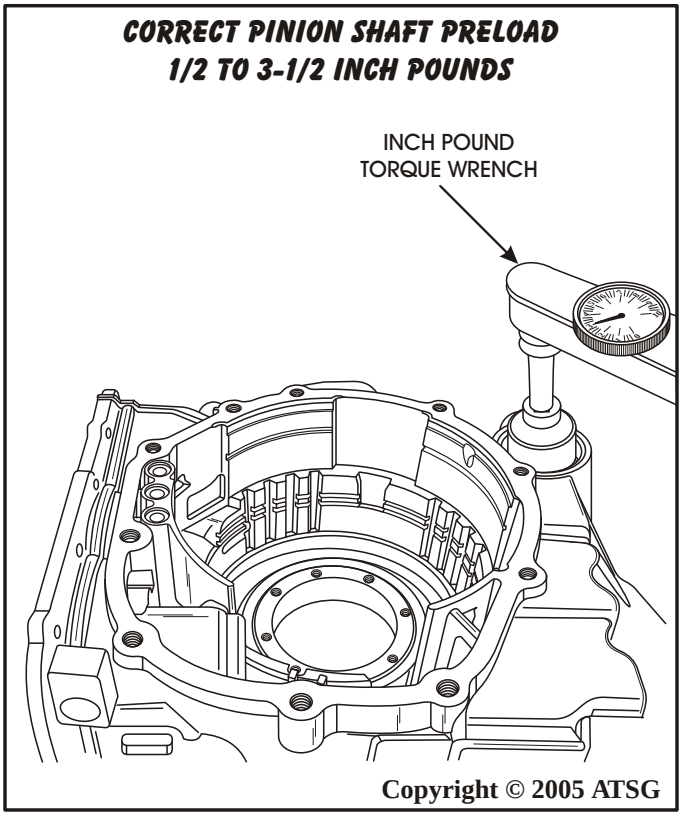


Figure 154

PINION SHAFT SELECTIVE SPACER CHART		
Thickness	*I.D. Symbol*	*Part Number*
1.88 mm (.0740")	*88*	*MD756579*
1.92 mm (.0756")	*92*	*MD756580*
1.96 mm (.0772")	*96*	*MD756581*
2.00 mm (.0787")	*00*	*MD756582*
2.04 mm (.0803")	*04*	*MD756583*
2.08 mm (.0819")	*08*	*MD756584*
2.12 mm (.0835")	*12*	*MD756585*
2.16 mm (.0850")	*16*	*MD756586*
2.20 mm (.0866")	*20*	*MD756587*
2.24 mm (.0882")	*24*	*MD756588*
2.28 mm (.0898")	*28*	*MD756589*
2.32 mm (.0913")	*32*	*MD756590*
2.36 mm (.0929")	*36*	*MD756591*
2.40 mm (.0945")	*40*	*MD756592*
2.44 mm (.0961")	*44*	*MD756593*
2.48 mm (.0976")	*48*	*MD756594*
2.52 mm (.0992")	*52*	*MD756595*
2.56 mm (.1008")	*56*	*MD756596*
2.60 mm (.1024")	*60*	*MD756597*
2.64 mm (.1039")	*64*	*MD756598*
2.68 mm (.1055")	*68*	*MD756599*
2.72 mm (.1071")	*72*	*MD760685*
2.76 mm (.1087")	*76*	*MD760686*

Figure 155

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

12. If turning torque is not correct, choose a new spacer thickness from the chart in Figure 155, based on your turning torque.
    Note: If turning torque is less than 1/2" lb, you will need a thicker spacer. If turning torque is more than 3-1/2" lb, you need thinner spacer.
13. This procedure was based on you having the spacer in your unit. If the spacer is lost you must start from scratch. You will have to install the small bearing race without the spacer, and torque the nut to specification. Then measure the end play of pinion with a dial indicator, as shown in Figure 156. Then you can choose a spacer from the chart that is approximately .002" thicker than your dial indicator reading.
14. After the turning torque is correct, stake the pinion retaining nut in two places, as shown in Figure 157.

Continued on Page 84

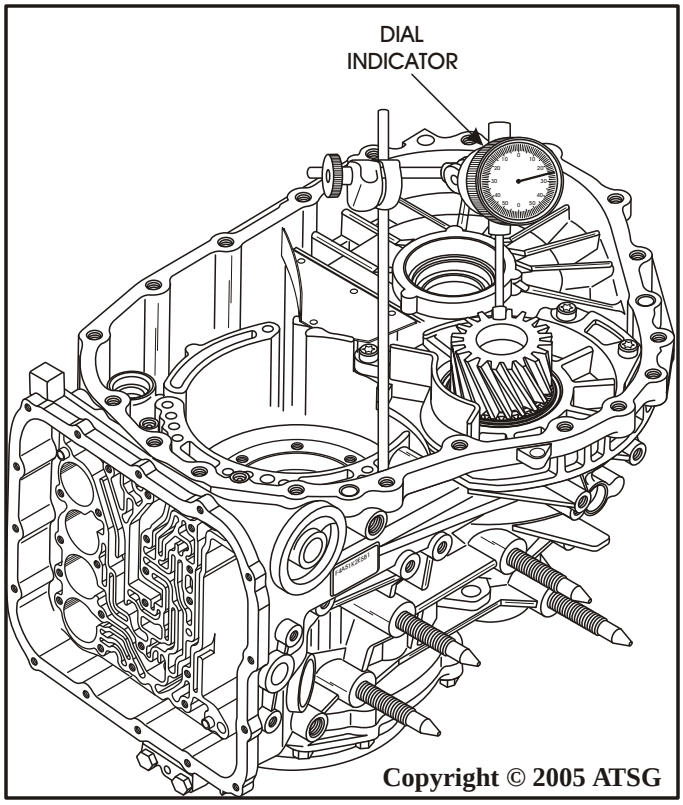


Figure 156

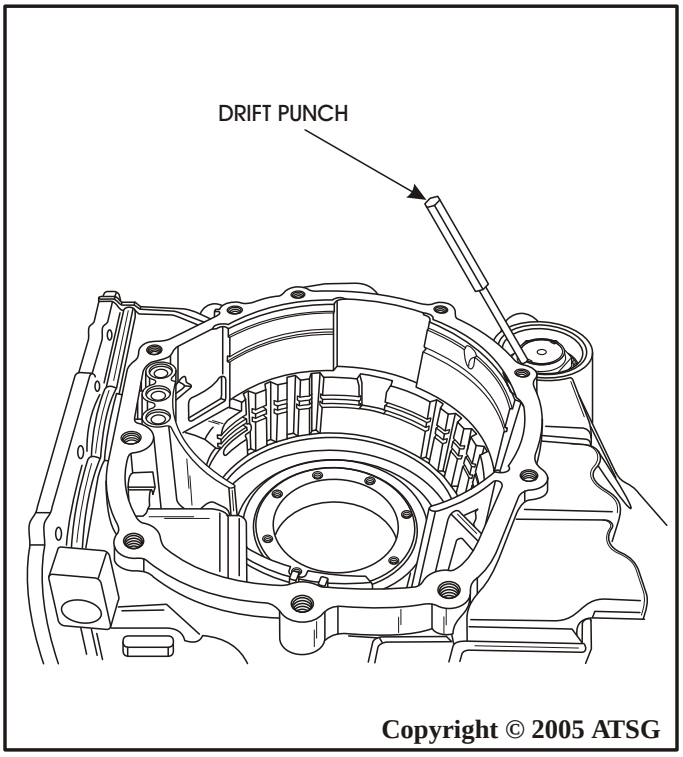
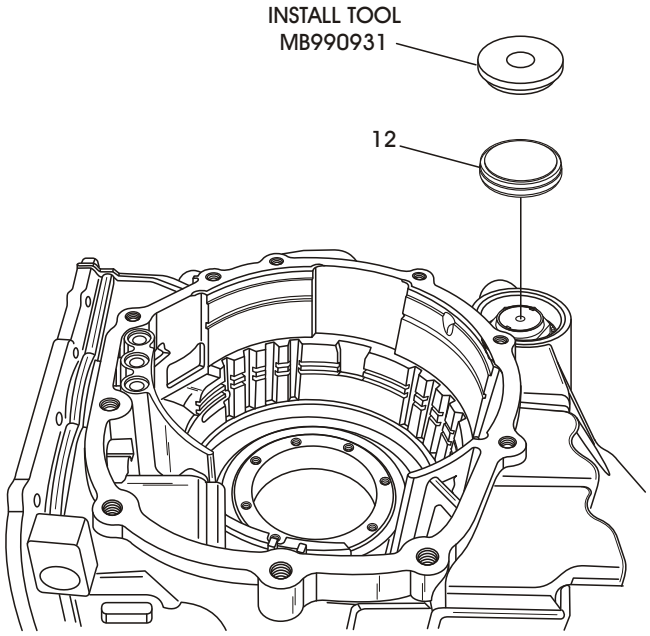


Figure 157



12 PINION SHAFT COVER.

Figure 158

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

15. Install a new pinion shaft cover/seal into case, as shown in Figure 158, using proper driver.
16. Align the reference marks that you put on the case and bearing housing during disassembly, as shown in Figure 159.
    Note: If you neglected to do this, you will have to search, as it installs in one direction only.
17. Install transfer drive gear assembly, as shown in Figure 160, by aligning the reference marks.
18. Install the retaining bolts by rotating the gear as necessary to expose the bolt holes through the access holes in the drive gear.
    Note: The number of retaining bolts will vary depending on model. There could be four, seven, or eight bolts.

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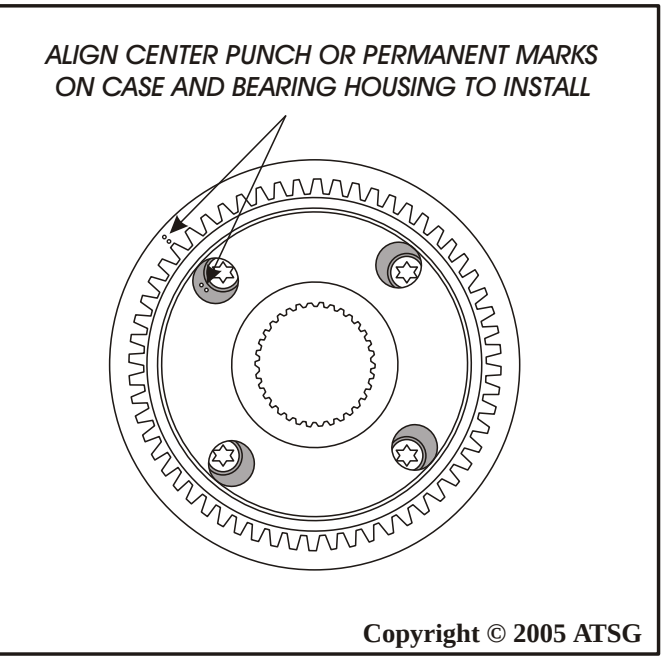

Figure 159

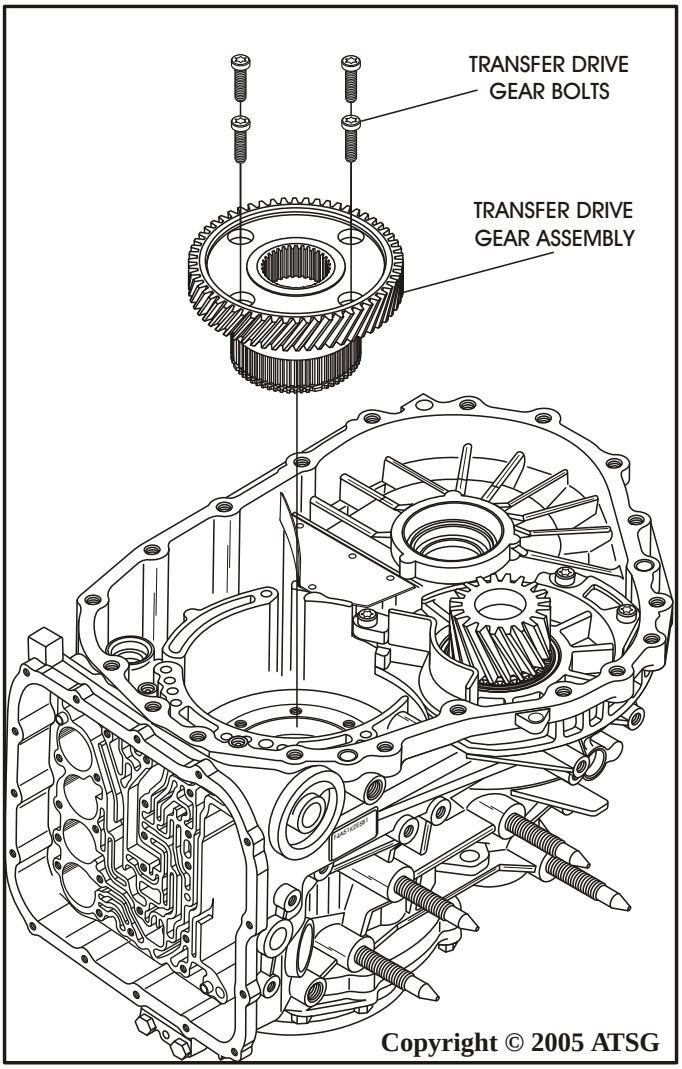

Figure 160

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

19. Rotate transfer drive gear as necessary so the access holes expose the retaining bolts to get them all installed and tightened.
20. Torque transfer gear drive gear retaining bolts to, 34 N·m (25 ft.lb.), as shown in Figure 161.
21. Rotate transaxle case so front side is facing up, as shown in Figure 164.
22. Inspect all parking pawl parts thoroughly for any wear and/or damage, replace as necessary. ***Note: All parking pawl parts are illustrated in Figure 162.***
23. Pre-assemble park pawl, return spring, and the bushing, as shown in Figure 163.
24. Install parking pawl, return spring and bushing assembly into the case, as shown in Figure 164, and install the pivot pin. ***Note: The park pawl pivot pin is the larger diameter of the three pins.***
25. Hook the parking pawl return spring in the window of bearing support (See Figure 165).

Continued on Page 86

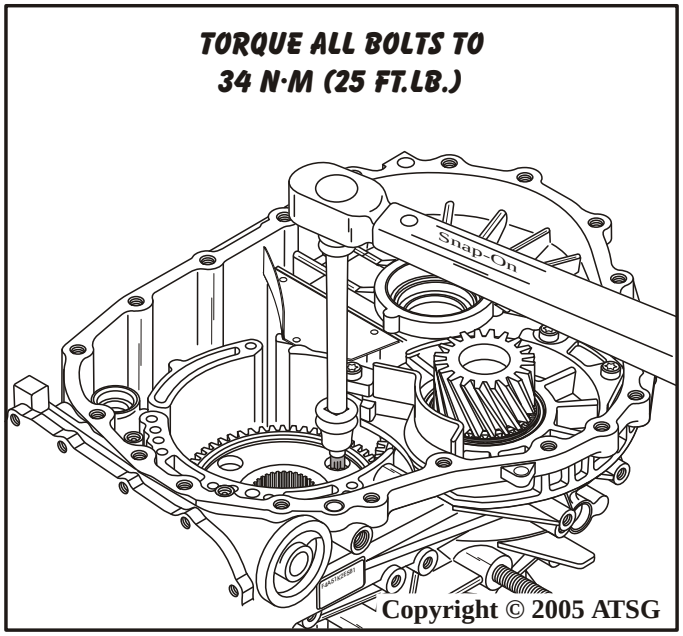

Figure 161

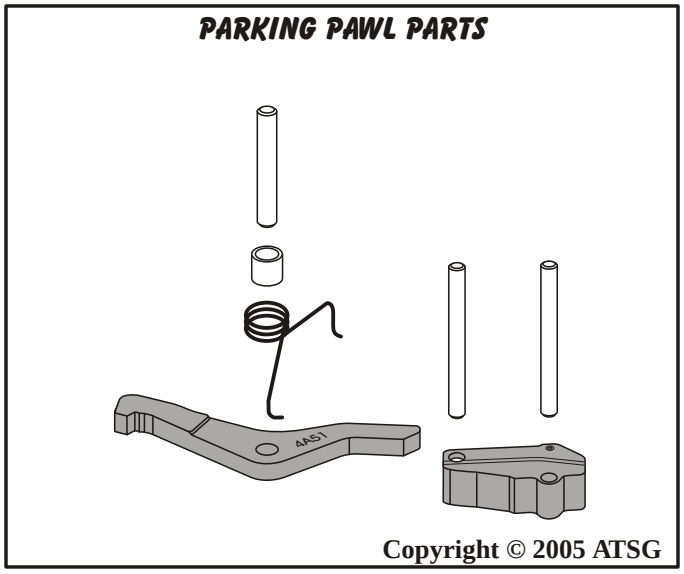

Figure 162

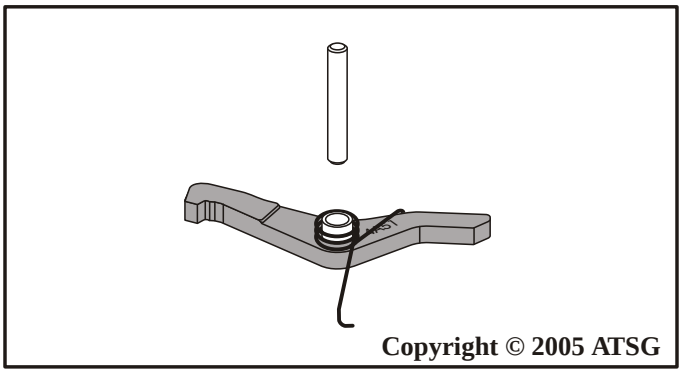

Figure 163

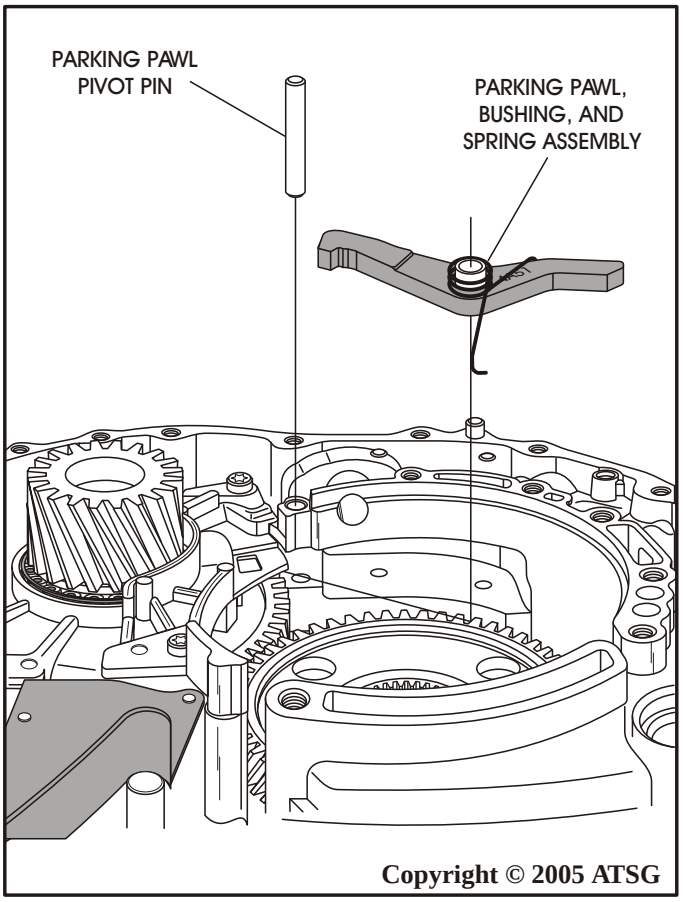

Figure 164

INTERNAL COMPONENTS (CONT'D)

26. Install the parking roller support, as shown in Figure 165, and install the retaining pins.
Note: All of the parking pawl pins are soft and will bend easily. "Do Not" install them with hammer.
Note: Check once again to ensure that park pawl return spring is hooked in the window, as shown in Figure 165.
27. Push the pins down as far as they will go, by ***hand only***, as shown in Figure 166.
28. Install new inner and outer "D" ring seals onto low/reverse piston, as shown in Figure 167, and lube with a small amount of Trans-Jel®.
29. Install the low/reverse piston assembly into the case, as shown in Figure 169.
30. Install the low/reverse piston return spring into the case, as shown in Figure 169.
31. Install low/reverse piston return spring retainer as shown in Figure 169, on top of the return spring.

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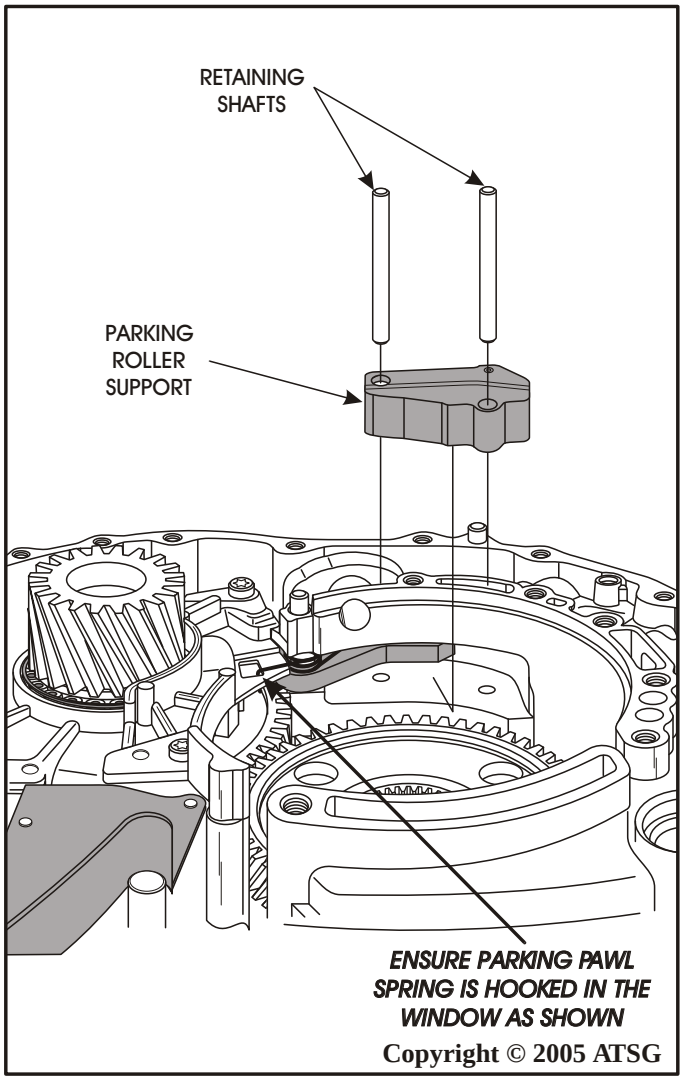

Figure 165

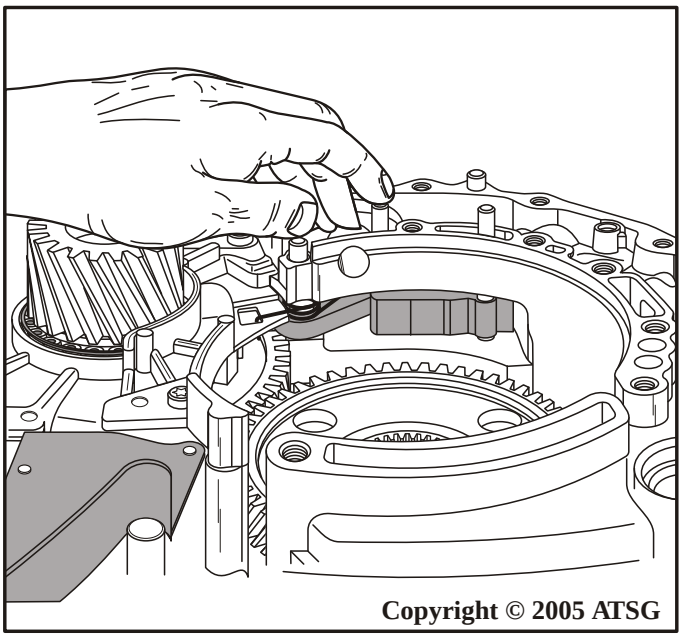

Figure 166

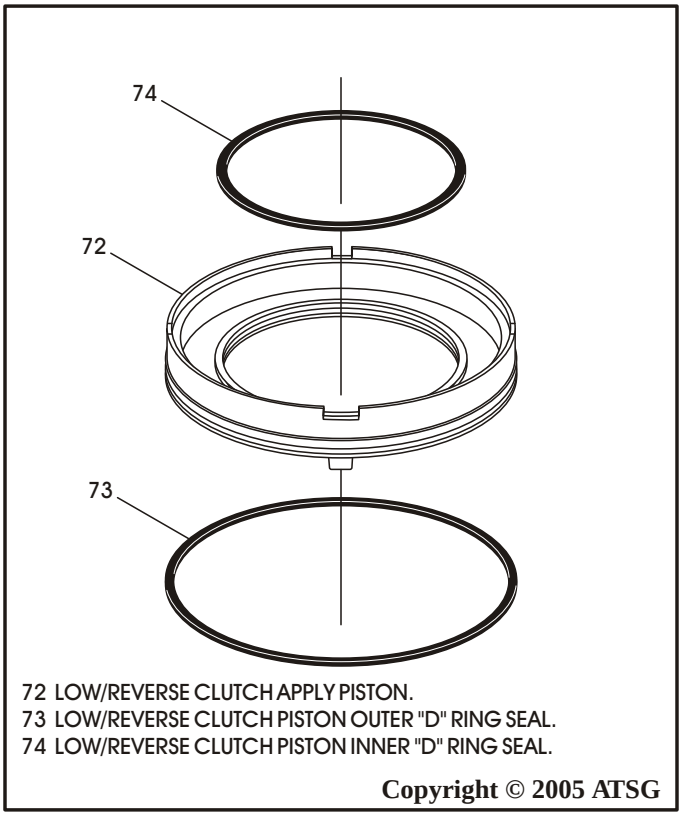

Figure 167

INTERNAL COMPONENTS (CONT'D)

32. Install a new "Lip" type seal into the groove on back side of the sprag inner race, as shown in Figure 169, with the lip facing down.
    Note: This is a lube seal and must be installed in sprag race with lip facing down as shown.
33. Install the sprag inner race, with the seal side facing down, as shown in Figure 169.
34. Check the placement of the I.D. notches in the sprag inner race, as shown in Figure 168. The sprag inner race ***must*** be installed with the I.D. notches along the 6 and 12-O-Clock line, as shown in Figure 168.

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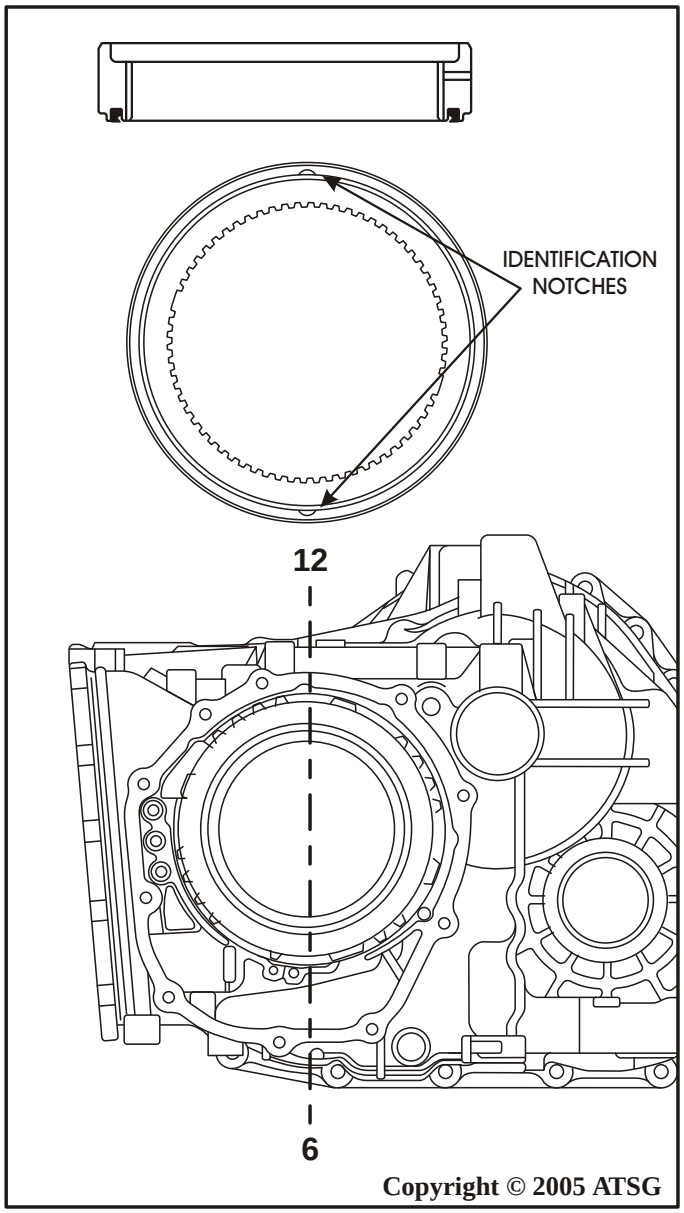
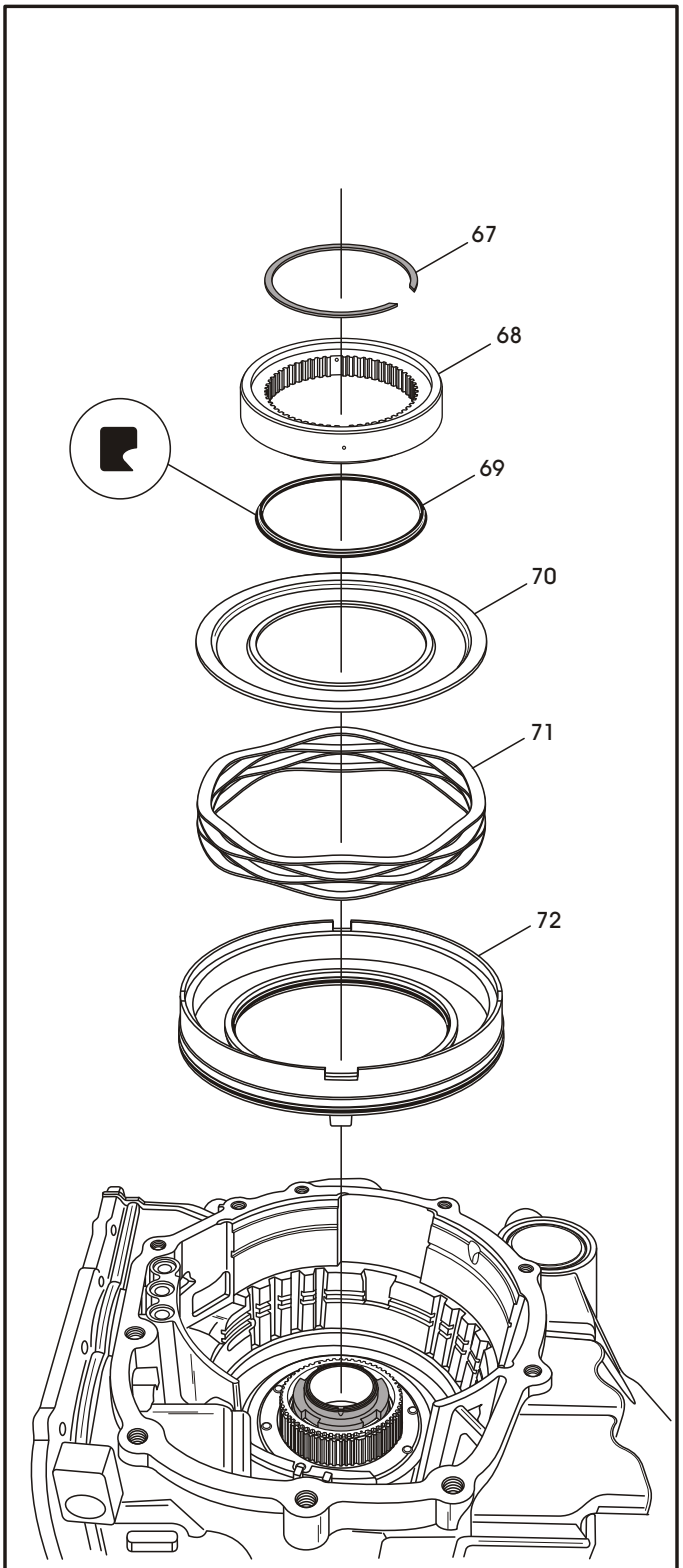


Figure 168



67 LOW SPRAG INNER RACE RETAINING SNAP RING.
68 LOW SPRAG INNER RACE.
69 LOW SPRAG INNER RACE LIP TYPE LUBE SEAL.
70 LOW/REVERSE CLUTCH RETURN SPRING RETAINER.
71 LOW/REVERSE CLUTCH RETURN SPRING.
72 LOW/REVERSE CLUTCH APPLY PISTON ASSEMBLY.

Figure 169

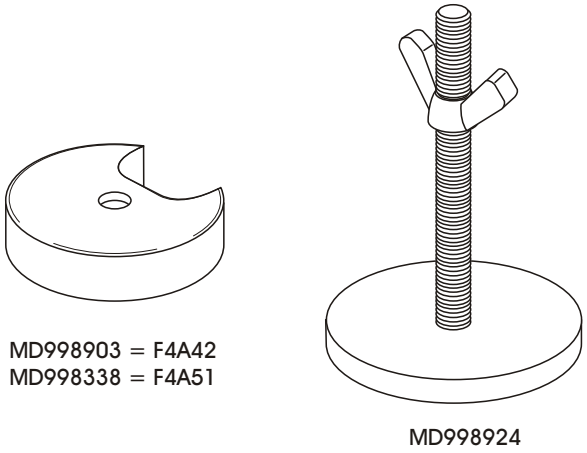


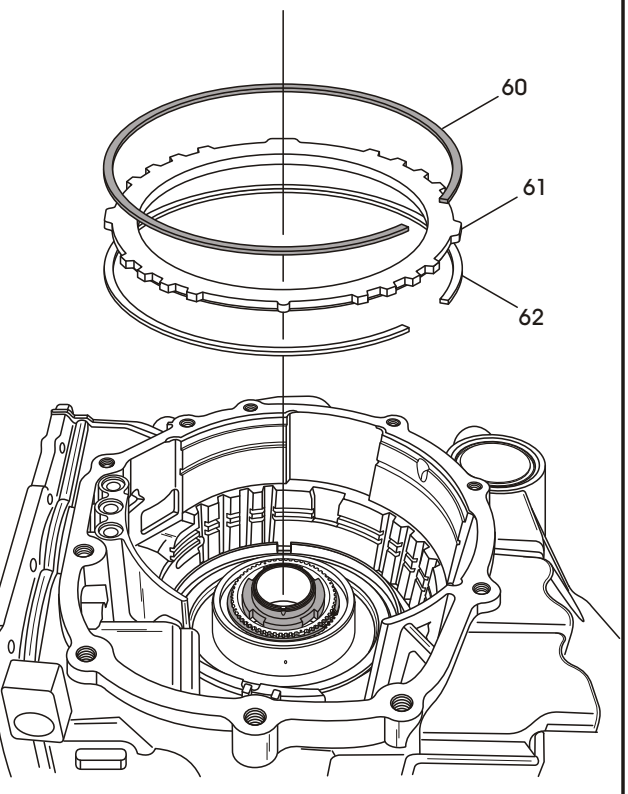
Figure 170

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

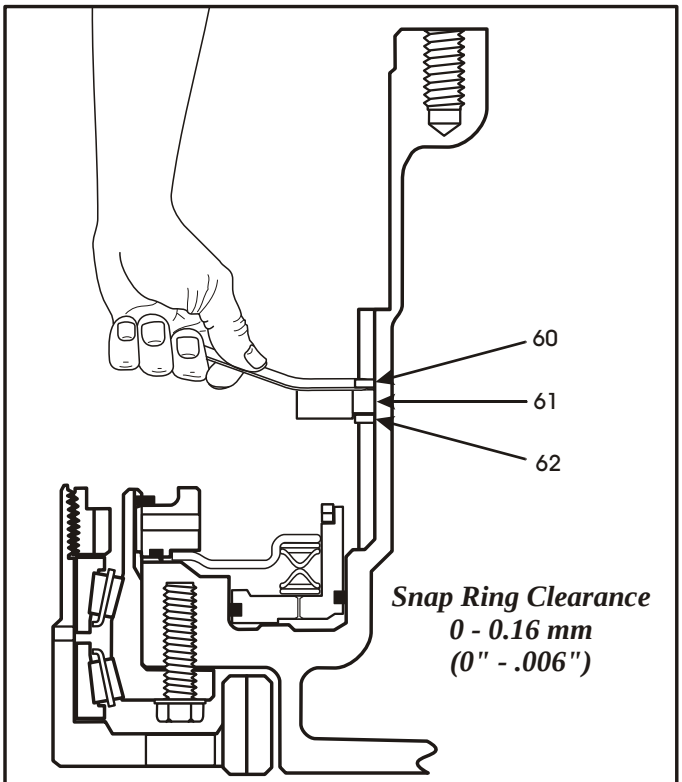
35. Compress the sprag race, retainer and return spring using special tools shown in Figure 170, and install snap ring.
36. Remove the compression tools.
37. Install the .099" snap ring, the pressure plate with step down, and the selective snap ring only, as shown in Figure 171 and 172.
    Note: Do not install any clutches at this time.
38. Measure with a feeler gage between pressure plate and the selective snap ring, as shown in Figure 172.
39. Mitsubishi wants maximum of .006" at this location. Specification is 0" - .006".
40. Select a snap ring from the chart in Figure 175 to achieve the desired specification.
41. Now remove the pressure plate and snap rings from the transaxle case.

Continued on Page 89



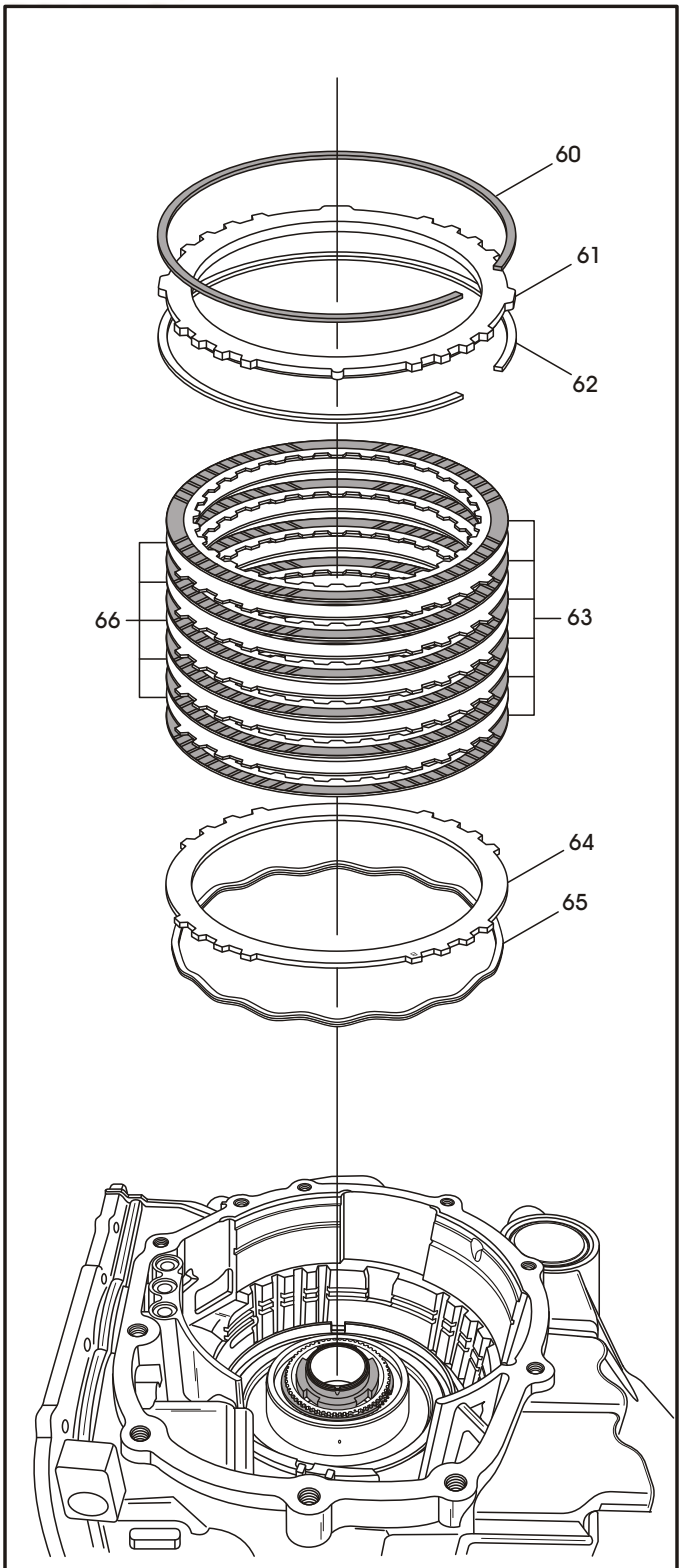
60 LOW/REVERSE PRESSURE PLATE SNAP RING *(SELECTIVE).*
61 LOW/REVERSE STEPPED PRESSURE PLATE.
62 LOW/REVERSE PRESSURE PLATE SNAP RING (.099" THICK).

Figure 171



60 LOW/REVERSE PRESSURE PLATE SNAP RING *(SELECTIVE).*
61 LOW/REVERSE STEPPED PRESSURE PLATE.
62 LOW/REVERSE PRESSURE PLATE SNAP RING (.099" THICK).

Figure 172



60 LOW/REVERSE PRESSURE PLATE SNAP RING *(SELECTIVE).*
61 LOW/REVERSE STEPPED PRESSURE PLATE.
62 LOW/REVERSE PRESSURE PLATE SNAP RING (.099" THICK).
63 LOW/REVERSE FRICTION PLATES.
64 LOW/REVERSE APPLY PLATE *(SELECTIVE).*
65 LOW/REVERSE "WAVED" CUSHION PLATE.
66 LOW/REVERSE STEEL PLATES

Figure 173

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

42. Install the low/reverse "Waved" cushion plate, as shown in Figure 173, on top of piston.
Note: This cushion plate is quite often broken and ATSG recommends replacement on every rebuild as a precautionary measure.
43. Install the low/reverse clutch selective apply plate, as shown in Figure 173.
44. Install the low/reverse clutch plates beginning with a friction and alternating with steel plates, as shown in Figure 173.
Note: "Do Not" yet install the last friction.
45. Install the .099" snap ring into the case groove, as shown in Figure 173.
46. Now, install the last friction, the pressure plate with step down and the selective snap ring.
47. Check the low/reverse clutch clearance using a feeler gage ***carefully,*** between the top friction and pressure plate, as shown in Figure 174.
48. The low/reverse clutch clearance should be, 1.65-2.11 mm (.065"-.083").
49. Change the selective apply plate using chart in Figure 176, to obtain specified clearance.

Continued on Page 91

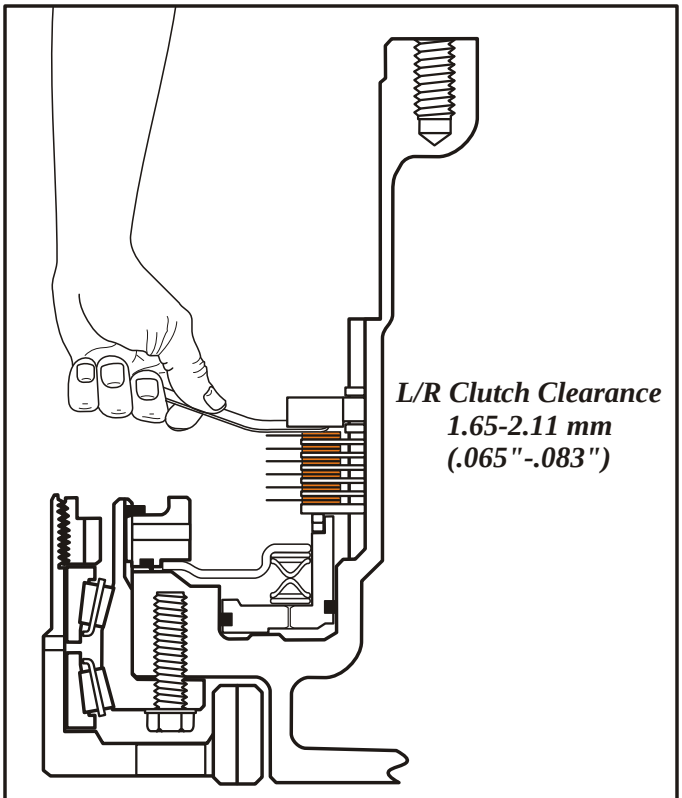
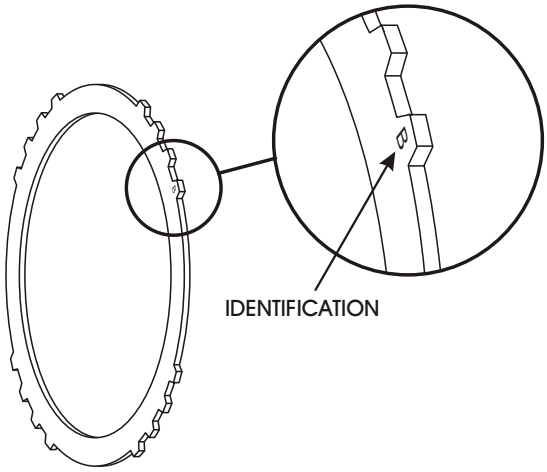


Figure 174

LOW/REVERSE CLUTCH SELECTIVE SNAP RING CHART						
F4A41, F4A42 MODELS				F4A51 MODELS		
Thickness	I.D. Color	Part Number		Thickness	I.D. Color	Part Number
2.2 mm (.087")	Blue	MD754786		2.2 mm (.087")	None	MD756784
2.3 mm (.091")	Brown	MD754785		2.3 mm (.091")	Blue	MD756785
2.4 mm (.094")	None	MD758240		2.4 mm (.094")	Brown	MD758552
2.5 mm (.098")	Blue	MD758241		2.5 mm (.098")	None	MD758553

Figure 175



2ND CLUTCH AND LOW/REVERSE CLUTCH SELECTIVE APPLY PLATE CHART						
F4A41, F4A42 MODELS				F4A51 MODELS		
Thickness	I.D. Symbol	Part Number		Thickness	I.D. Symbol	Part Number
1.6 mm (.063")	L	MD759567		1.6 mm (.063")	F	MD759568
1.8 mm (.071")	1	MD759414		1.8 mm (.071")	E	MD759425
2.0 mm (.079")	0	MD759415		2.0 mm (.079")	D	MD759426
2.2 mm (.087")	2	MD759416		2.2 mm (.087")	C	MD759427
2.4 mm (.094")	4	MD759417		2.4 mm (.094")	B	MD759428
2.6 mm (.102")	6	MD759418		2.6 mm (.102")	A	MD759429
2.8 mm (.110")	8	MD759419		2.8 mm (.110")	0	MD759430
3.0 mm (.118")	D	MD759420		3.0 mm (.118")	1	MD759431

Figure 176

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

50. Install the 2nd clutch plates, beginning with a friction, followed by the stepped plate with the step facing down, followed by frictions and steels, and finally the selective plate, piston retainer and snap ring. (See Figure 178).
Special Note: Number of plates will vary depending on the model.

MODEL	FRICTION	STEEL	STEPPED	SELECTIVE
F4A41, 42	3	2	1	1
F4A51	4	3	1	1

51. Check the 2nd clutch clearance with a feeler gage, between the selective apply plate and the 2nd clutch piston, as shown in Figure 177.
52. The 2nd clutch clearance should be:
F4A41, F4A42 = 0.79-1.25 mm (.031"-.049")
F4A51 = 1.09-1.55 mm (.043"-.061"), and is also shown in Figure 177.
53. Change selective apply plate as necessary to obtain correct 2nd clearance, using the chart in Figure 176.
54. Now, remove the complete 2nd clutch pack using Figure 178, as a guide.

Continued on Page 92

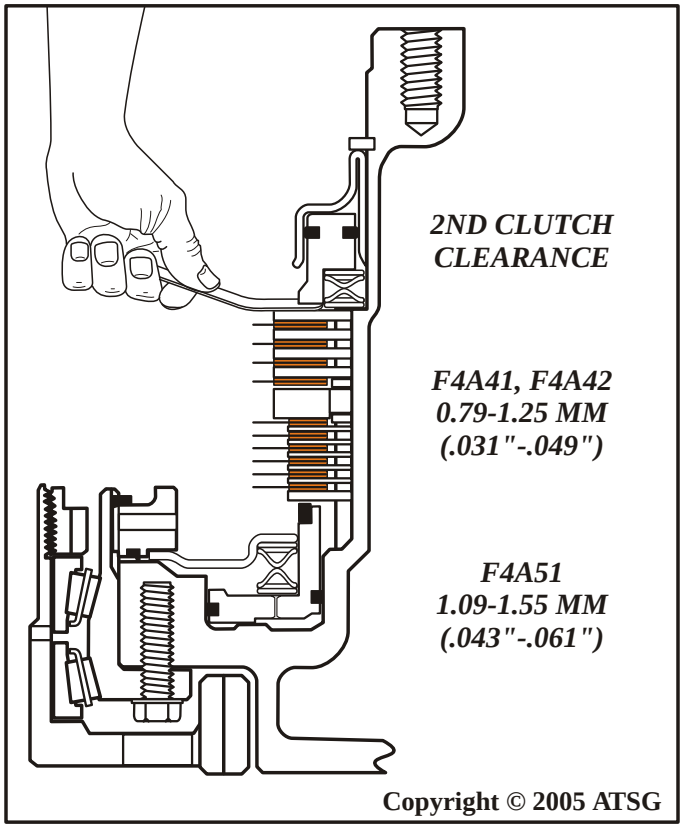
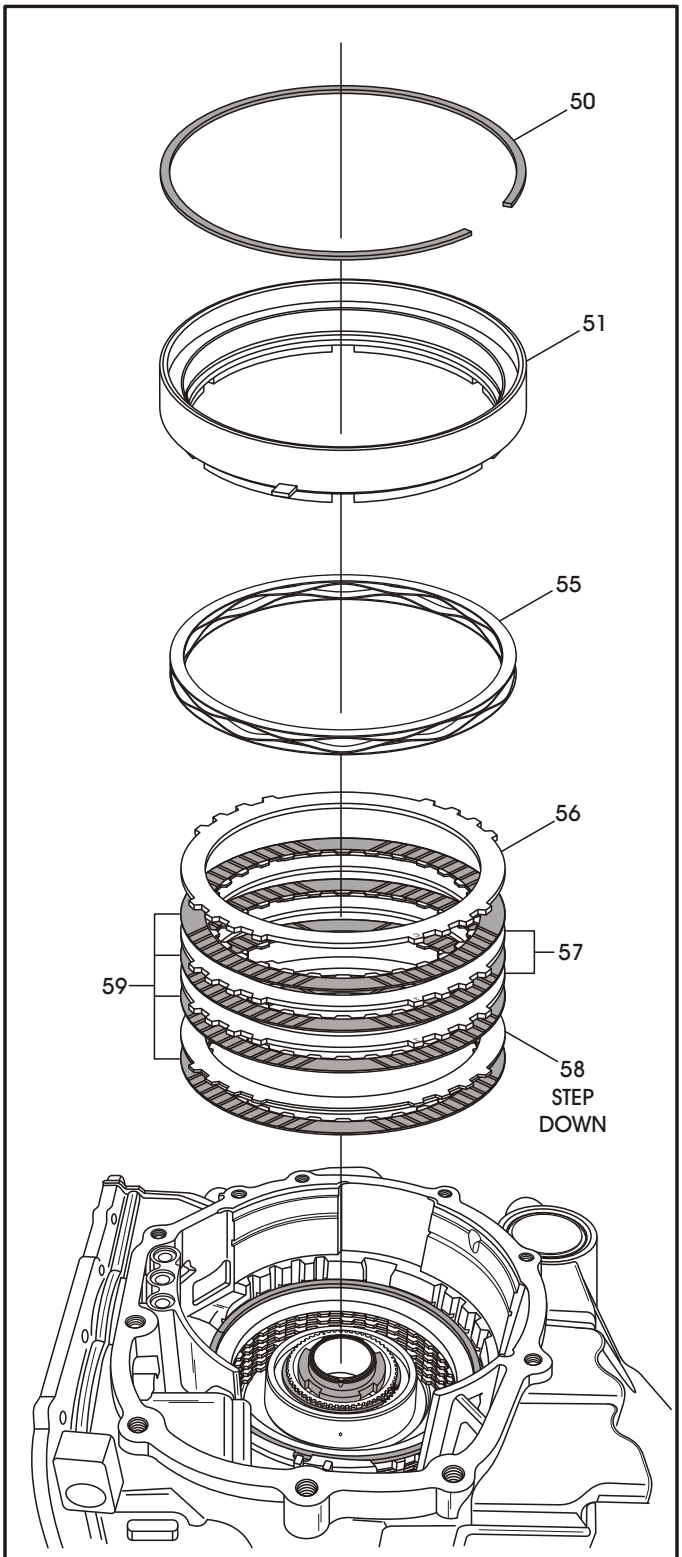


Figure 177



50 2ND CLUTCH RETAINER SNAP RING.
51 2ND CLUTCH RETAINER.
55 2ND CLUTCH PISTON RETURN SPRING.
56 2ND CLUTCH APPLY PLATE *(SELECTIVE)*.
57 2ND CLUTCH FLAT STEEL PLATES.
58 2ND CLUTCH STEPPED PLATE *(STEP FACING DOWN)*.
59 2ND CLUTCH FRICTION PLATES.

Figure 178

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

55. Install the pre-assembled planetary gear set and the low sprag assembly into the case, as shown in Figure 179, by rotating back and forth to engage the low/reverse frictions and the sprag onto the inner race.
56. Ensure proper sprag installation, as shown in Figure 180.
    Note: Planetary should freewheel counter-clockwise and lock clockwise, as shown in Figure 180. Sprag not used in all models. Refer to Page 117 for specific details.
57. Install the pre-assembled sun gear and shell assembly, as shown in Figure 181.
    Note: Ensure that number 5 thrust bearing is still in place and installed correctly, as shown in Figure 181.

Continued on Page 93

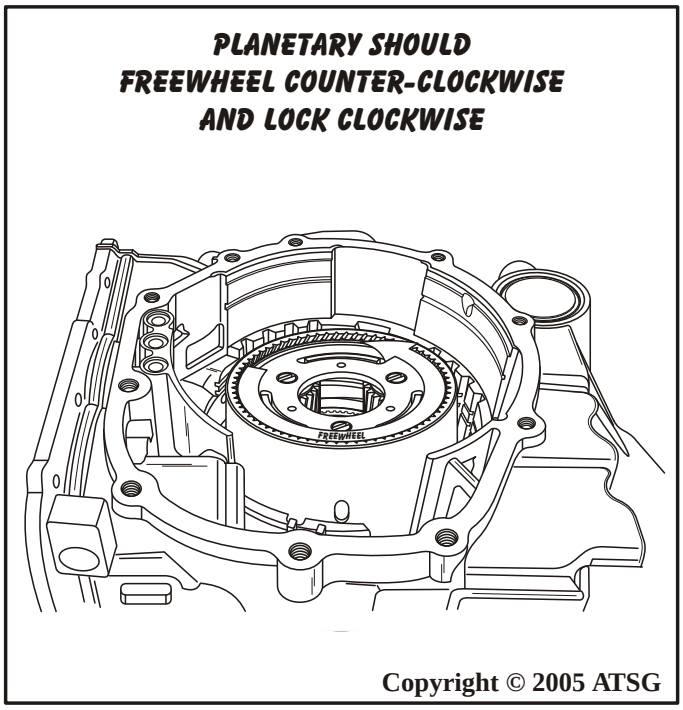


Figure 180

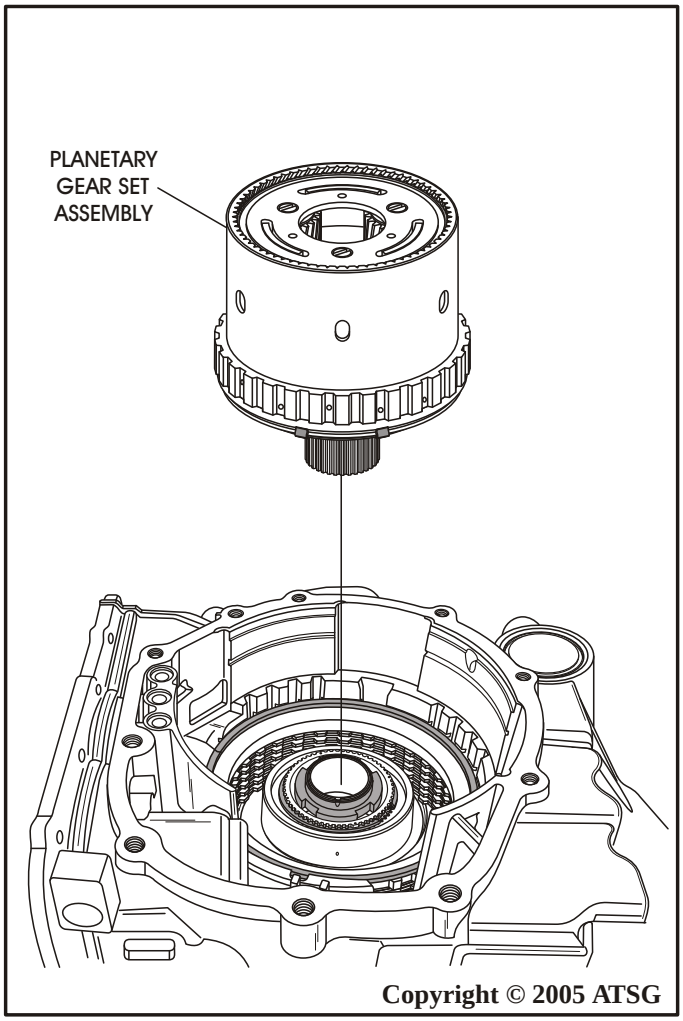


Figure 179

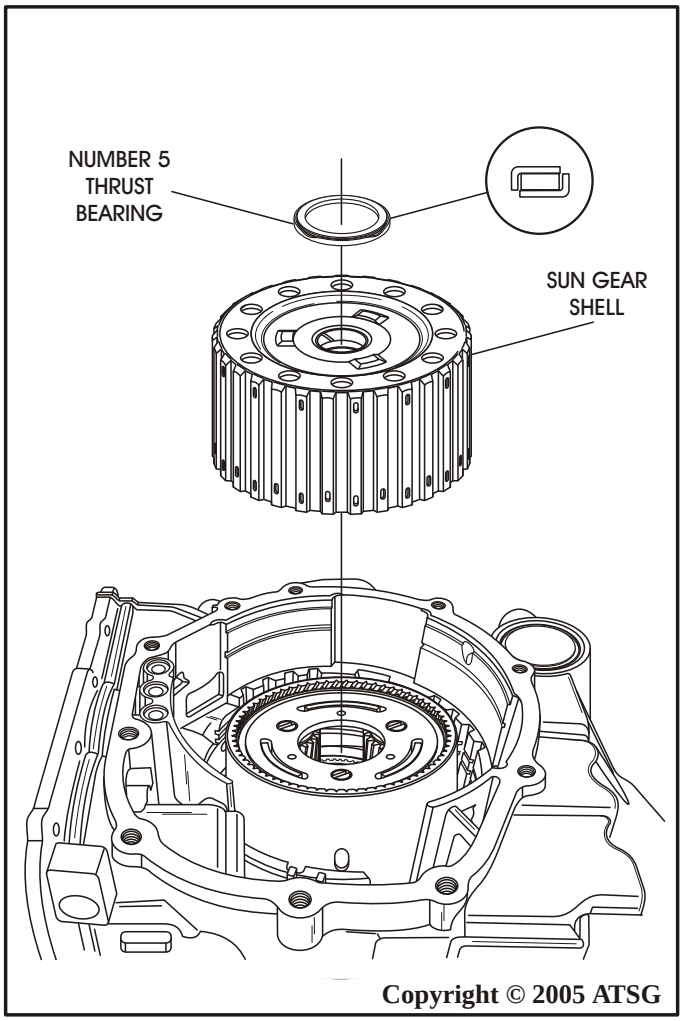
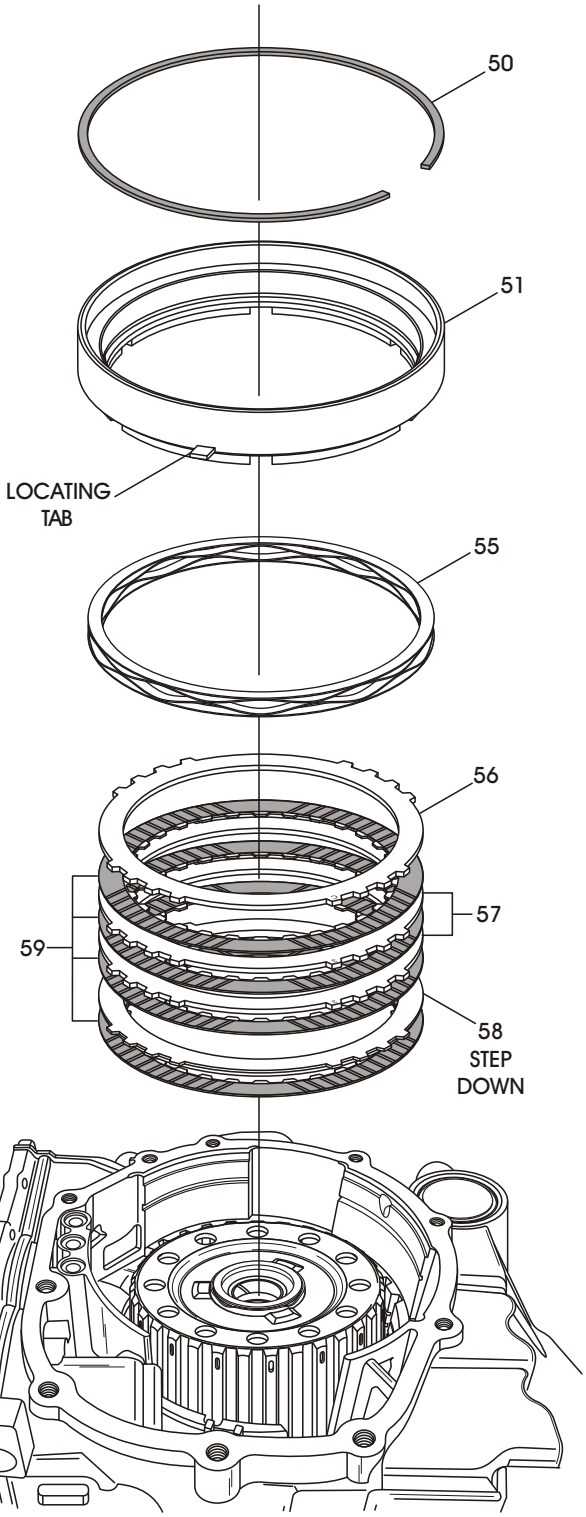


Figure 181



50 2ND CLUTCH RETAINER SNAP RING.
51 2ND CLUTCH RETAINER.
55 2ND CLUTCH PISTON RETURN SPRING.
56 2ND CLUTCH APPLY PLATE *(SELECTIVE).*
57 2ND CLUTCH FLAT STEEL PLATES.
58 2ND CLUTCH STEPPED PLATE *(STEP FACING DOWN).*
59 2ND CLUTCH FRICTION PLATES.

Figure 182

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

58. Now re-install the 2nd clutch plates beginning with 1 friction plate, as shown in Figure 182.
59. Install the "Stepped" apply plate, as shown in Figure 182, with the ***step facing down.***
60. Install the remaining friction and steel plates, as shown in Figure 182.
    Special Note: Number of plates will vary depending on model, as shown in the chart on Page 91.
61. Install the selective apply plate, as shown in Figure 182.
62. Install the 2nd clutch piston return spring, as shown in Figure 182.
63. Install 2nd clutch piston and retainer assembly, as shown in Figure 182, and install snap ring.
    Note: Ensure that locating tab is engaged into the case groove (See Figure 182).
64. Install the overdrive clutch hub, as shown in Figure 183, and ensure that number 6 thrust bearing is installed correctly.

Continued on Page 94

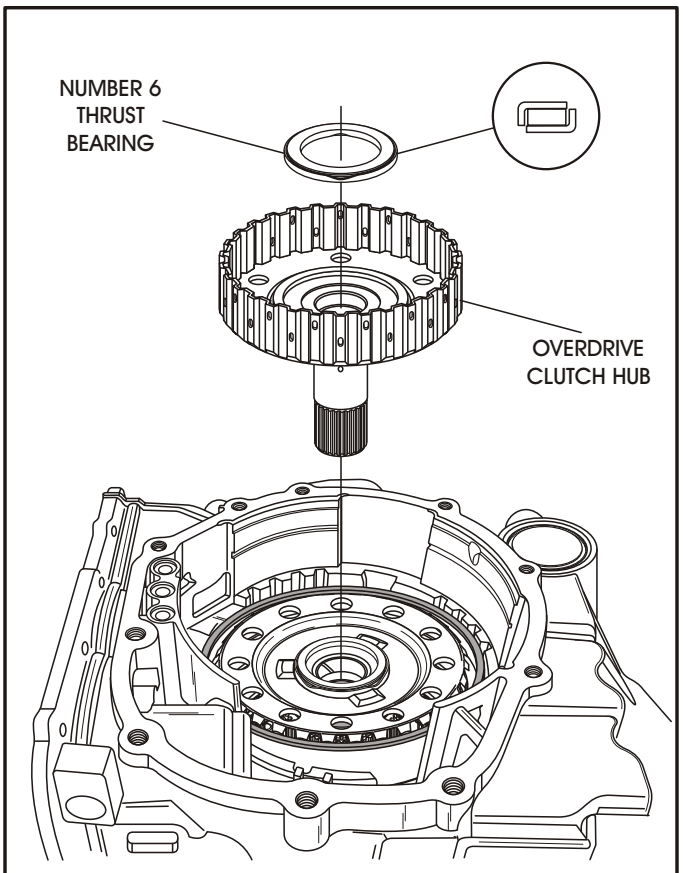


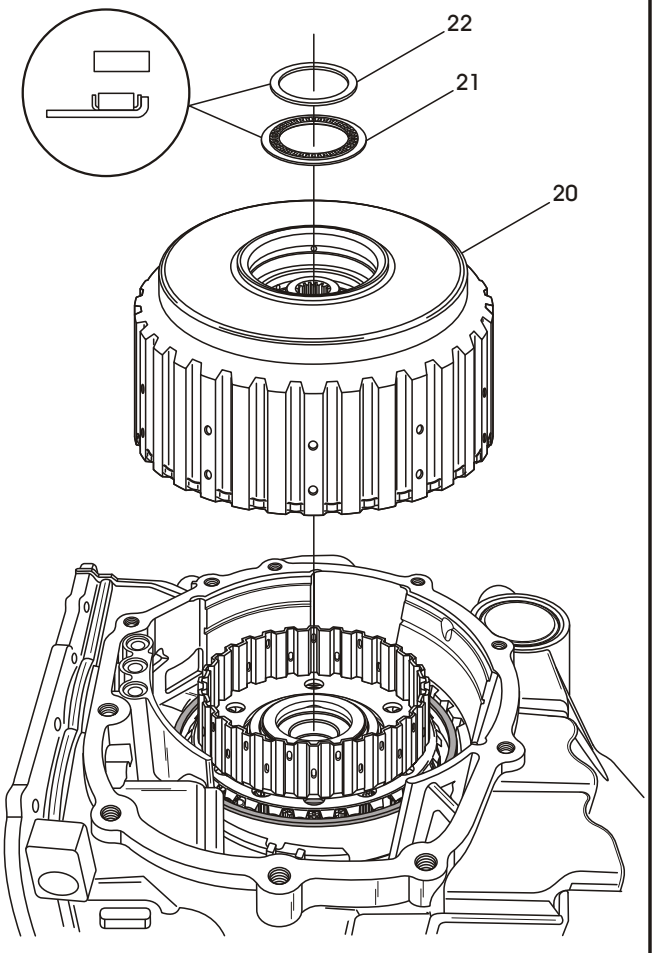
Figure 183

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

65. Install the overdrive/reverse clutch housing, as shown in Figure 184, by rotating the housing back and forth until all overdrive clutches are engaged with the hub and all reverse clutches are engaged on sun shell, and the housing is fully seated.
66. Install the number 7 thrust bearing, as shown in Figure 184.
    Note: Do not install the selective number 8 thrust plate. It is shown in Figure 184 for reference only as to where it goes when it is time to install the washer.
67. Install "H" gage on transaxle case, as shown in Figure 185, and set adjustment rod on roller surface of the number 7 bearing, as shown in Figure 186.
68. Lock the adjustment rod in place.
69. Adjustment rod ***must*** be on the roller surface of the bearing, as shown in Figure 186.

Continued on Page 95



20 OVERDRIVE/REVERSE CLUTCH RETAINER ASSEMBLY.
21 NUMBER 7 THRUST BEARING ASSEMBLY.
22 NUMBER 8 THRUST PLATE *(SELECTIVE).*

Figure 184

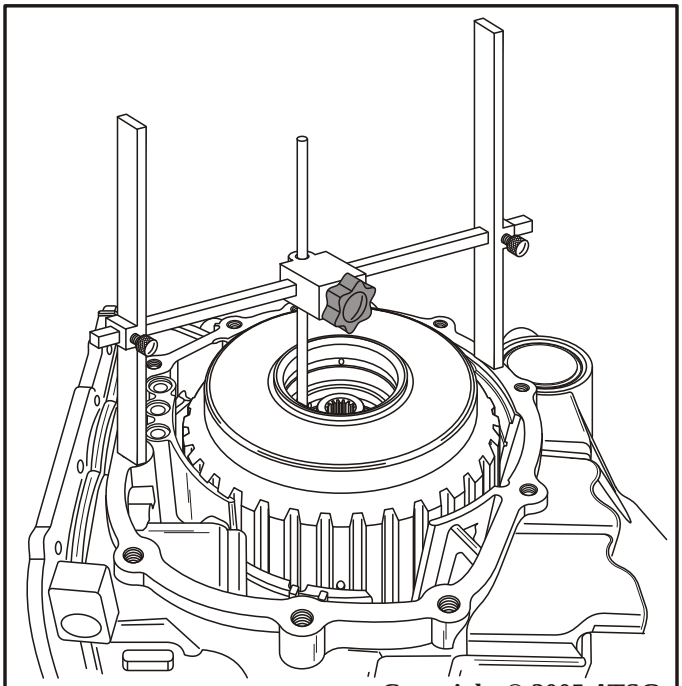


Figure 185

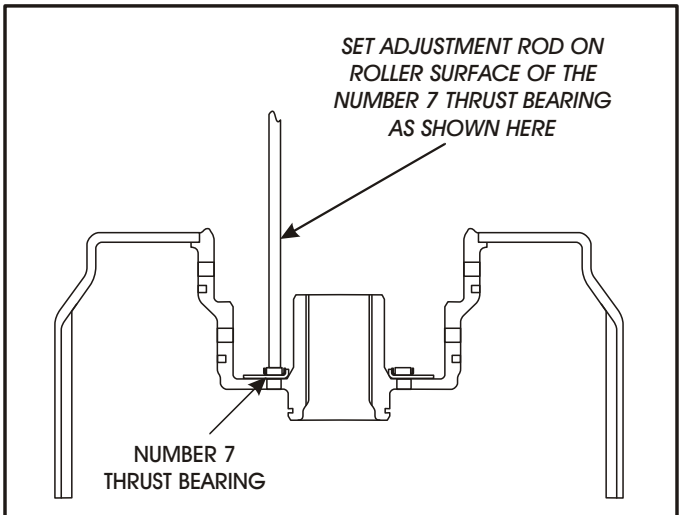


Figure 186

INTERNAL COMPONENTS (CONT'D)

70. Install number 8 selective thrust plate onto the rear cover, as shown in Figure 187, and retain with small amount of Trans-Jel®.
71. Now, turn "H" gage over and set on the rear cover, as shown in Figure 188.
72. Measure with feeler gage between number 8 thrust plate and adjustment rod, as shown in Figure 188, for proper rear end clearance.
73. Rear end clearance should be as follows: 0.25 - 0.45 mm (.010" - .018").
74. Change the selective plate as necessary to obtain the proper specification, using the chart in Figure 187.

NUMBER 8 THRUST PLATE CHART	
THICKNESS	PART NUMBER
1.6 mm (.063")	MD707267
1.7 mm (.067")	MD759681
1.8 mm (.071")	MD723064
1.9 mm (.075")	MD754794
2.0 mm (.079")	MD707268
2.1 mm (.083")	MD754795
2.2 mm (.087")	MD723065
2.3 mm (.091")	MD754796
2.4 mm (.094")	MD724358
2.5 mm (.098")	MD754797
2.6 mm (.102")	MD754798

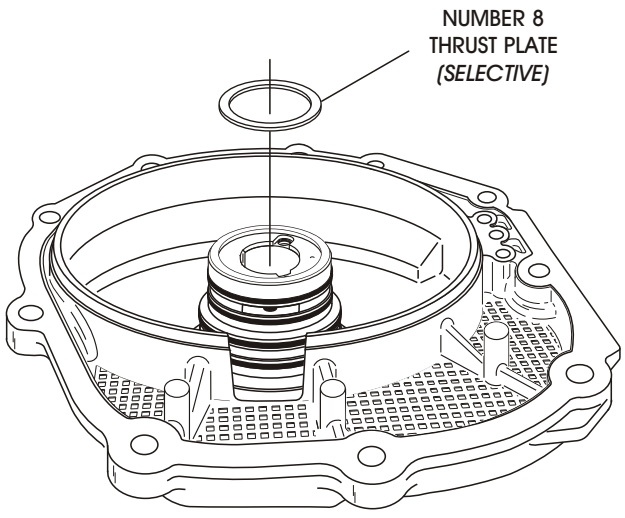


Figure 187

75. Install the 3 "O" ring seals into the pockets of the case, as shown in Figure 189, and retain with a small amount of Trans-Jel®.

Continued on Page 96

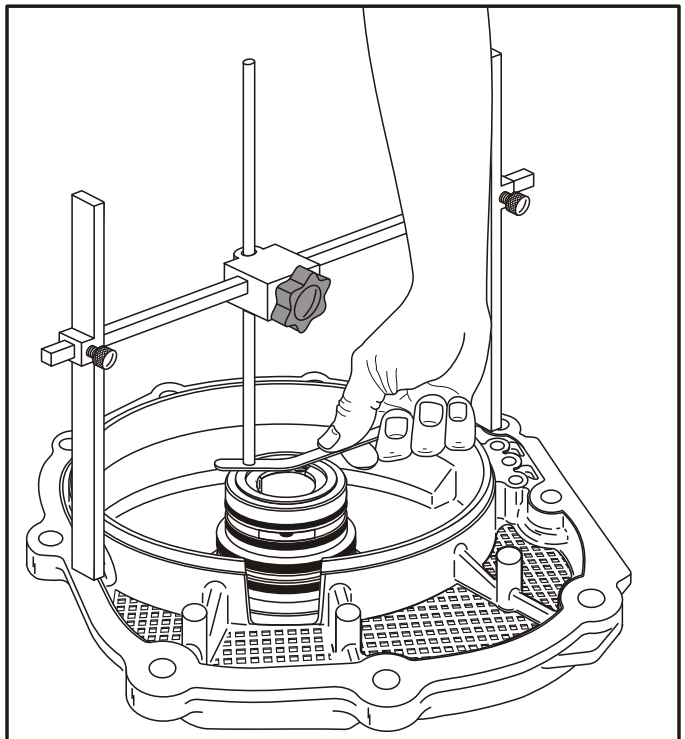


Figure 188

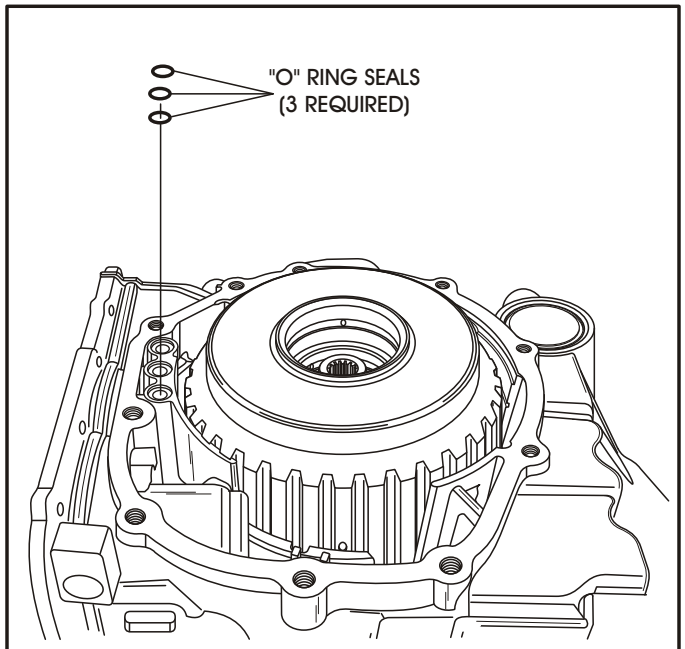


Figure 189

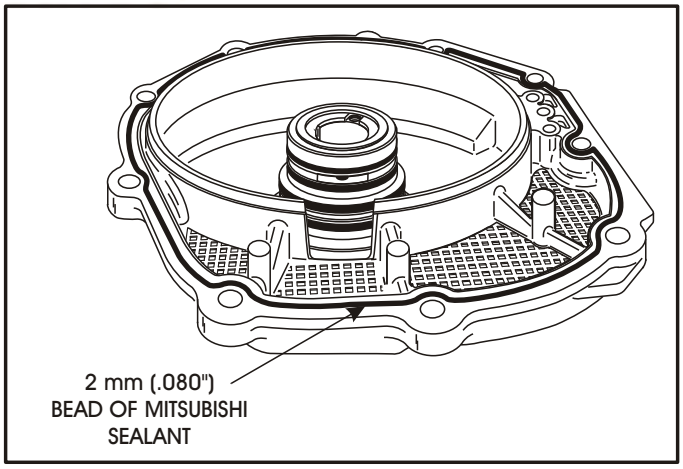


Figure 190

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

76. Apply a 2 mm (.080") bead of the Mitsubishi sealant, part number MD974421, or equivalent, to the rear cover, as shown in Figure 190.
Note: Install the cover within 15 minutes while the sealant is still wet.
77. Ensure that "O" rings are in place on the case and install rear cover, as shown in Figure 191.
78. Install the ten rear cover to case retaining bolts as shown in Figure 191.
79. Torque the ten rear cover retaining bolts to 23 N·m (17 ft.lb.), as shown in Figure 192.
80. Rotate the transaxle case so that front side is facing up, as shown in Figure 193.
81. Install the underdrive clutch hub, as shown in Figure 193.
82. Ensure that the number 2 thrust bearing is installed in the proper direction, as shown in Figure 193.

Continued on Page 97

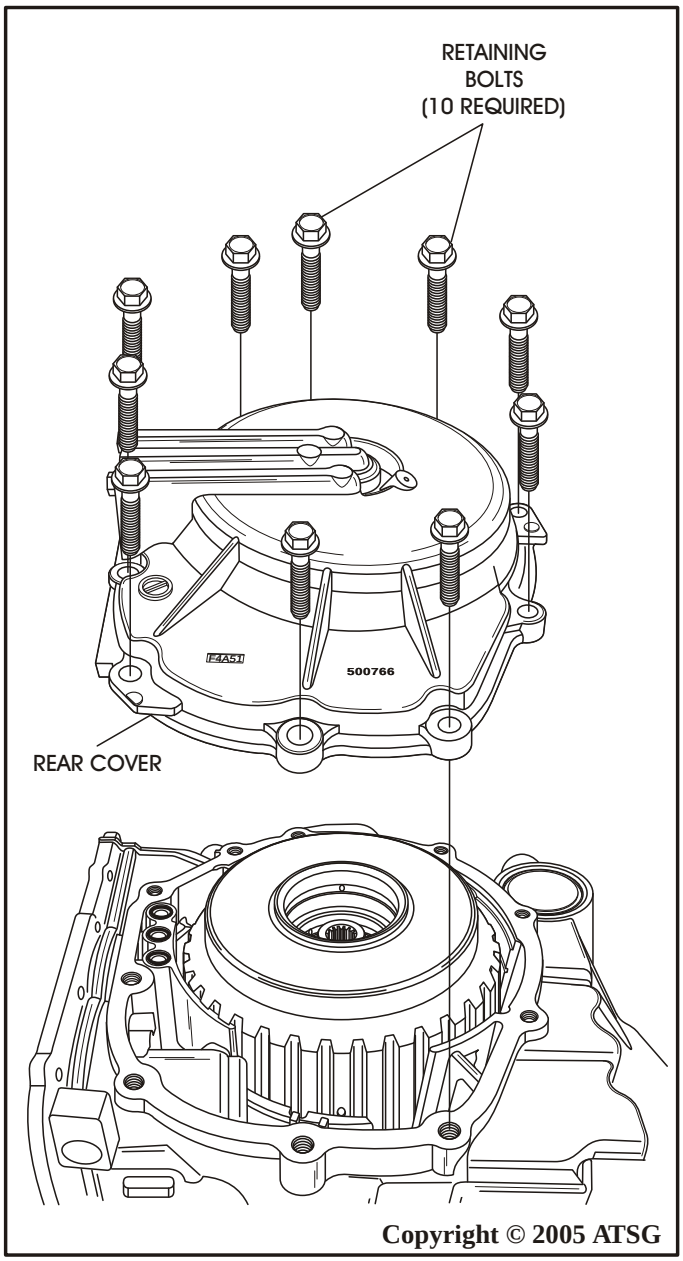


Figure 191

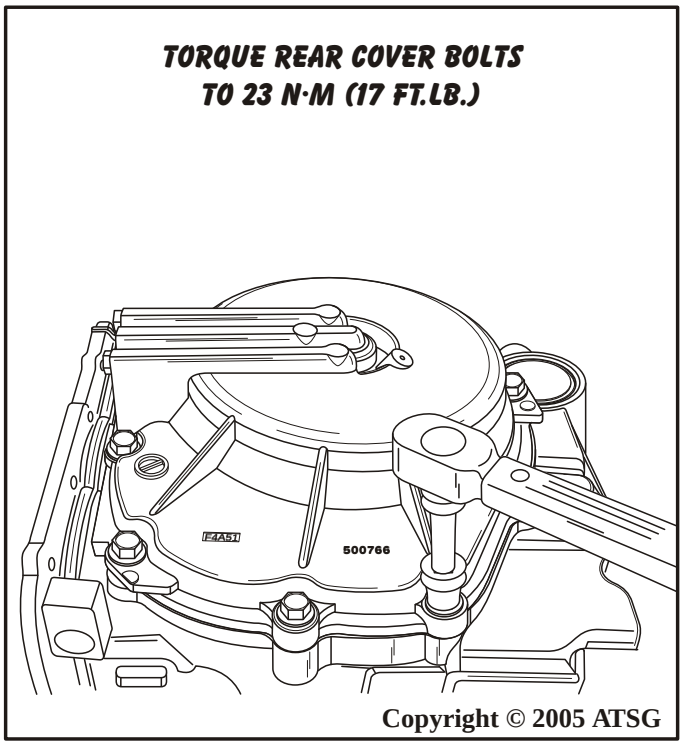


Figure 192

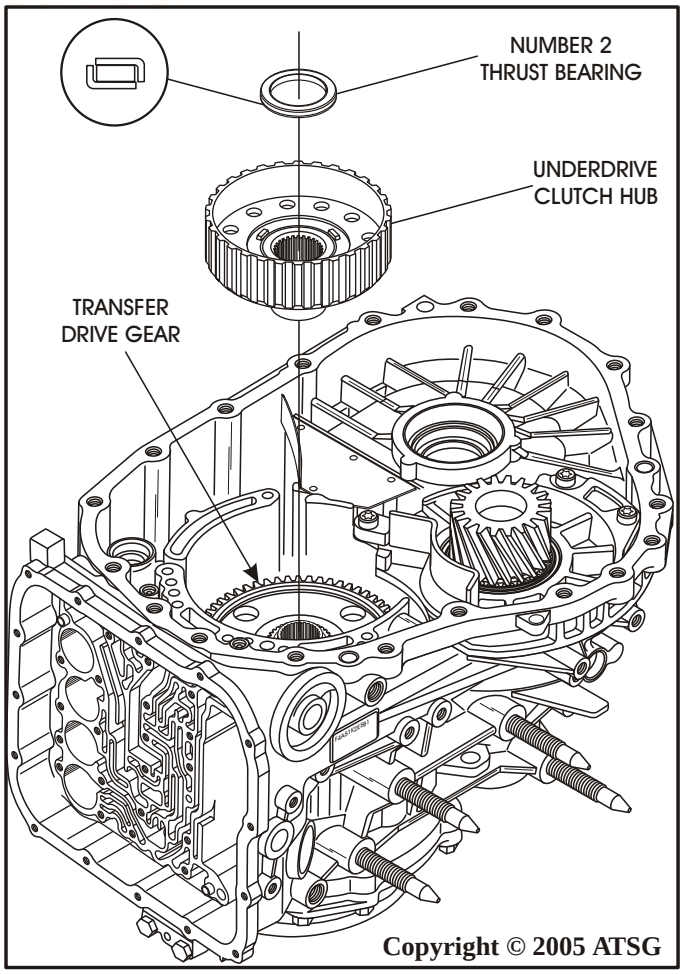


Figure 193

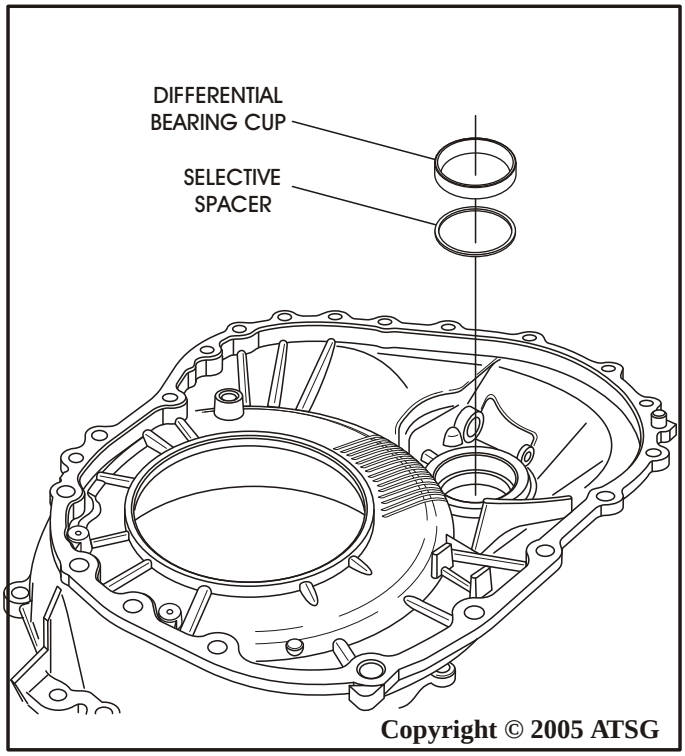


Figure 194

INTERNAL COMPONENTS (CONT'D)

83. Install the original selective shim and new bearing cone,as shown in Figure 194, into the converter housing using proper drivers. ***Note: If for any reason you do not know what spacer goes here, you must install the bearing cup without the spacer.***
84. Install the differential into case, install the converter housing, as shown in Figure 195, and torque the converter housing bolts to 48 N·m (35 ft.lb.).

Continued on Page 98

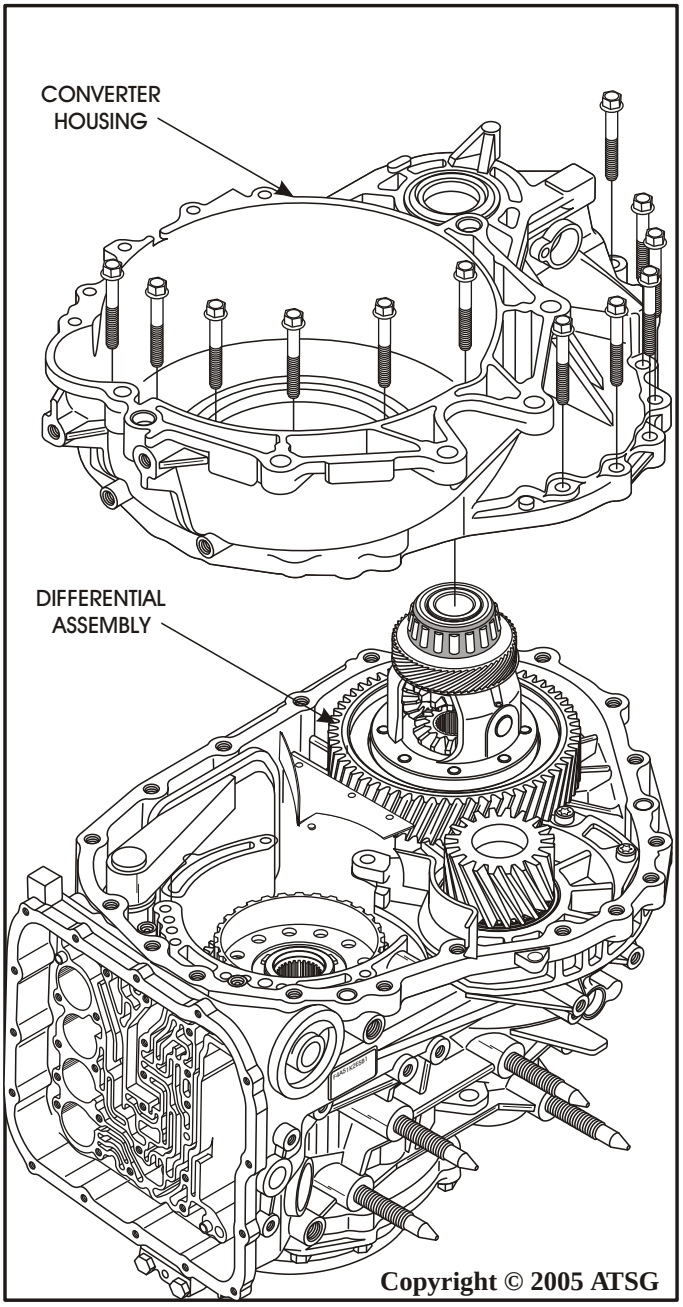


Figure 195

DIFFERENTIAL CASE SELECTIVE SPACER CHART		
Thickness	*I.D. Symbol*	*Part Number*
0.71 mm (.0280")	*71*	*MD754475*
0.74 mm (.0291")	*74*	*MD727660*
0.77 mm (.0303")	*77*	*MD754476*
0.80 mm (.0315")	*80*	*MD727661*
0.83 mm (.0327")	*83*	*MD720937*
0.86 mm (.0339")	*86*	*MD720938*
0.89 mm (.0350")	*89*	*MD720939*
0.92 mm (.0362")	*92*	*MD720940*
0.95 mm (.0374")	*95*	*MD720941*
0.98 mm (.0386")	*98*	*MD720942*
1.01 mm (.0398")	*01*	*MD720943*
1.04 mm (.0409")	*04*	*MD720944*
1.07 mm (.0421")	*07*	*MD720945*
1.10 mm (.0433")	*J*	*MD710454*
1.13 mm (.0445")	*D*	*MD700270*
1.16 mm (.0457")	*K*	*MD710455*
1.19 mm (.0469")	*L*	*MD710456*
1.22 mm (.0480")	*G*	*MD700271*
1.25 mm (.0492")	*M*	*MD710457*
1.28 mm (.0504")	*N*	*MD710458*
1.31 mm (.0516")	*E*	*MD706574*
1.34 mm (.0528")	*O*	*MD710459*
1.37 mm (.0539")	*P*	*MD710460*

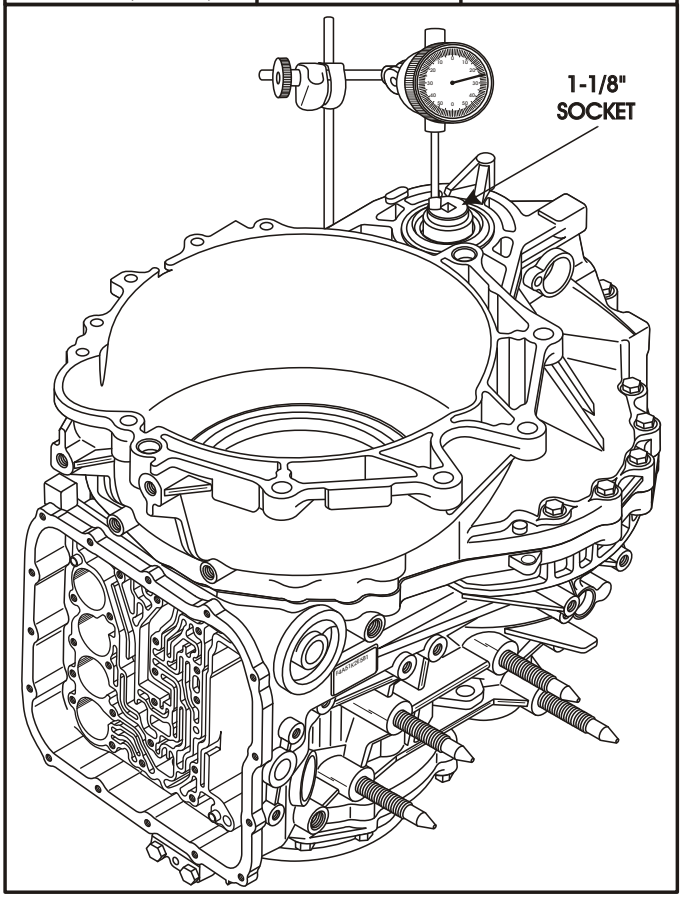


Figure 196

INTERNAL COMPONENTS (CONT'D)

85. Install 1-1/8", 1/2" drive socket through the axle seal, as shown in Figure 196.
86. Install a dial indicator with the stem resting on the socket, as shown in Figure 196, and zero the dial indicator.
87. With a large screwdriver coming through the axle seal on the opposite side and against the differential cross shaft, move the differential up and down to determine end play.
88. Choose a spacer from the chart in Figure 196 that is approximately .002" thicker than your end play reading.
89. Remove the converter housing and the bearing cup, install the selected spacer and re-install the bearing cup, as shown in Figure 194.
90. Install the underdrive clutch housing and the number 1 selective thrust washer, as shown in Figure 197.

Continued on Page 99

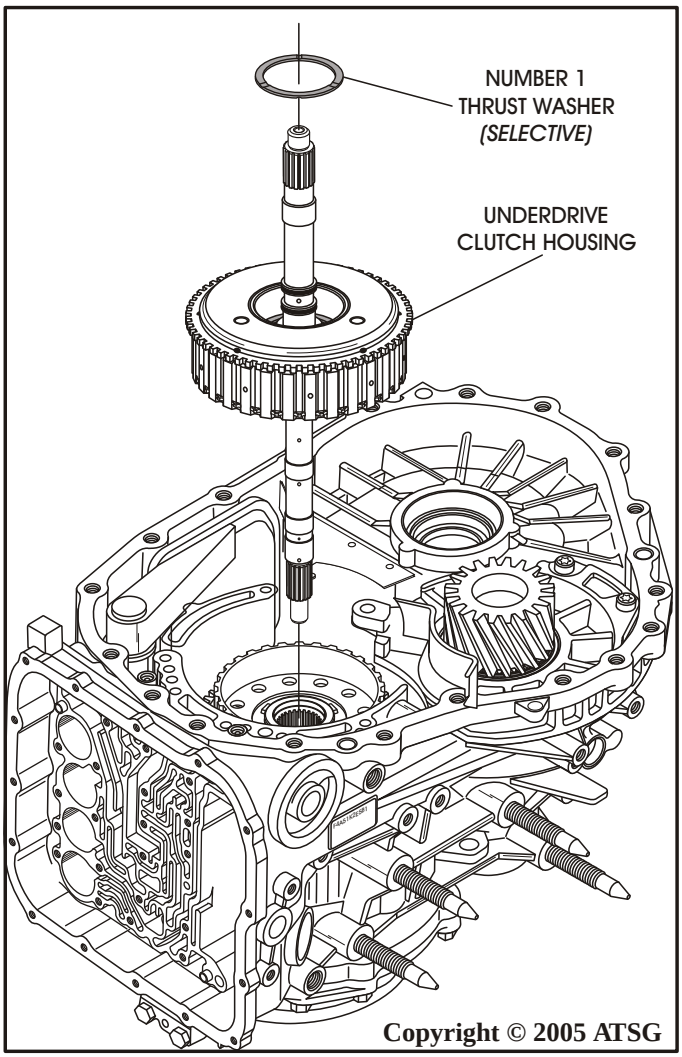


Figure 197

INTERNAL COMPONENTS (CONT'D)

91. Install the "H" gage on transaxle, as shown in Figure 198, and let the adjustment leg down to rest on the selective thrust washer.
92. Turn the "H" gage over and set it on oil pump assembly, as shown in Figure 199.
93. Measure with a feeler gage between the pump surface and "H" gage adjustment leg, as shown in Figure 199, for proper front end play.
94. Proper front end play should be as follows; .045 - .105 mm (.028" - .057").
95. Change selective thrust washer as necessary using the chart in Figure 199, to obtain proper input shaft end play.

Continued on Page 100

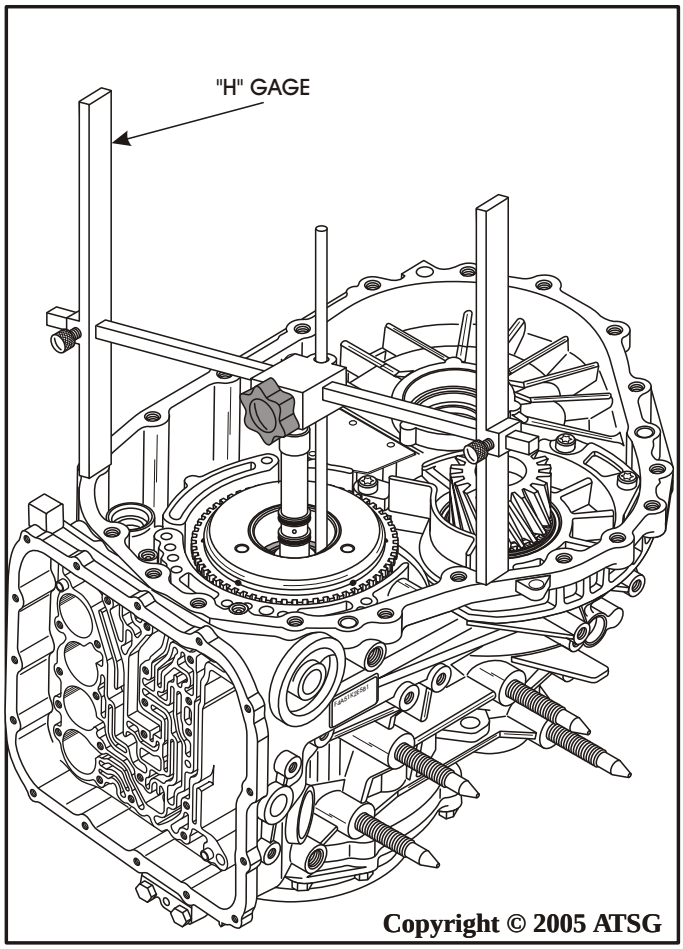


Figure 198

INPUT SHAFT SELECTIVE SPACER CHART		
Thickness	*I.D. Symbol*	*Part Number*
1.8 mm (.071")	*18*	*MD754509*
2.0 mm (.079")	*20*	*MD754508*
2.2 mm (.087")	*22*	*MD754507*
2.4 mm (.094")	*24*	*MD753793*
2.6 mm (.102")	*26*	*MD753794*
2.8 mm (.110")	*28*	*MD753795*

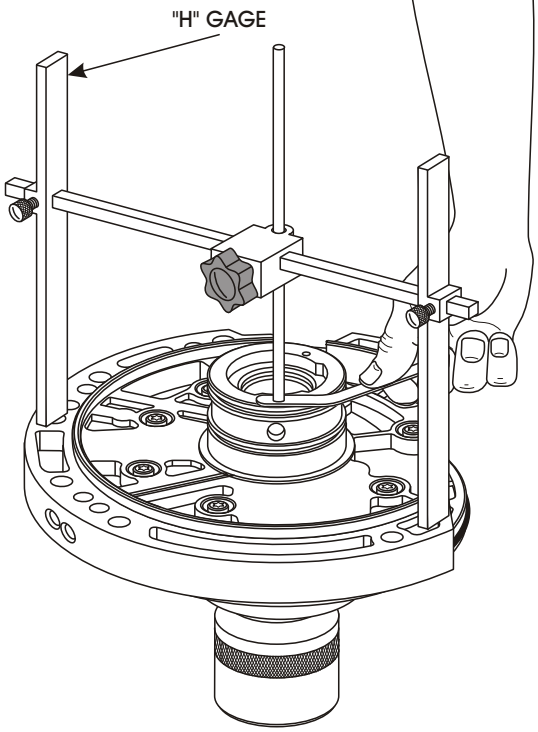


Figure 199

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

96. Install the oil pump gasket on transaxle case, as shown in Figure 200.
97. Install the pre-assembled oil pump assembly, as shown in Figure 200.
98. Install and torque the 6 oil pump to case bolts to 23 N·m (17 ft.lb.) (See Figure 200).
99. Install new "O" ring on new filter and lube the "O" ring with small amount of Trans-Jel®.
100. Install the filter assembly into the transaxle case, as shown in Figure 201.
101. Install the differential assembly into the case, as shown in Figure 201.
102. Install dial indicator, as shown in Figure 202, to ensure that front transaxle clearance is; .045-.105mm (.028" - .057")

Continued on Page 101

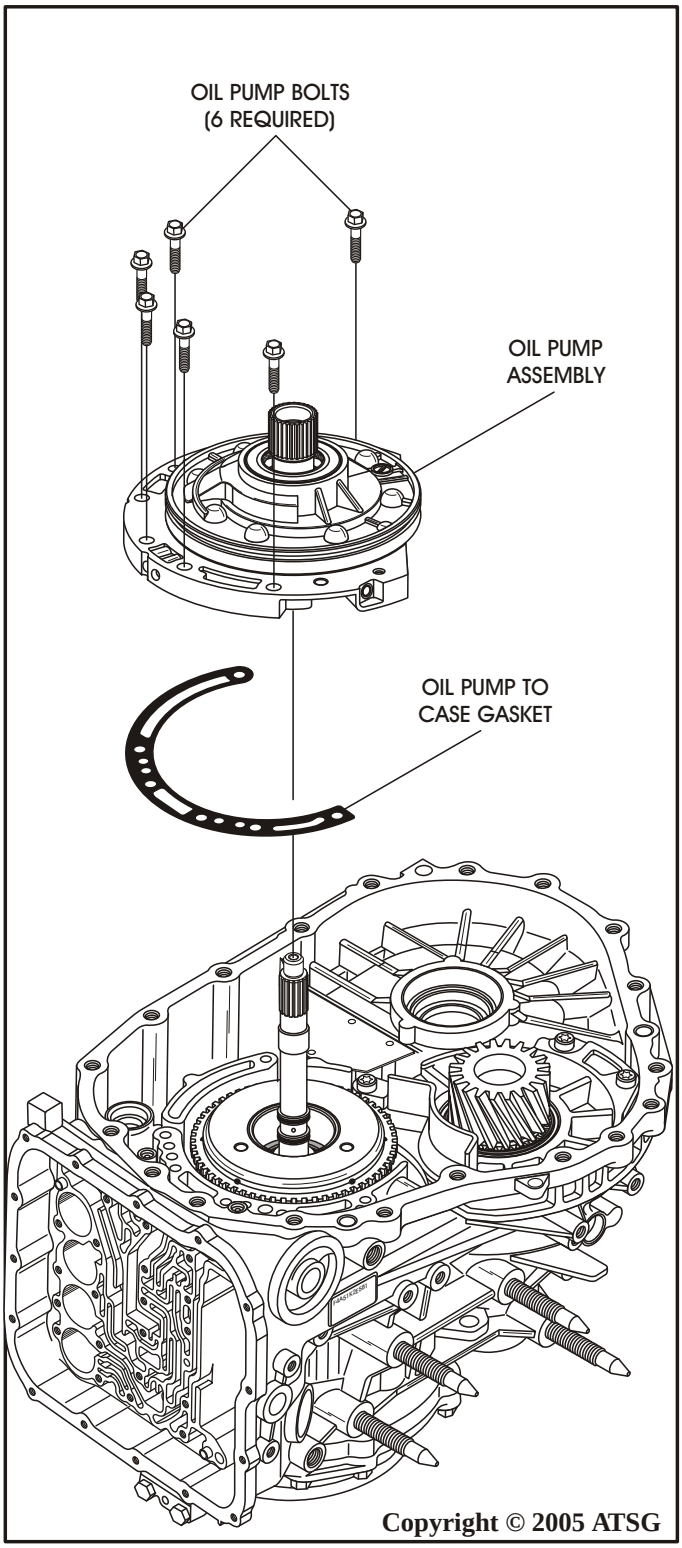


Figure 200

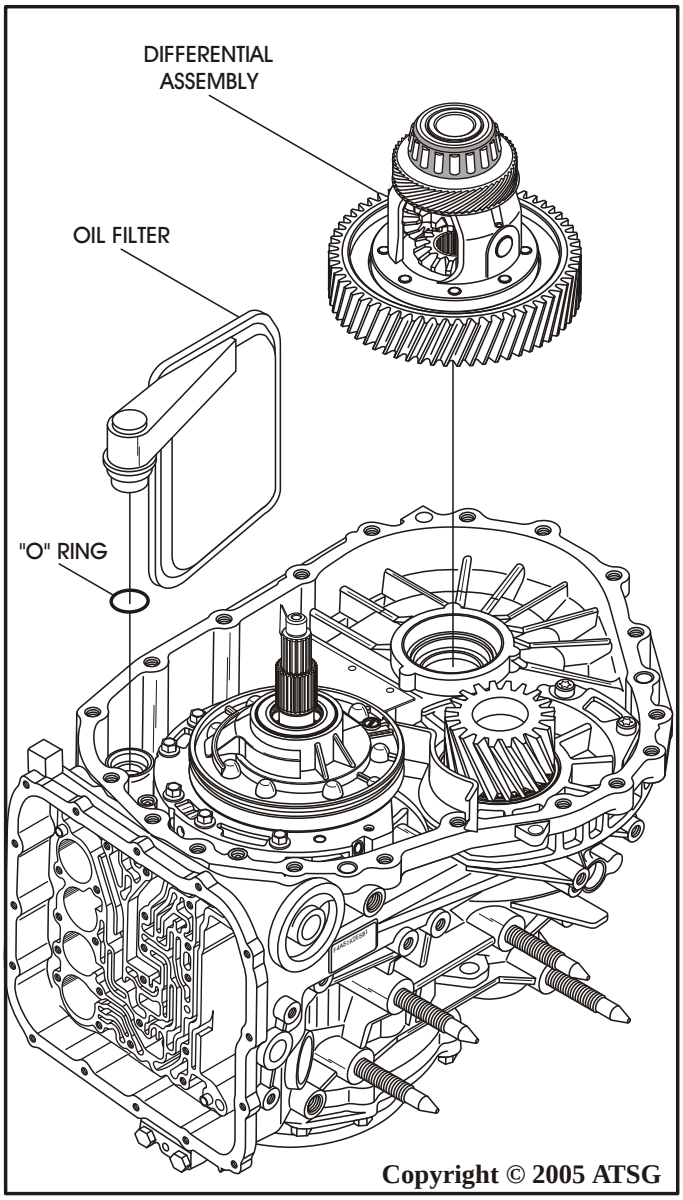


Figure 201

INTERNAL COMPONENTS (CONT'D)

103. Install two new "O" rings into the pockets in transaxle case, as shown in Figure 204, and retain with small amount of Trans-Jel®.
104. Apply a 2 mm (.080") bead of sealant to the converter housing, as shown in Figure 203.
105. Install the converter housing, as shown in Figure 204, while the sealant is still wet.
106. Install the eighteen converter housing bolts, as shown in Figure 204, and torque all bolts to 48 N·m (35 ft.lb.).

Continued on Page 102

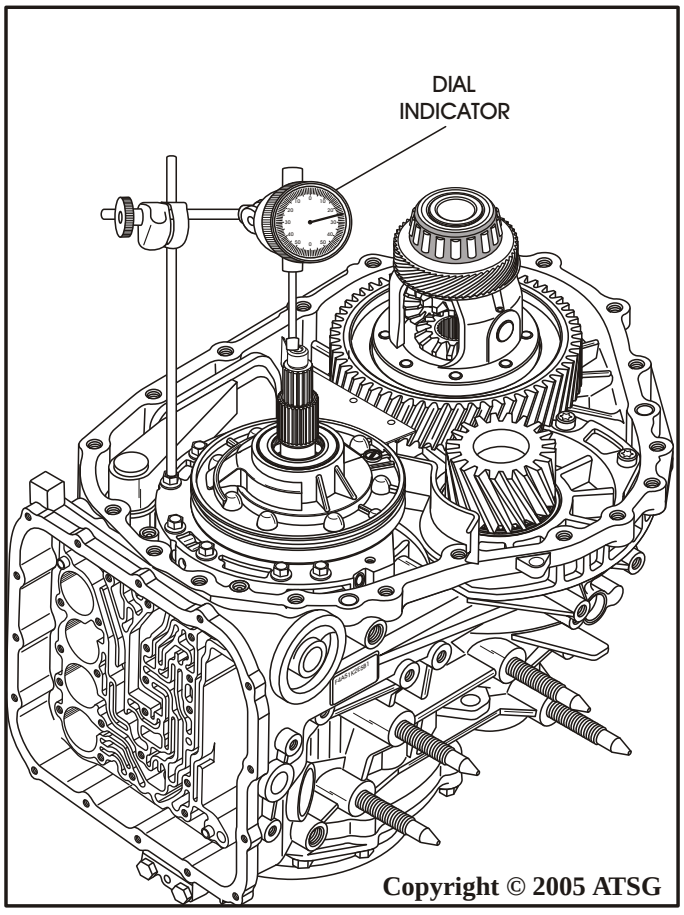


Figure 202

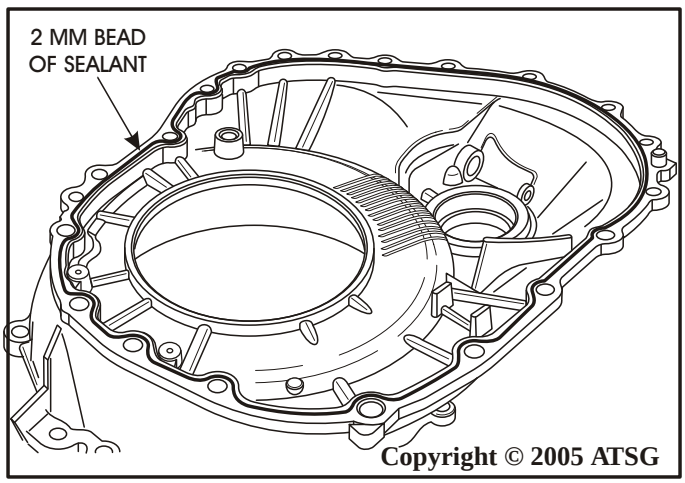


Figure 203

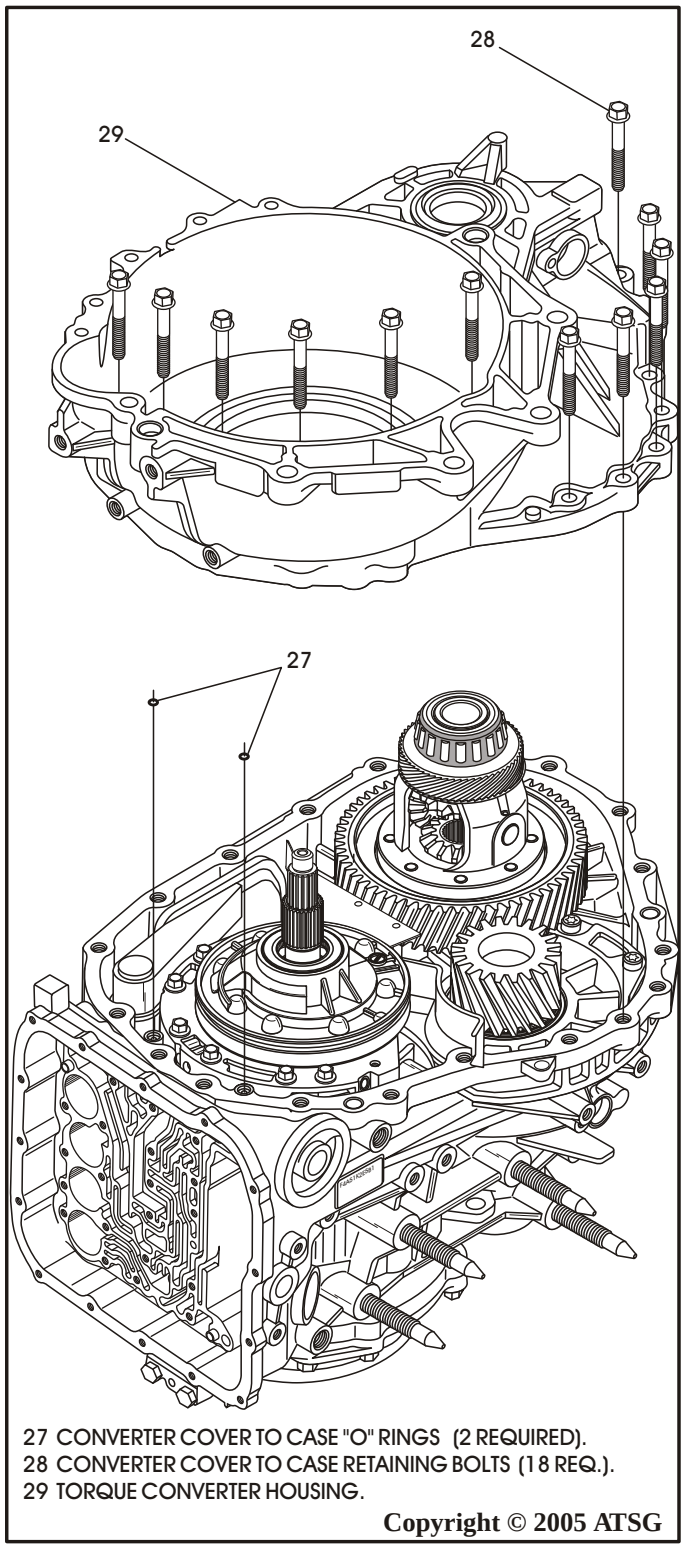
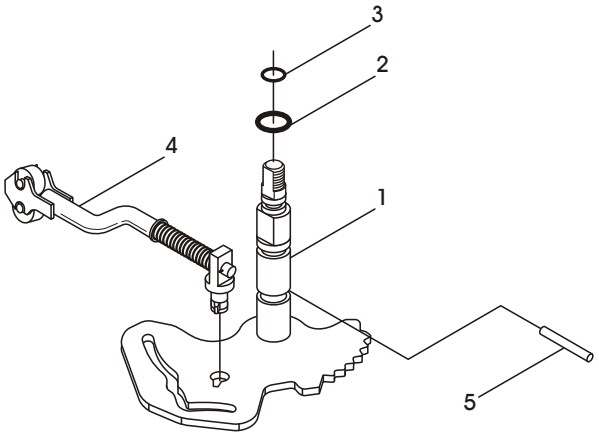


Figure 204



1 MANUAL LINKAGE SHAFT AND INSIDE DETENT LEVER ASSEMBLY.
2 MANUAL SHAFT LARGE "O" RING.
3 MANUAL SHAFT SMALL "O" RING.
4 PARK ACTUATING ROD ASSEMBLY.
5 MANUAL SHAFT RETAINING PIN.

Figure 205

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

107. Install two new "O" rings onto manual shaft, as shown in Figure 205, and lube with small amount of Trans-Jel®.
108. Assemble the park actuating rod to the inside detent lever, as shown in Figure 205 and 206.
109. Install the inside detent lever assembly into the case, as shown in Figure 206, and install the retaining pin through the pan rail and shaft.
110. Install new "O" ring on case connector, as shown in Figure 207, and lube with a small amount of Trans-Jel.
111. Install the internal wire harness from inside the case and through the case bore, as shown in Figure 207, and install snap ring.
112. Lay internal harness back over the pan rail, as shown in Figure 210, so that it is out of the way for accumulator piston and valve body installation.

Continued on Page 103

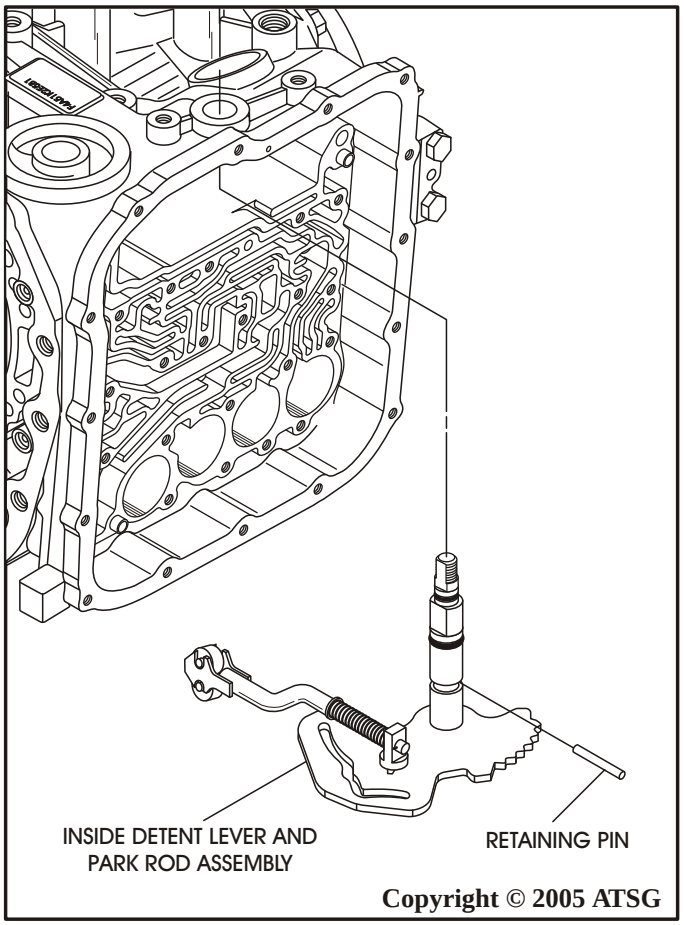


Figure 206

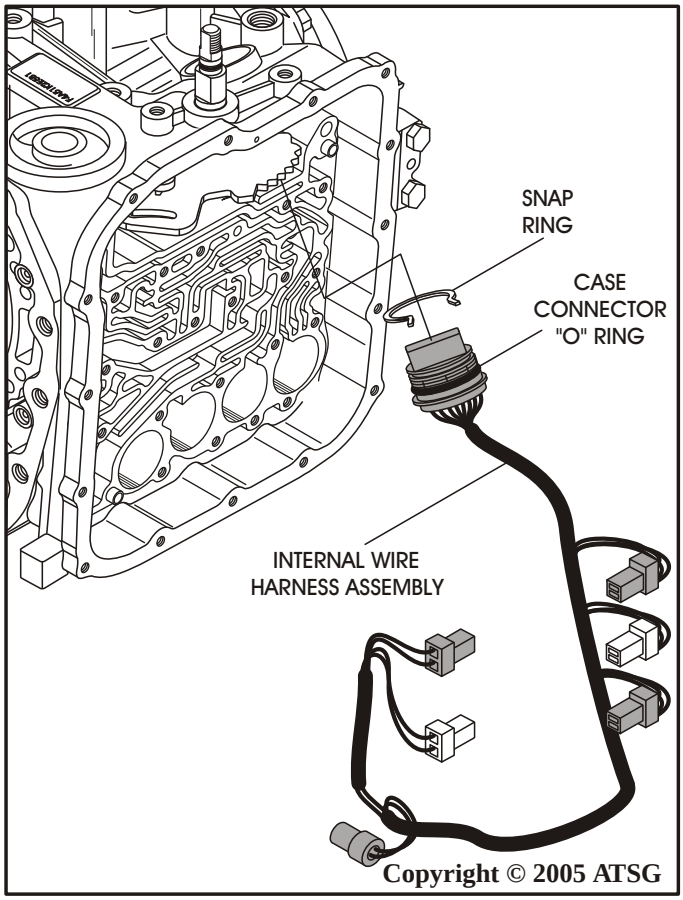


Figure 207

INTERNAL COMPONENTS (CONT'D)

113. Install new scarf cut accumulator piston seals on each of the four accumulator pistons, as shown in Figure 208.
114. Install each accumulator piston, seal and the proper springs, as shown in Figure 210. ***Note: The accumulator springs we observed were identified with blue dye, as shown in Figure 209.***
115. The accumulator pistons and piston seals are common parts, but the accumulator springs must be installed in their proper positions. Double check all of your accumulator spring positions at this time, as we are getting ready to install the valve body and cover them up.

Continued on Page 104

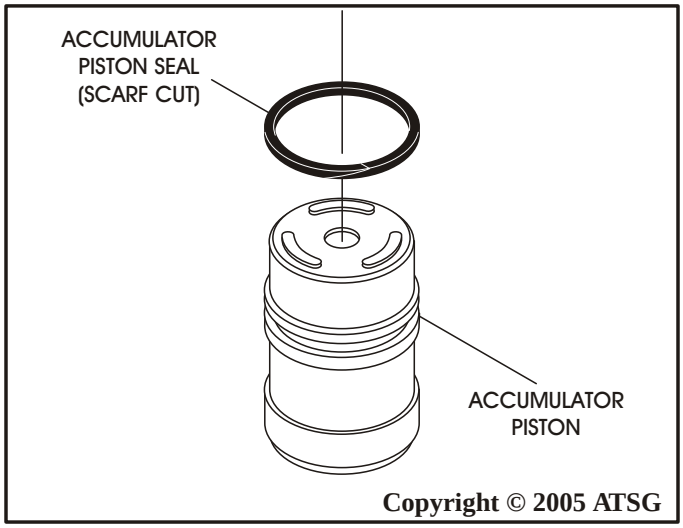
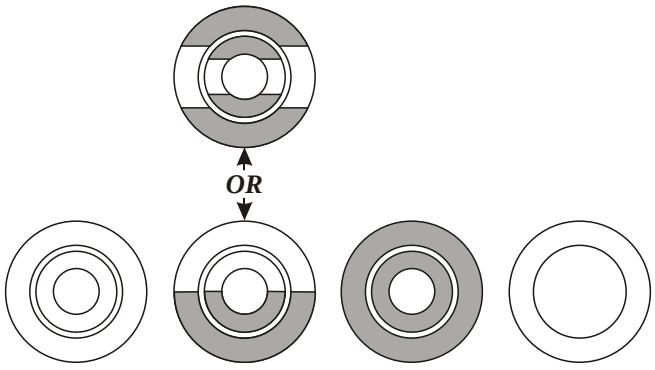


Figure 208

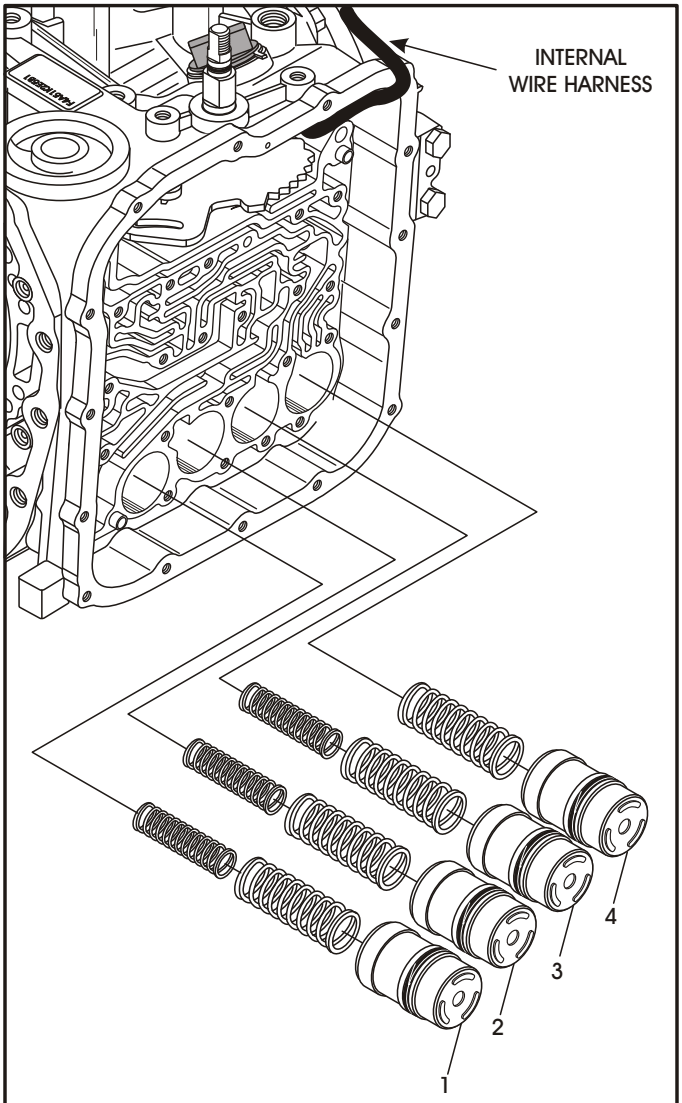
ACCUMULATOR SPRING IDENTIFICATION

NOTE: The shaded areas are the identification "Bluing".



NO.	ACCUMULATOR	I.D. "Bluing"
1	*Low/Reverse Clutch*	*None*
2	*Underdrive Clutch*	*Half or 2/3rds*
3	*2nd Clutch*	*Full Surface*
4	*Overdrive Clutch*	*None*

Figure 209



1 LOW/REVERSE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
2 UNDERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
3 2ND CLUTCH ACCUMULATOR PISTON AND SPRINGS.
4 OVERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRING.

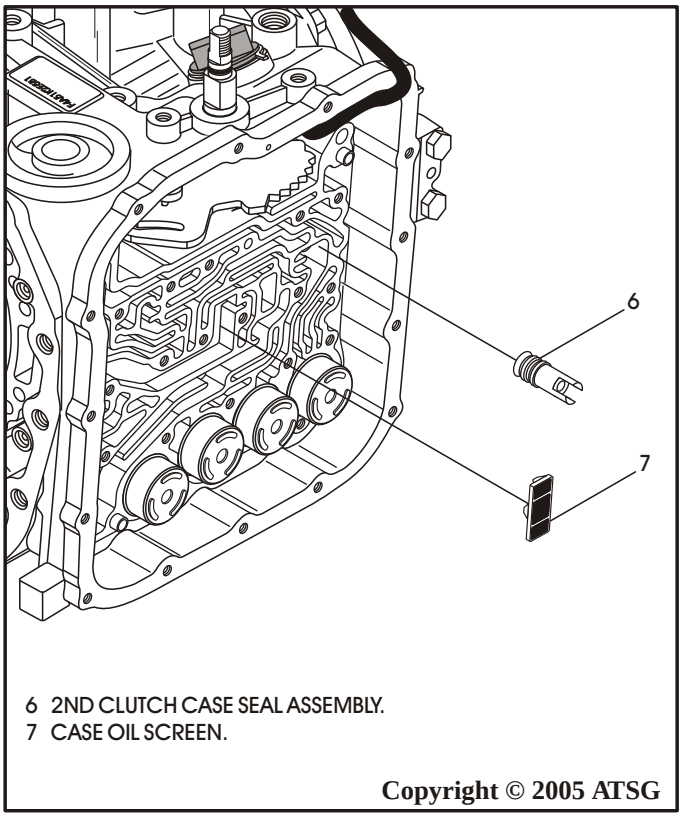
Figure 210

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

116. Install the case oil screen into the worm track as shown in Figure 211.
117. Install a new 2nd clutch case seal assembly, as shown in Figure 211.
118. Ensure that the two steel exhaust balls are still in place in the top of valve body, as shown in Figure 212.
119. Install the pre-assembled valve body assembly over the hollow dowels in the case, as shown in Figure 212.
Note: Ensure that manual valve is engaged into the slot in the inside detent lever as you install the valve body.
120. Install all valve body bolts in their proper locations, as shown in Figure 212.
Note: Refer to Figure 213 for proper bolt location, length and identification.
121. Hand tighten only at this time.

Continued on Page 106



6 2ND CLUTCH CASE SEAL ASSEMBLY.
7 CASE OIL SCREEN.

Figure 211

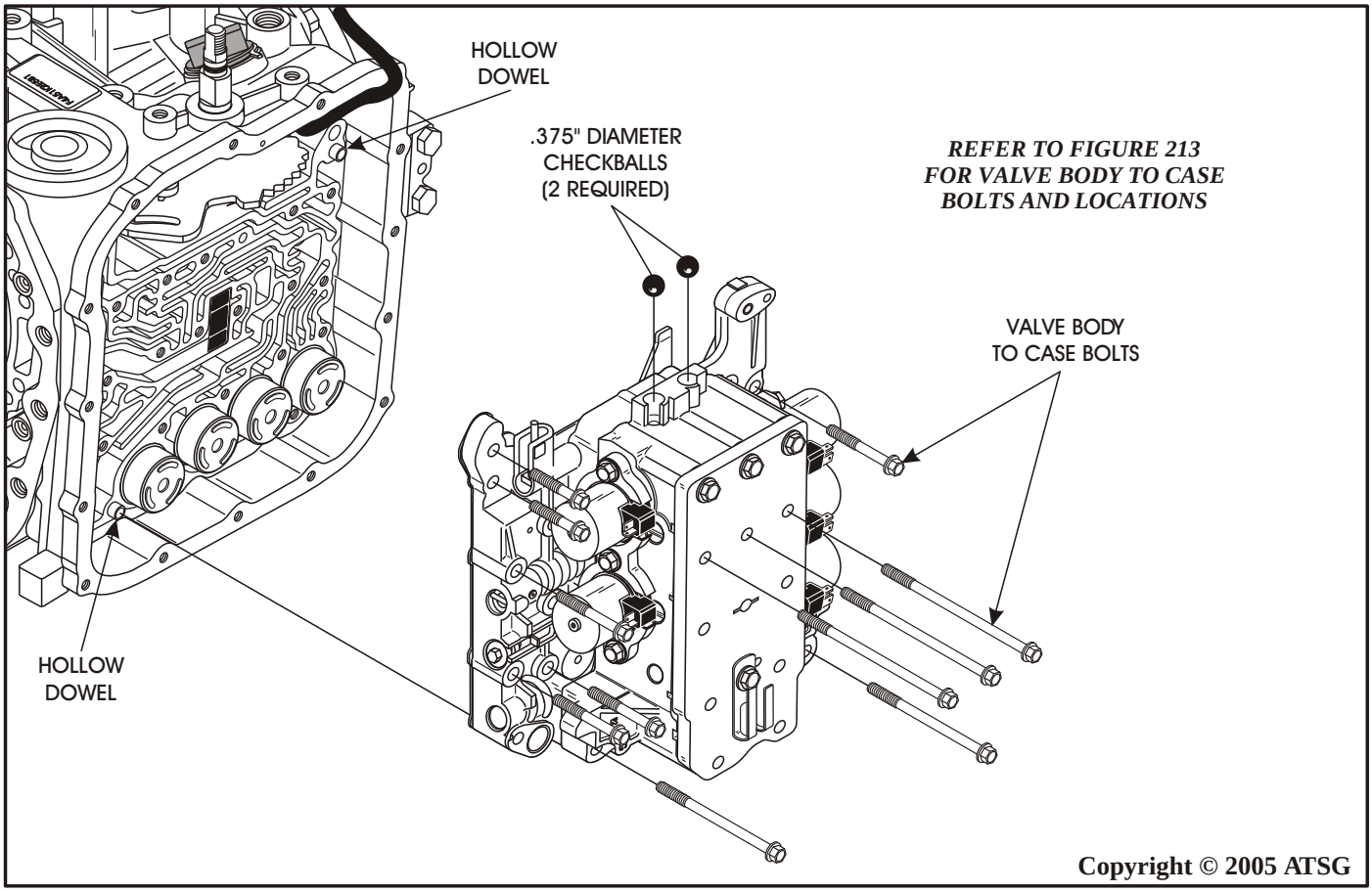
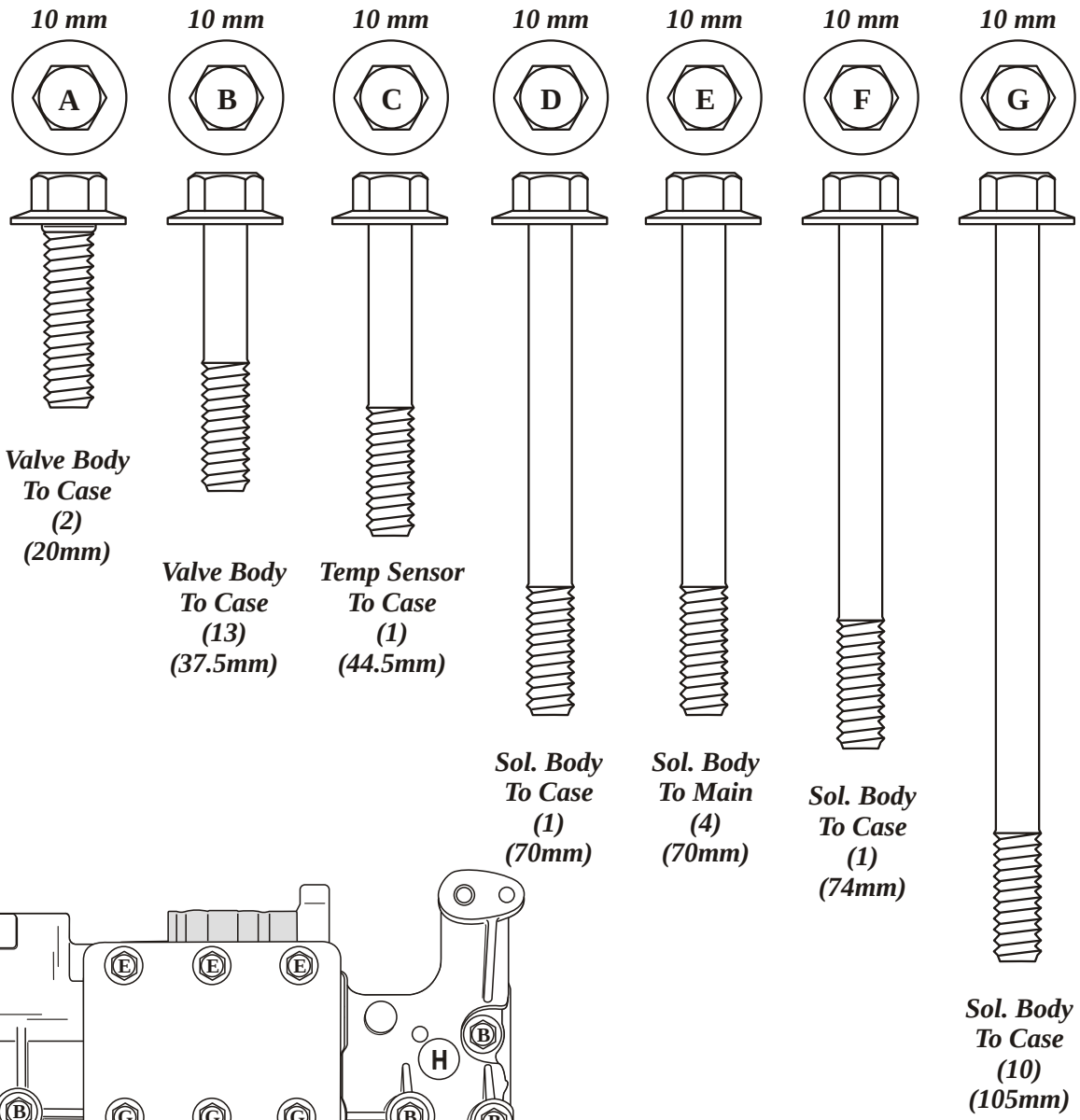


Figure 212

VALVE BODY BOLT CHART AND LOCATIONS



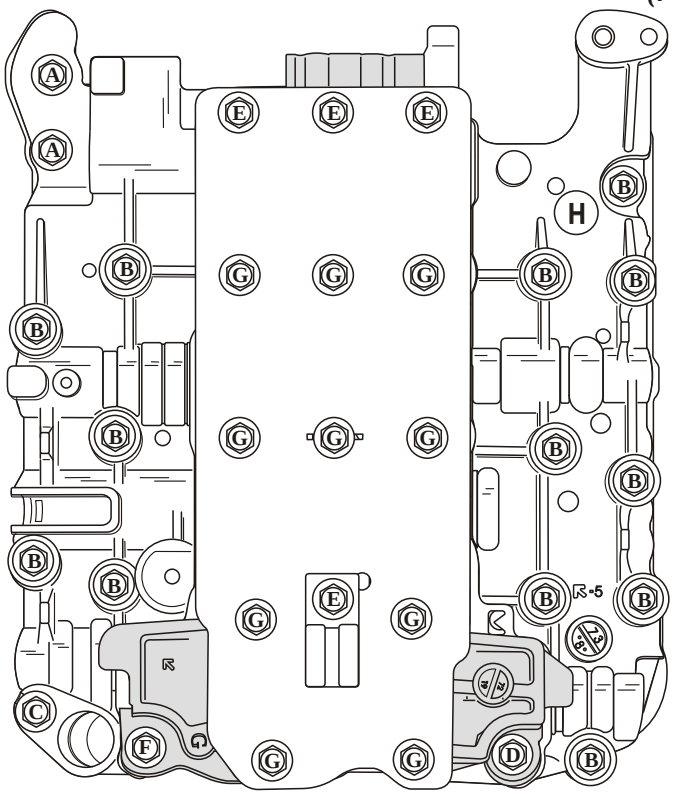


Figure 213

FINAL ASSEMBLY

INTERNAL COMPONENTS (CONT'D)

122. Install a new "O" ring on the transaxle temp sensor, as shown in Figure 214.
123. Install the temperature sensor and retaining bolt, as shown in Figure 214.
124. Now, torque ***all*** valve body bolts to 11 N·m (95 in.lb.), beginning in the center and work in a circular pattern.
125. Check once again to ensure that manual valve is connected to inside detent lever, and install the detent spring, as shown in Figure 214.
126. Torque the bolt to 6 N·m (52 in.lb.).
127. Connect the internal harness connectors to the individual solenoids, and connect the temp sensor, as shown in Figure 215.
    Note: The colors shown in Figure 215 were observed on Mitsubishi Galant and Dodge Stratus. Hyundai and Kia colors may vary.

Continued on Page 107

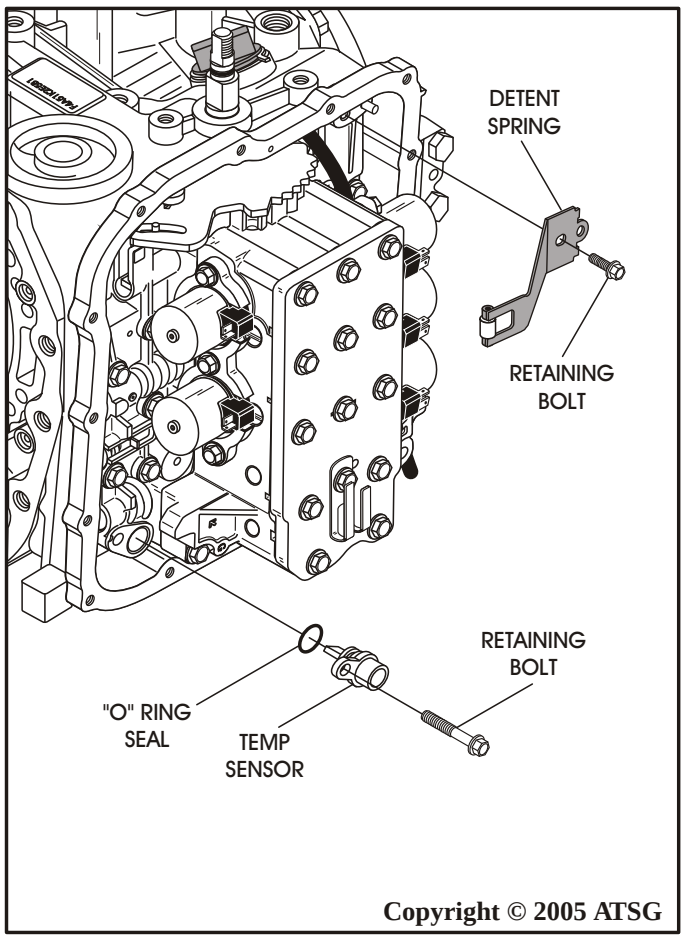


Figure 214

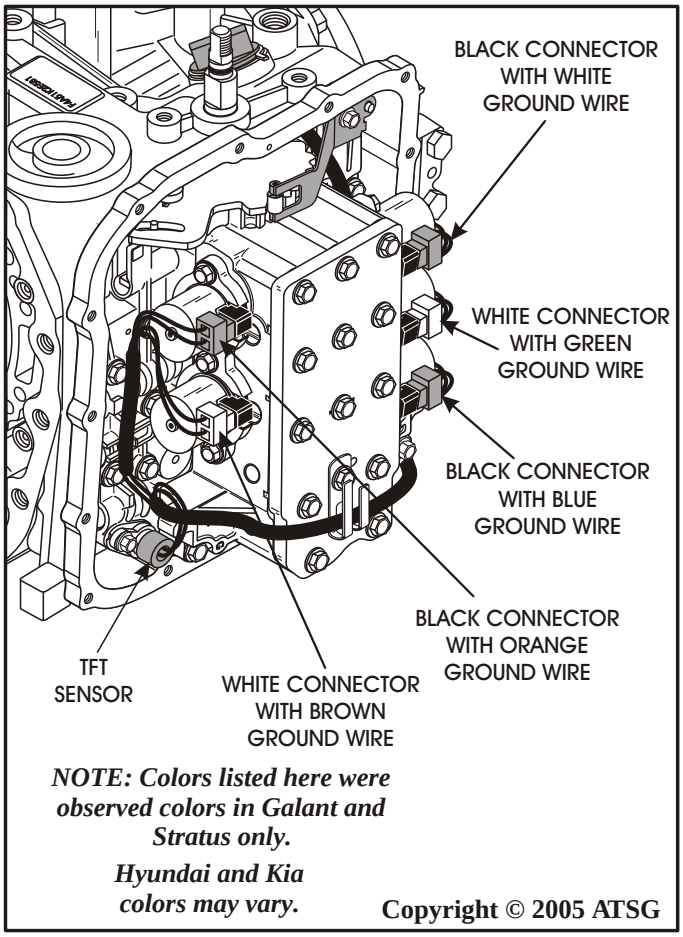


Figure 215

FINAL ASSEMBLY
INTERNAL COMPONENTS (CONT'D)

128. Apply a 2 mm (.080") bead of sealant around the oil pan, as shown in Figure 216.
Note: Install oil pan while sealant is still wet.
129. This would be a good time to ensure that the manual valve is properly hooked, all solenoid connectors and temp sensor are connected.
130. Install the oil pan onto transaxle, as shown in Figure 217, and torque all pan bolts to; 11 N·m (95 in.lb.).
Note: None of the sealant surfaces or fresh sealant can be exposed to ATF for 1 hour, to give sealant time to dry properly.

Continued on Page 108

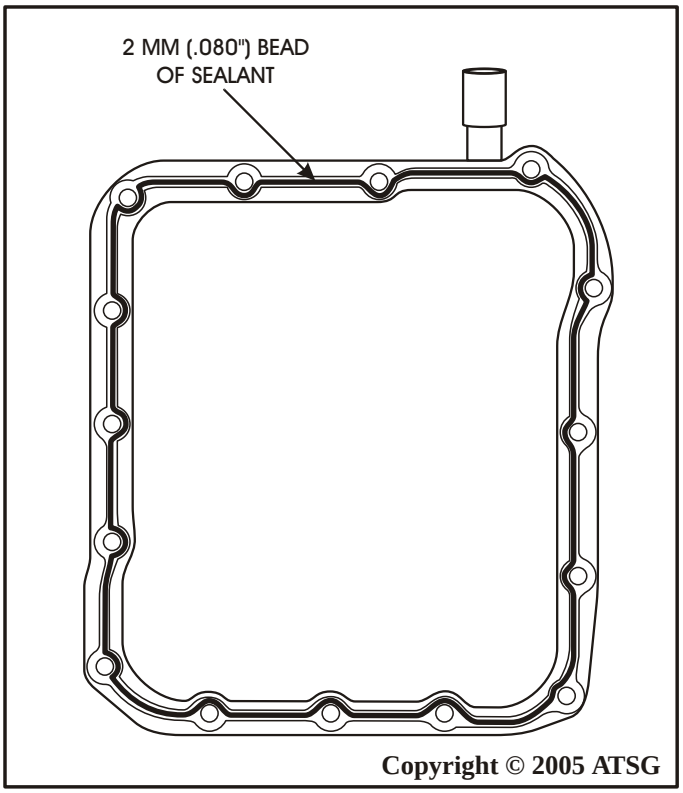


Figure 216

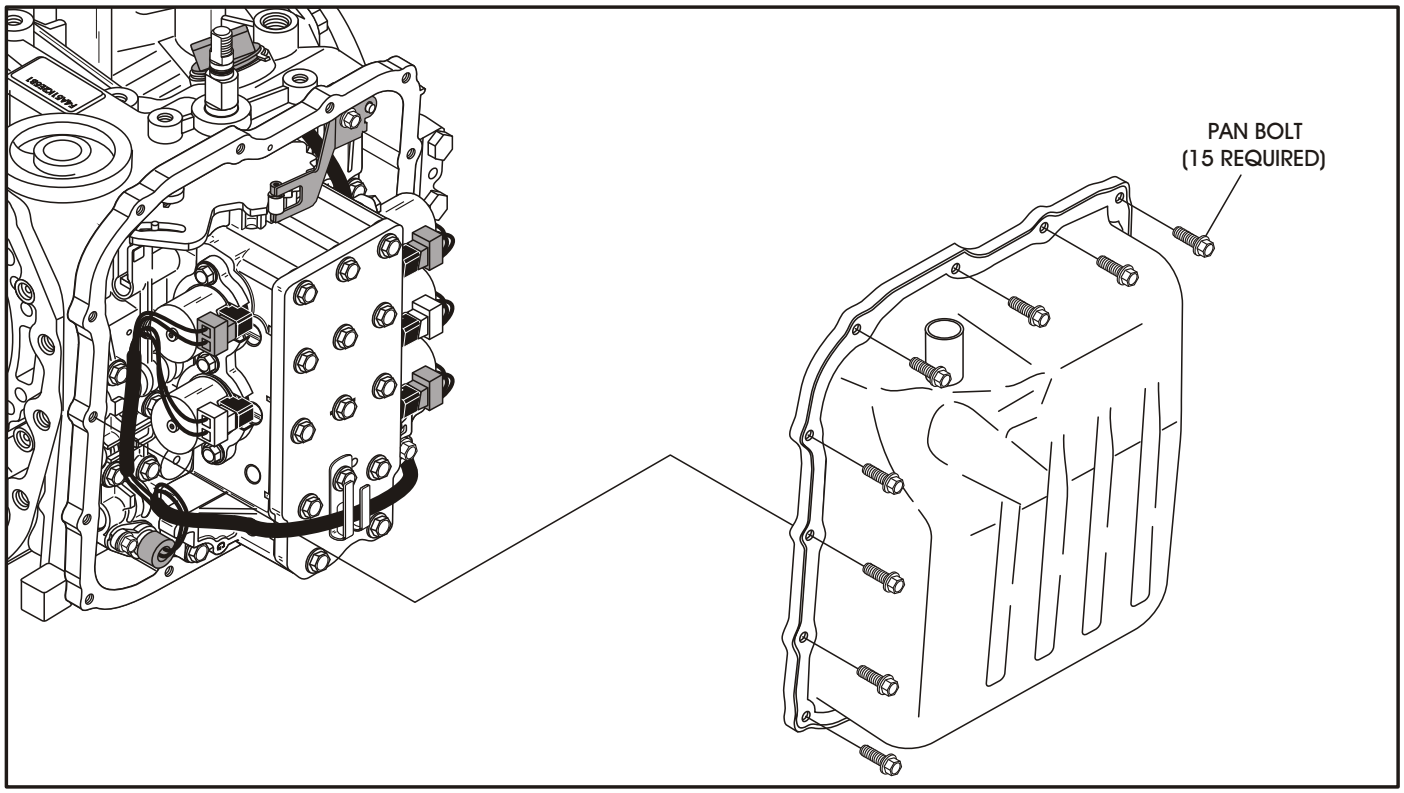


Figure 217

FINAL ASSEMBLY

EXTERNAL COMPONENTS

131. Install a new "O" ring on output shaft speed sensor, lube with small amount of Trans-Jel®, and install the assembly into case, as shown in Figure 218.
132. Torque the output shaft speed sensor bolt to; 11 N·m (95 in.lb.).
133. Install a new "O" ring on input shaft speed sensor, lube with small amount of Trans-Jel®, and install the assembly into case, as shown in Figure 218.
134. Torque the input shaft speed sensor bolt to; 11 N·m (95 in.lb.).
135. Install the fluid level indicator into tube, as shown in Figure 218.
136. Install new external oil filter on transaxle, as shown in Figure 218. Do not over-tighten.
Note: The external oil filter is not used on all model transaxles.

Continued on Page 109

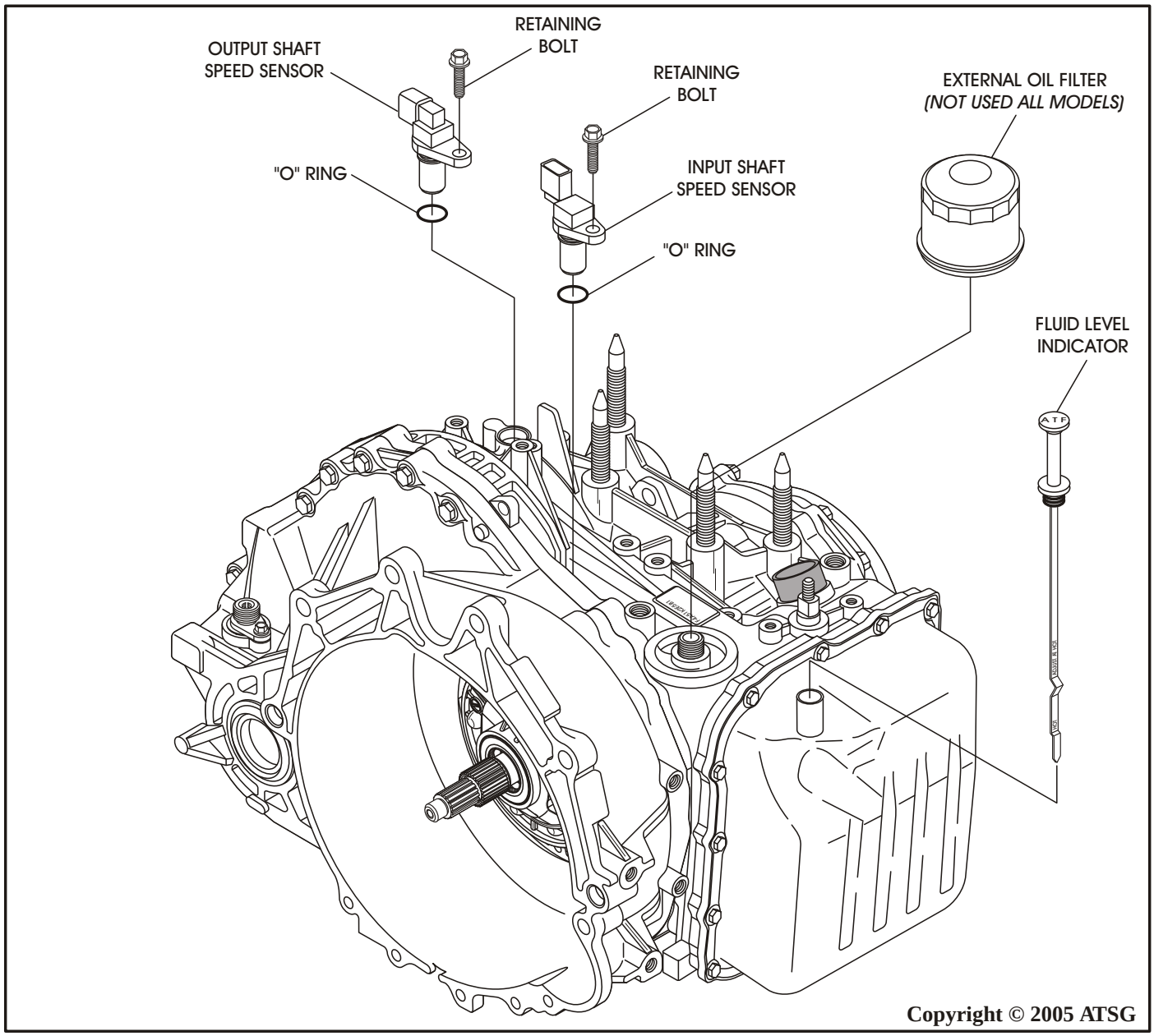


Figure 218

FINAL ASSEMBLY

EXTERNAL COMPONENTS (CONT'D)

137. Install a new "O" ring on speedometer adapter, pulse generator, or the sealing cap, depending on how the transaxle is equipped, as shown in Figure 220.
138. Install new speedometer driven gear shaft seal with lip facing gear, as shown in Figure 219, install retaining clip and driven gear. ***Note Lube seal and gear with Trans-Jel®.***
139. Install speedometer adapter, pulse generator, or sealing cap, depending on how transaxle is equipped, as shown in Figure 220, torque bolt as follows:
Sealing Cap = 5 N·m (9 in.lb.).
Speedometer Adapter = 11 N·m (95 in.lb.).
Pulse Generator = 11 N·m (95 in.lb.).
140. Install the P/N position switch and torque the bolts to 11 N·m (95 in.lb.).
141. Install the manual control lever and torque the nut to 22 N·m (16 ft.lb.).

Continued on Page 110

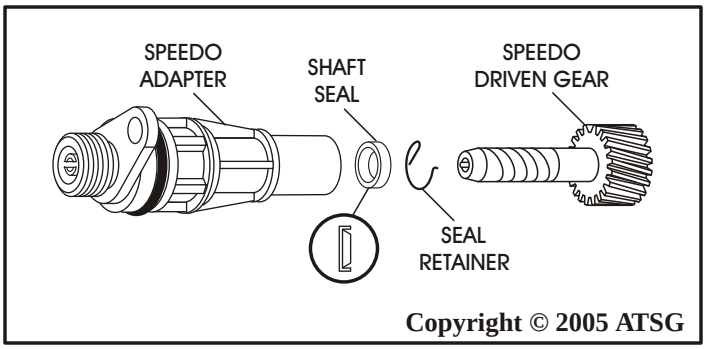


Figure 219

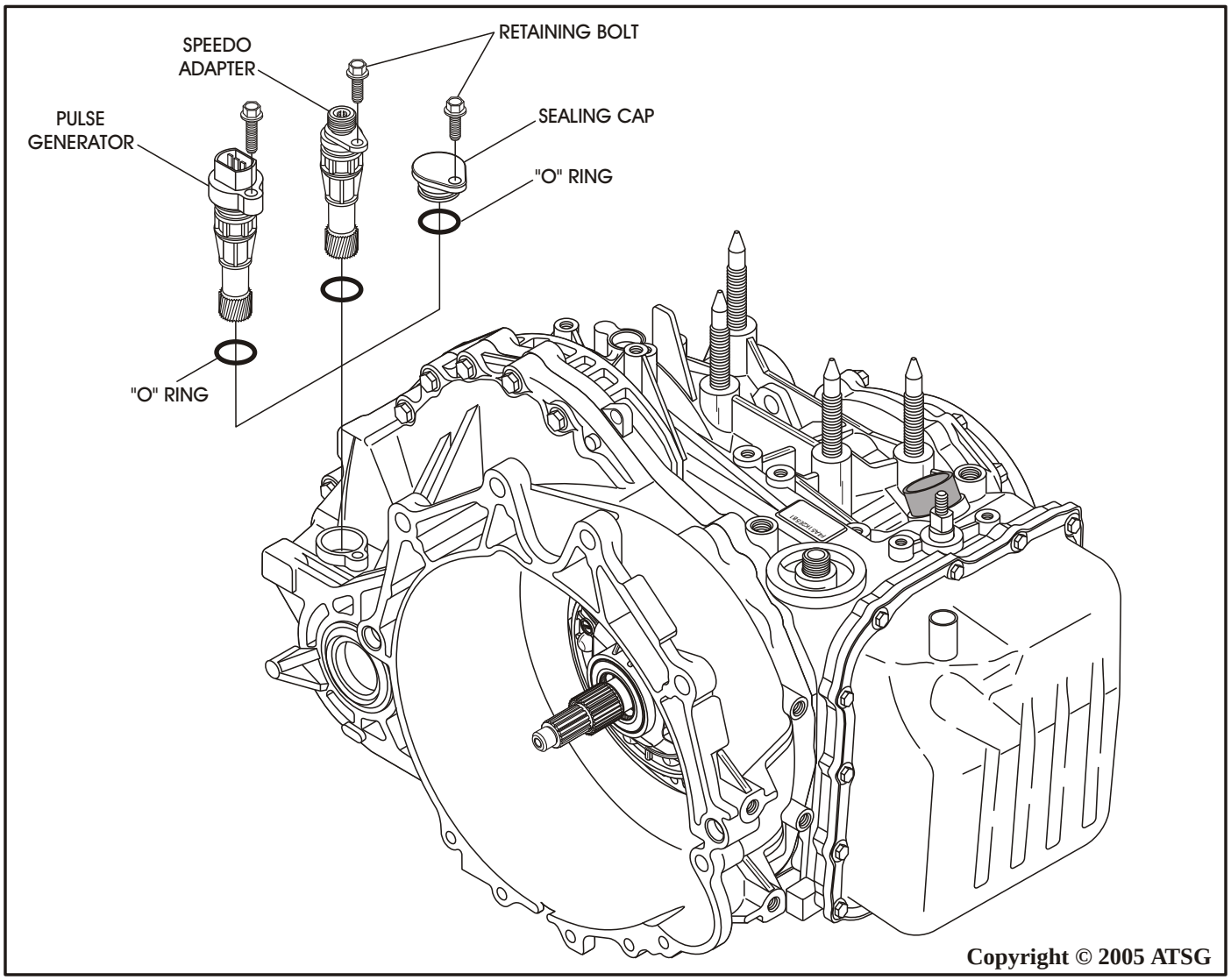


Figure 220

FINAL ASSEMBLY

EXTERNAL COMPONENTS (CONT'D)

142. Install the torque converter into the transaxle, as shown in Figure 222, and ensure that hub is engaged properly in pump gear.
Note: Apply ATF to converter hub and also prime converter to soak the converter clutch before installing, and use care not to damage converter seal during installation.
143. Ensure that converter is engaged into pump gear by measuring from face of bell housing to converter pad surface (See Figure 221). This dimension should be as follows:
F4A41,42 = 12.2 mm (.480").
F4A51 = 9.4 mm (.370").

CONGRATULATIONS, YOU ARE FINISHED.

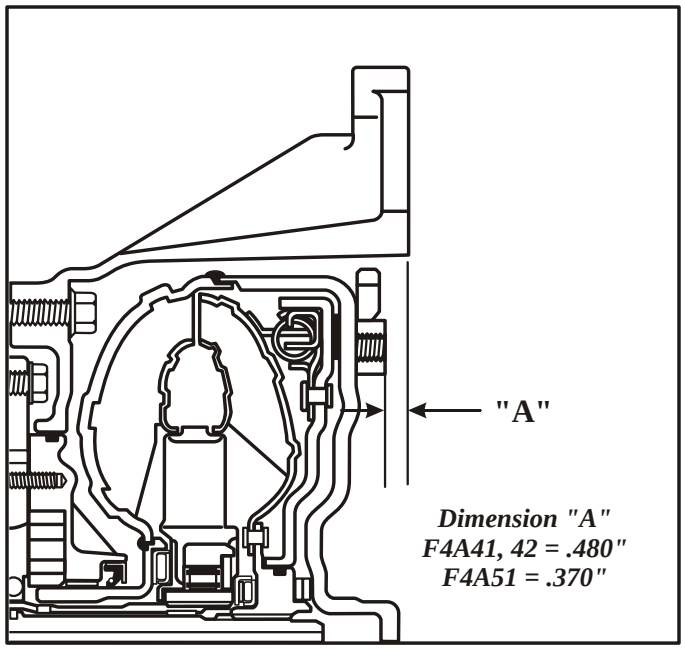


Figure 221

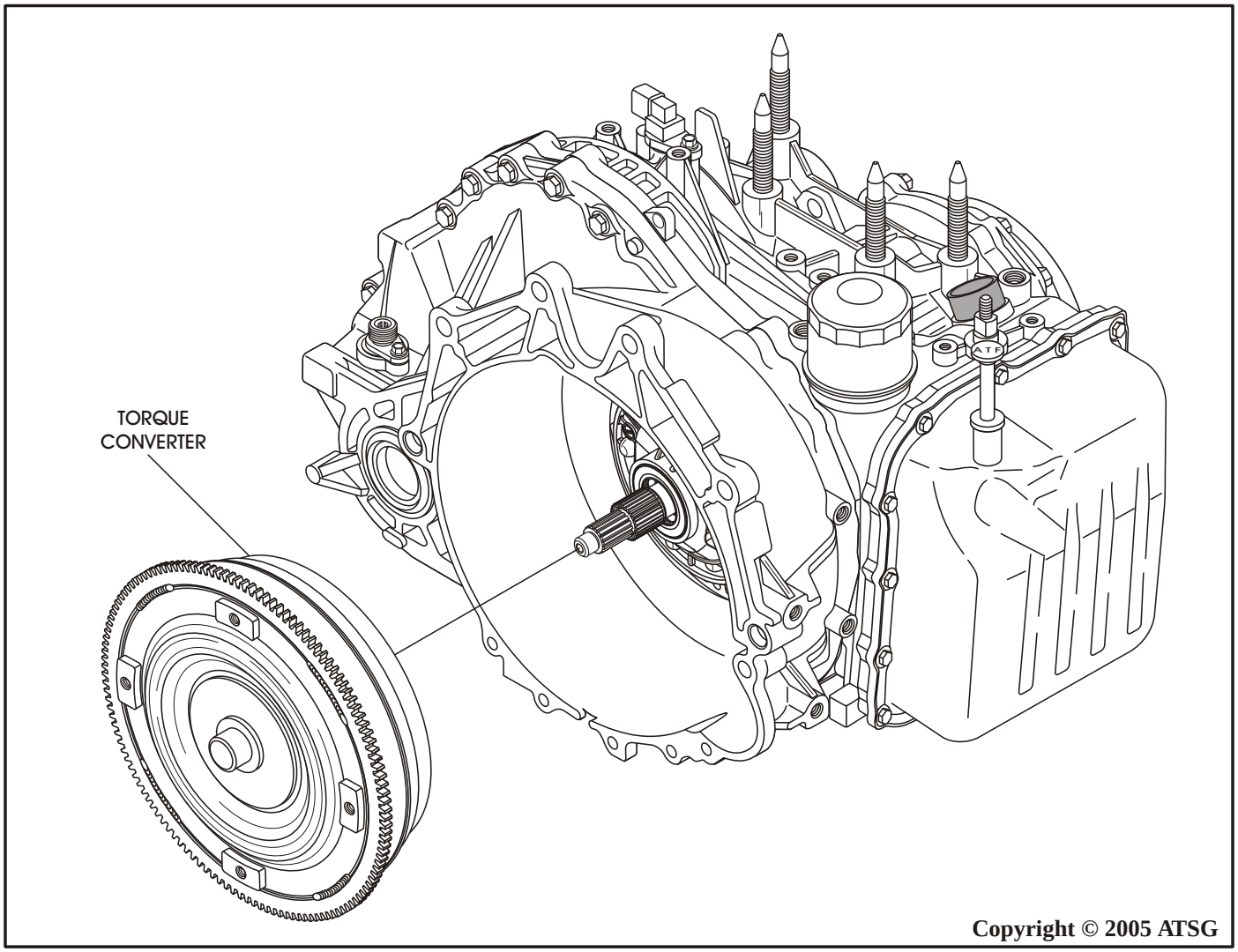
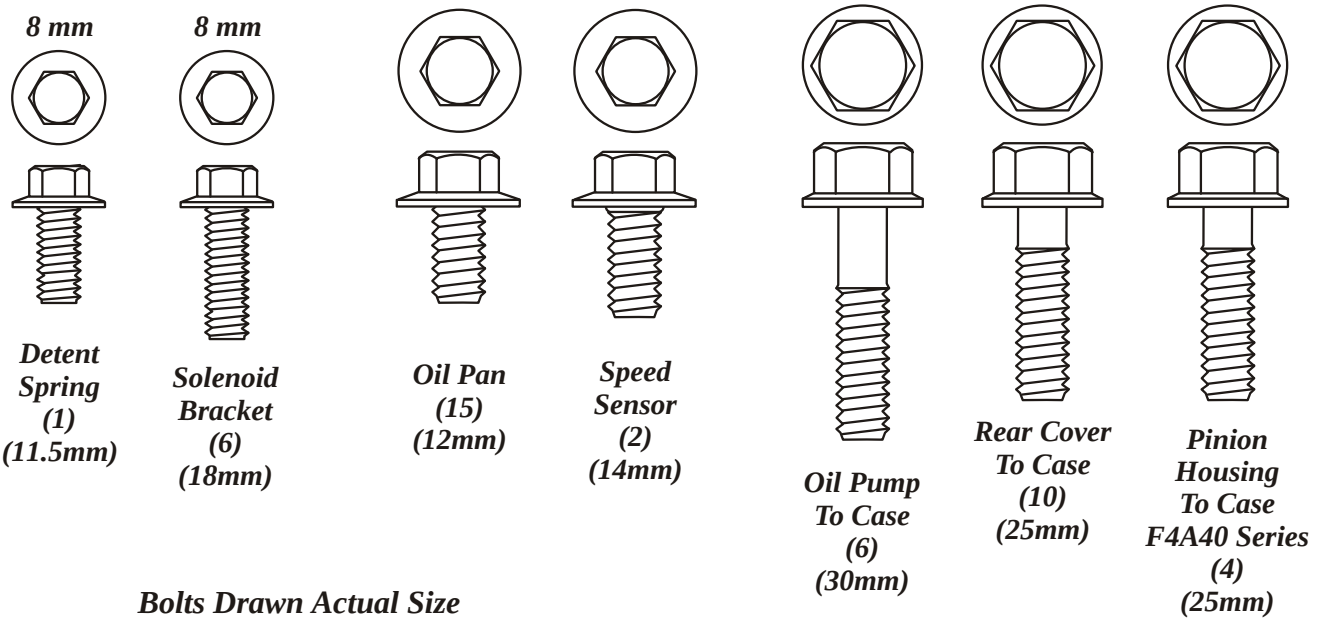
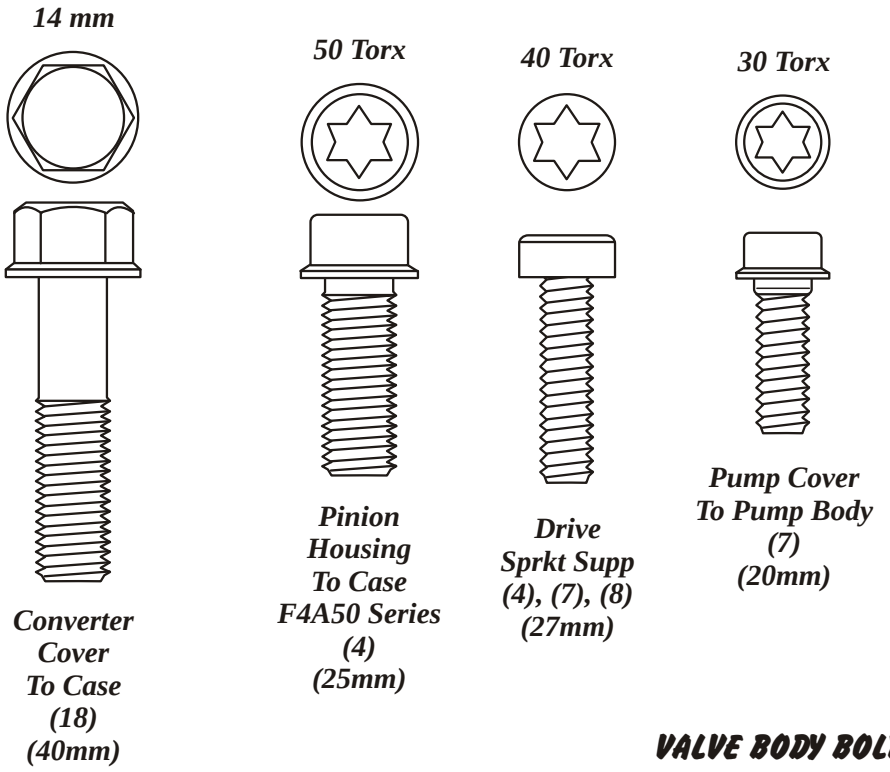


Figure 222

ALL EXCEPT VALVE BODY BOLT CHART



Bolts Drawn Actual Size



VALVE BODY BOLT CHART
FOUND ON PAGE 105

Figure 223

SPECIAL SERVICE TOOLS

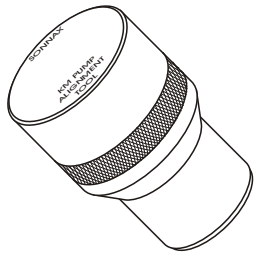
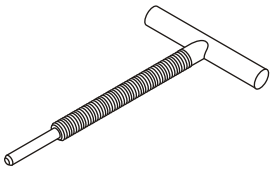
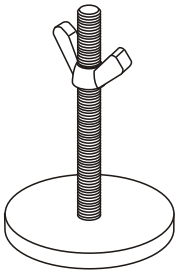
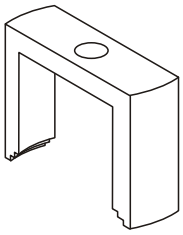
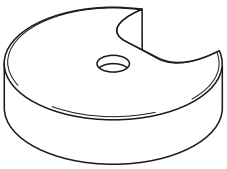
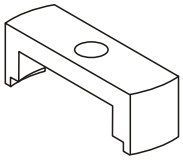
	FUNCTION	40 SERIES	50 SERIES
	OIL PUMP ALIGNMENT	SONNAX® 41005-TL	SONNAX® 41005-TL
	OIL PUMP REMOVAL	MITSUBISHI MD998333	MITSUBISHI MD998333
	UNIVERSAL SPRING COMPRESSOR	MITSUBISHI MD998924	MITSUBISHI MD998924
	REMOVE AND INSTALL ONE-WAY CLUTCH INNER SNAP RING ON F4A40 SERIES	MITSUBISHI MD998903	
	REMOVE AND INSTALL ONE-WAY CLUTCH INNER SNAP RING ON F4A50 SERIES		MITSUBISHI MD998338
	REMOVE AND INSTALL OVERDRIVE CLUTCH SNAP RING	MITSUBISHI MD999590	MITSUBISHI MD999590

Figure 224

SPECIAL SERVICE TOOLS

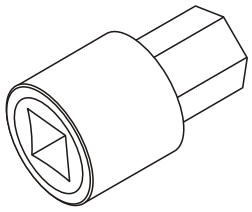
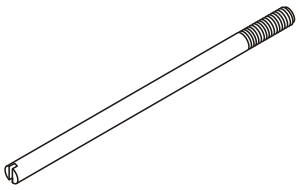
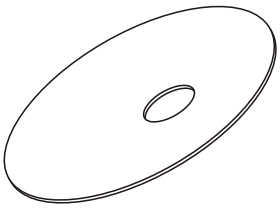
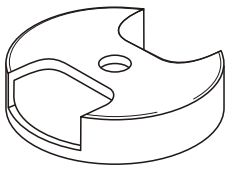
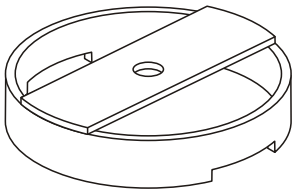
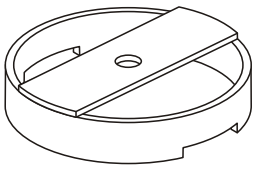
	FUNCTION	40 SERIES	50 SERIES
	HOLDS PINION GEAR TO REMOVE AND INSTALL PINION SHAFT NUT	UNIVERSAL 3/4" (19MM) ALLEN HEAD SOCKET	UNIVERSAL 15/16" (24MM) ALLEN HEAD SOCKET
	ALIGNMENT DOWEL FOR OIL PUMP AND TRANSFER DRIVE GEAR	MITSUBISHI MD998412	MITSUBISHI MD998412
	CLEARANCE DUMMY PLATE FOR LOW/REVERSE AND 2ND CLUTCH CLEARANCE	MITSUBISHI MD991631	MITSUBISHI MD991632
	REMOVE AND INSTALL UNDERDRIVE CLUTCH SNAP RING	MITSUBISHI MD998907	MITSUBISHI MD998907
	MEASUREMENT OF REVERSE CLUTCH END PLAY	MITSUBISHI MB991790	MITSUBISHI MB991789
	MEASUREMENT OF OVERDRIVE CLUTCH AND UNDERDRIVE CLUTCH END PLAY	MITSUBISHI MB991628	MITSUBISHI MB991629

Figure 225

SPECIAL SERVICE TOOLS

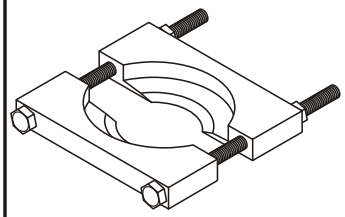
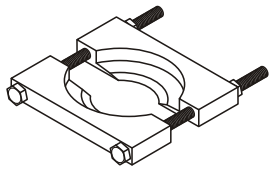
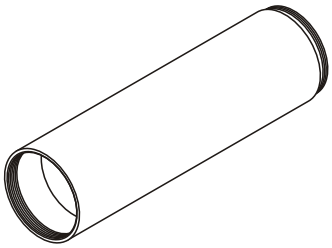
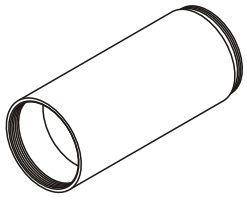
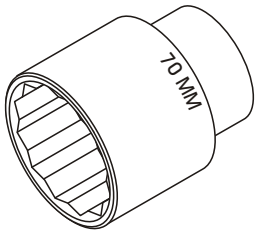
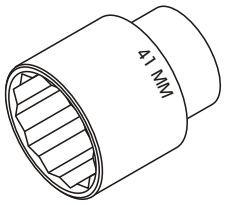
	FUNCTION	40 SERIES	50 SERIES
	BEARING REMOVER	UNIVERSAL OR MITSUBISHI MD998917	UNIVERSAL OR MITSUBISHI MD998917
	BEARING REMOVER	UNIVERSAL OR MITSUBISHI MD998801	UNIVERSAL OR MITSUBISHI MD998801
	INSTALLER CAP	UNIVERSAL OR MITSUBISHI MD998812	UNIVERSAL OR MITSUBISHI MD998812
	INSTALLER ADAPTER FOR INSTALLATION OF DIFFERENTIAL TAPERED ROLLER BEARINGS	MITSUBISHI MD998820	
	INSTALLER ADAPTER FOR INSTALLATION OF PINION LARGE TAPERED BEARING AND THE TRANSFER DRIVEN GEAR	MITSUBISHI MD998823	
	INSTALLER ADAPTER FOR INSTALLATION OF PINION LARGE TAPERED BEARING		MITSUBISHI MD998827

Figure 226

SPECIAL SERVICE TOOLS

	FUNCTION	40 SERIES	50 SERIES
	INSTALLER ADAPTER FOR INSTALLATION OF DIFFERENTIAL TAPERED ROLLER BEARINGS AND TRANSFER DRIVEN GEAR		MITSUBISHI MD998824
	INSTALLER ADAPTER LONG EXTENSION FOR USE WITH CAP AND ADAPTERS ON PINION SHAFT	MITSUBISHI MD998814	MITSUBISHI MD998814
	INSTALLER ADAPTER SHORT EXTENSION FOR USE WITH CAP AND ADAPTERS	MITSUBISHI MD998813	MITSUBISHI MD998813
	REMOVE AND INSTALL BALL BEARING STYLE TRANSFER DRIVE GEAR JAM NUT (70 MM SOCKET)	MITSUBISHI MD991626	
	REMOVE AND INSTALL PINION SHAFT JAM NUT (41 MM SOCKET)	MITSUBISHI MD991625	MITSUBISHI MD991625

In addition to the tools listed above, you will need standard bushing and seal drivers, and "H" gage for end play measurements.

Figure 227

TORQUE SPECIFICATIONS			
Description	*N•m*	*lb.ft.*	*lb.in.*
Oil Pump Stator to Oil Pump Body	*13*	*10*	
Oil Pump to Case	*23*	*17*	
Valve Body to Case (All)	*11*		*95*
Detent Spring to Valve Body	*6*		*55*
Spacer Plate to Valve Body	*6*		*55*
Solenoid Retainer Plates to Valve Body	*6*		*55*
Transfer Drive Gear Nut (Ball Bearing Style)	*191*	*141*	
Transfer Drive Gear Housing to Case	*34*	*25*	
Pinion Shaft Nut	*167*	*123*	
Transfer Driven Gear Housing to Case (F4A40 Series)	*23*	*17*	
Transfer Driven Gear Housing to Case (F4A50 Series)	*54*	*40*	
Differential Ring Gear Bolts	*135*	*100*	
Converter Housing to Case	*48*	*35*	
Rear Cover to Case	*23*	*17*	
Oil Pan to Case	*11*		*95*
Input And Output Shaft Speed Sensor	*11*		*95*
Transaxle Range Sensor to Case	*11*		*95*
External Manual Lever to Shaft Nut	*22*	*16*	
Speedometer Adapter to Case	*11*		*95*
Pulse Generator to Case	*11*		*95*
Sealing Cap to Case	*5*		*9*

These Units Are Very Sensitive To Fluid Requirements *Mitsubishi Diamond SP III*

Figure 228

IMPORTANT SPRAG INFORMATION

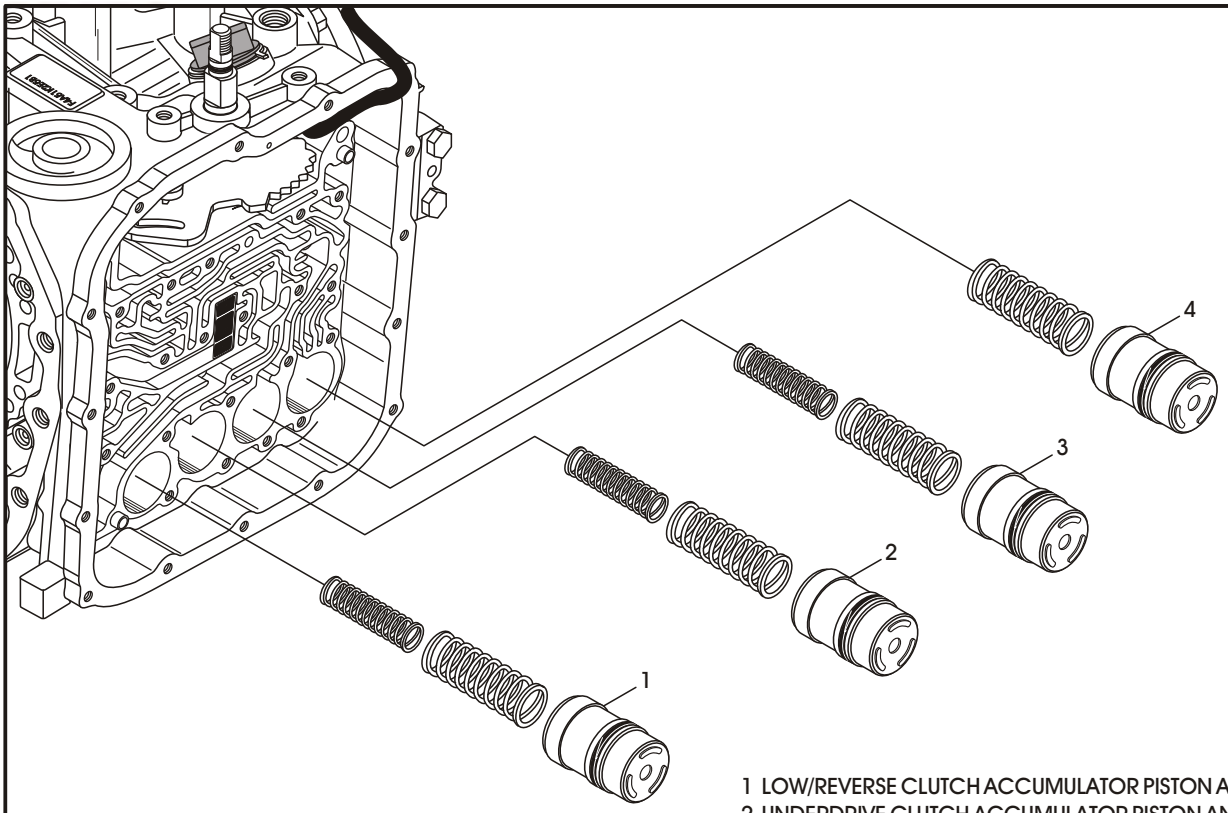
- *Units "without" a one-way clutch, early design F4A41, F4A42, and F4A51 have a 4 bolt transfer drive gear bearing housing that mounts it to the case. On these units the transfer drive gear housing can be removed through the front of the case by removing just the four bolts.*

- *Units that are equipped with a one-way clutch, will have either 7 or 8 transfer drive gear bearing housing mounting bolts. F4A41 and F4A42 will have 7. The F4A51 will have 8. On these units the housing cannot be removed by just removing the bolts. The one-way clutch inner race must be dis-assembled and removed first, which is basically the rear end of the unit.*
  The one-way clutch inner race is splined onto the back of the transfer drive gear and is used as a retainer for the low/reverse piston return spring and retainer plate. It is held in place with a snap ring. This prevents removal of the transfer drive gear and housing, without first dis-assembling the rear end of the unit.

- *The bottom of the one-way clutch inner race, has a groove that a "Lip Type" seal fits into. This seal "must" be installed, and installed in the right direction for proper sprag lubrication.*
  The top of the one-way clutch inner race has two half-moon shaped notches, 180 degrees apart. These half-moon notches must be placed at the 6 and 12 o'clock positions during assembly, again for proper one-way clutch lubrication.

- *1997 Diamonte with the F4A51, without a one-way clutch, use a TCM with a "Metal" case.*
  1997-1/2 and later with F4A51, with a one-way clutch, use a TCM with a "Plastic" case.
  The TCM and the transaxles "are not interchangeable" with one another. If they happen to be interchanged, the following will occur:
  Late "Plastic" TCM installed in early production non one-way clutch unit, will produce neutral condition at 6mph when taking off from a stop.
  Early "Metal" TCM installed in late production unit, equipped with one-way clutch, will result in harsh coasting 2-1 downshift, just before coming to a stop.

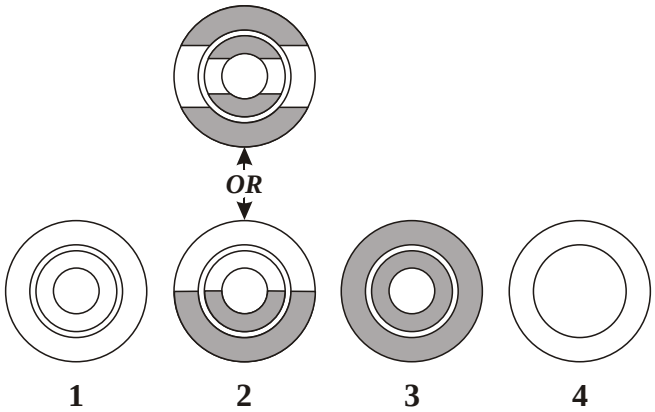
Figure 229



1 LOW/REVERSE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
2 UNDERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRINGS.
3 SECOND CLUTCH ACCUMULATOR PISTON AND SPRINGS.
4 OVERDRIVE CLUTCH ACCUMULATOR PISTON AND SPRING.

ACCUMULATOR SPRING IDENTIFICATION

NOTE: The shaded areas are the identification "Bluing".



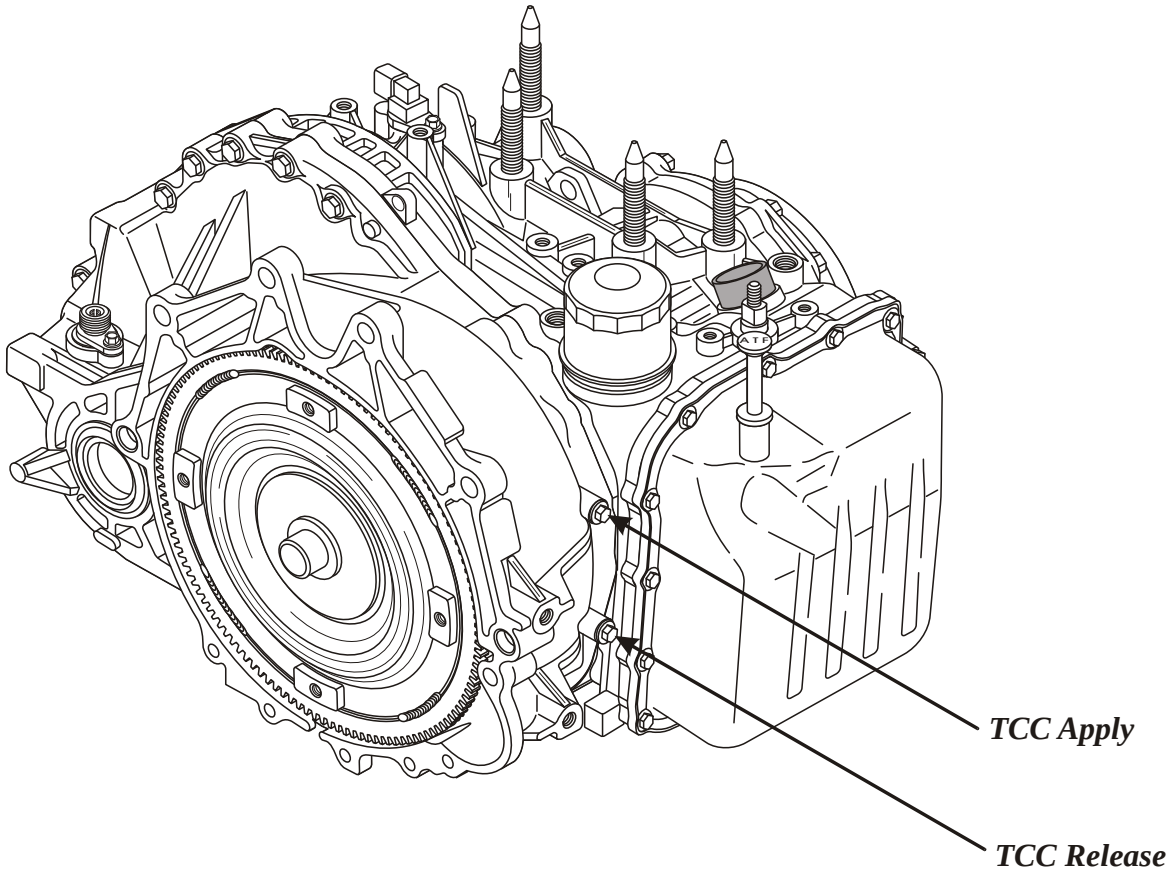
NO.	ACCUMULATOR	I.D. "Bluing"
1	*Low/Reverse Clutch*	*None*
2	*Underdrive Clutch*	*Half or 2/3rds*
3	*2nd Clutch*	*Full Surface*
4	*Overdrive Clutch*	*None*

ACCUMULATOR SPRING PART NUMBERS

SPRING AND LOCATION	PART NUMBER
Low/Reverse Outer	*MD757750*
Low/Reverse Inner	*MD758139*
Underdrive Outer	*MD758143*
Underdrive Inner	*MD758144*
2nd Clutch Outer	*MD758138*
2nd Clutch Inner	*MD758140*
Overdrive Outer	*MD757750*
Overdrive Inner	*Not Used*

Figure 230

PRESSURE TAP LOCATIONS



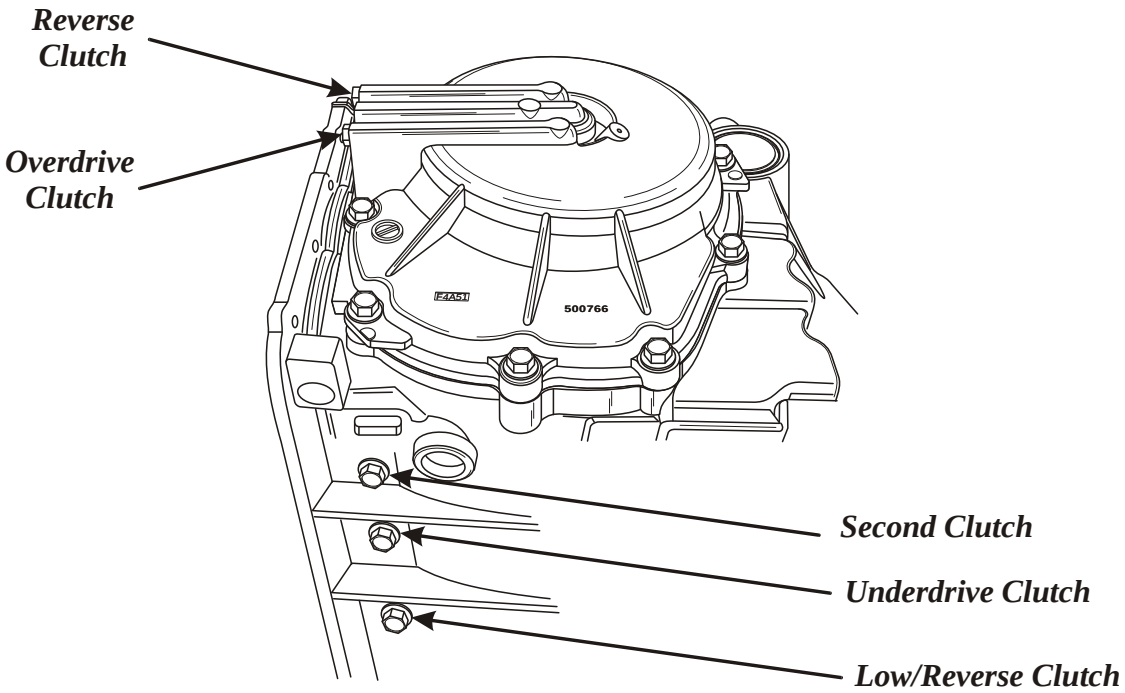


Figure 231

LINE PRESSURE TEST SPECIFICATIONS

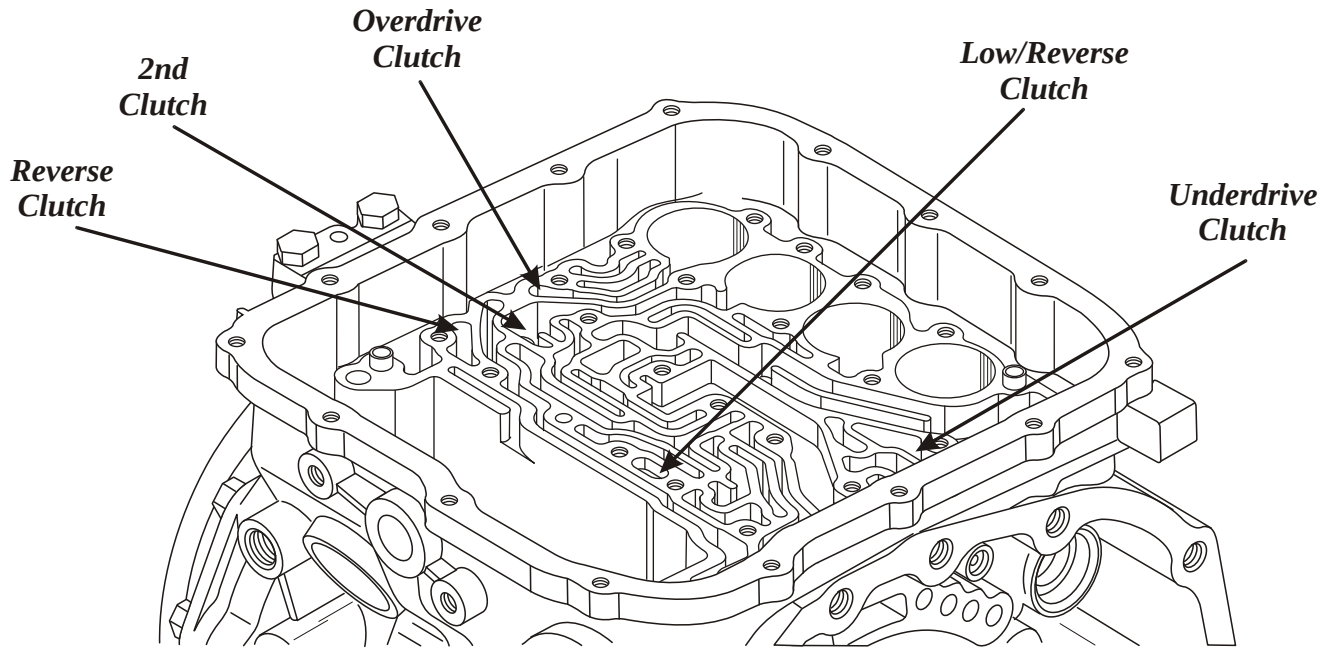
PRESSURES (PSI) MEASURED AT 2500 RPM

Gear	Underdrive Clutch	Second Clutch	Overdrive Clutch	Low/Rev Clutch	Reverse Clutch	T.C.C. Apply	T.C.C. Release	
Park				37-50			* 37-57	
Reverse				184-256	184-256		* 73-101	
Neutral				37-50			* 37-57	
"D"-1st	147-152			147-152			* 73-101	
"D"-2nd	147-152	147-152					* 73-101	
"D"-3rd	113-127		113-127			**		
"D"-4th		113-127	113-127			**		

** TCC Release (DR) pressures measured at 1500 RPM.*

*** TCC Apply (DA) pressures may vary between 0 and 50 psi, when OFF, depending on throttle opening and vehicle speed. With TCC fully applied pressure should be approximately 100 psi.*

CASE PASSAGE IDENTIFICATION FOR CLUTCH PACKS



The case passages for air checking are identified here for you, but this task is made much easier with an air test plate that is currently only available from Zoom Technology.

Figure 232