# SPECIFICATIONS

## TEMPERATURE VERSUS RESISTANCE - B13 AUTOMATIC TRANSMISSION FLUID TEMPERATURE SENSOR

### Temperature Versus Resistance - B13 Automatic Transmission Fluid Temperature Sensor

| Temperature | Resistance |
|---|---|
| 140B°C (284B°F) | 69 to 73 ohms |
| 130B°C (266B°F) | 86 to 90 ohms |
| 120B°C (248B°F) | 110 to 114 ohms |
| 110B°C (230B°F) | 140 to 144 ohms |
| 100B°C (212B°F) | 182 to 186 ohms |
| 95B°C (203B°F) | 211 to 215 ohms |
| 90B°C (194B°F) | 239 to 243 ohms |
| 85B°C (185B°F) | 279 to 283 ohms |
| 80B°C (176B°F) | 318 to 322 ohms |
| 75B°C (167B°F) | 374 to 378 ohms |
| 70B°C (158B°F) | 430 to 434 ohms |
| 65B°C (149B°F) | 509 to 513 ohms |
| 60B°C (140B°F) | 589 to 593 ohms |
| 55B°C (131B°F) | 705 to 709 ohms |
| 50B°C (122B°F) | 821 to 825 ohms |
| 45B°C (113B°F) | 994 to 998 ohms |
| 40B°C (104B°F) | 1.166 k to 1.170 kohms |
| 35B°C (95B°F) | 1.427 k to 1.431 kohms |
| 30B°C (86B°F) | 1.688 k to 1.692 kohms |
| 25B°C (77B°F) | 2.093 k to 2.097 kohms |
| 20B°C (68B°F) | 2.498 k to 2.502 kohms |
| 15B°C (59B°F) | 3.141 k to 3.145 kohms |
| 10B°C (50B°F) | 3.784 k to 3.788 kohms |
| 5B°C (23B°F) | 4.835 k to 4.839 kohms |
| 0B°C (32B°F) | 5.886 k to 5.890 kohms |
| -5B°C (23B°F) | 7.652 k to 7.656 kohms |
| -10B°C (14B°F) | 9.418 k to 9.422 kohms |
| -15B°C (5B°F) | 12.463 k to 12.467 kohms |
| -20B°C (-4B°F) | 15.509 k to 15.513 kohms |
| -25B°C (-13B°F) | 20.941 k to 20.945 kohms |
| -30B°C (-22B°F) | 26.374 k to 26.378 kohms |
| -35B°C (-31B°F) | 36.431 k to 36.435 kohms |
| -40B°C (-40B°F) | 46.489 k to 46.493 kohms |

## FASTENER SPECIFICATIONS

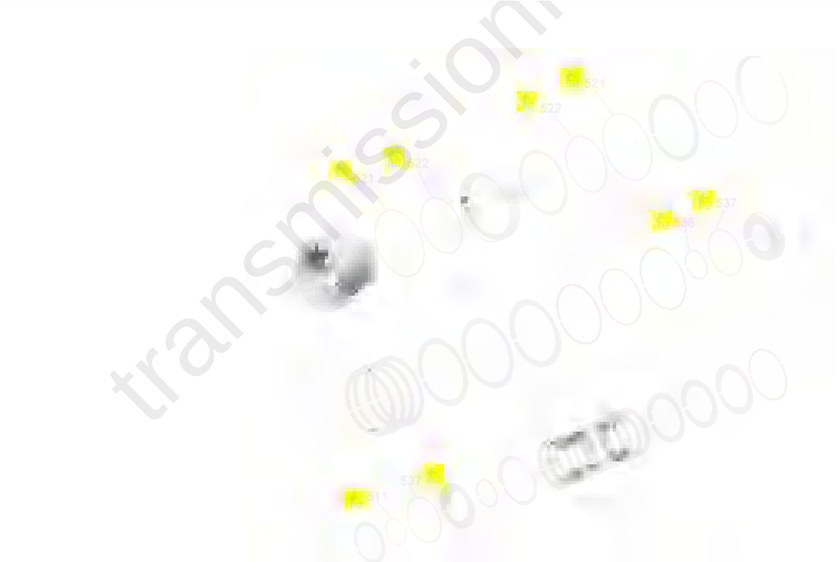


Fig. 1: Exploded View Of 1-2-3-4-6-7-8-10 Reverse And 4-5-6-7-8-9-10 Reverse Clutch Assembly Components
Courtesy of GENERAL MOTORS COMPANY

**1-2-3-4-6-7-8-10 Reverse and 4-5-6-7-8-9-10 Reverse Clutch Assembly**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 510 | 2-3-4-5-7-9-10 Clutch Piston Dam Retaining Ring | - | - | - | Triple Clutch Housing Assemble |
| 511 | 2-3-4-5-7-9-10 Clutch Piston Seal - Inner | Yes | - | - | Triple Clutch Housing Assemble |
| 521 | 4-5-6-7-8-9-10-Reverse Clutch Piston Seal - Outer [2x] | Yes | - | - | Triple Clutch Housing Assemble |
| 522 | 4-5-6-7-8-9-10-Reverse Clutch Piston Seal - Inner [2x] | Yes | - | - | Triple Clutch Housing Assemble |
| 527 | 4-5-6-7-8-9-10-Reverse Clutch Piston Dam Retaining Ring | - | - | - | Triple Clutch Housing Assemble |
| 533 | 4-5-6-7-8-9-10-Reverse Clutch Backing Plate Retaining Ring - Inner | - | - | - | Triple Clutch Housing Assemble |
| 534 | 4-5-6-7-8-9-10-Reverse Clutch Backing Plate Retaining Ring - Middle | - | - | - | Triple Clutch Housing Assemble |

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 535 | 4-5-6-7-8-9-10-Reverse Clutch Backing Plate Retaining Ring - Outer | - | - | - | Triple Clutch Housing Assemble |
| 536 | 1-2-3-4-6-7-8-10-Reverse Clutch Piston Seal - Inner | Yes | - | - | Triple Clutch Housing Assemble |
| 537 | 1-2-3-4-6-7-8-10-Reverse Clutch Piston Seal - Outer [2x] | Yes | - | - | Triple Clutch Housing Assemble |
| 547 | 1-2-3-4-6-7-8-10-Reverse Clutch Backing Plate Retaining Ring | - | - | - | Triple Clutch Housing Assemble |

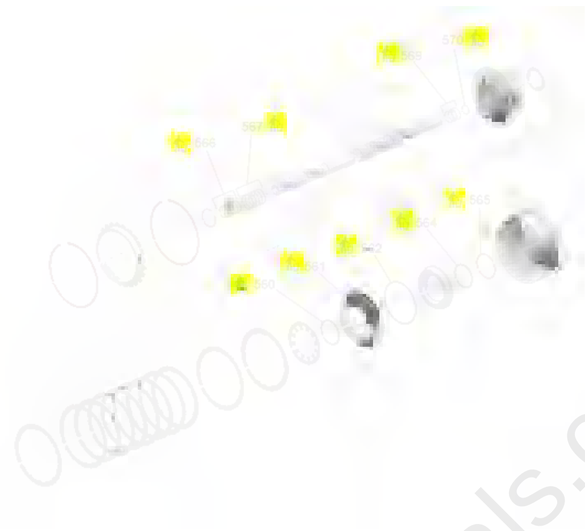


Fig. 2: Exploded View Of 1-3-5-6-7-8-9 Clutch Assembly Components
Courtesy of GENERAL MOTORS COMPANY

**1-3-5-6-7-8-9 Clutch Assembly**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 550 | Direct Overdrive Internal Gear Retaining Ring [2x] | - | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 553 | Turbine Shaft Retainer Ring | - | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 560 | 1-3-5-6-7-8-9 Clutch Piston Seal | Yes | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 561 | 1-3-5-6-7-8-9 Clutch Piston | Yes | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 562 | 1-3-5-6-7-8-9 Clutch Piston Dam Seal | Yes | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 564 | 1-3-5-6-7-8-9 Clutch Piston Dam Seal | Yes | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 565 | 1-3-5-6-7-8-9 Clutch Piston Dam Retaining Ring | Yes | - | - | 1-3-5-6-7-8-9 Clutch Hub and Output Sun Gear Assemble |
| 566 | Turbine Shaft Seal [5x] | Yes | - | - | Turbine Shaft Seal Installation |
| 567 | Turbine Shaft Seal [5x] | Yes | - | - | Turbine Shaft Seal Installation |
| 569 | Turbine Shaft Seal [3x] | Yes | - | - | Turbine Shaft Seal Installation |
| 570 | Turbine Shaft Seal | Yes | - | - | Rotating Clutch, Gear, and Shaft Shell Assembly Assemble |



Fig. 3: Exploded View Of 2-3-4-5-7-9-10 Clutch Assembly Components
Courtesy of GENERAL MOTORS COMPANY

**2-3-4-5-7-9-10 Clutch Assembly**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 505 | 2-3-4-5-7-9-10 Clutch Backing Plate Retaining Ring | - | - | - | Triple Clutch Housing Assemble |
| 510 | 2-3-4-5-7-9-10 Clutch Piston Dam Retaining Ring | - | - | - | Triple Clutch Housing Assemble |

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 511 | 2-3-4-5-7-9-10 Clutch Piston Dam Seal - Inner | Yes | - | - | Triple Clutch Housing Assemble |
| 512 | 2-3-4-5-7-9-10 Clutch Piston Seal - Outer [2x] | Yes | - | - | Triple Clutch Housing Assemble |
| 536 | 1-2-3-4-6-7-8-10-Reverse Clutch Piston Seal - Inner | Yes | - | - | Triple Clutch Housing Assemble |



**Automatic Transmission Manual Shift Auxiliary Position Switch**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Steering Wheel Bolt @ Automatic Transmission Manual Shift Auxiliary Position Switch [4x] | - | - | 3.5 N.m (31 lb in) | • Automatic Transmission Manual Shift Auxiliary Position Switch Replacement - Left Side<br>• Automatic Transmission Manual Shift Auxiliary Position Switch Replacement - Right Side |



Fig. 4: Exploded View Of Case And Associated Parts (1 of 5)
Courtesy of GENERAL MOTORS COMPANY

**Case and Associated Parts (1 of 5)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 2 | Input Shaft Support Bolt M8 x 27 [12x] | Yes | Yes | **Input Shaft Support Bolt Sequence** | Automatic Transmission Case Front Cover Installation |
| 28 | Automatic Transmission Case Plug M18 x 16.25 [2x] | - | Yes | 40 N.m (29.5 lb ft) | Automatic Transmission Case Plug Installation |
| 78 | Transmission Nut [6x] | - | - | - | Transmission Housing Sound Insulator Installation |
| 84 | Automatic Transmission Case Front Cover | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 398 | Automatic Transmission Case Cover Retaining Ring | - | - | - | Automatic Transmission Case Front Cover Assemble |
| 401 | Automatic Transmission Case Front Cover Bolt M5 x 16.5 | - | - | 4.7 N.m (42 lb in) | Automatic Transmission Case Front Cover Assemble |



Fig. 5: Exploded View Of Case And Associated Parts (2 of 5)
Courtesy of GENERAL MOTORS COMPANY

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**Case and Associated Parts (2 of 5)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 18 | Automatic Transmission Fluid Pan Bolt M6 x 20 [16x] | - | - | **Automatic Transmission Fluid Pan Bolt Sequence** | Transmission Fluid Pan and Filter Assembly Installation |
| 20 | Automatic Transmission Fluid Pump Bolt M6 x 25 [3x] | - | - | 8 N.m (71 lb in) | Automatic Transmission Fluid Pump Installation |
| 22 | Automatic Transmission Fluid Pump Drive Shaft Retaining Ring | Yes | - | - | Automatic Transmission Fluid Pump Driven Gear Installation |
| 26 | Automatic Transmission Fluid Pump Seal | Yes | - | - | Automatic Transmission Fluid Pump Installation |
| 86 | Automatic Transmission Auxiliary Fluid Pump Bolt M6 x 35 [3x] | - | - | 10.5 N.m (93 lb in) | Auxiliary Fluid Pump Installation |
| 87 | Automatic Transmission Auxiliary Fluid Pump Outlet Pipe Seal | Yes | - | - | Auxiliary Fluid Pump Installation |
| 89 | Control Valve Upper Body Bolt M6 x 68 | - | - | 6 N.m (53 lb in) | Auxiliary Fluid Pump Installation |
| 90 | Automatic Transmission Auxiliary Fluid Pump Seal | Yes | - | - | Auxiliary Fluid Pump Installation |
| 92 | Transmission Oil Level Check Plug M6 x 16 | - | - | 9 N.m (80 lb in) | - |

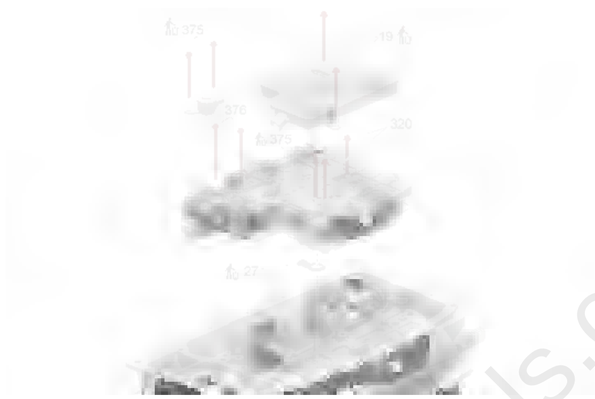


**Fig. 6: Exploded View Of Case And Associated Parts (3 of 5)**
**Courtesy of GENERAL MOTORS COMPANY**

**Case and Associated Parts (3 of 5)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 19 | Automatic Transmission Fluid Filter Bolt M6 x 85 [2x] | Yes | - | First Pass: 5 N.m (44 lb in)<br>Final Pass: 128 degrees | Transmission Fluid Pan and Filter Assembly Installation |
| 27 | Automatic Transmission Fluid Pump Seal | Yes | - | - | Control Valve Assembly Assemble |
| 320 | Control Valve Solenoid Body Bolt M6 x 68 [2x] | - | - | **Control Valve Solenoid Body Bolt Sequence** | Control Valve Assembly and Transmission Wiring Harness Installation |
| 375 | Control Valve Solenoid Body Bolt M6 x 80 [3x] | Yes | Yes | **Control Valve Solenoid Body Bolt Sequence** | Control Valve Assembly and Transmission Wiring Harness Installation |
| 376 | Control Valve Solenoid Body Bolt M6 x 100 [2x] | - | - | **Control Valve Solenoid Body Bolt Sequence** | Control Valve Assembly and Transmission Wiring Harness Installation |

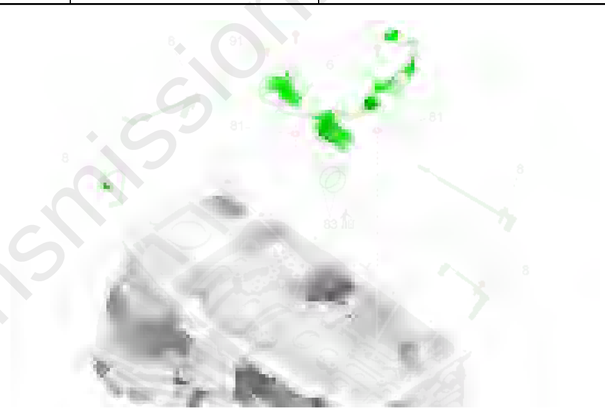


**Fig. 7: Exploded View Of Case And Associated Parts (4 of 5)**
**Courtesy of GENERAL MOTORS COMPANY**

**Case and Associated Parts (4 of 5)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 6 | Automatic Transmission Control Wiring Harness Clip Bracket Bolt M6 x 16 [2x] | - | - | 9 N.m (80 lb in) | Control Valve Assembly and Transmission Wiring Harness Installation |
| 8 | Automatic Transmission Speed Sensor Bolt M6 x 20 [4x] | - | - | 9 N.m (80 lb in) | Control Valve Assembly and Transmission Wiring Harness Installation |
| 81 | Automatic Transmission Control Wiring Harness Retainer [2x] | Yes | - | - | Control Valve Assembly and Transmission Wiring Harness Installation |
| 83 | Wiring Harness Connector Seal [2x] | Yes | - | - | Control Valve Assembly and Transmission Wiring Harness Installation |
| 91 | Automatic Transmission Control Wiring Harness Retainer | Yes | - | - | Control Valve Assembly and Transmission Wiring Harness Installation |

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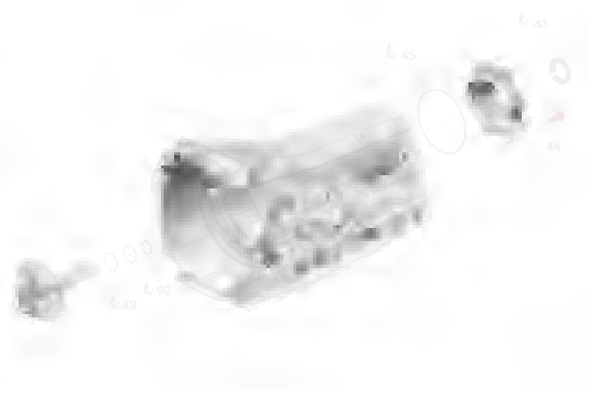


Fig. 8: Exploded View Of Case And Associated Parts (5 of 5)
Courtesy of GENERAL MOTORS COMPANY

**Case and Associated Parts (5 of 5)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 43 | Propeller Shaft Transmission Flange Fluid Seal | Yes | - | - | Case Extension Assemble (AWD) , or Case Extension Assemble (2WD) |
| 44 | Automatic Transmission Case Extension Bolt M10 x 35 [6x] | - | - | Automatic Transmission Case Extension Bolt Sequence - 2WD<br>Automatic Transmission Case Extension Bolt Sequence - AWD | Case Extension Assembly Installation (AWD) , or Case Extension Assembly Installation (2WD) |
| 45 | Automatic Transmission Case Extension Seal | Yes | - | - | Case Extension Assembly Installation (AWD) , or Case Extension Assembly Installation (2WD) |
| 49 | Output Shaft Seal [2x] | Yes | - | - | Output Carrier Assembly and Output Carrier Thrust Bearings Installation (AWD) , or Output Carrier Assembly and Output Carrier Thrust Bearings Installation (2WD) |
| 92 | Output Shaft Seal - Model Dependant | Yes | - | - | Output Carrier Assembly and Output Carrier Thrust Bearings Installation (AWD) , or Output Carrier Assembly and Output Carrier Thrust Bearings Installation (2WD) |



Fig. 9: Exploded View Of Clutch Assemblies And Associated Parts
Courtesy of GENERAL MOTORS COMPANY

**Clutch Assemblies and Associated Parts**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 50 | Reaction Internal Gear Spacer Retainer | - | - | - | Rotating Clutch, Gear, and Shaft Shell Assembly Assemble |
| 53 | Reaction Carrier Hub Retaining Ring | Yes | - | - | Rotating Clutch, Gear, and Shaft Shell Assembly Assemble |
| 73 | Output Carrier Internal Gear Retaining Ring | Yes | - | - | Rotating Clutch, Gear, and Shaft Shell Assembly Assemble |

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Fig. 10: Exploded View Of Control Valve Assembly Components
**Courtesy of GENERAL MOTORS COMPANY**

**Control Valve Assembly**

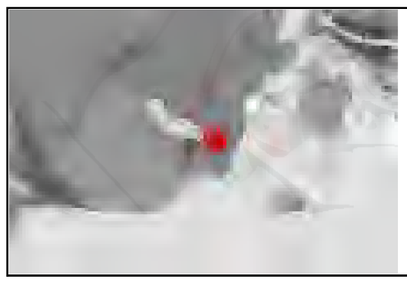
| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 91 | Automatic Transmission Control Wiring Harness Retainer | Yes | - | - | Control Valve Assembly Assemble |
| 320 | Control Valve Solenoid Body Bolt M6 x 68 | - | - | 9 N.m (80 lb in) | Control Valve Assembly Assemble |
| 372 | Control Valve Upper Body Bolt M6 x 45 [4x] | - | - | 9 N.m (80 lb in) | Control Valve Assembly Assemble |
| 373 | Control Valve Upper Body Bolt M6 x 55 | - | - | 9 N.m (80 lb in) | Control Valve Assembly Assemble |
| 377 | Control Valve Upper Body Bolt M6 x 60 | - | - | 9 N.m (80 lb in) | Control Valve Assembly Assemble |




Fig. 11: Exploded View Of Direct/Overdrive Sun Gear Shaft Assembly Components
**Courtesy of GENERAL MOTORS COMPANY**

**Direct/Overdrive Sun Gear Shaft Assembly**

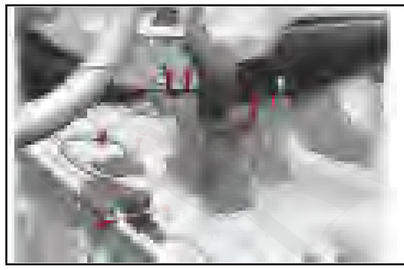
| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 502 | Input Internal Gear Retaining Ring | - | - | - | Direct Overdrive Sun Gear Shaft Assemble |
| 503 | Direct Overdrive Sun Gear Shaft Seal [4x] | Yes | - | - | Direct Overdrive Sun Gear Shaft Assemble |



**Electronic Transmission Range Selector Manual Park Release Cable Guide**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Electronic Transmission Range Selector Manual Park Release Cable Guide Nut | - | - | 9 N.m (80 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Replacement |

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**Electronic Transmission Range Selector Park Release Cable and Transmission Control**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Electronic Transmission Range Selector Manual Park Release Shift Lever Nut | - | - | 2.5 N.m (22 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Replacement |
| 2 | Front Floor Console Bracket Bolt | - | - | 7 N.m (62 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Replacement |
| 3 | Automatic Transmission Range Selector Lever Cable Grommet Bolt | - | - | 9 N.m (80 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Replacement |
| 4 | Automatic Transmission Control Bolt | - | - | 9 N.m (80 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Replacement<br>Electronic Transmission Range Selector Manual Park Release Cable Replacement |



Fig. 12: Exploded View Of Park System Components
Courtesy of GENERAL MOTORS COMPANY

**Park System Components**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 605 | Manual Shift Shaft Pin | Yes | - | - | Park Release Lever and Park Pawl Actuator Installation |
| 607 | Transmission Fluid Cooler Pipe Fitting Seal [2x] | Yes | - | - | Park Release Lever and Park Pawl Actuator Installation |
| 608 | Automatic Transmission Fluid Pressure Test Hole Plug1/8" - 27 NPTF | - | Yes | 11 N.m (97 lb in) | Automatic Transmission Fluid Pressure Test Hole Plug Replacement |
| 609 | Manual Shift Shaft Seal | Yes | - | - | Manual Shift Shaft Seal Installation |
| 610 | Park Pawl Actuator Guide Pin | Yes | - | - | Park Release Lever and Park Pawl Actuator Installation |

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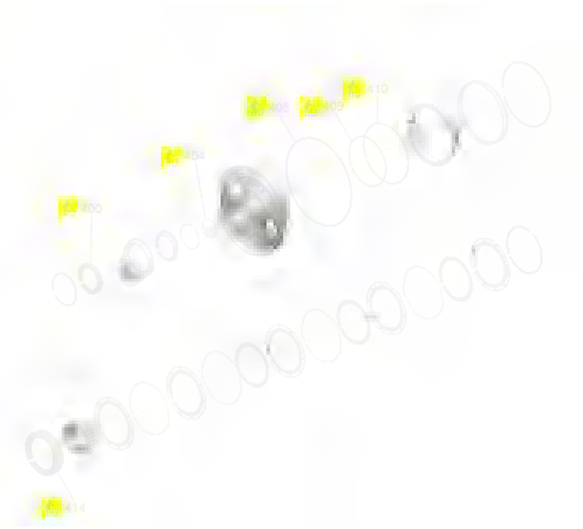
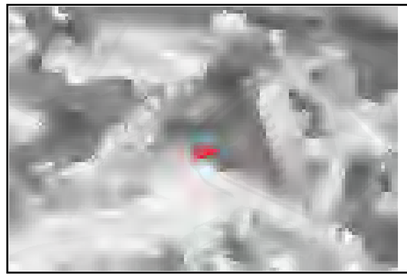


Fig. 13: Exploded View Of Stator Shaft Support Assembly Components
Courtesy of GENERAL MOTORS COMPANY

**Stator Shaft Support Assembly**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 399 | Torque Converter Fluid Seal Retaining Ring | - | - | - | Automatic Transmission Case Front Cover Assemble |
| 400 | Torque Converter Fluid Seal | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 404 | Torque Converter Fluid Seal | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 408 | Stator Shaft Support Seal | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 409 | 1-2-3-4-5-6-Reverse Clutch Piston Seal - Inner | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 410 | 1-2-3-4-5-6-Reverse Clutch Piston Seal - Outer | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 413 | 1-2-3-4-5-6 Clutch Spring Retaining Ring | - | - | - | Automatic Transmission Case Front Cover Assemble |
| 414 | 1-2-8-9-10-Reverse Clutch Piston | Yes | - | - | Automatic Transmission Case Front Cover Assemble |
| 420 | 1-2-8-9-10-Reverse Clutch Backing Plate Retaining Ring | - | - | - | Automatic Transmission Case Front Cover Assemble |



**Torque Converter Bolt Specification**

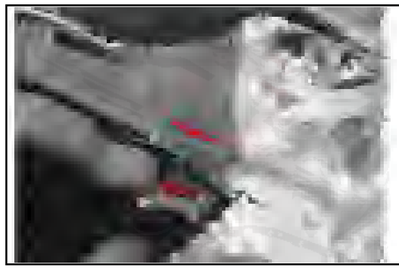
| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Torque Converter Bolt [6x] | - | Yes | 60 N.m (44 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |



**Transmission Bolts**

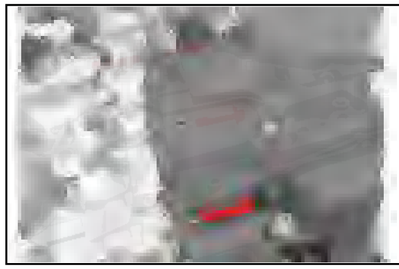
| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Bolt | - | - | 58 N.m (43 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |

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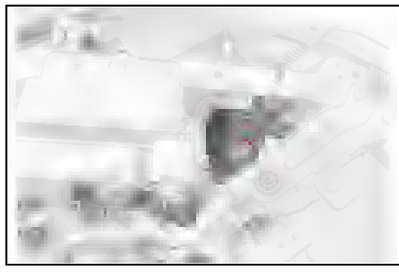
**Transmission Bolts & Stud**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Bolt [3x] | - | - | 58 N.m (43 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |
| 2 | Transmission Stud | - | - | 58 N.m (43 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |



**Transmission Bolts & Stud**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Stud | - | - | 58 N.m (43 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |
| 2 | Transmission Bolt [3x] | - | - | 58 N.m (43 lb ft) | Transmission Replacement (All Wheel Drive) , or Transmission Replacement (Rear Wheel Drive) |



**Transmission Control Module Bracket**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Control Module Bracket Bolt | - | - | 9 N.m (80 lb in) | Transmission Control Module Bracket Replacement |



**Transmission Mount (Rear Wheel Drive)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Mount Bracket Bolt [4x] | - | - | 58 N.m (43 lb ft) | Transmission Mount Replacement (All Wheel Drive) , or Transmission Mount Replacement (Rear Wheel Drive) |
| 2 | Transmission Mount Bolt [2x] | - | - | 58 N.m (43 lb ft) | Transmission Mount Replacement (All Wheel Drive) , or Transmission Mount Replacement (Rear Wheel Drive) |

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**Transmission Mount (All Wheel Drive)**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Transmission Mount Bracket Bolt [4x] | - | - | 58 N.m (43 lb ft) | Transmission Mount Replacement (All Wheel Drive) , or Transmission Mount Replacement (Rear Wheel Drive) |
| 2 | Transmission Mount | - | - | 100 N.m (74 lb ft) | Transmission Mount Replacement (All Wheel Drive) , or Transmission Mount Replacement (Rear Wheel Drive) |

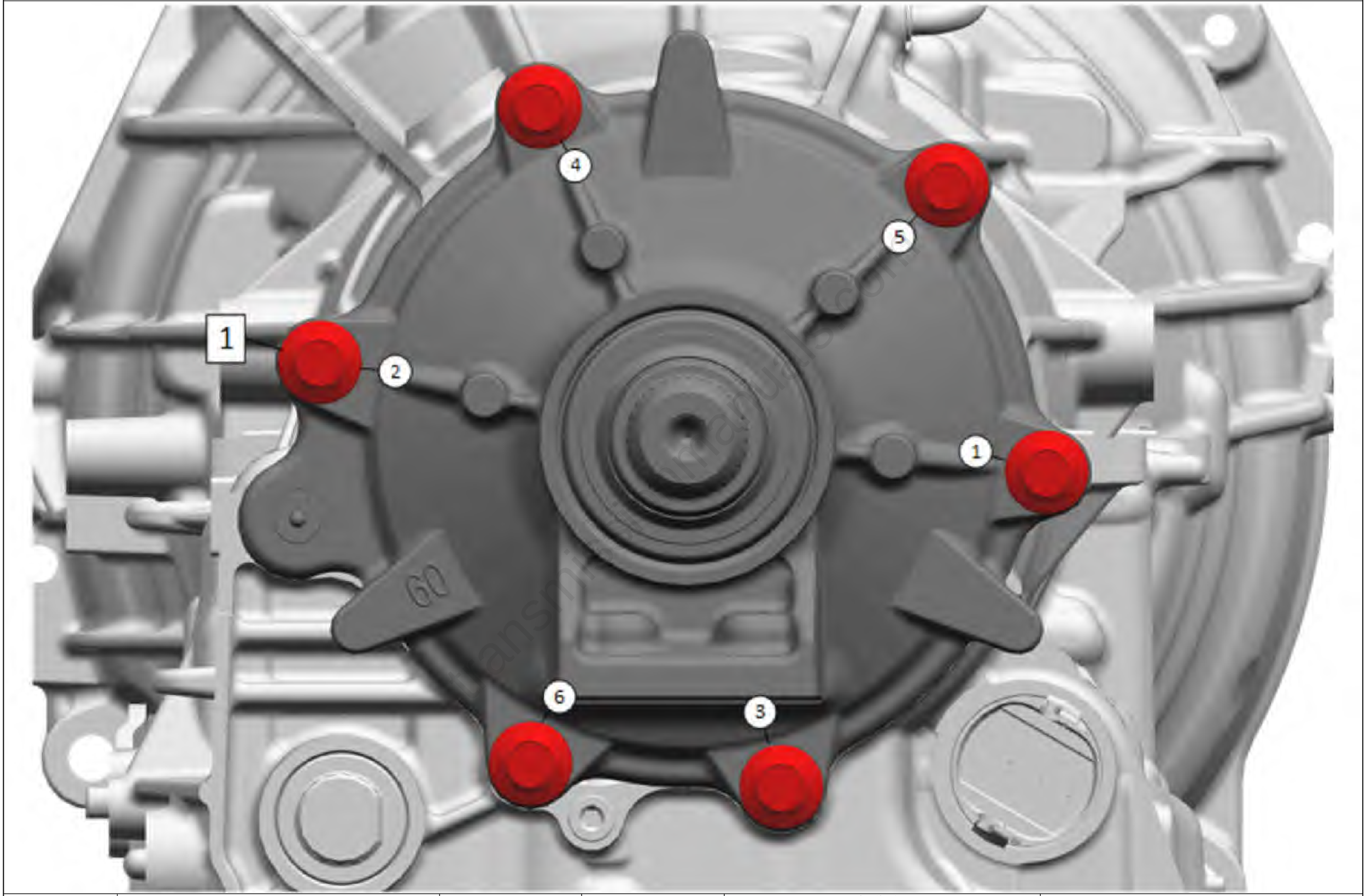


**Transmission Range Selector Parking Release Cable and Bracket**

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Electronic Transmission Range Selector Manual Parking Release Cable Bracket Bolt [2x] | - | - | 22 N.m (16 lb ft) | Electronic Transmission Range Selector Manual Park Release Cable Bracket Replacement |
| 2 | Electronic Transmission Range Selector Manual Park Release Cable Clamp Bolt | - | - | 9 N.m (80 lb in) | Electronic Transmission Range Selector Manual Park Release Cable Bracket Replacement |

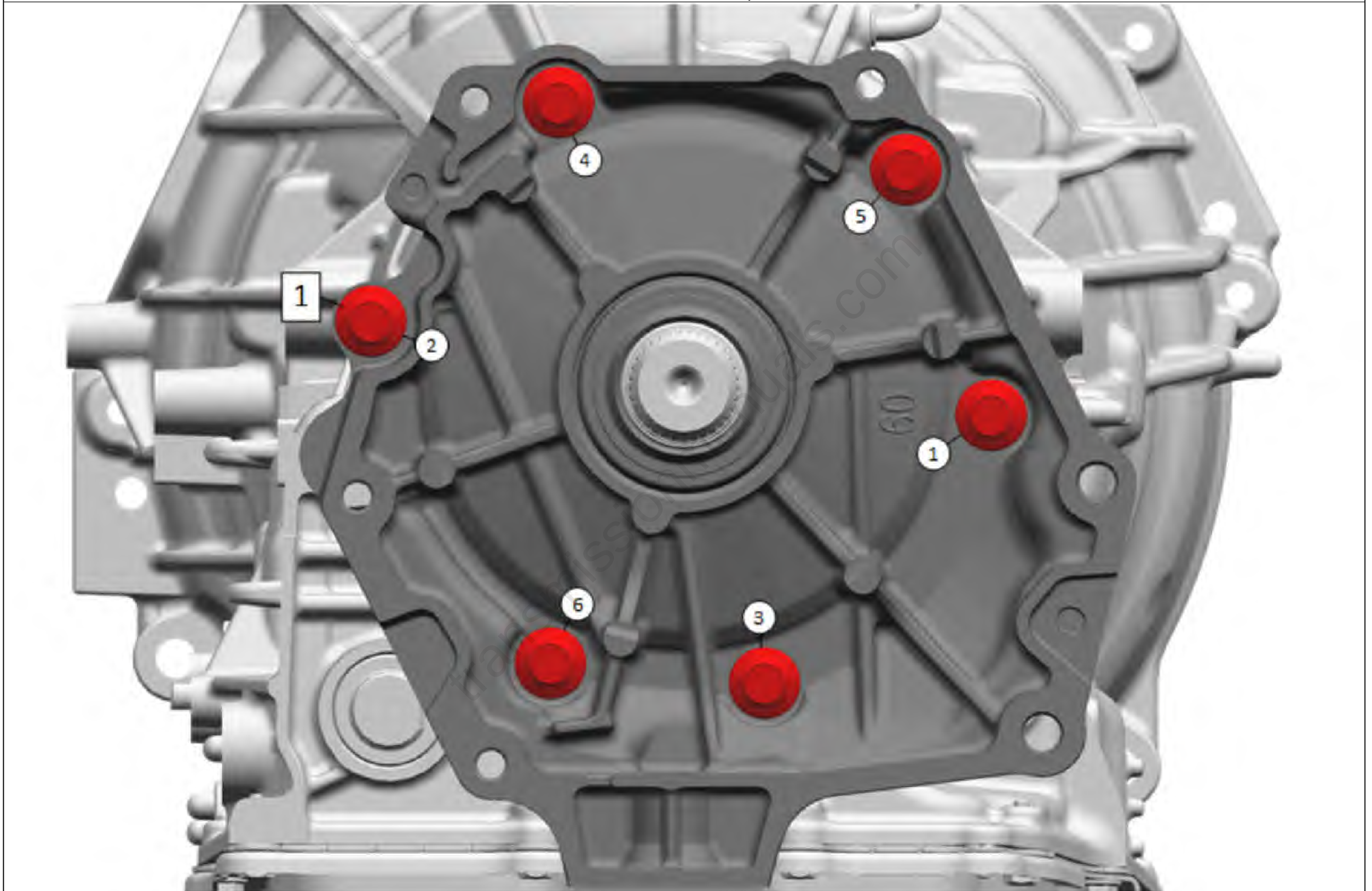
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**Automatic Transmission Case Extension Bolt Sequence - 2WD**



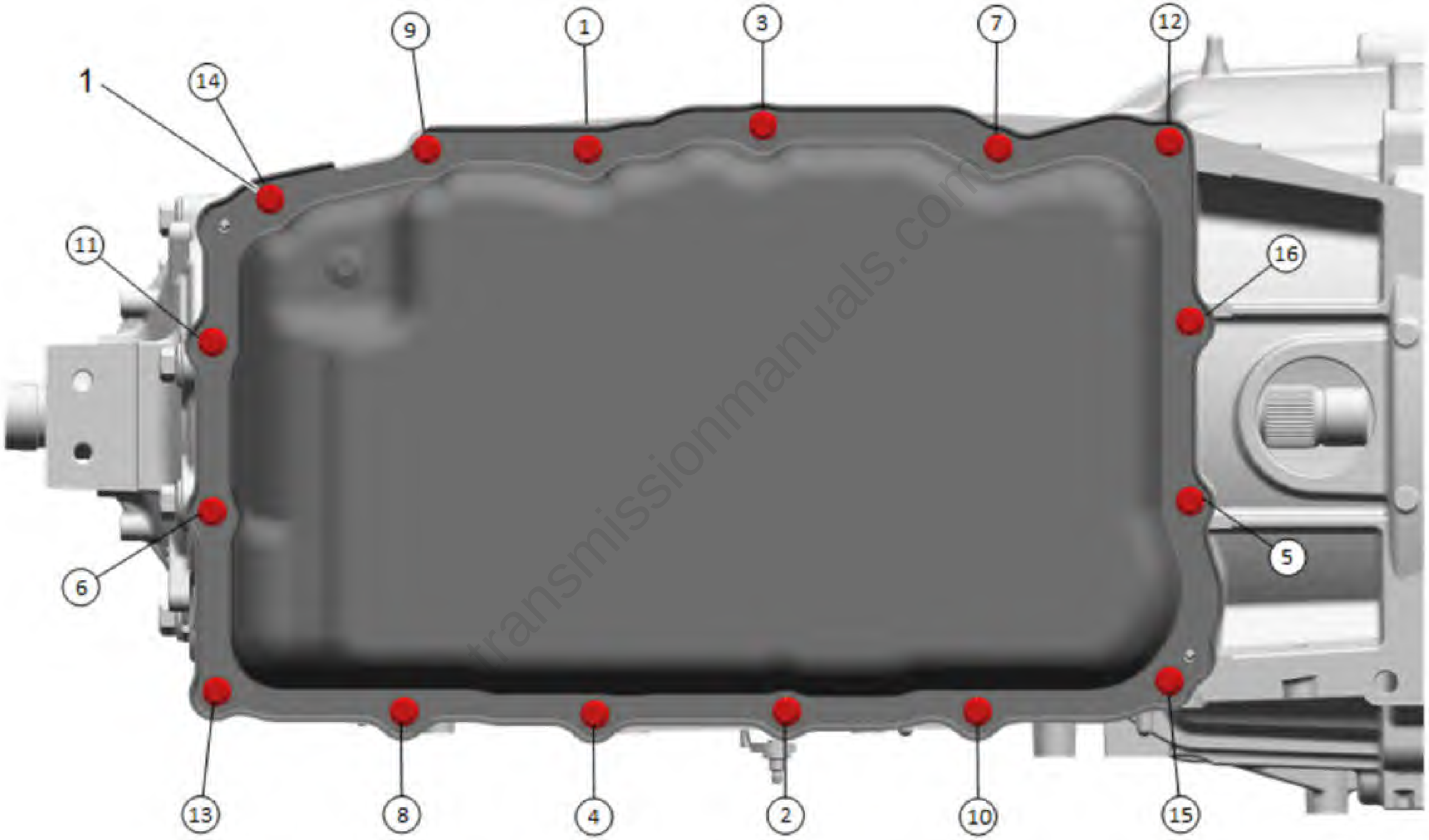

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Automatic Transmission Case Extension Bolt M10 x 35 [6x] | - | - | 58 N.m (43 lb ft) | Case Extension Assembly Installation (2WD) |

**Automatic Transmission Case Extension Bolt Sequence - AWD**



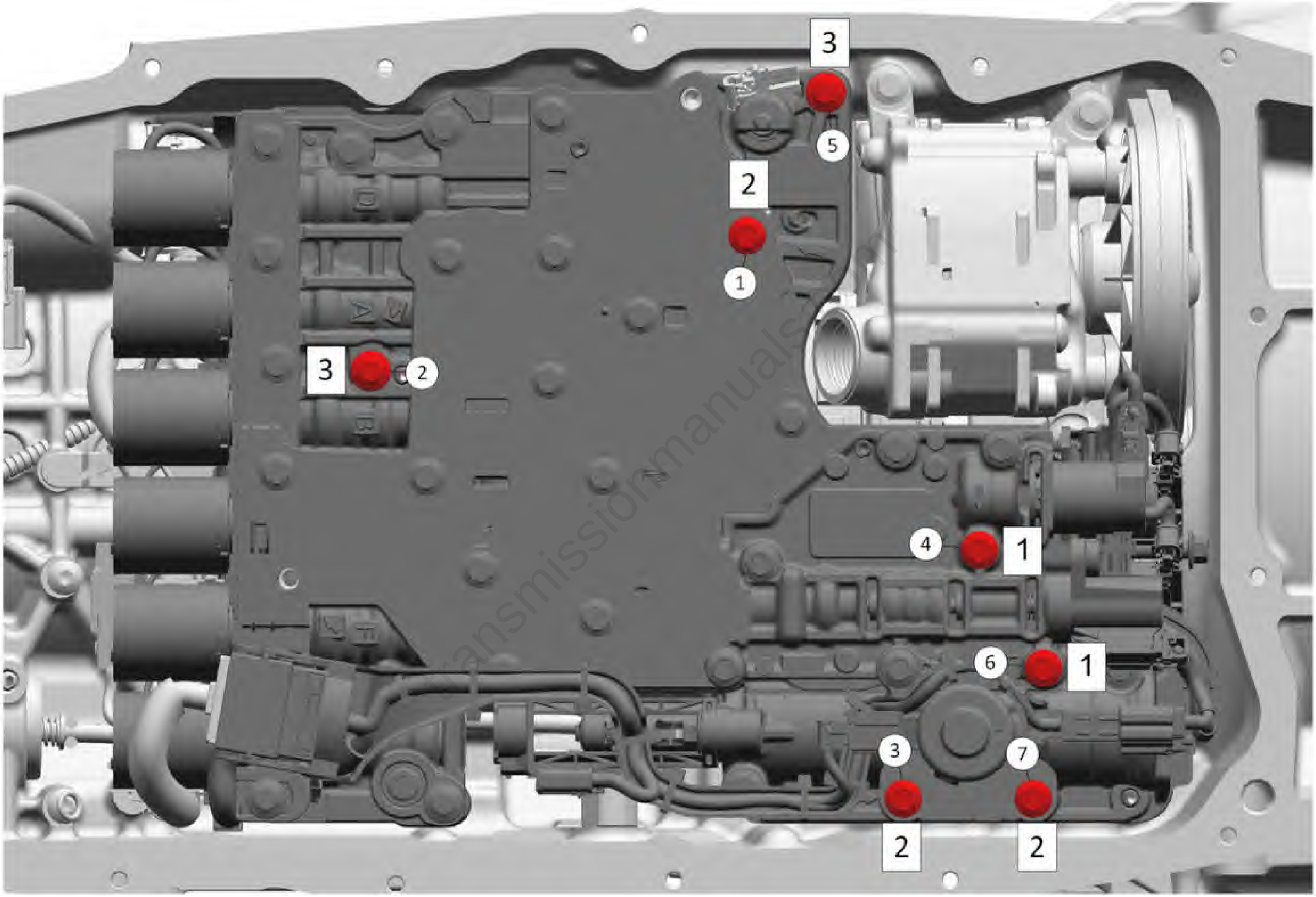

| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Automatic Transmission Case Extension Bolt M10 x 35 [6x] | - | - | 58 N.m (43 lb ft) | Case Extension Assembly Installation (AWD) . |

**Automatic Transmission Fluid Pan Bolt Sequence**




| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Automatic Transmission Fluid Pan Bolt M6 x 20 [16x] | - | - | 10.5 N.m (93 lb in) | Transmission Fluid Pan and Filter Assembly Installation |

**Control Valve Solenoid Body Bolt Sequence**

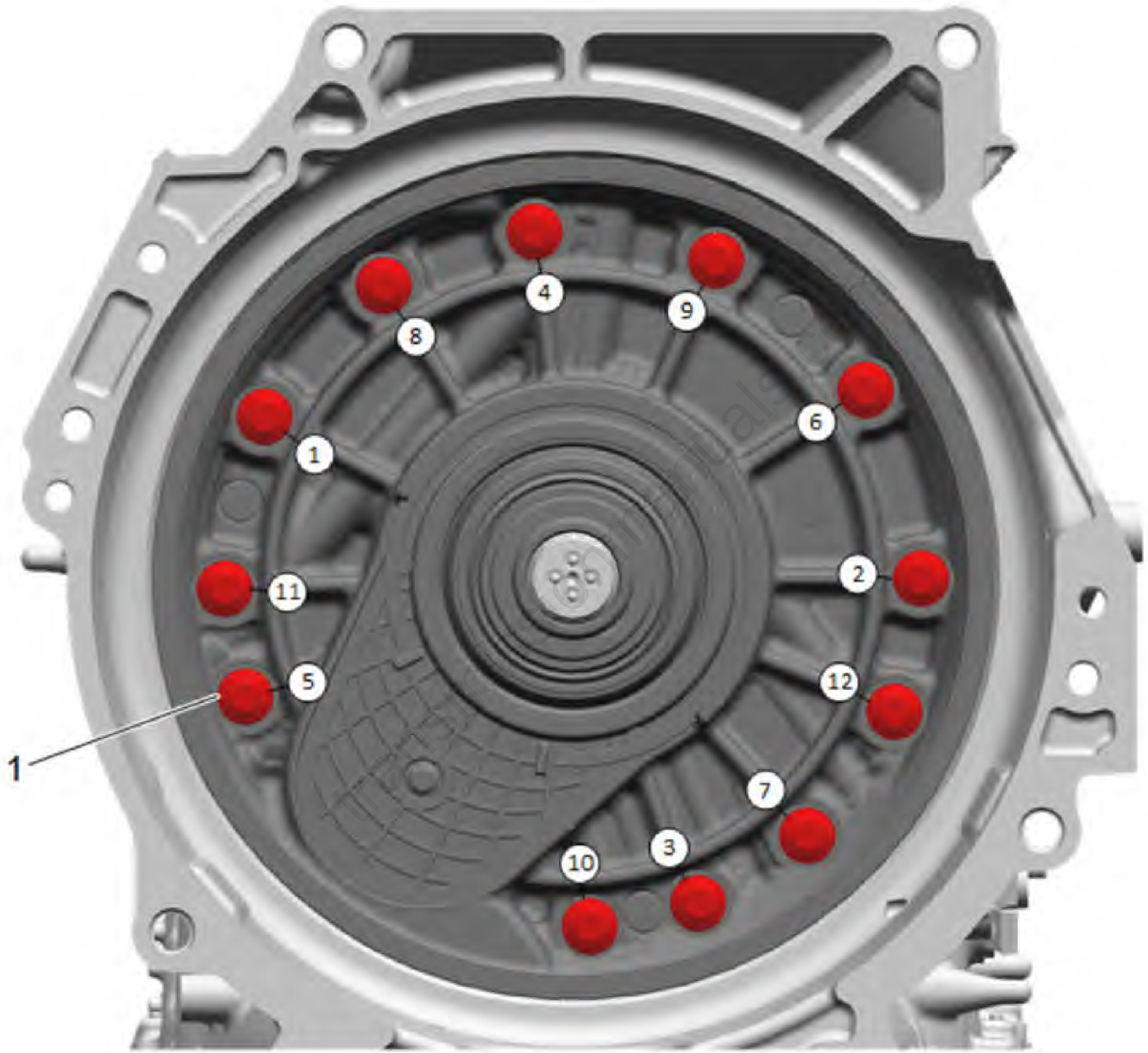



| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Control Valve Solenoid Body Bolt M6 x 100 [2x] | - | - | 9 N.m (80 lb in) | Control Valve Assembly and Transmission Wiring Harness Installation |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Control Valve Solenoid Body Bolt M6 x 80 [3x] | Yes | Yes | 9 N.m (80 lb in) | Control Valve Assembly and Transmission Wiring Harness Installation |
| 3 | Control Valve Solenoid Body Bolt M6 x 68 [2x] | - | - | 9 N.m (80 lb in) | Control Valve Assembly and Transmission Wiring Harness Installation |

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**Input Shaft Support Bolt Sequence**




| Callout | Component Name [Component Quantity] | Single Use Fastener/Component | Thread Locking Adhesive Required | Specification | Procedure |
|---|---|---|---|---|---|
| | | | | Metric (English) | |
| 1 | Input Shaft Support Bolt M8 x 27 [12x] | Yes | Yes | First Pass: 12 N.m (106 lb in) | Automatic Transmission Case Front Cover Installation |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Final Pass: 120 degrees | |

## TRANSMISSION GENERAL SPECIFICATIONS

| Name | 10L60 |
|---|---|
| RPO Codes | MQA |
| Production Location | Silao (Mexico) |
| Transmission Drive | Rear Wheel Drive / All Wheel Drive |
| 1st Gear Ratio | 4.696 |
| 2nd Gear Ratio | 2.985 |
| 3rd Gear Ratio | 2.156 |
| 4th Gear Ratio | 1.779 |
| 5th Gear Ratio | 1.526 |
| 6th Gear Ratio | 1.278 |
| 7th Gear Ratio | 1.000 |
| 8th Gear Ratio | 0.854 |
| 9th Gear Ration | 0.689 |
| 10th Gear Ratio | 0.636 |
| Reverse | 4.866 |
| Torque Converter Size - Diameter of Torque Converter Turbine | 260 mm |
| Pressure Taps | Line Pressure |
| Transmission Fluid Type | DEXRONB® ULV |
| Transmission Type: 10 | Ten Forward Gears |
| Transmission Type: L | Longitude Mount |
| Transmission Type: 60 | Product Series |
| Position Quadrant | P, R, N, D, M |
| Case Material | Die Cast Aluminum |
| Transmission Net Weight (Approximate) | 107.586 kg (237.19 lb) |
| Maximum Trailer Towing Capacity | Refer to applicable owner's manual |

## ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

| Application | Type of Material | GM Part Number | |
|---|---|---|---|
| | | United States | Canada |
| Automatic Transmission Case Plug | Sealant | 19333512 | 10953480 |
| Automatic Transmission Fluid | DexronB® ULV | 19352619 | 19352620 |
| Propeller Shaft Transmission Flange | Adhesive | 89021297 | 10953488 |
| Propeller Shaft Transmission Flange Nut | Adhesive | 89021297 | 10953488 |

## APPROXIMATE FLUID CAPACITIES

| Application | Specification | |
|---|---|---|
| | Metric | English |
| 10L60 | | |
| Pan Removal and Filter Replacement - Approximate Capacity | 7.7 liters | 8.1 quarts |
| Overhaul - Approximate Capacity (Transmission Volume Only) | 10.3 liters | 10.88 quarts |
| Complete Trans System - Approximate Capacity (Including Cooler Volume) | 10.79 liters | 11.4 quarts |

## TRANSMISSION CASE WASHER SPECIFICATIONS

**Transmission Case Washer Specifications**

| Transmission End Play Specification - 0.20 - 0.79 mm (0.007 - 0.031 in) | | |
|---|---|---|
| Transmission Case Washer Thickness | | Ring Identification Color |
| Metric | English | |
| **NOTE:** **After measuring end play travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing case washer, and then choose a thicker or thinner case washer that will bring the measurement within specification.** | | |
| 2.90 - 3.00 mm | 0.114 - 0.118 in | Orange |
| 3.05 - 3.15 mm | 0.120 - 0.124 in | Steel Blue |
| 3.20 - 3.30 mm | 0.125 - 0.129 in | Black |
| 3.35 - 3.45 mm | 0.131 - 0.135 in | Light Blue |
| 3.50 - 3.60 mm | 0.137 - 0.141 in | Green |
| 3.65 - 3.75 mm | 0.143 - 0.147 in | Pink |
| 3.80 - 3.90 mm | 0.149 - 0.153 in | Yellow |

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## CLUTCH BACKING PLATE RETAINING RING SPECIFICATIONS

**2-3-4-5-7-9-10 Clutch Backing Plate Retaining Ring**

| Clutch Pack Travel Specification - 1.57 - 1.87 mm (0.061 - 0.073 in) | |
|---|---|
| Retaining Ring Thickness | |
| Metric | English |
| **NOTE:** After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing retaining ring, and then choose a thicker or thinner retaining ring that will bring the measurement within specification. | |
| 1.65 - 1.75 mm | 0.064 - 0.068 in |
| 1.85 - 1.95 mm | 0.072 - 0.076 in |
| 2.05 - 2.15 mm | 0.080 - 0.084 in |
| 2.25 - 2.35 mm | 0.088 - 0.092 in |
| 2.45 - 2.55 mm | 0.096 - 0.100 in |
| 2.65 - 2.75 mm | 0.104 - 0.108 in |

**4-5-6-7-8-9-10-Reverse Clutch Backing Plate Retaining Ring**

| Clutch Pack Travel Specification - 1.22 - 1.52 mm (0.048 - 0.059 in) | |
|---|---|
| Retaining Ring Thickness | |
| Metric | English |
| **NOTE:** After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing retaining ring, and then choose a thicker or thinner retaining ring that will bring the measurement within specification. | |
| 1.85 - 1.95 mm | 0.072 - 0.076 in |
| 2.05 - 2.15 mm | 0.080 - 0.084 in |
| 2.25 - 2.35 mm | 0.088 - 0.092 in |
| 2.45 - 2.55 mm | 0.095 - 0.099 in |
| 2.65 - 2.75 mm | 0.103 - 0.107 in |
| 2.85 - 2.95 mm | 0.112 - 0.116 in |

**1-2-3-4-6-7-8-10-Reverse Clutch Backing Plate Retaining Ring**

| Clutch Pack Travel Specification - 1.75 - 2.05 mm (0.068 - 0.080 in) | |
|---|---|
| Retaining Ring Thickness | |
| Metric | English |
| **NOTE:** After measuring clutch pack travel, determine if | |

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| Clutch Pack Travel Specification - 1.75 - 2.05 mm (0.068 - 0.080 in) | |
|---|---|
| Retaining Ring Thickness | |
| Metric | English |
| **the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing retaining ring, and then choose a thicker or thinner retaining ring that will bring the measurement within specification.** | |
| 1.65 - 1.75 mm | 0.064 - 0.068 in |
| 1.85 - 1.95 mm | 0.072 - 0.076 in |
| 2.05 - 2.15 mm | 0.080 - 0.084 in |
| 2.25 - 2.35 mm | 0.088 - 0.092 in |
| 2.45 - 2.55 mm | 0.096 - 0.100 in |
| 2.65 - 2.75 mm | 0.104 - 0.108 in |

**1-2-8-9-10-Reverse Clutch Backing Plate Retaining Ring**

| Clutch Pack Travel Specification - 1.31 - 1.74 mm (0.051 - 0.068 in) | | |
|---|---|---|
| Retaining Ring Thickness | | Ring Identification |
| Metric | English | |
| **NOTE:** **After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing retaining ring, and then choose a thicker or thinner retaining ring that will bring the measurement within specification.** | | |
| 2.23 - 2.36 mm | 0.087 - 0.092 in | 4 Strips |
| 2.53 - 2.66 mm | 0.099 - 0.104 in | 2 Stripes |
| 2.83 - 2.96 mm | 0.111 - 0.116 in | 1 Stripes |
| 3.13 - 3.26 mm | 0.123 - 0.128 in | 3 Stripes |
| 3.43 - 3.56 mm | 0.135 - 0.140 in | 0 Stripes |

## 1-3-5-6-7-8-9 CLUTCH BACKING PLATE SPECIFICATIONS

**1-3-5-6-7-8-9 Clutch Backing Plate Specifications**

| Clutch Pack Travel Specification - 1.12 - 1.72 mm (0.044 - 0.067 in) | |
|---|---|
| Backing Plate Thickness | |
| Metric | English |
| **NOTE:** **After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification,** | |

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| Clutch Pack Travel Specification - 1.12 - 1.72 mm (0.044 - 0.067 in) | |
|---|---|
| Backing Plate Thickness | |
| Metric | English |
| **measure the thickness of the existing backing plate, and then choose a thicker or thinner backing plate that will bring the measurement within specification.** | |
| 1.60 - 1.70 mm | 0.063 - 0.067 in |
| 1.95 - 2.05 mm | 0.077 - 0.081 in |
| 2.30 - 2.40 mm | 0.091 - 0.095 in |
| 2.65 - 2.75 mm | 0.104 - 0.108 in |
| 3.00 - 3.10 mm | 0.118 - 0.122 in |

## 1-2-3-4-5-6-REVERSE CLUTCH APPLY PLATE SPECIFICATIONS

**1-2-3-4-5-6-Reverse Clutch Apply Plate Specifications**

| Clutch Pack Travel Specification - 0.73 - 1.23 mm (0.028 - 0.048 in) | |
|---|---|
| Apply Plate Thickness | |
| Metric | English |
| **NOTE:** **After measuring clutch pack travel, determine if the measurement is within the specification. If the measurement is not within the specification, measure the thickness of the existing apply plate, and then choose a thicker or thinner apply plate that will bring the measurement within specification.** | |
| 3.55 - 3.75 mm | 0.140 - 0.148 in |
| 3.75 - 3.95 mm | 0.148 - 0.156 in |
| 3.95 - 4.15 mm | 0.156 - 0.163 in |
| 4.15 - 4.35 mm | 0.163 - 0.171 in |
| 4.35 - 4.55 mm | 0.171 - 0.179 in |
| 4.55 - 4.75 mm | 0.179 - 0.187 in |

## RANGE REFERENCE

| Range | Gear | 1-2-3-4-5-6-Reverse Clutch | 1-2-8-9-10-Reverse Clutch | 2-3-4-5-7-9-10 Clutch | 1-2-3-4-6-7-8-10-Reverse Clutch | 1-3-5-6-7-8-9 Clutch | 4-5-6-7-8-9-10-Reverse Clutch | One Way Clutch (OWC) |
|---|---|---|---|---|---|---|---|---|
| Park | P | Applied | Applied | - | - | - | - | - |
| Reverse | R | Applied | Applied | - | Applied | - | Applied | - |
| Neutral | N | Applied | Applied | - | Applied | - | - | - |
| D | 1st | Applied | Applied | - | Applied 1 | Applied | - | Holding |
| | 2nd | Applied | Applied | Applied | Applied | - | - | Holding |
| | 3rd | Applied | - | Applied | Applied | Applied | - | O/R |
| | 4th | Applied | - | Applied | Applied | - | Applied | O/R |
| | 5th | Applied | - | Applied | - | Applied | Applied | O/R |
| | 6th | Applied | - | - | Applied | Applied | Applied | O/R |
| | 7th | - | - | Applied | Applied | Applied | Applied | O/R |
| | 8th | - | Applied | - | Applied | Applied | Applied | - |
| | 9th | - | Applied | Applied | - | Applied | Applied | - |
| | 10th | - | Applied | Applied | Applied | - | Applied | - |

O/R - Over-running.

[1] - The clutch it is applied, but not with line pressure. It only has enough pressure to prevent the 1-2-3-4-6-7-8-10-Reverse Clutch from slip.

**NOTE:**

**The clutch names reflect the proper part name at the time they were released/developed. Calibration changes**

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| Range | Gear | 1-2-3-4-5-6-Reverse Clutch | 1-2-8-9-10-Reverse Clutch | 2-3-4-5-7-9-10 Clutch | 1-2-3-4-6-7-8-10-Reverse Clutch | 1-3-5-6-7-8-9 Clutch | 4-5-6-7-8-9-10-Reverse Clutch | One Way Clutch (OWC) |
|---|---|---|---|---|---|---|---|---|
| **may make the naming inaccurate.** | | | | | | | | |

**SHIFT SOLENOID VALVE STATE AND GEAR RATIO**

| Range | Gear | Shift Solenoid A | Shift Solenoid B | Shift Solenoid C | Shift Solenoid D | Shift Solenoid E | Shift Solenoid F | Default Disable Solenoid | PISA |
|---|---|---|---|---|---|---|---|---|---|
| Park | P | On | On | Off | Off | Off | Off | Off | Off |
| Reverse | R | On | On | Off | On | Off | On | On | On |
| Neutral | N | On | On | Off | On | Off | Off | On | On |
| D | 1st | On | On | On | Off | On | Off | On | On |
| | 2nd | On | On | On | On | Off | Off | On | On |
| | 3rd | On | Off | On | On | On | Off | On | On |
| | 4th | On | Off | On | On | Off | On | On | On |
| | 5th | On | Off | On | Off | On | On | On | On |
| | 6th | On | Off | Off | On | On | On | On | On |
| | 7th | Off | Off | On | On | On | On | On | On |
| | 8th | Off | On | Off | On | On | On | On | On |
| | 9th | Off | On | On | Off | On | On | On | On |
| | 10th | Off | On | On | On | Off | On | On | On |
| **NOTE:** **For Shift solenoids, "On" = Pressurized, "Off" = No pressure.** | | | | | | | | B | B |

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