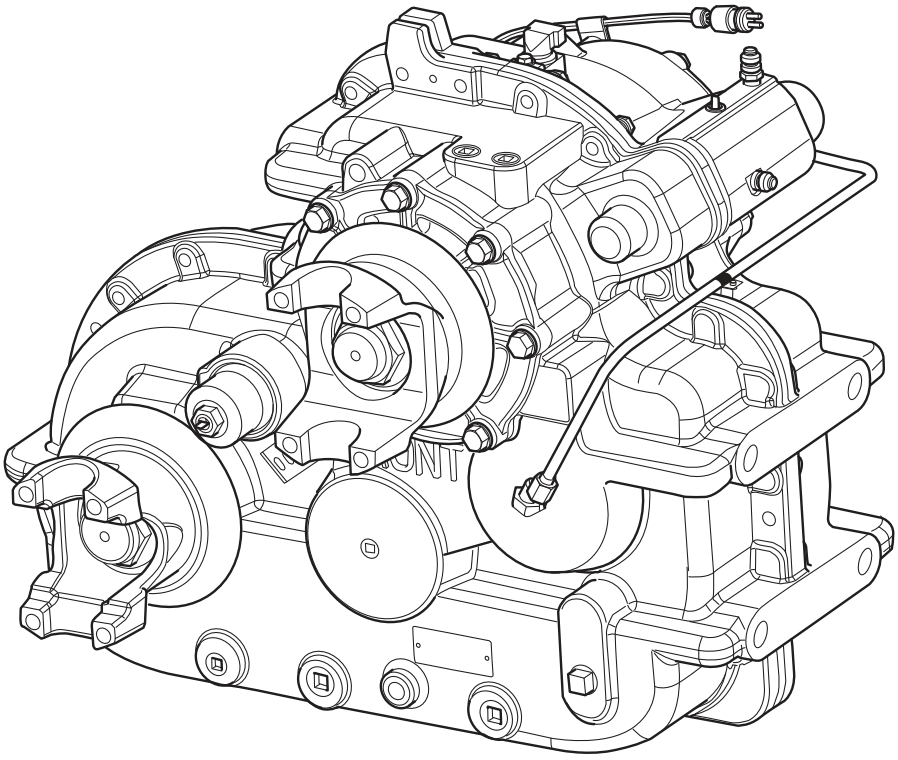
MERITOR
RUN WITH THE BULL

MAINTENANCE MANUAL MM-0861

MTC-4208X/XL/XP/XLEV/XLEC, MTC-4210X/XL/XP/ XLEV/XLEC AND MTC-4213X SERIES TRANSFER CASES



Service Notes

About This Manual

This manual provides service and repair procedures for Meritor MTC-4208X/XL/XP/XLEV/XLEC, MTC-4210X/XL/XP/XLEV/XLEC, and MTC-4213X transfer cases.

Transfer Case Interchangeability

The MTC-4208XL/XLEV/XLEC and MTC-4210XL/XLEV/XLEC transfer case models are directly interchangeable with MTC-4208XL and MTC-4210XL transfer case specifications.
Interface points for the oil cooler inlet and outlet lines (if equipped) on the XL, XLEV, and XLEC models are different from the X and XP, which affect the lengths of the oil cooler lines. The exterior geometry of the housing and location of lubrication lines also change, which potentially impacts clearances to surrounding components. In addition, GS models cannot be used in place of the X models in applications with “engage-on-the-fly” systems or mid-ship pumps.
The MTC-4208XP, MTC-4210XP, and MTC-4213X transfer case models are backward-compatible with MTC-4208GS, MTC-4210GS, and MTC-4213GS transfer case specifications.
There are no changes to the oil cooler interface points with these models.
For more information on MTC-4208, MTC-4210, and MTC-4213GS Series transfer cases, refer to Maintenance Manual MM-0146 - Transfer Cases. To obtain this publication, visit Literature on Demand at meritor.com.

How to Obtain Additional Maintenance and Service Information

Visit Literature on Demand at meritor.com to access and order additional information. Additional information is also available at meritorbullpen.com.
Contact the OnTrac™ Customer Call Center at 866-668-7221 (United States and Canada); 001-800-889-1834 (Mexico); or email OnTrac@meritor.com.

If Parts, Tools, and Supplies are Specified in this Manual

Contact Meritor’s Commercial Vehicle Aftermarket at 888-725-9355.
For assistance with parts, you may also contact the Meritor Parts Center in Florence, KY at CustCareCntr.Florence@Meritor.com or 859-525-3500.
Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. Meritor Heavy Vehicle Systems, LLC, reserves the right to revise the information presented or to discontinue the production of parts described at any time.

Table of Contents

Safety Information

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ DANGER

Indicates imminent danger. Failure to follow this instruction will result in death or serious injury.

⚠ WARNING

Indicates a possibly impending danger. Failure to follow this instruction can result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation or unsafe practice which, if not avoided, could result in injury or damage to components.

Safety Precautions

Before performing service and maintenance procedures, read and understand the following safety precautions. Failure to follow these instructions may result in death or injury. Additional hazard alert messages are included throughout this publication where applicable.

⚠ DANGER

- Before starting any work on the vehicle, carefully read and understand all instructions and hazard alert messages provided in this publication. Failure to follow procedures and alerts as directed can result in death, serious injury and damage to components.
- Procedures may only be performed by qualified professionals who are trained and certified in vehicle service. Death or serious personal injury and damage to components can result.
- Only perform work on a flat, level surface in a well-lighted, ventilated area. Death or serious personal injury and damage to components can result.
- Follow all safety instructions and service guidelines established at the service facility where work is being performed. Death or serious personal injury and damage to components can result.

⚠ DANGER

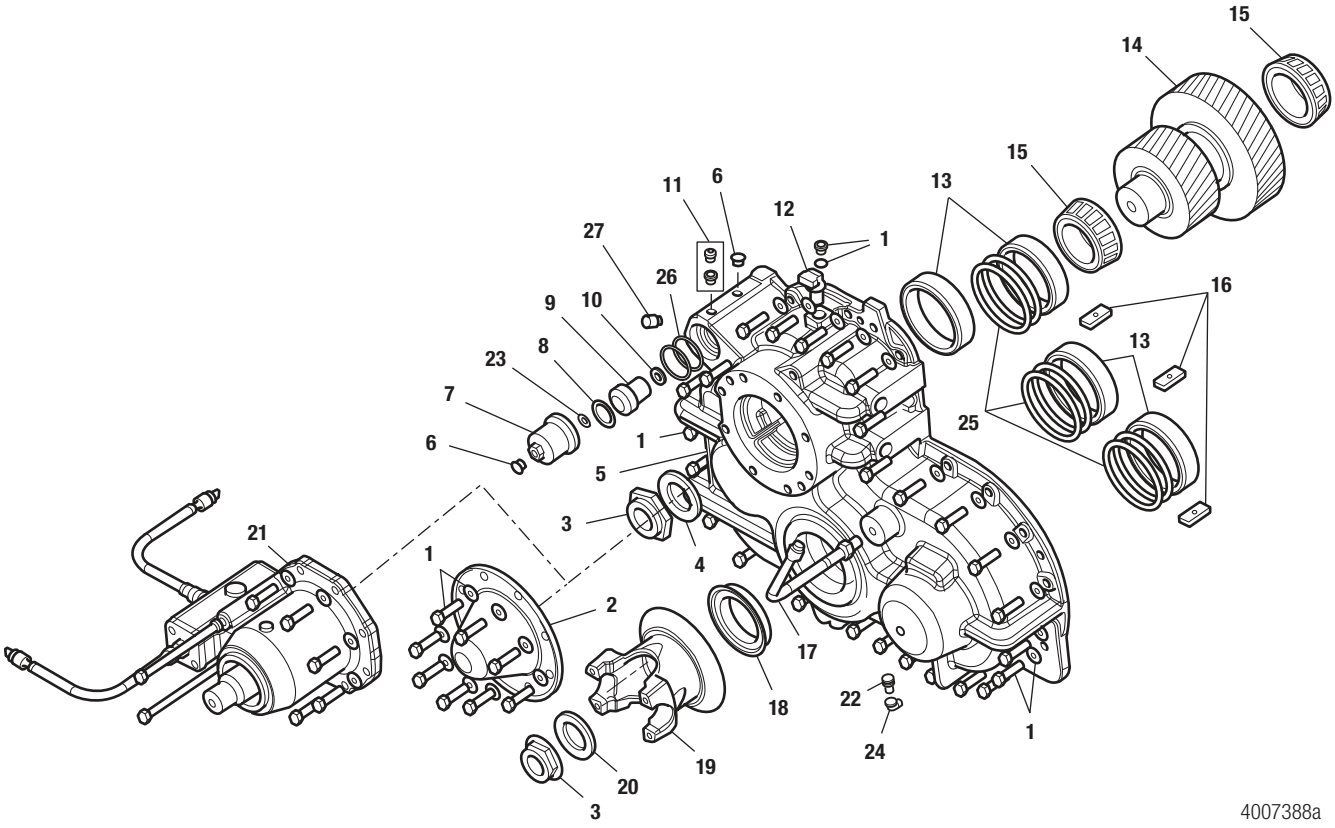
- Use only the recommended tools for service. Follow all safety guidelines and instructions provided by the tool manufacturer. Failure to do so can result in death or serious injury and damage to components.
- Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use safety stands can result in death or serious personal injury and damage to components.

⚠ WARNING

- Always wear proper eye protection and other appropriate personal protective equipment when performing procedures.
- Never wear loose clothing such as neck ties and jewelry such as necklaces, watches and rings when working on a vehicle. Always tie long hair back. Loose clothing, hair and jewelry can catch on parts, resulting in serious injury.
- Turn the engine Off and remove the ignition key before working on a vehicle. Contact with moving parts can result in serious injury.
- After operating a vehicle, allow the vehicle to cool down before performing service. Coming into contact with hot parts and fluids can cause burns and serious injury.
- Drain the air completely from the air system before working on any connected air lines or components.
- Never disconnect or connect an air line containing pressurized air. The air line can whip around or project debris, resulting in personal injury.
- Do not actuate a brake with the brake pads or shoe linings removed.
- Use only Meritor® brand replacement parts, components and kits. Use of unauthorized parts can result in damage or injury, and void the Meritor warranty.
- Use only wheels and valve stems approved by the vehicle manufacturer for use with Meritor air disc brakes. Use of unapproved wheels and valve stems can result in valve stem damage.
- Always ensure all components and systems are in correct operating condition before returning the vehicle to service.

Exploded Views

MTC-4208X/XP Transfer Case Rear Cover



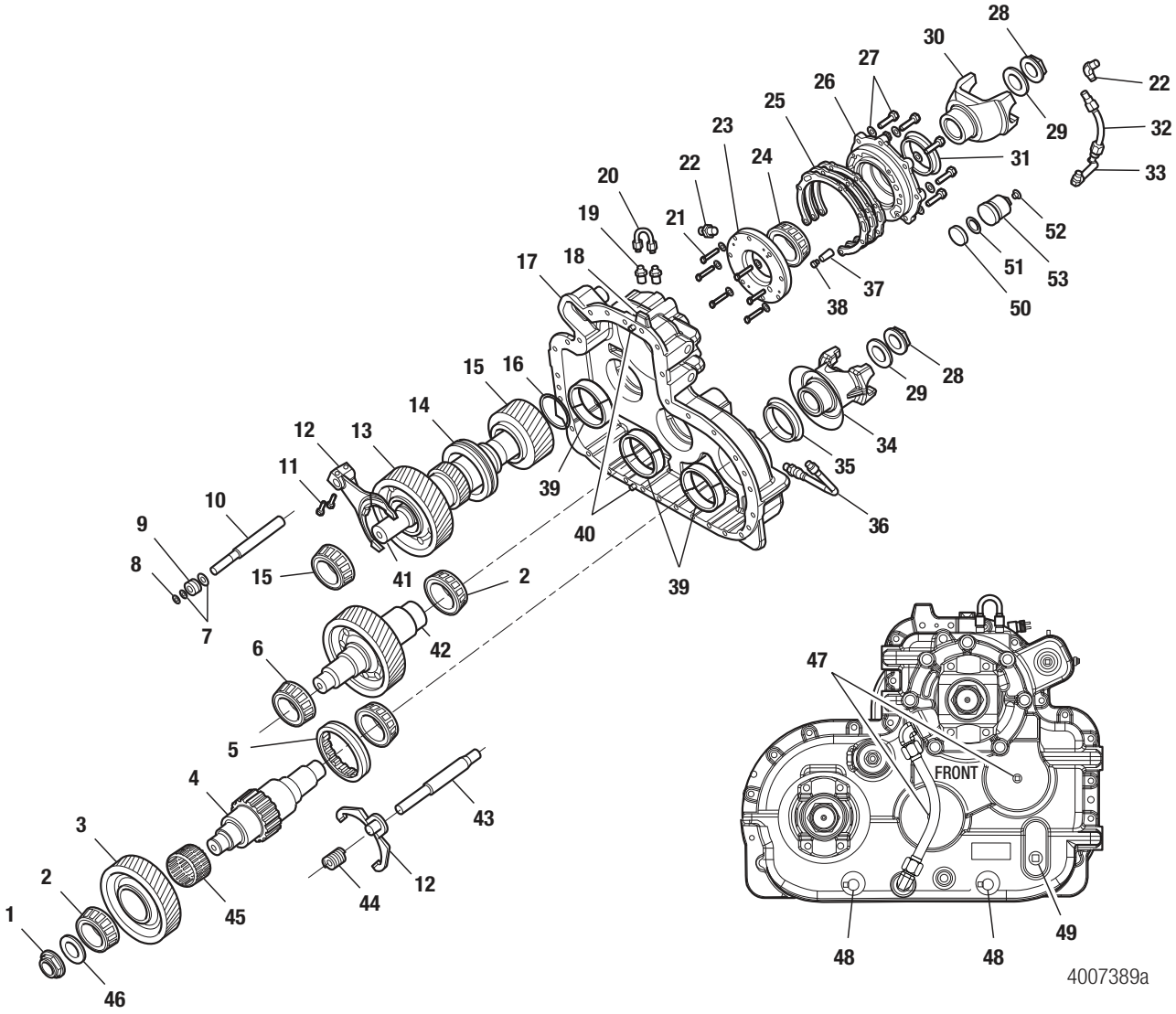
Item	Description
1	Capscrew and Washer
2	Cover
3	Lock Nut
4	Hardened Washer
5	Transfer Case Rear Cover
6	Shipping Protector
7	Shift Cylinder
8	Shift Piston O-ring
9	Shift Piston
10	O-ring
11	Neutral Breather*
12	Speed Sensor
13	Bearing Cup
14	Idler Gear

Item	Description
15	Bearing Cone
16	Ceramic Magnet
17	Switch Assembly
18	Rear Output Oil Seal
19	Rear Output Yoke
20	Flat Washer
21	PTO Assembly (Optional)
22	Breather Assembly
23	Snap Ring
24	Elbow
25	Shim
26	O-ring, Housing
27	Blow-by Breather

* Vehicles not equipped with a transfer case neutral air control may be equipped with a neutral breather which allows the shift cavity to exhaust. On vehicles equipped with a neutral air control, the solenoid allows this cavity to exhaust.

2 Exploded Views

MTC-4208X/XP Transfer Case Front Cover

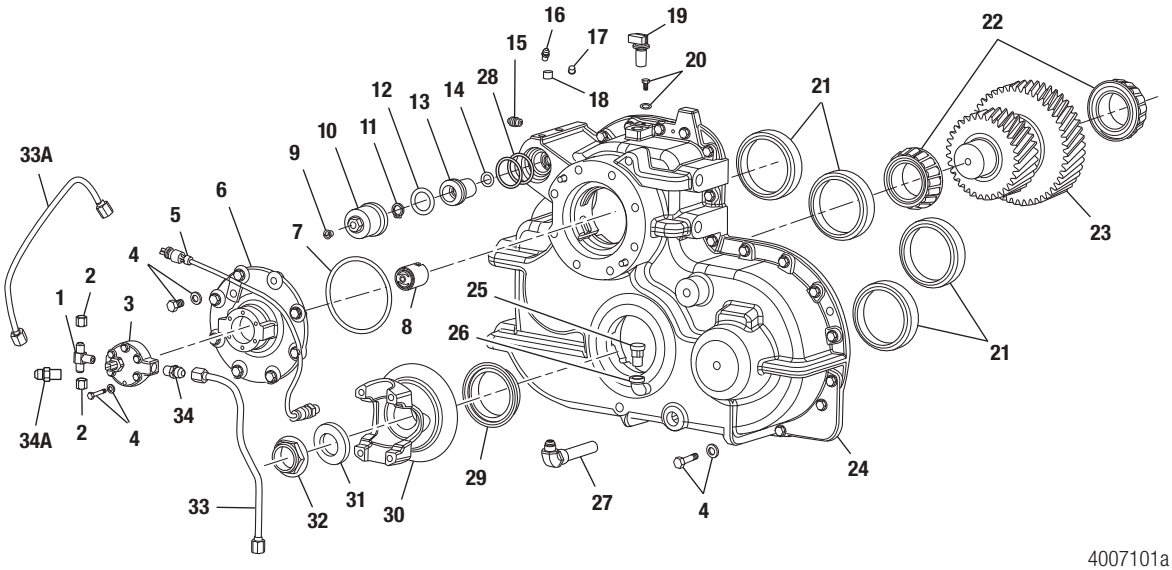


Item	Description
1	Lock Nut
2	Bearing Cone
3	Helical Driven Gear
4	Front Output Shaft
5	Front Output Clutch Collar
6	Bearing Cone
7	O-ring
8	Snap Ring
9	Shift Piston
10	Shift Shaft
11	Shift Fork Capscrew
12	Shift Fork
13	Helical Drive Gear, High Range
14	High and Low Clutch Collar
15	Helical Drive Gear, Low Range
16	Snap Ring
17	Transfer Case Front Case
18	Locating Dowel Pin
19	Oil Cooler Male Connector
20	Loop Tube
21	Oil Pump Capscrew and Washer
22	Male Fitting
23	Oil Pump Assembly
24	Bearing Cone
25	Shim
26	Input Bearing Cage
27	Bearing Cage Capscrew and Washer

Item	Description
28	Lock Nut
29	Flat Washer
30	Input Yoke
31	Input Oil Seal
32	Inlet Oil Tube Assembly
33	Oil Fitting Assembly
34	Front Output Yoke
35	Front Output Oil Seal
36	Switch Assembly
37	Relief Valve Spring
38	Relief Valve
39	Bearing Cup
40	Locating Dowel Pin
41	Input Shaft
42	Driven Gear and Rear Output Shaft
43	Push Rod
44	Spring
45	Needle Bearing
46	Flat Washer
47	3/8” Plug
48	Drain Plug
49	Oil Fill Plug
50	Shift Piston
51	Shift Piston O-ring
52	Shipping Protector
53	Shift Cylinder

2 Exploded Views

MTC-4208XL Transfer Case Rear Cover



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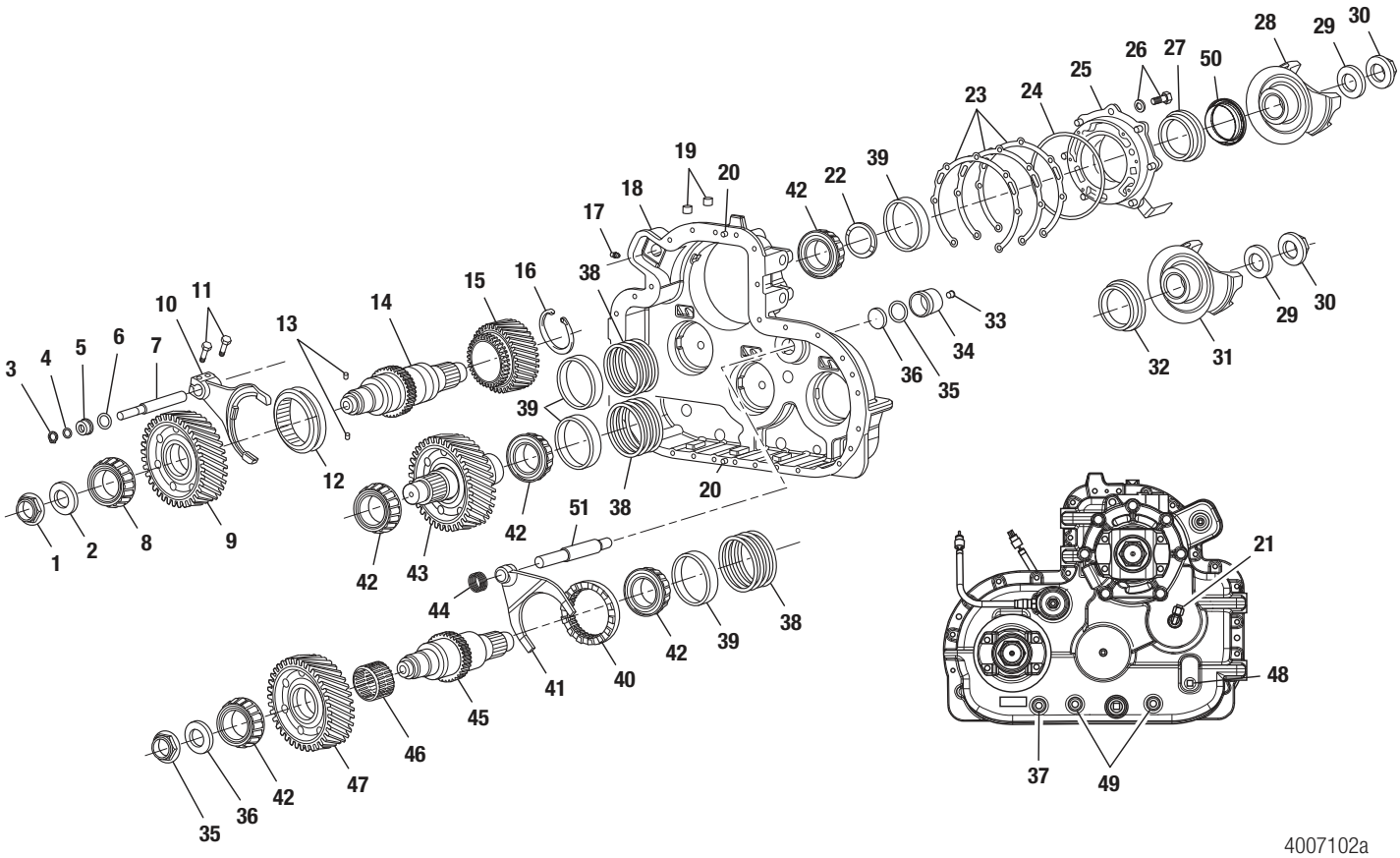
Item	Description
1	T-Fitting
2	Cap
3	Oil Pump Cover
4	Capscrew and Washer
5	Switch Assembly
6	Oil Pump Housing
7	Pump Cover O-ring
8	Oil Pump Assembly
9	Shipping Protector
10	Shift Cylinder
11	Snap Ring
12	Shift Piston O-ring
13	Shift Piston
14	O-ring
15	Blow-by Breather
16	Neutral Breather
17	Shipping Protector
18	Neutral Breather Fitting

Item	Description
19	Speed Sensor
20	Capscrew and Washer
21	Bearing Cups
22	Bearing Cone
23	Double Idler Gear
24	Rear Housing
25	Breather
26	Elbow
27	Filter Screen Assembly Tube
28	O-ring, Housing
29	Rear Output Oil Seal
30	Rear Output Yoke
31	Flat Washer
32	Lock Nut
33	Oil Pump Inlet Tube
33A	Tube Assembly, without Oil Cooler
34	Oil Pump Inlet Fitting
34A	Fitting, without Oil Cooler

2 Exploded Views

MTC-4208XL Transfer Case Front Cover



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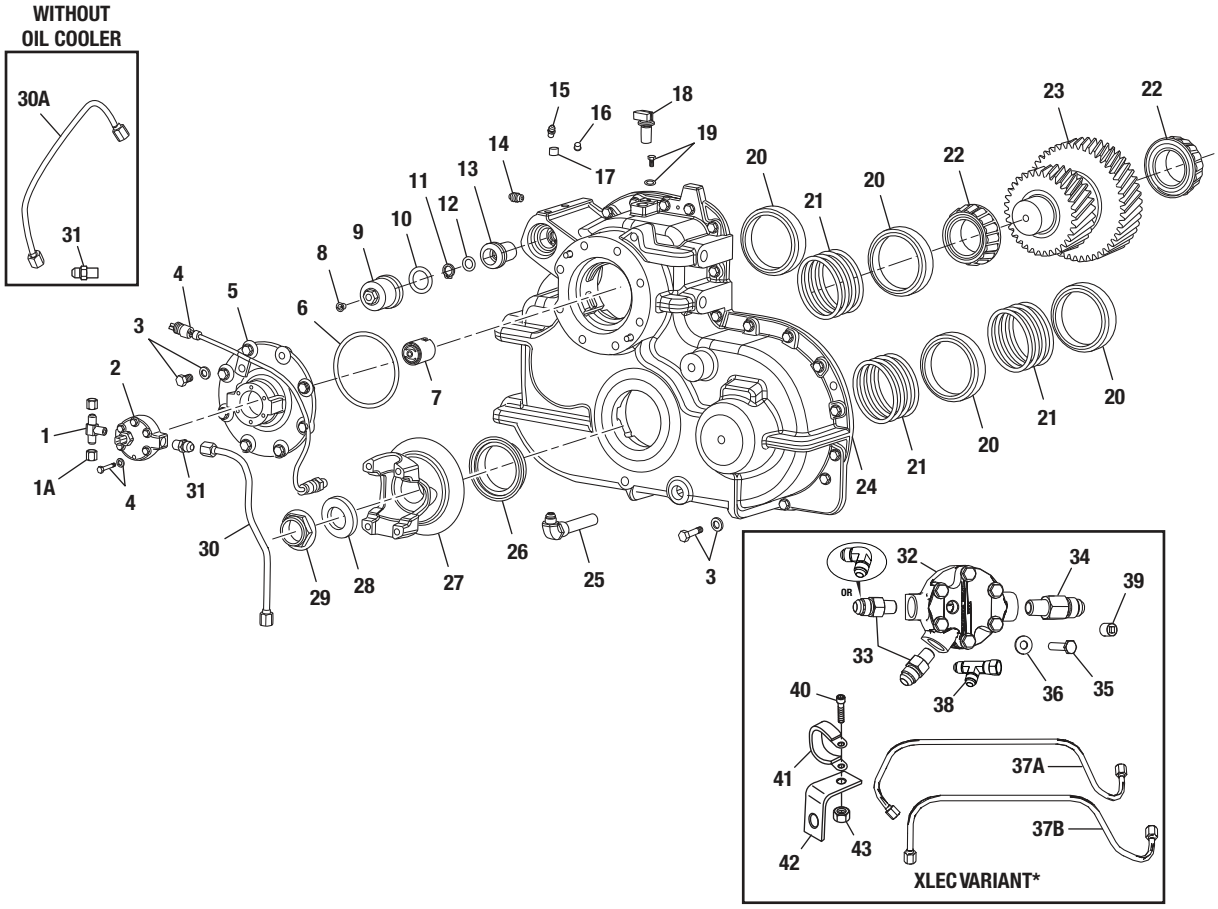
Item	Description
1	Lock Nut
2	Washer
3	Snap Ring
4	Shift Piston O-ring
5	Shift Piston
6	O-ring
7	Shift Shaft
8	Bearing Cone
9	Helical Drive Gear, High Range
10	Shift Fork
11	Shift Fork Capscrew
12	High and Low Clutch Collar
13	Oil Pump Pin
14	Input Shaft
15	Helical Drive Gear, Low Range
16	Snap Ring
17	Male Fitting
18	Front Cover Housing
19	Plug
20	Locating Dowel Pin
21	Elbow
22	Oil Spacer
23	Shim
24	O-ring
25	Input Bearing Cage

Item	Description
26	Bearing Cage Capscrew and Washer
27	Input Oil Seal
28	Input Yoke
29	Flat Washer
30	Lock Nut
31	Front Output Yoke
32	Front Output Oil Seal
33	Plug / Fitting
34	Declutch Cylinder
35	O-ring
36	Declutch Cylinder Piston
37	Drain Plug
38	Shim
39	Bearing Cup
40	Front Output Clutch Collar
41	Shift Fork
42	Bearing
43	Driven Gear and Rear Output Shaft
44	Spring
45	Front Output Shaft
46	Needle Bearing
47	Helical Driven Gear
48	Fill Plug
49	Magnetic Drain Plug
50	Yoke Sleeve
51	Push Rod

2 Exploded Views

MTC-4208XLEV/XLEC Transfer Case Rear Cover



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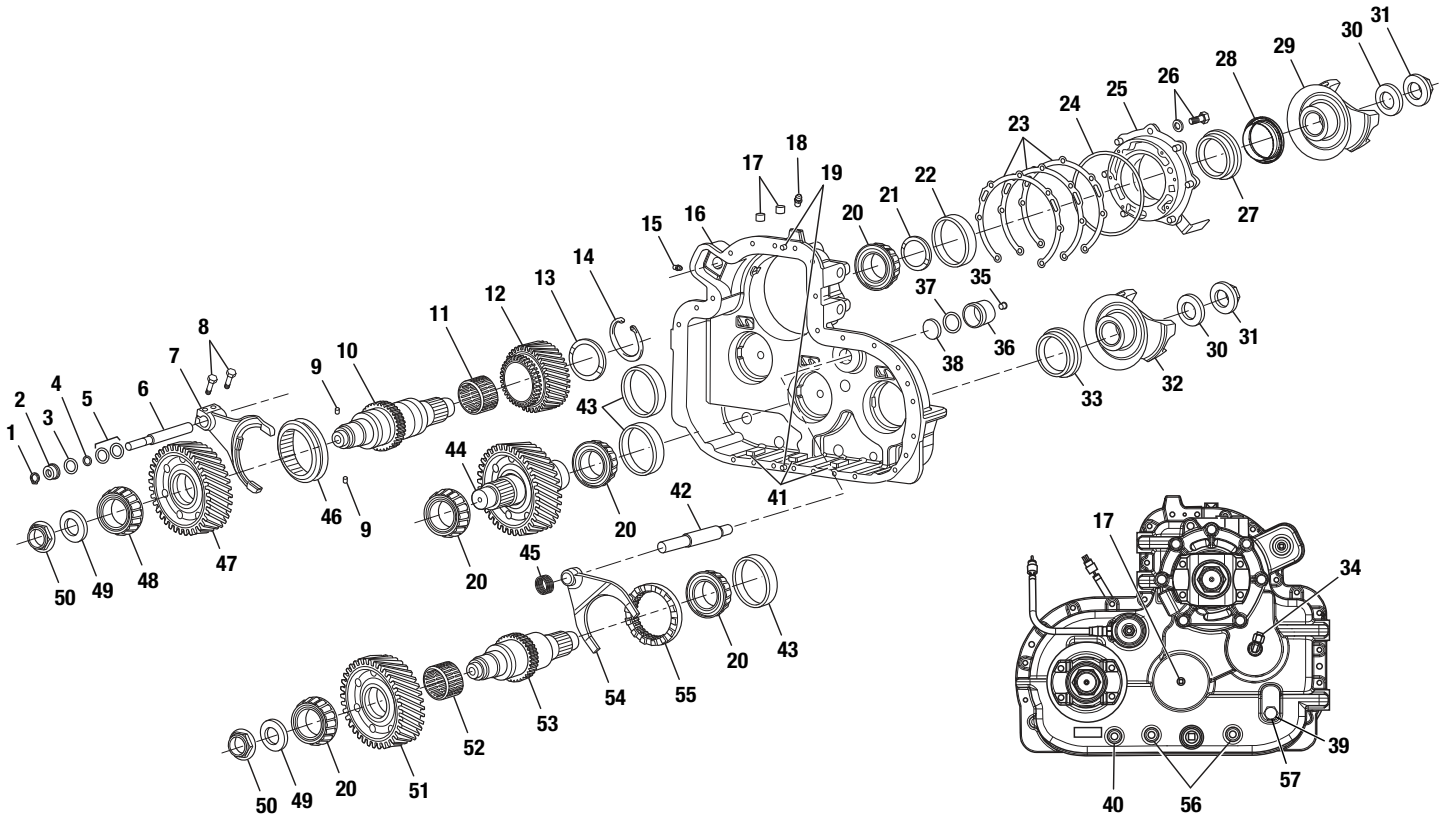
* If installing an EC kit on an EV, see TP-1923.

Item	Description
1	T-Fitting
1A	Cap
2	Oil Pump Cover
3	Capscrew and Washer
4	Switch Assembly
5	Oil Pump Housing
6	Pump Cover O-ring
7	Oil Pump Assembly
8	Shipping Protector
9	Shift Cylinder
10	Shift Piston O-ring
11	Snap Ring
12	O-ring
13	Shift Piston
14	Blow-by Breather
15	Neutral Breather
16	Shipping Protector
17	Neutral Breather Fitting
18	Speed Sensor
19	Capscrew and Washer
20	Bearing Cups
21	Shims
22	Bearing Cone
23	Double Idler Gear

Item	Description
24	Rear Housing
25	Filter Screen Tube Assembly
26	Rear Output Oil Seal
27	Rear Output Yoke
28	Flat Washer
29	Lock Nut
30	Oil Pump Inlet Tube
30A	Tube Assembly, without Oil Cooler
31	Fitting, without Oil Cooler
32	Pump Cover Assembly
33	#6 Male JIC 37° x 3/8” NPT Fitting
34	Connector Fitting
35	Capscrew
36	Flat Washer
37A	LH-Side Cooler Oil Pump Tube
37B	RH-Side Cooler Oil Pump Tube
38	#6 Male JIC 37° (2 Port) x #6 Male JIC 37° Swivel
39	Pipe Plug, 1/4-18 NPT
40	Socket Head Bolt
41	P-Clamp
42	Angle Bracket
43	Lock Nut

2 Exploded Views

MTC-4208XLEV/XLEC Transfer Case Front Cover

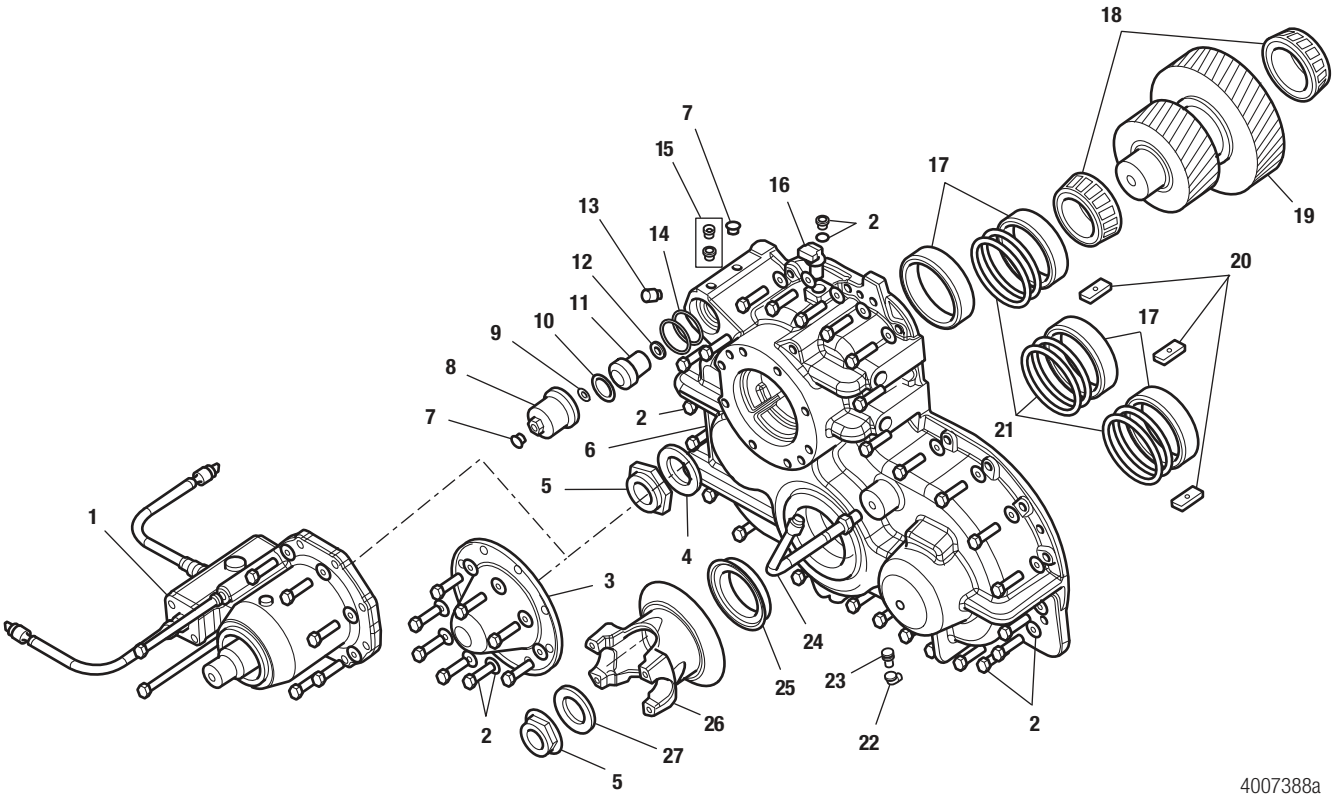


Item	Description
1	Snap Ring
2	Shift Piston
3	O-ring
4	Shift Piston O-ring
5	O-ring
6	Shift Shaft
7	Shift Fork
8	Shift Fork Capscrew
9	Oil Pump Pin
10	Input Shaft
11	Needle Bearing
12	Helical Drive Gear, Low Range
13	Spacer
14	Snap Ring
15	Male Fitting
16	Front Cover Housing
17	Plug
18	Breather
19	Locating Dowel Pin
20	Bearing
21	Oil Spacer
22	Bearing Cup
23	Shim
24	O-ring
25	Input Bearing Cage
26	Bearing Cage Capscrew and Washer
27	Input Oil Seal
28	Yoke Sleeve
29	Input Yoke

Item	Description
30	Flat Washer
31	Lock Nut
32	Front Output Yoke
33	Front Output Oil Seal
34	Elbow
35	Plug / Fitting
36	Declutch Cylinder
37	O-ring
38	Declutch Cylinder Piston
39	Fill Plug Adapter
40	Drain Plug
41	Magnets
42	Push Rod
43	Bearing Cup
44	Driven Gear and Rear Output Shaft
45	Spring
46	High and Low Clutch Collar
47	Helical Drive Gear, High Range
48	Bearing Cone
49	Washer
50	Lock Nut
51	Helical Driven Gear
52	Needle Bearing
53	Front Output Shaft
54	Shift Fork
55	Front Output Clutch Collar
56	Magnetic Drain Plug
57	Fill Plug Cap

2 Exploded Views

MTC-4210X/XP Transfer Case Rear Cover



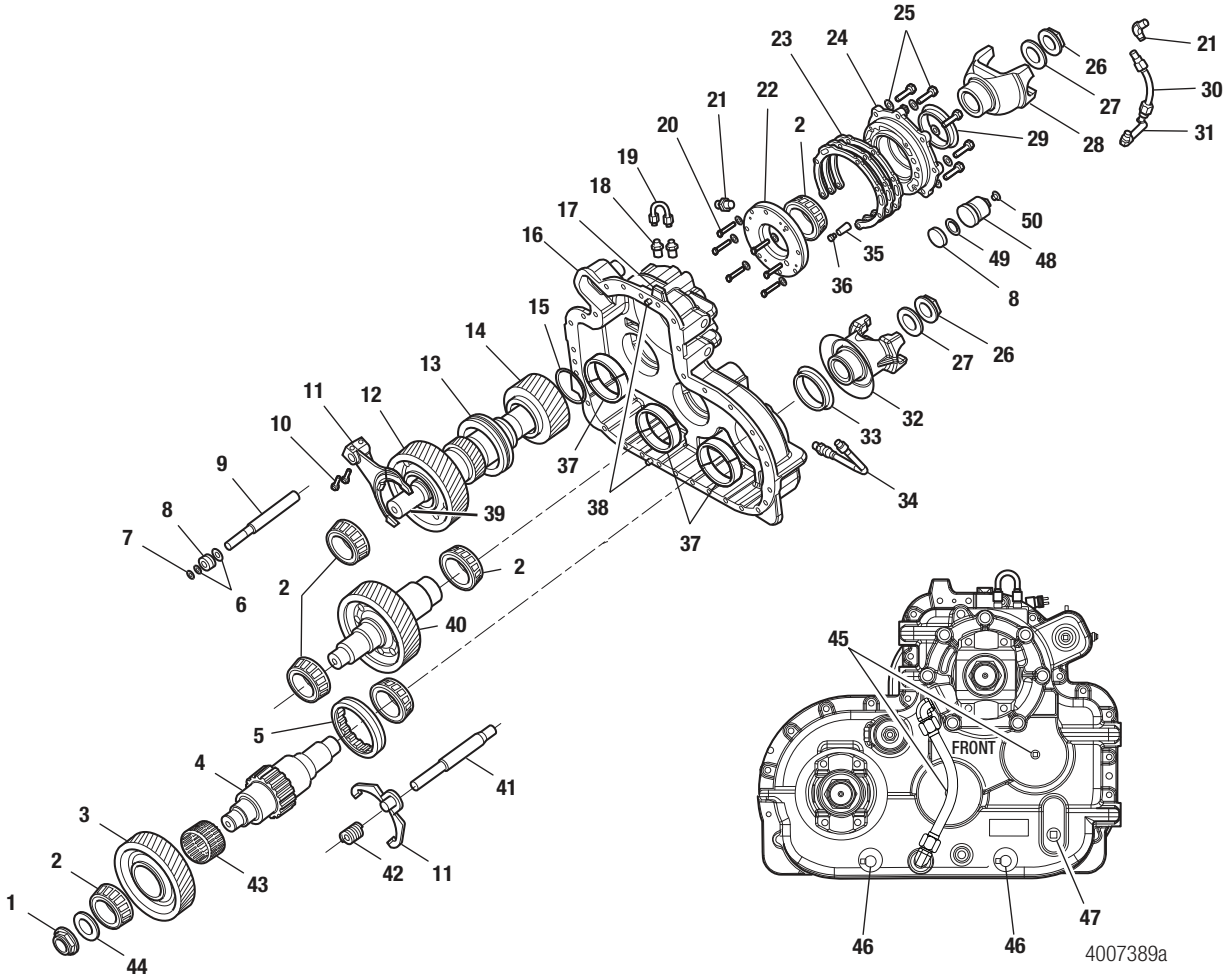
Item	Description
1	PTO Assembly (Optional)
2	Capscrew and Washer
3	Cover
4	Hardened Washer
5	Lock Nut
6	Transfer Case Rear Cover
7	Shipping Protector
8	Shift Cylinder
9	Snap Ring
10	Shift Piston O-ring
11	Shift Piston
12	O-ring
13	Blow-by Breather
14	Housing O-ring

Item	Description
15	Neutral Breather*
16	Speed Sensor
17	Bearing Cup
18	Bearing Cone
19	Idler Gear
20	Ceramic Magnet
21	Shim
22	Elbow
23	Breather Assembly
24	Switch Assembly
25	Rear Output Oil Seal
26	Rear Output Yoke
27	Flat Washer

* Vehicles not equipped with a transfer case neutral air control may be equipped with a neutral breather which allows the shift cavity to exhaust. On vehicles equipped with a neutral air control, the solenoid allows this cavity to exhaust.

2 Exploded Views

MTC-4210X/XP Transfer Case Front Cover

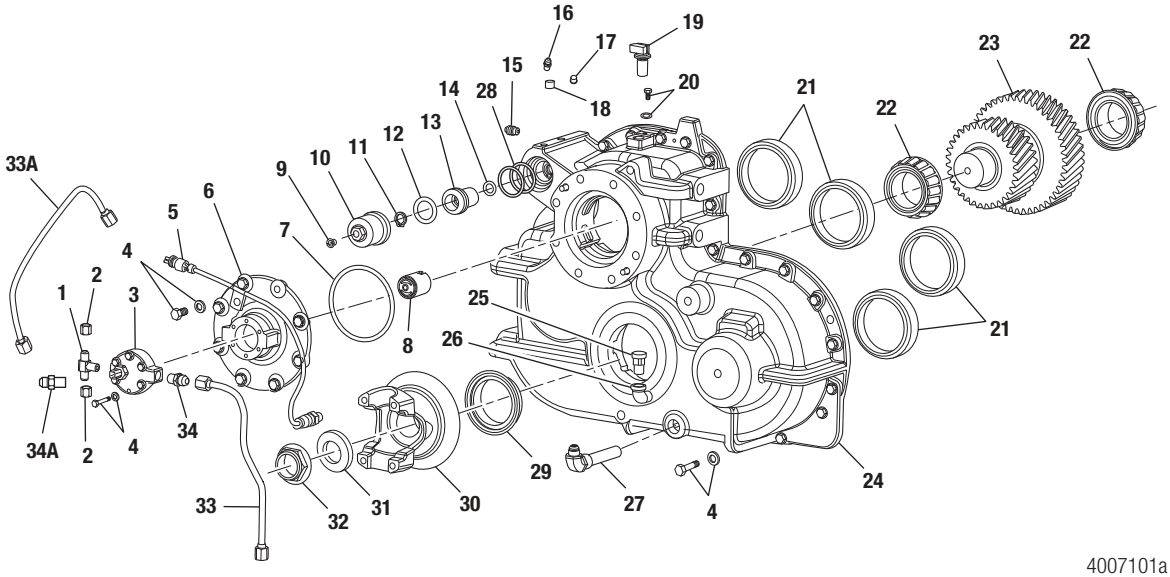


Item	Description
1	Lock Nut
2	Bearing Cone
3	Helical Driven Gear
4	Front Output Shaft
5	Front Output Clutch Collar
6	O-ring
7	Snap Ring
8	Shift Piston
9	Shift Shaft
10	Shift Fork Capscrew
11	Shift Fork
12	Helical Drive Gear, High Range
13	High and Low Clutch Collar
14	Helical Drive Gear, Low Range
15	Snap Ring
16	Transfer Case Front Cover
17	Locating Dowel Pin
18	Oil Cooler Male Connector
19	Loop Tube
20	Oil Pump Capscrew and Washer
21	Male Fitting
22	Oil Pump Assembly
23	Shim
24	Input Bearing Cage
25	Bearing Cage Capscrew and Washer
26	Lock Nut

Item	Description
27	Flat Washer
28	Input Yoke
29	Input Oil Seal
30	Inlet Oil Tube Assembly
31	Oil Fitting Assembly
32	Front Output Yoke
33	Front Output Oil Seal
34	Switch Assembly
35	Relief Valve Spring
36	Relief Valve
37	Bearing Cup
38	Locating Dowel Pin
39	Input Shaft
40	Driven Gear and Rear Output Shaft
41	Push Rod
42	Spring
43	Needle Bearing
44	Flat Washer
45	3/8” Plug
46	Drain Plug
47	Oil Fill Plug
48	Shift Cylinder
49	Shift Piston O-ring
50	Shipping Protector

2 Exploded Views

MTC-4210XL Transfer Case Rear Cover



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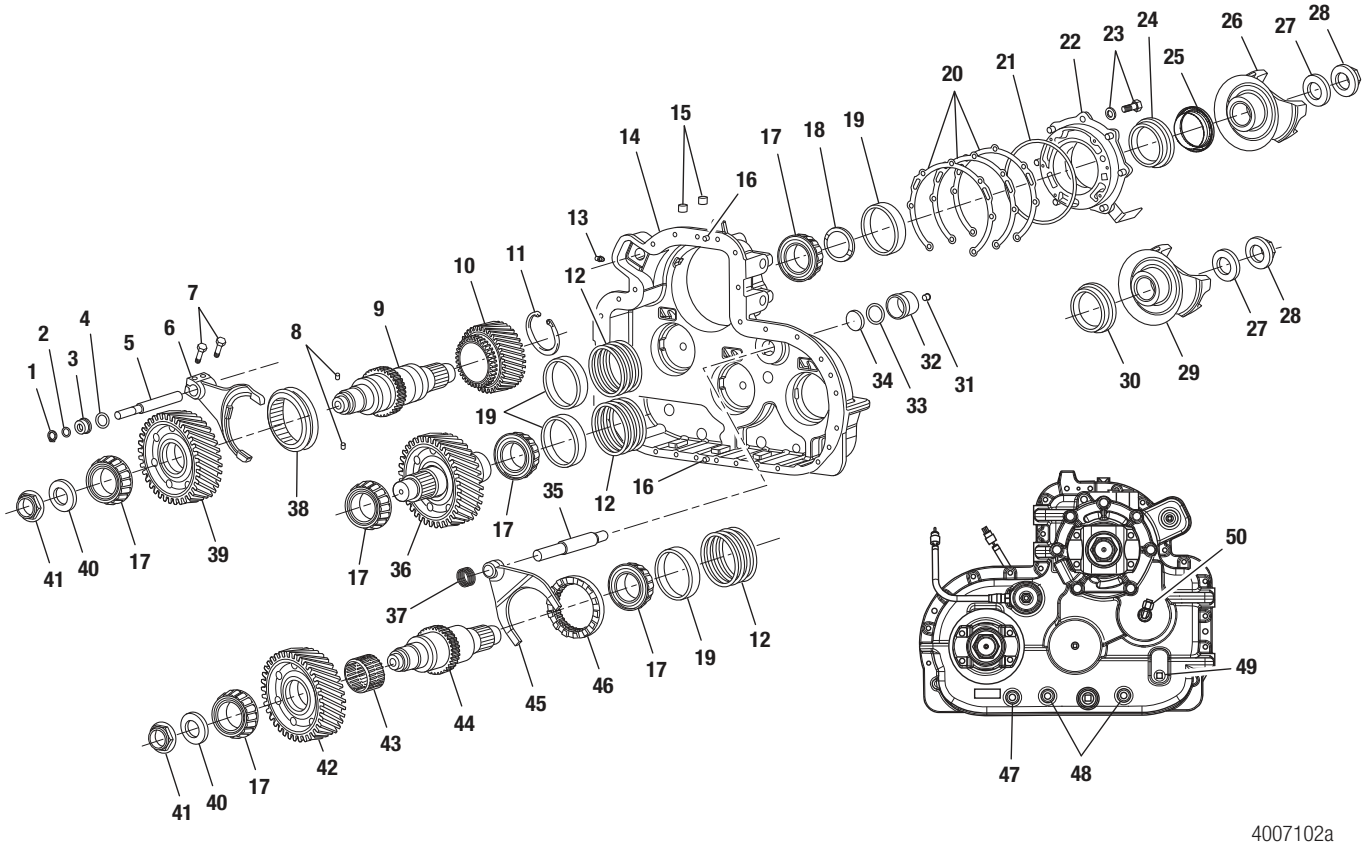
Item	Description
1	T-Fitting
2	Cap
3	Oil Pump Cover
4	Capscrew and Washer
5	Switch Assembly
6	Oil Pump Housing
7	Pump Cover O-ring
8	Oil Pump Assembly
9	Shipping Protector
10	Shift Cylinder
11	Snap Ring
12	Shift Piston O-ring
13	Shift Piston
14	O-ring
15	Blow-by Breather
16	Neutral Breather
17	Shipping Protector
18	Neutral Breather Fitting

Item	Description
19	Speed Sensor
20	Capscrew and Washer
21	Bearing Cup
22	Bearing Cone
23	Double Idler Gear
24	Rear Housing
25	Breather
26	Elbow
27	Filter Screen Assembly Tube
28	Housing O-ring
29	Rear Output Oil Seal
30	Rear Output Yoke
31	Flat Washer
32	Lock Nut
33	Oil Pump Inlet Tube
33A	Tube Assembly, without Oil Cooler
34	Oil Pump Inlet Fitting
34A	Fitting, without Oil Cooler

2 Exploded Views

MTC-4210XL Transfer Case Front Cover



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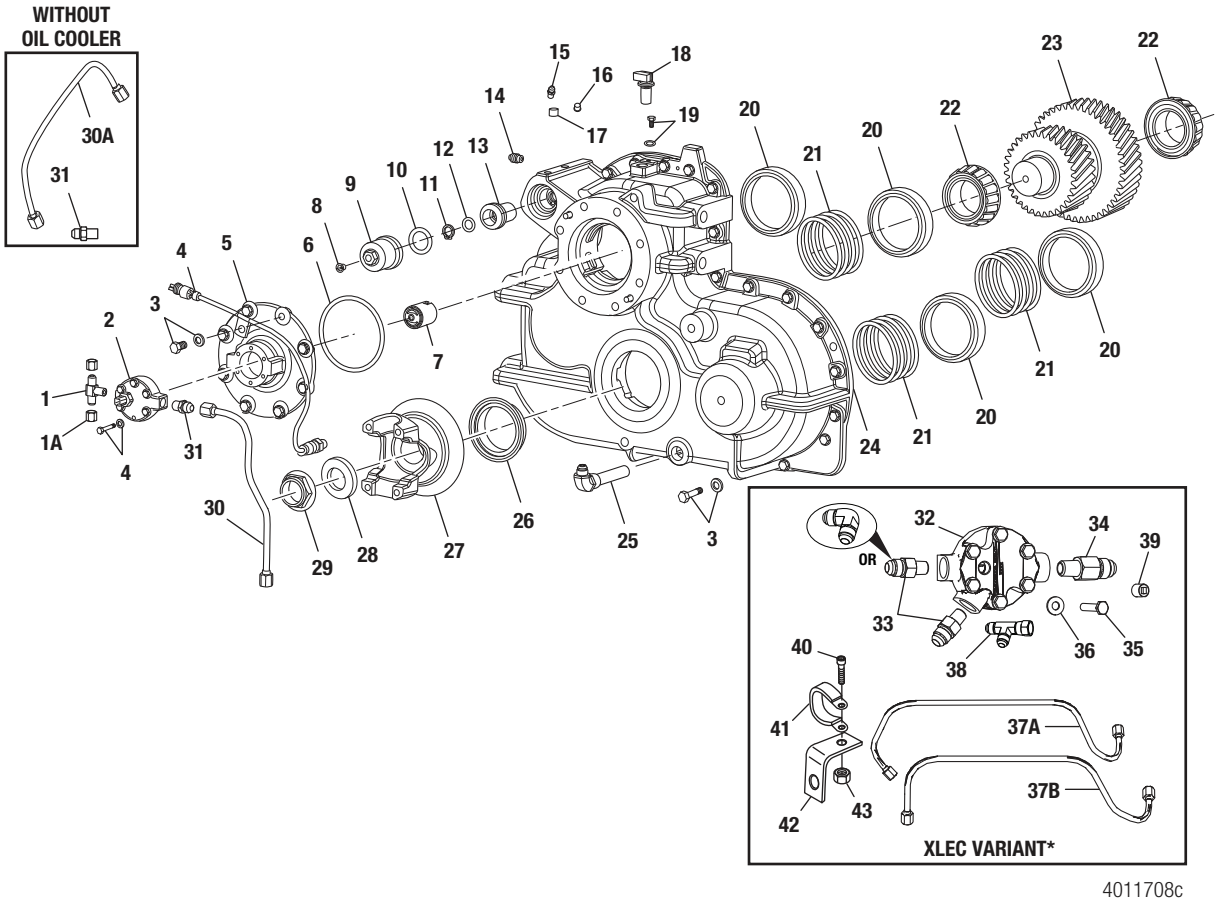
Item	Description
1	Snap Ring
2	Shift Piston O-ring
3	Shift Piston
4	O-ring
5	Shift Shaft
6	Shift Fork
7	Shift Fork Capscrew
8	Oil Pump Pin
9	Input Shaft
10	Helical Drive Gear, Low Range
11	Snap Ring
12	Shim
13	Male Fitting
14	Front Housing Cover
15	Plug
16	Locating Dowel Pin
17	Bearing Cone
18	Oil Spacer
19	Bearing Cup
20	Shim
21	O-ring
22	Input Bearing Cage
23	Bearing Cage Capscrew and Washer
24	Input Oil Seal
25	Yoke Sleeve

Item	Description
26	Input Yoke
27	Flat Washer
28	Lock Nut
29	Front Output Yoke
30	Front Output Oil Seal
31	Plug / Fitting
32	Declutch Cylinder
33	O-ring
34	Declutch Cylinder Piston
35	Push Rod
36	Driven Gear and Rear Output Shaft
37	Spring
38	High and Low Clutch Collar
39	Helical Drive Gear, High Range
40	Washer
41	Lock Nut
42	Helical Driven Gear
43	Needle Bearing
44	Front Output Shaft
45	Shift Fork
46	Front Output Clutch Collar
47	Drain Plug
48	Magnetic Drain Plug
49	Fill Plug
50	Elbow

2 Exploded Views

MTC-4210XLEV/XLEC Transfer Case Rear Cover



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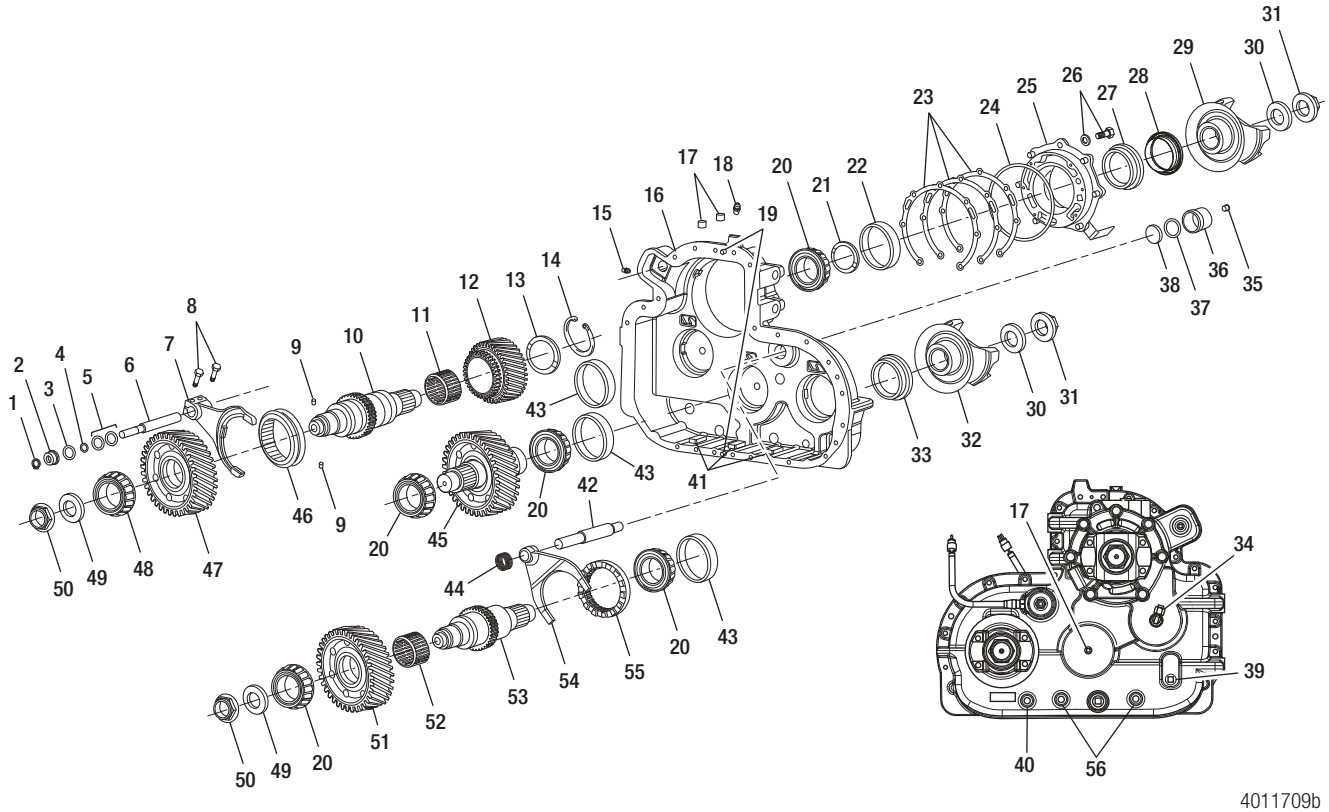
* If installing an EC kit on an EV, see TP-1923.

Item	Description
1	T-Fitting
1A	Cap
2	Oil Pump Cover
3	Capscrew and Washer
4	Switch Assembly
5	Oil Pump Housing
6	Pump Cover O-ring
7	Oil Pump Assembly
8	Shipping Protector
9	Shift Cylinder
10	Shift Piston O-ring
11	Snap Ring
12	O-ring
13	Shift Piston
14	Blow-by Breather
15	Neutral Breather
16	Shipping Protector
17	Neutral Breather Fitting
18	Speed Sensor
19	Capscrew and Washer
20	Bearing Cups
21	Shims
22	Bearing Cone
23	Double Idler Gear

Item	Description
24	Rear Housing
25	Filter Screen Assembly Tube
26	Rear Output Oil Seal
27	Rear Output Yoke
28	Flat Washer
29	Lock Nut
30	Oil Pump Inlet Tube
30A	Tube Assembly, without Oil Cooler
31	Fitting, without Oil Cooler
32	Pump Cover Assembly
33	#6 Male JIC 37° x 3/8” NPT Fitting
34	Connector Fitting
35	Capscrew
36	Flat Washer
37A	LH-Side Cooler Oil Pump Tube
37B	RH-Side Cooler Oil Pump Tube
38	#6 Male JIC 37° (2 Port) x #6 Male JIC 37° Swivel
39	Pipe Plug, 1/4-18 NPT
40	Socket Head Bolt
41	P-Clamp
42	Angle Bracket
43	Lock Nut

2 Exploded Views

MTC-4210XLEV/XLEC Transfer Case Front Cover

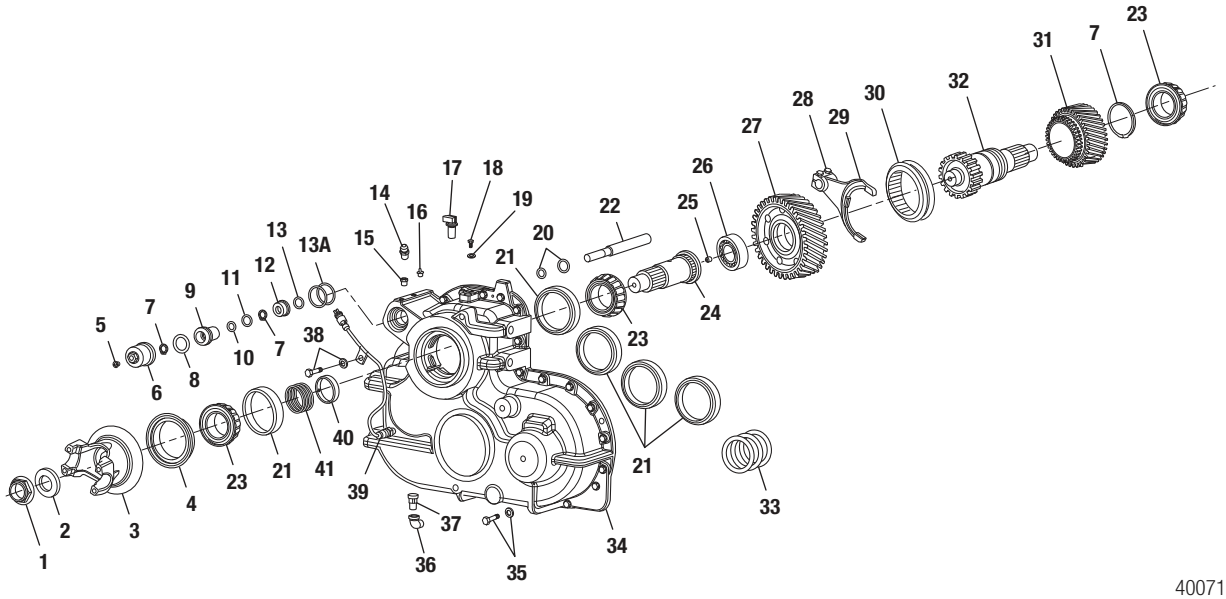


Item	Description
1	Snap Ring
2	Shift Piston
3	O-ring
4	Shift Piston O-ring
5	O-ring
6	Shift Shaft
7	Shift Fork
8	Shift Fork Capscrew
9	Oil Pump Pin
10	Input Shaft
11	Needle Bearing
12	Helical Drive Gear, Low Range
13	Spacer
14	Snap Ring
15	Male Fitting
16	Front Cover Housing
17	Plug
18	Breather
19	Locating Dowel Pin
20	Bearing
21	Oil Spacer
22	Bearing Cup
23	Shim
24	O-ring
25	Input Bearing Cage
26	Bearing Cage Capscrew and Washer
27	Input Oil Seal
28	Yoke Sleeve

Item	Description
29	Input Yoke
30	Flat Washer
31	Lock Nut
32	Front Output Yoke
33	Front Output Oil Seal
34	Elbow
35	Plug / Fitting
36	Declutch Cylinder
37	O-ring
38	Declutch Cylinder Piston
39	Fill Plug
40	Drain Plug
41	Magnets
42	Push Rod
43	Bearing Cup
44	Spring
45	Driven Gear and Rear Output Shaft
46	High and Low Clutch Collar
47	Helical Drive Gear, High Range
48	Bearing Cone
49	Washer
50	Lock Nut
51	Helical Driven Gear
52	Needle Bearing
53	Front Output Shaft
54	Shift Fork
55	Front Output Clutch Collar
56	Magnetic Drain Plug

2 Exploded Views

MTC-4213X Transfer Case Rear Cover



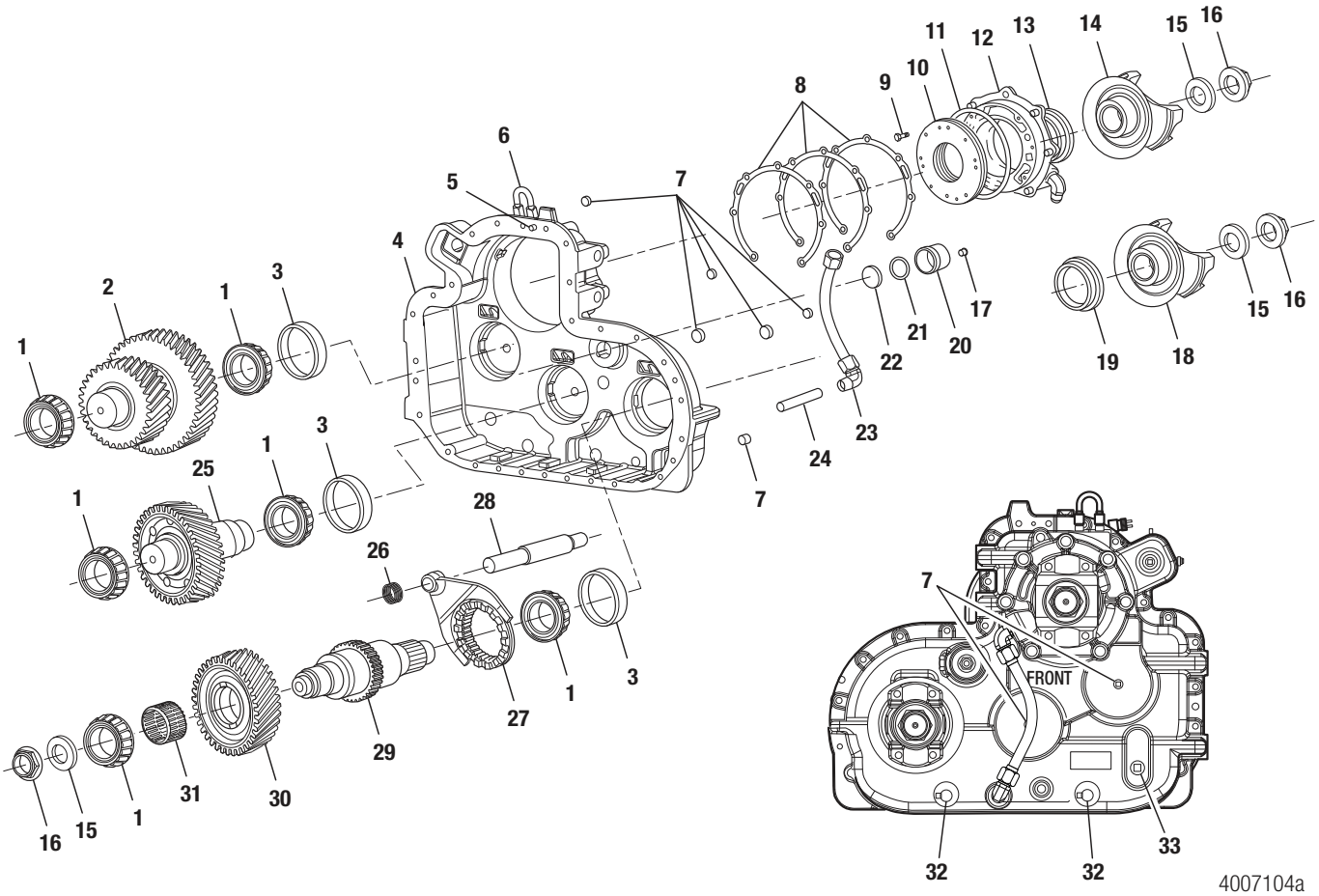
4007103a

Item	Description
1	Lock Nut
2	Flat Washer
3	Rear Output Yoke
4	Rear Output Oil Seal
5	Plug
6	Shift Cylinder
7	Snap Ring
8	O-ring
9	Outer Shift Piston
10	O-ring
11	Piston O-ring
12	Inner Shift Piston
13	O-ring
13A	Housing O-ring
14	Neutral Breather
15	Neutral Breather Fitting
16	Plug
17	Speed Sensor
18	Capscrew
19	Washer
20	O-ring

Item	Description
21	Bearing Cup
22	High and Low Shift Shaft
23	Bearing Cone
24	Rear Output Shaft
25	Plug
26	Pocket Bearing
27	Helical Drive Gear, High Range
28	Shift Fork Capscrew
29	High and Low Shift Fork
30	High and Low Clutch Collar
31	Helical Drive Gear, Low Range
32	Input Shaft
33	Shims
34	Rear Housing
35	Capscrew and Washer
36	Elbow
37	Breather
38	Capscrew and Washer
39	Switch Assembly
40	Spacer
41	Shims

2 Exploded Views

MTC-4213X Transfer Case Front Cover

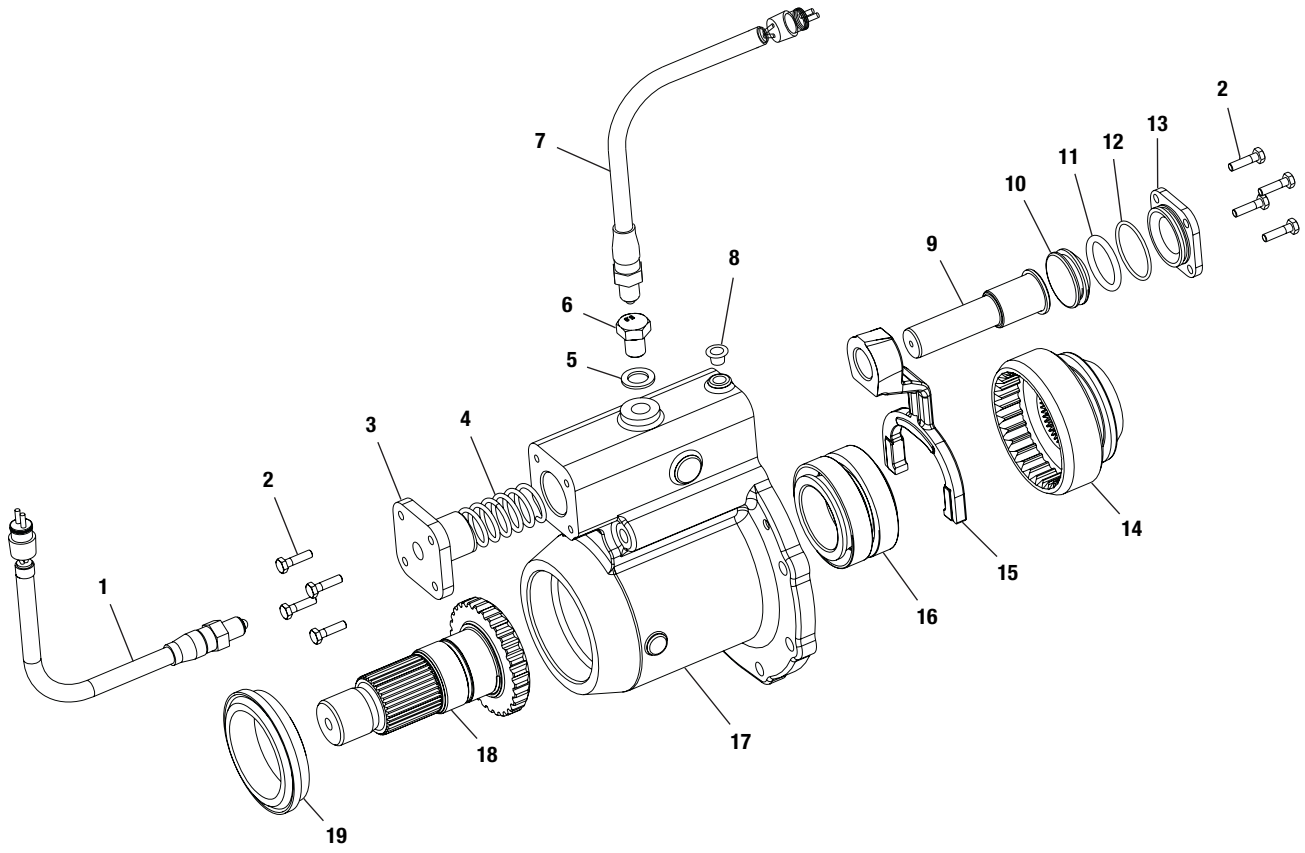


Item	Description
1	Bearing Cone
2	Double Idler Gear
3	Bearing Cup
4	Front Housing
5	Locating Dowel Pin
6	Oil Loop Tube
7	Shipping Plug
8	Shims
9	Oil Pump Capscrews
10	Front Oil Pump
11	O-ring
12	Input Bearing Cage
13	Input Oil Seal
14	Input Yoke
15	Flat Washer
16	Lock Nut
17	Plug

Item	Description
18	Front Output Yoke
19	Front Output Oil Seal
20	Declutch Shift Cylinder
21	Shift Piston O-ring
22	Declutch Shift Piston
23	Shift Piston O-ring
24	Inlet Tube
25	Single Idler Gear
26	Shift Fork Spring
27	Shift Fork
28	Shift Shaft
29	Front Output Shaft
30	Helical Drive Gear
31	Needle Bearing
32	Drain Plug
33	Oil Fill Plug

2 Exploded Views

MTC-4208XP and MTC-4210XP Declutch/PTO



4000182a

Item	Description
1	Connector Switch Assembly - Engage
2	Capscrew
3	Cap
4	Shifter Spring
5	Flat Washer
6	Special Screw
7	Connector Switch Assembly - Disengage (Optional)
8	Shipping Protector
9	Push Rod
10	Shifter Piston
11	O-ring
12	O-ring
13	Cover Plate
14	Clutch Collar
15	Shift Fork
16	Bearing Assembly
17	PTO Housing
18	PTO Shaft
19	Oil Seal Assembly

Introduction

Model Nomenclature

Identification tags are riveted on the axle housing and the differential carrier. Use the model number and ratio number marked on the identification tag to obtain replacement parts. Figure 3.1.

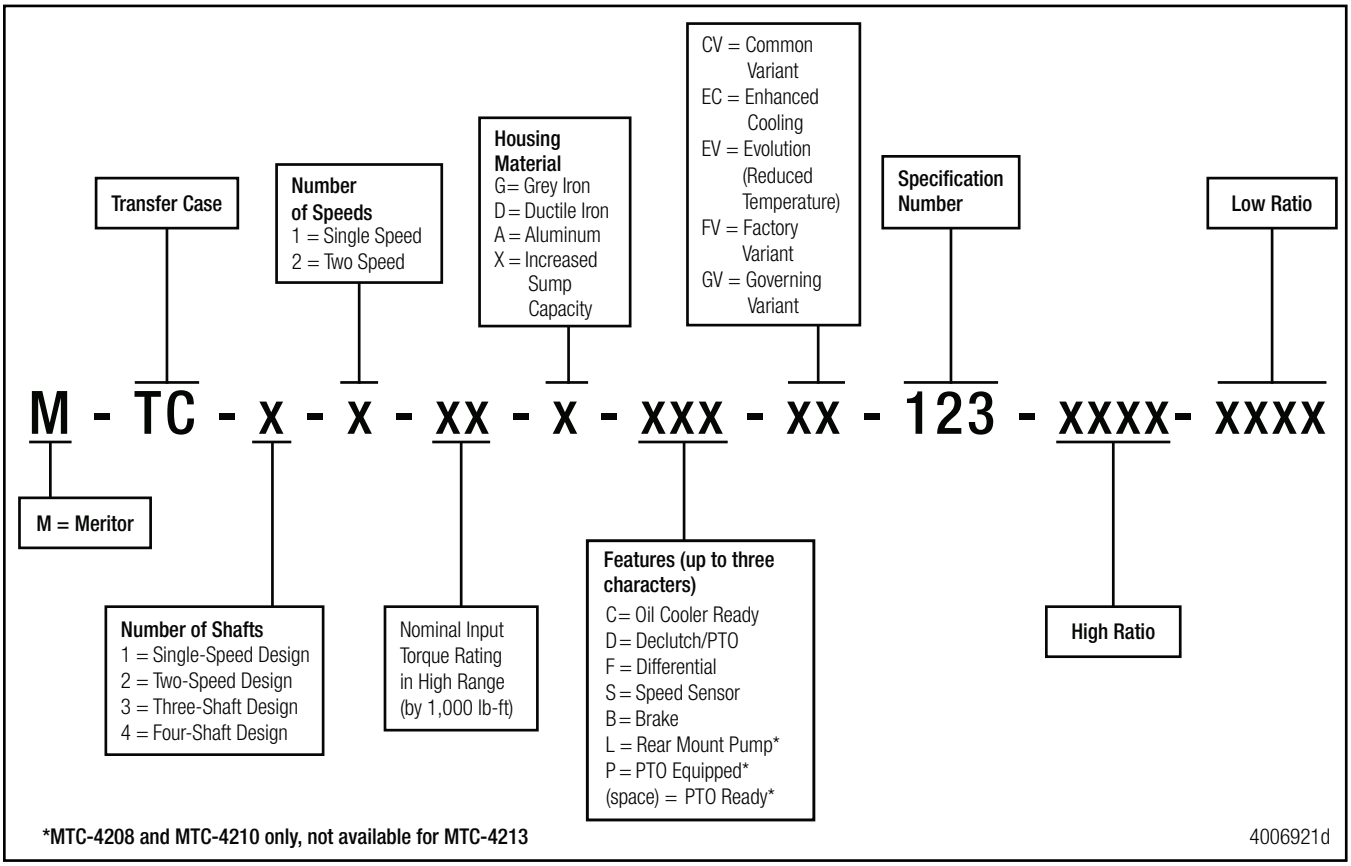


Figure 3.1

Description

Meritor MTC-4208X/XL/XP/XLEV/XLEC, MTC-4210X/XL/XP/XLEV/XLEC and MTC-4213X Series transfer cases are four-shaft designs with two-speed front and rear output having a 1:1 and a 1:2.05 ratio for use with part-time 4x4 and 6x6 vehicles. The MTC-4208 and MTC-4210 Series are designed specifically for use in 4x4 vehicles (the MTC-4213 Series is designed specifically for 6x6) as part of the Meritor medium-duty 4x4 drive system. Figure 3.2.

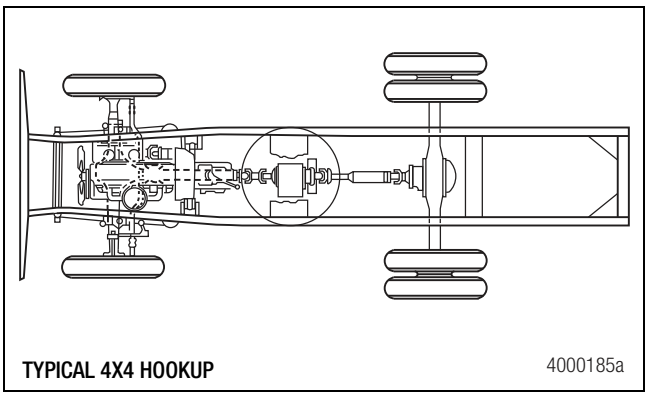


Figure 3.2

The air-actuated front-axle declutch (if equipped), high and low shifter and full-torque power take-off (PTO) lockup are controlled from the cab. An air plunger or electric switch, usually mounted on the instrument panel, engages or disengages a mechanical clutch.

An optional speed sensor measures transfer case output driveline rpm. Optional switches indicate when the front axle declutch is fully engaged or disengaged.

These transfer cases provide for two-speed output (high range and low range) and a neutral position used for PTO-equipped transfer cases only. Non-PTO cases can have this neutral position plugged with a breather. Figure 3.3.

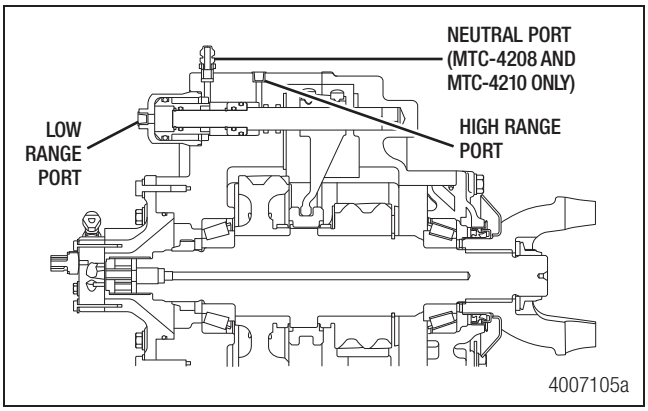


Figure 3.3

The front axle declutch permits shifting from part-time 4x4 or 6x6 operation to rear-wheel drive (RWD). Figure 3.4, Figure 3.5 and Figure 3.6. Engagement can be confirmed by hearing it, noticing improved vehicle performance, or observing the optional indicator light in the cab.

The full-torque PTO option provides an outlet to drive auxiliary power devices. Figure 3.7.

Optional switches for full-torque PTOs indicate full engagement or disengagement.

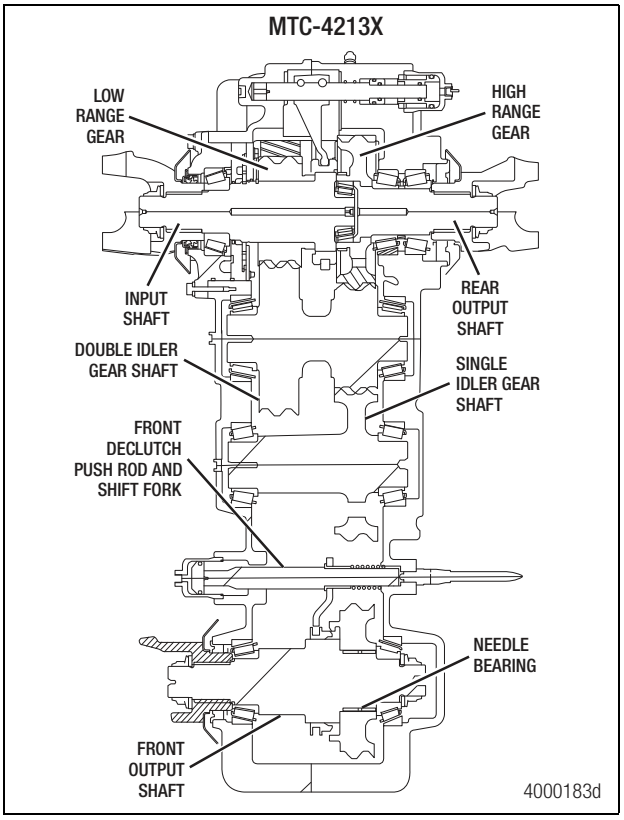


Figure 3.4

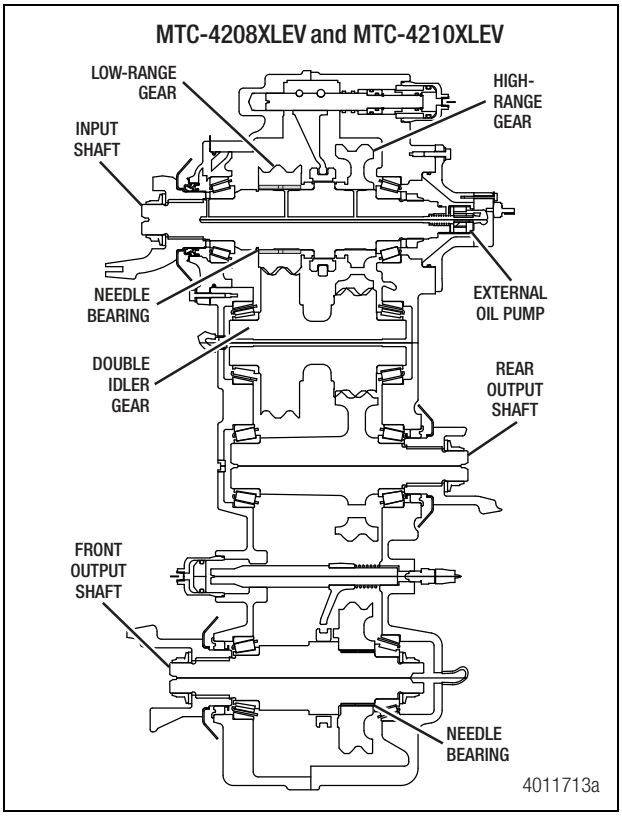


Figure 3.6

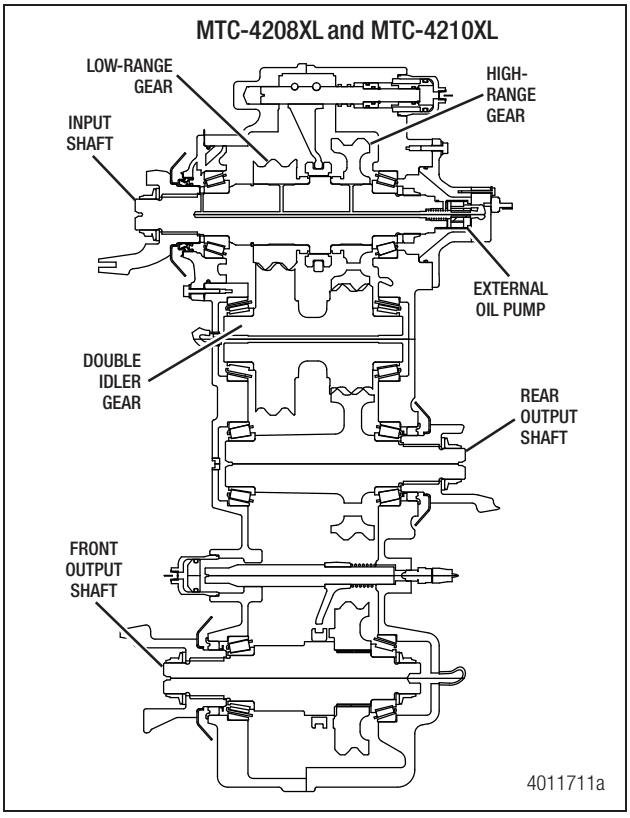


Figure 3.5

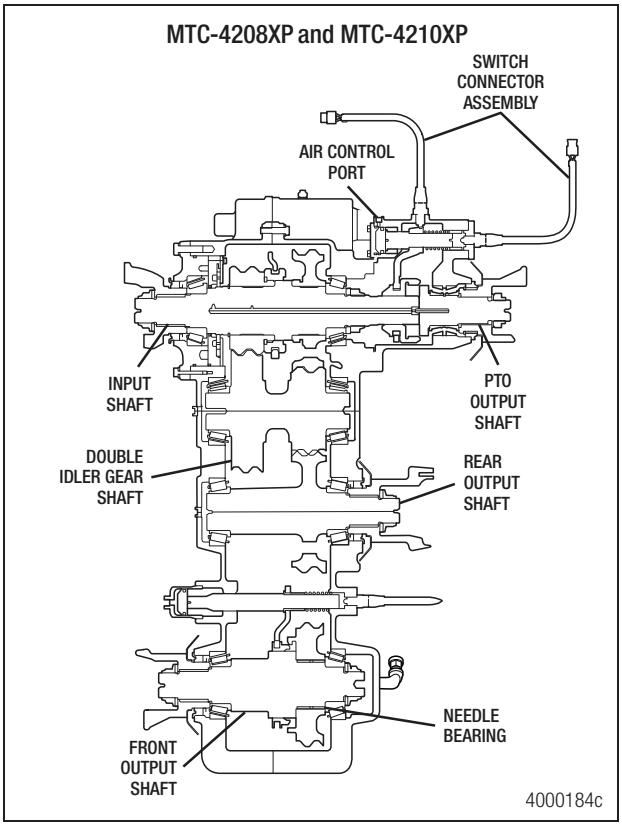


Figure 3.7

Operation

Front Axle Declutch

⚠ WARNING

Do not engage the front axle declutch when the vehicle's wheels are slipping or when moving up or down a steep hill or grade, which can cause the vehicle to lose stability. Serious personal injury and damage to components can result.

Operation of the front axle should occur only on off-road or poor traction conditions. Engaging the declutch affects the vehicle's turning and steering responsiveness. Do not engage the declutch or low gear range under normal operating conditions. Serious personal injury and damage to components can result.

Speeds of under 20 mph or 32 km/h are recommended for part-time 4x4 or 6x6 operation.

Engage the declutch when the vehicle is stationary or operating at constant low speed, below 10 mph or 4 km/h.

NOTE: Front engagement can take place when the wheels are slipping, but a 150 rpm driveline differential speed guideline must be adhered to. Special ECU programming is required.

High-Low Shifting

Shift the transfer case into low from high gear or from high to low gear when the vehicle is stationary. Apply the parking brake with the transmission in Neutral on automatic or manual transmissions.

If the clutch does not fully engage:
Turn the steering wheel in one direction and rock the vehicle back and forth until engagement occurs.

Engagement can be confirmed by hearing it, noticing improved vehicle performance, or observing the optional indicator light in the cab.

Oil Cooler Option

Vehicle configuration can have a significant impact on MTC model transfer cases. Vehicles with overdrive transmissions used primarily for high-speed highway routes run at higher transfer case input speeds. Transfer case running temperature is primarily affected by input speed, regardless of rear-wheel-drive only or part-time 4x4 or 6x6 operation.

A transfer case oil cooler reduces operating temperatures which will improve yoke seal life, reduce oil degradation and reduce the likelihood for other oil and air leaks. Figure 3.8, Figure 3.9, Figure 3.10, Figure 3.11, Figure 3.12, and Figure 3.13.

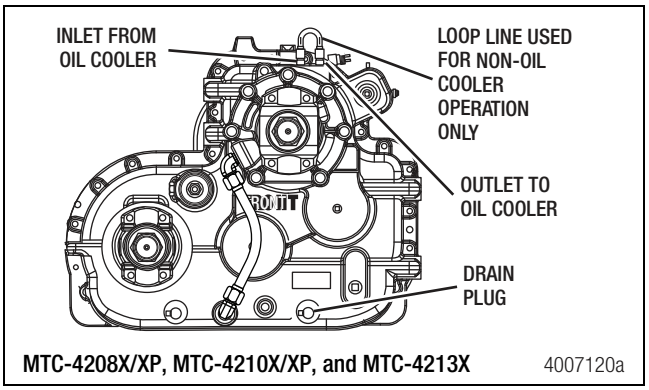


Figure 3.8

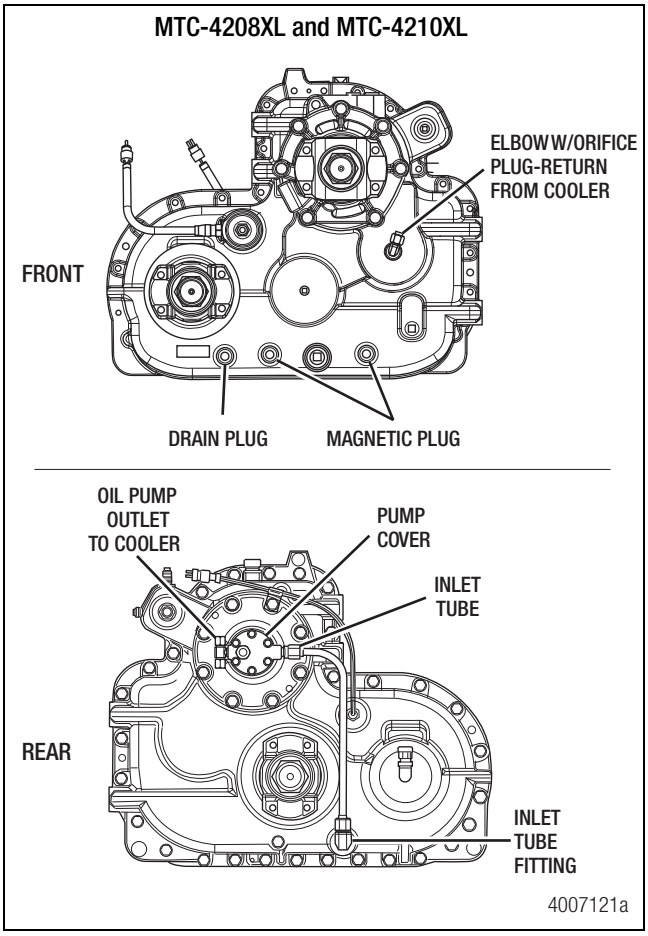


Figure 3.9

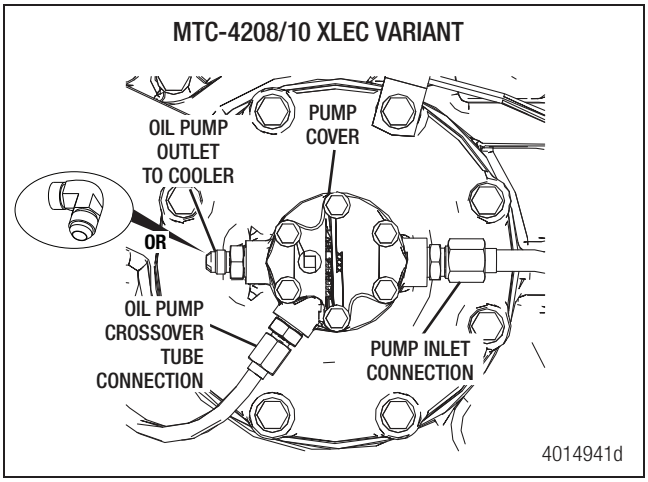


Figure 3.10

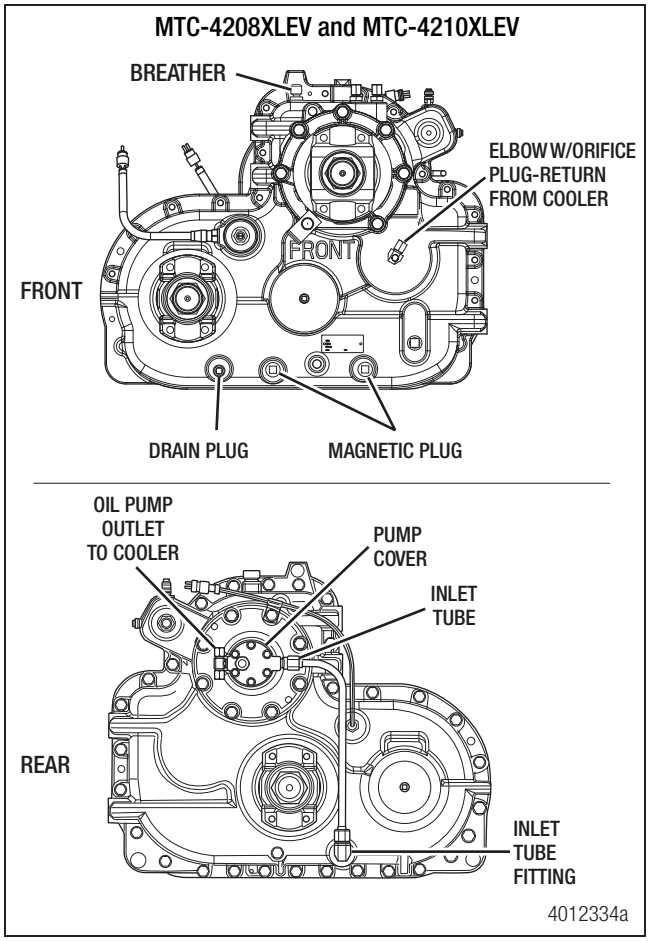


Figure 3.11

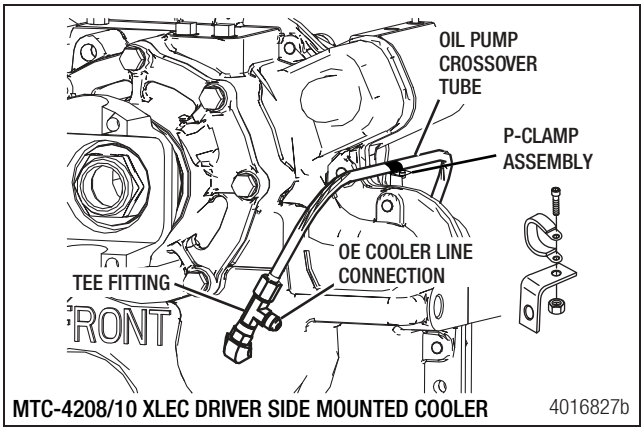


Figure 3.12

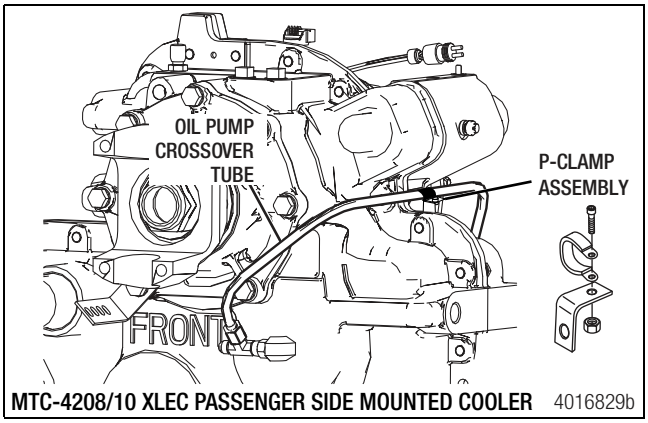


Figure 3.13

Blow-by Breather

The rear cover portion of the housing is equipped with a blow-by breather for the high/low shifter. Figure 3.14. The breather, which points sideways on the driver side of the housing, prohibits pressurization of the housing if an o-ring becomes damaged. Because all range shifts require full time pressurization, a damaged o-ring would allow air to fill the housing which could further damage the yoke seals or blow oil from the housing.

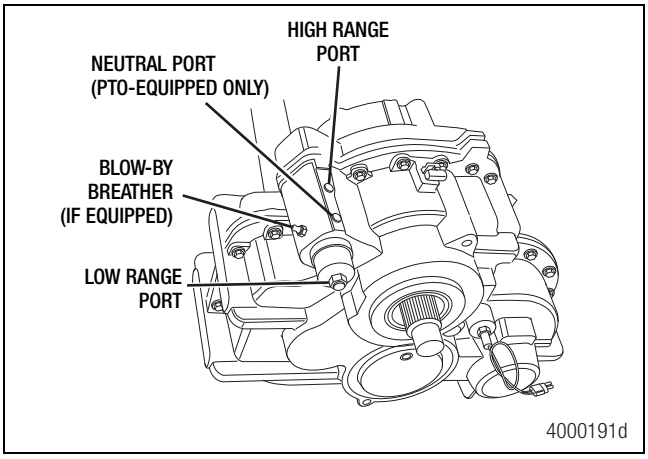


Figure 3.14

Full-Torque Power Take-Off (PTO)

⚠ CAUTION

Do not engage the full-torque power take-off (PTO) when the transfer case prop shafts are turning. Damage to the transfer case will result.

Engage or disengage the PTO when the vehicle is stationary, the transmission is in Neutral, and the transfer case prop shafts are not turning. NEVER load the driven auxiliary device when PTO is initially engaged. Use the transfer case in-cab switches to place the transfer case into Neutral.

Engagement can be confirmed by hearing it or observing the optional indicator light in the cab.

The PTO may be operated in high/low/Neutral range.

When operating the PTO in Neutral range, do not exceed 2,000 rpm. Control the transmission shift range and engine rpm to ensure this limit is not exceeded.

Removal

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use safety stands can result in death or serious personal injury and damage to components.

⚠ DANGER

Follow all safety guidelines and instructions provided by the lifting device manufacturer. Check that the lift capacity marked on the lifting device, straps and chains is correct for the weight being lifted. If they are not marked with the lift capacity, do not use them. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading. Failure to follow these directives can result in death or serious personal injury and damage to components.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Remove the Transfer Case Assembly

1. Wear eye protection.
2. Park the vehicle on a level surface. Place blocks under the wheels not being raised to keep the vehicle from moving.
3. Raise the vehicle so the area to be serviced is off the ground. Support the vehicle with safety stands.
4. Place a large container under the transfer case.
5. Remove the magnetic drain plug from the bottom of the transfer case. Drain and discard the oil correctly according to local and state environmental standards. Clean the magnetic drain plug. Figure 4.1, Figure 4.2, and Figure 4.3.

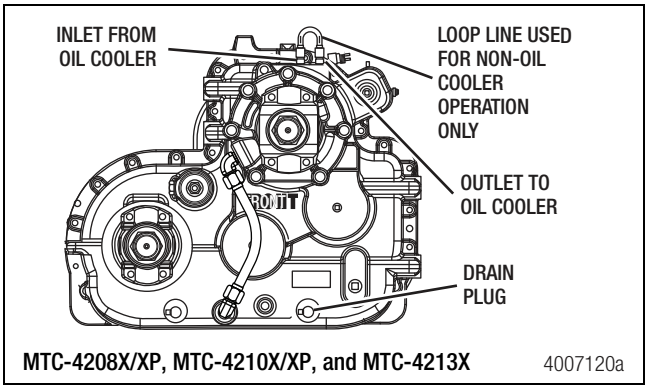


Figure 4.1

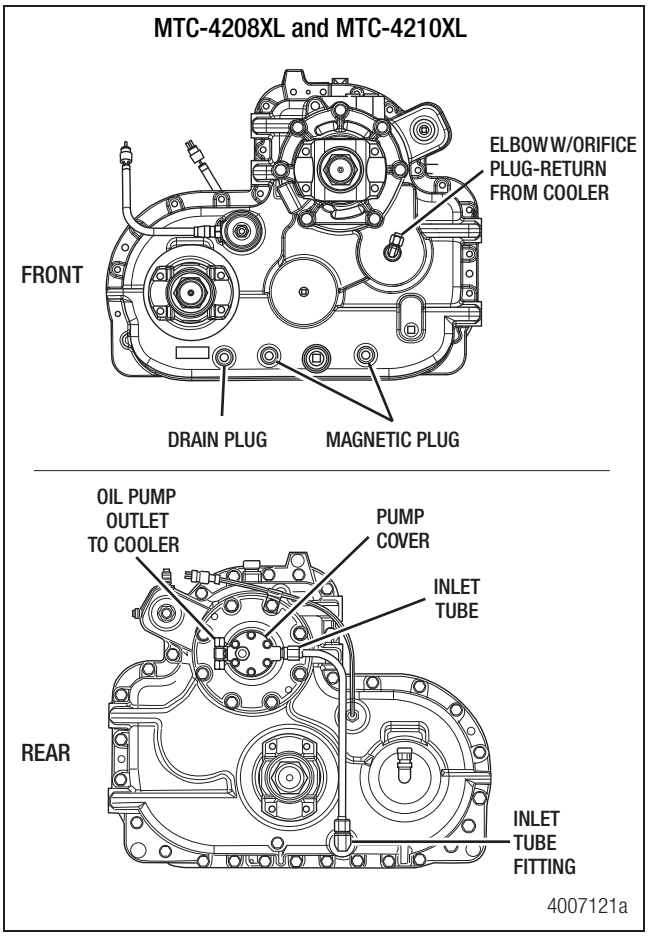


Figure 4.2

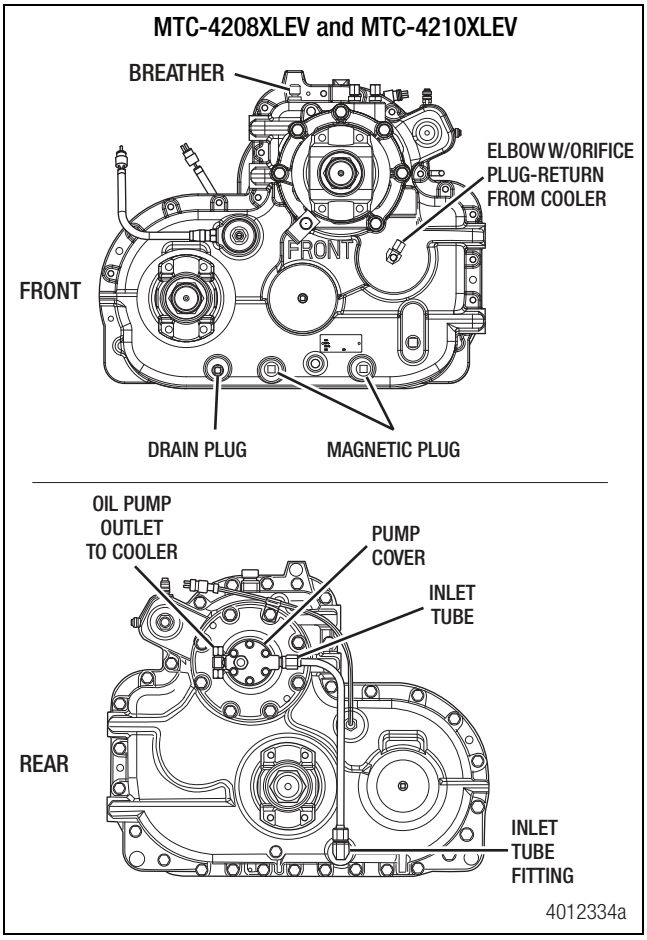


Figure 4.3

6. Disconnect the drivelines from the input and output yokes or flanges of the transfer case.

7. Disconnect the cooler lines. Loosen or remove the p-clamp assembly, if necessary. Figure 4.1, Figure 4.2, Figure 4.3, Figure 4.4, Figure 4.5, and Figure 4.6.

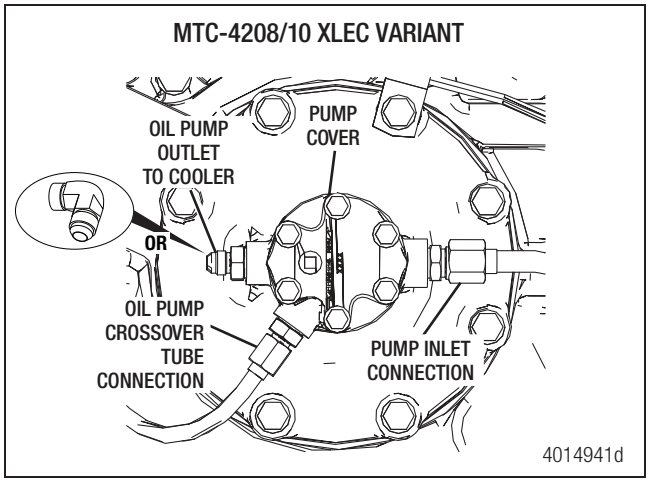


Figure 4.4

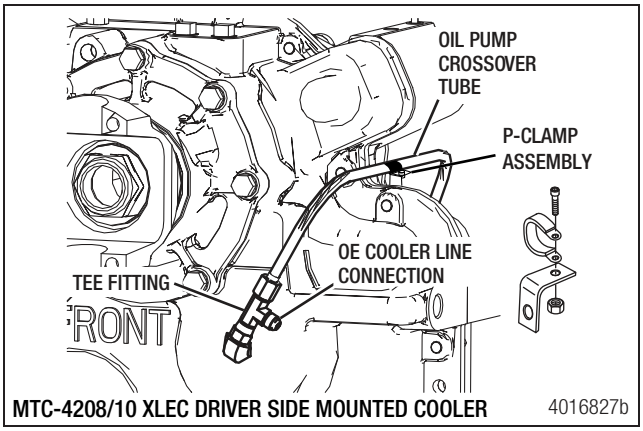


Figure 4.5

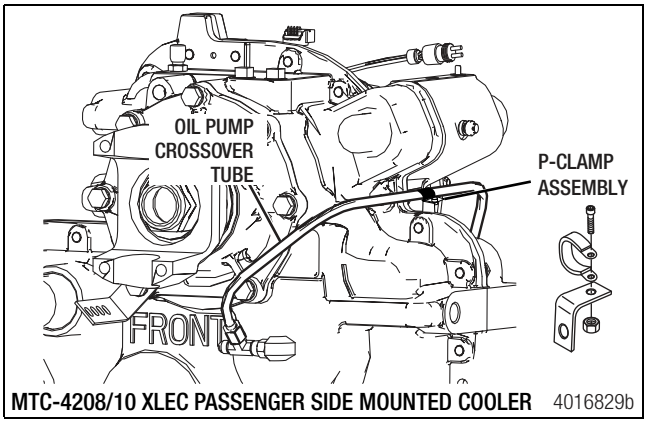


Figure 4.6

8. Disconnect the air lines at the shift cylinders of the transfer case.

9. Disconnect the harness for the indicator switch wires.

10. Use a hydraulic roller jack to support the transfer case. Remove the mounting bolts attaching the transfer case to the vehicle.

11. Carefully remove the transfer case with the hydraulic jack.

> **⚠ CAUTION**
>
> Close or cover all openings, including breather, oil drain, and speed sensor, before steam cleaning. Steam can cause component damage.

12. Close or cover all openings before steam cleaning. These openings include the breather, oil drain and speed sensor.

13. Steam clean the outside of the transfer case to remove heavy amounts of dirt.

14. Construct suitable mounting brackets or similar fixtures. Attach the brackets to the front half of the transfer case by installing bolts through the mounting holes in the transfer case. Figure 4.7 and Figure 4.8.

    NOTE: Eyebolts permit easier lifting of the transfer case.

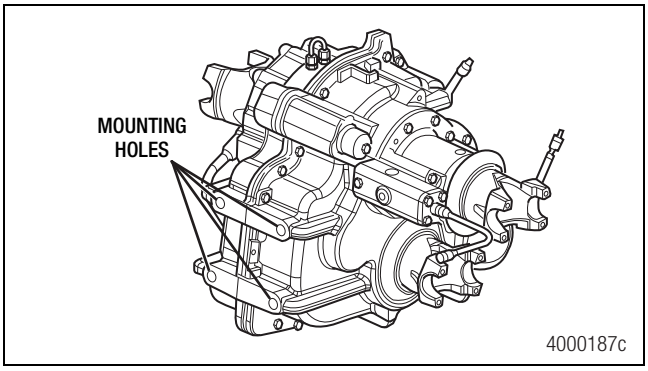


Figure 4.7

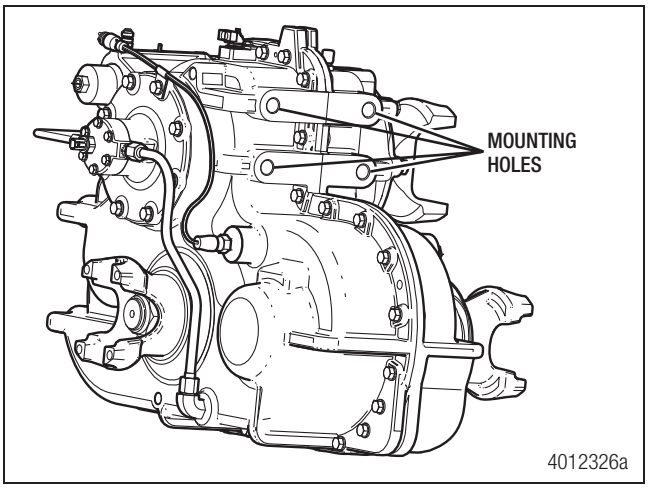


Figure 4.8

15. Install eyebolts in the lifting holes located in either half of the transfer case housing. Lifting holes are located at the top and bottom of each half of the transfer case near the center. Figure 4.9.

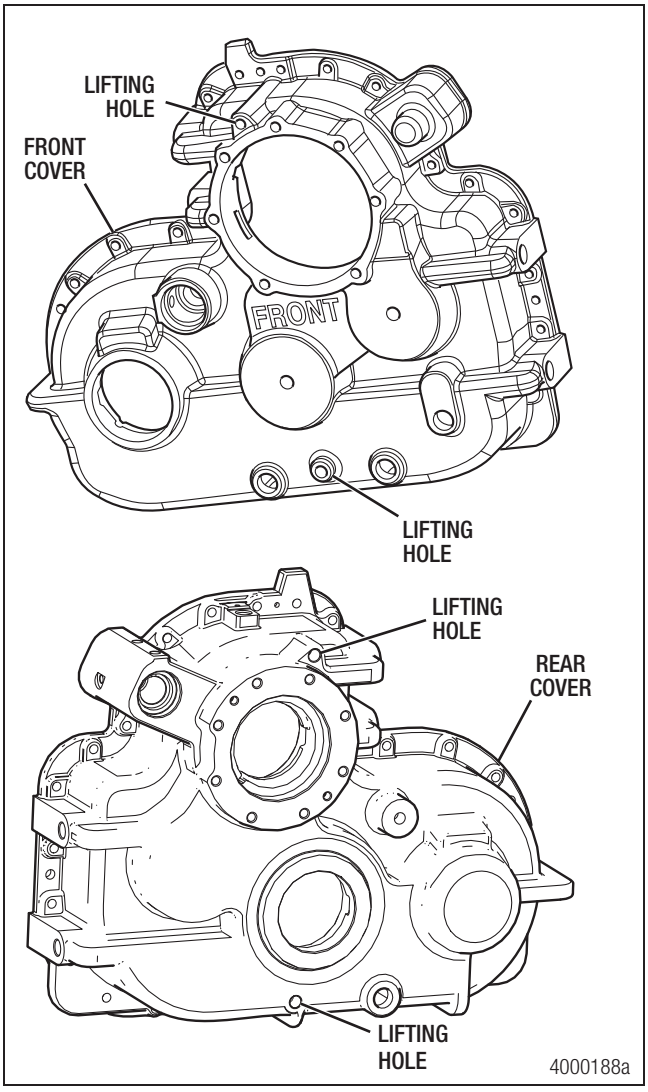


Figure 4.9

⚠ DANGER

Support the transfer case with a lifting strap before mounting the transfer case into the repair stand. A transfer case not supported correctly can fall. Death or serious personal injury and damage to components can result.

NOTE: The transfer case filled with lubricant weighs approximately 750 lbs (340.2 kg) without the PTO.

16. Attach a suitable lifting device to the eyebolts to lift the transfer case. Use suitable brackets to mount the case in the repair stand. Figure 4.7 and Figure 4.8.

Disassembly

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

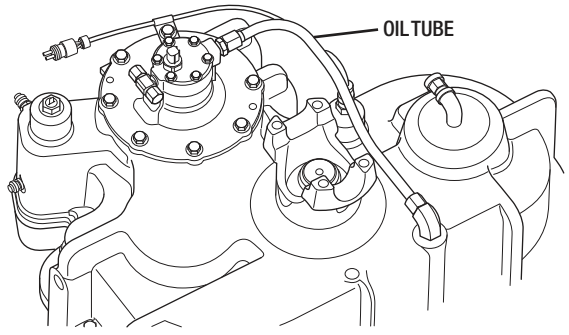
Remove the Input Shaft Assembly

(From an assembled transfer case - for input shaft repairs only)

If necessary, the input shaft may be removed without separating the transfer case halves. Once the transfer case is removed from the vehicle and the oil drained, Meritor recommends checking and recording the end play for the input shaft, output shafts, and idler gears before beginning this procedure. Refer to the procedures in “Removal” on page 40 and “Assembly” on page 60.

1. **MTC-4208XL and MTC-4210XL Transfer Cases Only:**

   a. Disconnect the transfer case oil inlet line from the oil pump cover. Figure 5.1.



MTC-4208XL AND MTC-4210XL SHOWN 4007108a

Figure 5.1

   b. Disconnect the oil cooler-to-pump cover oil lines.

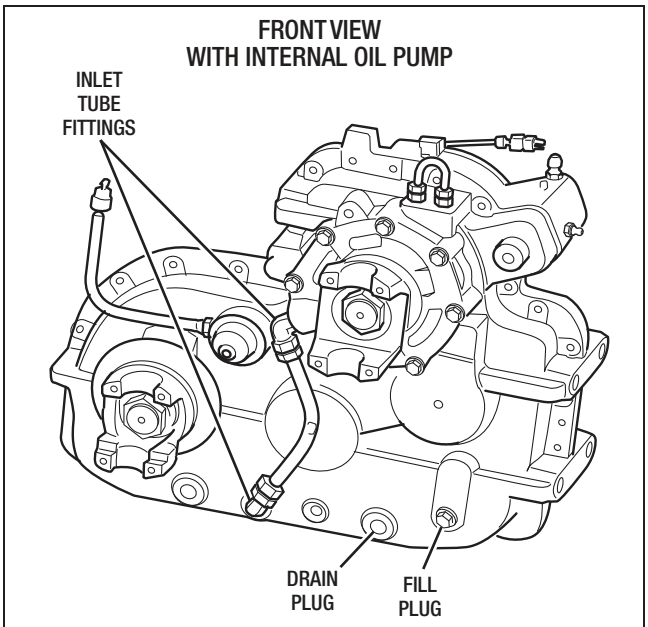
   c. Plug the oil lines and cap the oil cover fittings.

   d. Remove the external oil pump housing from the transfer case.

   e. Remove the oil pump assembly from the rear of the input shaft. Refer to the procedure on page 45.

2. **MTC-4208X and MTC-4210X Transfer Cases Only:**

   a. Disconnect the transfer case oil inlet line from the oil pump cover. Figure 5.2.



MTC-4208X/XP, MTC-4210X/XP, AND MTC-4213X 4006988a

Figure 5.2

   b. Remove the PTO capscrews and remove the PTO cover.

3. **MTC-4208XP and MTC-4210XP Transfer Cases Only:**

   a. Disconnect the transfer case oil inlet line from the oil pump cover. Figure 5.2.

   b. Remove the PTO air lines.

   c. Remove the PTO-to-transfer case capscrews.

   d. Remove the PTO.

4. Remove the 3” (76 mm) diameter locknut and washer from the rear half of the input shaft.

5. Apply shop air to the high range shift cylinder air port to engage the clutch collar in the high range position. This will prevent the high range gear and bearing from falling out of position when removing the input shaft from the transfer case assembly.

6. Rotate the transfer case so it is in the normal operating position.

7. Remove the input bearing cage capscrews and washers.

8. Remove the input bearing cage and input shaft assembly from the transfer case. If necessary, use a yoke puller or an appropriate lifting device. It may be necessary to gently pry the input bearing cage up to dislodge it from the transfer case. Figure 5.3.

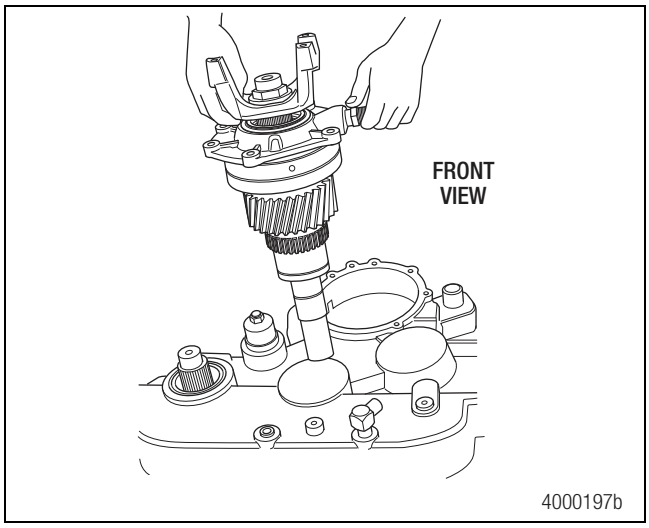


Figure 5.3

9. Remove the shims.

10. Remove the input bearing cage oil seal (o-ring) and discard it.

11. Remove the air line from the high range port. The high/low shift is air actuated and will remain in the high position.

    NOTE: For disassembly of the input shaft, refer to page 47.

MTC-4213X Transfer Case Only:

1. Disconnect the oil line from the input bearing cage. Figure 5.2.

2. Apply shop air to the high range shift cylinder air port to engage the high range gear. This will prevent the clutch collar from falling into the transfer case half.

3. Rotate the transfer case so it is in the normal operating position.

4. Remove the input bearing cage capscrews and washers.

5. Remove the input bearing cage and input shaft assembly from the transfer case. If necessary, use a yoke puller or an appropriate lifting device. It may be necessary to gently pry the input bearing cage up to dislodge it from the transfer case.

6. Remove the shims.

   NOTE: The MTC-4213X has a two piece through shaft. Because of this design, only the forward half of the input shaft will be removed while the upper rear output shaft will remain in place.

Disassemble the Transfer Case

Front and Rear Output Yokes

1. Rotate the transfer case in the repair stand so the yoke being removed faces UPWARD.

2. Use a yoke holder to secure the yokes from turning. Remove the yoke lock nuts and washers from the front and rear output shafts. Figure 5.4.

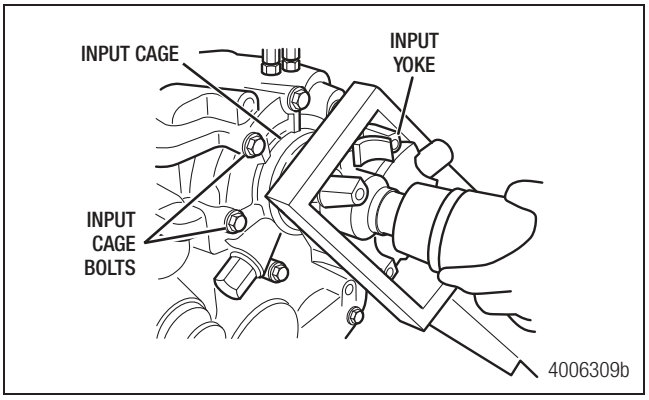


Figure 5.4

3. Use a yoke puller to remove the yokes from the output shafts. Do not remove the deflector from the yoke or flange unless it is damaged.

4. Use a yoke holder to secure the input yoke from turning. Loosen but do not remove the front input yoke, lock nut, and washer from the front input shaft. The yoke is used to lift the input shaft assembly from the transfer case. Figure 5.4.

5. **MTC-4208XP and MTC-4210XP Transfer Cases Only:** Remove the PTO, if equipped, or rear-mounted pump assembly from the rear of the transfer case. Refer to the procedure on page 46.

Rear-Mounted Pump Assembly (MTC-4208XL/XLEV/XLEC and MTC-4210XL/XLEV/XLEC Only)

1. Disconnect the inlet oil line and original lube fittings. Figure 5.5, Figure 5.6, Figure 5.7, Figure 5.8, and Figure 5.9.

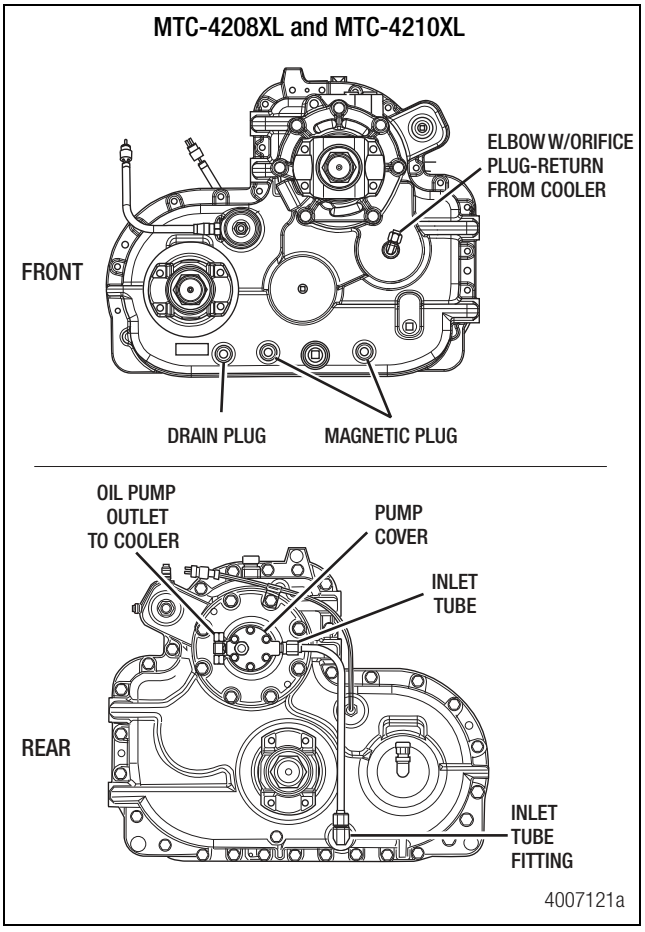


Figure 5.5

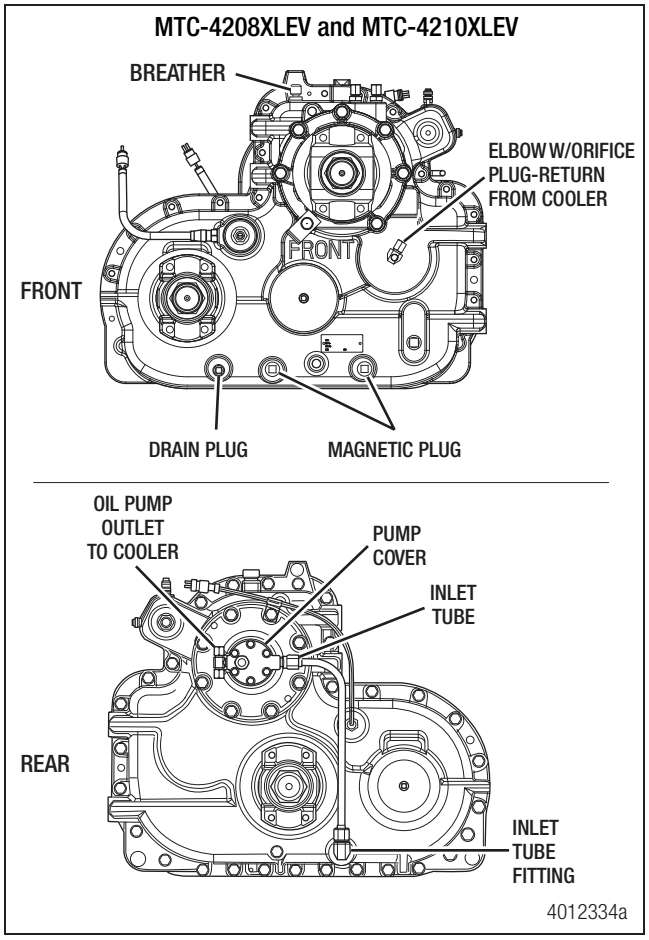


Figure 5.6

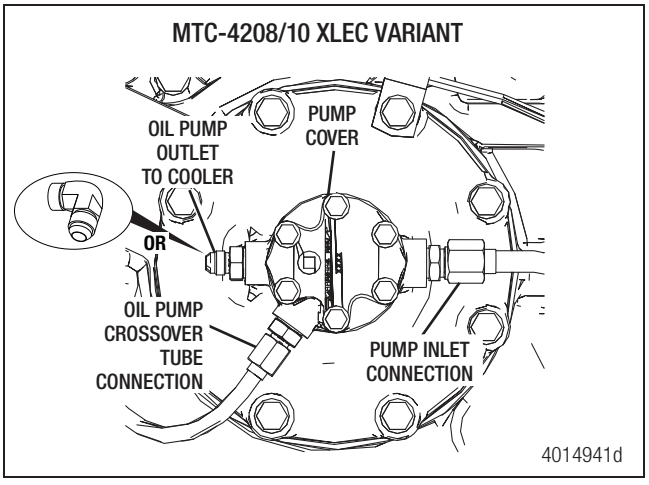


Figure 5.7

5 Disassembly

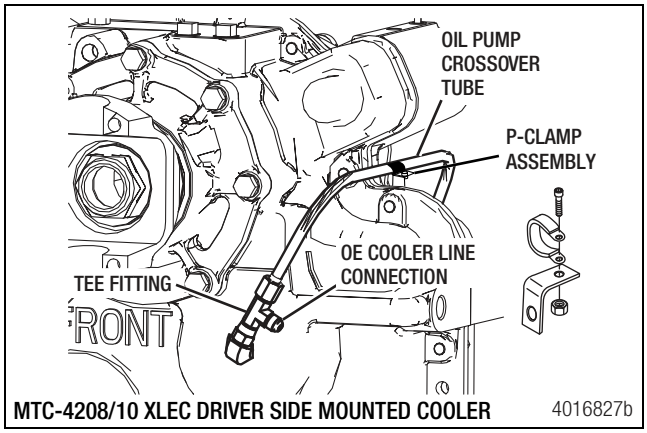


Figure 5.8

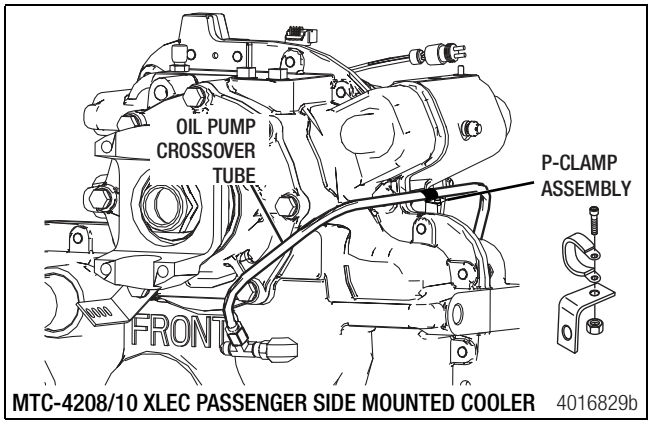


Figure 5.9

2. Remove the pump housing washers and bolts. Remove the pump housing and cover. Figure 5.10.

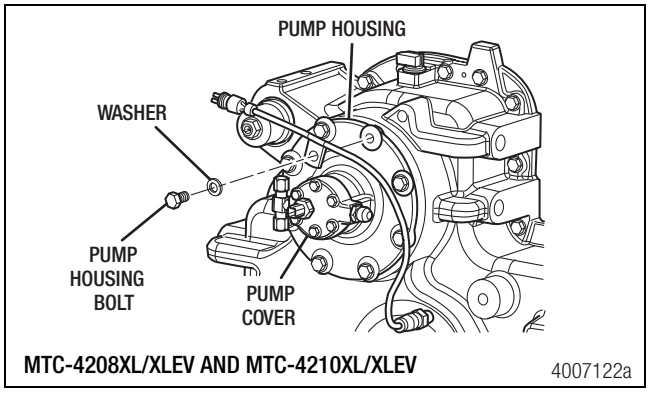


Figure 5.10

3. Remove the pump by applying forward pressure to the pump assembly and disengage the assembly from the oil pump drive pins located on the rear half on the input shaft. Figure 5.11.

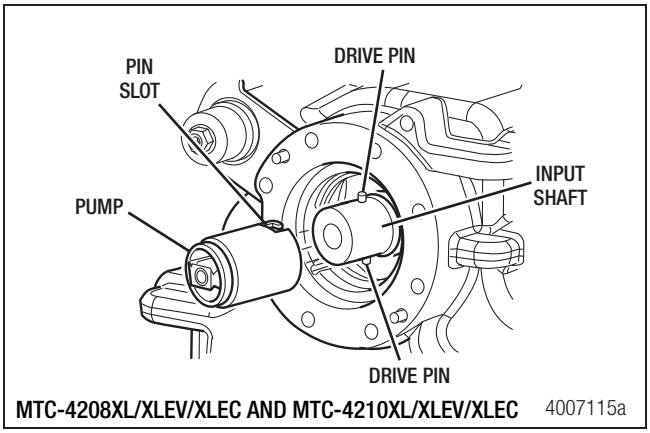


Figure 5.11

4. If necessary, disassemble the pump as follows:

   a. Remove the spring from the rear half of the input shaft.

   b. Gently tap the idler carrier out of the rotor. The idler and floating plate will come out with the idler carrier. Figure 5.12.

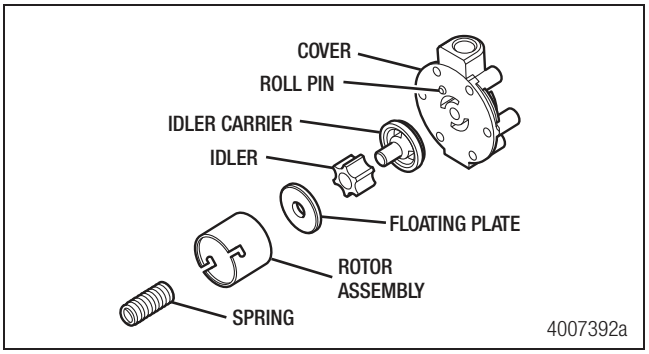


Figure 5.12

NOTE: Once the oil lines and pump cover have been removed from the MTC-4208/10XLEC, refer to the MTC-4208/10XLEV instructions throughout this section for disassembly of XLEC variants.

Optional PTO Assembly on MTC-4208XP and MTC-4210XP Transfer Cases

1. Rotate the transfer case in the repair stand so the PTO assembly, if so equipped, is facing UPWARD. Figure 5.13.

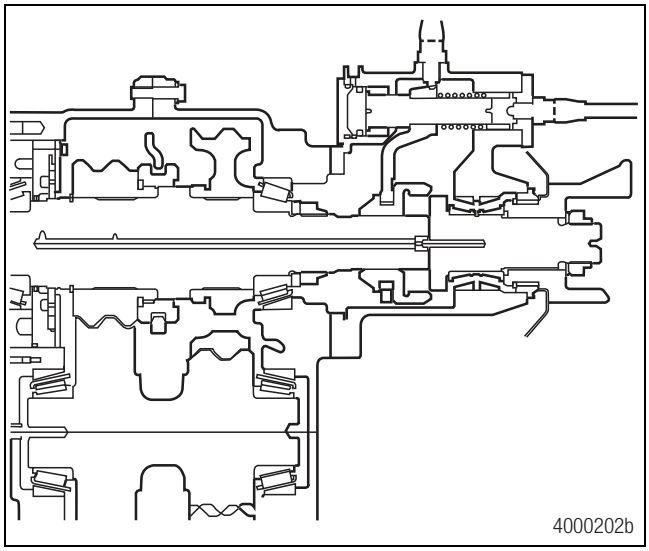


Figure 5.13

2. Remove the yoke nut, washer, and yoke. Use a yoke puller to remove the yoke.

3. Remove the PTO indicator switch from the shift plate, if equipped.

4. Remove the cage mounting capscrews and washers from the PTO. Lift the PTO assembly off the transfer case.

Remove the Front Input Shaft, Input Bearing Cage, and Internal Pump Assembly (If Equipped)

1. On transfer cases with an internal oil pump, remove the inlet oil tube from the transfer case by loosening the fittings at the lower front case and input-bearing cage. Figure 5.14.

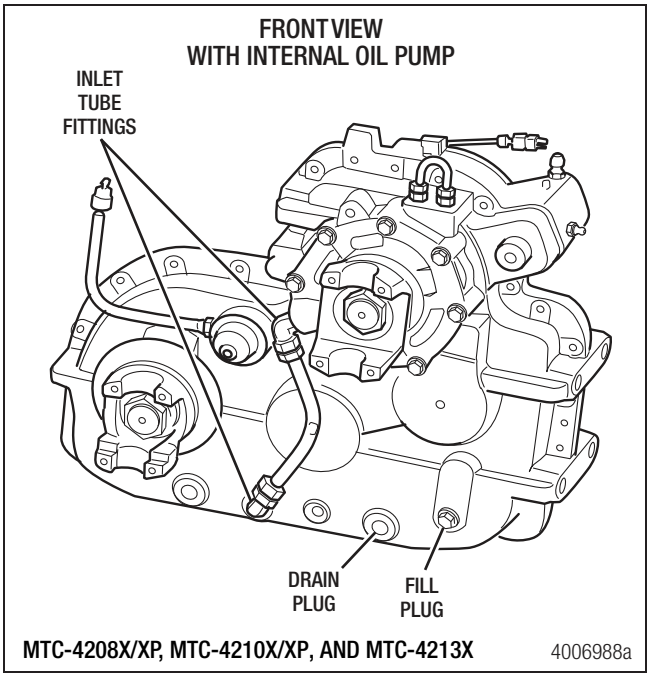


Figure 5.14

2. On transfer case models MTC-4208X/XP and MTC-4210X/XP, remove the PTO cover or PTO, whichever applies. Use a 3" socket to remove the large retaining nut and washer from the rear half of the input shaft. Use a yoke tool on the input shaft yoke to prevent the shaft from rotating while removing the retaining nut.

   If the input shaft retaining nut cannot be removed, it will not be possible to remove the front input shaft before opening the housing. Skip this procedure.

   NOTE: The MTC-4213X has a split shaft design. It is only necessary to remove the front half of the input shaft during disassembly. The rear half of the input shaft is pressed into the rear case half and cannot be removed until after the transfer case halves are separated.

3. On transfer case models MTC-4208XL/XLEV/XLEC and MTC-4210XL/XLEV/XLEC, use a 3" socket to remove the large retaining nut and washer from the rear half of the input shaft. Use a yoke tool on the input shaft yoke to prevent the shaft from rotating when removing the retaining nut.

   If the input shaft retaining nut cannot be removed, it will not be possible to remove the front input shaft before opening the housing. Skip this procedure.

4. Remove the capscrews securing the input bearing cage and internal pump assembly, if equipped.

NOTE: The high- and low-range clutch collar becomes loose on the shift fork as the input bearing cage and pump assembly is removed and may drop into the case. Shifting the transfer case into high range keeps the shift collar on the high-range gear, which keeps it in place. Also, shifting into high range allows easier rear cover removal on the MTC-4208 and MTC-4210 transfer cases.

5. Shift the transfer case into high range using compressed air at the high-range port of the shift cylinder. Figure 5.15.

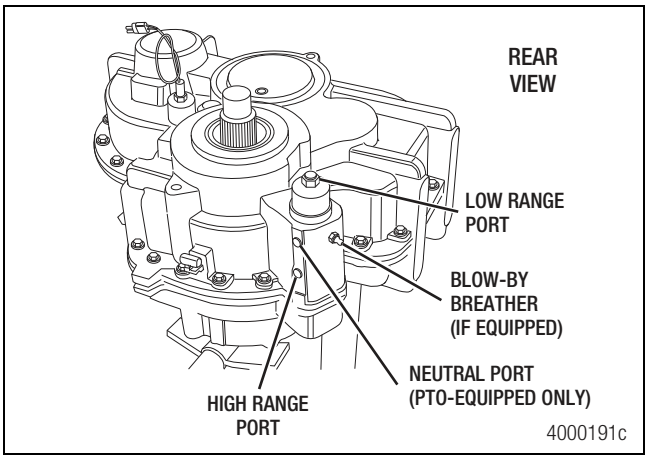


Figure 5.15

⚠ CAUTION

Use a pry bar and mallet to remove the input cage cover. Take care not to damage the shim pack. Damage to the transfer case will result.

6. Use a pry bar and mallet to loosen the input cage cover and internal pump assembly, if equipped. Figure 5.16.

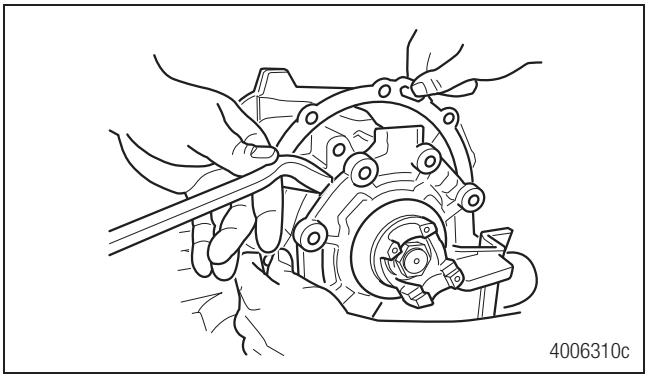


Figure 5.16

7. Remove the shim pack. Figure 5.16.

8. With the front input yoke still installed, remove the yoke nut, yoke, and front input bearing cage from the assembly. Figure 5.17.

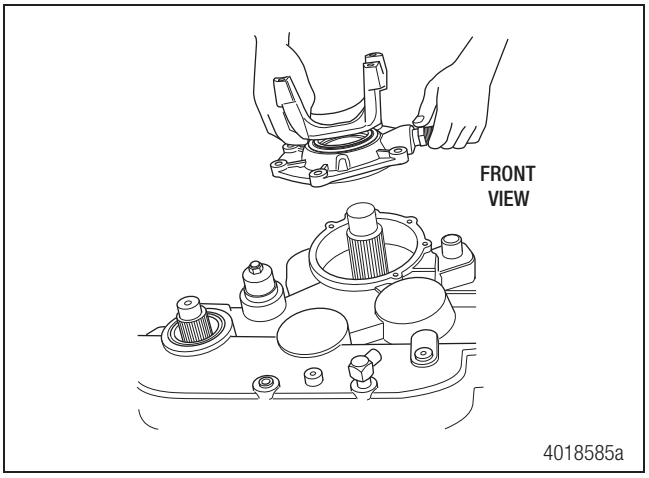


Figure 5.17

High/Low Shift Cylinder Components

Use the following procedure to disassemble the high/low shift components before separating the case halves.

1. Rotate the transfer case so the shift cylinder is facing UP.

   NOTE: After the air source is removed, the high range gear may move out of position.

2. Disconnect the air lines used to shift in the previous steps. Figure 5.18.

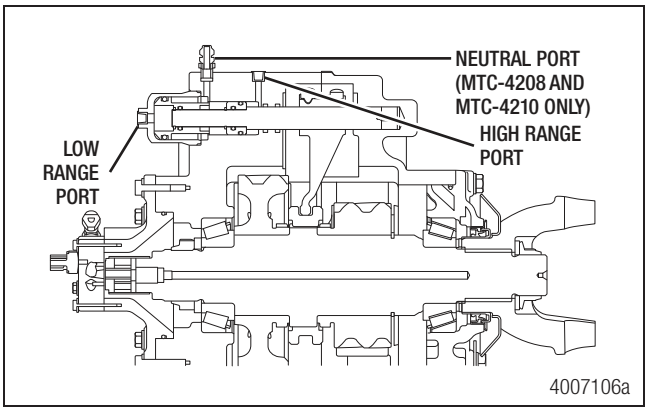


Figure 5.18

3. Remove the high and low range shift cylinder from the rear cover of the transfer case.

4. Remove the outer shift piston snap ring from the shift shaft. Remove the shift piston. Figure 5.19.

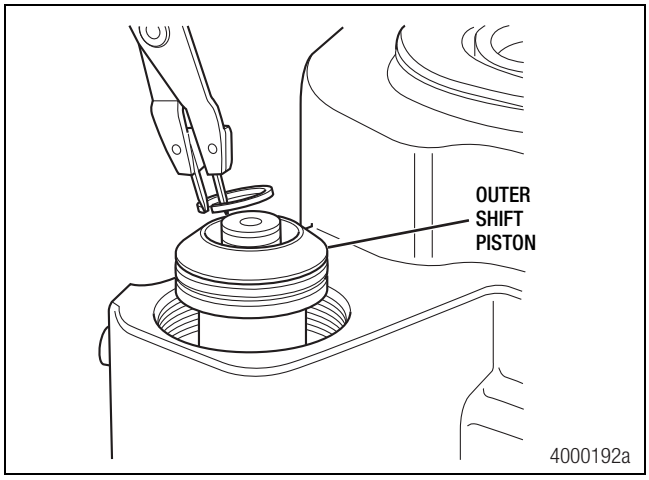


Figure 5.19

5. To remove the inner piston, reinstall and hand-tighten the shift cylinder. Apply air to the high gear input port. When the air pressure pushes the inner piston UP, remove the snap ring and inner piston. Figure 5.20.

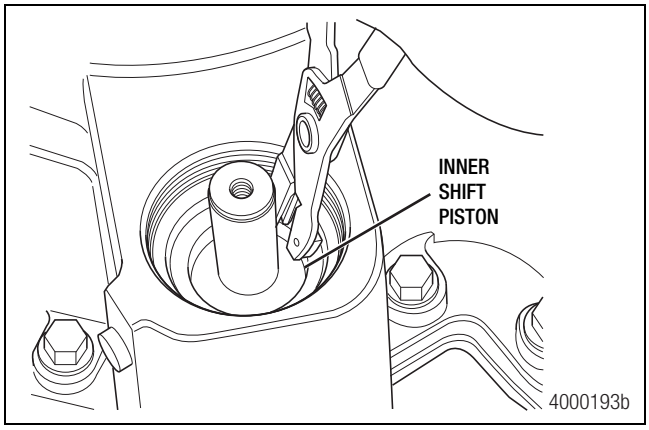


Figure 5.20

Split the Case Halves

1. Remove the capscrews securing the rear cover to the front case.

⚠ CAUTION

When using a pry bar, be careful not to damage the carrier or housing flange. Damage to these surfaces will cause oil leaks.

2. Use a pry bar to separate the two halves of the transfer case at the pry tab locations around the case.

3. Place eyebolts into the rear cover lift holes located at the top and bottom of the cover.

⚠ DANGER

Follow all safety guidelines and instructions provided by the lifting device manufacturer. Check that the lift capacity marked on the lifting device, straps and chains is correct for the weight being lifted. If they are not marked with the lift capacity, do not use them. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading. Failure to follow these directives can result in death or serious personal injury and damage to components.

⚠ CAUTION

As the rear cover is lifted, apply DOWNWARD pressure on the shift rod to prevent the gears from dropping out of the rear transfer case half.

4. Attach a suitable lifting device to the eyebolts. Lift the rear cover from the front case. Figure 5.21.

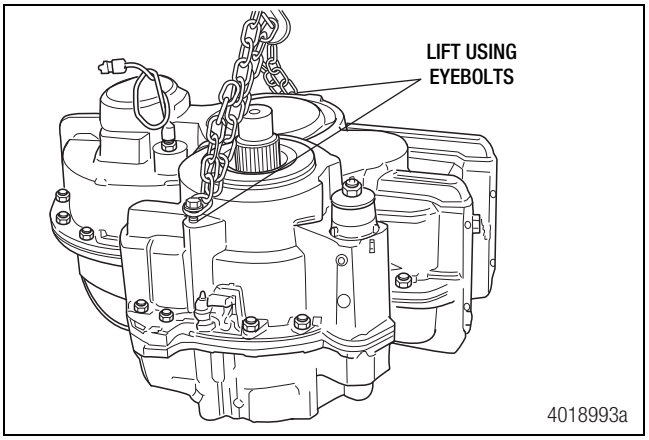


Figure 5.21

5. As the rear cover is lifted, verify the high and low shift shaft remains in the case by placing pressure on the shaft while separating the transfer case halves.

6. **MTC-4213X Only:** The rear output shaft and high-range gear are removed as an assembly along with the rear cover. The shaft is pressed into the bearing assembly which keeps the shaft retained in the housing. Refer to “Disassemble MTC-4213X Rear Output Shaft Assembly” on page 50.

7. **MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC Only:** Remove the high range helical gear.

8. Remove the high and low shift fork, shift shaft, and clutch collar from the front case. Figure 5.22.

5 Disassembly

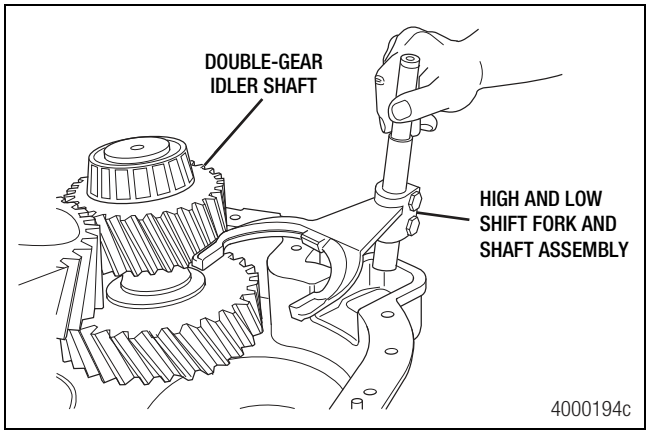


Figure 5.22

9. Remove the single-gear idler shaft on MTC-4213X, or rear output on MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC, and the double-gear idler shaft from the case. Figure 5.23.

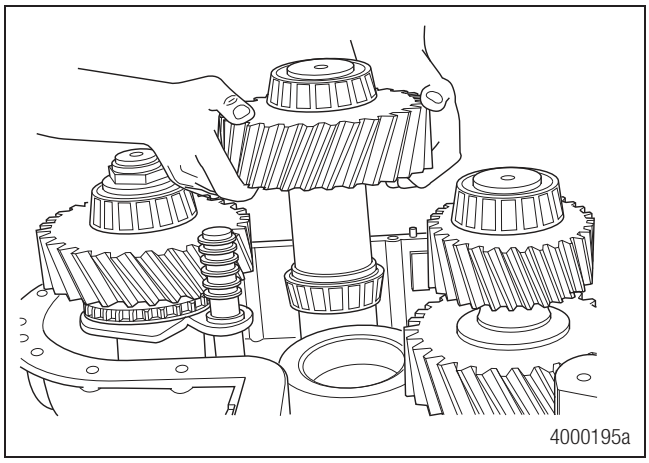


Figure 5.23

10. Remove the front output shaft, clutch collar, shift fork, and spring as an assembly.

11. Remove the shift cylinder and push rod from the front case.

12. Remove the two locating dowel pins. Note their correct location.

Disassemble the Front Output Shaft Assembly

1. Temporarily install the yoke and nut. Secure the yoke to prevent the shaft from rotating when removing the rear nut. Support the shaft correctly.

2. Remove the rear nut and washer.

3. Remove the yoke.

4. Prepare the shaft for bearing and gear removal. Install the front output shaft into a press with the rear of the output shaft facing UP. Support the shaft correctly. Figure 5.24.

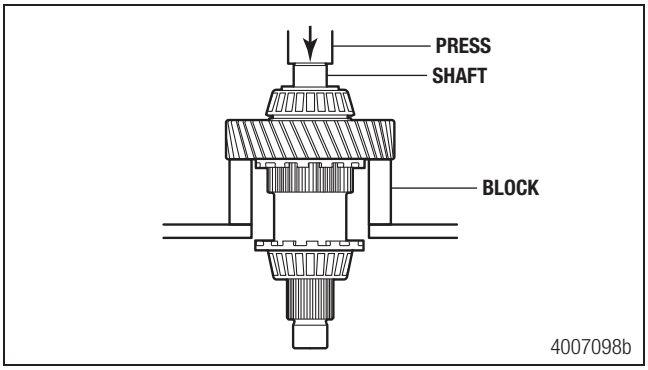


Figure 5.24

5. Press the shaft DOWNWARD to remove the rear tapered roller bearing, helical gear, clutch collar, and needle bearing from the assembly.

6. Install a bearing separator or other suitable tool below the forward roller bearing. Figure 5.25.

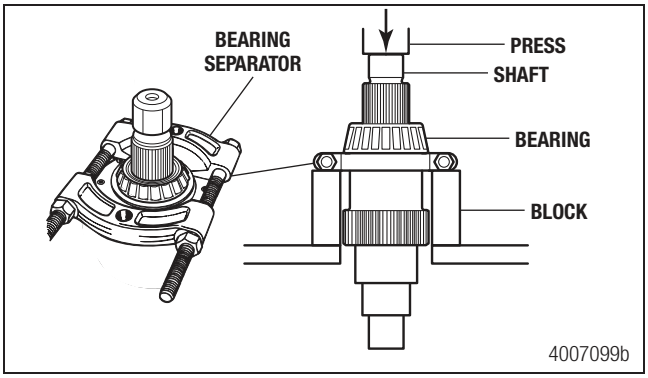


Figure 5.25

7. Install the output shaft assembly into a press and support it correctly. Figure 5.25.

8. Press the output shaft DOWNWARD to remove the front roller bearing.

Disassemble MTC-4213X Rear Output Shaft Assembly

⚠ DANGER

Observe all hazard alerts provided by the press manufacturer. Death or serious personal injury and damage to components can result.

⚠ WARNING

Use a suitable chain and lifting device to secure the rear cover in the press to prevent serious personal injury and damage to components.

1. Set the rear cover with the rear output shaft as an assembly into a suitable press. Figure 5.26.

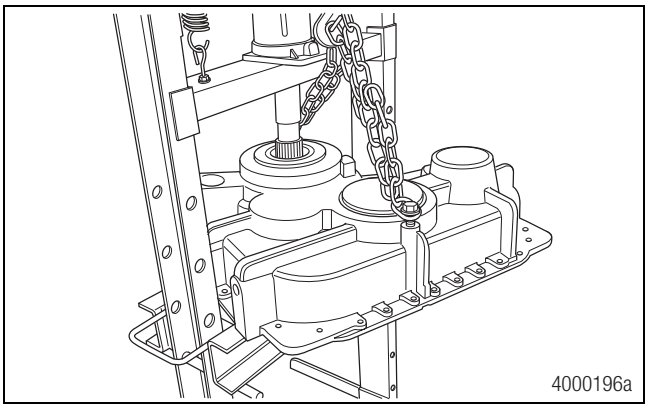


Figure 5.26

⚠ WARNING

The rear output shaft assembly is heavy. Support the assembly to prevent it from dropping during the pressing operation. Serious personal injury and damage to components can result.

2. Press the rear output shaft assembly out of the rear cover. Figure 5.26.

3. Use a suitable puller to remove the rear output shaft outer bearing cup from the rear cover if required. Discard the cone and cup.

4. Inspect the rear output shaft inner bearing cone and cup for wear or damage. Replace a worn or damaged bearing cone and cup as a set. If the bearings are going to be reused, then keep them together and do not mix with other bearings.

5. Remove the high range helical gear from the upper rear output shaft. The gear is splined to the shaft.

6. Turn the shaft assembly over. Install a bearing separator or suitable tool under the bearing.

7. Install the shaft assembly into a press.

8. Press the shaft assembly DOWNWARD until the bearing is free from the shaft.

Disassemble the Front Input Shaft, Input Shaft Bearing Cage, and Internal Oil Pump, If Equipped

1. Support the front input shaft and bearing cage assembly at the workbench. Figure 5.27.

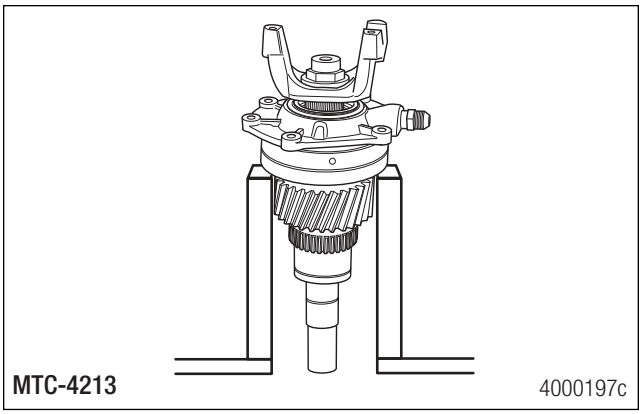


Figure 5.27

2. Remove the yoke nut and washer.

3. Use a yoke puller to remove the front input yoke. Figure 5.28.

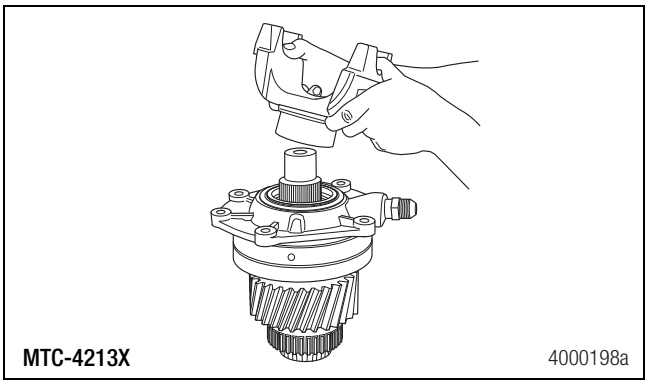


Figure 5.28

4. Lift the front input bearing cage and internal oil pump assembly, if equipped, off the input shaft. Figure 5.29.

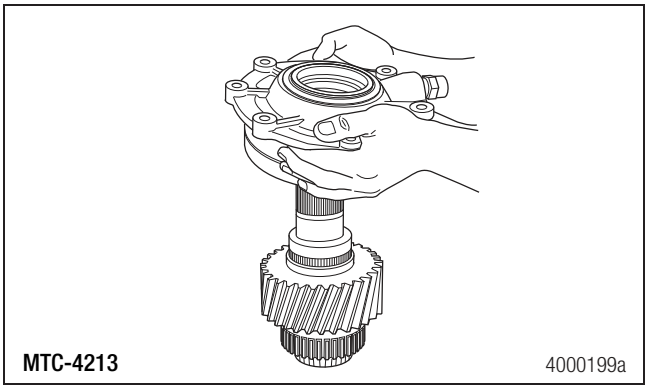


Figure 5.29

5. Remove the snap ring retaining the small helical gear on the input shaft. For MTC-4208XLEV/XLEC and MTC-4210XLEV,/XLEC remove the spacer from the input shaft. Lift the small helical gear off the shaft. For MTC-4208XLEV/XLEC and MTC-4210XLEV/XLEC, remove the needle bearing from the input shaft. Figure 5.30 and Figure 5.31.

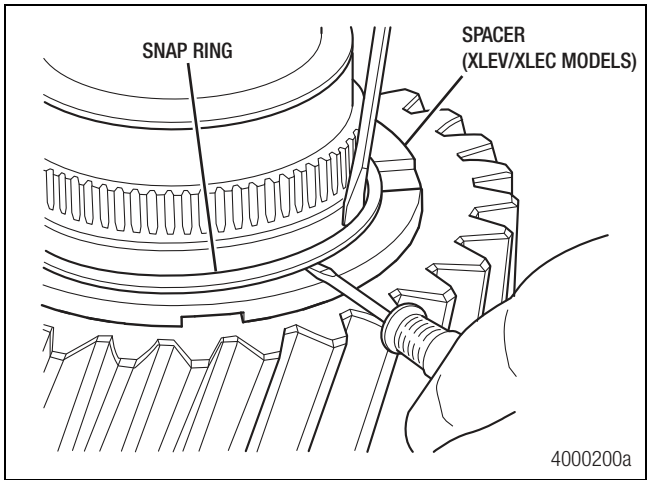


Figure 5.30

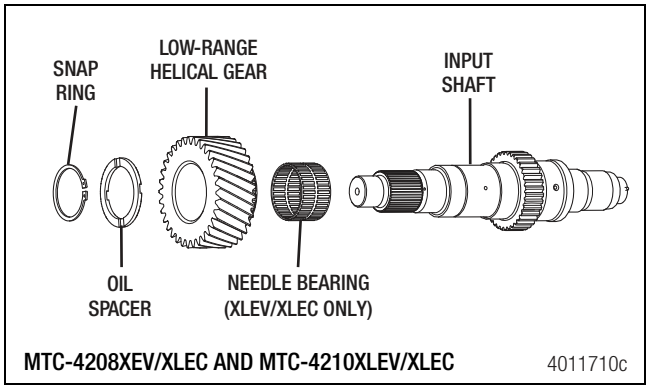


Figure 5.31

6. **MTC-4208X/XP and MTC-4210X/XP Only:**
   Remove the internal pump, if equipped, from the input-bearing cage to service the front input shaft tapered roller bearing cone and cup.

   a. Remove the six bolts retaining the oil pump to the input-bearing cage.

   b. Mark the position of the pump to the cage for reassembly. Figure 5.32.

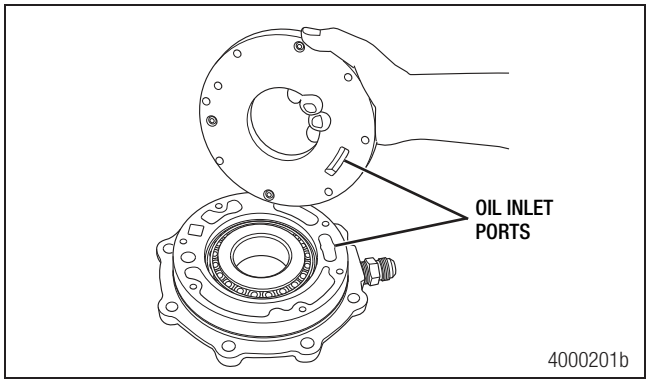


Figure 5.32

   c. Inspect the pump inner rotor in the spline area for cracks or other damage. The entire pump must be replaced if the pump or inner gear rotor is damaged in any way. The bearing cup is pressed into the bearing cage.

   d. Remove the relief valve and spring.

7. Replace the bearing cone and cup as necessary.

Idler Gear and Rear Output Shaft Disassembly

1. Use a suitable bearing cone puller to remove the bearing cones as necessary from the single idler-gear shaft, rear output shaft on MTC-4208 and MTC-4210 transfer cases, or double idler-gear shaft assemblies.

2. Inspect and replace bearing cones with new as needed. Replace bearing cones and cups as a set. If the bearings are going to be reused, then keep them together and do not mix with other bearings.

3. Inspect the shafts and gears for wear or damage.

Remove the Bearing Cups

1. Correctly support the transfer case half.

2. Use a suitable puller to remove the bearing cups from the transfer case half. Figure 5.33.

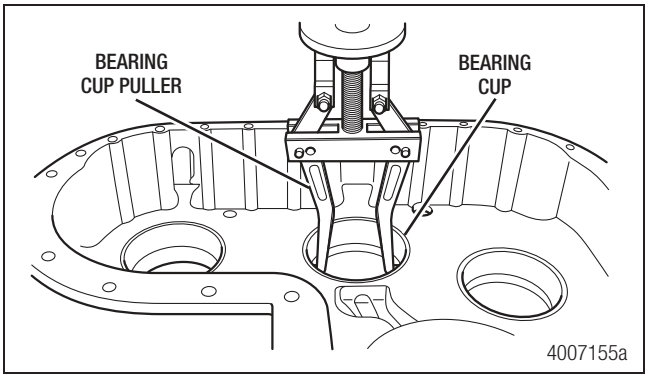


Figure 5.33

3. Clean and save the shims so they can be used to measure the shim pack thickness during reassembly, if necessary.

Prepare Parts for Assembly

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ DANGER

Solvent cleaners can be flammable, poisonous, and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Death or serious personal injury and damage to components can result. Follow the procedures below.

- Wear eye protection.
- Wear clothing that protects the skin.
- Work in a well-ventilated area.
- NEVER use gasoline or solvents containing gasoline. Gasoline can explode.
- Hot solution tanks or alkaline solutions must be used correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

⚠ WARNING

The use of compressed air is unlawful in some areas of Canada and should not be used where prohibited. Personal injury and damage to parts can result.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Clean Parts

Ground and Polished Parts

⚠ CAUTION

NEVER use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Damage to parts can result.

- NEVER clean ground or polished parts in a hot solution tank, water, steam, or alkaline solution to avoid damaging the surfaces.
- Use a cleaning solvent to clean ground or polished parts or surfaces. NEVER USE GASOLINE.
- Use a knife, if required, to remove gasket material from parts. Be careful not to damage the ground or polished surfaces.

Clean Rough Parts

- Clean rough parts with the same method as cleaning ground and polished parts.
- Use a cleaning solvent or a hot solution tank with a weak alkaline solution to clean parts with a rough finish.
- Leave the parts in the hot solution tank until they are completely cleaned and heated. When the parts are clean, remove them from the tank.
- Wash the parts with water until the alkaline solution is completely removed.

Clean Transfer Case Assemblies

⚠ CAUTION

Close or cover all openings, including breather, oil drain, and speed sensor, before steam cleaning. Steam can cause component damage.

- Steam clean transfer cases on the outside to remove heavy amounts of dirt.
- Before steam cleaning the transfer case, close or put a cover over all openings in the case.
- Remove any remaining silicone sealant from the transfer case halves using a suitable scraper or wire wheel.

6 Prepare Parts for Assembly

Dry Parts

⚠ WARNING

Dry bearings with clean paper or rags. NEVER use compressed air, which can cause abrasive particles to contaminate the bearings. Damage to components and reduced lining life can result. Using compressed air can also cause the rollers to be forced out of their cage and propelled into the air, causing injury.

- Immediately after cleaning, use clean paper, cloth rags, or compressed air to dry the parts. Do not use compressed air to dry the bearings.

Prevent Corrosion

NOTE: Parts must be clean and dry before lubricating them.

- Apply a light oil to cleaned and dried parts that are not damaged and are to be immediately assembled.
- If the parts are being stored after cleaning, apply a corrosion-preventive material to all machined surfaces. Store the parts in a special paper or other material that prevents corrosion.

Oil Seals and O-rings

Discard all oil seals and o-rings. Replace with new parts.

Inspect Parts

It is very important to inspect all parts carefully and completely before the transfer case is assembled. Check all parts for wear and stress. Replace all damaged parts to avoid costly downtime at a future date.

For more detailed information about parts inspection, refer to TP-0445, Meritor Parts Failure Analysis. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

Tapered Roller Bearings

Inspect the tapered roller bearings. Inspect the cup, cone, rollers, and cage of all tapered roller bearings in the assembly. If any of the following conditions exist, the bearing must be replaced:

- The center of the large diameter end of the rollers is worn level with or below the outer surface.
- The radius at the large diameter end of the rollers is worn to a sharp edge.

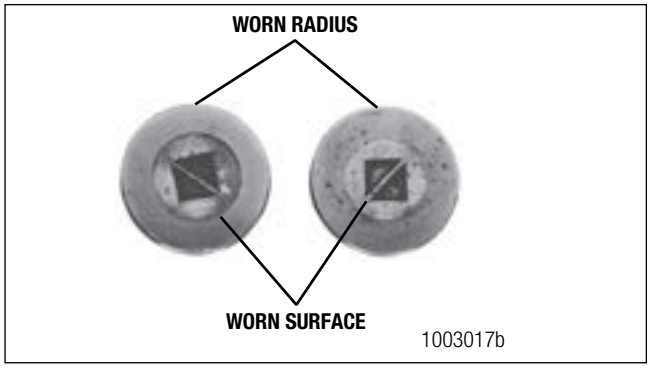


Figure 6.1

- A visible roller groove is worn in the inner race surfaces of the cup or cone. The groove can be seen at the small or large diameter end of both parts.
- Deep cracks or breaks appear in the surfaces of the cup, cone, inner race, or rollers.

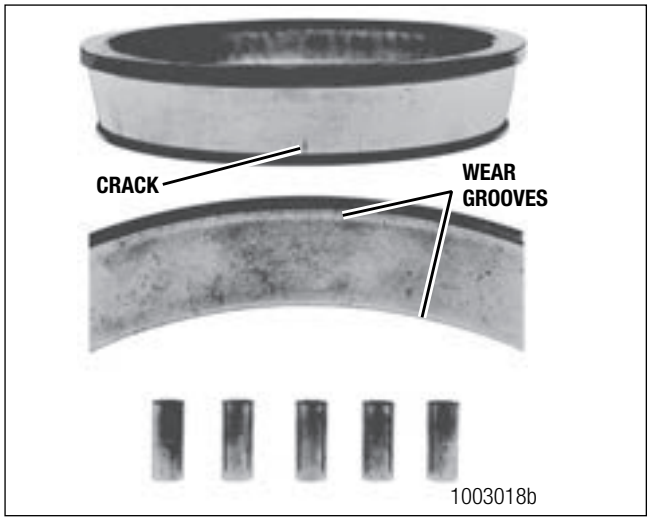


Figure 6.2

- Bright wear marks appear on the outer surface of the roller cage.

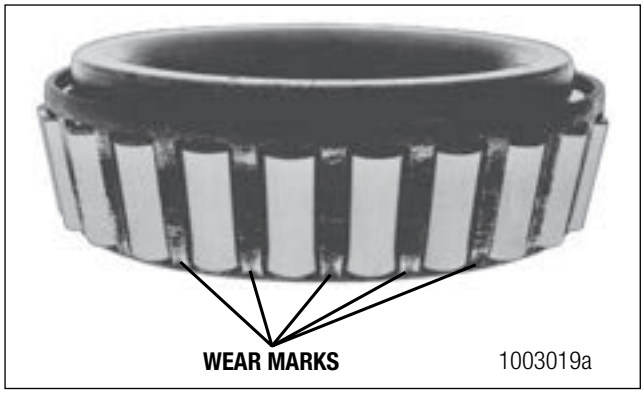


Figure 6.3

- The rollers and surfaces of the cup and cone inner race touching the rollers are damaged.

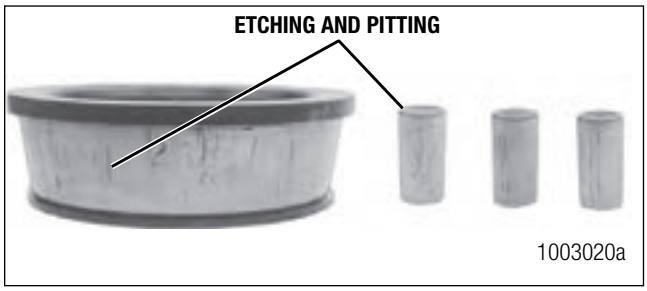


Figure 6.4

- The cup and cone inner race surfaces touching the roller are damaged.

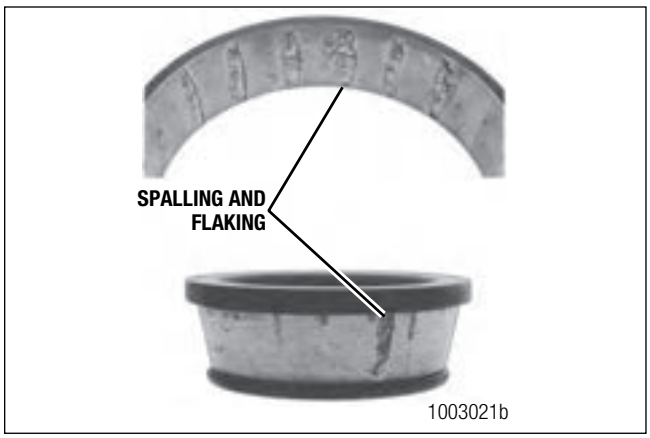


Figure 6.5

Other Components

- Inspect the gears for wear or damage. Replace worn or damaged gears.
- Inspect the housing:
  - Remove all dirt from the housing and oil lubrication passages, troughs, slots, and holes.
  - Inspect machined surfaces for cracks and damage. Repair or replace damaged parts.
- Inspect all shafts, flanges and yokes for wear, stress, and cracks at the splines, shaft, and yoke ears. Replace worn or cracked shafts, flanges, and yokes.
- Verify oil passages in the shafts are clean and free of debris.
- Inspect the declutch and output shaft components, if applicable:
  - Inspect the clutch collar internal splines, external declutch teeth and shift for grooves. Replace worn, cracked, or damaged collars.
  - Inspect the collar pads of the shift fork for wear. If the pads are worn, replace the shift fork.
  - Inspect the declutch shaft and yoke for wear, stress and cracks at the splines, shaft and yoke ears. Replace worn or cracked shafts and yokes.
  - Inspect the declutch or PTO push rod and piston for wear or damage. Replace worn or damaged parts.
- Inspect the rotor, housing, and idler of the oil pump, if equipped, for scoring. Inspect the drive tab of the rotor assembly. Inspect the splines on the pump inner rotor for cracks along the spline area. Also, check for excessive wear. Replace the pump if these conditions exist.
- Remove and inspect the plug at the end of the input shaft. Verify the orifice is clear of debris.

Repair or Replace Parts

⚠ DANGER

Replace damaged or out-of-specification axle components. NEVER bend, repair, or recondition axle components by welding or heat treating. A bent axle beam reduces axle strength, affects vehicle operation, and voids Meritor's warranty. Death or serious personal injury and damage to components can result.

Replace worn or damaged parts of a transfer case assembly. The following are some conditions to check:

- Replace the fasteners if the corners of the head are worn.
- Replace damaged washers.
- Replace the gaskets, oil seals, grease seals or felt seals at the time of transfer case repair.
- Clean the parts. Apply new silicone gasket material, where required, when the transfer case is assembled.
- Use a fine file, emery cloth or crocus cloth to remove rough edges from parts that have machined or ground surfaces.
- Clean and repair fastener threads and holes. Use a die or tap of the correct size or a fine file.
- Verify the threads are clean and not damaged, so the correct torque specifications for fasteners can be obtained.
- Tighten all fasteners to the correct torque specifications. See "Torque Specifications" on page 103.

6 Prepare Parts for Assembly

Applying Adhesive and Silicone Gasket Material

⚠ DANGER

Solvent cleaners can be flammable, poisonous, and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Death or serious personal injury and damage to components can result. Follow the procedures below.

- Wear eye protection.
- Wear clothing that protects the skin.
- Work in a well-ventilated area.
- NEVER use gasoline or solvents containing gasoline. Gasoline can explode.
- Hot solution tanks or alkaline solutions must be used correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

The silicone gasket products listed in the table below or their equivalent can be used on Meritor components.

Table A: Silicone Gasket Products

Product	Description
Loctite® 5699 Ultra Grey	Adhesive/Sealant
Permatex® 82194 Ultra Grey	Silicone Sealant
Three Bond 1216	Silicone Sealant
Three Bond 1216E	Silicone Sealant

1. Remove all old gasket material from both surfaces.
2. Clean the surfaces where you'll apply the silicone gasket material. Remove all oil, grease, dirt and moisture. Dry both surfaces.

⚠ CAUTION

Apply silicone gasket material in a continuous 0.125" (3 mm) bead. If more than this amount is used, the gasket material can break off and plug lubrication passages. Damage to components can result.

3. Apply a 0.125" (3 mm) diameter continuous bead of silicone gasket material around one surface. Also apply the gasket material around the edge of all the fastener holes on that surface. Figure 6.6.

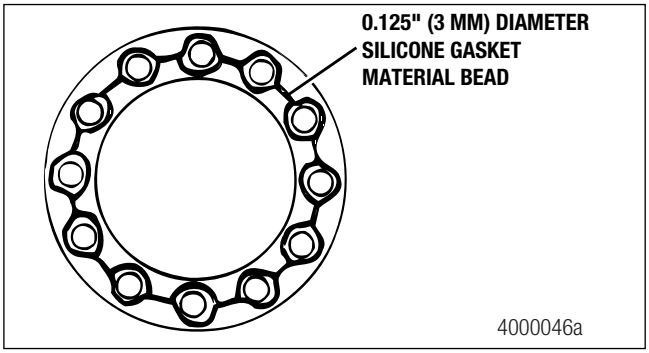


Figure 6.6

4. Assemble the components immediately to permit the gasket material to compress evenly between the parts.
5. Tighten the fasteners to the required torque specification for that size fastener. See "Torque Specifications" on page 103.
6. Wait 20 minutes before filling the assembly with lubricant.

Fasteners

Removing Fasteners Secured with Adhesive

If it is difficult to remove fasteners secured with Dri-Loc®, Meritor adhesive, or Loctite® 277 adhesive, use the following procedure.

⚠ CAUTION

Use a heat gun to slowly heat fasteners for removal. NEVER use a flame to heat fasteners. Do not use excessive heat or heat fasteners quickly. Do not use an impact wrench or hit fasteners with a hammer. Damage to the fastener and components can result.

1. Using a heat gun, slowly heat the fastener three to five seconds at a time to 350°F (177°C). NEVER exceed this temperature or heat the fastener quickly. Try to loosen the fastener with a wrench. NEVER use an impact wrench or hit the fastener with a hammer.
2. Repeat Step 1 until the fastener can be removed.

New Fasteners with Pre-Applied Adhesive

1. Use a wire brush to clean the oil and dirt from the threaded holes.
2. Install new fasteners with pre-applied adhesive to assemble parts. NEVER apply adhesives or sealants to fasteners with pre-applied adhesive, or to fastener holes.
3. Tighten the fasteners to the required torque value for that size fastener. No drying time is required for fasteners with pre-applied adhesive.

Original or Used Fasteners

1. Use a wire brush to clean the oil, dirt, and old adhesive from all threads and threaded holes.
2. Apply liquid adhesive to the bolt threads or bore threads, as required, for the specific component.
3. Tighten the fasteners to the torque specified in "Torque Specifications" on page 87.

Helical Gears

Inspect the helical gear teeth, splines and journals. If any of the following conditions exist, replace the gear.

- A crack in the root of a tooth or along the tooth flank.

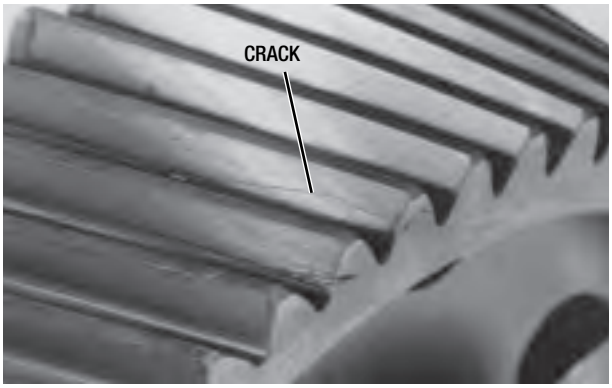


Figure 6.7

- Severe scoring or fretting on the surface of a tooth. Gears with scoring and fretting on the teeth, but without cracks, may continue to operate satisfactorily with higher noise.

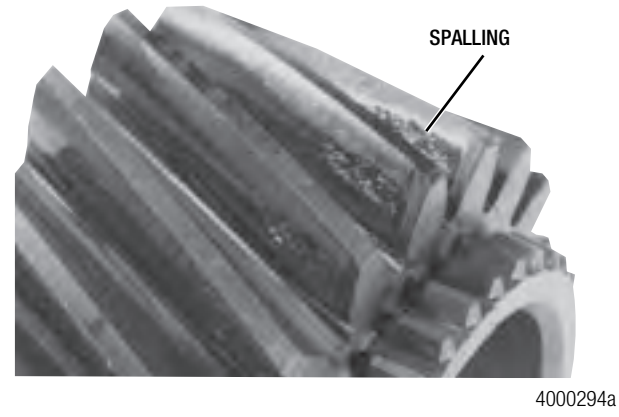


Figure 6.8

- Cracks along the internal journal of the input gears.

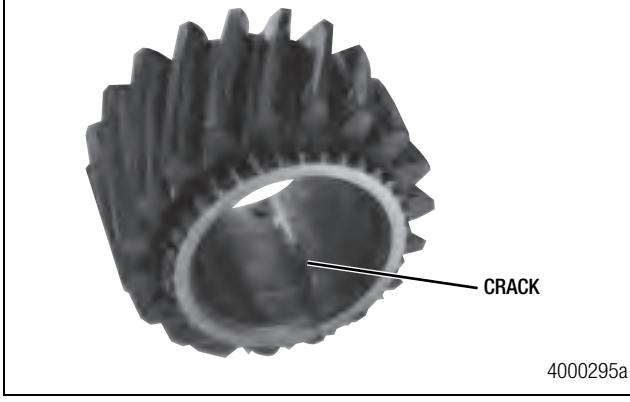


Figure 6.9

- Deep gouges or metal transfer along the input gear journals.

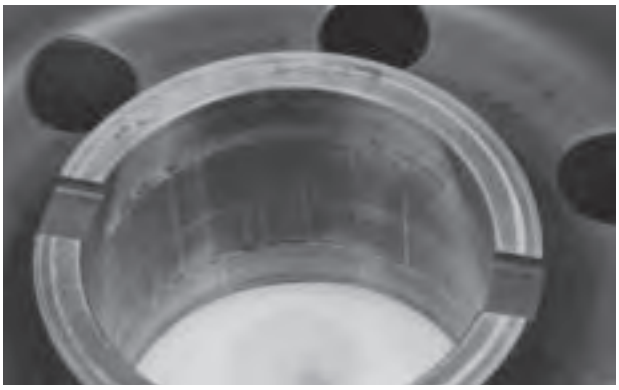


Figure 6.10

- Chipped or severely worn shifting splines on the input gears.
- Chipped or cracked splines on the output gears.

Shafts

Inspect the input and output shafts for damage to the gear journals, shifting splines, threads and gear retaining splines. If any of the following conditions exist, replace the shaft.

- Deep gouges or metal transfer along the input shaft journals.

Figure 6.11

- Chipped or worn shifting splines on the input shaft.
- Chipped or cracked splines on the output shaft.

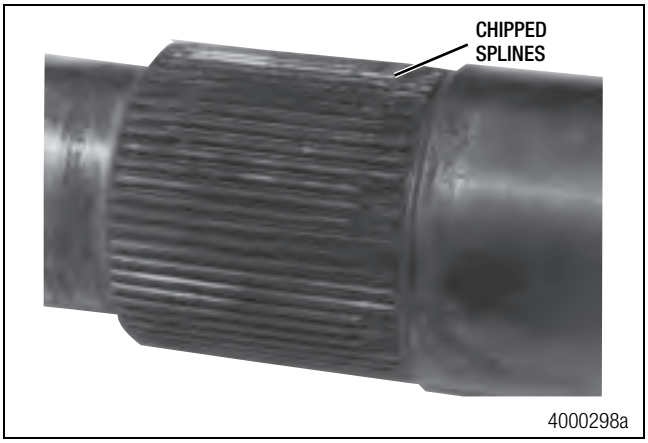


Figure 6.12

- Cracks along the yoke splines, bearing journal abutments, or cross-drilled holes. Magnaflux may be necessary to see small cracks.

PTO Components

Inspect the PTO housing, shaft, taper bearings, shift collar, shift fork, and sensors for damage. If any of the following conditions exist, replace the component.

- Cracks in the housing.
- Cracks along the shaft yoke spline or ball bearing abutment. Magnaflux may be necessary to see small cracks.
- Chipped or cracked shifting splines on the shift collar or shaft.
- The rollers of the taper bearings do not roll easily or lack lubrication. The raceway is cracked or dented.
- Cracked or missing tangs on the shift fork arms.
- The sensor ball sticks or does not return to its resting position. The sensors do not complete a circuit when tested with a volt-ohm meter (VOM).
- Check all shift forks and slots in sliding clutches for wear or discoloration due to heat.

High and Low Shifting Components

Inspect the shift collar, shift fork, shift shaft, retaining pins, shift cylinder, piston, o-ring and case halves for damage. If any of the following conditions exist, replace or repair the component.

- Cracked or missing tangs on the shift fork arms.
- Chipped or cracked shifting splines on the shift collar.
- Cracks or deep gouges on the shift shaft.

- The retaining pins in the shift shaft are not 0.100” (2.54 mm) above the shaft diameter. Remove and set to the correct position.
- Gouges on the inside of the shift cylinder.
- Torn or feathered areas on the o-ring.
- Deep gouges in the shifting bores of the case halves.

Oil and Lubrication System

The lubrication system is extremely important to the performance of the transfer case. Inspect all parts closely for excessive wear or damage. Perform the following checks:

1. Inspect the oil for metal shavings, dirt, and consistency. Perform an analysis if the oil appears contaminated.
2. Check the magnets for metal shavings. A small amount of metal shavings is normal. However, excessive build-up indicates gear and bearing damage. Thoroughly remove all metal shavings from the magnets. The magnets must be firmly fastened to the case.
3. Check the sump screen. Remove any material that may restrict oil flow through the mesh.
4. Check the oil line for damage. Replace if it is dented or kinked.

Internal Oil Pump

1. Inspect the seals closely. Look for nicks and tears on all sealing lips. Any damage is likely to result in a seal leak.
2. Check the pump for easy rotation. If the internal gear does not spin easily or jams when rotating the crescent plate, replace the pump. Also inspect for signs of heat/discoloration.
3. Inspect the input shaft and oil pump splines for damage.
4. Verify the relief valve spring and bushing are in good condition and replace, if necessary.

External Rear-Mounted Oil Pump

1. Verify the pump drive pins on the rear half of the input shaft correctly engage the pump. If necessary, remove the pump and reinstall it in the correct position.
2. Inspect the pump gear for damage.
3. Verify the transfer spring is in good condition.
4. Once the transfer case has been installed on the vehicle, verify the pump pressure is correct. Refer to the pump pressure check instructions in the final assembly procedures

Transfer Case Halves

Inspect the case halves for cracks and internal wear. If any of the following conditions exist, replace the damaged parts.

- A crack in either case half.
- Deep gouges in the shifting bores.
- Signs of bearing cup rotation.

Preparing the Case and Cover for Seal Replacement

1. Pry out all oil seals using a suitable pry bar.
2. As necessary, use a suitable puller to remove the bearing cups pressed into the transfer case halves.
3. Clean and inspect the transfer case and cover for cracks, worn threaded holes or other wear or damage. Clean the gasket surfaces of both transfer case halves using a suitable gasket scraper or wire wheel.
4. Press new bearing cups into the case halves as necessary. Refer to “Assembly” for bearing settings and starting shim pack procedures, if required.
5. Inspect the bearing end play to ensure that it’s within specification. Adjust the end play, if required. Refer to “Assembly”.
6. Install new oil seals into the case halves. Refer to Table H on page 102 for correct seal part numbers and installation tool kit numbers. Refer to the Service Notes page on the front inside cover of this manual to obtain new seals and installation tools. Refer to "Input Shaft Oil Seal and Yoke" on page 72 for seal and sleeve installation instructions.

Assembly

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

⚠ CAUTION

Although Meritor does not recommend its use in transfer cases, if a formed-in-place gasket is used for repairs, extreme caution must be exercised to prevent compound from entering bearings, oil galleries, and passages or tapped holes. All beads must be kept smaller than 0.100" diameter.

Gear and Shaft Sub-Assembly Build Up

Assemble the Front Output Shaft Subassembly

1. Use an appropriate holding fixture to fully support the shaft assembly. Refer to the "Holding Fixture (905473-140)" on page 108.

⚠ DANGER

Observe all hazard alerts provided by the press manufacturer. Death or serious personal injury and damage to components can result.

2. Use a press and sleeve, tool number 905473-82, to press the forward bearing DOWN onto the output shaft until it is fully seated. Refer to page 111 for the tool drawing. Press down only on the inner race of the bearing during installation. Use a 0.002" shim or feeler gauge to verify the bearing is correctly seated. Figure 7.1.

   NOTE: Unless otherwise noted, follow the MTC-4208 XLEV and MTC-4210 XLEV assembly instructions throughout this section for assembly of MTC-4208/10 XLEC variants.

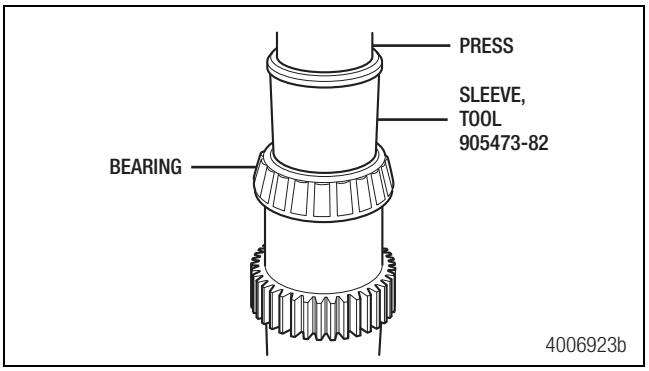


Figure 7.1

3. Turn the shaft over and reinstall it into the holding fixture. Refer to tool "Holding Fixture (905473-140)" on page 108.

4. Install the clutch collar. Figure 7.2.

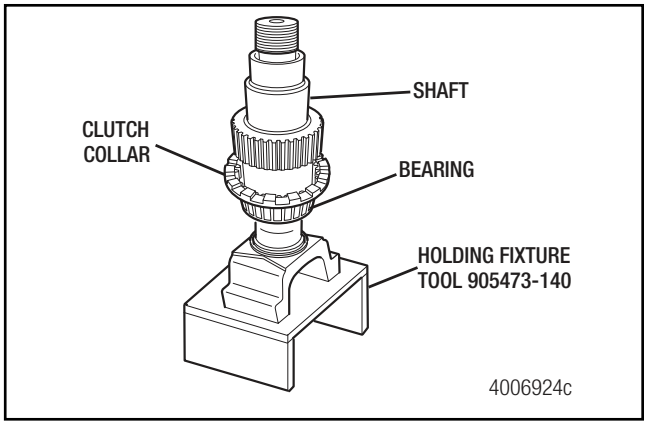


Figure 7.2

5. Install the needle bearing onto the rear half of the output shaft and lubricate it with a light coat of lithium-based grease, Meritor specification 0-668. The needle bearing is a slip fit assembly. Figure 7.3.

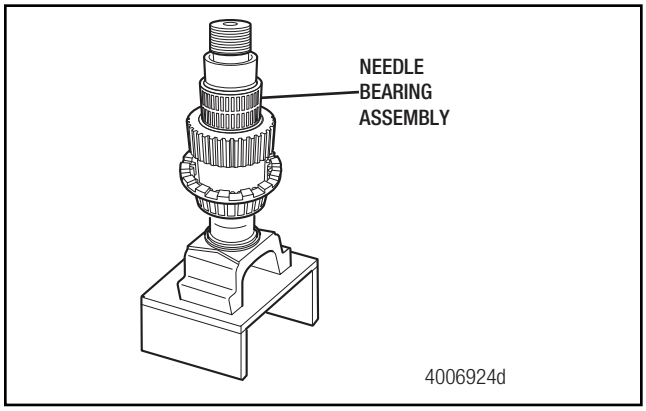


Figure 7.3

6. Install the helical gear onto the shaft. The helical gear is a slip fit gear.

7. Remove the shaft from the holding fixture and install it into a press. Correctly support the shaft in the press.

8. Use tool number 905473-92 to install the bearing onto the top of the output shaft with the small tapered end UP. Use a press and sleeve to push the bearing DOWN onto the output shaft until it is fully seated. Refer to page 109 for the tool drawing. Press down only on the inner race of the bearing during installation. Use a 0.002” shim or feeler gauge to verify the bearing is correctly seated. Figure 7.4.

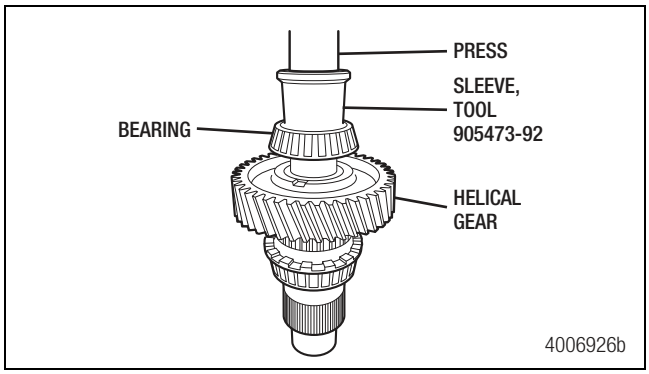


Figure 7.4

⚠ DANGER

Follow all safety guidelines and instructions provided by the lifting device manufacturer. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading. Death or serious personal injury and damage to components can result.

9. Remove the output shaft from the press and reinstall it into the holding fixture. Refer to tool "Holding Fixture (905473-140)" on page 108. Use an appropriate lifting device to lift the shaft.

10. Lubricate the output shaft threads with SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81.

11. Install the washer and the locknut onto the shaft. Tighten the locknut to 700-900 lb-ft (949-1220 Nm). Figure 7.5.

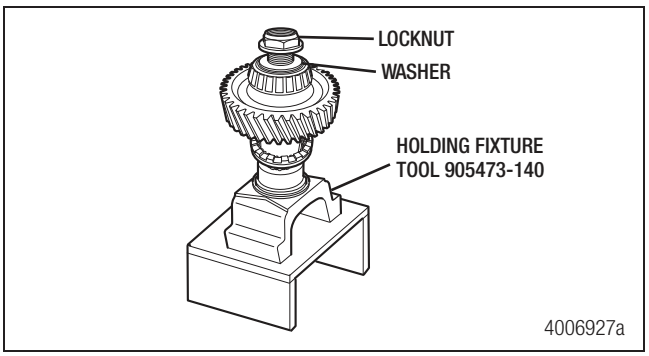


Figure 7.5

Assemble the Single Idler Gear Subassembly (MTC-4213X Only)

1. Install the shaft assembly into a press and support it correctly with the forward end facing UP.

2. Place the bearing onto the forward end of the shaft assembly. Use a sleeve, "Bearing Cone Driver (905473-82)" on page 111, and press to push the forward bearing cone DOWN until it is fully seated. Only press on the inner race of the bearing cone. Use a 0.002” shim or feeler gauge to ensure the bearing cone is correctly seated.

3. Rotate the shaft so the rear half of the shaft is facing UP. Use a sleeve, tool number 905473-92, and press to push the rear bearing cone DOWN until it is fully seated. Refer to page 109 for the tool drawing. Only press on the inner race of the bearing cone. Use a 0.002” shim or feeler gauge to ensure the bearing cone is correctly seated.

Assemble the Rear Output Shaft Subassembly (MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC Only)

1. Install the shaft assembly into a press and support it correctly.

2. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, "Bearing Cone Driver (905473-82)" on page 111, and press to push the bearing cone DOWN until it is fully seated. Only press on the inner race of the bearing cone. Use a 0.002” shim or feeler gauge to ensure the bearing cone is correctly seated.

3. Turn the shaft assembly over and install the bearing cone on the other end using Steps 1-2.

7 Assembly

Assemble the Double Idler Gear Subassembly (All Models)

1. Install the shaft assembly into a press and support it correctly.
2. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, (non-XLEV/XLEC models use "Bearing Cone Driver (905473-82)" on page 111) (XLEV/XLEC models use "Bearing Driver (4FI20-27110-000008-D01)" on page 110), and press to push the bearing cone DOWN until it is fully seated. Only press on the inner race of the bearing cone. Use a 0.002” shim or feeler gauge to ensure the bearing cone is correctly seated.
3. Turn the shaft assembly over and install the bearing cone on the other end using Steps 1-2.

Assemble the Input Shaft Subassembly (MTC-4213X Only)

1. Press the bearing cup into the input bearing cage until it is fully seated.
2. Place the large o-ring around the groove on the bearing cage.
3. Install the relief valve and spring into the oil pump. The plunger should be seated into the relief valve orifice.
4. Install the internal oil pump using the following procedure.
   a. Pack lithium-complex grease, Meritor specification 0-668, into the pump oil inlet port before assembling the oil pump to the input bearing cage.
   b. Place the bearing cone on the race in the bearing cage.
   c. Insert the relief valve and spring into the relief port of the input bearing cage. Install the large diameter end of the spring down. Align the oil pump inlet with the oil inlet port of the input bearing cage.
   d. Install the six pump-to-inlet bearing cage capscrews and washers. Apply Loctite® 277 sealant to the capscrews. Tighten the capscrews to 35-50 lb-ft (48-68 Nm).
   e. Lubricate the sealing rings on the inside diameter of the pump and the shaft journal adjacent to the pump splines.
5. Place the small helical gear over the input shaft with the spline side of the gear down and install the spiral snap ring. The gear is a slip fit.
6. Install the shaft assembly into a press and support it correctly.
7. Place the bearing cone onto the end of the shaft assembly with the appropriate end facing UP. Use a sleeve, "Bearing Cone Driver (905473-82)" on page 111, and press to push the bearing cone DOWN until it is fully seated. Only press on the inner race of the bearing cone. Use a 0.002” shim or feeler gauge to ensure the bearing cone is correctly seated.
8. Apply Loctite® 592 threadlocker to the restrictor plug and install it into the end of the bearing cone. Tighten the plug to 15 lb-ft (20 Nm). Figure 7.6.

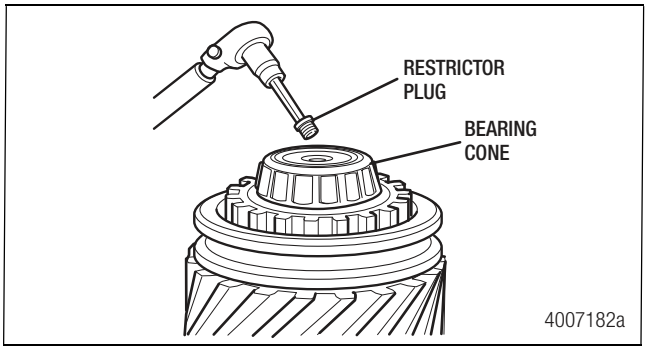


Figure 7.6

Assemble the Front Input Shaft, Input Shaft Bearing Cage, and Internal Oil Pump Sub-Assemblies (MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC Only, If Equipped)

1. Use "Bearing Cup Driver (910203-37)" on page 113 to press the bearing cup into the input bearing cage until it is fully seated.
2. Place the large o-ring around the groove on the bearing cage. Figure 7.7.

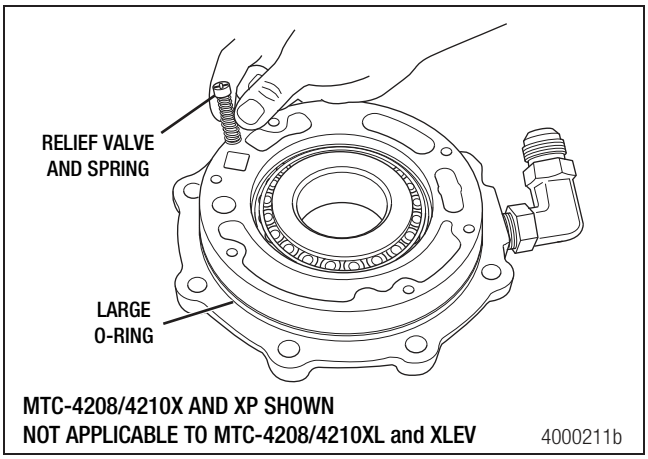


Figure 7.7

3. Install the internal oil pump, if equipped, using the following procedure.
   a. **MTC-4208X/XP and MTC-4210X/XP transfer cases only:** Pack lithium-complex grease, Meritor specification 0-668, into the pump oil inlet port before assembling the oil pump to the input bearing cage. Figure 7.8.

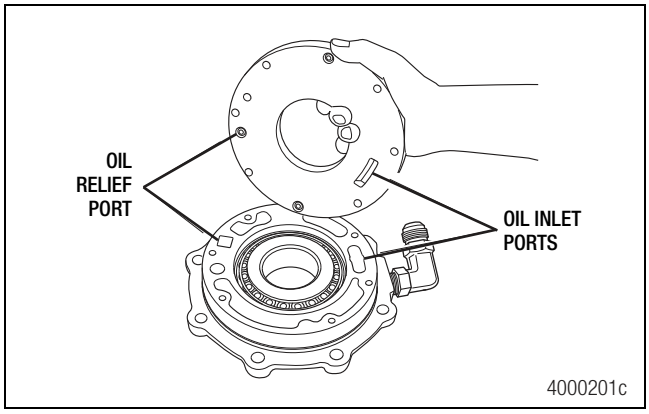


Figure 7.8

b. Place the bearing cone on the race in the bearing cage.

c. MTC-4208X/XP and MTC-4210X/XP transfer cases only: Insert the relief valve and spring into the relief port of the input bearing cage. Install the large diameter end of the spring down. Figure 7.7. Align the oil pump inlet with the oil inlet port of the input bearing cage. Figure 7.8.

d. MTC-4208X/XP and MTC-4210X/XP transfer cases only: Install the six pump-to-inlet bearing cage capscrews and washers. Apply Loctite® 277 sealant to the capscrews. Tighten the capscrews to 22-29 lb-ft (29-39 Nm).

e. MTC-4208X/XP and MTC-4210X/XP transfer cases only: Lubricate the sealing rings on the inside diameter of the pump and the shaft journal adjacent to the pump splines. Figure 7.9.

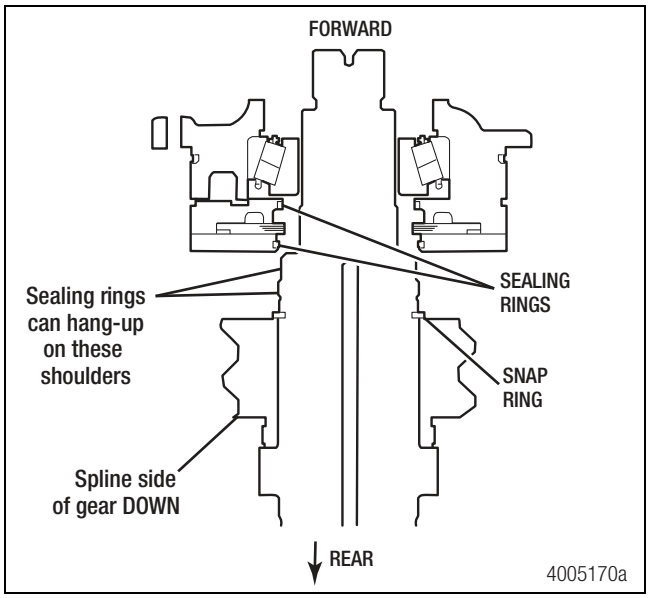


Figure 7.9

4. **MTC-4208XLEV/XLEC and MTC-4210XLEV/XLEC transfer cases only:** Install the needle bearing on the input shaft. Figure 7.10.

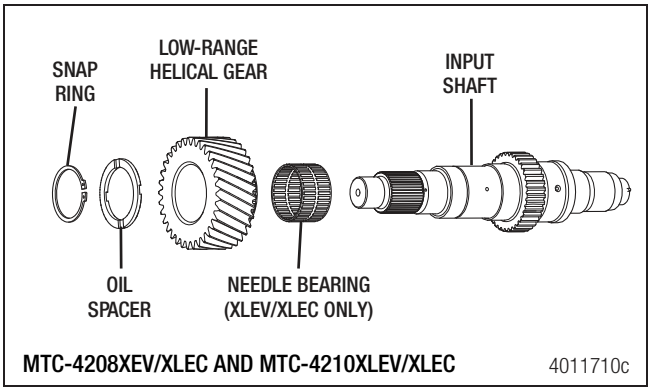


Figure 7.10

5. Place the low-range helical gear over the input shaft with the spline side of the gear down. For MTC-4208XLEV/XLEC and MTC-4210XLEV/XLEC, install the oil spacer. The oil spacer has two oil channels cut into it. The oil channels can face forward or aft when installed. Install the spiral snap ring to secure the helical gear. The gear is a slip fit. Figure 7.10.

6. Lubricate the gear and shaft before assembly.

7. **MTC-4208XL/XLEV/XLEC and MTC-4210XL/XLEV/XLEC transfer cases only:** Install the high- and low-range clutch collar over the input shaft splines. Place the high-range helical gear over the input shaft with the spline side of the gear facing the low-range helical gear. Install the bearing cone with the large end of the cone toward the high-range gear. Install the spacer on the shaft next to the bearing cone. Figure 7.11.

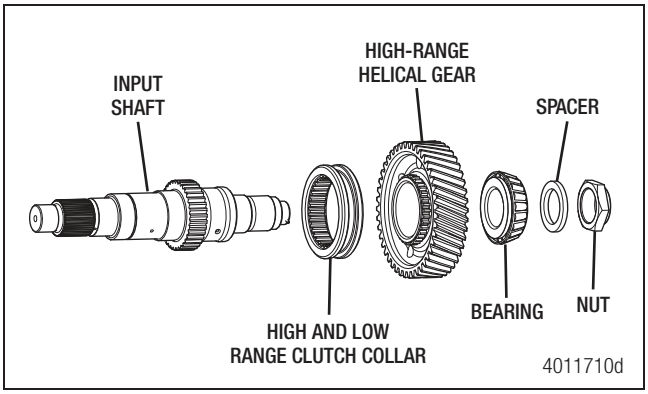


Figure 7.11

⚠ CAUTION

Exercise care when assembling the input shaft to the pump. Line up and slowly direct the input shaft into the pump opening. Misalignment during assembly can cause the shaft to “hang up” on the pump sealing rings resulting in damage to the rings.

NOTE: Use care when installing the input bearing cage to prevent damage to the o-ring.

8. Place the oil pump, if equipped, and input bearing cage assembly over the input shaft. The drive teeth on the inner pump rotor must engage the teeth on the input shaft. NEVER use force to engage the splines. If a sealing ring is broken, remove and replace the pump.

9. Place the assembly into a holding fixture (refer to "Holding Fixture (905473-140)" on page 108) and install the yoke assembly.

10. Install the washer and yoke nut. Tighten the yoke nut to 700-900 lb-ft (949-1220 Nm).

Assemble the Upper Rear Output Shaft (MTC-4213X Only)

1. Place the shaft into a holding fixture with the larger end facing UP.

2. Align the internal splines of the high range helical gear with the shaft splines and install the gear onto the shaft. Ensure the clutch collar gears are facing UP. Figure 7.12.

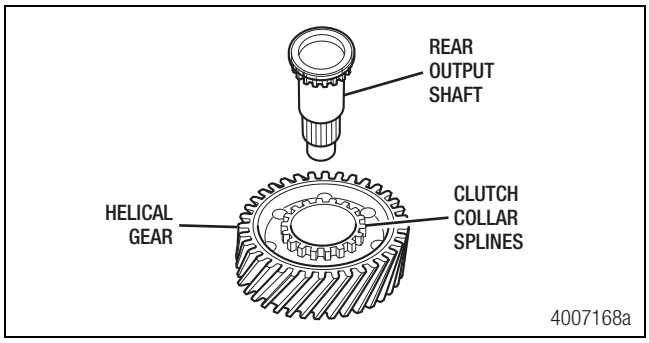


Figure 7.12

3. Turn the shaft assembly over and secure it in a holding fixture.

4. Use a press and sleeve to press the bearing DOWNWARD onto the output shaft until it bottoms out against the helical gear. Refer to "Bearing Cone Driver (905473-82)" on page 111. Use a 0.002” shim or feeler gauge to verify the bearing is fully seated against the gear. Figure 7.13.

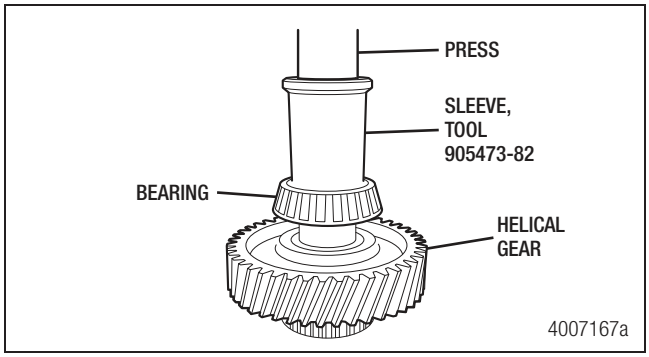


Figure 7.13

Gear and Shaft Installation into the Transfer Case Halves

Before installing the gear shafts, refer to "End Play Check and Adjustment" on page 67 for the correct shim pack starting thickness.

1. Lubricate all bearing cups and cones, gears, and shaft assemblies before installation into the case. Use SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81.

2. Use a mallet or press and sleeve to install the bearing cups into the bore until correctly seated. Refer to "Tools" on page 108 to identify the correct sleeve for the model being serviced. Refer to "End Play Check and Adjustment" on page 67 for initial shim stack up requirements. Figure 7.14.

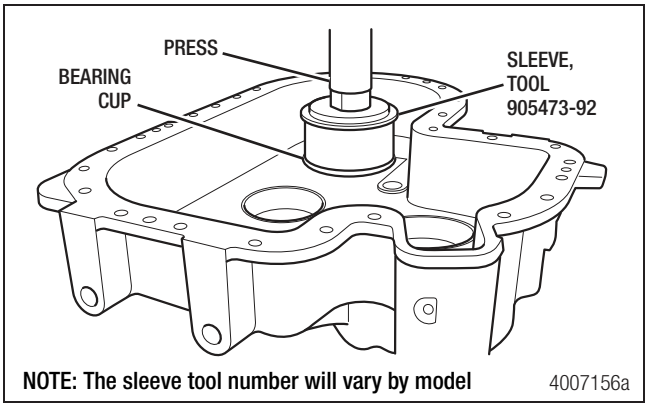


Figure 7.14

3. With the inside of the front case facing UPWARD, install the single idler shaft (MTC-4213X only), or rear output shaft (MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC), and double-gear idler shaft assemblies (all models). Figure 7.15.

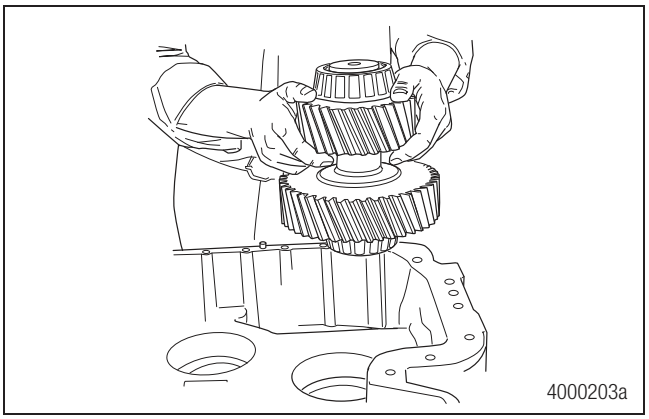


Figure 7.15

4. Position the clutch collar onto the shift fork. Position the shift fork and clutch collar onto the front output shaft clutch hub.

5. Install the push rod into the transfer case.

6. Install the front output shaft, shift fork, and clutch collar in the front case. The shift fork will slide over the push rod. Figure 7.16 and Figure 7.17.

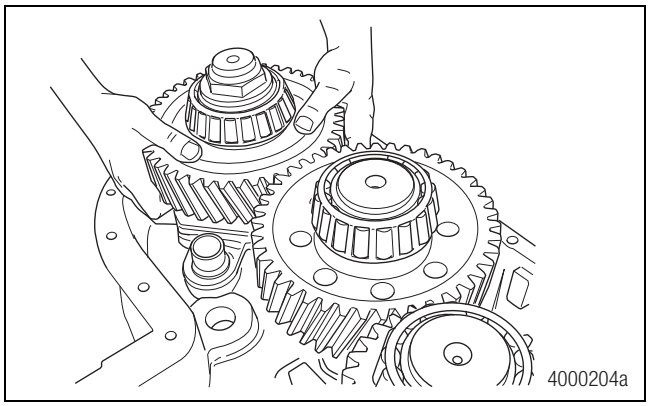


Figure 7.16

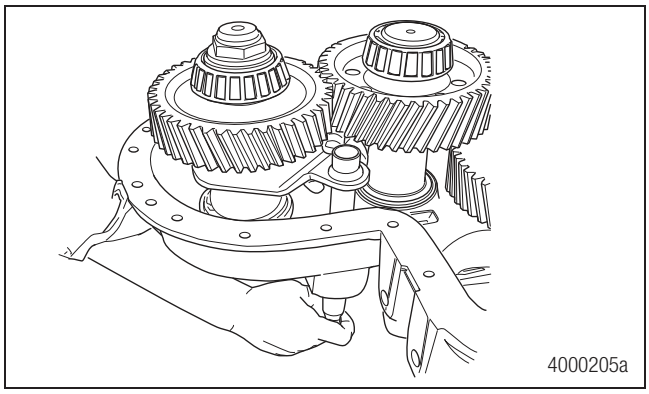


Figure 7.17

7. Install the release spring over the push rod and shift fork.

8. Temporarily install the shift cylinder onto the case to secure the push rod in place.

9. The shift cylinder requires Loctite® 272 sealant for final assembly.

10. Install the input shaft, input bearing cage, and internal oil pump, if equipped. Refer to page 65 for the procedure.

11. For MTC-4213X transfer cases, install the upper rear output shaft into the rear transfer case half. Refer to page 66 for the procedure.

12. Install the pocket bearing into the recess in the input shaft.

    NOTE: All shaft bearing end plays must be determined before final assembly. Refer to "End Play Check and Adjustment" on page 67.

13. Install the two locating dowel pins into the corresponding holes in the front case.

    NOTE: Do not install sealant at this time.

⚠ DANGER

Follow all safety guidelines and instructions provided by the lifting device manufacturer. Check that the lift capacity marked on the lifting device, straps and chains is correct for the weight being lifted. If they are not marked with the lift capacity, do not use them. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading. Failure to follow these directives can result in death or serious personal injury and damage to components.

14. Use a suitable lifting device to install the rear cover and output shaft as an assembly over the front case. Figure 7.18. Guide the cover over the shift fork and push rod as the cover is being set into place over the case.

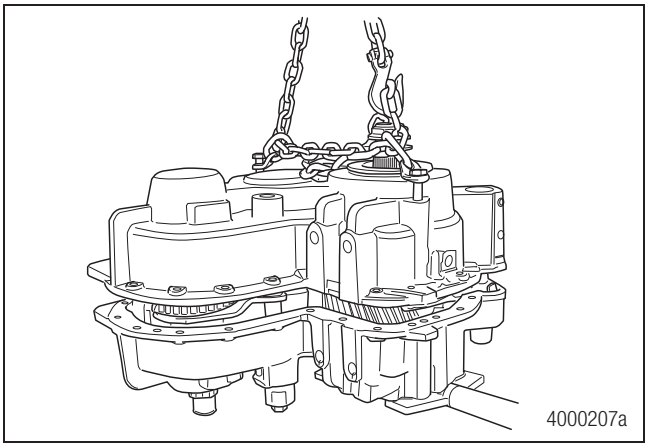


Figure 7.18

15. Verify the locating dowel pins have engaged both the case and the cover and that the cover is fully seated on the case.

16. Secure the case to the cover joint by assembling at least six equally spaced case-to-cover capscrews.

Install the Front Input Shaft, Input Bearing Cage, and Internal Oil Pump Assembly Installation (If Equipped)

1. Rotate the transfer case so the front is facing UPWARD.

2. Position the shim pack for the input bearing cage and internal oil pump assembly, if equipped, over the front input opening. Position so that the open areas of the shims face the bottom of the transfer case.

   MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC Models: The initial input bearing cage shim pack thickness is 0.036".

   MTC-4213X Model: The initial input bearing cage shim pack thickness is 0.056".

3. Lubricate the input bearing cage large o-ring, internal oil pump, if equipped, helical drive gear, and bearing cone before installation. Use SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81.

4. Install the input shaft with the bearing cage and internal oil pump assembly, if equipped, into the transfer case. Position the assembly so that the inlet oil tube fitting is facing the correct direction.

5. Install at least three input bearing cage-to-housing capscrews. Tighten the capscrews to 85-115 lb-ft (115-156 Nm).

   NOTE: For MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC models, continue with the steps in this procedure. For MTC-4213X shaft completion, proceed to the upper rear output shaft procedure and the input shaft procedure in this section.

6. Install the high range helical gear and bearing cone onto the input shaft. The gear and bearing are a slip-type fit.

7. **MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC Models:** Install the 3" (76 mm) diameter nut and washer onto the rear end of the input shaft. Tighten the nut to 700-900 lb-ft (949-1220 Nm).

8. After installing all gearing and shaft assemblies into the transfer case half, continue the assembly of the transfer case by installing the rear cover. Refer to "End Play Check and Adjustment" on page 67.

Install the Upper Rear Output Shaft (MTC-4213X Only)

1. Position the output shaft under the rear transfer case half. Use an appropriate lifting device to place the shaft and transfer case into a press.

2. Use bar stock or other material to support the rear output shaft underneath the rear transfer case half. Ensure the bar stock does not rest under the transfer case mounting flange, but only supports the gear and shaft assembly. Figure 7.19.

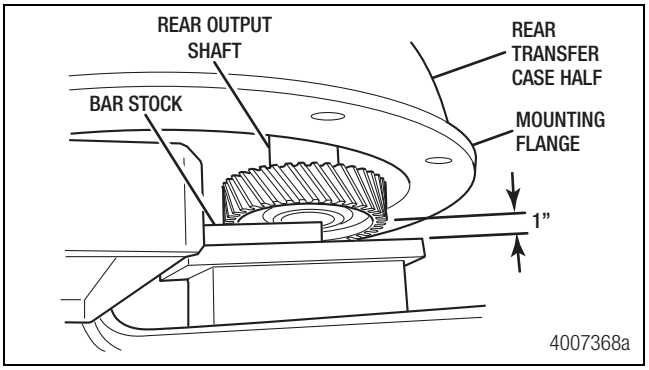


Figure 7.19

3. Check the inner bearing is seated in the bearing cup and the gear is vertical and not leaning.

4. Install the shims and spacer over the shaft. If the bearings are being replaced, install a starting shim pack thickness of 0.036" (0.91 mm) or use the same thickness as removed. Figure 7.20.

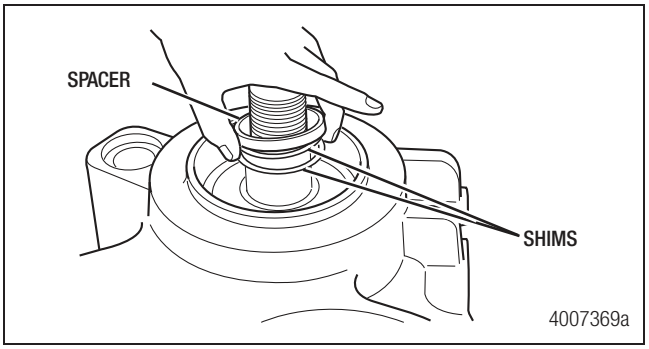


Figure 7.20

5. Use a bearing cone driver, tool number 905473-82, and a press to press the bearing down on the shaft until it is fully seated. Press only on the inner race of the bearing during installation. Figure 7.21.

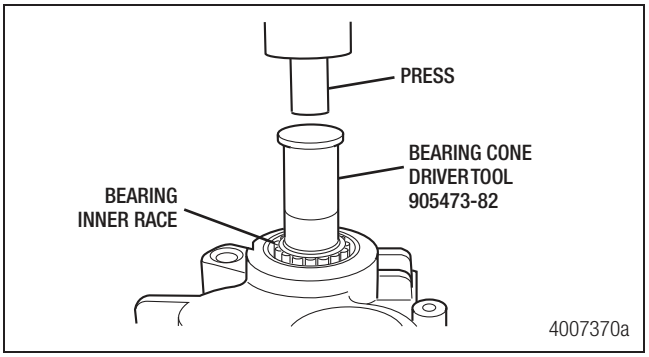


Figure 7.21

6. Install the yoke, washer, and locknut. Tighten the lock nut to 700-900 lb-ft (949-1220 Nm).

7. Use a dial indicator to check the end play on the rear upper output shaft. Refer to "End Play Check and Adjustment" on page 67. The end play must be 0.002-0.004” (0.051-0.102 mm). To adjust the end play, remove the rear output shaft and outer bearing cone and add or remove shims, as necessary, to achieve the correct end play.

   NOTE: The end play for the MTC-4213X upper rear output can be completed before installing the rear case half onto the front case half.

End Play Check and Adjustment

Shim Pack Starting Thickness Requirements

End play must be checked and adjusted at all shaft positions before final assembly.

NOTE: Reuse the existing yoke nuts during end play preliminary measurements. Install new yoke nuts only on final assembly.

NOTE: Unless otherwise noted, all 29 fasteners must be installed and tightened to the specified torque prior to checking end plays. Start with the following shim pack thicknesses to begin this process.

- MTC-4213X input shaft starting thickness must be equal to or greater than 0.056”.
- MTC-4213X upper output starting thickness is 0.039”.
- MTC-4213X begins by setting the upper rear output end play first with a starting shim pack size of 0.039”. Set the end play to 0.002-0.004” (0.051-0.102 mm). After setting the MTC-4213X upper rear output, rotate the transfer case and set the input shaft end play to 0.002-0.004” (0.051-0.102 mm). All other MTC-4213X shaft end plays are 0.001-0.005” (0.025-0.127 mm).
- MTC-4208X/XP/XL/XLEV/XLEC and MTC-4210X/XP/XL/XLEV/XLEC input shaft initial starting shim pack thickness is 0.036”.
- MTC-4208XP and MTC-4210XP upper rear output yoke does not require an end play check.

For all other locations, determine the starting shim pack size by cleaning and measuring the thickness of shims removed from the respective bearing cup location. Use new shims to obtain the same thickness as the original shim pack. This will be the starting shim pack thickness to use when setting the respective shaft’s end play.

MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC Lower Rear Output Shaft End Play

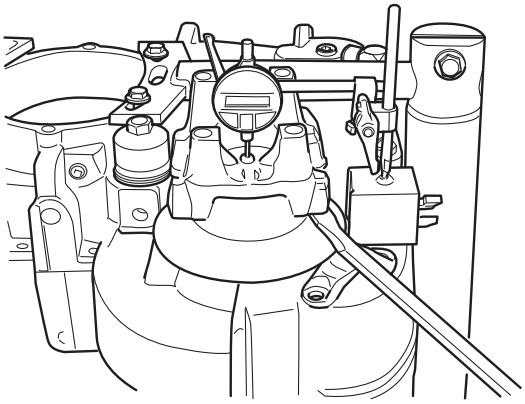
Determine the rear output shaft bearing end play before final assembly. Seals should not be installed until the end plays are set.

1. Install the rear output shaft yoke. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 Nm).

2. Rotate the output shaft several times to seat the bearings.

3. Use a dial indicator to check output shaft bearing end play. Center the dial indicator over the shaft.

   NOTE: For accuracy, place a ball bearing into the recess found on the end of the shaft, then place the tip of the dial indicator on top of the ball bearing. Figure 7.22 and Figure 7.23.



MTC-4213X REAR OUTPUT YOKE SHOWN 4000209a

Figure 7.22

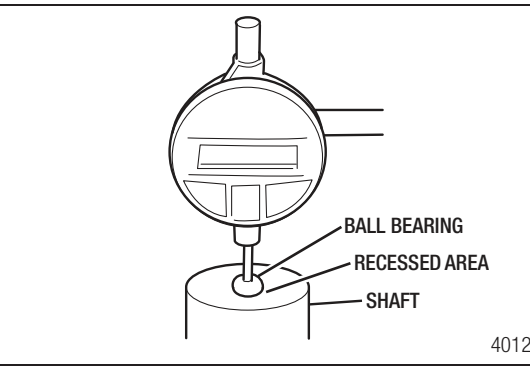


Figure 7.23

4. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft. The end play should be 0.002-0.006" (0.051-0.152 mm).

   If the end play reading is not within 0.002-0.006" (0.051-0.152 mm): Add shims to reduce end play or remove shims to increase end play. Bearing shims come in 0.003-, 0.005- and 0.010" (0.08, 0.13 and 0.25 mm) thicknesses.

5. If the rear output shaft bearing end play requires adjustment, remove the rear output shaft yoke so the case and cover can be easily separated.

6. Measure the end play on the remaining shafts before splitting the case to make adjustments.

7. After performing all bearing end play measurements, separate the transfer case halves as necessary to adjust shims and achieve the correct end play on the shaft requiring adjustment.

8. Adjust shims to achieve the correct bearing end play on all shafts as required.

Front Output Shaft End Play (All Models)

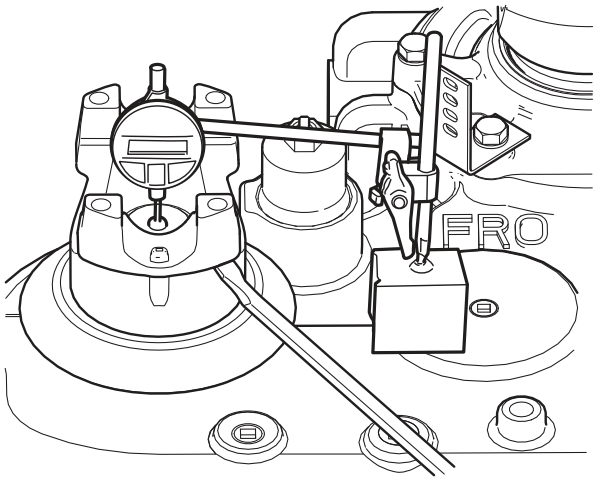
Determine the front output shaft bearing end play before final assembly. Seals should not be installed until the end plays are set.

1. Install the front output shaft yoke. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 Nm).

2. Rotate the output shaft several times to seat the bearings.

3. Set up a dial indicator to check the output shaft bearing end play. Center the dial indicator over the shaft.

   NOTE: For accuracy, place a ball bearing into the recess found on the end of the shaft, then place the tip of the dial indicator on top of the ball bearing. Figure 7.23 and Figure 7.24.



MTC-4210XLEV/XLEC FRONT OUTPUT YOKE SHOWN 4011825a

Figure 7.24

4. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft.

   - **If the end play is greater than 0.002-0.006" (0.051-0.152 mm):** Add shims to reduce end play.
   - **If the end play is less than specification:** Remove shims to increase end play. Bearing shims come in 0.003", 0.005", and 0.010" (0.08, 0.13, and 0.25 mm) thicknesses.
   - **If the front output shaft bearing end play requires adjustment:** Remove the front output shaft yoke so the case and cover can be easily separated.

5. Measure the end play on the remaining shafts before splitting the case to make adjustments.

6. After performing all bearing end play measurements, separate the transfer case halves as necessary to adjust the shims and achieve the correct end play on the shaft requiring adjustment.

7. Adjust the shims to achieve the correct bearing end play on all shafts as required and recheck.

8. Before installing the yoke, clean the splines of old silastic. Apply a 1/8" (3.175 mm) bead of RTV 732 sealant 360 degrees around the underside of the washer. Figure 7.25.

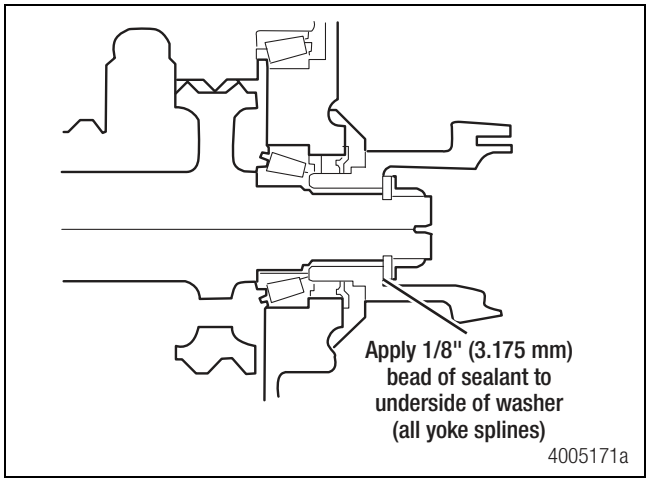


Figure 7.25

Idler Shaft (Single or Double) Bearing End Play (All Models)

Determine the shaft bearing end play before final assembly. The MTC-4213X has both single idler and double idler gear shafts while all other models have a double idler gear shaft. Seals should not be installed until the end plays are set.

1. Rotate the transfer case with the front of the case facing UPWARD.
2. Remove the 3/8” (9.5 mm) pipe plugs at the shaft locations on the front of the case.
3. To prepare to check shaft bearing end play, insert a 1/2”-13 bolt into the shaft through the pipe plug hole, until the bolt is fully seated. The bolt should extend out of the transfer case enough to be used to lift the idler shaft.
4. Tighten the bolt until it bottoms in the shaft for an accurate end play measurement.
5. Rotate the idler shaft several times to help seat the bearing cones.
6. Set up the dial indicator to check the idler shaft bearing end play. Center the dial indicator on the bolt head. Zero the indicator. Figure 7.26.

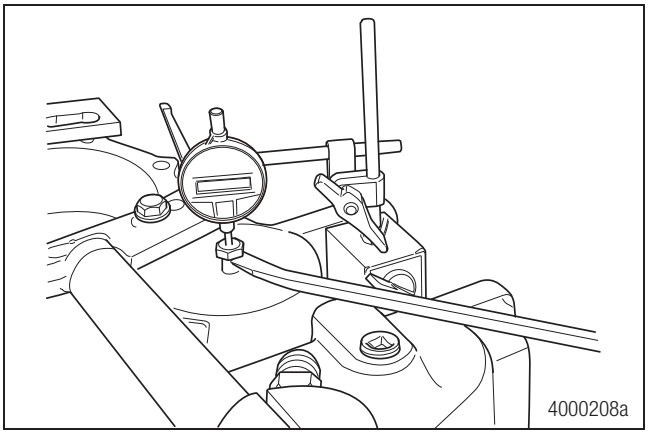


Figure 7.26

7. Use pry bars to lift up on the bolt head to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for this shaft. The specification is 0.002-0.006” (0.051-0.152 mm).
   - **If the end play is greater than 0.006” (0.152 mm):** Add shims to reduce end play.
   - **If the end play is less than 0.002” (0.051 mm):** Remove shims to increase end play. Bearing shims come in 0.003”, 0.005”, and 0.010” (0.08, 0.13, and 0.25 mm) thicknesses.
8. Remove the bolt from the shaft. Install the 3/8” pipe plug or breather assembly depending on shaft measured. Tighten the bolt to 20-25 lb-ft (27-34 Nm).
9. After performing all bearing end play measurements, if adjustment is required, separate the transfer case halves.
10. Adjust the shims to achieve the correct bearing end play on all shafts as required and recheck. Refer to "End Play Check and Adjustment" on page 67.

MTC-4213X Rear Output Shaft End Play

NOTE: Determine the rear output shaft bearing end play before installing the rear cover onto the front case.

1. If the rear output shaft and cover assembly has been disassembled, install the rear output shaft, bearing cones, spacer, and shims, yoke into the rear cover. Temporarily tighten the yoke nut to 700-900 lb-ft (949-1220 Nm). Place the rear cover on the bench to measure bearing end play. Refer to the bearing cup and shim installation procedures in this section. Figure 7.27.

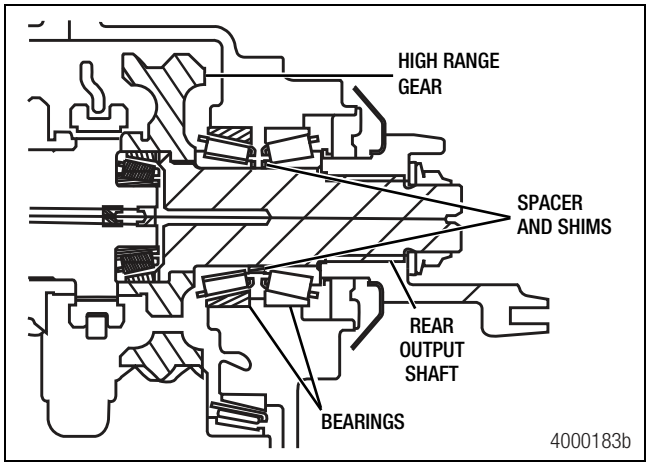


Figure 7.27

2. Rotate the output shaft several times to seat the bearings.

3. Use a suitable dial indicator setup and pry UP on the yoke to determine bearing end play. End play should be 0.002-0.004" (0.051-0.102 mm). To obtain a consistent reading, perform this operation two or three times. Record the reading for this shaft. Figure 7.28.

   - **If bearing end play is within specification:** The rear cover assembly is ready for installation.
   - **If bearing end play is out of specification:** Remove the rear output shaft and install an appropriate spacer and shim combination between the bearing cones.

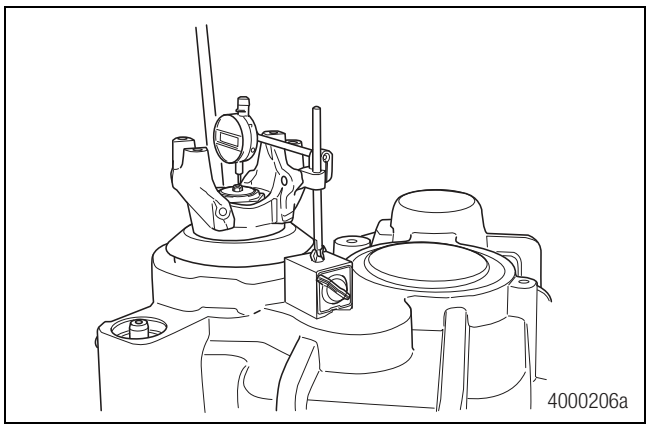


Figure 7.28

4. If necessary, remove the rear output shaft. Add shims to increase end play or remove shims to reduce end play. Reinstall the rear output shaft assembly.

5. Recheck the end play.

Front Input Shaft End Play Check and Adjustment (All Models)

1. Set up a dial indicator to check input shaft bearing end play. Center the dial indicator over the shaft using a ball bearing for accuracy. Figure 7.29.

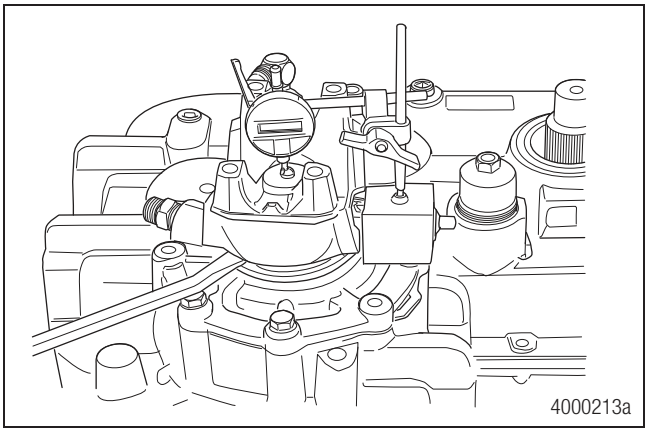


Figure 7.29

2. Use a pry bar to lift the yoke to obtain a measurement. To obtain a consistent and averaged reading, perform this operation two or three times. Record the reading for the input shaft. The specification for MTC-4208 and MTC-4210 transfer cases is 0.002-0.006" (0.052-0.152 mm), and 0.002-0.004" (0.051-0.102 mm) for the MTC-4213 transfer case.

   - **If the end play is greater than 0.006" (0.152 mm) for MTC-4208 and MTC-4210 transfer cases, or 0.004" (0.051-0.102 mm) for the MTC-4213 transfer case:** Remove shims to decrease end play.
   - **If the end play reading is less than specification:** Add shims to increase end play. Bearing shims come in 0.003", 0.005", and 0.010" (0.08, 0.13, and 0.25 mm) thicknesses.

3. If it is necessary to add or remove shims, remove the input bearing cage and oil pump assembly capscrews and lift the assembly enough to insert or remove shims.

   - This can be done without completely removing the pump and shaft assembly from the housing.
   - The nut on the rear end of the shaft on MTC-4208 and MTC-4210 transfer cases must be removed first. Refer to the exploded views in this manual starting on page 4.

4. When the correct shim pack is chosen, reinstall all seven input bearing cage and oil pump assembly capscrews. Tighten the capscrews to 85-115 lb-ft (115-156 Nm).

5. Recheck the input shaft bearing end play. Adjust the end play as necessary.

Shim Assembly

In order to adjust the end play on any shaft, it is necessary to split the transfer case.

NOTE: The exception is the input shaft which can have the horseshoe-style shims removed or added by loosening or removing the input bearing cage capscrews.

1. Rotate the transfer case in the stand with the rear cover facing UP. Remove the case-to-cover capscrews.
2. Use a suitable lift to remove the rear cover. Mount the cover so the pressed-in bearing cups can be removed.
3. Use a bearing puller to remove the bearing cups from the cover. Shims are placed between the cover and the cup. Refer to "Remove the Bearing Cups" on page 52.
4. Select the correct shim or shims to achieve the correct end play. If the end play measurement is below 0.002" (0.051 mm), which indicates a pre-loaded shaft, start by removing shims until some measurable end play is observed.

Table B: Shim Selection Example

Initial measurement (idler shaft)	0.018"	0.46 mm
Specification	0.002" - 0.006"	0.051 - 0.152 mm
Required shim stack	0.016 - 0.012"	0.406 - 0.305 mm

Table C: Possible Shim Stack Combinations

2 (0.005) 1 (0.003) 0.013"	1 (0.010) 1 (0.005) 0.015"	1 (0.010) 2 (0.003) 0.016"
2 (0.13 mm) 1 (0.08 mm) 0.34 mm	1 (0.25 mm) 1 (0.13 mm) 0.38 mm	1 (0.25 mm) 2 (0.08 mm) 0.41 mm

5. After selecting the correct shim combination, place the shims in the bottom of the bearing bore. Refer to the exploded views starting on page 4 in this manual.
6. Press the bearing cup into the bore until it is completely seated. The shims must be centered in the bore while pressing in the bearing cup.

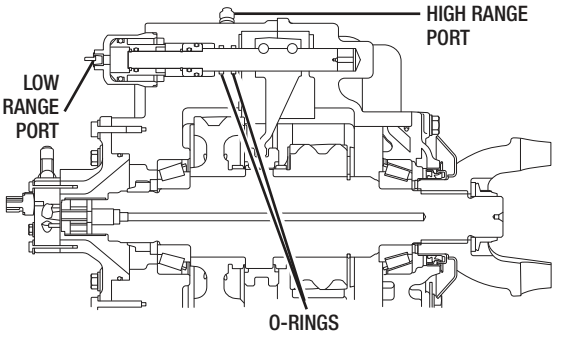
   NOTES:

   - On MTC-4208 and MTC-4210 models, shims are installed between the bearing cups and housing bore on the rear cover, except at the input shaft position. The shims for input shaft are installed between the input cage and front cover.
   - On MTC-4213 models, the front input shaft is shimmed between the input cage and front case half. The rear output shaft is shimmed between the two tapered bearing set. All others shafts are shimmed between the bearing cup and housing bore on the rear case cover.
7. Repeat Step 3 through Step 6 for each bearing needing an end play adjustment.

   NOTE: Before final assembly, verify each shim selection procedure results in the correct end play specification. Repeat the end play measurement steps, as necessary, to obtain the correct end play specification on all shafts.
8. Reassemble the cover to the case. Install all 29 case-to-cover capscrews and flat washers. Tighten the capscrews to 60-75 lb-ft (81-102 Nm).
9. Recheck the end play. Once the measurements are correct, remove the cover and prepare for final assembly.

Final Assembly

1. Lubricate and install the o-ring into the rear cover push rod journal. Use a light coat of lithium-based grease, Meritor specification 0-668, prior to cover installation. Figure 7.30.



MTC-4208XL/XLEV/XLEC AND MTC-4210XL/XLEV/XLEC 4007107a

Figure 7.30

2. Apply Loctite® 518 sealant to the case-to-cover flange. Apply a 1/8" (3 mm) bead of sealant around the entire flange between each bolt hole making sure to encircle each hole.
3. Reinstall the rear cover over the front case. Guide the high and low shift shaft and push rod through the cover as necessary. Verify the cover is aligned with the locating dowel pins and correctly seated.
4. If the capscrews do not have pre-applied adhesive, apply Loctite® 272 sealant to the first three threads of the cover-to-case capscrews.

5. Install all cover-to-case capscrews and flat washers. Tighten the capscrews to 60-75 lb-ft (81-102 Nm).

6. Recheck the end play. Repeat the end play measurements on all shafts. Repeat the adjustment procedures as required.

High and Low Shifter

1. Grease all o-ring seals. Use a light coat of lithium-based grease, Meritor specification 0-668. Refer to Figure 7.31 for shifter component arrangement.

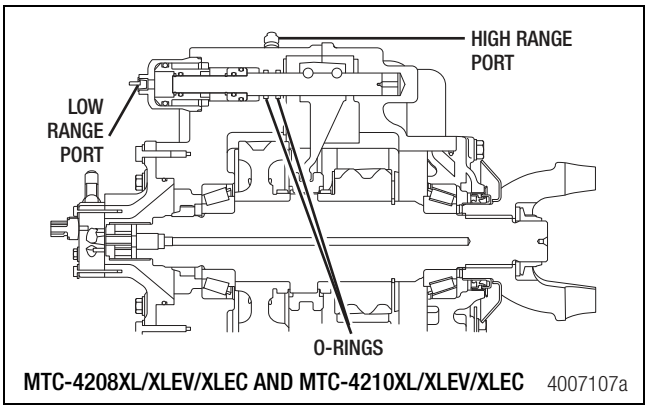


Figure 7.31

2. Install o-rings onto the inside diameter and outside diameter of the inner piston. Install the inner shift piston and snap ring onto the shift shaft. Figure 7.32.

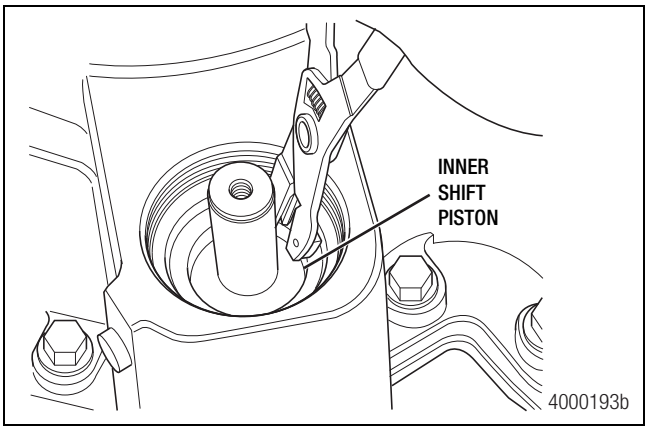


Figure 7.32

3. Install o-rings onto the inside diameter and outside diameter of the outer piston. Install the outer shift piston with the o-ring end first to ensure the piston is facing the correct direction.

4. Install the outer shift piston outer snap ring onto the shift shaft. Figure 7.33.

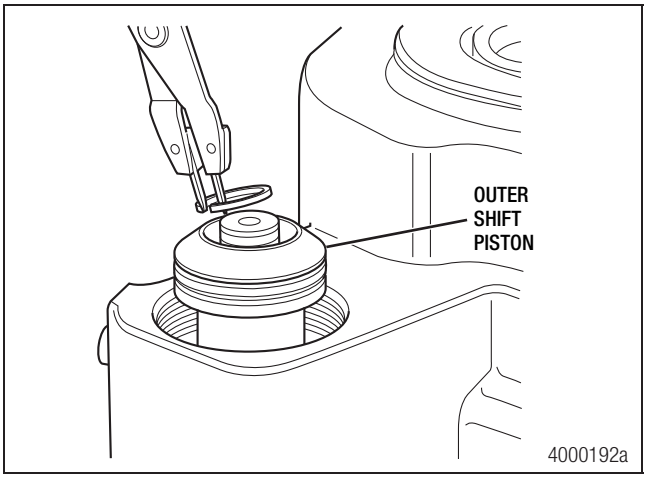


Figure 7.33

5. Apply a 1/8" (3 mm) bead of Loctite® 277 sealant to the first three threads of the shift cylinder.

6. Install the high and low shift cylinder. Tighten the cylinder to 80-100 lb-ft (108-136 Nm).

Input Shaft Oil Seal and Yoke

For all transfer cases: Install the input seal and sleeve using Meritor kits 2728T1 and 2728T2 respectively. Install the forward output shaft seal using Meritor Kit 4454.

For MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC transfer cases: Install the rear output shaft seal using Meritor Kit 4454.

For MTC-4213X transfer case: Install the rear output shaft seal using Meritor Kit 4454.

⚠ DANGER

Solvent cleaners can be flammable, poisonous, and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Death or serious personal injury and damage to components can result. Follow the procedures below.

- Wear eye protection.
- Wear clothing that protects the skin.
- Work in a well-ventilated area.
- NEVER use gasoline or solvents containing gasoline. Gasoline can explode.
- Hot solution tanks or alkaline solutions must be used correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

1. If a seal sleeve is installed onto a yoke, remove the sleeve using a bearing puller. NEVER reuse seal sleeves.

2. Inspect the yoke seal area for damage that could cause lubricant leaks after installing the seal. Use emery paper or an equivalent product to remove scratches, nicks, or burrs only.

3. Clean the ground and polished surface of the yoke journal using a clean shop towel and a safe cleaning solvent. NEVER use abrasive cleaners, towels, or scrubbers to clean the yoke or flange surface. NEVER use gasoline.

4. Inspect the yoke seal area for damage that could cause lubricant leaks after installing the seal. Use emery paper or an equivalent product to remove scratches, nicks, or burrs only.

⚠ DANGER

Observe all hazard alerts provided by the press manufacturer. Death or serious personal injury and damage to components can result.

⚠ WARNING

Use a brass or synthetic mallet for assembly and disassembly procedures. NEVER hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

5. Apply a light coat of lubricant to the yoke seal journal. Position the sleeve into the yoke sleeve driver. NEVER touch the greased areas of the sleeve. The sleeve must be kept clean prior to assembly into the seal. Use an arbor press and the appropriate driver to install the sleeve into the yoke. Verify the sleeve is fully seated in the yoke to prevent damage to components. Figure 7.34.

   The yoke must be fully pressed into the sleeve driver until the end of the yoke bottoms out in the sleeve driver. This will correctly position the sleeve on the yoke. When correctly seated, the sleeve is positioned 0.030” ± 0.030” (0.76 mm ± 0.76 mm) from the end of the yoke. Figure 7.35.

   If a press is not available:
   Position the yoke on a 5” (127 mm) spacer on a workbench. Use a dead-blow hammer and the appropriate driver to install the sleeve into the yoke. Figure 7.36.

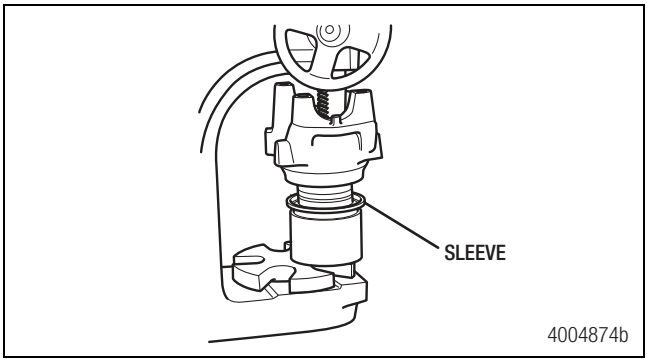


Figure 7.34

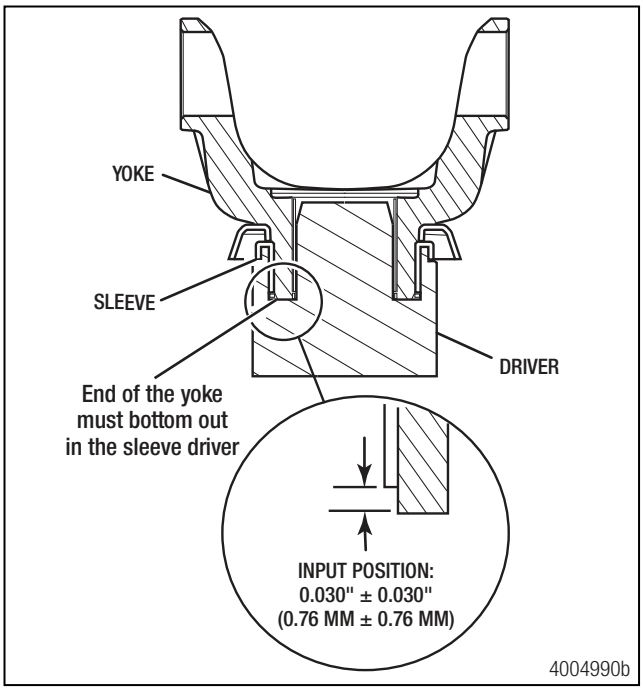


Figure 7.35

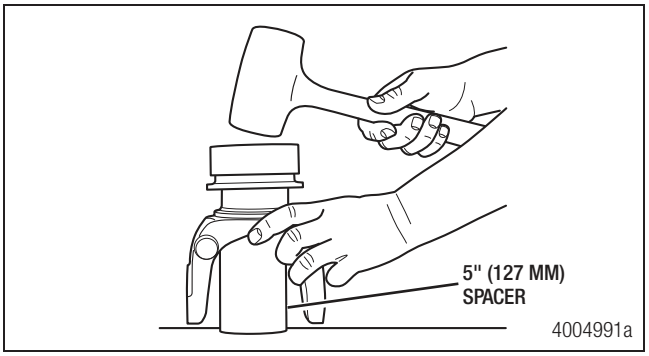


Figure 7.36

6. Install the input seal. Hold the sleeve and seal only on the outer diameter. Position the seal onto the input seal driver and align it with the shaft. NEVER touch the lips in the inner diameter of the seal. Use a dead-blow hammer and the appropriate driver to install the seal onto the input bearing cage. Figure 7.37.

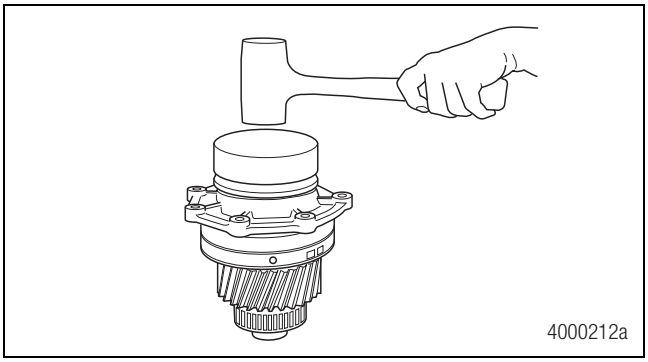


Figure 7.37

7. Use a feeler gauge to check the seal gap. The seal is correctly installed if the gap is less than 0.005" (0.127 mm) around the circumference of the seal flange.

   If the gap is more than 0.005" (0.127 mm):
   Use a dead-blow hammer and the appropriate driver to completely install the seal.

8. Clean the splines of the old Silastic before installing the yoke. Apply a light coat of transfer case oil to the yoke seal journal and then use a mallet to install the yoke.

9. Verify the yoke is fully seated on the input shaft.

10. Apply a 1/8" (3.175 mm) bead of Silastic RTV 732 sealant 360° around the underside of the washer. Figure 7.38.

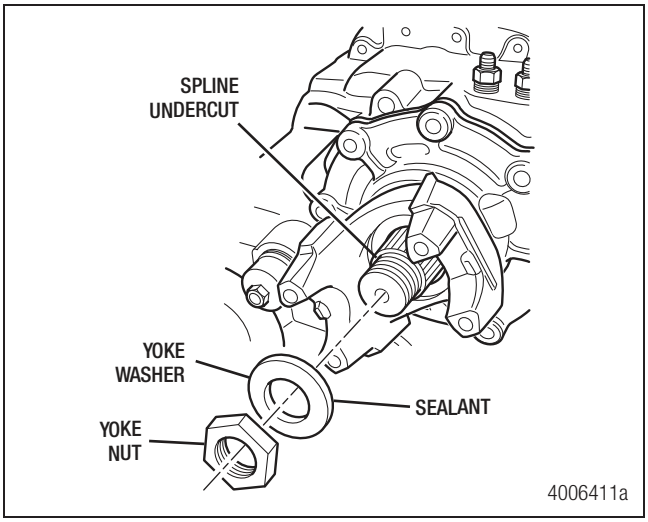


Figure 7.38

11. Install the rear output shaft yoke washer and new yoke nut. Tighten the nut to 700-900 lb-ft (949-1220 Nm).

Front Axle Shift Cylinder

1. Rotate the transfer case to install the front axle shift cylinder.

2. Remove the front axle shift cylinder used to temporarily hold the shift shaft in place.

3. Grease the o-ring on the piston and install the piston into the cylinder.

4. Apply a 1/8" (3 mm) bead of Loctite® 277 sealant to the first three threads of the shift cylinder.

5. Install and tighten the shift cylinder to 80-100 lb-ft (108-136 Nm).

Output Shaft Oil Seal and Yoke

All Models: Install the input seal and sleeve using Meritor kits 2728T1 and 2728T2 respectively. Install the forward output shaft seal using Meritor Kit 4454.

MTC-4208X/XL/XP/XLEV/XLEC and MTC-4210X/XL/XP/XLEV/XLEC Models: Install the rear output shaft seal using Meritor Kit 4454.

MTC-4213X Model: Install the rear output shaft seal using Meritor Kit 4454.

1. Install the front output shaft oil seal using the appropriate seal driver. Drive the seal until it is fully seated. Figure 7.39.

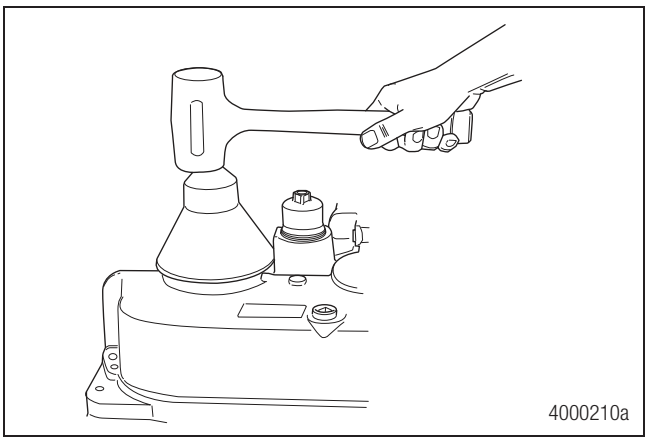


Figure 7.39

2. Apply a light coat of transfer case oil to the yoke journal. Install the front output yoke, washer and new yoke nut. Tighten the yoke nut to 700-900 lb-ft (949–1220 Nm).

3. Repeat Steps 1 and 2 for the rear output seal and yoke.

4. Once final assembly of the transfer case has been completed and the yokes have been installed, remeasure the input and output yoke end plays to ensure they are within specification.

Rear-Mounted Pump

Assembly

1. Install the floating plate, idler and idler carrier into the rotor body. Figure 7.40.

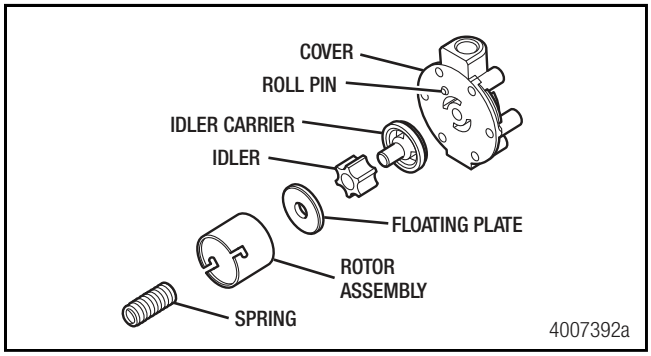


Figure 7.40

2. Install the pump assembly according to the procedure in this section.

Installation

1. Verify the drive pins are installed into the input shaft. Figure 7.41.

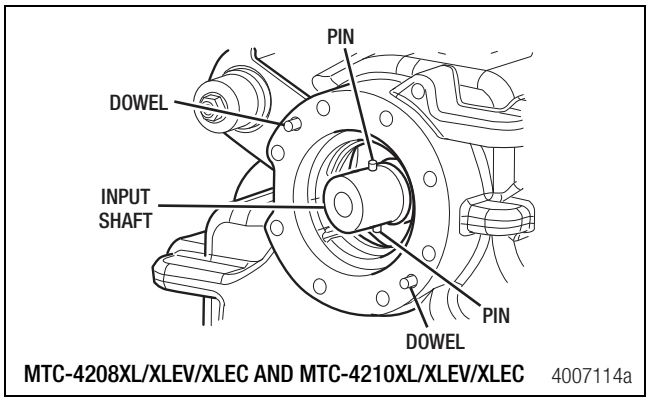


Figure 7.41

2. Install the pump spring into the orifice at the rear of the input shaft.

3. Place the pump onto the input shaft. Rotate the pump assembly to engage the drive pins. Ensure the pump is correctly seated. Leave 3/16" (4.763 mm) of the drive pins extending from the input shaft. Figure 7.42.

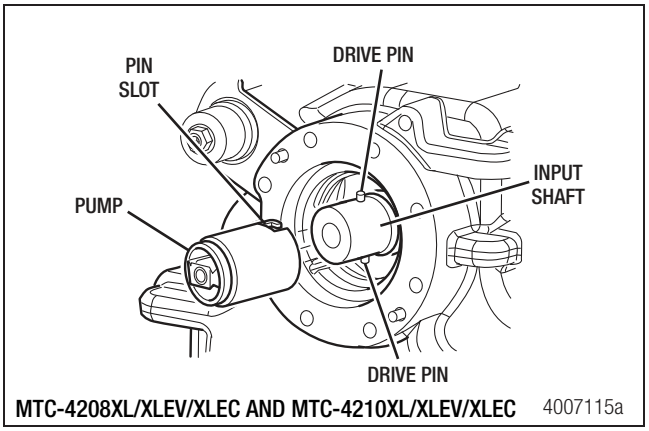


Figure 7.42

4. Apply a 0.125" (3.175 mm) bead of Loctite® 518 sealant around the rear housing face. Figure 7.43.

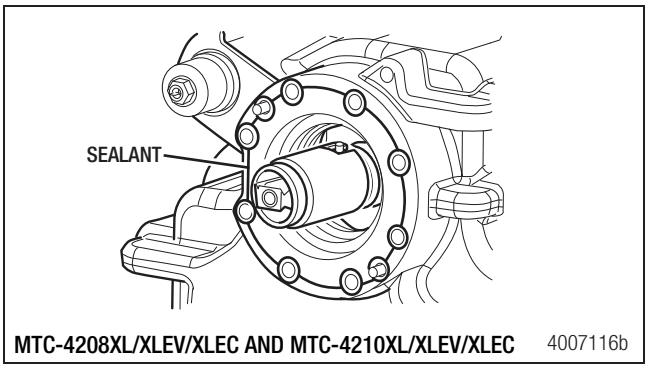


Figure 7.43

5. Install the pump housing and align with the transfer case alignment dowels. Tap the cover into place with a mallet. Figure 7.44.

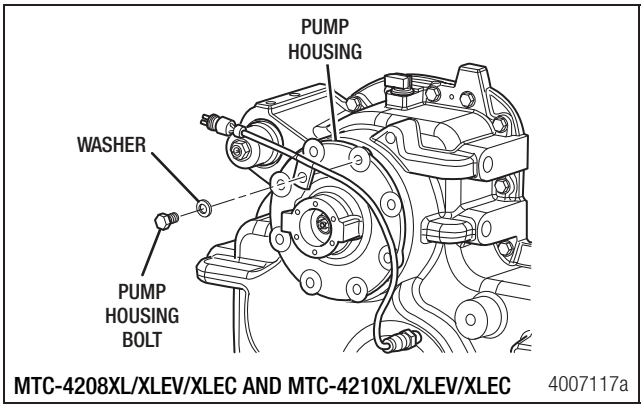


Figure 7.44

6. Install the pump housing washers and bolts.

7. Use a 5/8" socket and tighten the housing bolts in a criss-cross pattern to 60-75 lb-ft (101 Nm).

8. Apply a very light bead of Loctite® 518 sealant onto the pump housing. NEVER allow the sealant to enter the pump cavity. Damage to the pump can result. Figure 7.45.

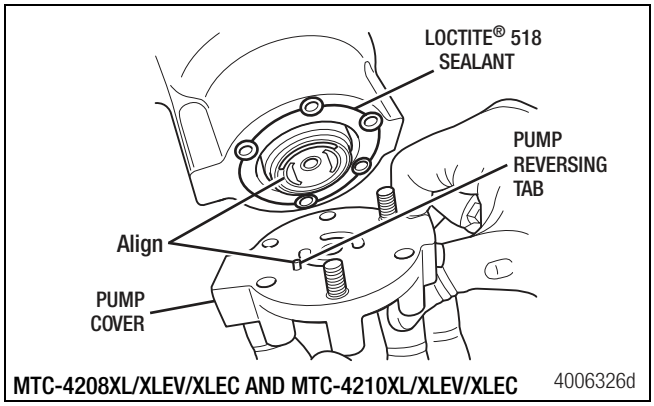


Figure 7.45

⚠ CAUTION

Verify the pump cover pin is the correct height or the transfer case can become damaged due to low oil pressure.

9. Install the pump cover at the 9:00 position.

10. Align the reversing tab (roll pin) on the pump cover with the corresponding recess on the pump. The pump cover must be at this orientation to prevent damage to components. Figure 7.45.

11. Install the pump cover washers and bolts. Figure 7.46.

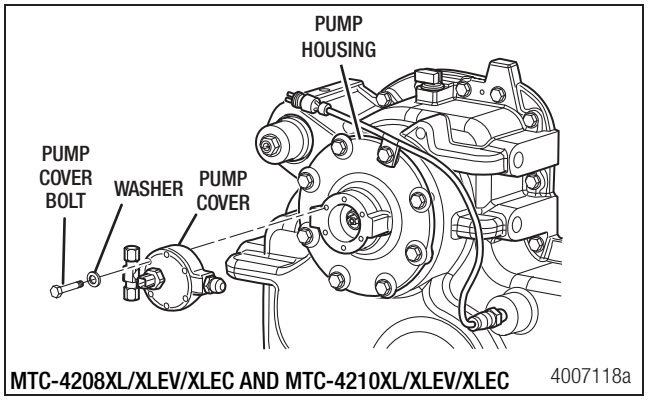


Figure 7.46

12. Use a 7/16” socket and tighten the bolts in a criss-cross pattern to 10-13 lb-ft (14-18 Nm).

Breather, Speed Sensor and Plugs

1. If necessary, install the breather into the rear cover. Figure 7.47.

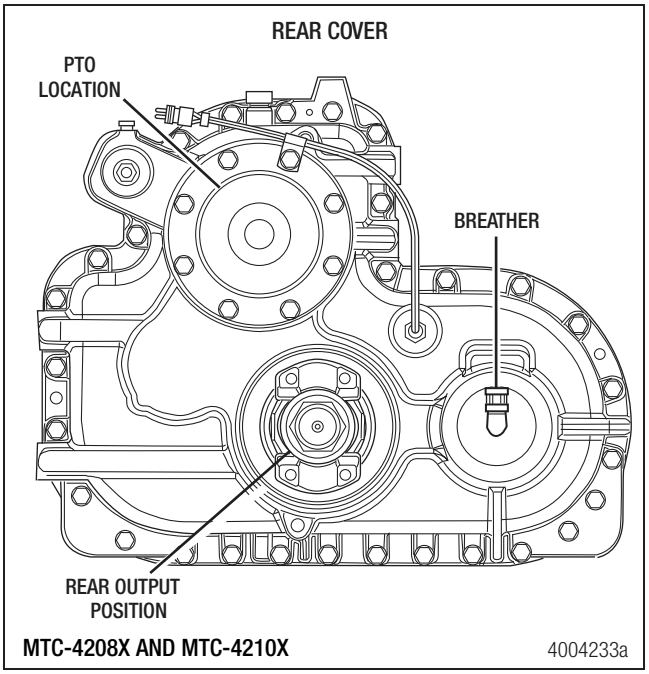


Figure 7.47

2. Install the oil inlet tube to the lower and upper fittings. Tighten the fitting nuts to 35-40 lb-ft (48-54 Nm). Figure 7.48.

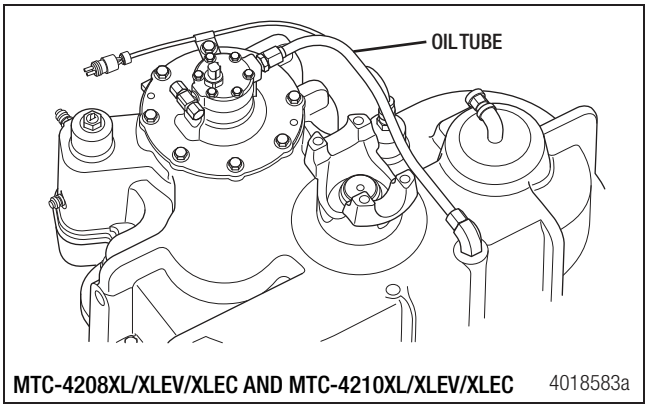
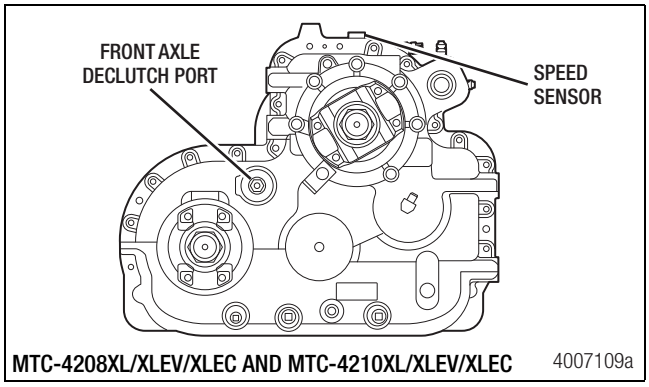


Figure 7.48

3. If removed, install the speed sensor into the top of the transfer case. Figure 7.49. Fasten with a capscrew and washer.



MTC-4208XL/XLEV/XLEC AND MTC-4210XL/XLEV/XLEC 4007109a

Figure 7.49

4. On MTC-4208XP and MTC-4210XP, install the PTO engagement and disengagement switch assemblies, if equipped. Otherwise, install a nut and washer into the open port.

5. Reinstall all other pipe threaded plugs using Loctite® 592 threadlocker.

Oil Cooler Connections

1. Reinstall the male connector fittings, if removed. Apply Loctite® 592 threadlocker to the pipe threads. Tighten the fittings to 25 lb-ft (34 Nm).

2. Connect the oil cooler lines:

   - **MTC-4213X, MTC-4208X/XP, and MTC-4210X/XP, PTO Ready:** Reconnect the loop line. Tighten the fittings to 20 lb-ft (27 Nm).

   - **MTC-4208XL/XLEV and MTC-4210XL/XLEV with Rear-Mounted Pump:** Reconnect the tube between the pump outlet and front idler bearing orificed elbow.

   - **MTC-4208XLEC and MTC-4210XLEC:** Refer to the instructions on page 90 for oil tube installation.

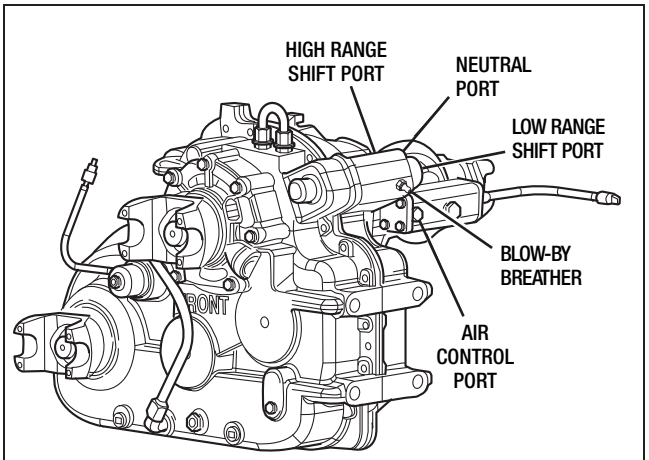
Transfer Case Shifting Check

1. Apply 60 psi (4.14 bar) or greater of air pressure to the front axle declutch. Figure 7.49.

2. Turn the input shaft by hand to verify the front output turns at same rate as the rear output.

3. Remove the air pressure.

4. Apply 60 psi (4.14 bar) or greater of air pressure to the high-range shaft air port. Figure 7.50.



MTC-4208XP AND MTC-4210XP SHOWN 4000218c

Figure 7.50

5. Turn the input shaft by hand to verify the rear output turns at same rate as the input.

6. Remove the air pressure.

7. Apply 60 psi (4.14 bar) or greater of air pressure to the low-range shaft cylinder air port. Figure 7.50.

8. Turn the input shaft by hand to verify the rear output turns at approximately half the rate as the input.

9. Remove the air pressure.

10. For PTO-equipped cases, apply 60 psi (4.14 bar) or greater of air pressure to the neutral shift location. Figure 7.50.

11. Turn the input shaft by hand to verify the rear output does not turn at all. Have someone hold the output shafts to prevent them from turning while spinning the input.

12. Remove the air pressure.

13. Remove the transfer case from the stand.

7 Assembly

Transfer Case Assembly Test

⚠ CAUTION

The air pressure must not exceed 10 psi (0.69 bar). Damage to components can result.

1. Pressure test the transfer case assembly for air leakage.
2. Verify the fittings are installed correctly.
3. Remove the breather assembly. Figure 7.51.

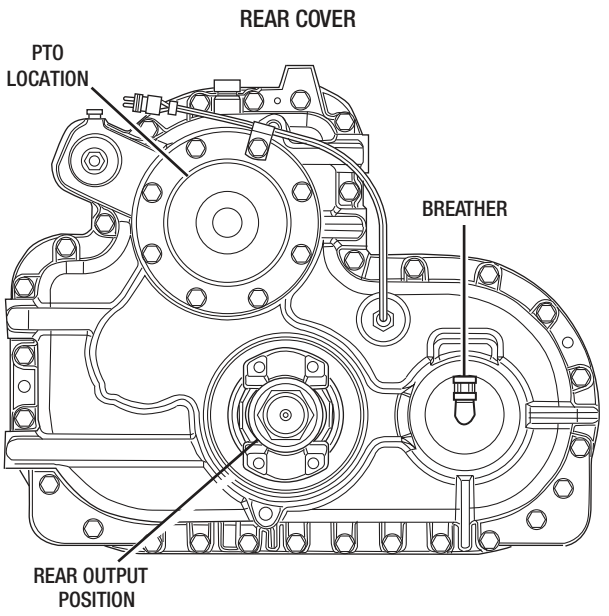


Figure 7.51

4. With the correct fitting installed into the breather port, apply a pressure of 8-10 psi (0.55-0.69 bar).
5. Shut the air supply off.

   If the pressure decreases by more than 2 psi (0.14 bar) in 10 minutes: Check for external leaks at the fittings.
6. Correct the leakage problem and retest.
7. Reinstall the breather assembly.

Power Take-Off (PTO)

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ DANGER

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. NEVER work under a vehicle supported only by jacks. Jacks can slip and fall over. Failure to use safety stands can result in death or serious personal injury and damage to components.

⚠ DANGER

Observe all hazard alerts provided by the press manufacturer. Death or serious personal injury and damage to components can result.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

⚠ WARNING

When applying some silicone gasket materials, a small amount of acid vapor is present. To prevent serious personal injury, ensure the work area is well-ventilated. Read the manufacturer's instructions before using a silicone gasket material, then carefully follow the instructions. If a silicone gasket material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

⚠ WARNING

Take care when using Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into the eyes, follow the manufacturer's emergency procedures and get checked by a physician as soon as possible.

⚠ WARNING

Wear heat-resistant gloves and appropriate protective clothing when working with heating equipment and heated parts. Coming into contact with hot surfaces and parts can result in serious personal injury.

Installation

This section provides instructions on installing a power take-off (PTO) assembly onto Meritor MTC-4208 and MTC-4210 transfer cases using Kit 2540. Refer to Table D and Figure 8.1. Refer to the Service Notes page on the front inside cover of this manual to obtain this kit.

Table D: Kit 2540

Model	Qty	Part #	Description
PTO Assembly	1	MDP-10-AF-100	10,000 lb-ft (13 500 N·m) torque rating
Washer	8	1229-E-1513	0.81" O.D. x 0.47" I.D. x 0.09" thickness
Capscrew	6	S-2710-2	7/16" - 14 thread x 1.25" long
Capscrew	2	S-2746-2	7/16" - 14 thread x 5.75" long
Washer	1	1229-T-1736	2.36" x 1.56 I.D. x 0.12" thickness
Lock Nut	1	40-X-1237	M39 x 1.5 thread
Dowel Pin	2	1246-T-1190	3/8" diameter x 1" long

8 Power Takeoff (PTO)

Exploded View

PTO MDP-10-AF-100

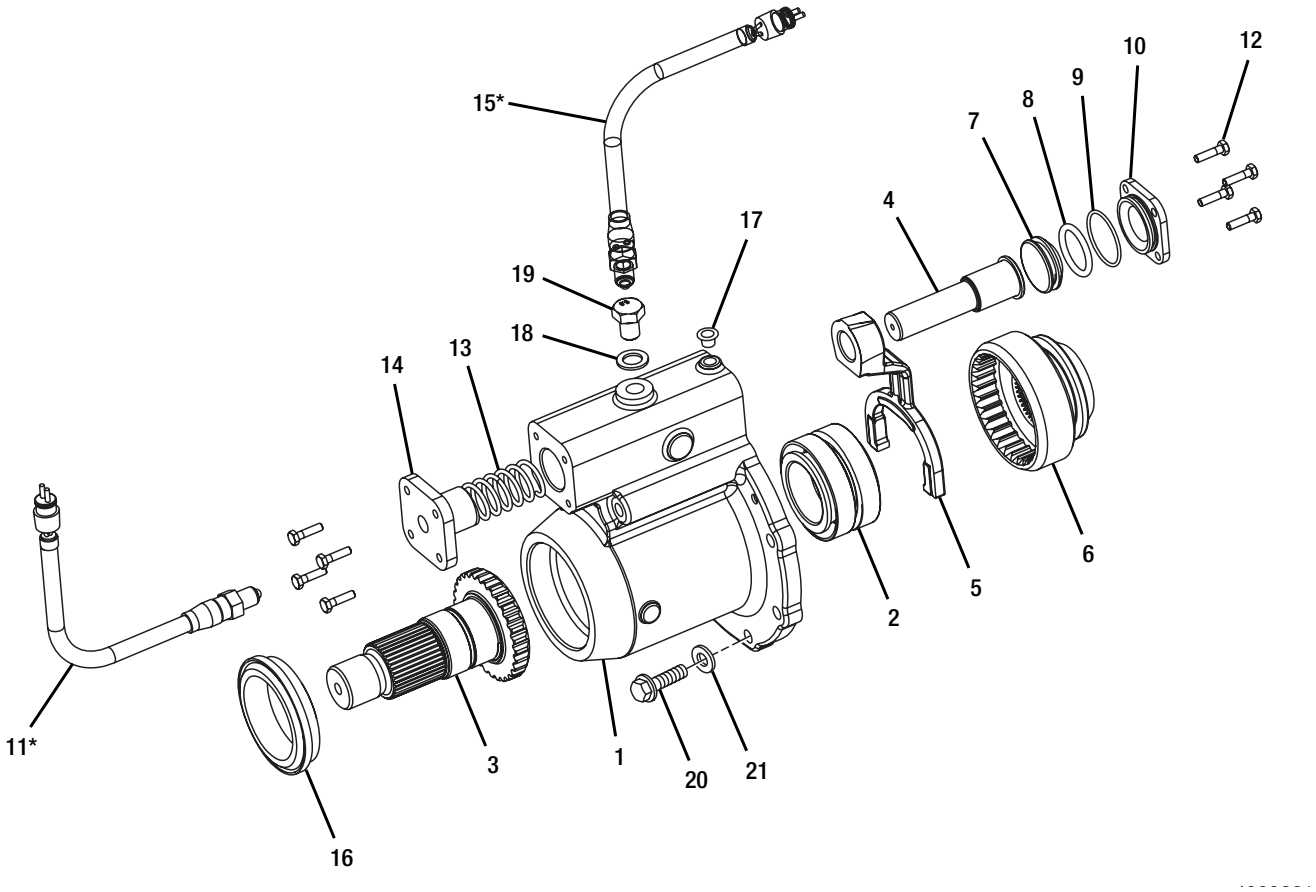


Figure 8.1

Item	Description	Qty
1	Bearing Cage	1
2	Bearing Assembly	1
3	PTO Shaft	1
4	Push Rod	1
5	Shift Fork	1
6	Differential Lockout Collar	1
7	Shifter Piston	1
8	O-ring, 1.46” (37 mm) Diameter	1
9	O-ring, 1.80” (46 mm) Diameter	1
10	Cover Plate	1
11	Switch Assembly, Standard (Optional)	1

Item	Description	Qty
12	Capscrew	1
13	Shifter Spring	1
14	Cap	1
15	Declutch Switch Assembly (Optional)	1
16	Oil Seal Assembly	1
17	Shipping Protector	1
18	Flat Washer	2
19	Special Screw	2
20	Capscrew, 1.25” (32 mm) Long	6
20	Capscrew, 5.75” (146 mm) Long	2
21	Washer	8

Remove the Transfer Case Rear Access Cover

1. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
2. Remove the air from the vehicle's system.
3. Place a suitable container under the transfer case to catch the hydraulic fluid when removing the rear access cover.
4. Remove the mounting bolts and washers securing the rear-mounted pump housing. Figure 8.2.

   NOTE: It is necessary to replace the rear-mounted pump with the internal pump in order to install the PTO. Refer to Technical Bulletin TP-0708 - Removing the External Oil Pump and Installing the Internal Oil Pump for the correct kit and instructions.
5. Clean the PTO mounting surface to remove all sealant.

8 Power Takeoff (PTO)

Exploded View

MTC-4210 Transfer Case and KIT 2540 Components

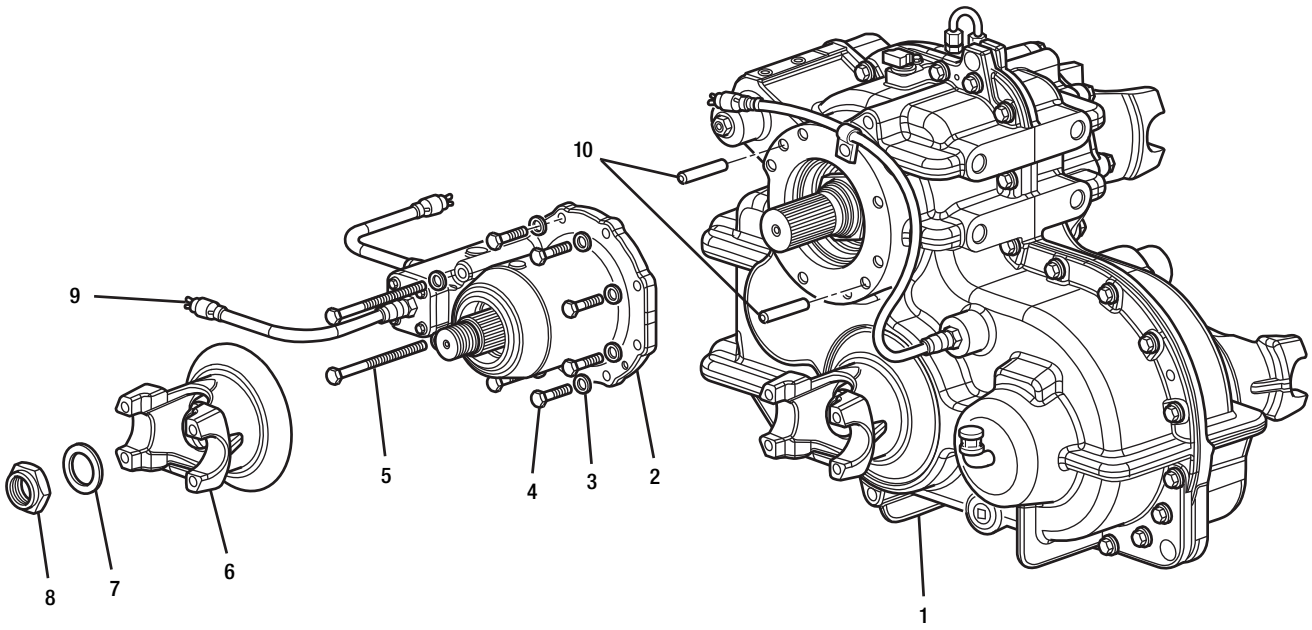


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Figure 8.2

Item	Description
1	Transfer Case
2*	PTO Assembly
3*	Washer, 0.47” (12 mm) Inside Diameter
4*	Capscrew, 1.25” (32 mm) Long
5*	Capscrew, 5.75” (146 mm) Long
6	Yoke
7*	Washer, Yoke Mounting
8*	Lock Nut, Yoke Mounting
9	Switch and Connector Assembly
10	Dowel Pin

* Kit 2540 component

Install the Yoke onto the PTO

A Meritor yoke with the spline code "RAI" must be installed onto the PTO. For yoke options, refer to Table E and Figure 8.3.

Table E: PTO Yoke Options and Dimensions

	Part #	17NYS32-100A1	17TYS32-68A1
	Yoke Type	Full Round	Easy Service™
A	Center to End	5.16" (131 mm)	5.47" (139 mm)
B	Spline Length	2.32" (59 mm)	2.32" (59 mm)
C	Hub Diameter	3.00" (76 mm)	3.00" (76 mm)
D	Bearing Diameter	1.94" (49 mm)	1.94" (49 mm)
E	Across Ears	6.00" (152 mm)	6.20" (157 mm)
F	Spline Size	2.00 x 39" (51 x 991 mm)	2.00 x 39" (51 x 991 mm)

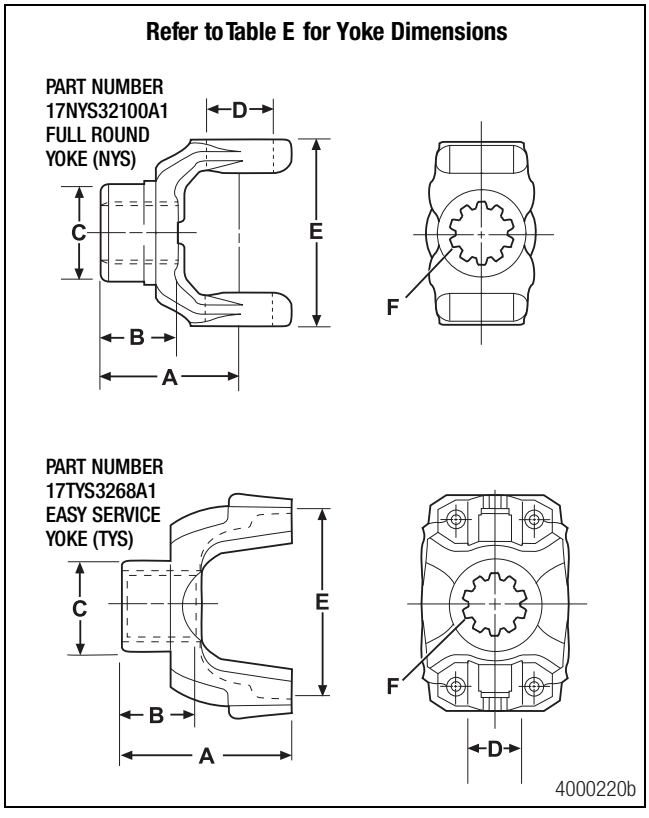


Figure 8.3

1. Use a press and an applied press force of 500-1500 lbs (227-680 kg) to install a Meritor yoke, spline code RAI, onto the PTO shaft. Figure 8.2.
2. Apply a 1.8" (46 mm) bead of RTV silicone gasket material around the end of the yoke spline under the washer surface.
3. Install the washer and locknut supplied in the kit. Tighten the lock nut to 700-900 lb-ft (949-1220 Nm).

Install the Optional Indicator Switch

Table F: PTO Switch Option

Part #	3237-W-1167
Part Name	Switch and Connector Assembly
Description	2 Amp x 12 VDC, M16 x 1" thread
Qty	1

1. Remove the screw and washer from the end of the PTO cap. Figure 8.4.

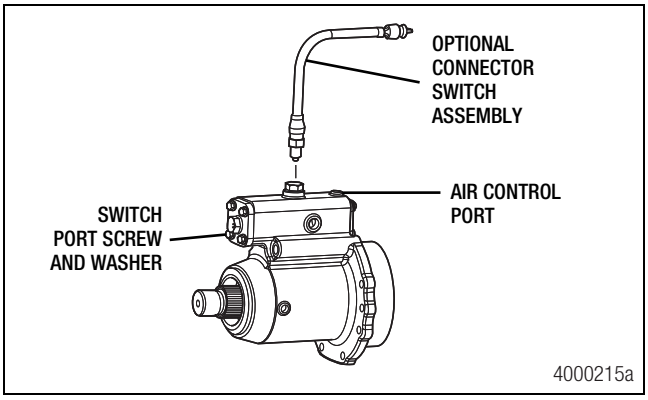


Figure 8.4

2. Apply Loctite® 518 gasket sealant to the indicator switch threads.
3. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-41 Nm). Figure 8.5.

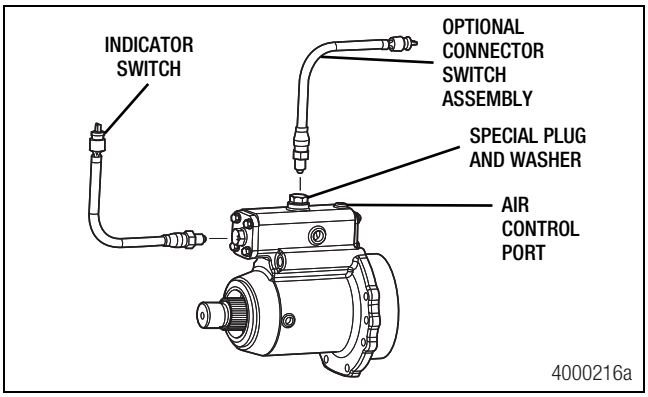


Figure 8.5

8 Power Takeoff (PTO)

Install the PTO Onto the Transfer Case

1. Install two dowel pins into the transfer case PTO flange. Figure 8.2.
2. Apply a thin coating of Loctite® 518 gasket sealant to the entire PTO flange mounting surface.
3. Slide the PTO assembly onto the output shaft spline. Align the assembly to the two dowel pins.
4. Install the washers and mounting bolts. Tighten the bolts to 60-75 lb-ft (81-102 Nm).
5. Install the PTO air control line and fitting. Follow the vehicle manufacturer's instructions.

Test the PTO Installation

⚠ CAUTION

The PTO clutch must be engaged to operate the drive. Always engage and disengage the PTO with the vehicle stationary and in Neutral. NEVER apply a load to the PTO drive until the drive has been engaged. Damage to components can result.

The air pressure must not exceed 90 psi (6.2 bar). Damage to components can result.

1. Connect a regulated air pressure line to the air control port. Figure 8.6.

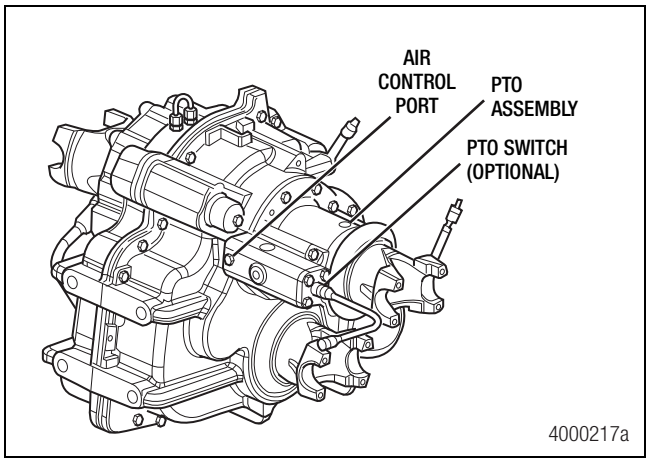


Figure 8.6

2. Apply 90 psi (6.2 bar) of air pressure.
3. Check for leaks in the PTO air control line.
4. Cycle the air control pressure. Follow the procedures below to verify the PTO clutch engages correctly.

PTO Without an Optional Indicator Switch

1. Remove the switch port screw and washer. Figure 8.4.
2. Measure the PTO push rod travel to verify the travel is 0.75" (19 mm) and the clutch is fully engaged.

   If the push rod travel is not at 0.75" (19 mm) and the PTO clutch is not fully engaged:
   Disengage the clutch by releasing the air pressure. Rotate the clutch output shaft by hand and retest.

   If the clutch still is not fully engaged:
   Remove the PTO assembly. Check the transfer case output shaft splines and the PTO clutch collar splines. Replace worn or damaged parts. Repeat the assembly procedures.

PTO with an Optional Indicator Switch

1. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-40.8 Nm).
2. Verify the indicator switch closes when the PTO completes a shift to engage the drive. Figure 8.5.

   If the indicator switch does not close to fully engage the drive:
   Measure the PTO push rod travel to verify the travel is 0.75" (19 mm) and the clutch is fully engaged.

   If the push rod travel is not at 0.75" (19 mm) and the PTO clutch is not fully engaged:
   Disengage the clutch by releasing the air pressure. Rotate the clutch output shaft by hand and retest.

   If the clutch still is not fully engaged:
   Remove the PTO assembly. Check the transfer case output shaft splines and the PTO clutch collar splines. Replace worn or damaged parts. Repeat the assembly procedures.

   NOTE: If there is any concern about the functionality of the indicator switch, consult the indicator switch manufacturer for guidance.

Test the Transfer Case with the PTO Assembly Installed

⚠ CAUTION

The air pressure must not exceed 10 psi (0.69 bar). Damage to components can result.

1. Connect a regulated air pressure line to the air transfer case breather. Figure 8.7.

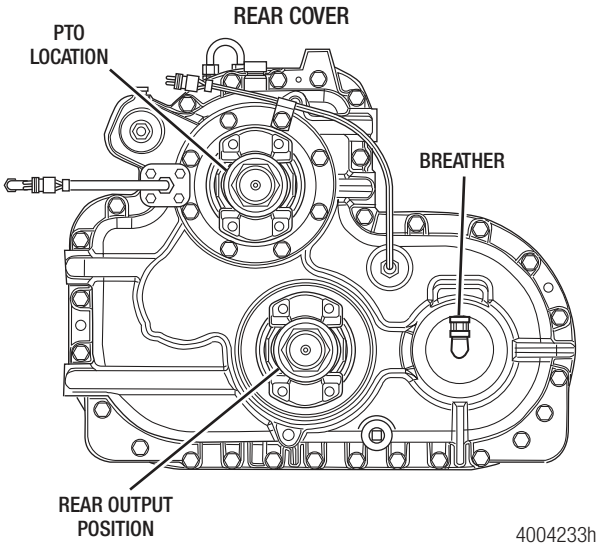


Figure 8.7

2. Verify the air pressure line fittings are installed correctly.
3. With the correct fitting installed into the breather port, apply a pressure of 8-10 psi (0.55-0.69 bar).
4. Turn the air supply OFF. Check the pressure.

   If the pressure decreases by more than 2 psi (0.14 bar) in 10 minutes:
   Check for external leaks at the fittings. Correct any leaks. Recheck the pressure.

5. Install the breather.

PTO Disassembly

Once the PTO has been removed according to the procedure in Section 5, use the following procedure for disassembly.

⚠ WARNING

Take care when removing the spring-loaded PTO cap. Serious personal injury and damage to components can result.

1. Carefully remove the spring-loaded PTO cap by turning each bolt a few turns at a time until all the bolts can be removed at once.
2. Remove the capscrews from the cover of the declutch piston. Remove the cover.
3. Remove the PTO piston push rod and the return spring. Remove the o-ring seal from the PTO piston.
4. Remove the o-ring seal on the cover. Discard the seal. Remove the shift fork and clutch collar.
5. Remove the oil and dirt seals from the bearing cage assembly. Discard the seals.
6. Press the shaft out of the bearing cage. Remove the bearing assembly.
7. Remove the bearing cups as a unit with the bearing spacer by pressing the cups out of the bearing cage. NEVER separate these parts. They are a matched set.

PTO Assembly

1. Rotate the transfer case in the repair stand so the output shaft to the PTO is facing UPWARD.

⚠ CAUTION

The cups must fit securely in the housing bores. Damage to the components can result.

2. Assemble the PTO components by performing the following steps.

   a. Install the bearing cups into the PTO bearing cage housing. This is an interference fit. Freeze the bearing to –65°F (–54°C) and position the two cups into the housing bores. As the cups warm up to ambient temperature, they can move off their seat. Use a bearing cup driver to ensure they are seated. Figure 8.8.

   If the cups are loose after the cup warms:
   Replace the housing.

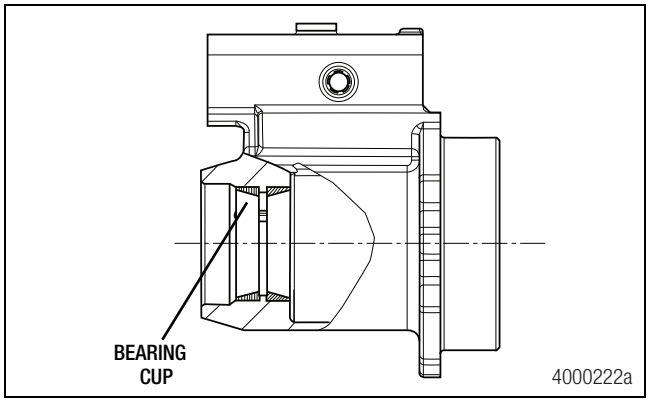


Figure 8.8

⚠ CAUTION

Preheat bearing cones using an oven or inductive bearing heater. Do not use flame heat which can cause damage or shorten the life of the bearings.

b. Preheat the first bearing cone to 200°F (93°C) using an oven or inductive bearing heater. Do not use flame heat. Support the shaft and slide the heated cone in place onto the output shaft. Figure 8.9.

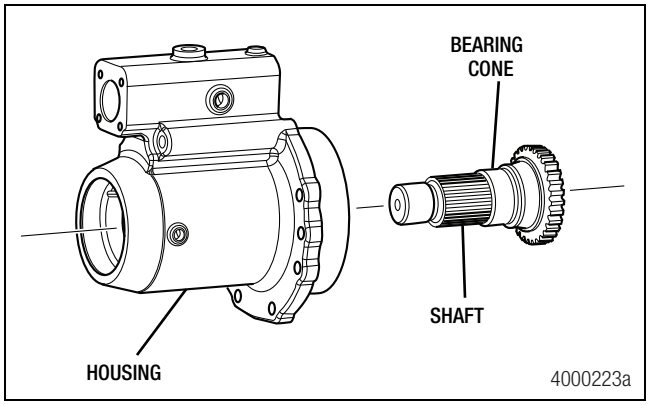


Figure 8.9

c. Install the shaft assembly into the housing. Slide the bearing spacer onto the splined end of the shaft.

d. With the bearing spacer in position, preheat the second bearing cone to 200°F (93°C) using an oven or inductive bearing heater and install it onto the shaft. Figure 8.10.

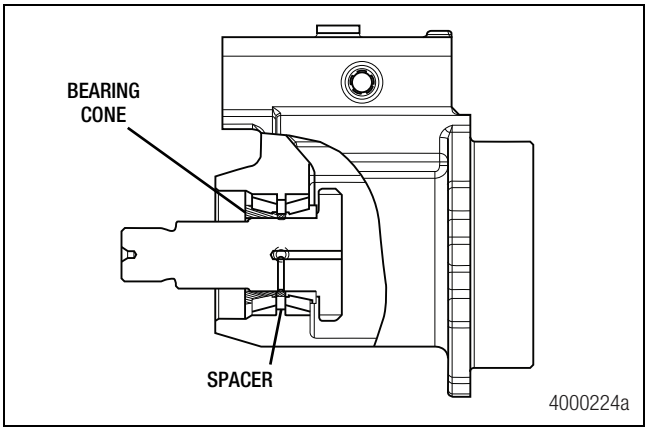


Figure 8.10

e. Support the shaft and apply a press of 50-60 lbs (23-27 kg) to the bearing cone to set the bearing in place while the bearing cools.

f. Apply a light film of SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81.

g. Assemble the shift fork to the clutch collar. Install this unit into the bearing cage housing.

h. Install the push rod into the housing and through the shift fork assembly.

i. Apply 20-30 lbs (9-14 kg) of pressure to insert the piston into the housing. Figure 8.11.

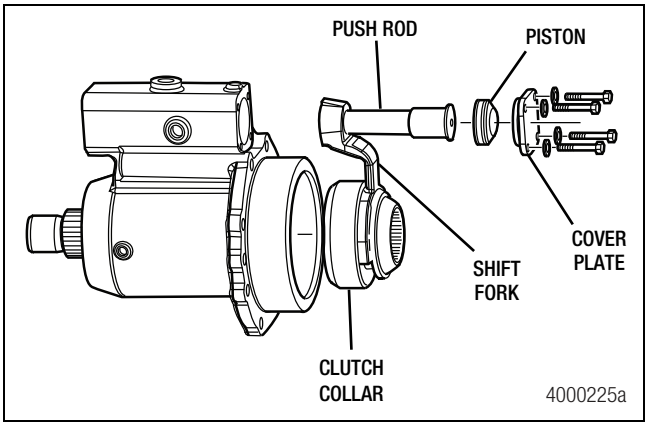


Figure 8.11

j. Install the cover plate with the o-ring seal in place.

k. Lightly lubricate all parts with SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81.

l. Install the 1/4-20 screws using Loctite® 242 sealant. Tighten the screws to 10-14 lb-ft (14-19 Nm).

m. Insert the spring into the housing over the push rod. Figure 8.12.

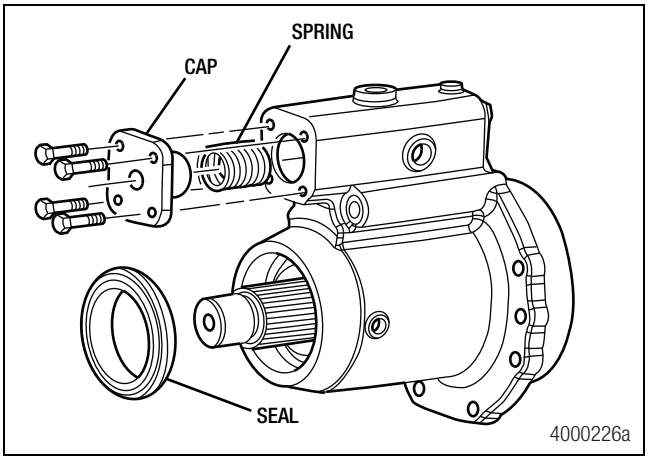


Figure 8.12

n. Apply a thin film of Loctite® 518 gasket material to the cap surface. Install the cap with the 1/4-20 screws using Loctite® 242 sealant. Tighten the screws to 10-14 lb-ft (14-19 Nm). Figure 8.12.

o. Install the PTO shaft seal into the housing.

p. Press the seal into position until the seal is seated on the housing.

3. Install the PTO assembly onto the transfer case.

4. Apply a thin film of Loctite® 518 gasket material to the housing.

5. Slide the housing onto the output shaft of the transfer case, aligning the splines of the clutch to the shaft.

6. Install the eight 7/16" (11 mm) diameter screws and washers using Loctite® 277 sealant. Tighten the screws to 60-75 lb-ft (81-102 Nm).

7. Verify the clutch engages and disengages correctly.

8. Pressure test the PTO shifter for air leakage by performing the following steps.

a. With the correct fitting installed into the air control port, apply a pressure of 90 psi (6.2 bar).

b. Shut off the air supply.

⚠ CAUTION

Check for external leaks at the cover plate joint and fitting if the pressure decreases more than 5 psi (0.3 bar) in 10 minutes. Leaks can cause component damage.

c. Check for external leaks at the cover plate joint and fitting if the pressure decreases more than 5 psi (0.3 bar) in 10 minutes.

If the external joints are sealed and the leakage is still more than 5 psi (0.3 bar): Remove the piston and inspect the o-ring and housing bore for damage. Repair parts as necessary.

9. Install the indicator switch. Tighten the switch to 25-30 lb-ft (34-40 Nm). Figure 8.13.

If a switch is not used:
Install the special plug and washer used to cap the access hole. Tighten the plug to 25-30 lb-ft (34-40 Nm). Figure 8.13.

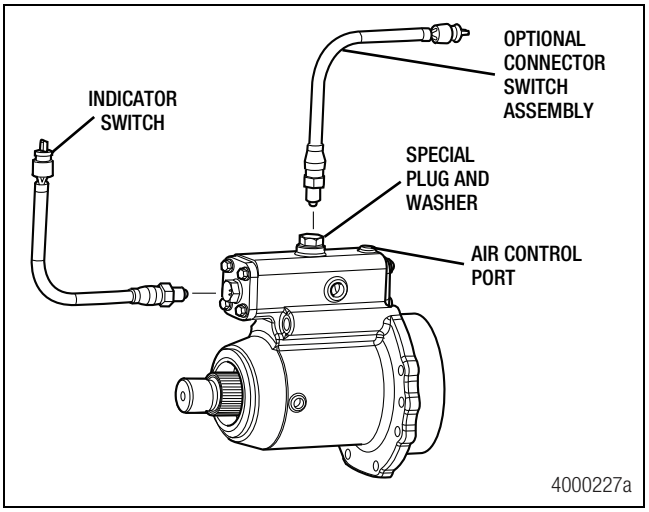


Figure 8.13

10. Repeat Step 1 through Step 9 for each remaining declutch, PTO or proportional differential lockout assemblies.

Installation

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

Install the Transfer Case

⚠ DANGER

Follow all safety guidelines and instructions provided by the lifting device manufacturer. Check that the lift capacity marked on the lifting device, straps and chains is correct for the weight being lifted. If they are not marked with the lift capacity, do not use them. Inspect lifting straps to ensure they are not damaged. NEVER subject lifting straps to shocks or drop-loading. Failure to follow these directives can result in death or serious personal injury and damage to components.

⚠ DANGER

Support the transfer case with a lifting strap when transferring the assembly from the repair stand to the vehicle. A transfer case not supported correctly can fall. Serious personal injury and damage to components can result.

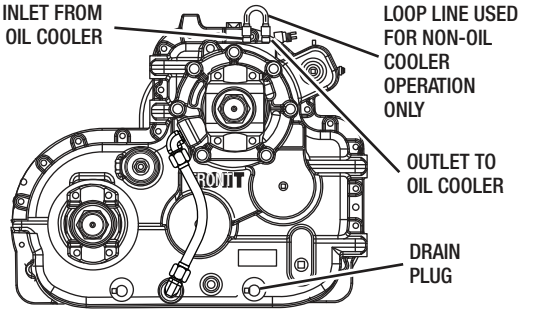
1. Use a suitable lifting device to move the transfer case from the repair stand to a suitable hydraulic roller jack. If used, remove the temporary eye-bolts and mounting brackets from the transfer case housing.
2. Move the transfer case into position under the vehicle with the hydraulic roller jack.
3. Install the transfer case into the vehicle with the mounting bolts. Tighten the bolts to the torque specification supplied by the vehicle manufacturer.
4. Connect the drivelines to the input and output yokes of the transfer case. Refer to the vehicle manufacturer's recommended procedure.
5. Connect any switch or speed sensor wiring.
6. Fill the transfer case with the correct quantity of specified lubricant. Refer to "Lubrication and Maintenance" on page 97.

Oil Cooler Line Connections

MTC-4213, or MTC-4208 and MTC-4210 with Oil Cooler

NOTE: There are different transfer case lubrication systems available. Determine the transfer case model before ordering cooler adaptation ports.

MTC-4213 or MTC-4208 and MTC-4210 Models with PTO



MTC-4208X/XP, MTC-4210X/XP, and MTC-4213X 4007120a

Figure 9.1

1. Disconnect the loop line on top of the transfer case connecting the pump exit and return ports on the transfer case. Figure 9.1 and Figure 9.2.
2. Install the cooler inlet and outlet lines.

MTC-4208 and MTC-4210 with Rear-Mounted Pump

1. Disconnect the tube between the pump outlet and orificed elbow fitting at the front idler bearing port.
2. Install the cooler inlet line at the pump outlet. Connect the cooler outlet line to the front idler bearing orificed elbow. Figure 9.2, Figure 9.3, and Figure 9.4.
3. Connect the oil exit line JIC fitting to the transfer case. Tighten to 20 lb-ft (27.2 Nm).
4. Connect the oil return line JIC fitting to the transfer case. Tighten to 20 lb-ft (27.2 Nm).

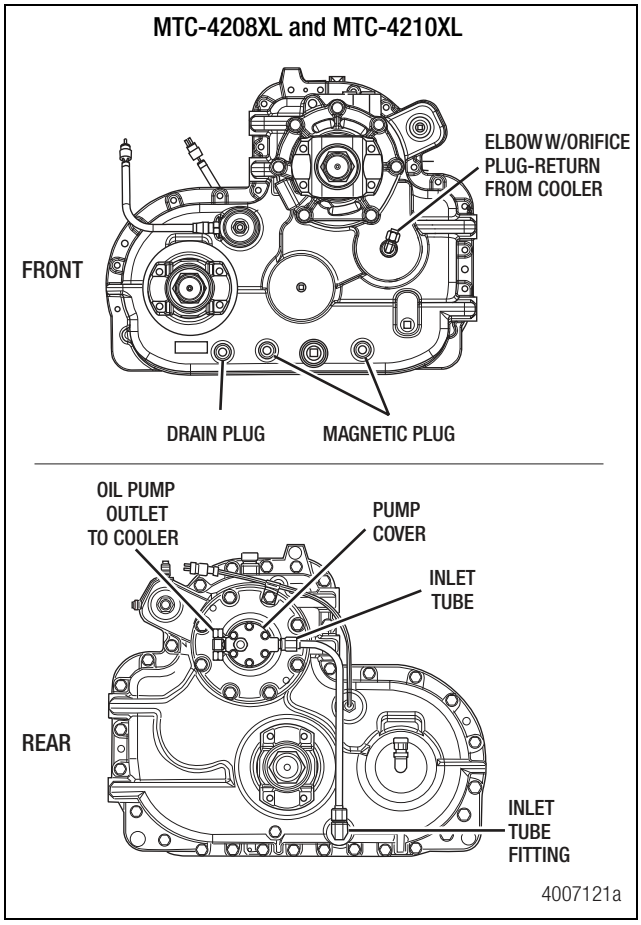


Figure 9.2

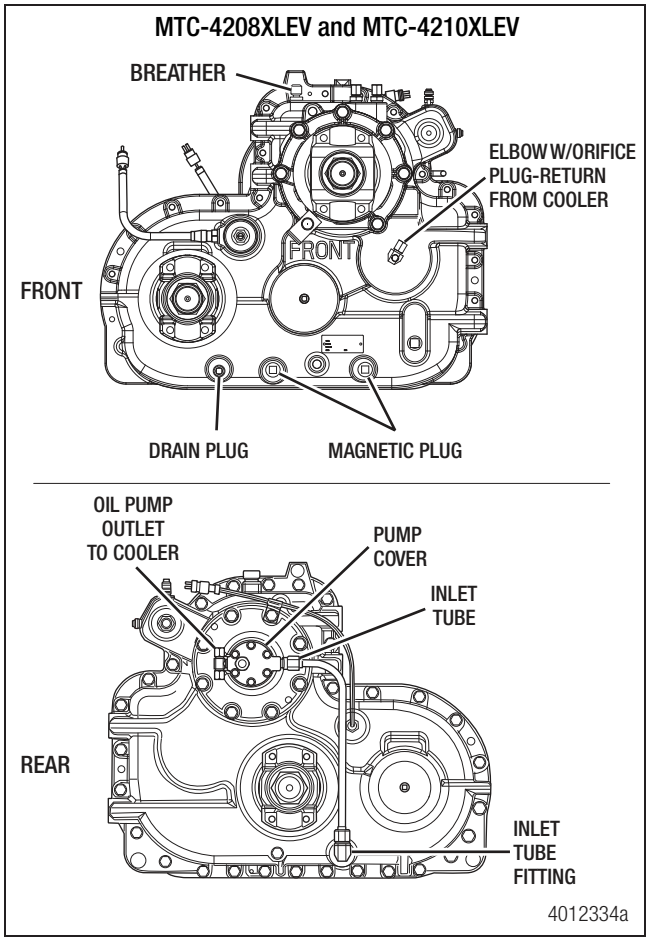


Figure 9.3

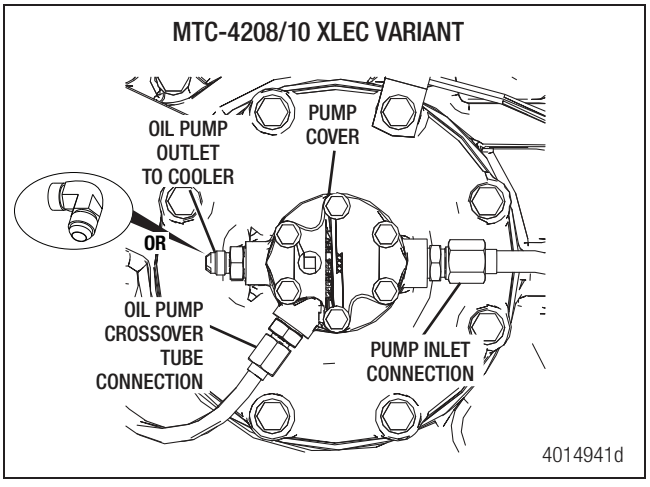


Figure 9.4

9 Installation

MTC-4208/10 XLEC Crossover Tube Installation for Driver-Side Mounted Cooler (Connection at 1:00 Position)

1. Install the tee fitting onto the front case idler bearing oil supply port elbow fitting. Tighten the tee fitting to 20 lb-ft (54 Nm). Figure 9.5.

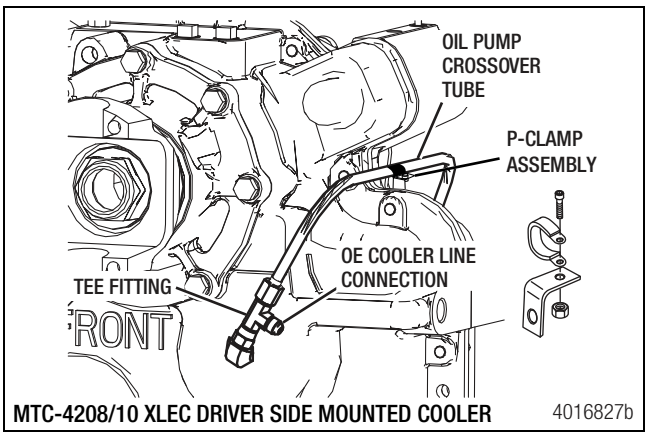


Figure 9.5

2. Install the new oil pump crossover tube to the tee fitting on the front case half. Tighten the tube nut to 20 lb-ft (27 Nm). Figure 9.5.

3. Reconnect the OE chassis cooler return hose to the tee fitting on the front case half at the idler front bearing position. Tighten the hose nut to 40 lb-ft (54 Nm). Figure 9.5.

4. Connect the oil pump crossover tube from the front case to the pump outlet fitting on the rear case half. Tighten the tube nut to 20 lb-ft (27 Nm). Figure 9.6.

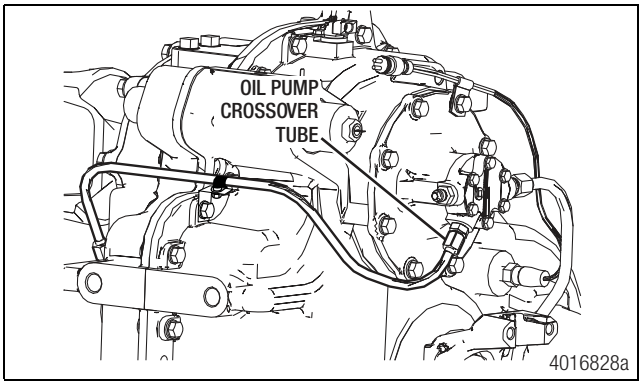


Figure 9.6

5. Remove the housing capscrew and install through the angle bracket as shown in Figure 9.5. Apply Loctite® 242 to the first 3 threads, reinstall, and tighten to 60-75 lb-ft (81-102 Nm). Place the P-clamp around the oil pump crossover tube and, using the supplied socket head bolt and lock nut, attach it to the angle bracket and tighten to 8-10 lb-ft (11-14 Nm).

   NOTE: The P-clamp bracket is intended to support the crossover tube. Make certain there is no tension applied to the crossover tube once the fasteners have been tightened.

MTC-4208/10 XLEC Crossover Hose Installation for Passenger-Side Mounted Cooler (Connection at 9:00 Position)

1. Install the tee fitting onto the front case idler bearing oil supply port elbow fitting. Tighten the tee fitting to 20 lb-ft (54 Nm). Figure 9.7.

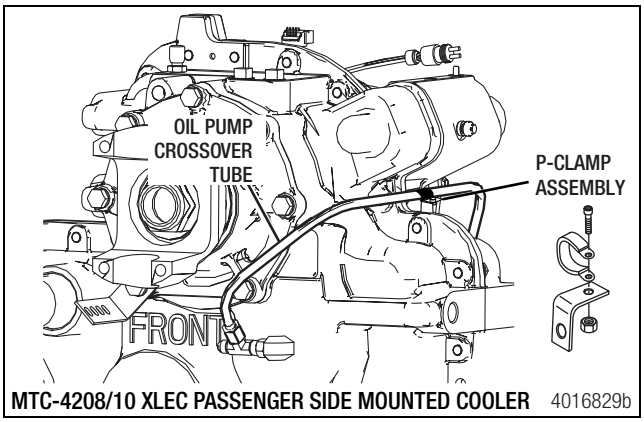


Figure 9.7

2. Install the new oil pump crossover tube to the tee fitting on the front case half. Tighten the tube nut to 20 lb-ft (27 Nm). Figure 9.7.

3. Reconnect the OE chassis cooler return hose to the tee fitting on the front case half at the idler front bearing position. Tighten the hose nut to 40 lb-ft (54 Nm). Figure 9.7.

4. Connect the oil pump crossover tube from the front case to the pump outlet fitting on the rear case half. Tighten the tube nut to 20 lb-ft (27 Nm). Figure 9.8.

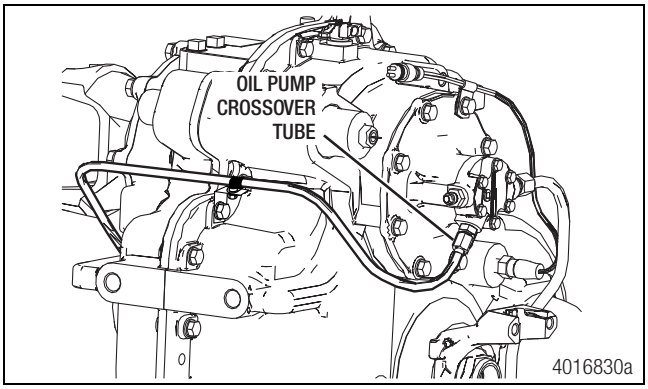


Figure 9.8

5. Remove the housing capscrew and install through the angle bracket as shown in Figure 9.7. Apply Loctite® 242 to the first 3 threads, reinstall, and tighten to 60-75 lb-ft (81-102 Nm). Place the P-clamp around the oil pump crossover tube and, using the supplied socket head bolt and lock nut, attach it to the angle bracket and tighten to 8-10 lb-ft (11-14 Nm).

   NOTE: The P-clamp bracket is intended to support the crossover tube. Make certain there is no tension applied to the crossover tube once the fasteners have been tightened.

Troubleshooting

Transfer Case Lubrication Diagnostics

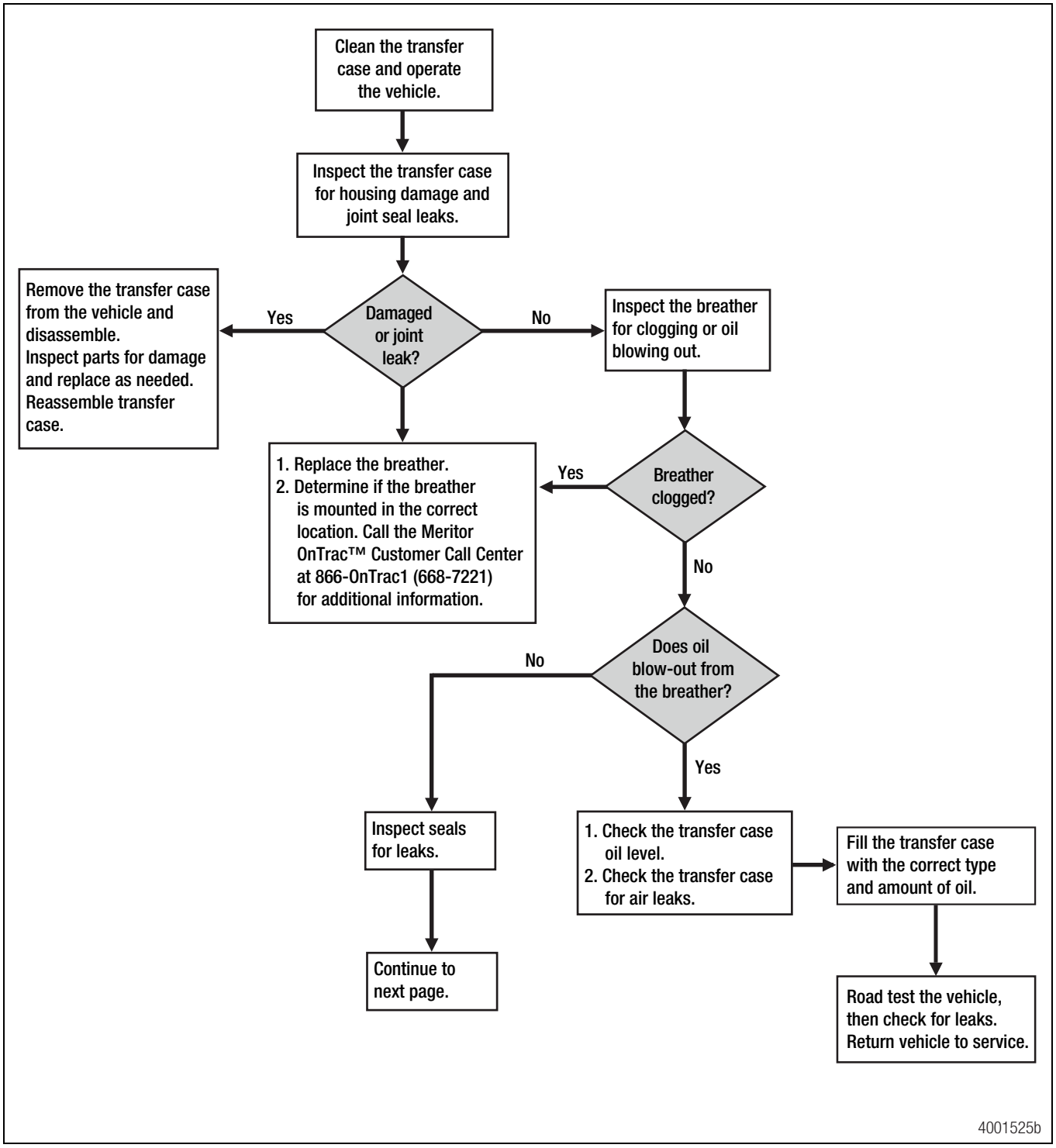


Figure 10.1

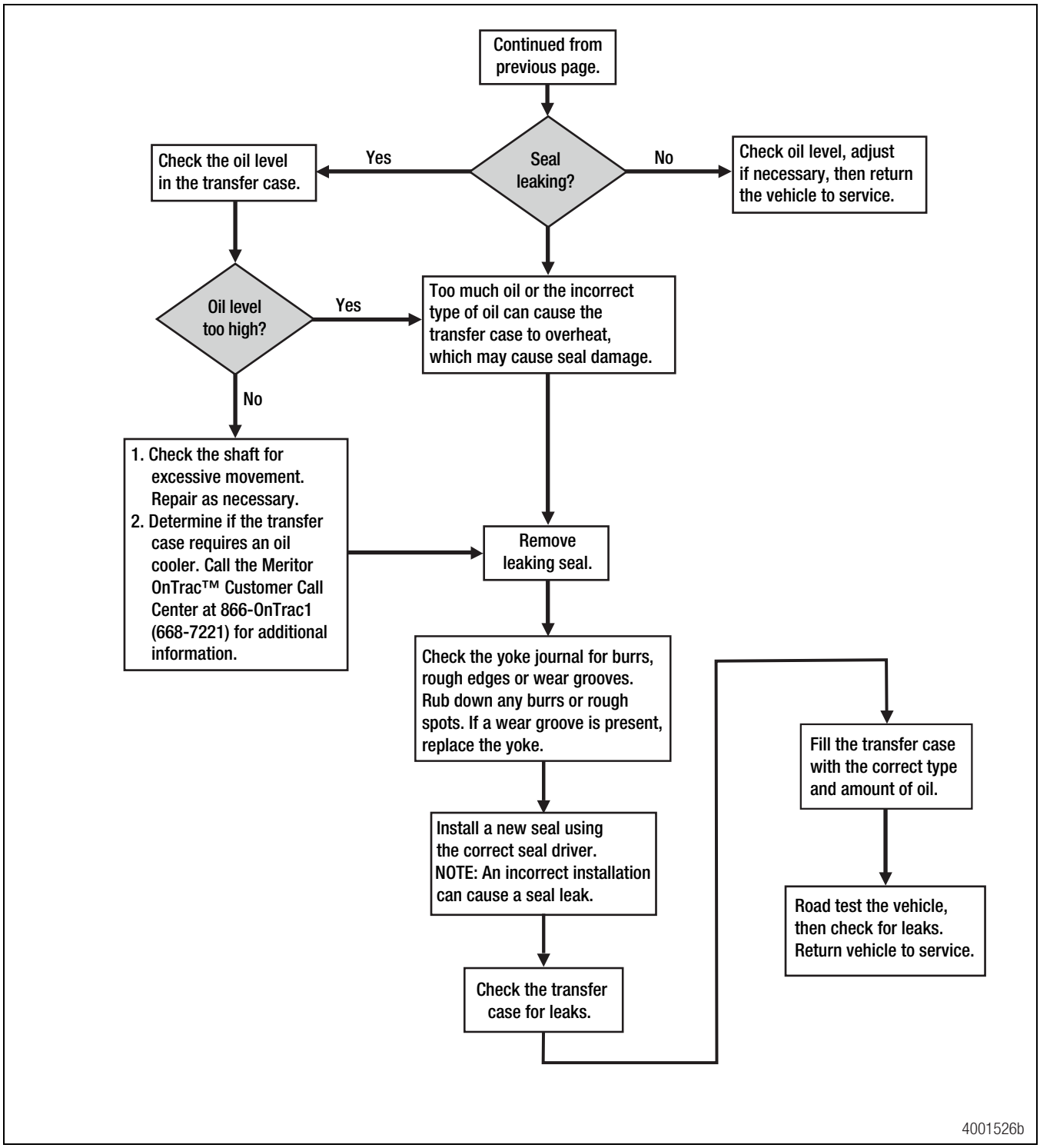


Figure 10.2

Excessive Noise and Vibration Diagnostics

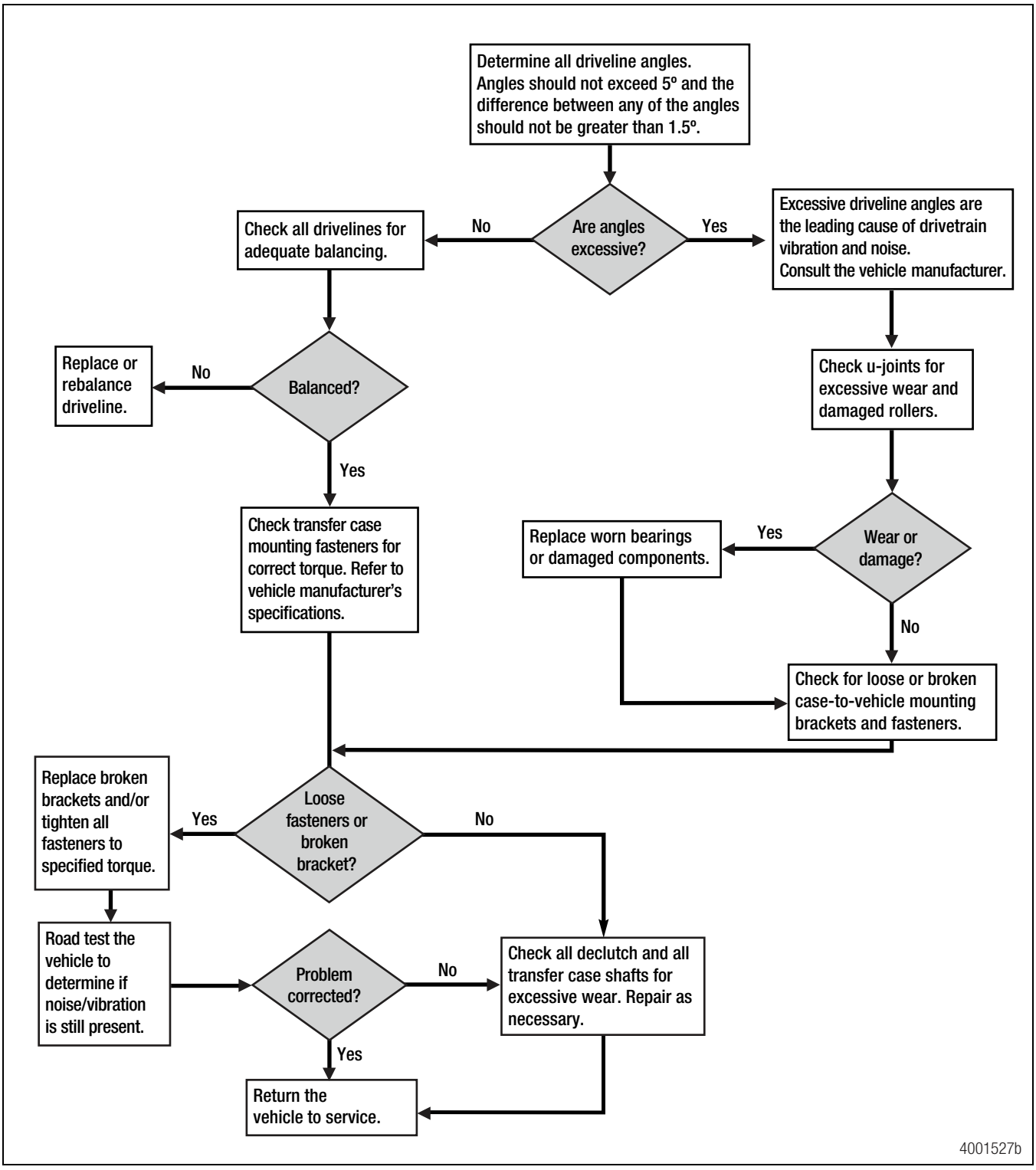


Figure 10.3

10 Troubleshooting

PTO Does Not Engage/Disengage Diagnostics

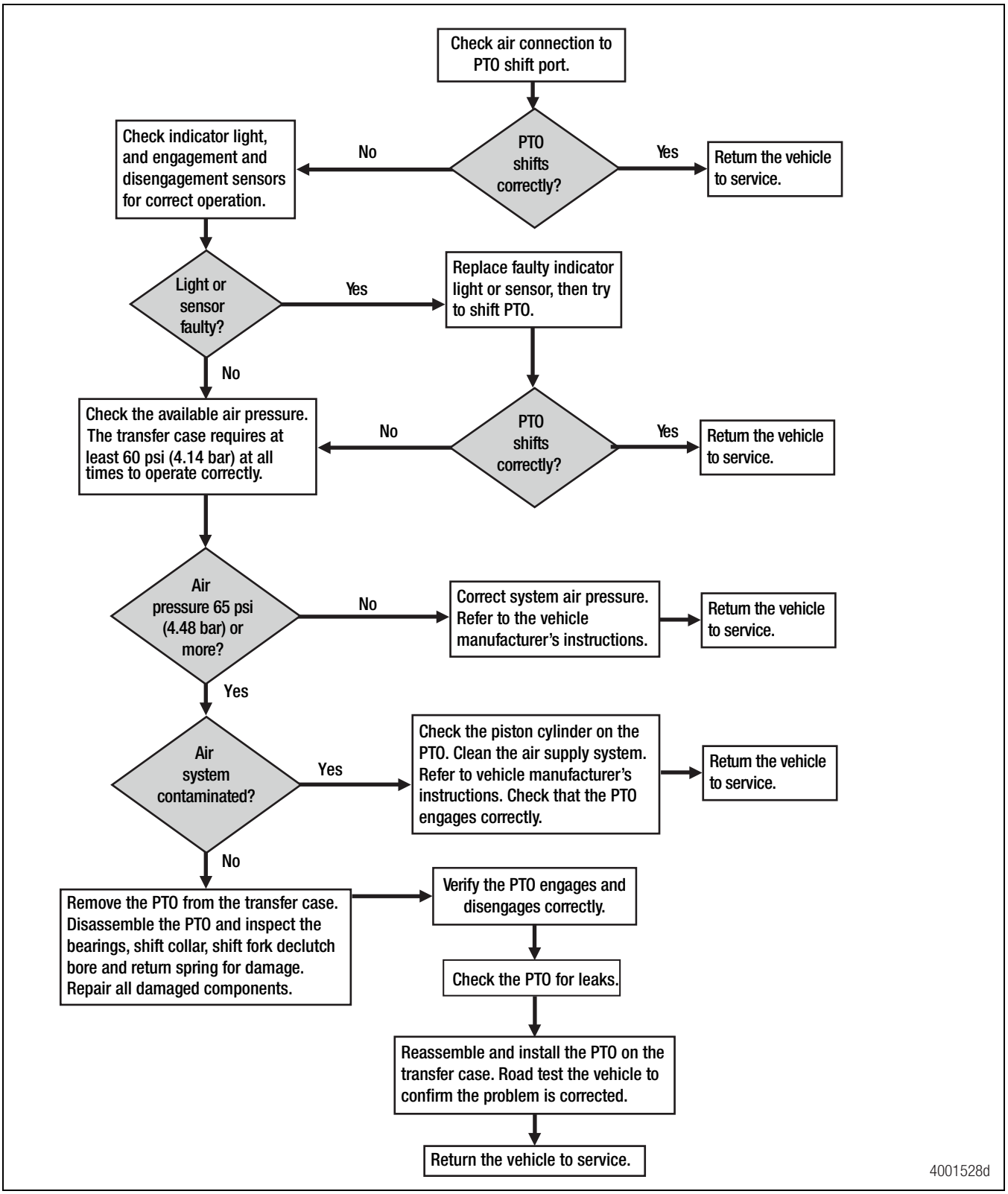


Figure 10.4

Front Axle Declutch Does Not Engage/Disengage Diagnostics

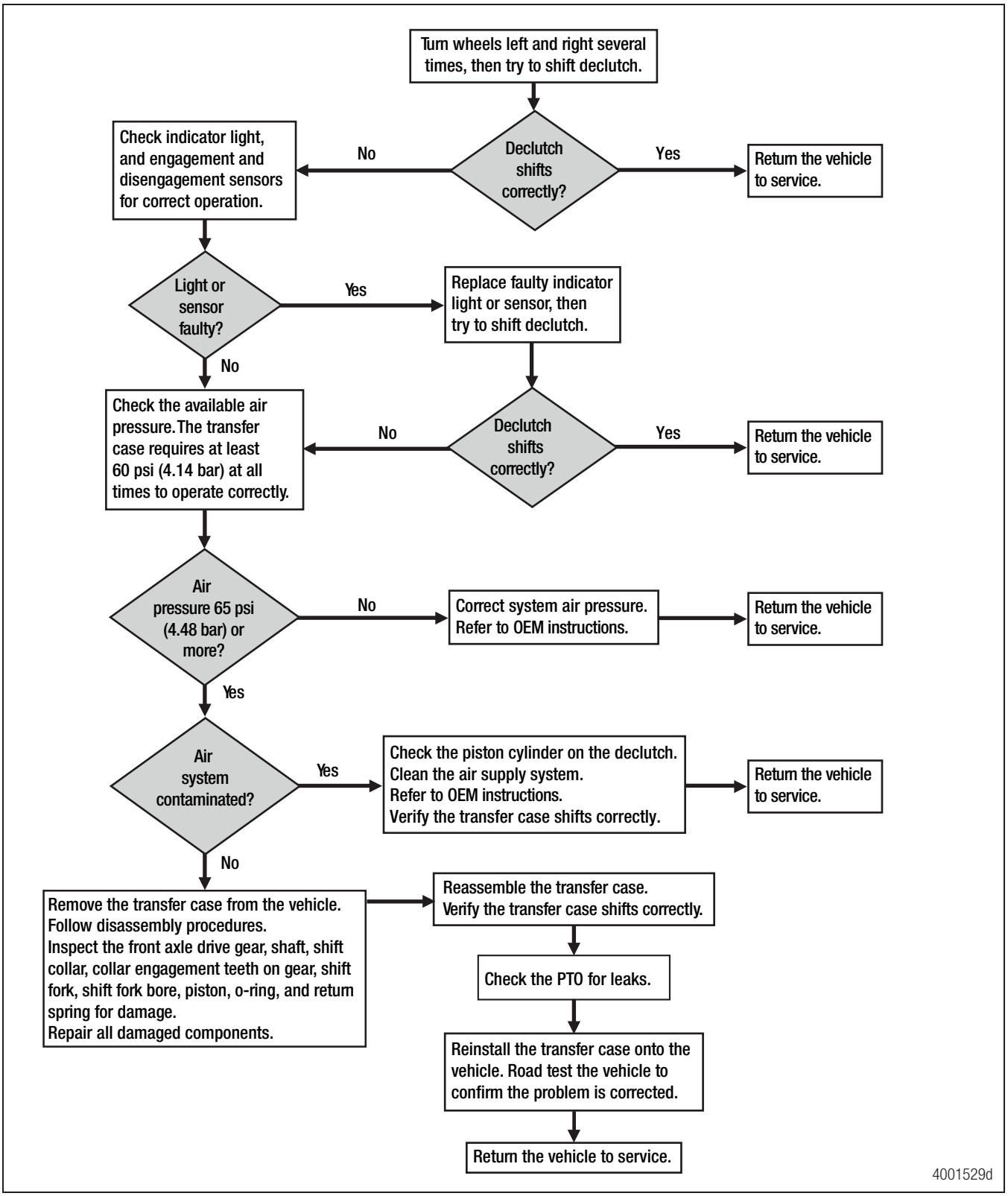


Figure 10.5

10 Troubleshooting

High/Low Gear Shifting Diagnostics

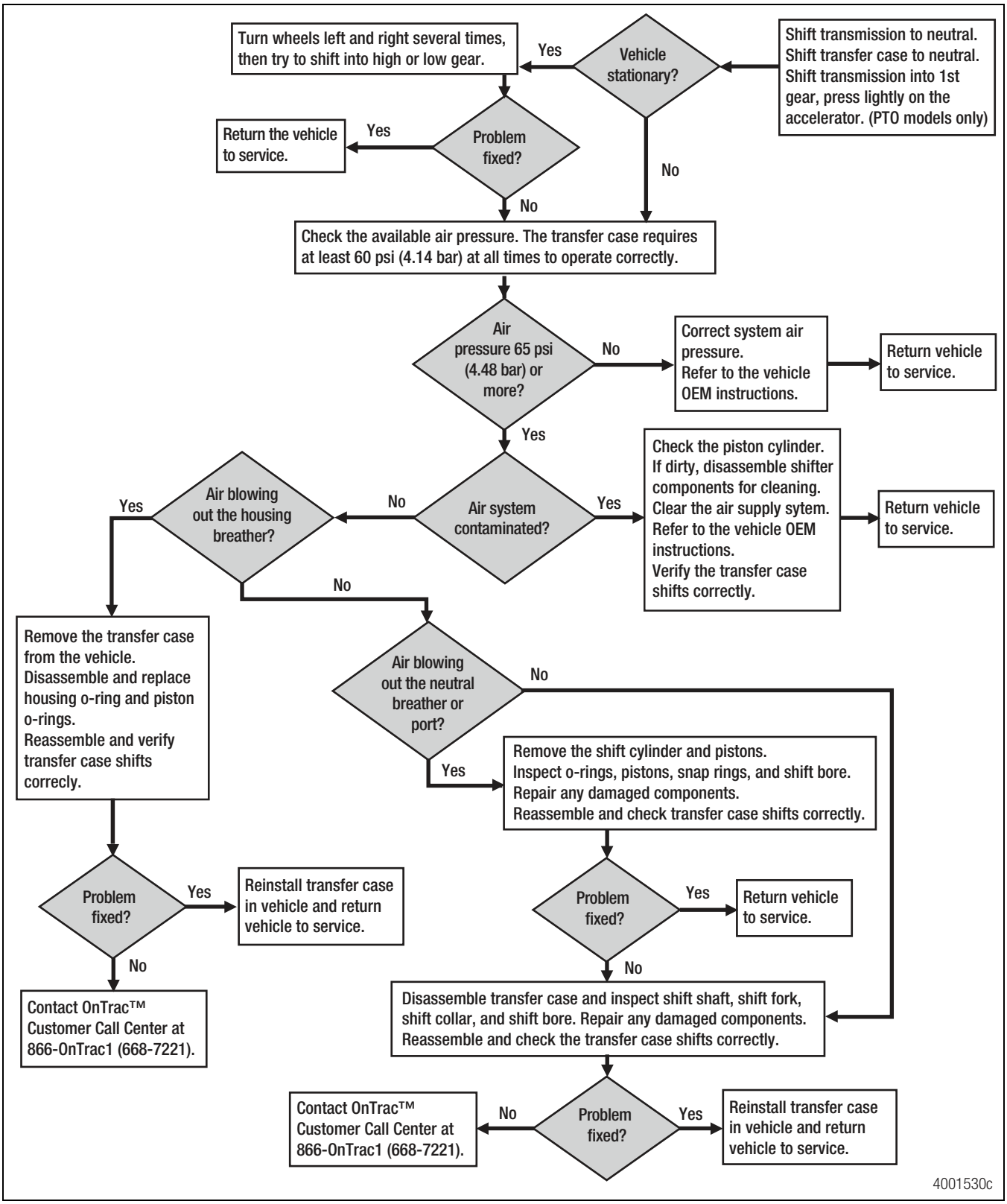


Figure 10.6

Lubrication and Maintenance

Hazard Alert Messages

Read and observe all hazard alert messages in this publication.

⚠ WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance or service.

For complete lubrication information for Meritor's transfer cases, refer to Maintenance Manual MM-1, Preventive Maintenance and Lubrication. To obtain a copy of this publication or access it on Meritor's website, refer to the Service Notes page on the inside front cover of this manual.

Lubricant Temperatures

Meritor MTC-4208, MTC-4210, and MTC-4213 Series Transfer Cases

⚠ CAUTION

Meritor MTC-4208, MTC-4210, and MTC-4213 Series transfer cases may operate with an oil temperature above 250°F (121°C). However, if the oil temperature reaches 300°F (149°C), stop the vehicle immediately. Check for the cause of overheating to prevent damage to components.

Meritor Transfer Cases can operate with an oil temperature above 250°F (121°C). However, if the oil temperature reaches 300°F (149°C), stop the vehicle immediately. Check for the cause of overheating to prevent damage to components.

Do Not Install API GL-5 Oils

⚠ CAUTION

Meritor does not approve petroleum-based and multi-viscosity oil. NEVER install API GL-5 oils, which contain extreme-pressure (EP) additives. These additives can form sludge at normal operating temperatures. Damage to components can result. Use only SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81, in the transfer case.

NEVER install API GL-5 oils in a transfer case. This specification contains extreme pressure (EP) additives that can form sludge at normal operating temperatures and damage transfer case components.

Petroleum-Base and Multi-Viscosity Oils

Meritor does not approve the use of petroleum-base and multi-viscosity motor oils. Refer to Maintenance Manual MM-1, Preventive Maintenance and Lubrication.

Meritor does approve the use of synthetic-base oils.

Operating Information

Magnets and Magnetic Drain Plugs

Most Meritor transfer cases are equipped with magnetic drain plugs with a minimum pick-up capacity of 20 ounces (0.57 kg) of low carbon steel. Reinstall the magnetic drain plug each time the oil is changed. Use the correct part. If a pipe plug is used instead of a drain plug, the pipe plug will leak.

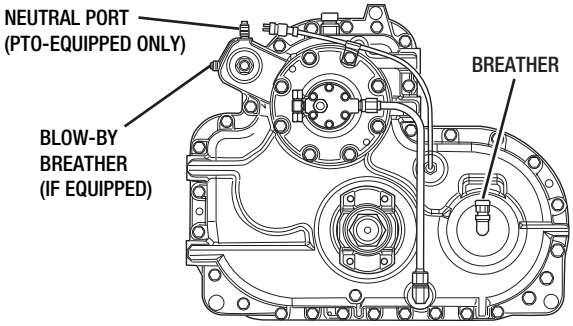
Drain plugs can be reused if it has a minimum pick-up capacity of 20 ounces (0.57 kg) of low carbon steel after it has been cleaned.

Breather

⚠ CAUTION

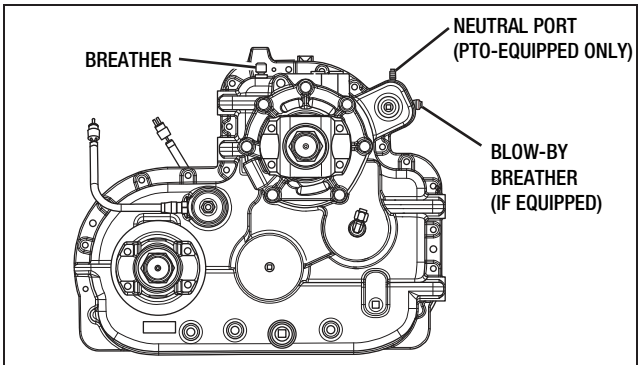
Close or cover all openings, including breather, oil drain, and speed sensor, before steam cleaning. Steam can cause component damage.

The breather releases pressure that builds up inside the transfer case during vehicle operation. Figure 11.1, Figure 11.2, and Figure 11.3.



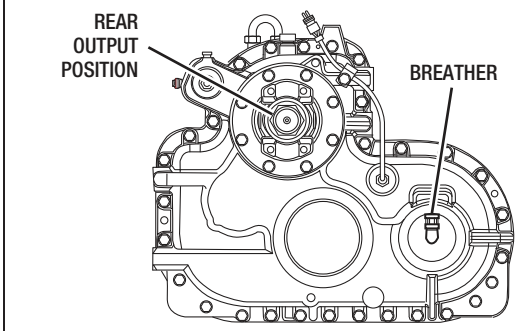
MTC-4208XL AND MTC-4210XL REAR COVER 4007127a

Figure 11.1



MTC-4208XLEV/XLEC AND
MTC-4210XLEV/XLEC REAR COVER 4011824a

Figure 11.2



MTC-4213X REAR COVER 4004233g

Figure 11.3

Seals

⚠ CAUTION

Always use the correct tools and procedures when replacing seals to prevent incorrect installation and help prevent seals from leaking. Seals keep lubricant in and dirt out of a component. When they are worn or damaged, seals leak and produce low lubricant levels, which may damage components.

Always replace unitized seals after yokes have been removed. MLS seals may be reused if they are not damaged or leaking.

Meritor has released the multiple-lip seal (MLS) for use in the INPUT POSITION ONLY on the MTC-4208, MTC-4210, and MTC-4213 transfer cases. The multiple-lip seal is compatible with the current input shaft seal and can be used in service. Refer to Figure 11.4 for the INPUT position and front OUTPUT position. Refer to Figure 11.1 for the MTC-4208 and MTC-4210 rear OUTPUT position. Refer to Figure 11.3 for the MTC-4213 rear OUTPUT position.

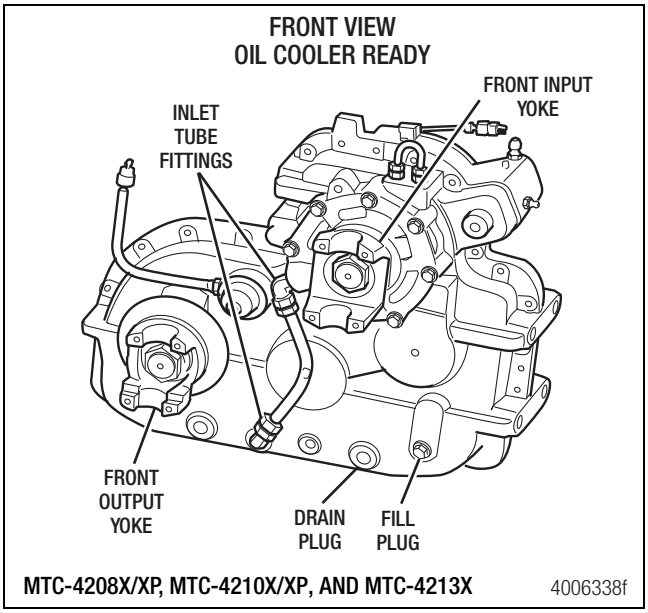


Figure 11.4

⚠ CAUTION

Only install the Meritor multi-lip unidirectional seal at the input position from the transmission in an MTC-4208, MTC-4210, or MTC-4213 Series transfer case. If the multi-lip seal is installed in either the rear output position or forward output position on these transfer cases, loss of lubricant and damage to components can occur.

The multiple-lip seal must be serviced with the seal and sleeve. The service part number provides both when required. Check the application carefully before installing the multiple-lip seal.

Oil Fill Procedure

⚠ CAUTION

Only use new lubricant when changing or adjusting the oil in the transfer case. NEVER reuse lubricant, which can contain metallic particles and other contaminants. Damage to components can result.

⚠ CAUTION

Meritor does not approve petroleum-based and multi-viscosity oil. NEVER install API GL-5 oils, which contain extreme-pressure (EP) additives. These additives can form sludge at normal operating temperatures. Damage to components can result. Use only SAE Grade full-synthetic 40W or 50W oil, Meritor specification O-81, in the transfer case.

⚠ CAUTION

When servicing the transfer case, add the specified lubricant until the oil level is even with the bottom of the fill hole. NEVER overfill the transfer case, which can cause the transfer case to overheat. Damage to components can result.

⚠ CAUTION

NEVER operate the transfer case if the oil level is below the bottom of the fill hole, which may be an indication that the transfer case is leaking. Damage to components can result. If the transfer case is leaking, repair the leak. Adjust the oil level before returning the transfer case to service.

NOTE: Meritor recommends the oil cooler lines should be routed to prevent oil flow back into the transfer case sump. This can be accomplished by routing lines with a P-trap configuration for both the oil cooler inlet and outlet lines. Failure to do so may result in the oil draining back in to the transfer case sump, giving the appearance of an over filled transfer case when checking and adjusting the oil level.

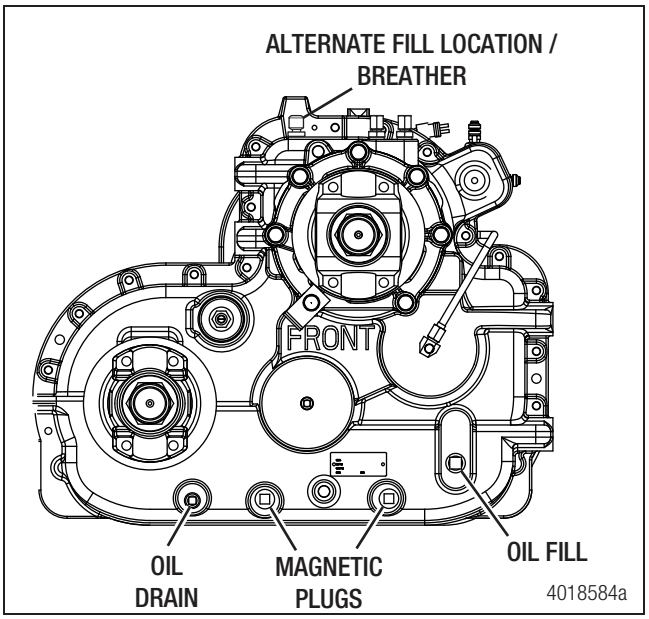


Figure 11.5

NOTE: The transfer case oil fill volume does not account for the external cooling system. If this is a maintenance oil change, where the cooling system is not drained, the additional cooling system volume does not need to be added to the transfer case.

1. Fill the transfer case to the bottom of the oil fill plug opening. See "Table G: Transfer Case Oil Specifications" on page 102.
2. After filling the transfer case, apply Loctite® 592 or equivalent to the oil fill plug and tighten to 38 lbs-ft (52 Nm).
3. If cooling system drain-back has occurred, add the cooling circuit quantity through the alternate fill location / breather hole.
4. Complete the "Pump Priming and Pressure Check Procedure" on page 100.

Pump Priming and Pressure Check Procedure

For MTC-4213 models, the pressure check procedure is not necessary.

Pump priming pushes lubricant through the pump and cooling system lines. It is important during this procedure that the oil volume for both the transfer case AND the cooling system be added to the transfer case. Please reference OEM documentation for the cooling system volume. Before the priming procedure is started, the volume of the cooling system must be added through the alternate fill location / breather hole. Figure 11.5.

NOTE: At this point the transfer case oil level will be higher than the bottom of the primary oil fill hole. After priming is completed, this level will drop. Check the oil fill level in the transfer case and ensure it is to the bottom of the fill hole.

For units with a external rear-mounted oil pump, monitor the oil pressure during the priming procedure.

1. Install a pressure gauge to the diagnostic port using a suitable adapter. For XL/XLEV use the diagnostic port shown in Figure 11.6. For XLEC use the diagnostic port shown in Figure 11.7.
2. Use one of the following methods to test the oil pump pressure:
   - **Test Drive:** Install the gauge on a hose long enough to position the gauge inside the vehicle cab and road test the vehicle for at least two miles (3.2 km), at a speed of at least 30 mph (48 km/h).
   - **Stationary:** If the transfer case is not equipped with a neutral range shift, remove the rear drive shaft from the transfer case rear output yoke. Place the transfer case in high range, 2-wheel drive, and the transmission in 4th gear (1:1 ratio), and run the engine at least 400 rpm for 20 seconds.

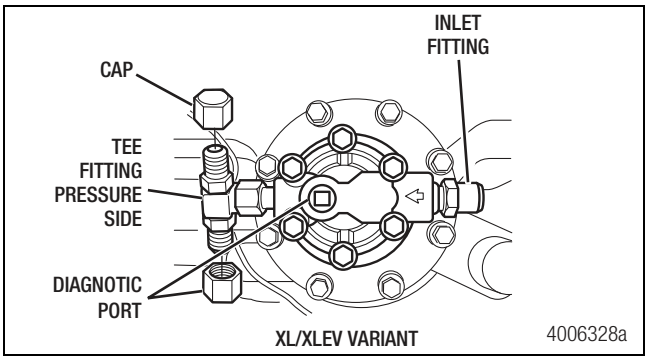


Figure 11.6

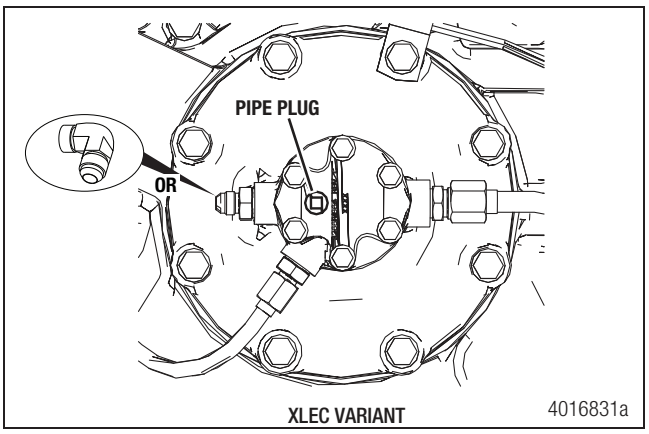


Figure 11.7

⚠ CAUTION

When performing an oil pump pressure diagnostic check, road test the system for two miles (3.2 km). If the oil pressure is not at required pressure after two miles, turn the vehicle OFF. Do not repeat the road test. Damage to components can result. Call the Meritor OnTrac™ Customer Call Center at 866-668-7221 for assistance.

NOTE: System pressure can be in excess of 75 psi (5.17 bar). Use an appropriate pressure gauge.

3. Check the oil pump pressure to verify it has reached 10 psi (0.69 bar) for XLEC (Figure 11.7) or 3 psi (0.21 bar) for XL/ XLEV (Figure 11.6).

   - A positive pressure at or above these ranges indicates that the pump and oil cooler system are correctly primed.
   - If the pressure is lower than these ranges, turn the vehicle off. Do not repeat the test or damage to components can result. Recheck the oil fill level at the transfer case fill port on the front case. Ensure the oil is at the bottom of the fill hole. Check that the hose and fittings are tight and no leaks are evident.

4. Remove the pressure gauge and fitting from the diagnostic port.

5. If the pipe plug was removed, apply Loctite® 592 or equivalent pipe sealant to the pipe plug and reinstall it into the diagnostic port of the pump cover. Using a 1/4" square drive, tighten the pipe plug to 15 lbs-ft (20 Nm). If the diagnostic port on the tee fitting, reinstall the cap.

⚠ WARNING

Use caution checking the oil level as it may be hot.

6. Check the oil fill level in the transfer case within 15 minutes of priming. Use caution when removing the oil fill plug as the oil may be hot.

   NOTE: The oil level may be higher than the oil fill plug after 15 minutes due to drain back from the cooling system.

7. Apply Loctite® 592 or equivalent to the oil fill plug, install, and tighten to 38 lbs-ft (52 Nm).

Transfer Case Inspection

Visually inspect the transfer case daily for any leaks. The oil level should be inspected every 1,000 miles (1069 km), 100 hours or every month, whichever comes first. In addition, the transfer case should be inspected for leaks and the correct oil level before and after extended time high speed road trips. Areas to inspect include:

- Cooler lines and fittings
- Seals
- Breather
- Fill and drain plugs
- Pump inlet tube and fittings
- Gaskets and shims
- During the inspection visually check to ensure the transfer case oil level is to the bottom of the oil fill hole.

Operation	Frequency
Inspect for oil leaks	Daily
Check oil level	Check oil level 1,000 miles (1609 km), 100 hours, or every month, whichever occurs first
	Before and after extended time high speed road trips
Initial oil change	2,500 miles (4000 km) or 125 hours, whichever occurs first
Synthetic oil change	Every 25,000 miles (40 000 km), 1,250 hours, or every 12 months, whichever occurs first

Table G: Transfer Case Oil Specifications

Oil Description [1] [2]	Full-Synthetic Oil [3]	A.P.I. GL-5 (Axle Lube) [4]
Meritor Specification	O-81	DO NOT USE IN TRANSFER CASES
A.P.I. Specification	—	
Military Specification	SAE J2360	
SAE Grade	40W	
Outside Temperature	Above -40°F (-40°C)	

1 Do not mix or switch oil types. Use the same oil that initially filled the transfer case.

2 Do not use multi-viscosity oils.

3 Meritor-approved full-synthetic oil for Meritor manual transmissions is also approved for Meritor transfer cases. Use synthetic oil only if the transfer case was initially filled with synthetic oil.

4 Do not use multi-viscosity (i.e., 80/90W) GL-5 Gear Oil, axle lube.

- Do not mix or switch oil types. Use the same oil that initially filled the transfer case. Use synthetic oil only if the transfer case was initially filled with synthetic oil.
- Any Meritor-approved full synthetic oil for Meritor manual transmissions is also approved for Meritor transfer cases.

⚠ CAUTION

Transfer case input speed requirements apply. Damage to the transfer case can occur if TP-9441 requirements are not followed.

⚠ CAUTION

Transfer case oil fill volumes do not include additional oil needed to fill the OEM oil cooler and lines. The transfer case oil fill volumes listed below are for reference only. Fill to the bottom of the oil fill hole for proper oil level.

Table H: Transfer Case Oil Fill Volumes*

Model	Pints (Liters)
MTC-4208X	13.25 (6.27)
MTC-4208XLEC	13.50 (6.39)
MTC-4208XLEV	12.50 (5.92)
MTC-4208XP	13.25 (6.27)
MTC-4210X	13.25 (6.27)
MTC-4210XLEC	13.50 (6.39)
MTC-4210XLEV	12.50 (5.92)
MTC-4210XP	13.25 (6.27)
MTC-4213	13.25 (6.27)

*All oil cooler equipped transfer cases will use additional oil to compensate for the cooler and cooler lines. OEM's and vehicle operators must ensure during oil level check and adjustment additional oil is added. See procedure to in this section to check and adjust the oil level for cooler equipped transfer cases.

Table I: Transfer Case Seals and Drivers

Model	Seal Position	Seal Service Part Number	Previous Seal Part Number	Seal Driver	Sleeve Driver
MTC-4208, MTC-4210, and MTC-4213	Input Shaft	A1-1205X2728	A 1205R2592	2728T1	2728T1
MTC-4208 and MTC-4210	Forward and Rear Output	R945007	A 1205R2592	KIT 4454	NA
MTC-4213	Forward Output	R945007	A 1205R2592	KIT 4454	NA
	Rear Output	R945010	A 1205Q2591	KIT 4454	NA
MTC-4208 and MTC-4210	PTO Seal	R945008	A 1205P2590	KIT 4454	NA

Torque Specifications

Standard MTC-4213X, MTC-4208XP, and MTC-4210XP

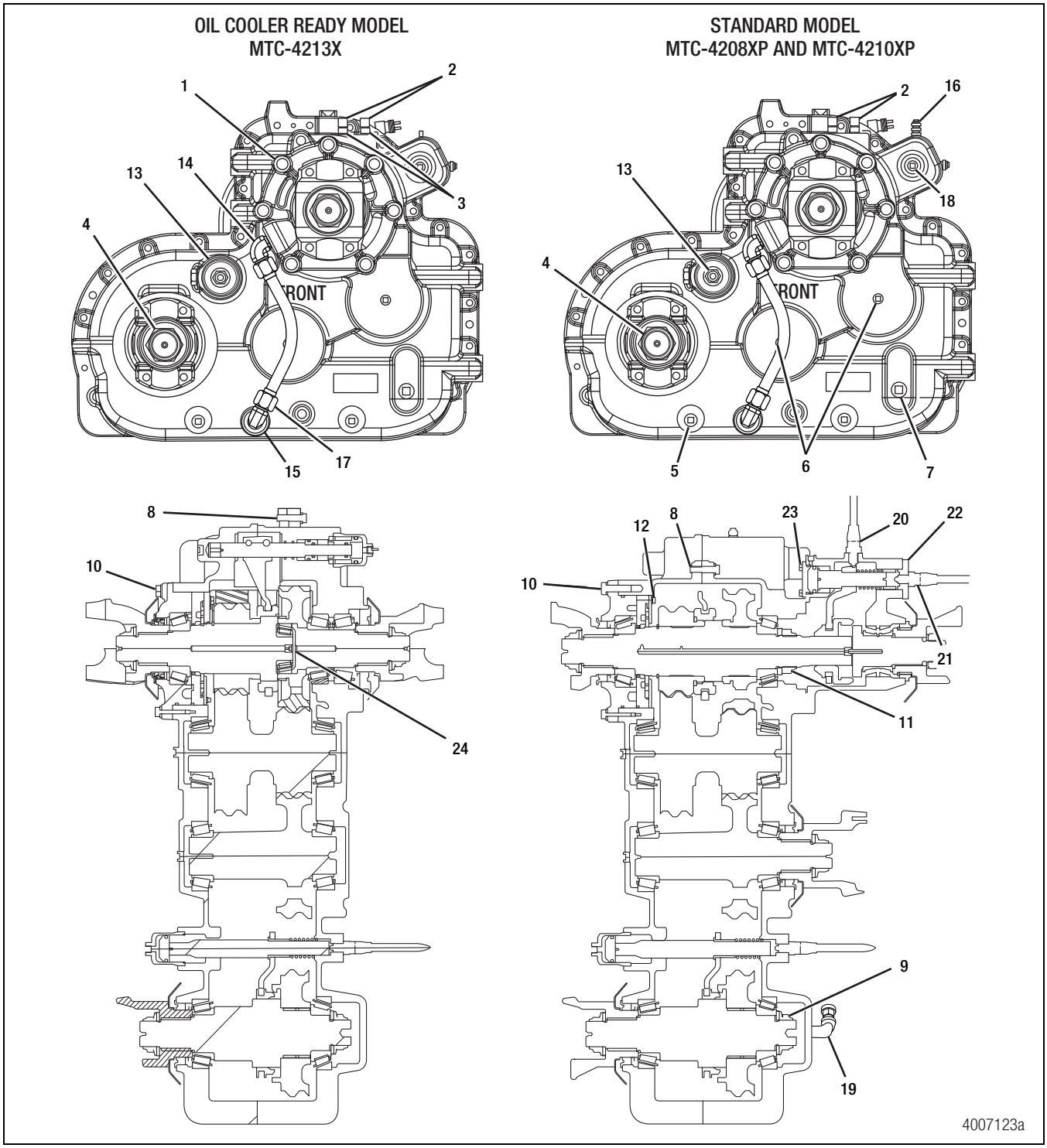


Figure 12.1

12 Specifications

Item	Description	Torque lb-ft (N·m)
1	Bearing Cage Cover Capscrews	85-115 (115-156)
2	Loop Tube Fittings	20 (27)
3	Oil Cooler Male Connectors[1]	25 (34)
4	Yoke Lock Nuts	700-900 (949-1220)
5	Magnetic Drain Plug[2]	35-50 (48-68)
6	3/8" (9.5 mm) Plug[2]	20 (27)
7	Fill Plug[2]	35 (48)
8	Cover-to-Case Capscrews	60-75 (81-102)
9	Shaft Lock Nut	700-900 (949-1220)
10	Bearing Cage Capscrews	85-115 (115-156)
11	Shaft Lock Nut	700-900 (949-1220)
12	Oil Pump Capscrews[3]	22-29 (29-39)
13	Shift Cylinders[4]	80-100 (108-136)
14	Male Connector	35 (49)
15	Fitting — Screen	35-50 (48-68)
16	Neutral Breather/Bushing	10 (14)
17	Female Connector	25 (34)
18	3/8" (9.5 mm) Plug[2]	20 (27)
19	Elbow[2]	20 (27)
20	Fitting	25-30 (34-41)
21	Fitting	25-30 (34-41)
22	Capscrews	10-13 (14-18)
23	Capscrews	10-13 (14-18)
24	Restrictor Plug[2]	15 (20)

1 Apply Loctite® 582 threadlocker to pipe threads
2 Apply Loctite® 592 threadlocker
3 Apply Loctite® 242 threadlocker
4 Apply Loctite® 518 threadlocker to the first three threads

Standard MTC-4208X/XL/XLEV and MTC-4210X/XL/XLEV

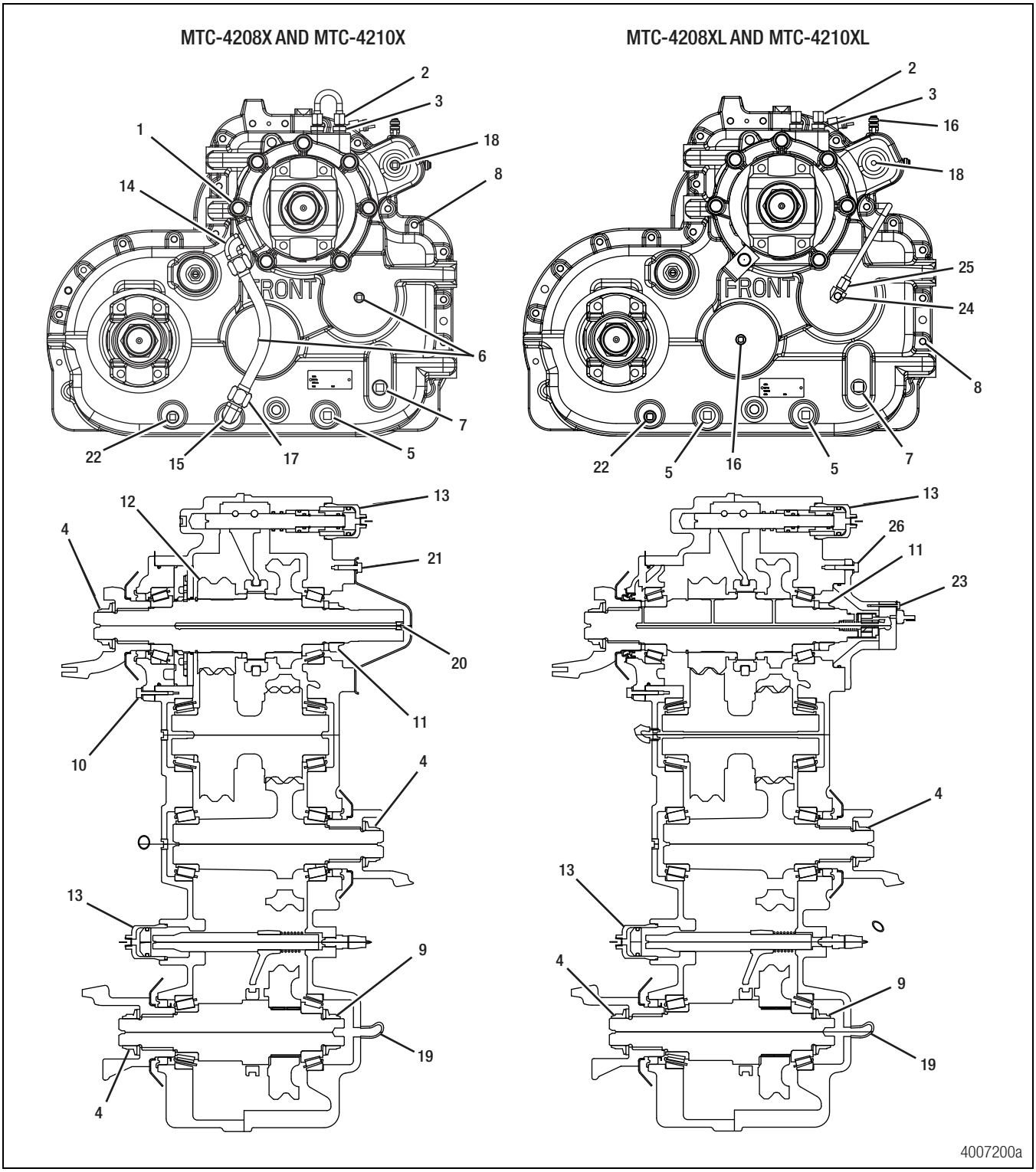


Figure 12.2

12 Specifications

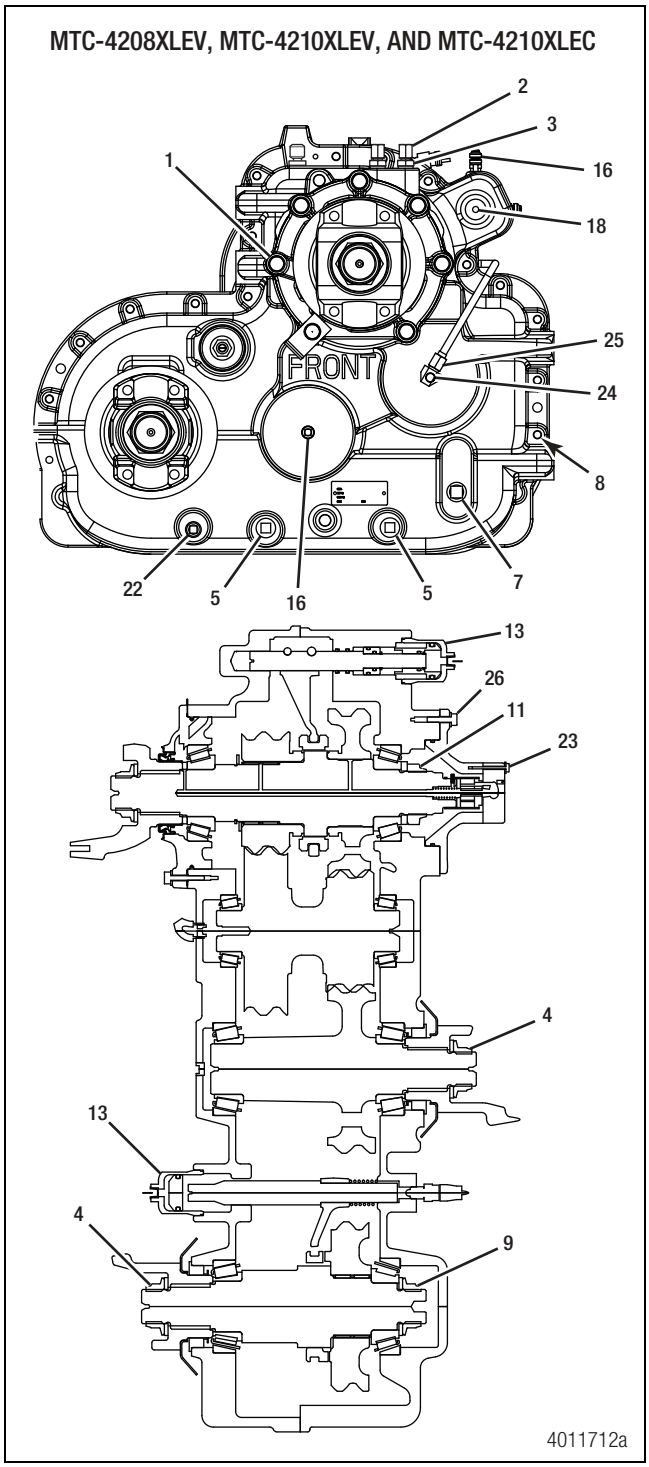


Figure 12.3

Item	Description	Torque lb-ft (N·m)
1	Bearing Cage Cover Capscrews	85-115 (115-156)
2	Loop Tube Fittings	20 (27)
3	Loop Tube Connectors[1]	25 (34)
4	Yoke Lock Nuts	700-900 (949-1220
5	Magnetic Drain Plug[2]	35-50 (48-68)
6	3/8" (9.5 mm) Plug[2]	20 (27)
7	Fill Plug[2]	35 (48)
8	Cover-to-Case Capscrews	60-75 (81-102)
9	Shaft Lock Nut	700-900 (949-1220)
10	Bearing Cage Capscrews	85-115 (115-156)
11	Shaft Lock Nut	700-900 (949-1220)
12	Oil Pump Capscrews[3]	22-29 (29-39)
13	Shift Cylinders[4]	80-100 (108-136)
14	Male Connector	35 (48)
15	Fitting - Screen	35-50 (48-68)
16	Neutral Breather/Bushing	10 (14)
17	Female Connector	25 (34)
18	3/8" (9.5 mm) Plug[2]	20 (27)
19	Elbow[2]	20 (27)
20	Restrictor Plug[2]	15 (20)
21	7/16 x 1.75 PTO Cover Capscrews	60-75 (81-102)
22	Plug	25 (34)
23	Oil Pump Cover Capscrews[3]	10-13 (14-18)
24	Elbow	20 (27)
25	Connector	20 (27)
26	Pump Housing Capscrews	60-75 (81-102)

1 Apply Loctite® 582 threadlocker to pipe threads
2 Apply Loctite® 592 threadlocker
3 Apply Loctite® 242 threadlocker
4 Apply Loctite® 518 threadlocker to the first three threads

Table J: Transfer Case Dry Weight

Unit	Weight lbs (kg)
Base Model	670 (304)
PTO	65 (29.5)

NOTE: The transfer case filled with lubricant weighs approximately 750 lbs (340.2 kg) without the PTO.

Vehicle Towing Instructions

⚠ CAUTION
Follow towing procedures recommended by Meritor to prevent internal damage to the transfer case.

Meritor recommends using one of the two methods below when towing to prevent damage to the transfer case.

NOTE: For complete towing information and instructions on axle shaft removal, refer to Technical Bulletin TP-9579 - Driver Instruction Kit.

METHOD 1:
Remove both axle shafts from the axles that will remain on the road when the vehicle is transported.

METHOD 2:
Remove the drive shafts from axles that contact the ground.

Tools

The following section provides details of tooling to facilitate service of the transfer case. Service tools may be manufactured using these drawings or contact Meritor for a price and delivery quotation. The manufacture of these tools should be carried out by professional machinists and certified welders, following typical good workmanship procedures and safe practices.

Holding Fixture (905473-140)

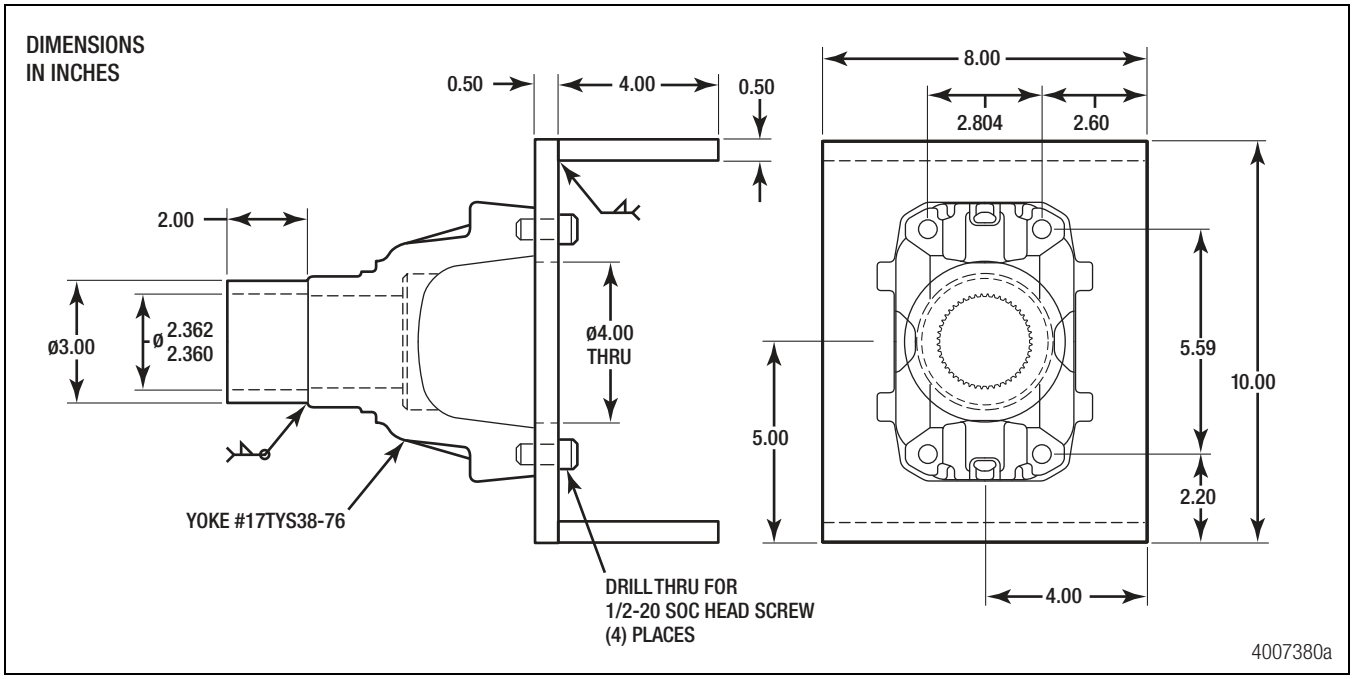


Figure 14.1

Bearing Cone Driver (905473-92)

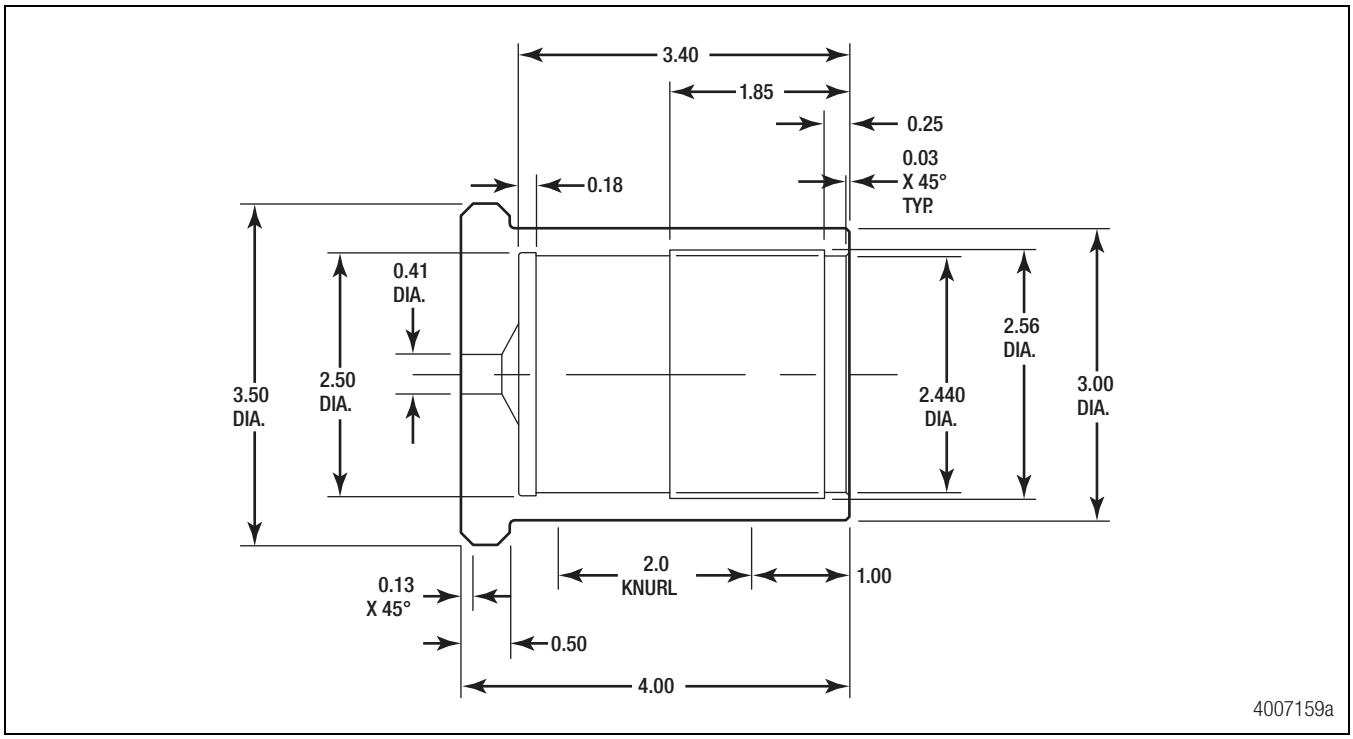


Figure 14.2

Bearing Driver (4FI20-27110-000008)

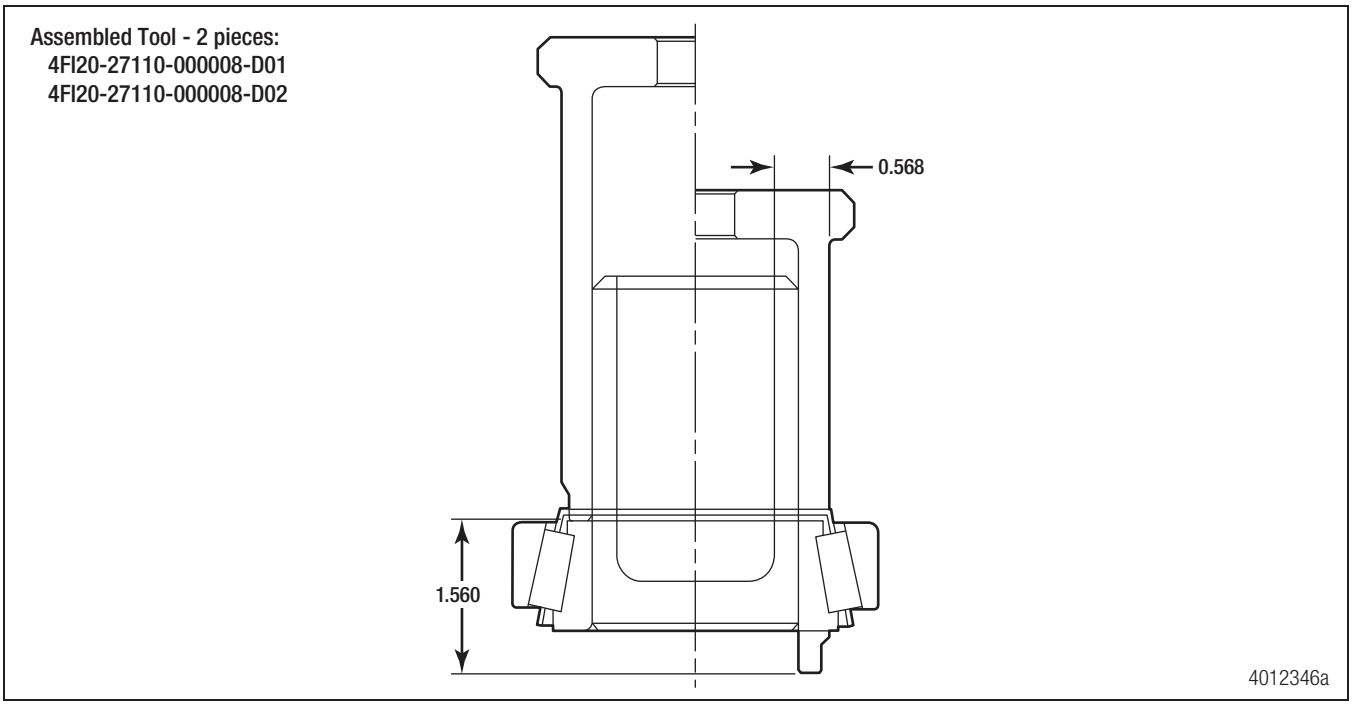


Figure 14.3

Bearing Driver (4FI20-27110-000008-D01)

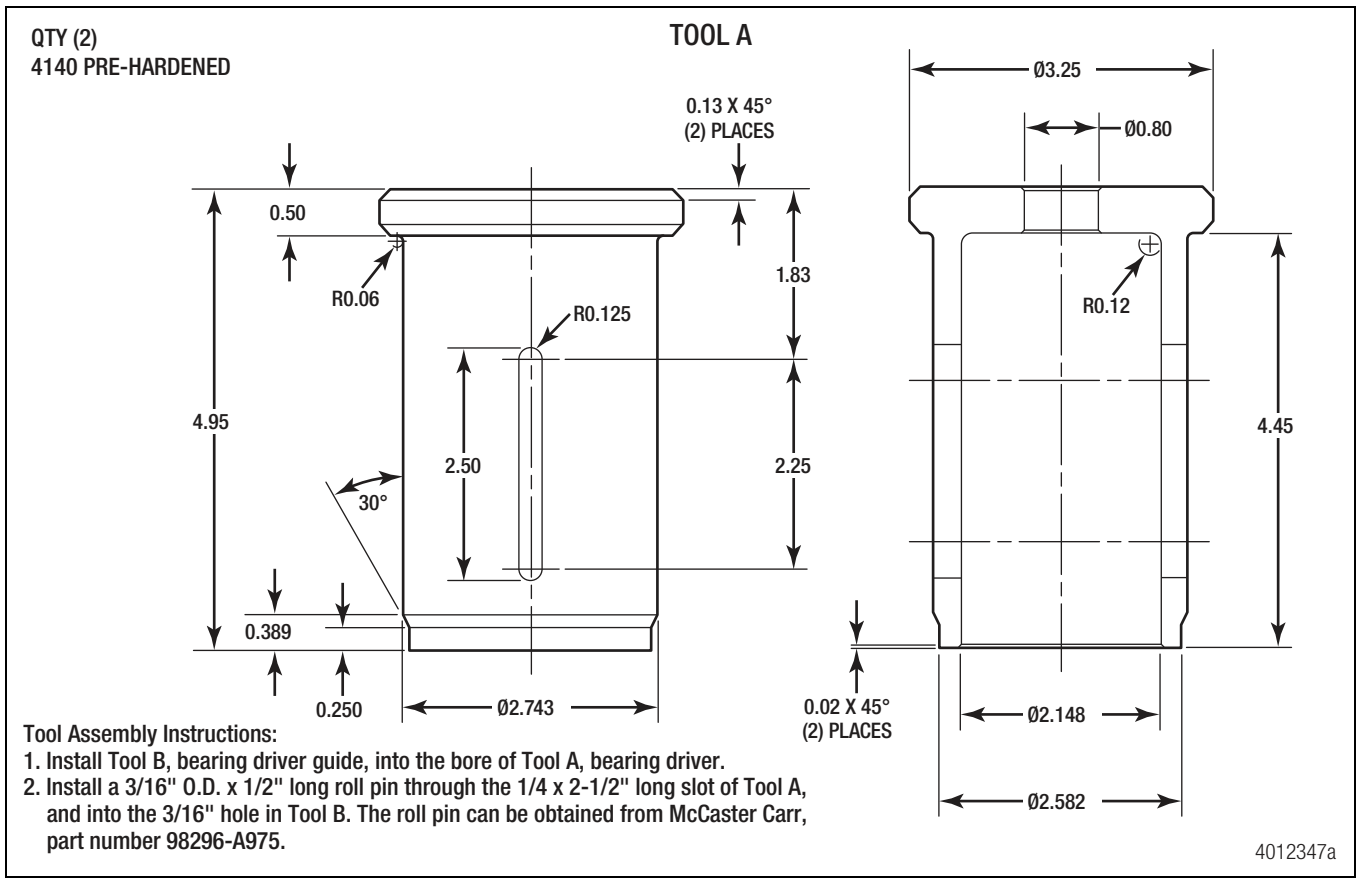


Figure 14.4

Bearing Driver Guide (4FI20-27110-000008-D02)

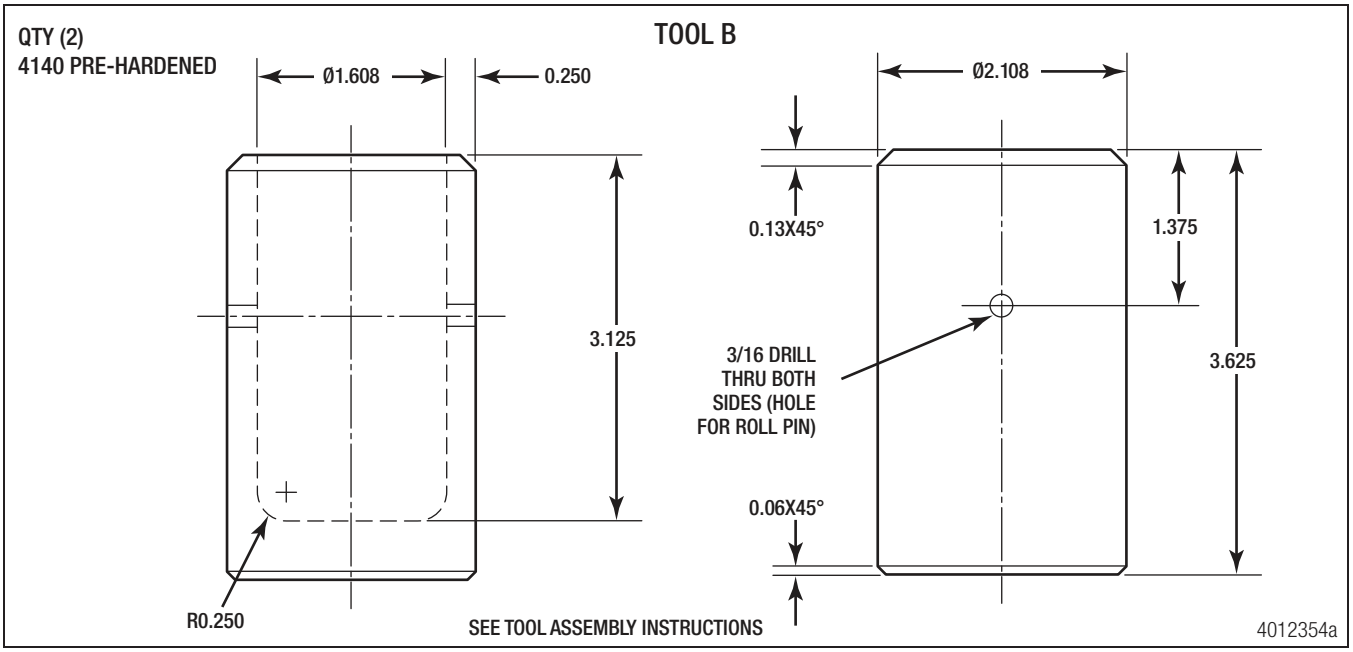


Figure 14.5

Bearing Cone Driver (905473-82)

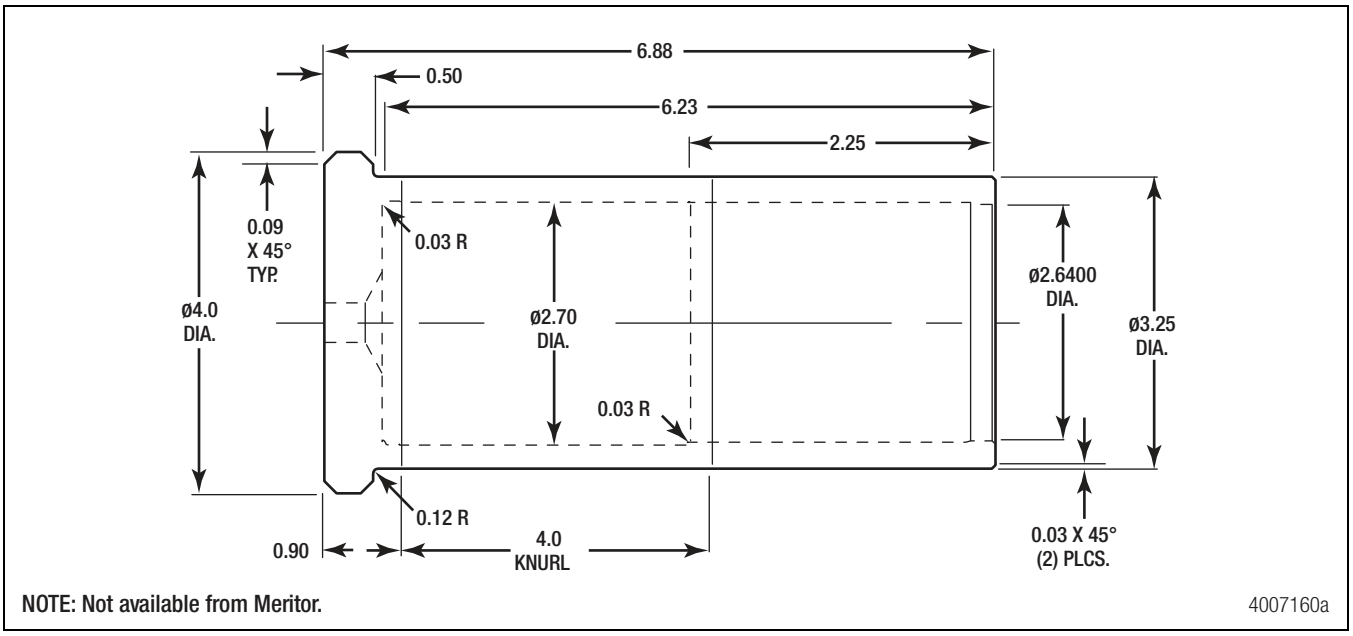


Figure 14.6

Bearing Cup Driver (910203-36)

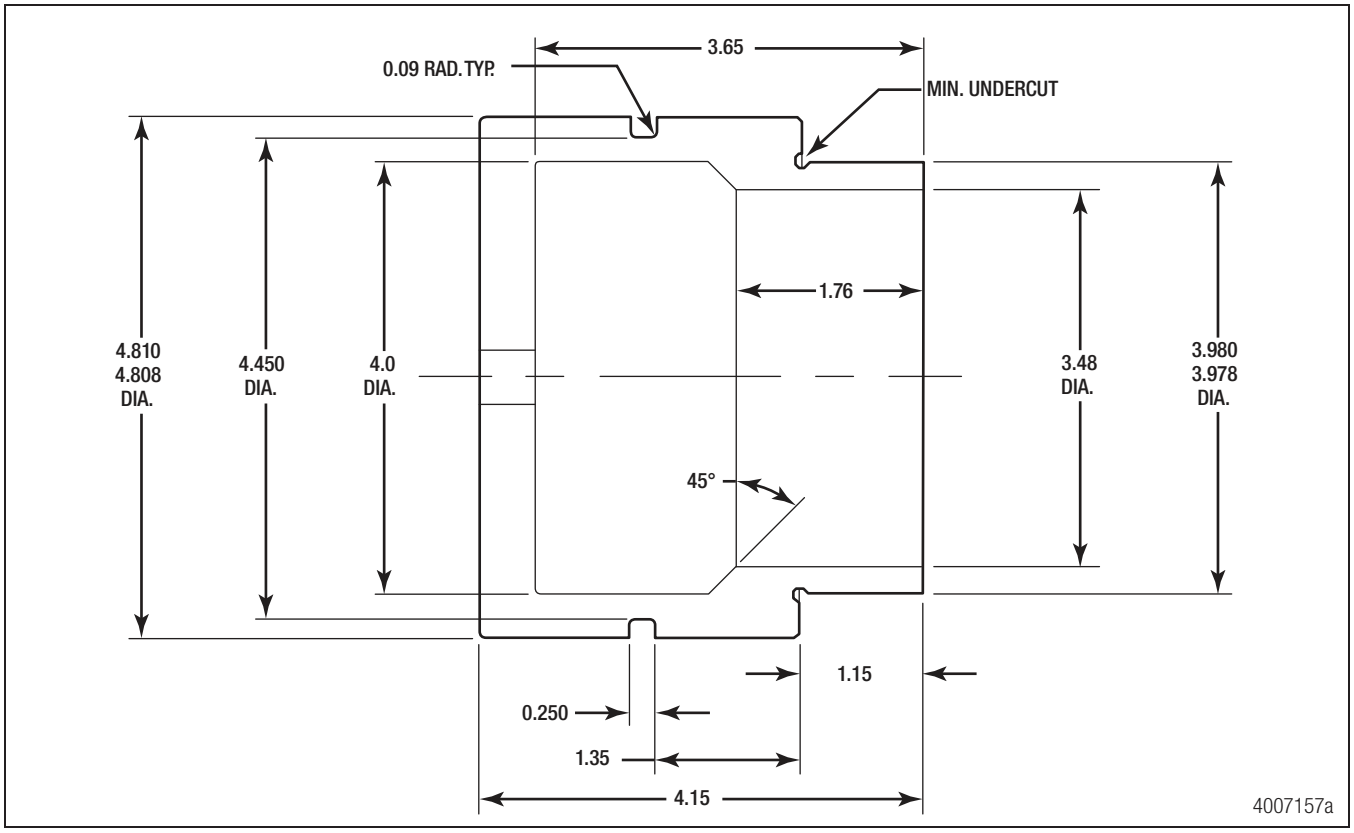


Figure 14.7

Bearing Cup Driver (4FI20-27110-000007)

4FI20-27110-000007-D01

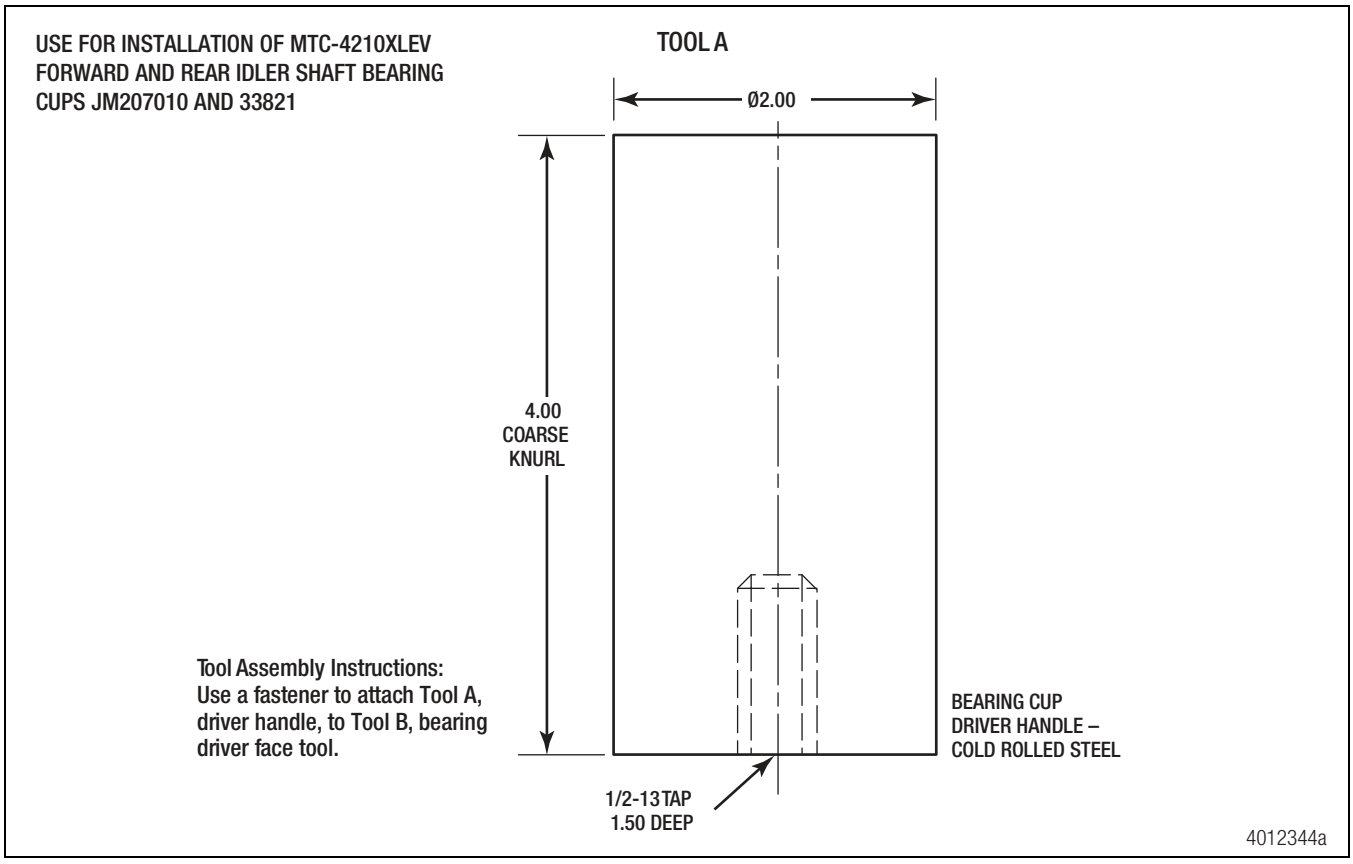


Figure 14.8

4FI20-27110-000007-D02

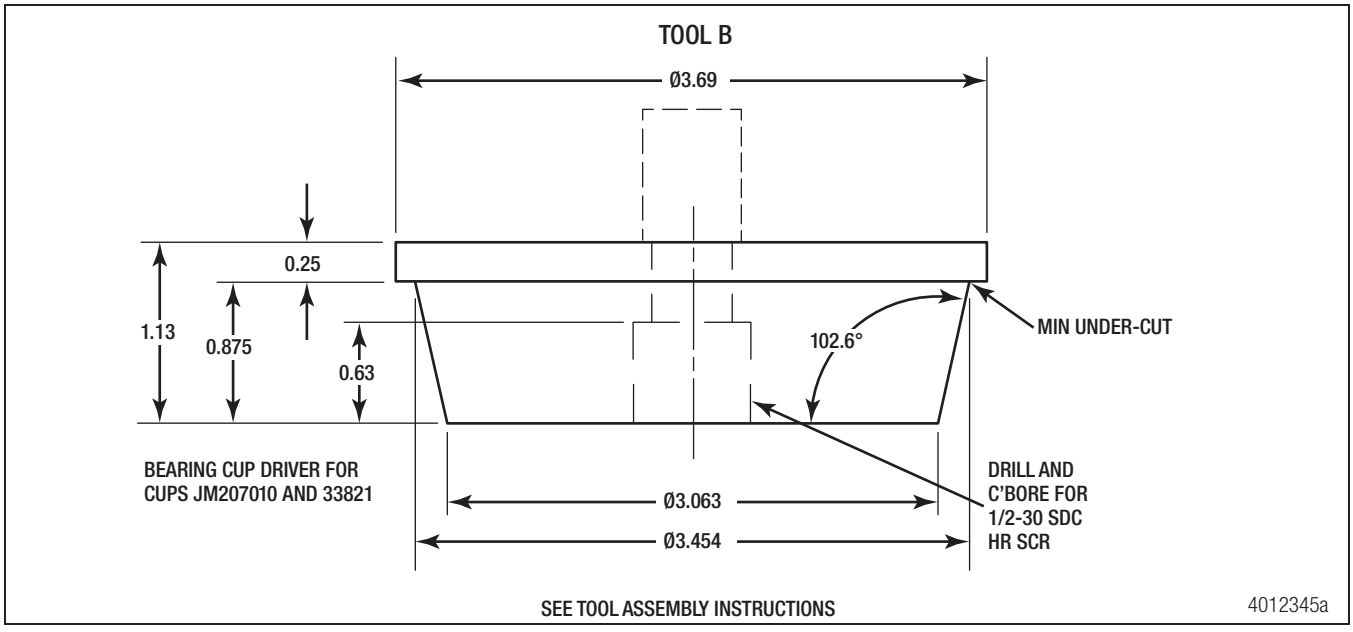


Figure 14.9

Bearing Cup Driver (910203-37)

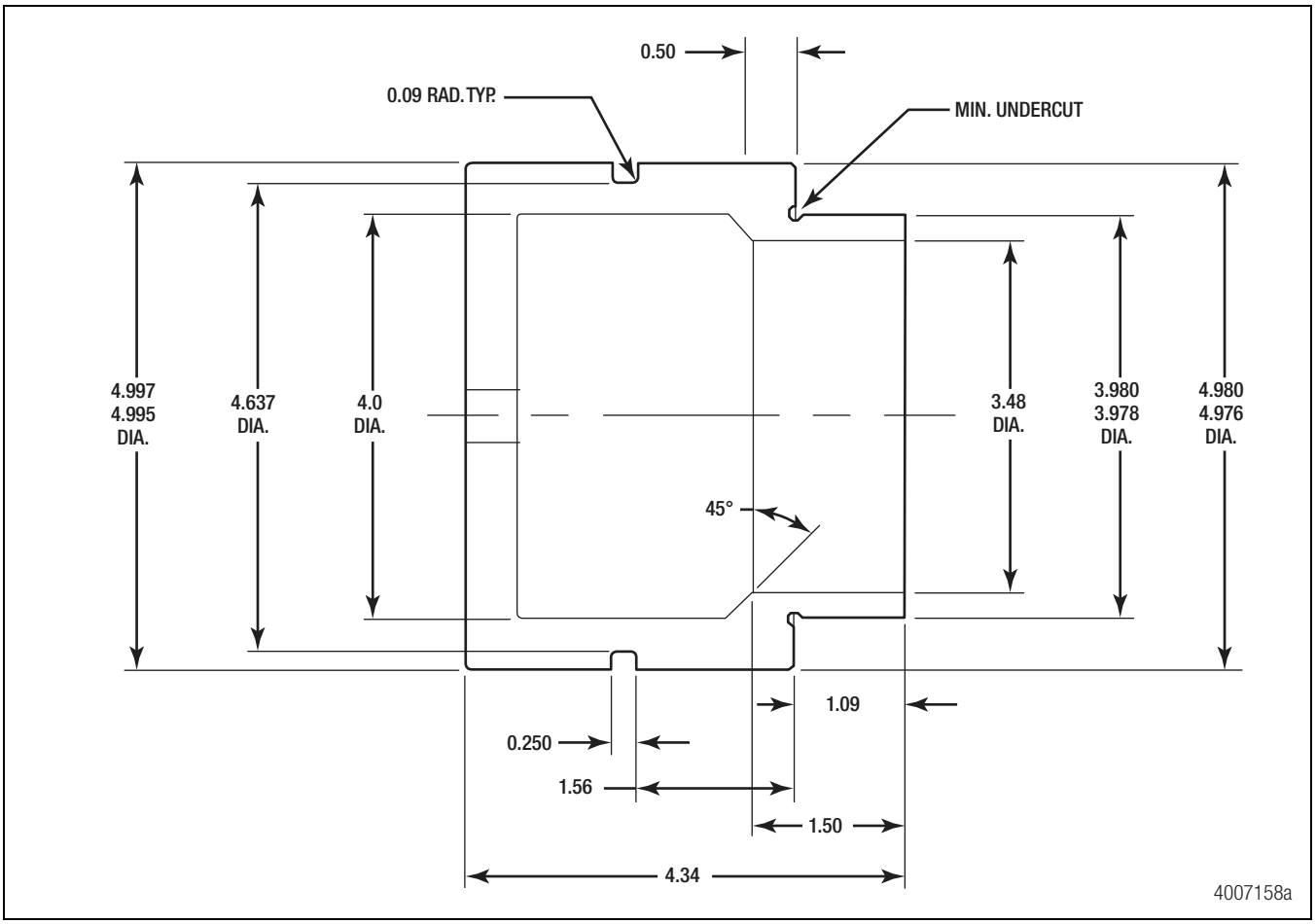


Figure 14.10

PTO Bearing Cone Driver

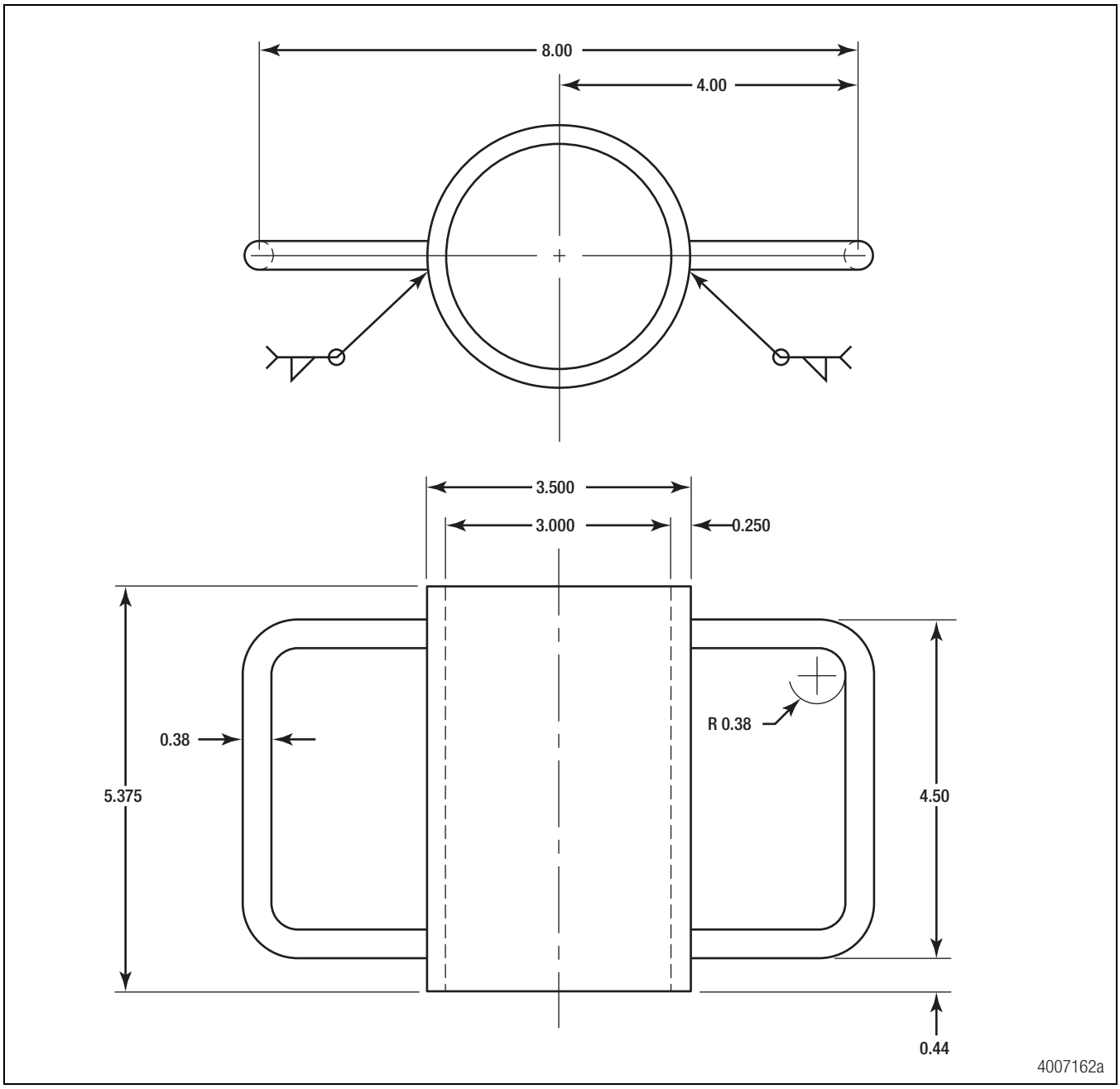


Figure 14.11

Modified Bearing Cup Puller

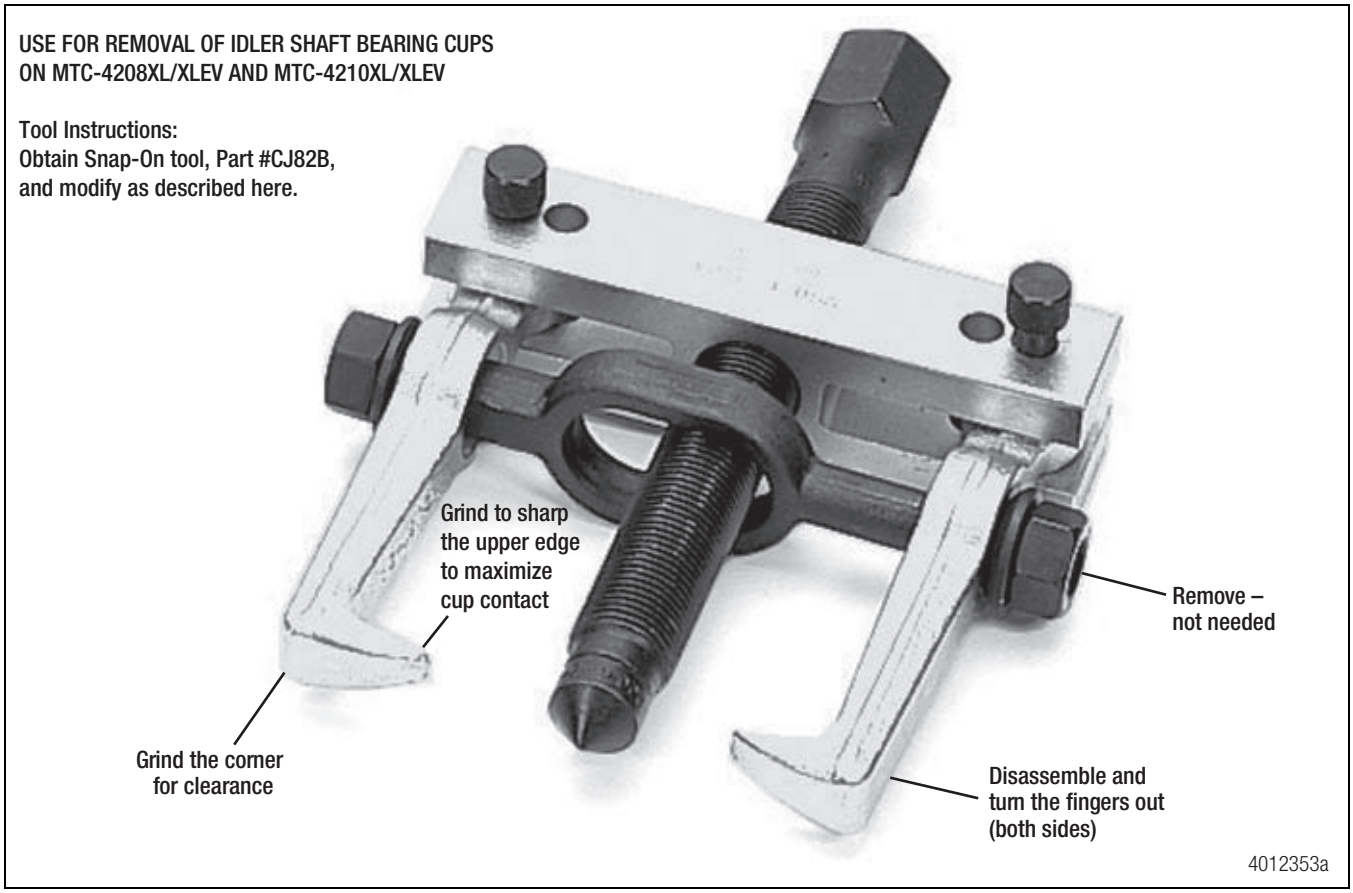


Figure 14.12

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