Pump Removal

Special Instructions

Refer to OEM guidelines for transmission removal.

Special Tools

Removal

- Shift Rail Actuation Tool (RR1039TR)
- Snap-on CJ85-1 Puller or equivalent
- Snap-on CJ105-6 Medium Jaw (Qty 2) or equivalent
- Snap-on CJ105-7 Large Jaw (Qty 2) or equivalent

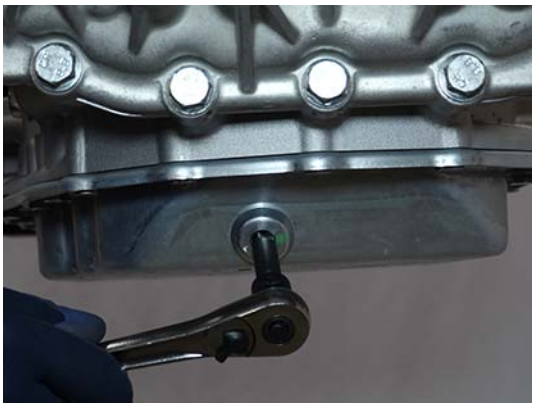
Installation

- Gasket Remover (Loctite SF 7631)
- Gasket Sealant (Loctite 5188)
- ACM Alignment Pins (RR1036TR)
- Shift Rail Actuation Tool (RR1039TR)
- Lower Shaft Rear Bearing Inner Race & 4th Gear Inner Sleeve Driver (RR1040TR)
- Inner Race Driver (RR1041TR)

Drain Oil

1. Locate the Oil Drain Plug on the Sump Pan.
2. Place a suitable container under the Oil Drain Plug.

   Note: If reusing oil, use a clean container free of contamination and debris.
3. Remove Oil Drain Plug with a 3/8” square drive ratchet and drain oil.



4. If PTO-equipped, remove PTO and drain oil.
5. Inspect the Oil Drain Plug and Oil Drain Plug O-ring for damage. If damaged, replace the Oil Drain Plug.

   Note: O-ring is serviced with plug.

6. Install the Oil Drain Plug and torque to 27.5-32.5 Nm (20.3-24 lb-ft)

   NOTICE: Do not over-torque Oil Drain Plug or damage to threads may occur.

Transmission Removal

1. Key on with engine off.
2. Connect ServiceRanger.
3. Select “Service Activity Report” and create a Service Activity Report.
4. Select “Close Report”.
5. Disconnect ServiceRanger.
6. Key off.
7. Refer to OEM guidelines for transmission removal.

Secure Transmission (Horizontal)

1. Securely place the transmission in the horizontal position.

WARNING: Transmission weighs approximately 375 lbs. Keep fingers clear of pinch point between Clutch Housing and other surfaces. Dropping transmission may result in major component damage, severe injury or death.

NOTICE: Use an appropriate lifting device to safely lift component.

Remove Front Cover/Dual Clutch Module (DCM) Assembly

1. Remove 16 Front Cover 13 mm cap screws.

2. Locate 2 jackscrew threaded holes in Front Cover at the 2 & 8 o'clock positions.

3. Install 2 Front Cover 13 mm cap screws into jackscrew holes.

4. Hand tighten jackscrews equally in an alternating pattern until Front Cover separates from Clutch Housing, then remove jackscrews.

5. Carefully pull and remove Front Cover/DCM assembly from Clutch Housing.

CAUTION: Front Cover/DCM assembly weighs approximately 45 lbs. Keep fingers clear of pinch point between Front Cover and Clutch Housing. Dropping Front Cover/DCM assembly could result in component damage and/or personal injury.

Note: Ensure proper support for Front Cover/DCM assembly when removing to avoid dropping.

Remove the Pump Driven Gear

1. Install drift into Pump Driven Gear.

2. Hold drift securely against Clutch Housing to hold Pump Driven Gear stationary.

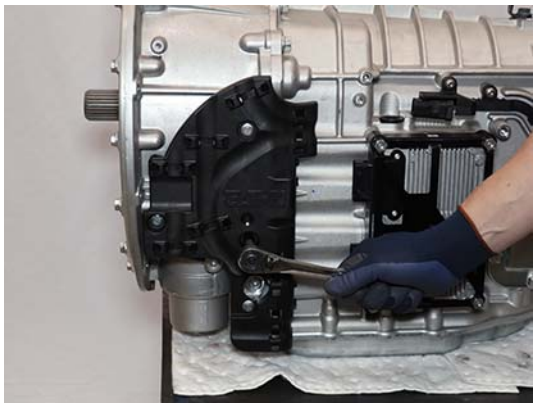
CAUTION: Failure to hold Pump Driven Gear stationary during cap screw removal could result in component damage and/or personal injury.

3. Remove Pump Driven Gear 13 mm cap screw.

4. Remove Pump Driven Gear.

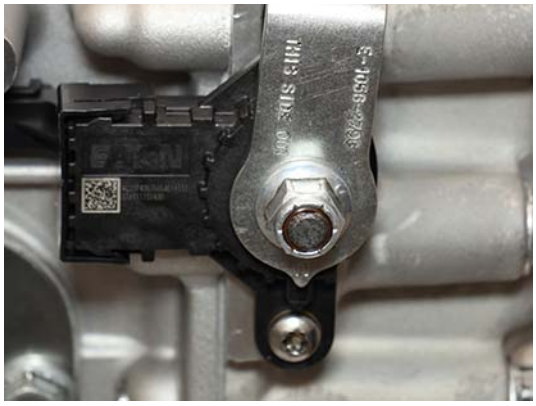
Remove the OEM Harness Bracket

1. Remove 4 OEM Harness Bracket 10 mm cap screws; remove OEM Harness Bracket.



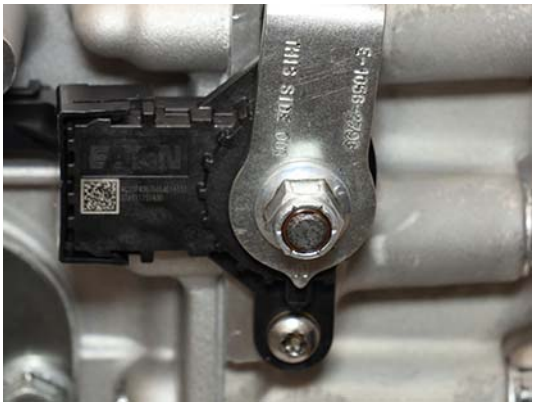
Remove the Transmission Range Sensor (TRS)

1. Place the Transmission Cable Shift Lever in the Neutral (N) position.



2. Use hand tools to remove Transmission Cable Shift Lever retaining nut.

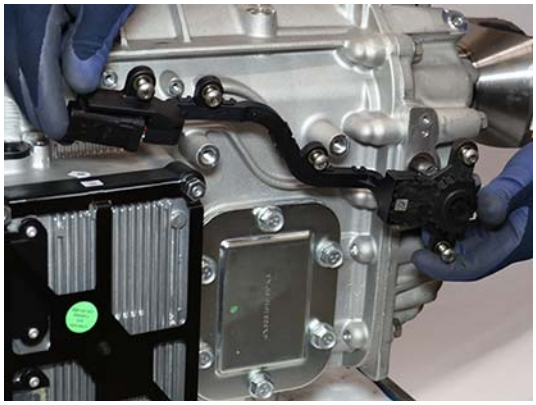
   NOTICE: Retain TRS Internal Shift Shaft position by holding Transmission Shift Lever in the Neutral (N) position while loosening the retaining nut to prevent internal TRS damage. Do not use power tools.



3. Remove Transmission Cable Shift Lever.

4. Remove 5 TRS Harness Bracket T30 torx head screws.

5. Remove TRS assembly from Main Housing and Rear Housing Cover Internal Shift Shaft.



Remove the Output Yoke

1. Remove the two 15 mm yoke Retainer Bolts, Retainer Plate, and Retainer O-ring.

   Note: New Retainer Bolts, Retainer Plate and Retainer O-ring are required when reinstalling.

WARNING: Reusing Retainer Bolts, Retainer Plate and Retainer O-ring could result in major vehicle component damage, severe injury or death.

2. Remove the Output Yoke

   Note: There is an interference fit between the Output Yoke and output shaft splines that may require an output yoke puller.

Remove the Rear Housing Cover

1. Remove Output Seal Slinger Shield.

2. Remove 18 Rear Housing Cover 16mm cap screws.

   Note: Three Rear Housing Cover cap screws are a different length than the rest. Note their proper position for re-installation.

3. Separate Rear Housing Cover from Main Housing at 2 pry points.

   NOTICE: Do not pry on sealing surfaces or damage may occur.

   NOTICE: If transmission is equipped with a Park Pawl, confirm the Internal Shift Shaft has remained in the Neutral position prior to removing the Rear Housing Cover or damage to the internal Park Pawl mechanism and Lower Shaft Rear Inner Bearing Race will occur.

4. Remove Rear Housing Cover.

Rear Housing Disassembly

1. Install Shift Rail Actuation Tool (RR1039TR) into Shift Rail C and place Shift Rail C in the Neutral position; remove Shift Rail Actuation Tool (RR1039TR).

   Note: Confirm Rail C Synchronizer is in Neutral position.

2. Install puller medium jaws into puller crossarm as shown.

3. For gear pulling clearance, rotate and align Park Pawl Gear tooth gap with Lower Shaft Bearing Inner Race as shown.

   NOTICE: Park Pawl Gear tooth gap must stay aligned with Lower Shaft Bearing Inner Race or damage may occur.

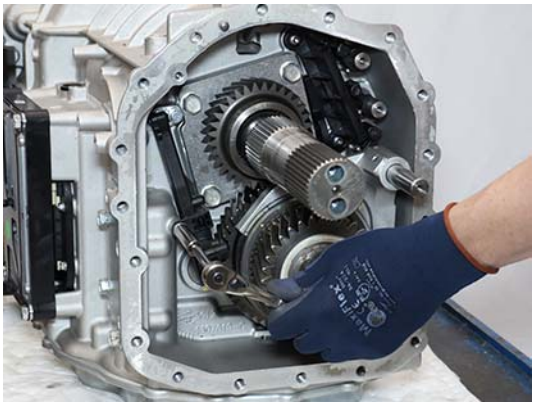
4. Install puller assembly onto Upper Shaft and under Park Pawl Gear as shown.

   NOTICE: Ensure puller jaws are fully seated under gear or damage may occur.

5. Pull off 4th Driven Gear, Park Pawl Gear and Upper Shaft Rear Bearing Inner Race then go to Step 25.

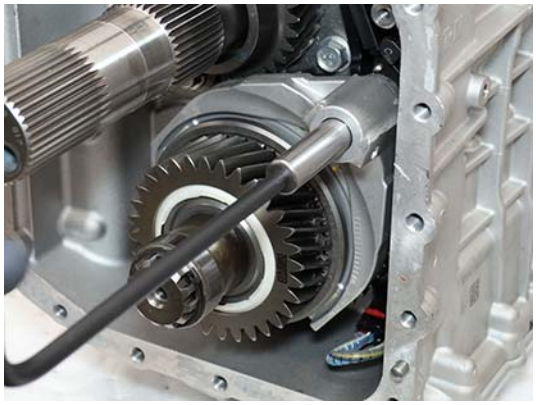
NOTICE: Park Pawl Gear tooth gap must stay aligned with Lower Shaft Bearing Inner Race or damage may occur.

6. Remove 2 Rear Lube Bar 10 mm cap screws.



7. Remove Rear Lube Bar from Main Housing and Reverse Idler Shaft.

8. Install Shift Rail Actuation Tool (RR1039TR) into Shift Rail C.



9. Pull Shift Rail C to engage Rail C Synchronizer Sleeve onto 4th Gear, remove Shift Rail Actuation Tool (RR1039TR).

10. Drive out Rail C Shift Yoke Roll Pin with 7/32 in. (5.5 mm) roll pin punch.

    Note: Roll Pin must be driven from the outside of housing inward or damage may occur.

11. Remove Lower Shaft Rear Bearing Inner Race Snap Ring from Lower Shaft and discard.

    Note: New Snap Ring is required when reinstalling.

12. Install puller large jaws into puller crossarm as shown.

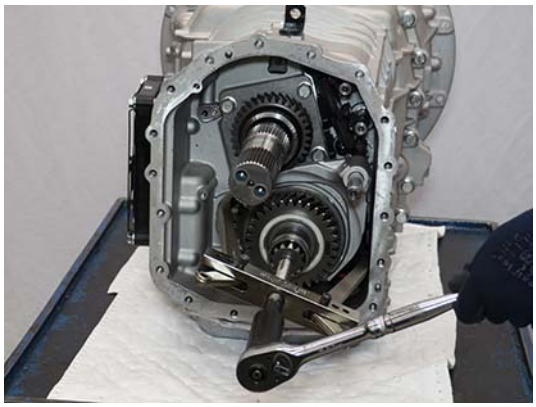
13. Install puller assembly onto Lower Shaft and under 6th Gear as shown.

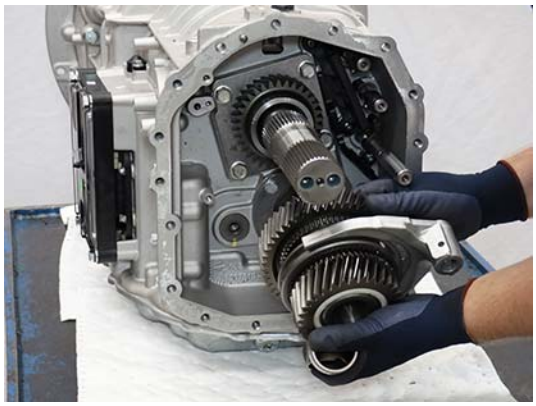
NOTICE: Ensure puller jaws are fully seated under gear or damage may occur.

14. Pull off 6th Gear, Rail C Synchronizer assembly, 4th Gear, Rail C Shift Yoke and Lower Shaft Rear Bearing Inner Race.

NOTICE: Ensure Rail C Shift Yoke does not bind on Shift Rail C when pulling or damage may occur.

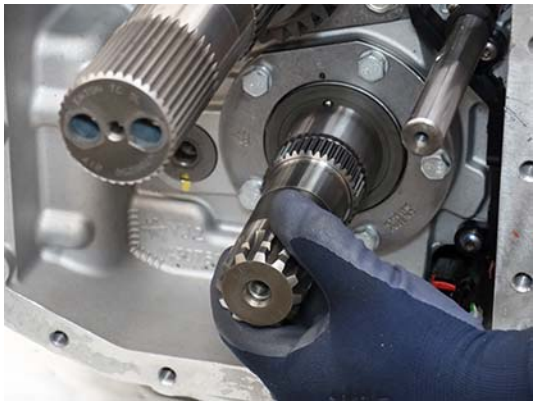
NOTICE: Ensure Synchronizer assembly remains together or Keys and Springs in Hub Key Slots may pop out and be lost.





15. Remove 6th Gear Bearing from Lower Shaft.

16. Rotate Lower Shaft to position 6th Gear Mid-Wall Bearing Spacer and Alignment Ball in 12 o'clock position.



17. Remove 6th Gear Mid-Wall Bearing Spacer.

Note: A magnet or small flat blade screwdriver may be used to aid in Spacer removal.

NOTICE: Note spacer orientation for re-installation. Raised side of Spacer faces front of transmission.

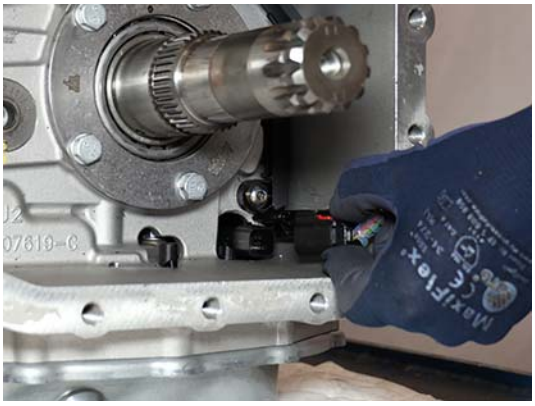
18. Use a magnet to remove 6th Gear Mid-Wall Spacer Alignment Ball.

19. Remove 6th Driven Gear from Upper Shaft.

Remove the 3-Rail Position Sensor and Magnets

1. Disconnect 8-Way 3-Rail Position Sensor Harness Connector from 90-Degree Connector.

Note: Connector red lock tab must be unlatched and the top of the connector depressed to remove.



2. Remove 4, 3-Rail Position Sensor T30 torx head screws.

3. Remove 3-Rail Position Sensor.

4. Remove the 3 Shift Rail Magnet T20 torx head screws from Shift Rails A, B and C.

5. Remove Shift Rail Magnets A, B and C.

Secure Transmission (Vertical)

1. Securely place transmission in the vertical position with front side down.

WARNING: Transmission weighs approximately 375 lbs. Keep fingers clear of pinch point between Clutch Housing and other surfaces. Dropping transmission may result in major component damage, severe injury or death.

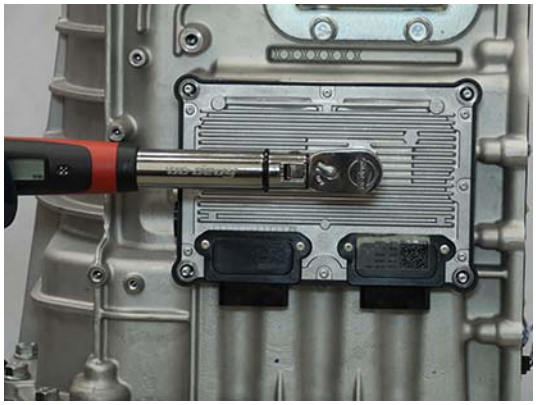
NOTICE: Use an appropriate lifting device to safely lift component.

Remove the Transmission Control Module (TCM)

1. Unscrew 4 TCM Cover nuts and remove TCM Cover.

   Note: TCM Cover nuts are 10 or 13 mm.

2. Unscrew the 7 mm jackscrew and remove TCM from transmission.



3. Unlatch 74-Way Connector Retainer from 74-Way Transmission Harness Connector.

Remove the Sump Pan and Filter

1. Remove 20 Sump Pan 13 mm cap screws.

2. Remove Sump Pan.

3. Remove Sump Pan Filter

   Note: Ensure Sump Pan Filter neck O-ring is attached. If not attached, inspect Pump inlet and remove.

   NOTICE: If O-ring must be removed from Pump inlet, do not damage Pump inlet sealing surface.

4. Inspect Sump Pan Seal (in place) for damage. If damaged, replace seal.

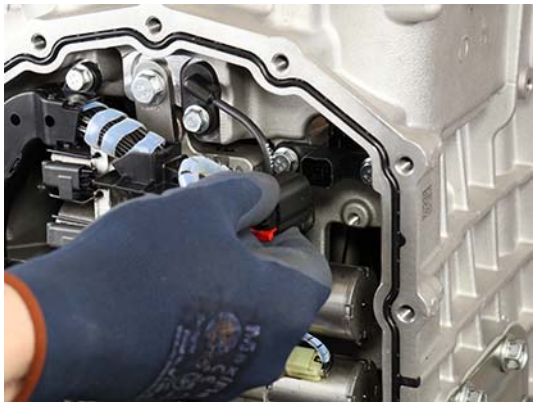
   Note: If replacing Sump Pan Filter, the Sump Pan Seal must be replaced.

   Note: Sump Pan Seal can only go in the Main Housing recess in one direction; use seal alignment tabs to ensure proper alignment during re-installation.

Remove the Actuation Control Manifold (ACM)

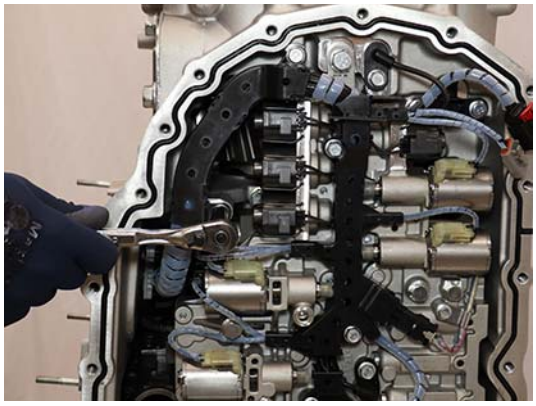
1. Locate and disconnect 8-Way Transmission Harness Connector from 90-Degree Connector.

   Note: Connector red lock tab must be unlatched and the top of the connector depressed to remove.

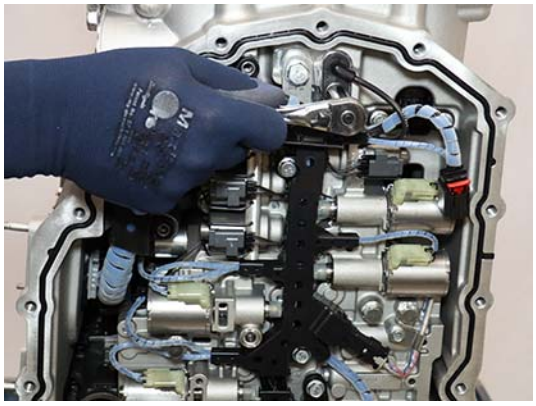


2. Disconnect 2-Way Transmission Harness Connector from Engine Speed Sensor Connector.

3. Remove the 2 Transmission Harness to Main Housing 10 mm cap screws.



4. Remove Output Speed Sensor 10 mm cap screw and pull Output Speed Sensor free from Main Housing.



5. Remove the ACM Retainer Tab 13 mm cap screw.

6. Remove ACM Retainer Tab and O-ring isolator.

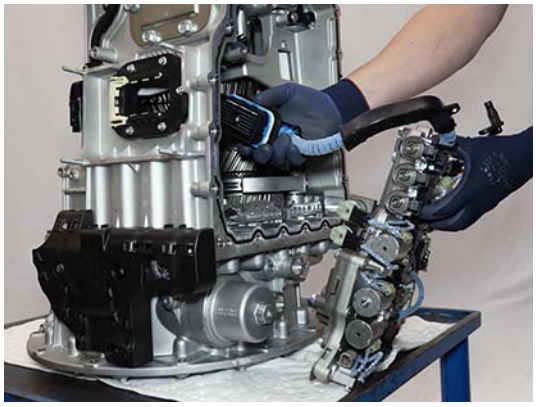
   Note: Ensure the O-ring isolator came off the ACM with the ACM Retainer Tab, if not remove O-ring isolator from ACM.

7. Remove 6 ACM to Interface Manifold 10 mm cap screws.

CAUTION: Support ACM when removing cap screws. Dropping ACM could result in component damage and/or personal injury.

8. Remove ACM/Transmission Harness assembly from Main Housing.

   Note: When removing ACM ensure 74-Way Transmission Harness Connector is free of 74-Way Connector Retainer.



9. Remove ACM rear lubrication O-ring.

   Note: If O-ring is missing it may be located on ACM.

10. Remove ACM to Interface Manifold Gasket.

11. Inspect ACM to Interface Manifold Gasket for damage. If damaged, replace Gasket.

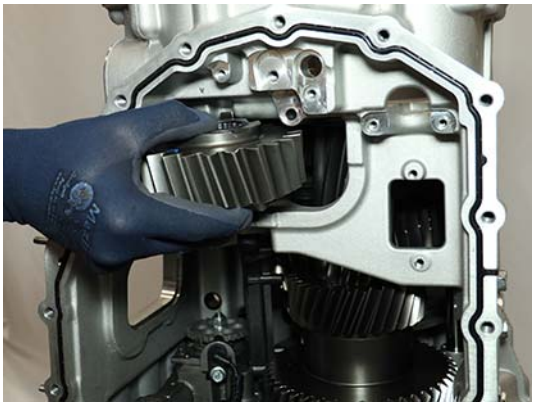
    Note: If replacing the ACM the Gasket must also be replaced.

Remove the Reverse Idler

1. Remove Reverse Idler Shaft 13 mm cap screw.

2. Install an M12x1.75x60 bolt into Reverse Idler Shaft and lift to remove Reverse Idler Shaft from Main Housing.

3. Remove Reverse Idler Gear, Bearings, and Thrust Washers.



Remove the Main Housing

1. Remove 16 external and 5 internal Main Housing 16 mm cap screws.

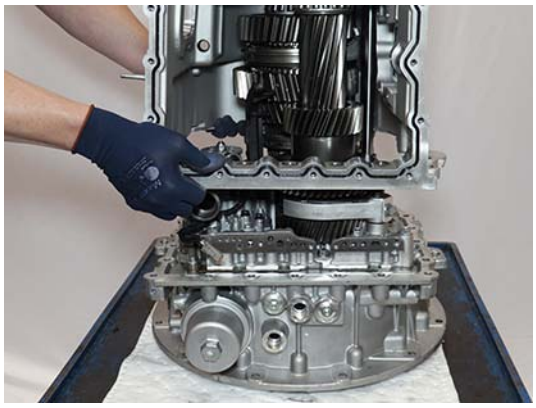
   NOTICE: To avoid internal transmission contamination, keep Main Housing cap screws separated.

2. Separate Main Housing from Clutch Housing at 3 pry points.

   NOTICE: Do not pry on sealing surfaces or damage may occur.

3. Lift and remove Main Housing from Clutch Housing.

CAUTION: Main Housing assembly weighs approximately 30 lbs. Dropping Main Housing assembly could result in component damage and/or personal injury.

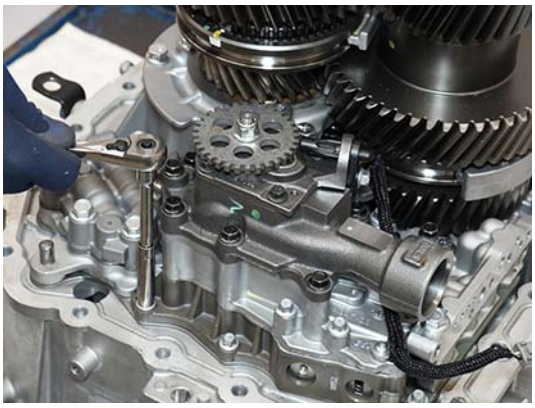


Remove the Pump

1. Lift and remove Main Housing Spray Bar from Pump Outlet.

2. Remove 10 Pump 8 mm cap screws.

   Note: Pump cap screws are 3 different lengths. Note their proper position for re-installation.



3. Remove Pump and Gasket.

Install the Pump

1. Position and install Pump Gasket on Clutch Housing.

   Note: Use small Clutch Housing Dowel Pins to ensure proper alignment.

2. Align Pump with small Clutch Housing Dowel Pins and install Pump.

3. Install 10 Pump 8 mm cap screws and torque to 8.8-10.4 Nm (77.9-92 lb-in) in a crisscross pattern.

   Note: Pump cap screws are 3 different lengths. Refer to Pump Removal notes for proper location.

4. Install Main Housing Spray Bar into Pump outlet aligning molded-in cap over Pump cap screw head.

   NOTICE: The Spray Bar molded-in cap ensures proper Spray Bar position for gear lubrication. Improper installation will result in gear failure when run.

5. Clean Rail D Position Sensor Magnet (in place) of any metal shavings or debris.

Install the Main Housing

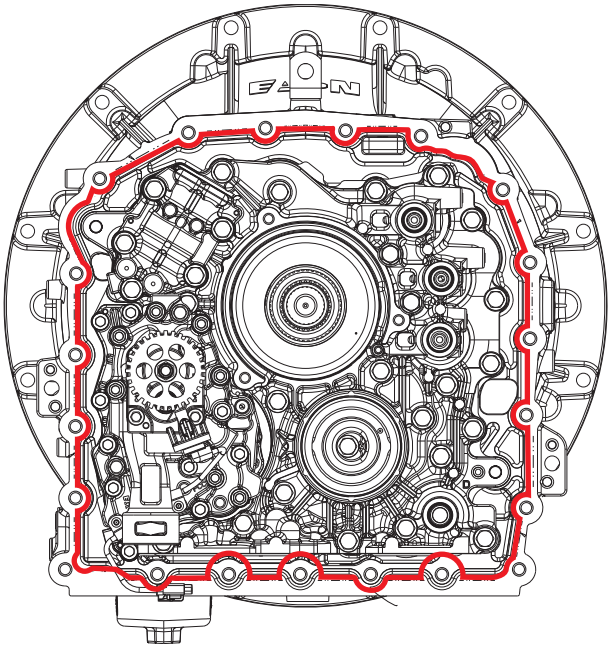
1. Clean sealing surfaces on Main Housing and Clutch Housing with Gasket Remover.

   NOTICE: Do not use abrasive scrapers or power tools to clean sealing surfaces.

2. Inspect threaded bolt holes for debris and clean if necessary.

   NOTICE: Ensure there is nothing in the threaded bolt holes or the Clutch Housing may be damaged when cap screws are tightened.

3. Apply Gasket Sealant in an 1/8" bead to the Clutch Housing sealing surface following the pattern below.



4. Lower Main Housing onto Upper Shaft, Lower Shaft, and Clutch Housing Dowel Pins.

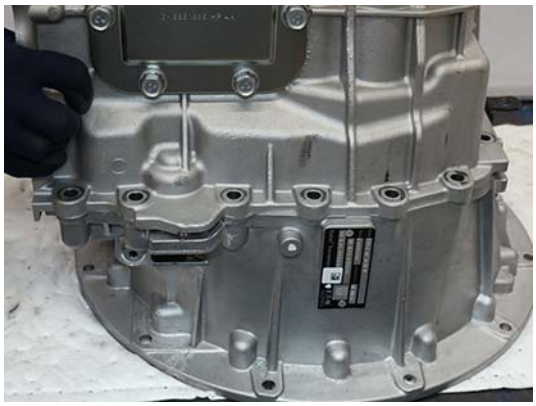
CAUTION: Main Housing assembly weighs approximately 30 lbs. Dropping Main Housing assembly could result in component damage and/or personal injury.

5. Push Main Housing flush to Clutch Housing.

Note: A rubber hammer may be used to gently tap Main Housing onto Clutch Housing Dowel Pins.

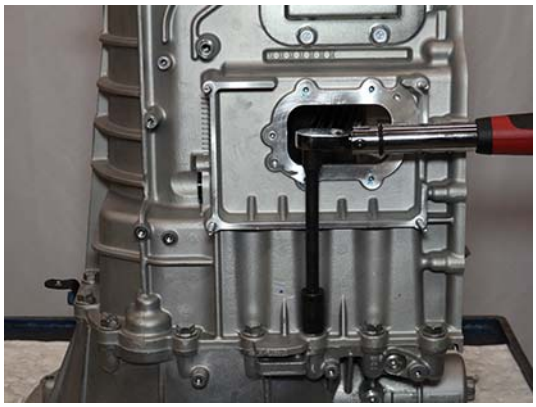
NOTICE: Main Housing should not be forced onto Clutch Housing. If Housings do not meet flush check internal assembly.

NOTICE: Do not use cap screws to pull Main Housing to Clutch Housing.



6. Install 16 external and 5 internal Main Housing 16 mm cap screws and torque to 44.5-51.5 Nm (32.8-38 lb-ft) in a crisscross pattern.

NOTICE: To avoid internal transmission contamination, keep Main Housing cap screws separated.



Install Reverse Idler Gear

1. Install Reverse Idler Gear Thrust Washers into Main Housing.

   Note: Assembly Grease may be used to hold thrust washers in place to aid in Reverse Idler Gear, Bearings and Shaft installation.

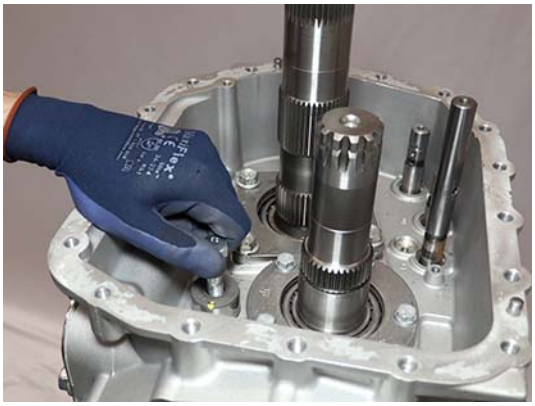
2. Install Reverse Idler Gear Bearings into Reverse Idler Gear.

3. Install Reverse Idler Gear assembly into Main Housing.

   NOTICE: Ensure “REAR” indicated on Gear faces rear of transmission.

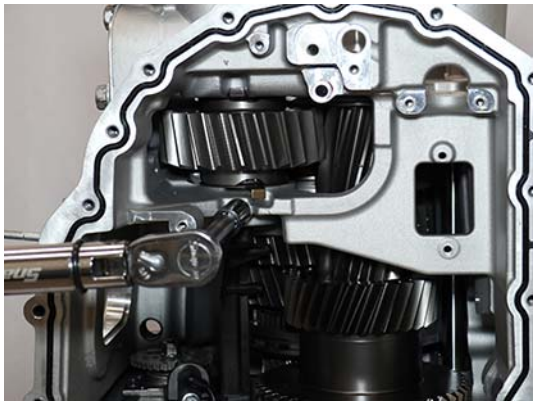
4. Install Reverse Idler Shaft into Main Housing and onto Main Housing Spray Bar.

   NOTICE: Ensure Spray Bar is centered in Main Housing shaft opening prior to installing shaft or damage may occur.



5. Align Reverse Idler Shaft to Main Housing to allow installation of the Main Housing to Reverse Idler Shaft cap screw.

6. Install Reverse Idler Shaft 13 mm cap screw and torque to 27.5-31.5 Nm (20.2-23.2 lb-ft).



7. Remove the M12x1.75x60 bolt used during disassembly/assembly from Reverse Idler Shaft.

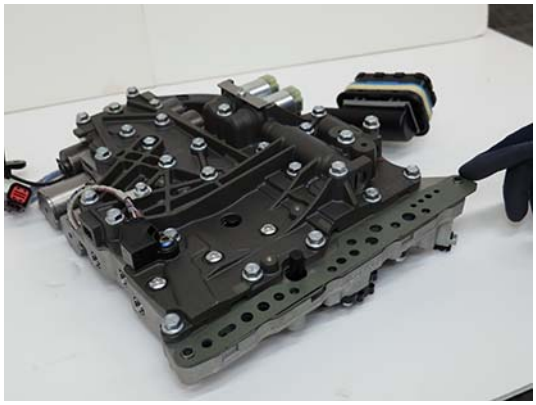
Install the Actuation Control Module (ACM)

1. Install ACM rear lubrication O-ring.

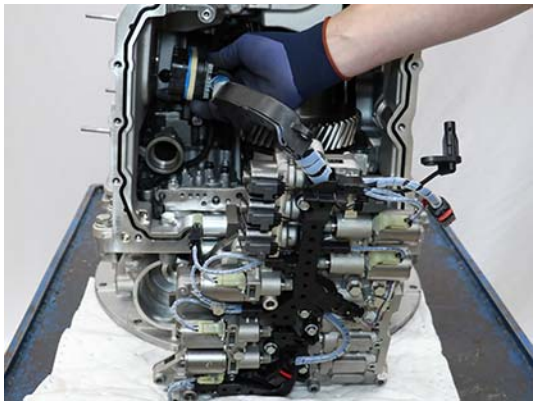
   Note: Assembly grease can be used to hold O-ring in place.

2. Install 2 ACM Alignment Pins (RR1036TR) into Interface Manifold outermost threaded mounting holes.

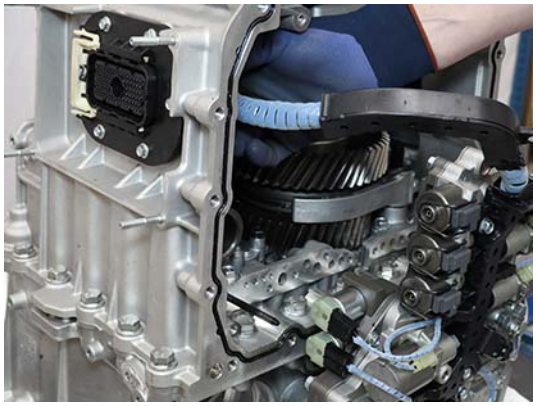
3. Orient and install ACM to Interface Manifold Gasket on ACM Dowel Pins.



4. Position ACM to Main Housing.



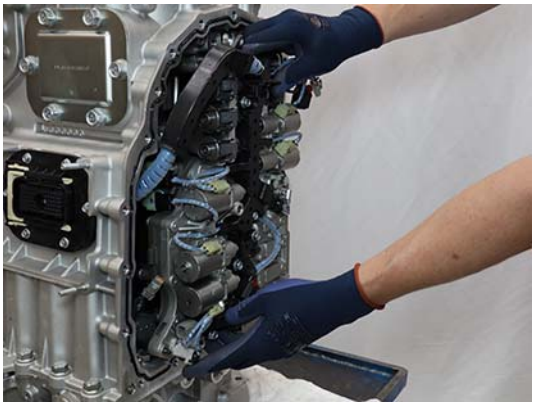
5. Route 74-Way Transmission Harness Connector into 74-Way Connector Retainer.



6. Latch 74-Way Connector Retainer to 74-Way Transmission Harness Connector.

7. Position ACM onto ACM Alignment Pins (RR1036TR).

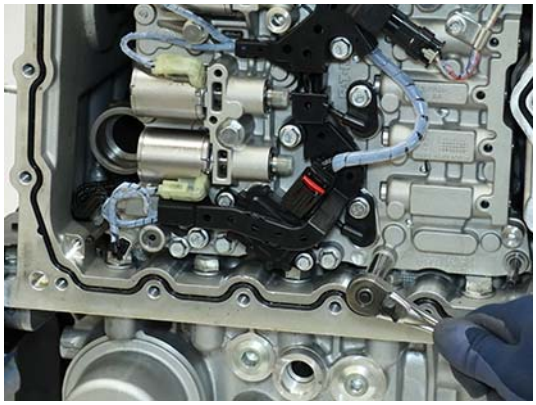
   Note: Ensure Engine Speed Sensor Connector remains accessible after ACM installation.



8. Push ACM flush to Interface Manifold and Main Housing rear lubrication O-ring.

   NOTICE: Ensure ACM to Interface Manifold Gasket is still positioned on ACM Dowel Pins. Improper installation will result in failure when run.

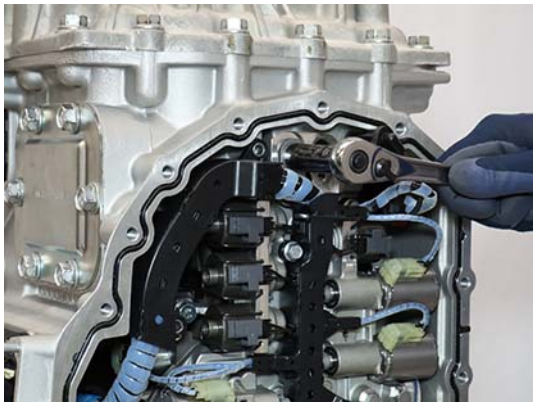
9. Install 4 ACM 10 mm cap screws and hand tighten.



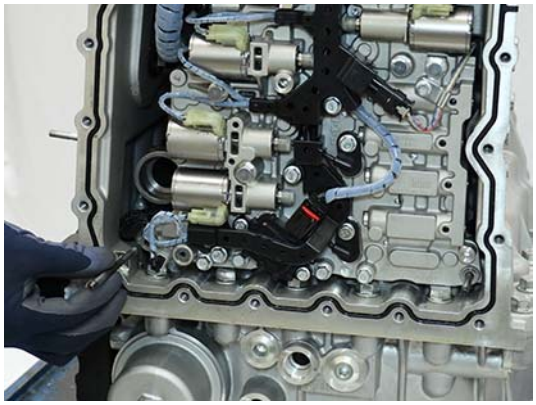
10. Install ACM Retainer Tab, O-ring isolator, and 13 mm cap screw and hand tighten.

    Note: Assembly grease may be used to hold O-ring in place.

    Note: Ensure ACM Retainer Tab is square with Main Housing and completely covers O-ring isolator.

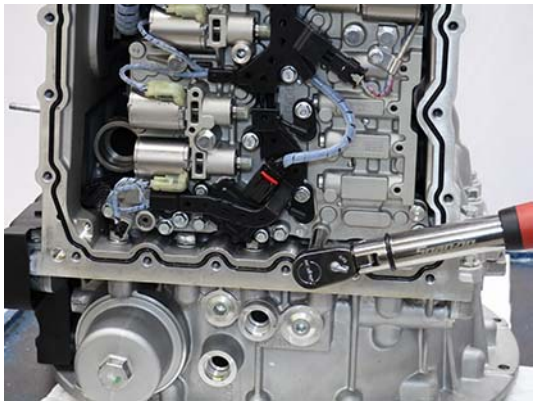


11. Remove the 2 ACM Alignment Pins (RR1036TR) from Interface Manifold outermost threaded mounting holes.



12. Install the 2 remaining ACM to Interface Manifold 10 mm cap screws into Interface Manifold outermost threaded mounting holes and hand tighten.

13. Torque all 6 ACM to Interface Manifold 10 mm cap screws to 8.8-10.4 Nm (77.9-92 lb-in).

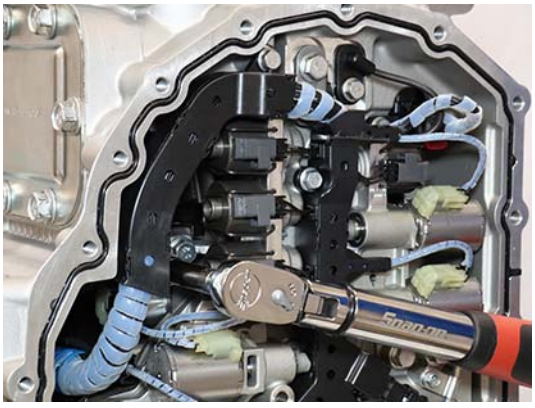


14. Torque ACM Retainer Tab 13 mm cap screw to 20.5-25.5 Nm (15.14-18 lb-ft).

Note: Ensure that ACM Retainer Tab is square with Main Housing and completely covers O-ring isolator.

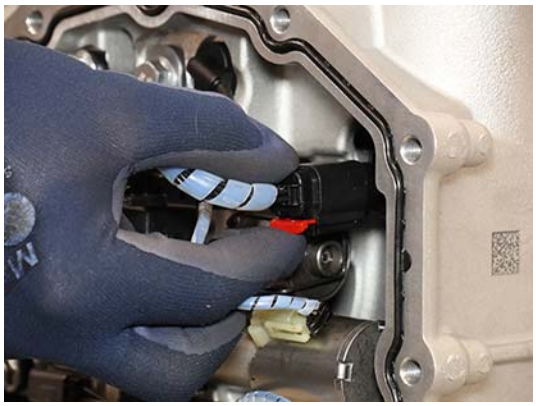
15. Install Output Speed Sensor and 10 mm cap screw into Main Housing and torque screw to 8.8-10.4 Nm (77.9-92 lb-in).

16. Install 2 Transmission Harness to Main Housing 10 mm cap screws and torque to 8.8-10.4 Nm (77.9-92 lb-in).



17. Connect 2-Way Transmission Harness Connector to Engine Speed Sensor Connector.

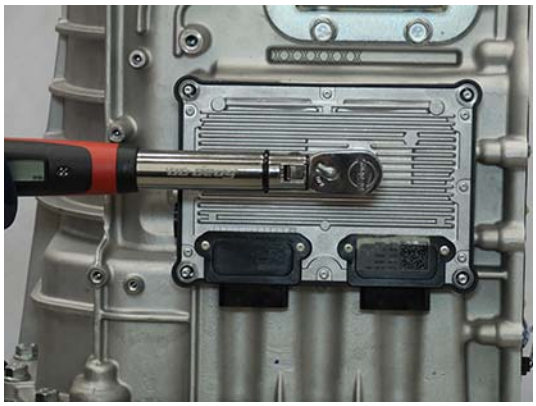
18. Connect 8-Way Transmission Harness Connector to 90-degree pass-through connector and latch red lock tab.



Install the Transmission Control Module (TCM)

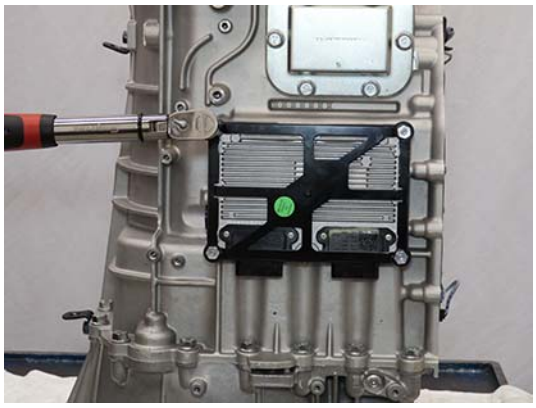
1. Align the TCM to the 74-Way Transmission Harness Connector and TCM studs.

2. Torque TCM jackscrew to 2.0-2.5 Nm (17.7-22.1 lb-in).



3. Install TCM Cover with 4 nuts over TCM studs and torque to 8.8-10.4 Nm (77.9-92 lb-in) in a crisscross pattern.

   Note: TCM Cover nuts are 10 or 13 mm.

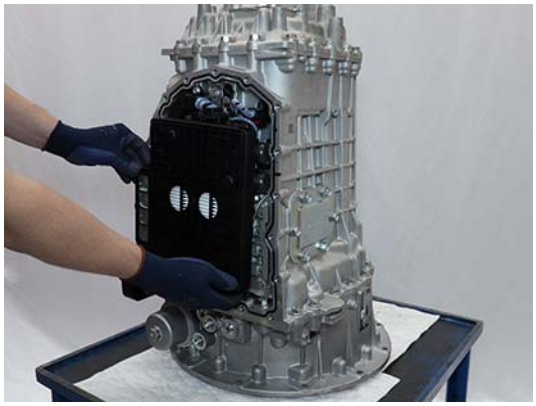


Install the Sump Pan and Filter

1. Clean Sump Pan and Main Housing sealing surfaces of old oil and debris.
2. Inspect threaded bolt holes for debris and clean if necessary.

   NOTICE: Ensure there is nothing in the threaded bolt holes or the Main Housing may be damaged when cap screws are tightened.
3. Lubricate Sump Pan Filter O-ring with Eaton® Procision DCT transmission oil.
4. Install Sump Pan Filter.

   Note: If the Sump Pan Filter was replaced with new the Sump Pan Seal must be replaced.



5. Install Sump Pan Seal into Main Housing recess if previously removed.

   Note: The Sump Pan Seal can only go in the Main Housing recess in one direction; use seal alignment tabs to ensure proper alignment during installation.

6. Position Sump Pan on Main Housing.

7. Install 20 Sump Pan13 mm cap screws and torque to 27.5-31.5 Nm (20.2-23.2 lb-ft) in a crisscross pattern.

8. Ensure Oil Drain Plug is installed. If not, Install the Oil Drain Plug and torque to 27.5-32.5 Nm (20.3-24 lb-ft)

   NOTICE: Do not over-torque Oil Drain Plug or damage to threads may occur.

Secure Transmission (Horizontal)

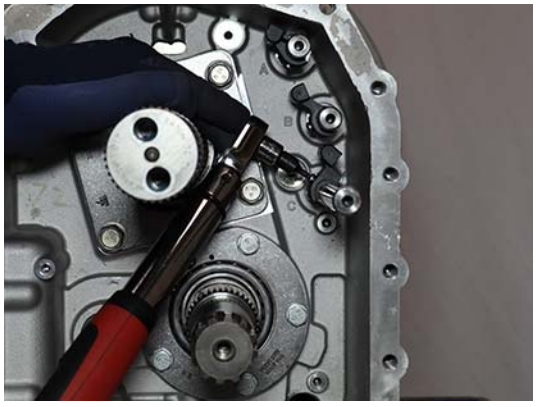
1. Securely place the transmission in the horizontal position.

WARNING: Transmission weighs approximately 375 lbs. Keep fingers clear of pinch point between Clutch Housing and other surfaces. Dropping transmission may result in major component damage, severe injury or death.

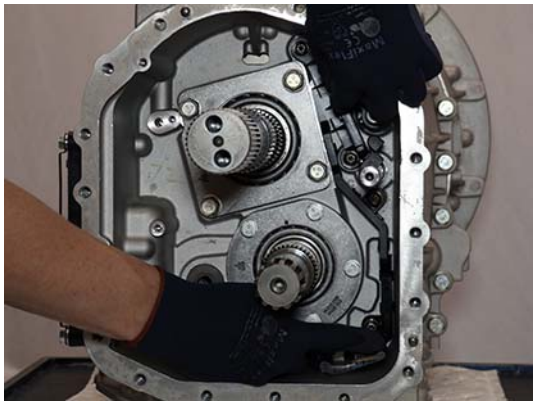
NOTICE: Use an appropriate lifting device to safely lift component.

Install 3-Rail Position Sensor and Magnets

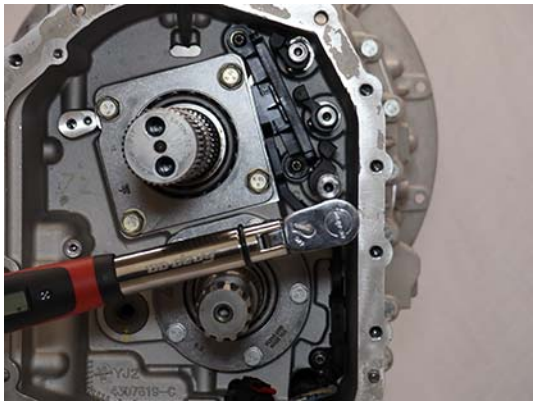
1. Clean Shift Rail Magnets A, B and C of any metal shavings or debris.
2. Install Shift Rail Magnets A, B and C on Shift Rails A, B, and C with T20 torx head screws and torque to 1.55-1.85 Nm (13.7-16.3 lb-in).



3. Position 3-Rail Position Sensor on Main Housing Mid-Wall.



4. Install 4, 3-Rail Position Sensor T30 torx head screws and torque to 8.8-10.4 Nm (77.9-92 lb-in).

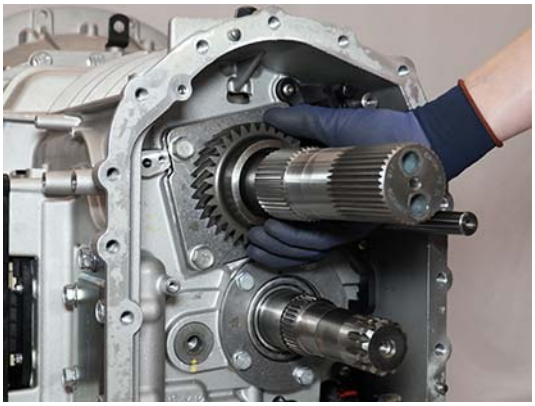


5. Connect 8-Way 3-Rail Position Sensor Harness Connector to 90-Degree Connector and latch red lock tab.

Rear Housing Assembly

1. Install 6th Driven Gear on Upper Shaft.

   Note: Raised side of gear faces rear of transmission.



2. Rotate Lower Shaft until 6th Gear Mid-Wall Bearing Spacer Alignment Ball locating hole is in 12 o'clock position.

3. Install Mid-Wall Bearing Spacer Alignment Ball on Lower Shaft.

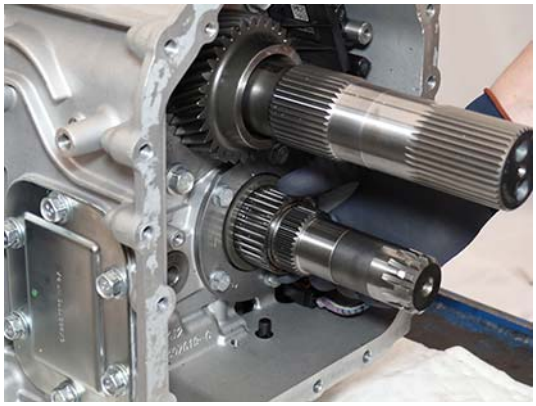
   Note: Assembly Grease should be used to hold Ball in place.

4. Install 6th Gear Mid-Wall Bearing Spacer on Lower Shaft.

   NOTICE: Raised side of Spacer faces front of transmission. Proper orientation is critical to final assembly.

   NOTICE: Notch in Spacer must align with Mid-Wall Bearing Spacer Alignment Ball.

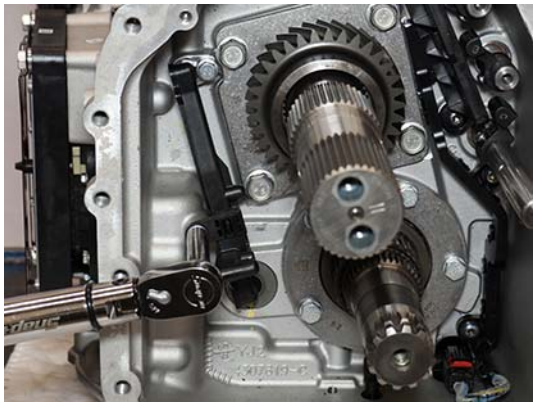
5. Install 6th Gear Bearing on Lower Shaft.



6. Install Rear Lube Bar into Main Housing and Reverse Idler Shaft.

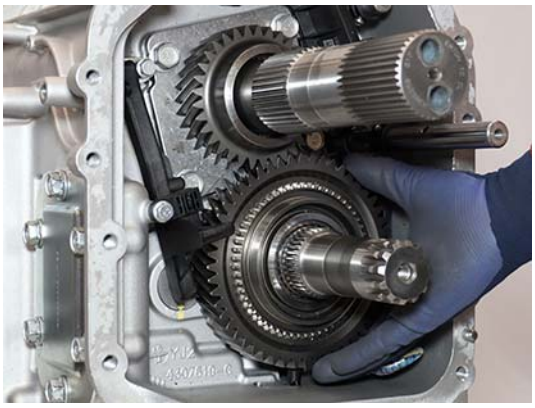
   Note: Ensure Rear Lube Bar is fully seated into Main Housing and Reverse Idler Shaft.

7. Install 2 Rear Lube Bar 10 mm cap screws and torque to 8.8-10.4 Nm (77.9-92 lb-in).



8. Install 6th Gear on Lower Shaft.

Note: Raised side of gear faces rear of transmission. Proper orientation is critical to final assembly.



9. Install Rail C Synchronizer Blocking Ring onto 6th Gear.

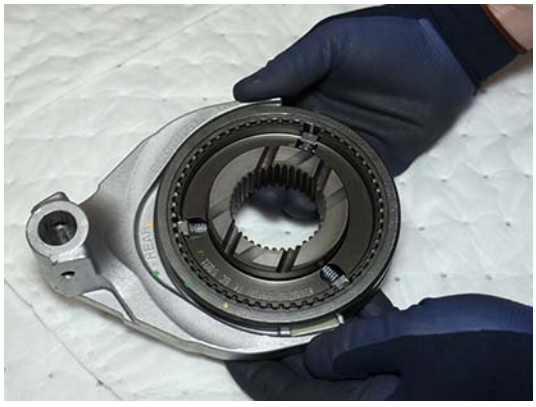
10. Assemble Rail C Synchronizer assembly.

NOTICE: Ensure all 3 Rail C Synchronizer Keys and Springs are in Synchronizer Hub Key Slots.

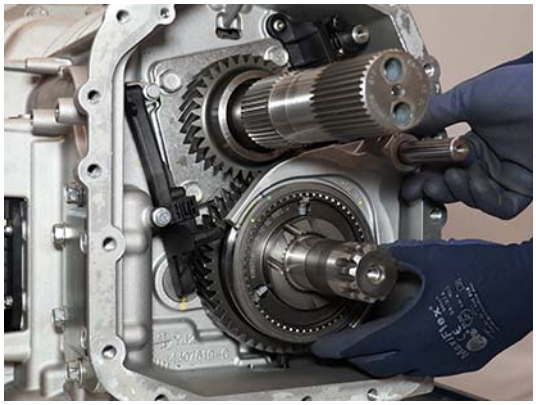
NOTICE: When installed in transmission beveled edge of Synchronizer Sleeve faces front of transmission while raised side of Synchronizer hub faces rear of transmission.

11. Position Rail C Shift Yoke onto Rail C Synchronizer assembly.

NOTICE: Ensure “REAR” indicated on Shift Yoke faces rear of transmission.

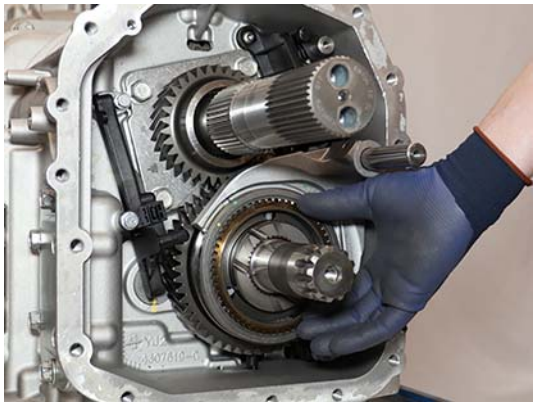


12. Install Rail C Synchronizer assembly with Rail C Shift Yoke on Lower Shaft and Shift Rail C.



13. Check proper assembly to this point before proceeding to next step. Confirm the following:
    - Synchronizer Blocking Ring tabs are aligned with Hub Key Slots.
    - Raised side of Synchronizer Hub faces rear of transmission.
    - Beveled edge of Synchronizer Sleeve faces front of transmission.
    - “REAR” indicated on Rail C Shift Yoke faces rear of transmission.
14. Install remaining Rail C Synchronizer Blocking Ring onto Rail C Synchronizer Hub.

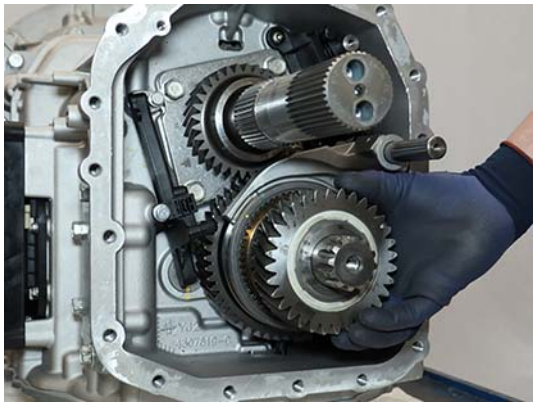
    NOTICE: Ensure Blocking Ring tabs align with Hub Key Slots.



15. Install 4th Gear Bearing and Captured Inner Race into 4th Gear.

    Note: Bearing and Captured Inner Race may already be installed in 4th Gear.

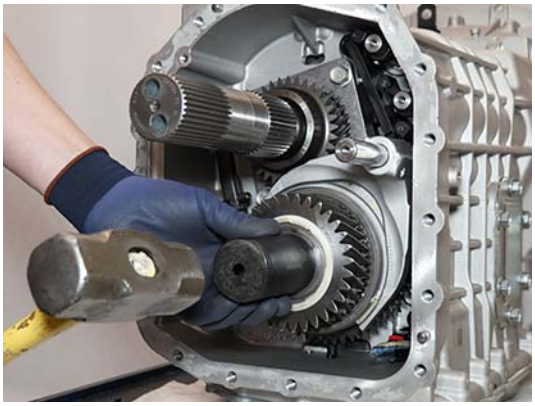
16. Place 4th Gear assembly onto Lower Shaft.



17. Place Lower Shaft 4th Gear Inner Sleeve Driver (RR1040TR) on Lower Shaft and against 4th Gear Captured Inner Race.

18. Drive 4th Gear assembly onto Lower Shaft.

NOTICE: Ensure Rail C Synchronizer Blocking Ring tabs stay aligned with Hub Key Slots during 4th Gear installation.

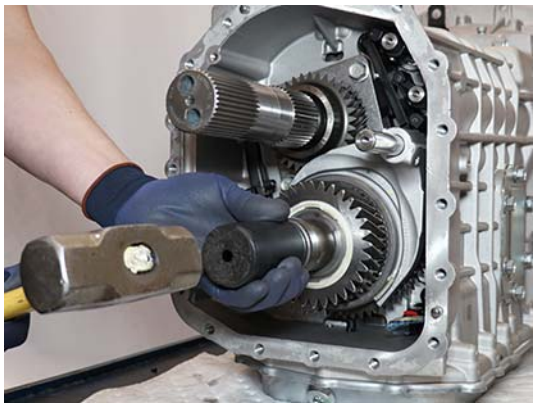


19. Install Spacer onto Lower Shaft.

20. Place Lower Shaft Rear Bearing Inner Race onto end of Lower Shaft.

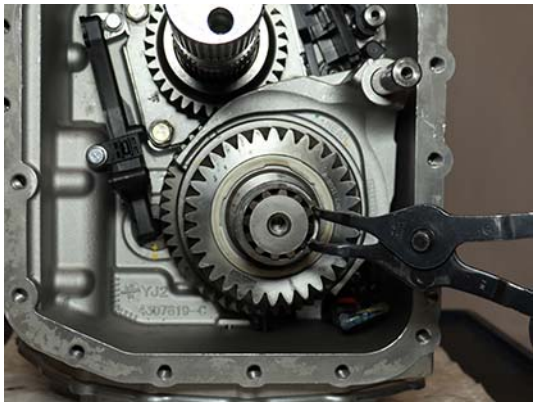
21. Use Lower Shaft Rear Bearing Inner Race Driver (RR1040TR) to drive Lower Shaft Rear Bearing Inner Race onto Lower Shaft.

    Note: Ensure Rear Bearing Inner Race is fully seated.



22. Install new Ring on Lower Shaft.

    NOTICE: If Ring cannot be properly installed into Ring groove due Rear Bearing Inner Race interference, check 6th Gear Mid-Wall Bearing Spacer installation orientation (Step 4). Raised side of Spacer must face front of transmission. Proper orientation is critical to final assembly.



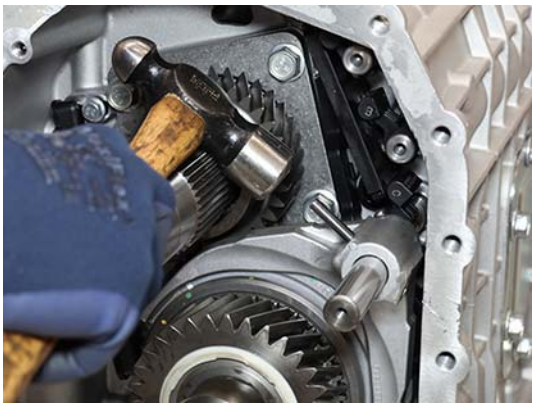
23. Install Shift Rail Actuation Tool (RR1039TR) into Shift Rail C.

24. Place Rail C Synchronizer Sleeve, Rail C Shift Yoke and Shift Rail C into the 4th Gear position then remove Shift Rail Actuation Tool (RR1039TR).

    Note: Ensure Rail C is fully extended rearward. Roll Pin hole in Rail must be aligned with Roll Pin hole in Shift Yoke.

25. Install Rail C Shift Yoke Roll Pin.

Note: Roll Pin must be driven from the inside of housing outward.



26. Install 4th Driven Gear and Park Pawl Gear assembly on Upper Shaft.

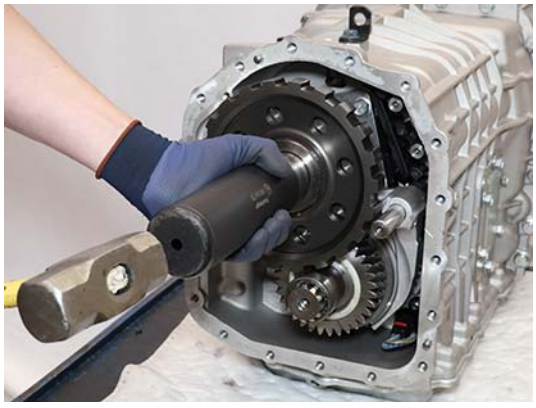
NOTICE: Align Park Pawl Gear tooth gap with Lower Shaft Bearing Race or damage may occur.

Note: For transmissions without a Park Pawl, install 4th Driven Gear on Upper Shaft.

27. Place Upper Shaft Rear Bearing Inner Race onto end of Upper Shaft.

28. Use Upper Shaft Rear Bearing Inner Race Driver (RR1041TR) to drive Upper Shaft Rear Bearing Inner Race onto Upper Shaft.

NOTICE: Ensure Park Pawl Gear tooth gap stays aligned with Lower Shaft Bearing Race or damage may occur.



Install the Rear Housing

1. Clean sealing surfaces on Rear Housing Cover and Main Housing with Gasket Remover.

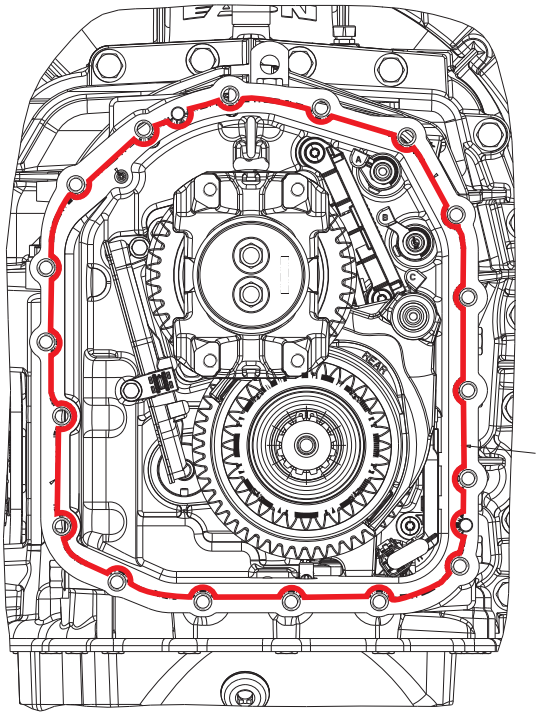
NOTICE: Do not use abrasive scrapers or power tools to clean sealing surfaces.

2. Inspect threaded bolt holes for debris and clean if necessary.

   NOTICE: Ensure there is nothing in the threaded bolt holes or the Main Housing may be damaged when cap screws are tightened.

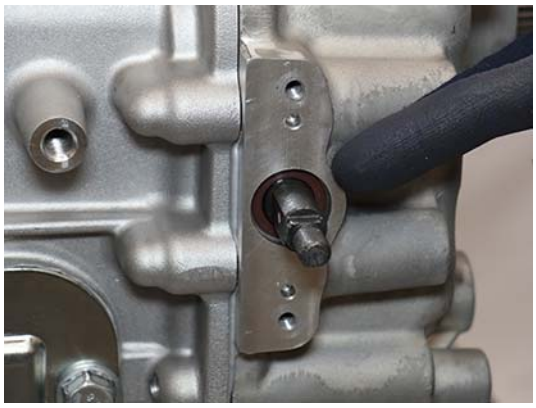
3. Apply Gasket Sealant in an 1/8" bead inward of all cap screw holes to the Main Housing sealing surface following the pattern below.

   NOTICE: Ensure there is no Gasket Sealant in Main Housing Rear Bearing Oil Passage.



4. Install Rear Housing Cover onto Upper Shaft, Lower Shaft and Main Housing Dowel Pins.

   NOTICE: If transmission is equipped with a park pawl confirm the Internal Shift Shaft has remained in the Neutral position as shown prior to installing the Rear Housing Cover or damage to the internal Park Pawl mechanism and Lower Shaft Rear Inner Bearing Race will occur.



5. Push Rear Housing Cover flush to Main Housing.

   NOTICE: Rear Housing Cover should not be forced onto Main Housing. If Housings do not meet flush check internal assembly.

   NOTICE: Do not use cap screws to pull Rear Housing Cover to Main Housing.

   Note: A rubber hammer may be used to gently tap Rear Housing Cover onto Main Housing Dowel Pins.

6. Install 18 Rear Housing Cover 16 mm cap screws torque to 44.5-51.5 Nm (32.8-38.0 lb-ft) in a criss-cross pattern.

   Note: Three Rear Housing Cover cap screws are a different length than the rest. Refer to Rear Housing Cover removal notes for proper location.

Install the Transmission Range Sensor (TRS)

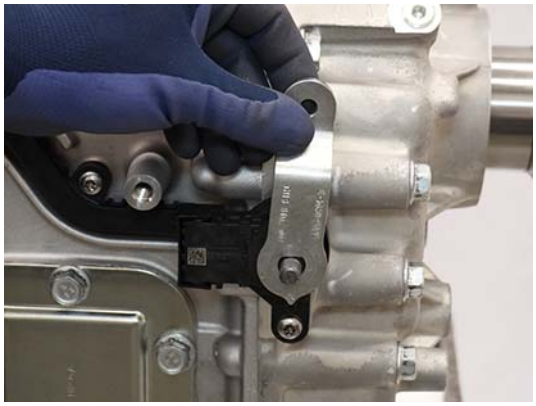
1. Install TRS assembly on Internal Shift Shaft and push flush to Rear Housing Cover and Main Housing.

   Note: Flat side of TRS must align with flat side of Internal Shift Shaft.

2. Install 5 TRS Harness Bracket to T30 torx head screws and torque to 8.8-10.4 Nm (77.9-92 lb-in).

3. Install Transmission Cable Shift Lever on Internal Shift Shaft.

   NOTICE: Cable Shift Lever must point upward and curve toward transmission. Improper installation will cause gear selection problems.

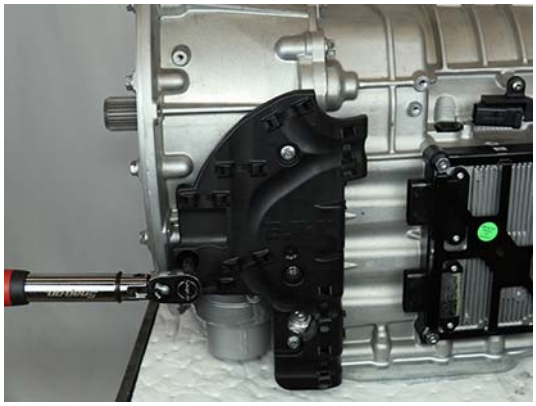


4. Use hand tools to install the Transmission Cable Shift Lever retaining nut on Internal Shift Shaft and torque nut to 20.5-25.5 Nm (15.1-18.8 lb-ft).

   NOTICE: Retain TRS Internal Shift Shaft position by holding Cable Shift Lever in the Neutral (N) position while tightening the retaining nut to prevent internal TRS damage. Do not use power tools.

Install OEM Harness Bracket

1. Position OEM Harness Bracket to Clutch Housing.
2. Install 4 OEM Harness Bracket 10 mm cap screws and torque to 8.8-10.4 Nm (77.9-92 lb-in).



Install Pump Driven Gear

1. Align and install Pump Driven Gear onto Pump Driveshaft with raised side toward Pump Driveshaft.

   Note: Ensure proper alignment of Gear square opening onto Driveshaft.

2. Install Pump Driven Gear 13 mm cap screw and hand tighten.

   Note: Do not torque cap screw yet.

3. Install drift into Pump Driven Gear.

4. Hold drift securely against Clutch Housing to hold Pump Driven Gear stationary and torque Pump Driven Gear 13 mm cap screw to 32.5-39.5 Nm (24.0-29.1 lb-ft).

CAUTION: Failure to hold Pump Driven Gear stationary during cap screw installation could result in component damage and/or personal injury.

Install Front Cover/Dual Clutch Module (DCM) Assembly

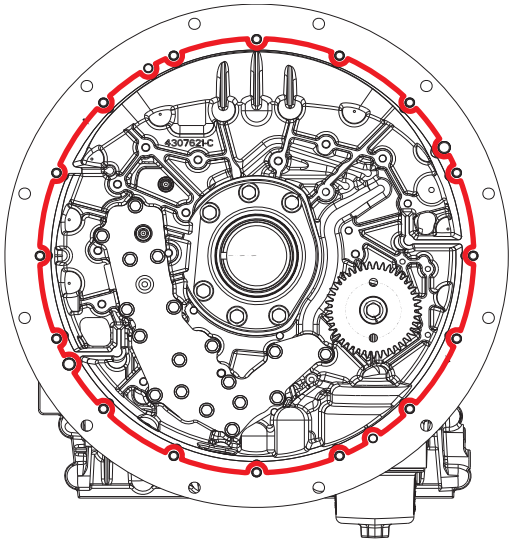
1. Clean sealing surfaces on Front Cover and Clutch Housing with Gasket Remover.

   NOTICE: Do not use abrasive scrapers or power tools to clean sealing surfaces.

2. Inspect threaded bolt holes for debris and clean if necessary.

   NOTICE: Ensure there is nothing in the threaded bolt holes or the Clutch Housing may be damaged when cap screws are tightened.

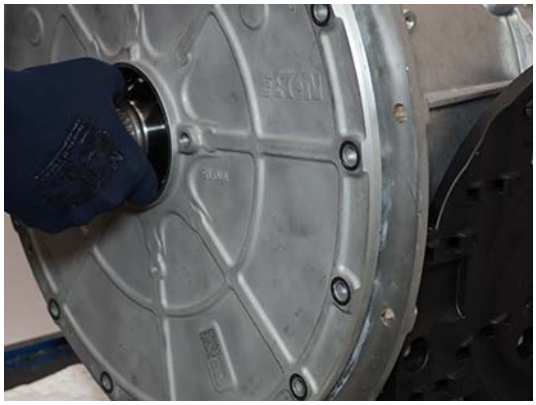
3. Apply Gasket Sealant in an 1/8” bead inward of all cap screw holes to the Clutch Housing sealing surface following the pattern below.



4. Install Front Cover/DCM assembly onto Clutch Support Manifold.

CAUTION: Front Cover/DCM assembly weighs approximately 45 lbs. Keep fingers clear of pinch point between Front Cover and Clutch Housing. Dropping Front Cover/DCM assembly could result in component damage and/or personal injury.

5. Rotate and push DCM Input Shaft to align DCM onto both transmission Input Shafts and the Pump Driven Gear.



6. Rotate Front Cover so “TOP” is at the 12 o'clock position.

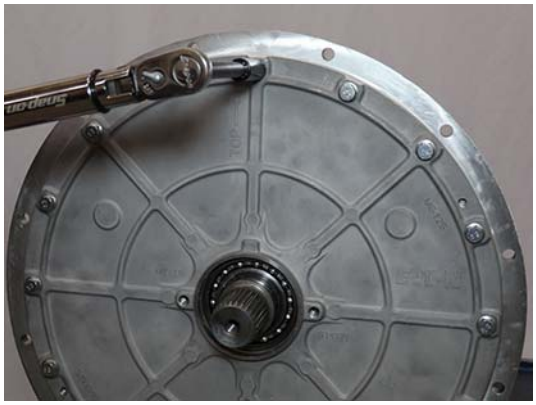
   Note: Ensure Front Cover dowel holes are aligned with Clutch Housing Dowel pins.

7. Push Front Cover flush to Clutch Housing.

   NOTICE: Front Cover should not be forced onto Clutch Housing. If Cover and Housings do not meet flush, check internal assembly.

   NOTICE: Do not use cap screws to pull Front Cover to Clutch Housing or damage may occur.

8. Install 16 Front Cover 13 mm cap screws and torque to 20.5-25.5 Nm (15.1-18.8 lb-ft) in a crisscross pattern.



Install Transmission

1. Refer to OEM guidelines for transmission installation.
2. Reconnect the negative battery cable.

Fill Oil

Note: For a list of Eaton Approved Synthetic Lubricants, see Eaton TCMT0021 Lubrication guide on Roadranger.com or call 1-800-826-HELP (4357).

1. Park vehicle in a safe area on level ground.

   Note: If equipped with a Shift Lever, ensure the transmission is in Park (P).

   Note: If equipped with a Push Button Shift Control, ensure the transmission is in Neutral (N).

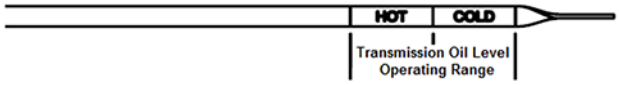
2. Set parking brake and block wheels to prevent vehicle movement.
3. Locate the transmission oil level dipstick and tube in the engine compartment and clean any dirt or debris from dipstick handle and tube.
4. Remove transmission oil level dipstick.
5. Fill transmission with 12 liters of Eaton Procision DCT transmission oil through the dipstick tube.
6. Key on, engine running at low idle RPM.
7. Wipe clean the transmission oil level dipstick and install in dipstick tube.
8. Remove transmission oil level dipstick and check oil level.

9. Repeat steps 7 and 8 to confirm oil level.
10. Add or drain oil if level is not within the normal operating range.

    NOTICE: When adding oil use only Eaton® approved transmission oil.

    NOTICE: Do not overfill transmission oil.

    Note: If PTO-equipped additional oil will be required.



11. Re-install transmission oil level dipstick.
12. Perform “Oil Leak Inspection Process” on page 407.

Calibrate and Clear Faults

1. Key on with engine running.
2. Connect ServiceRanger.
3. Go To “Service Routines”.
4. Select “Start” Rail Calibration and follow on-screen prompts.
5. Select “Start” Line Pressure Calibration and follow on-screen prompts.
6. Select “Start” Clutch Pressure (PI) Calibration and follow on-screen prompts.
7. Select “Start” Clutch Touch Point (PTP) Calibration and follow on-screen prompts.
8. Key off and wait 1 minute.
9. Key on with engine off.
10. Go To “Fault Codes”.
    - If active fault code(s) is set, refer to TRTS0990 Procision Troubleshooting Guide.
    - If no active fault codes, select “Clear Eaton Faults” and follow on-screen prompts.
11. Disconnect ServiceRanger.
12. Key off.