



Meritor MTC3124 / Fabco (T-2119) Transfer Case Service Manual

Pro Gear Meritor MTC3124 / Fabco (T-2119) Transfer Case Service Manual to assist in identifying your Meritor / Fabco unit.

If you need any assistance identifying the correct transfer case unit for your truck and equipment, contact your Meritor / Fabco replacement part specialists at Pro Gear and Transmission.

Pro Gear Transmission has same day shipping and 1000's of products in stock and ready to ship internationally for your next project.

For parts or service contact the Meritor / Fabco specialists at Pro Gear & Transmission, Inc.

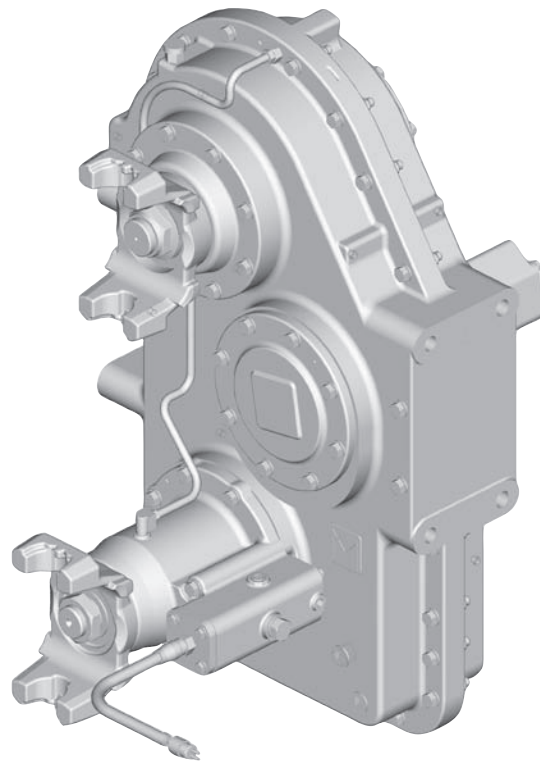
1 (877) 776-4600
(407) 872-1901
parts@eprogear.com

Maintenance Manual MM-01125

Transfer Case

T-2119 Series

Revised 12-08






Before You Begin

This manual provides maintenance and service procedures for Meritor's T-2119 Series transfer cases. Before you begin procedures:

1. Read and understand all instructions and procedures before you begin to service components.
2. Read and observe all Caution and Warning safety alerts that precede instructions or procedures you will perform. These alerts help to avoid damage to components, serious personal injury, or both.
3. Follow your company's maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Safety Alerts, Torque Symbol and Notes

 WARNING	A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.
 CAUTION	A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components and possible serious personal injury can also occur.
	The torque symbol alerts you to tighten fasteners to a specified torque value.
NOTE:	A Note provides information or suggestions that help you correctly service a component.

Access Product and Service Information in the DriveTrain Plus™ by Meritor Tech Library on our Web Site

Enter the following address in your browser's address box. The screen will display an index of publications by category. Bookmark this screen for quick access to the Tech Library.

www.meritor.com/tech_library/home.asp

Additional Information

Call Meritor's Customer Service Center at 800-535-5560 to order the following publications.

- Lubrication (Maintenance Manual 1)
- Transfer Case (Parts Book PB-0145)
- Drivetrain Plus™ by Meritor Technical Electronic Library on CD. Features product and service information on most Meritor and Meritor WABCO products. Order TP-9853.

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.

Section 1: Exploded View	
T-2119 Series Transfer Case	2
T-2119 Series Declutch/PTO	5
Section 2: Introduction	
Description	6
Operation	8
Engaging the Front Axle Declutch	
Engaging and Disengaging the Full-Torque Power Take Off (PTO)	
T-2119 Transfer Case.....	9
Section 3: Removal	
Removal	10
Transfer Case	
Drain the Oil	11
Section 4: Disassembly	
Disassembly	12
Yokes from the Input and Output Shafts	
Pump Assembly and Tubing	
Covers from the Shimmed Case Half	
Declutch/PTO Assembly	
Housing Halves	13
Covers from the Non-Shimmed Case Half	14
Idler Gear, and Input and Output Shaft Assemblies	
Section 5: Prepare Parts for Assembly	
Clean, Dry and Inspect Parts.....	15
Clean Ground and Polished Parts	
Clean Parts with a Rough Finish	
Clean Transfer Case Assemblies	
Dry Cleaned Parts	
Prevent Corrosion	
Inspect Parts.....	16
Section 6: Assembly	
Assembly.....	18
Input Shaft Assemblies	
Bearing Cages and Covers	
Bearing Cages, Cover and Declutch/PTO	19
Input Shaft Assemblies	
Transfer Case Housing.....	20
Remaining Bearing Cages, Covers, Declutch/PTO Housing	21
Check Bearing End Play	22
Declutch/PTO Assemblies.....	23
Front Output Declutch Assembly	25
Front Output Shaft	26
Yoke Installation	
Pump Assembly and Tubing	27
Transfer Case Assembly Test	

Table of Contents



Section 7: Installation

Installation.....	28
Transfer Case in Vehicle	
Check and Adjust Oil Level	
Replace the Oil	
Check the Transfer Case Lubrication Pressure	29

Section 8: Diagnostics

Transfer Case Lubrication Diagnostics.....	30
Excessive Noise and Vibration Diagnostics	32
Declutch/PTO Does Not Engage/Disengage Diagnostics.....	33

Section 9: Lubrication and Maintenance

Lubrication	34
Lubricant Temperatures	
Oil Substitutes	
Operating Information	
Magnets and Magnetic Drain Plugs	
Breather.....	35
Seals	
Temperature Indicator	
Check and Adjust the Oil Level	
Drain and Replace the Oil	36
Transfer Case Oil Change Intervals (Petroleum Oils)	
Transfer Case Oil Specifications	
Transfer Case Oil Change Intervals (Synthetic Oils)	
Transfer Case Oil Capacity.....	37
Dry Weight	

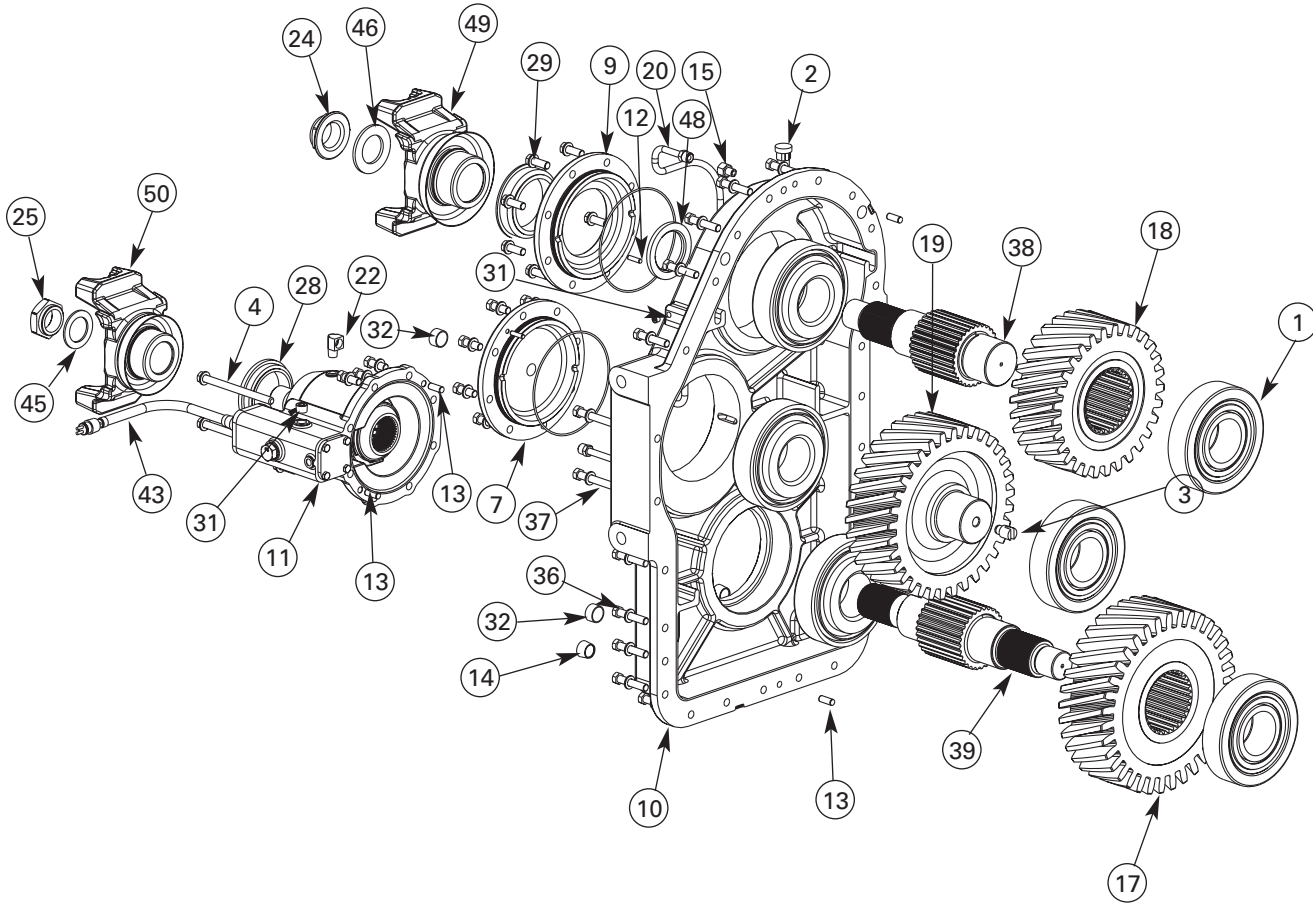
Section 10: Specifications and Applications

Driveline Application Guidelines.....	38
Driveline Length Guidelines	
Maximum Driveline Angle Guidelines	
Optional Equipment	39
Tire Mismatch	41
Application Guidelines.....	42

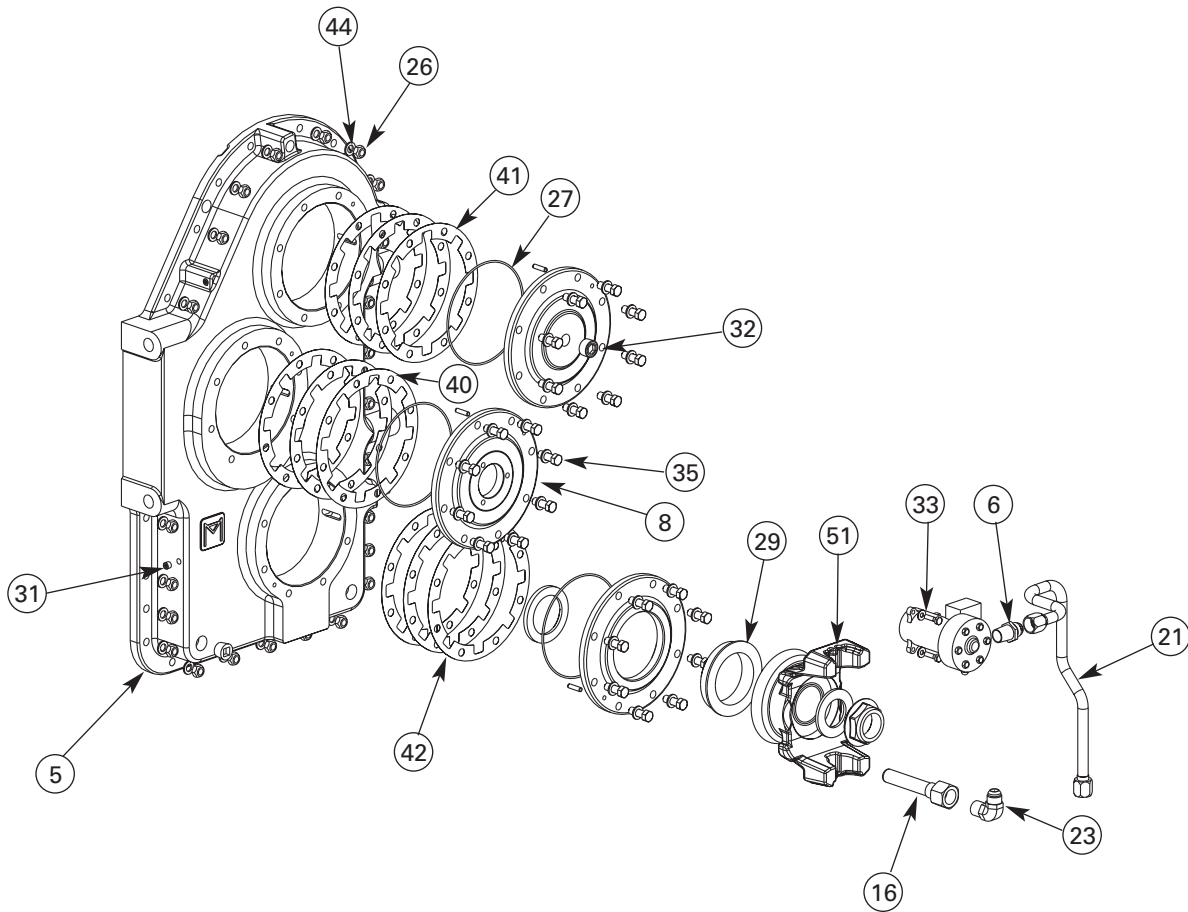
Section 1 Exploded View



T-2119 Series Transfer Case



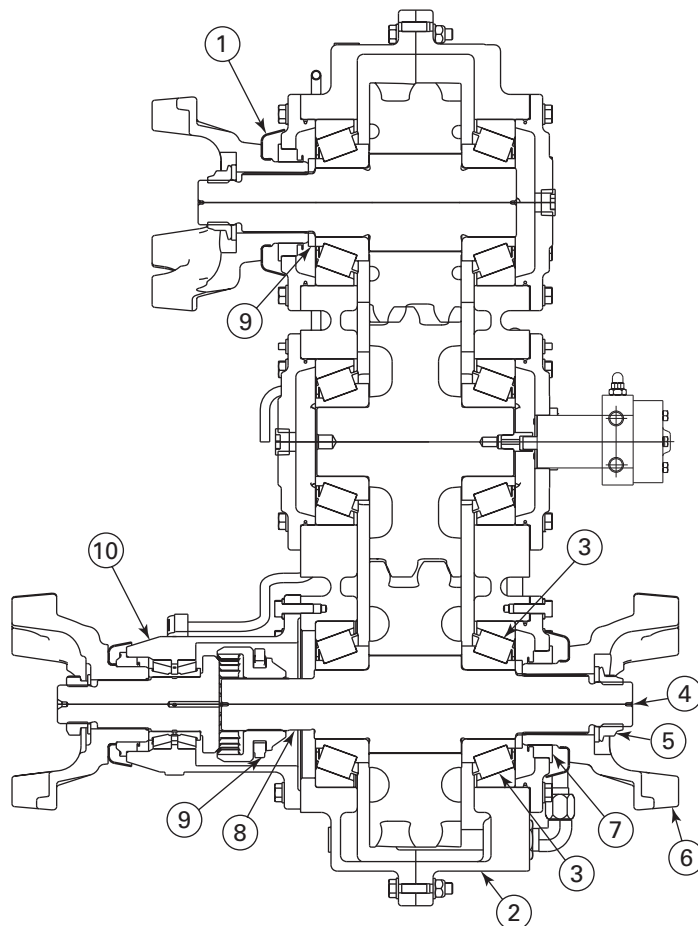
Item	Description	Item	Description
1	Bearing	14	Magnetic Drain Plug
2	Breather Assembly	15	Fitting Adapter
3	Pump Drive Button	16	Screen Fitting Assembly
4	Capscrew - 7/16	17	Helical Gear Drive
5	Transfer Case	18	Helical Gear Drive
6	Male Connector	19	Helical Gear Idler
7	Gear Case Cover	20	Declutch Lube Tube Assembly
8	Gear Case Cover	21	Inlet Lube Tube Assembly
9	Gear Case Cover	22	Female Elbow
10	Transfer Case Cover	23	Male Elbow
11	Declutch Assembly	24	Lock Nut
12	Dowel Pin	25	Lock Nut
13	Dowel Pin	26	Lock Nut



Item	Description	Item	Description
27	O-Ring	40	Shim, 0.003 in (0.076 mm)
28	Oil Seal Assembly*	41	Shim, 0.005 in (0.127 mm)
29	Oil Seal Assembly	42	Shim, 0.010 in (0.254 mm)
30	Plug	43	Connector Switch Assembly
31	Plug	44	Washer
32	Plug	45	Washer
33	Oil Pump	46	Flat Washer
34	Capscrew	47	Flat Washer
35	Capscrew	48	Thrust Washer
36	Capscrew	49	Front Input Yoke Assembly
37	Capscrew	50	Front Output Yoke Assembly
38	Input Shaft	51	Rear Output Yoke Assembly
39	Output Shaft		

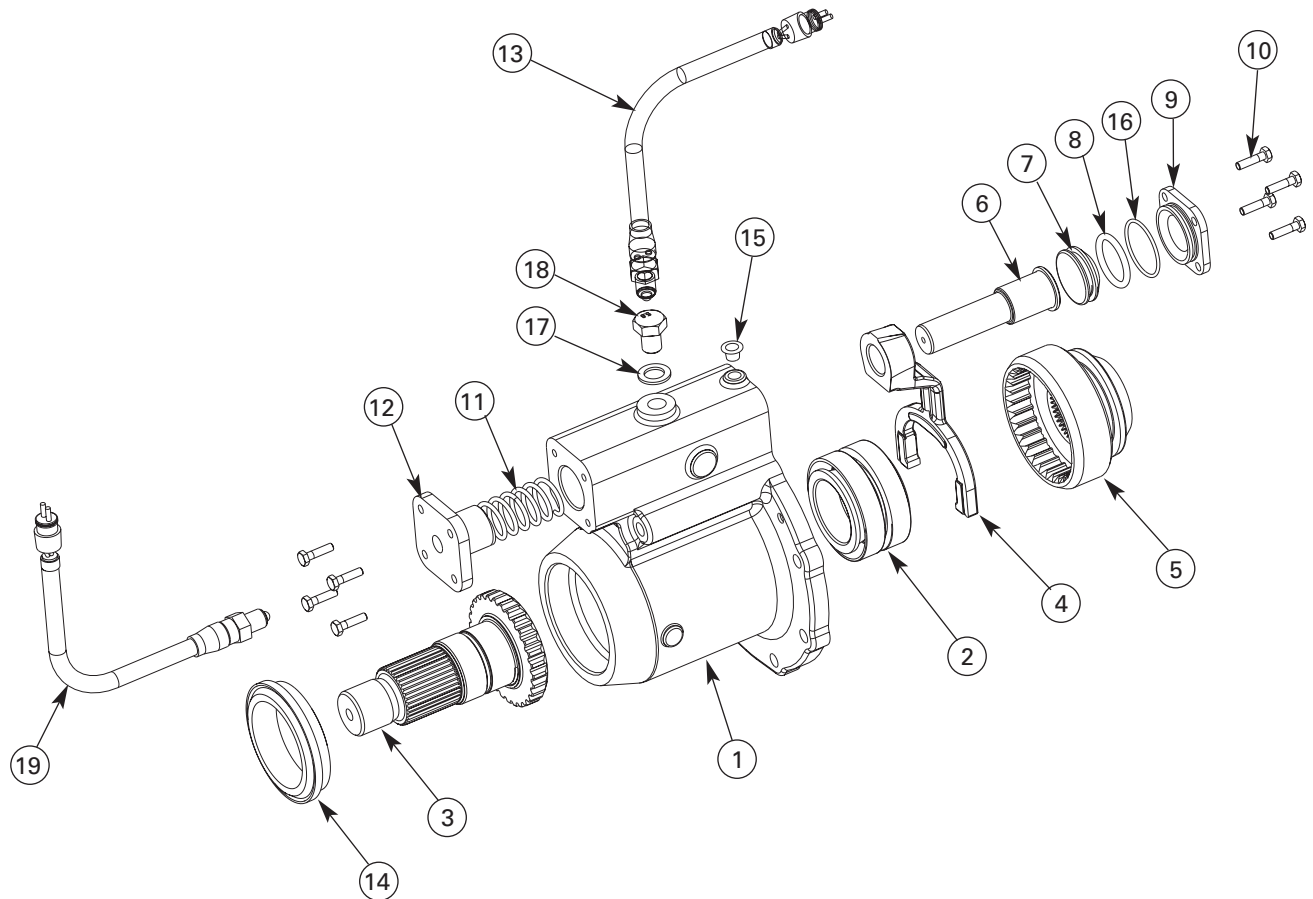
*Supply with Declutch

Section 1 Exploded View



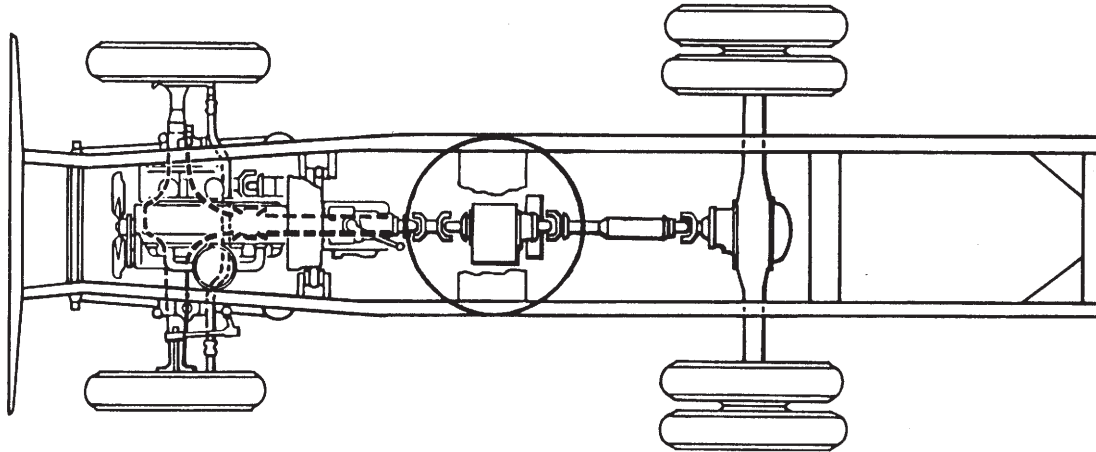
Item	Description	Item	Description
1	Slinger	6	Yoke
2	Spacer	7	Seal
3	Bearing	8	Output Shaft
4	Differential Shaft	9	Snap Ring
5	Yoke Nut	10	Declutch

T-2119 Series Declutch/PTO



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

Figure 2.1



TYPICAL 4X4 HOOKUP

Description

Meritor's model T-2119-D transfer cases are three-shaft designs with single-speed front and rear output, and a 1:1 ratio for use with 4x4 and 6x6 vehicles.

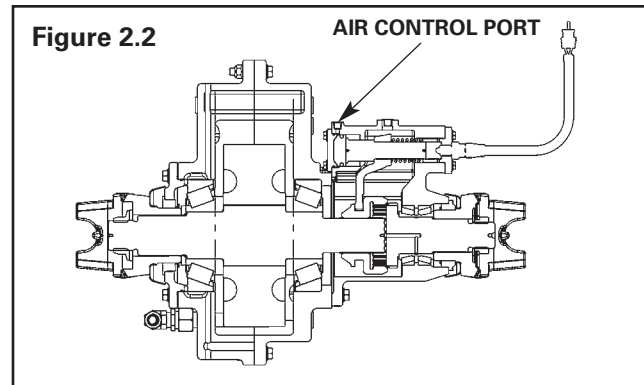
A 17.25-inch (438.2 mm) input-to-output drop permits engine clearance. **Figure 2.1.**

The air-actuated front axle declutch and full-torque power takeoff (PTO) lockup options are controlled from the cab. An operator activates an air plunger or electric switch, which is usually mounted on the instrument panel, to engage or disengage a mechanical clutch in each of these devices.

Optional indicator switches inform an operator when each clutch is fully engaged or disengaged.

Air-actuated options include an axle declutch option that permits shifting from part-time 4x4 or 6x6 to rear wheel drive. **Figure 2.2.**

Figure 2.2

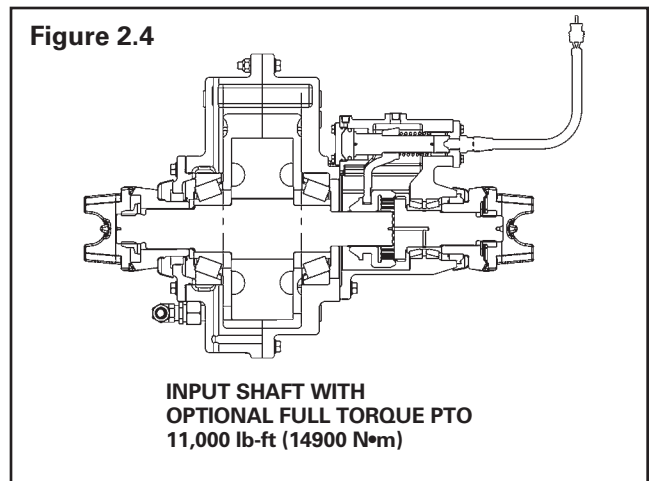
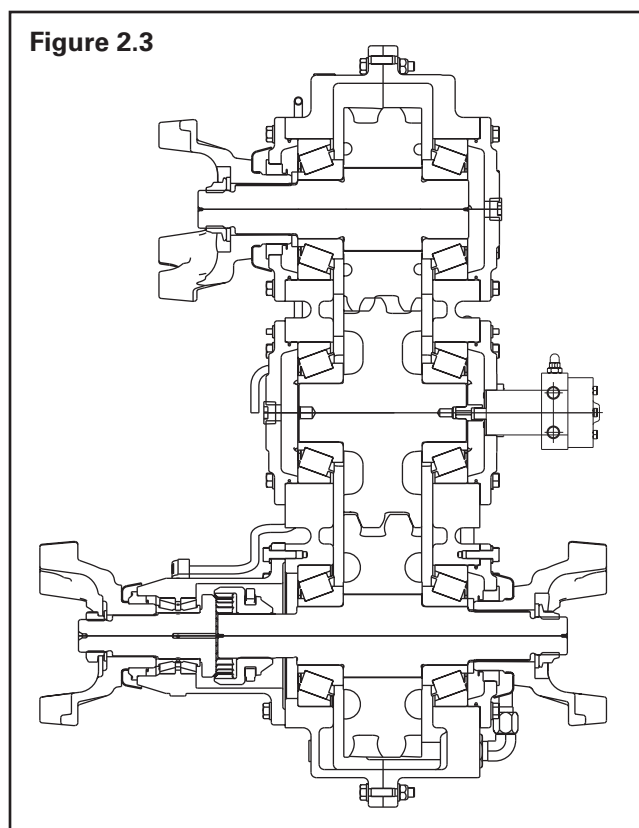


Declutch transfer cases permit part-time 4x4 or 6x6 operation. **Figure 2.3.**

The full-torque PTO option provides an outlet from the transfer case to drive auxiliary power devices. The PTO has the same type of clutch as the declutch. **Figure 2.4.**

Optional indicator switches for full torque PTOs are available.

Full round and easy service yokes or companion flanges are available as specified.



Operation

Engaging the Front Axle Declutch

CAUTION

Only engage the declutch when vehicle wheels will not slip at time of engagement. Damage to components can result.

1. Engage the declutch when the vehicle is stationary, or the vehicle is operating at constant low speed.
 - **If the clutch does not fully engage:** Turn the steering wheel in one direction and rock the vehicle back and forth until engagement occurs.

WARNINGS

Do not engage the 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 the transfer case can result.

Only engage the declutch under poor operating conditions. Engagement adjusts the vehicle's turning radius and steering responsiveness to poor road conditions. During normal operation, disengage the declutch whenever possible to prevent serious personal injury and damage to components.

2. You will know that engagement occurs by hearing it, noticing improved vehicle performance, or observing the optional indicator light in the cab.
 - **If the cab is equipped with optional indicator lights:** Watch the indicator lights, which will signal when PTO is engaged, so that you can operate the vehicle correctly.

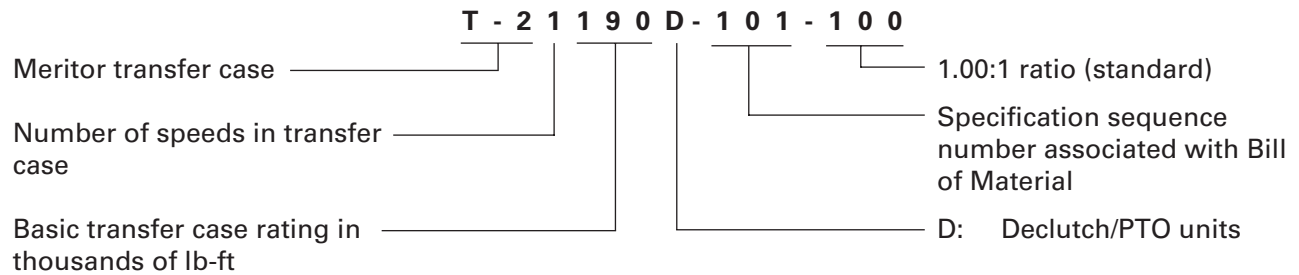
Engaging and Disengaging the Full-Torque Power Take Off (PTO)

CAUTION

Only engage the full-torque power take off (PTO) when the transfer case prop shafts are not turning. If the prop shafts are turning, and the device that the PTO will drive is turning, damage to the transfer case will result.

1. Engage or disengage the PTO when the vehicle is stationary, the transmission is in Neutral, and the transfer case prop shafts are not turning. Do not load the driven auxiliary device when PTO is initially engaged.
 - **If the clutch does not fully engage:** Put the transmission into LOW and slowly spin the transfer case until engagement occurs.
2. You will know that engagement occurs by hearing it, noticing improved vehicle performance, or observing the optional indicator light in the cab.
 - **If the cab is equipped with optional indicator lights:** Watch the indicator lights, which will signal when PTO is engaged, so that you can operate the vehicle correctly.

T-2119 Transfer Case



* If a transfer case contains a combination of options, use the first designation that the transfer case matches from the following given order:

- Plain in/out transfer case (No ID letter designation)
- D - Declutch/PTO unit

Section 3 Removal



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Removal

Transfer Case

WARNING

Keep the vehicle level when you remove the transfer case from the vehicle. If one end of the vehicle is raised, the vehicle will not remain stable. Serious personal injury and damage to components can result.

Support the vehicle with safety stands. Do not work under a vehicle only supported by jacks. Jacks can slip or fall over and cause serious personal injury.

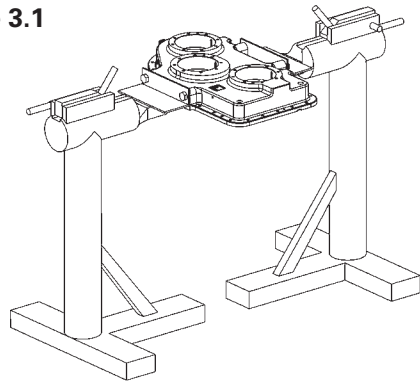
1. The vehicle must be on a level surface.
2. Put blocks under the wheels not being raised to keep the vehicle from moving.
3. Raise the vehicle so that the area to be serviced is off the ground. Support the vehicle with safety stands.
4. Remove the drain plug from the bottom of the transfer case. Drain the lubricant from the transfer case. Refer to Drain the Oil, below.
5. Disconnect the drivelines from the input and output yokes or flanges of the transfer case.
6. Disconnect the air line to the declutch/PTO.
7. Disconnect the harness for the indicator switch wires.
8. Use a hydraulic roller jack to support the transfer case. Remove the mounting bolts that hold the case to the vehicle.
9. Carefully remove the transfer case with the hydraulic jack.

CAUTION

Close or cover all openings, including the breather and oil/level drain, before you steam clean the outside of the transfer case. Steam can damage components.

10. Close or cover all openings before steam cleaning. These openings include the breather and oil/level drain.
11. Steam clean the outside of the transfer case to remove heavy amounts of dirt.
12. Attach angle iron brackets with bolts in the mounting holes of the brake half of the transfer case housing. **Figure 3.1.**

Figure 3.1



13. Install eyebolts in the mounting holes in the other half of the transfer case housing. The eye bolts permit easier lifting of the transfer case.

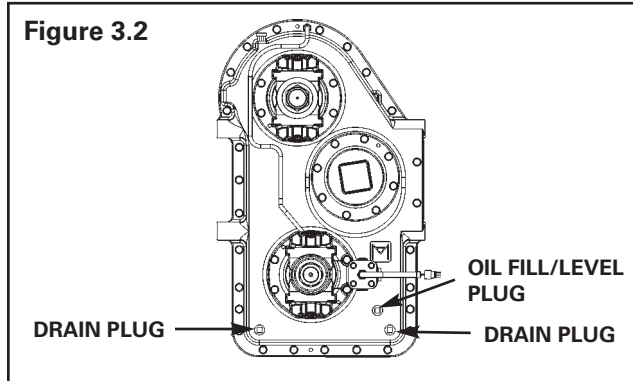
WARNING

Support the transfer case with a lifting strap before you mount the transfer case into the repair stand. A transfer case that is not supported correctly can fall. Serious personal injury and damage to components can result.

14. Use a lifting device attached to the lifting loops or eye bolts to lift the transfer case. Use the angle iron brackets to mount the case in the repair stand. **Figure 3.1.**

Drain the Oil

1. Park the vehicle on a level surface. Put a large container under the transfer case.
2. Remove the drain plug from the bottom of the transfer case. Drain and discard the oil correctly. Clean the plug. **Figure 3.2.**



Section 4 Disassembly



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Disassembly

Yokes from the Input and Output Shafts

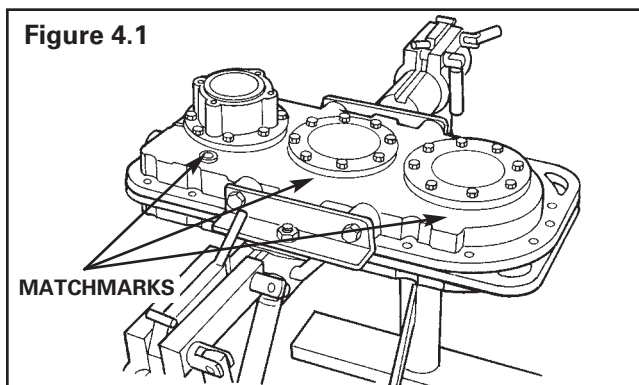
1. Rotate the transfer case in the repair stand so the yokes face UPWARD.
2. Remove the yoke nuts and washers from the input and output shafts.
3. Use a puller yoke to remove the yokes from the output shafts. Do not remove the slinger from the yoke or flange unless it is damaged.

Pump Assembly and Tubing

1. Remove the tubing from the transfer case by loosening the fittings at the housing and pump.
2. Remove the mounting bolts while holding the pump in place.
3. Slowly remove the pump.
4. Inspect the pump assembly. If the pump is leaking or damaged, the pump must be replaced.

Covers from the Shimmed Case Half

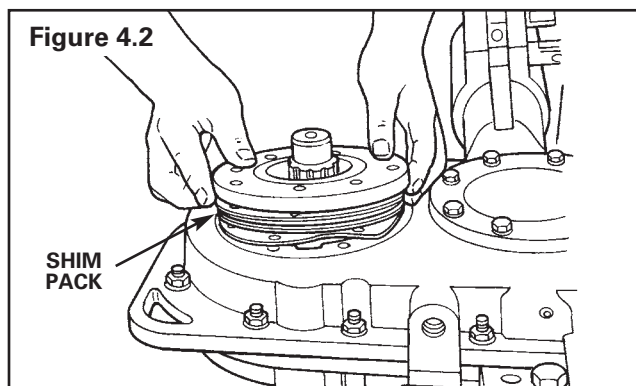
1. Matchmark the covers with the transfer case housing so that they can be put together in the same position at reassembly. **Figure 4.1.**
2. Remove the capscrews and washers that attach the covers to the transfer case housing.



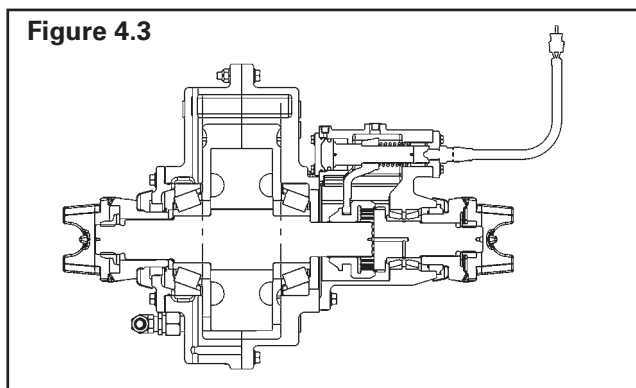
CAUTION

Take care when you remove the shim pack cover that you do not damage the shims. Replace damaged shims, which can cause fluid to leak. Damage to components can result.

3. Lift the cover and shim pack from both shafts. Keep the shim packs for use at reassembly. **Figure 4.2.**



Declutch/PTO Assembly



1. Rotate the transfer case in the repair stand so that the declutch assembly is facing UPWARD.
2. Use a puller yoke to remove the yoke nut, washer and yoke.
3. Remove the declutch indicator switch from the shift plate, if equipped.
4. Remove the cage mounting capscrews and washers from the declutch. Lift the declutch assembly off of the transfer case.

5. Disassemble the declutch cap by removing the four screws and washers from the declutch.
6. Remove the capscrews and washers from the cover of the declutch piston. Remove the cover.
7. Remove the declutch piston push rod and the return spring.
8. Remove the O-ring seal from the declutch piston. Discard the seal. Install a new seal at assembly.
9. Remove the O-ring seal on the cover and replace it.
10. Remove the shift fork and clutch collar.

WARNING

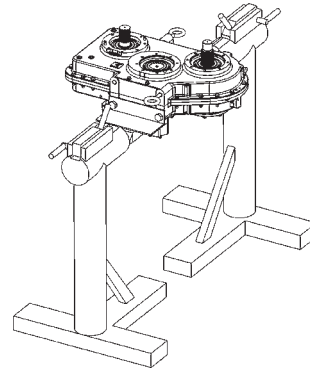
Take care when you remove the declutch cap, which is spring loaded. Serious personal injury can result.

11. Carefully remove the spring-loaded declutch cap. To remove the declutch cap, turn each bolt a few turns at a time until all bolts can be removed at once.
12. Remove the oil and dirt seals from the bearing cage assembly.
13. Press the shaft out of the bearing cage.
14. Remove bearing assembly.
15. Remove the bearing cups as a unit with the bearing spacer by pressing the cups out of the bearing cage. Do not separate these parts. They are a matched set.

Housing Halves

1. Remove the bolt, washers and nuts from the outer flange of the housing.
2. Separate the case halves with a pry bar. **Figure 4.4.**

Figure 4.4

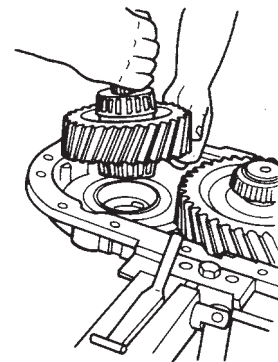


WARNING

Support the transfer case with a lifting strap before you remove the top half of the case. A transfer case that is not supported correctly can fall. Serious personal injury and damage to components can result.

3. Use the eyebolts to lift and remove the top half of the case.
4. Lift and remove the three gear and shaft assemblies from the bottom of the case. **Figure 4.5.**
5. Remove all bearing cups that are seated in the housing.

Figure 4.5



Section 4 Disassembly



Covers from the Non-Shimmed Case Half

1. Rotate the case half in the work stand so the covers face UPWARD.
2. Matchmark each one with the housing so that they can be reassembled in the same position.
3. Remove the capscrews and washers from each cover.

WARNING

Use a brass or rubber mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

4. Hit the inside of the housing with a soft mallet to loosen the housing covers.
5. Remove the covers from the housing.
6. Remove and discard the oil seals from all sealing covers.
7. Remove any bearing cups from the housing.

Idler Gear, and Input and Output Shaft Assemblies

1. Use a bearing puller to remove the bearing cones from the idler gear assembly.

WARNING

Observe all warnings and cautions provided by the press manufacturer concerning press operation to avoid serious personal injury and possible damage to components.

2. Use a hydraulic press with the correct support blocks to press the input and output shafts out of the gears and bearing cones.

 **WARNING**

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Clean, Dry and Inspect Parts

Clean Ground and Polished Parts

 **WARNING**

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, emulsion-type cleaners and petroleum-base cleaners. To avoid serious personal injury when you use solvent cleaners, you must carefully follow the manufacturer's instructions and these procedures:

- Wear safe eye protection.
- Wear clothing that protects your skin.
- Work in a well-ventilated area.
- Do not use gasoline or solvents that contain gasoline. Gasoline can explode.
- You must use hot solution tanks or alkaline solutions correctly. Carefully follow the manufacturer's instructions.

 **CAUTION**

Use only solvent cleaners to clean ground or polished metal parts. Hot solution tanks or water and alkaline solutions will damage these parts. Isopropyl alcohol, kerosene or diesel fuel can be used for this purpose.

If required, use a sharp knife to remove gasket material from parts. Be careful not to damage the ground or polished surfaces.

1. Use a cleaning solvent, kerosene or diesel fuel, to clean ground or polished parts or surfaces. NEVER USE GASOLINE.
2. Remove gasket material from parts. Take care not to damage ground surfaces.
3. DO NOT clean ground or polished parts in a hot solution tank, water, steam or alkaline solution.

Clean Parts with a Rough Finish

1. Use a cleaning solvent or a hot solution tank with a weak alkaline solution to clean parts with a rough finish.
2. Leave parts in the hot solution tank until they are completely cleaned and heated. When the parts are clean, remove them from the tank.
3. Wash the parts with water until you completely remove the alkaline solution.

Clean Transfer Case Assemblies

 **CAUTION**

Close or cover all openings before steam cleaning. Steam can cause component damage.

1. Steam clean transfer cases on the outside to remove heavy amounts of dirt.
2. Before steam cleaning the transfer case, close or put a cover over all openings in the case.

 **CAUTION**

Dry bearings with clean paper or rags. Do not use compressed air, which can cause abrasive particles to contaminate the bearings. Damage to components and reduced lining life can result.

Dry Cleaned Parts

- Immediately after cleaning, use clean paper, rags or compressed air to dry parts.

Prevent Corrosion

NOTE: Parts must be clean and dry before you lubricate them.

1. **If you assemble the parts immediately after you clean them:** Lubricate the clean, dry parts with grease to prevent corrosion.
2. **If you store the parts after you clean them:** Apply a corrosion-preventive material to all machined surfaces. Store the parts in a special paper or other material that prevents corrosion.

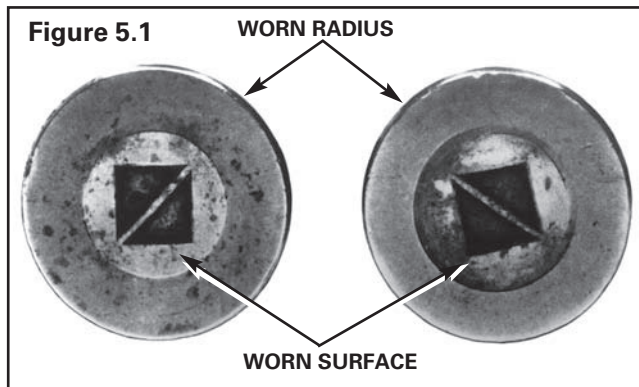
Section 5 Prepare Parts for Assembly



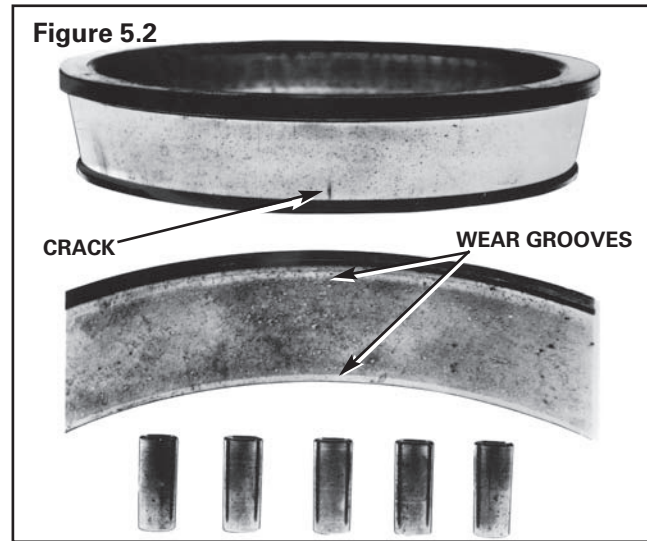
Inspect Parts

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. Replacement of the damaged parts before assembly can prevent complete failure of the assembly later.

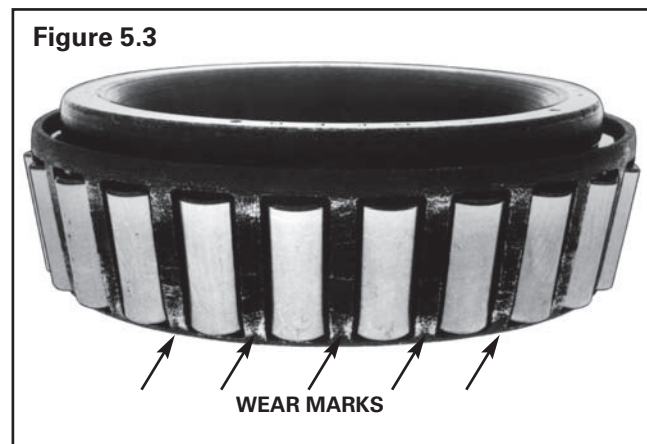
1. Inspect the tapered roller bearings. Inspect the cup, cone, rollers and cage of all tapered roller bearings in the assembly. If any of the following conditions exist, the bearing must be replaced:
 - The center of the large diameter end of the rollers is worn level with or below the outer surface.
 - The radius at the large diameter end of the rollers is worn to a sharp edge. **Figure 5.1.**



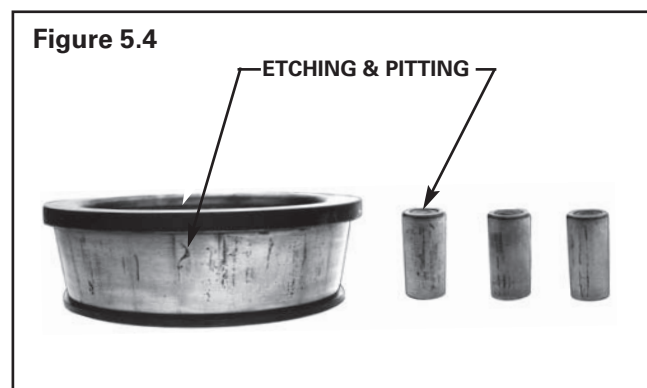
- A visible roller groove is worn in the inner race surfaces of the cup or cone. The groove can be seen at the small or large diameter end of both parts.
- Deep cracks or breaks appear in the surfaces of the cup, cone inner race or rollers. **Figure 5.2.**



- Bright wear marks appear on the outer surface of the roller cage. **Figure 5.3.**



- The rollers and surfaces of the cup and cone inner race that touch the rollers are damaged. **Figure 5.4.**



- The cup and cone inner race surfaces that touch the roller are damaged. **Figure 5.5.**



2. Inspect the gears for wear or damage. Replace worn or damaged gears.
3. Inspect the housing:
 - A. Remove all dirt from the housing and oil lubrication passages, troughs, slots and holes.
 - B. Inspect machined surfaces for cracks and damage. Repair or replace damaged parts.
4. Inspect all shafts and flange/yokes for wear, stress and cracks at the splines, shaft and yoke ears. Replace shafts and flange/yokes that are worn or cracked.
5. Make sure oil passages in the output shaft are clean and free of debris.

6. Inspect the declutch and output shaft components (if applicable):
 - A. Inspect the clutch collar internal splines, external declutch teeth and shift for grooves. Replace worn, cracked or damaged collars.
 - B. Inspect the collar pads of the shift fork for wear. If the pads are worn, replace the shift fork.
 - C. 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.
 - D. Inspect the declutch/PTO push rod and piston for wear or damage. Replace worn or damaged parts.

Section 6 Assembly



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Take care when you use silicone gasket materials to avoid serious personal injury. Follow the manufacturer's instructions to prevent irritation to the eyes and skin.

Small amounts of acid vapor are present when applying silicone gasket material. To prevent possible serious personal injury, make sure there is good ventilation in the work area. If the silicone gasket material gets in your eyes, flush your eyes with water for 15 minutes. Have your eyes checked by a doctor.

Take care when you use Loctite to avoid serious personal injury. Follow the manufacturer's instructions to prevent irritation to the eyes and skin.

Assembly

Input Shaft Assemblies

WARNING

Observe all warnings and cautions provided by the press manufacturer concerning press operation to avoid serious personal injury and possible damage to components.

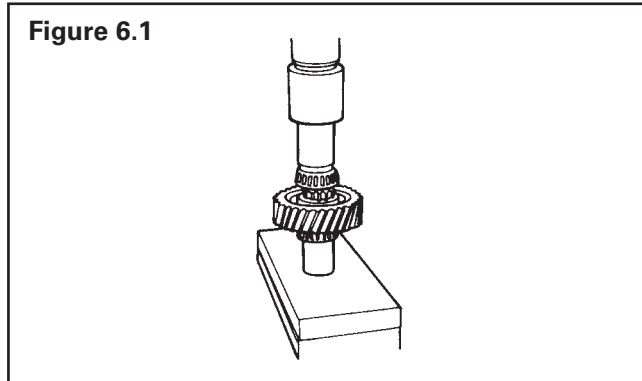
CAUTION

Use a sleeve that presses against the inner race only. Damage to the roller cage can result.

1. Depending on the configuration of the transfer case, add a spacer prior to pressing the bearing cones over the splined ends of the input and output shafts if necessary.
2. Press the bearing cones over the splined ends of the input and output shafts. Press until the cone and spacer are shouldered against the shaft-to-gear spline.
3. Turn the shafts over and assemble the gears on the shafts. The driven gear has a crossover fit to the shaft splines and may have to be pressed on to the shaft.
4. Press the bearing cones on to the other ends of the shafts until they are flat against the gears.

Figure 6.1.

Figure 6.1



Bearing Cages and Covers

NOTE: A bearing cage is used to both hold a bearing cup and to seal off the housing from a shaft assembly. A cover is also used for sealing purposes, but does not hold a bearing cup. Depending on the configuration of the transfer case, the transfer case may have a variety of combinations of bearing cages and covers.

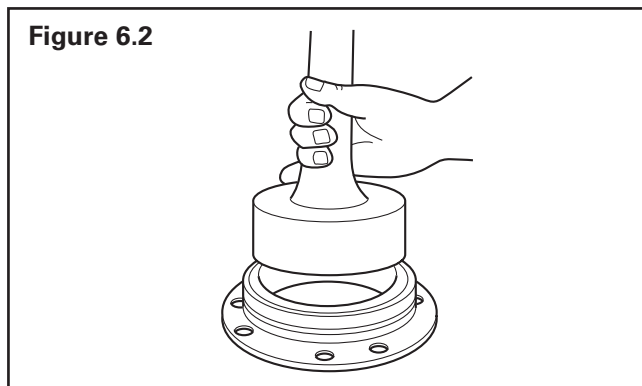
1. Press the bearing cups into the bores of all the bearing cages, if any, using the correct size driver. **Figure 6.2.**

CAUTION

Make sure that the seal is flat in its bore to prevent damage to components.

2. Install new seals into all sealing bearing cages and covers.

Figure 6.2

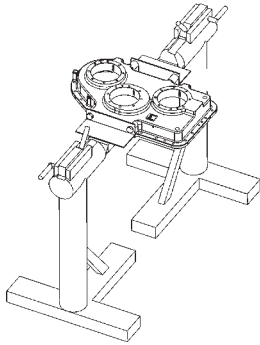


Bearing Cages, Cover and Declutch/PTO

NOTE: Do not install shims on this side of the transfer case.

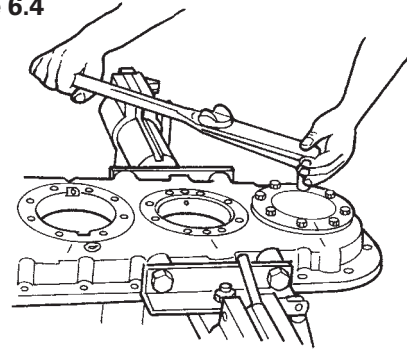
1. Rotate the case half in the repair stand so that the outside of the case half not to be shimmed faces UPWARD.
2. Apply a 0.125 inch (3.18 mm) diameter continuous bead of Loctite® 518 gasket material around the mounting surface of the input bearing cage on the housing. Also apply the gasket material around the edge of all the fastener holes. **Figure 6.3.**

Figure 6.3



3. Apply a light film of SAE 80W lubricant onto the spline of the transfer case shaft if mounting a declutch or PTO. Slide the declutch onto the shaft with the splined bore UPWARD.
4. Align the capscrew holes of the bearing cage, cover and declutch/PTO housing with the main housing. Use the matchmarks made at disassembly. **Figure 6.4.**

Figure 6.4



5. Install the eight capscrews and washers. Tighten the capscrews to 60-75 lb-ft (81-102 N•m). **T**
6. Repeat Steps 2 through 5 to install the second bearing cage, cover, declutch, or PTO housing.

Input Shaft Assemblies

1. Rotate the housing half in the repair stand so the open side faces UPWARD.
2. Install the remaining bearing cups in the housing against covers or declutch/PTO housings as required.

Section 6 Assembly



3. Apply a small amount of SAE 80W lubricant around the surfaces of both bearing cups. **Figure 6.5.**
4. Set the shaft assemblies in their correct positions in the housing. Make sure that the gear teeth are correctly engaged. **Figure 6.6.**

Figure 6.5

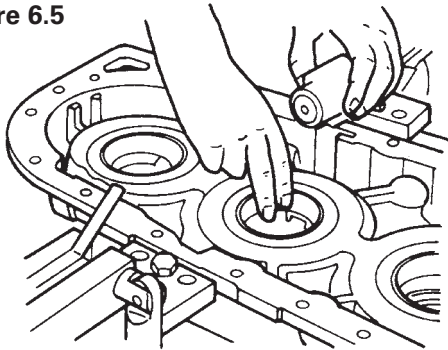
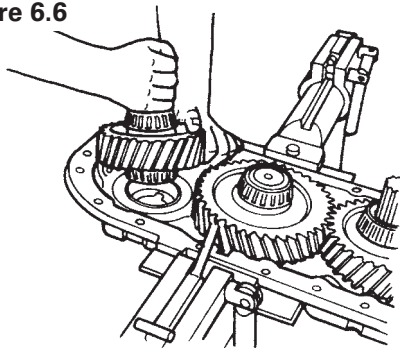


Figure 6.6





Transfer Case Housing

1. If a baffle plate is used, install the baffle plate into the housing half mounted in the repair stand.
2. Apply a 0.125 inch (3.18 mm) diameter continuous bead of Loctite® 518 gasket material around the mounting surface of the housing in the repair stand. Also apply the gasket material around the edge of all the fastener holes in the mounting surface.


WARNING

Support the transfer case housing half with a lifting strap before lifting it into place. A transfer case housing half that is not supported correctly can fall. Serious personal injury and damage to components can result.

3. Use the lifting loops or eye bolts to lift the other housing half and put it in the correct position.
4. Align the two dowels in the top and bottom of the housing halves.
5. Assemble the housing with bolts, washers and nuts. Use one washer under the bolt head and one under the nut.
 - A. Tighten the bolts on each side of the two dowels to 60-75 lb-ft (81-102 N•m). 
 - B. Tighten the remaining bolts to 60-75 lb-ft (81-102 N•m). 

Remaining Bearing Cages, Covers, Declutch/PTO Housing

NOTE: Depending on the configuration of the transfer case, the transfer case may have a variety of combinations of bearing cages, covers or declutches.

1. Apply a small amount of SAE 80W lubricant to the inner surface of each remaining transfer case bearing cup. The bearing cups previously pressed into the bearing cages should also be lubricated.
2. Install each bearing cup into its housing bore by positioning it over each bearing cone. Do not install the shims at this time.
3. Set each bearing cage in position over the bearing cone. Similarly, set each remaining cover into place.
4. Align the capscrew holes of a single bearing cage, cover, declutch housing or proportional differential cover with the housing. Use the matchmarks made at disassembly.
5. Fasten the bearing cage, cover, declutch housing or proportional differential cover to the housing with four capscrews 90 degrees apart.
6. Tighten the four capscrews to 30 lb-in (3.4 N•m) while rotating one of the shafts in both directions. **Figure 6.7.** 

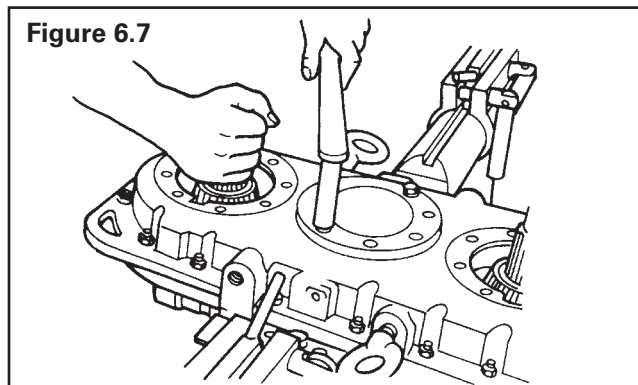


Figure 6.7

7. Use a feeler gauge to measure the gap between the cage, cover, declutch housing, and the mounting surface on the housing at the capscrews. **Figure 6.8.**
 - The average of the two lowest measurements plus 0.005 inch (0.127 mm) is equal to the thickness of the shim pack to be installed under the bearing cage.
8. Remove the bearing cage, cover, and declutch housing.

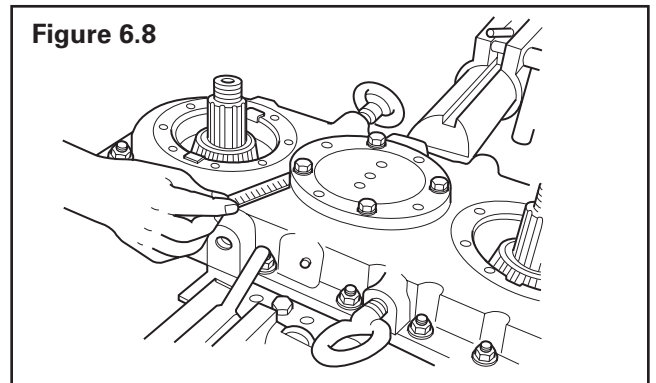


Figure 6.8

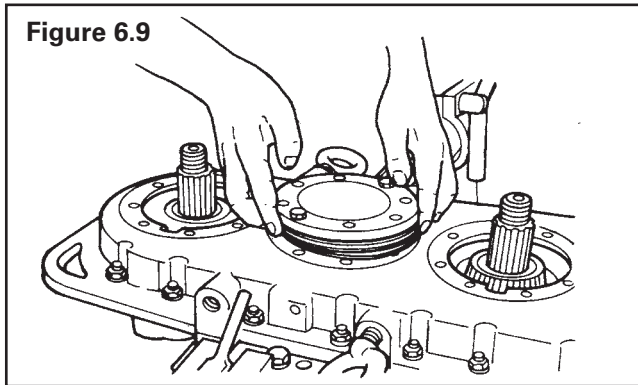
Example

Gap #1	0.032 in.	0.813 mm
Gap #2	+0.028 in.	0.711 mm
Total Gap	0.060 in.	1.524 mm
Average Gap	0.030 in.	0.762 mm
Total Shim Pack	+0.005 in.	0.127 mm
	0.035 in.	0.889 mm

Section 6 Assembly



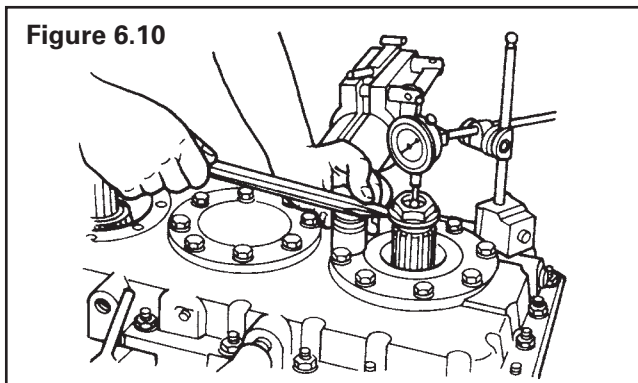
9. Assemble the unit with the correct shim pack into the housing with eight capscrews and washers. Tighten the capscrews to 60-75 lb-ft (81-102 N•m). **Figure 6.9.**



10. Repeat Steps 4 through 10 for the remaining bearing cage, cover, and declutch/PTO housing.

Check Bearing End Play

1. Mount an indicator gage to measure vertical shaft movement. Install a threaded fastener on the end of the shaft that will be used to apply a vertical load. **Figure 6.10.**



2. Tighten the fastener. Make sure there is no movement between the fastener and the shaft during the application of the load.
3. Apply a vertical load of 80-100 lbs (36-45 kg) to the shaft using the fastener threaded to the shaft end.
4. Rotate the shaft at least four times in each direction to set the bearings before the indicator measurement is recorded.
5. Repeat the measurement three times, recording the maximum movement.

CAUTION

The end play must be between 0.002-0.005 inches of travel. Add or remove shim stock to be within the 0.002-0.005 inch (0.051-0.127 mm) tolerance. Component damage can result.

6. Take the average of the three indicator measurements. The result is the bearing end play. The end play must be between 0.002-0.005 inches (0.051-0.127 mm) of travel. Component damage can result.
7. Add or remove shims to adjust end play to be within the 0.002-0.005 inch (0.051-0.127 mm) tolerance.
8. Rotate the transfer case shaft and verify that the shaft spins freely and smoothly. If it does not spin freely, repeat this procedure.
9. Repeat the end play measurement and record the final measurement.

Declutch/PTO Assemblies

1. Rotate the transfer case in the repair stand so that the output shaft to the declutch/PTO is facing UPWARD.
2. Assemble the declutch components by performing the following steps.

CAUTION

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

- A. Install the bearing cups into the declutch 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. **Figure 6.11.**
 - **If the cups are loose after the cup temperature warms:** Replace the housing.
- B. Preheat the first bearing cone to 200°F (93°C). Support the shaft and slide the heated cone in place onto the output shaft. **Figure 6.12.**

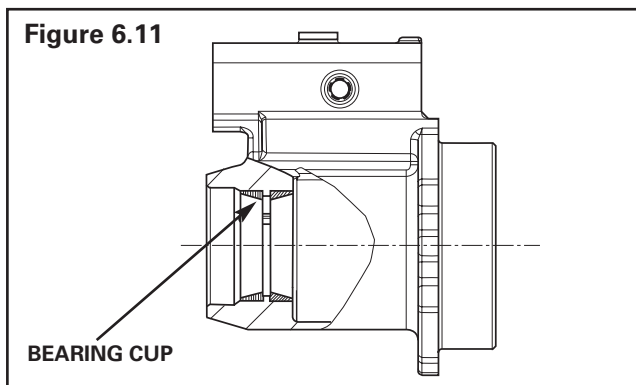
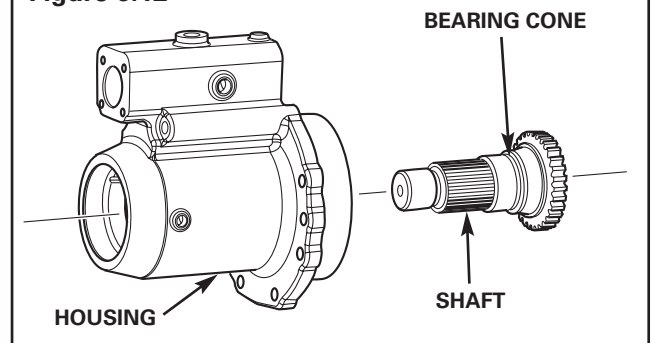
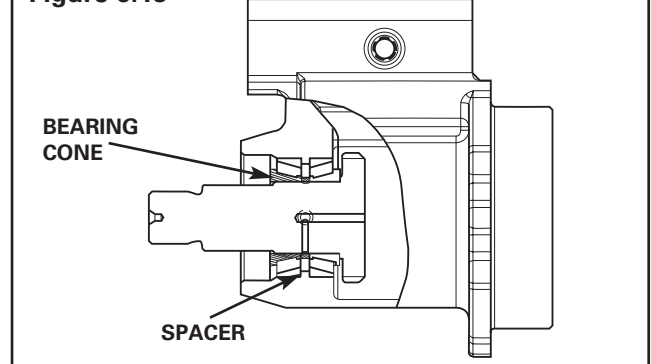


Figure 6.12



- C. Slide the shaft assembly into the housing.
- D. Select the 0.283-inch (7.19 mm) spacer from Bearing Kit 2593 and slide the spacer onto the splined end of the shaft.
- E. With the bearing spacer in position, heat the outer bearing cone to 200°F (93°C) and install it on the shaft. **Figure 6.13.**

Figure 6.13

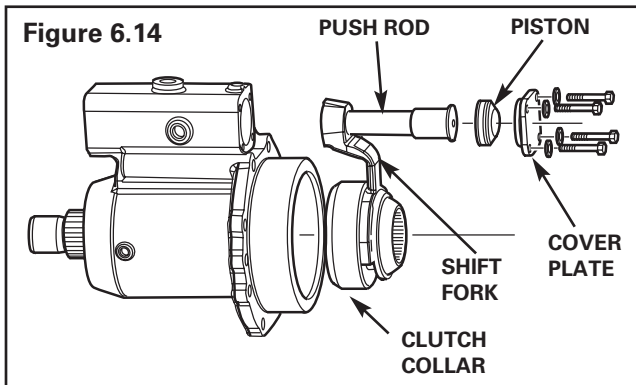


- F. Support the shaft in a vertical press and apply a load of 50-100 pounds (23-45 kg) to the bearing cone race to set the bearing.
- G. Measure the shaft end play.
- H. Remove the shaft by pressing the shaft from the housing. Remove the outer bearing cone and spacer.
- I. Select a smaller spacer width from the kit that would provide an end play of 0.001-0.003 inch (0.25-0.076 mm).

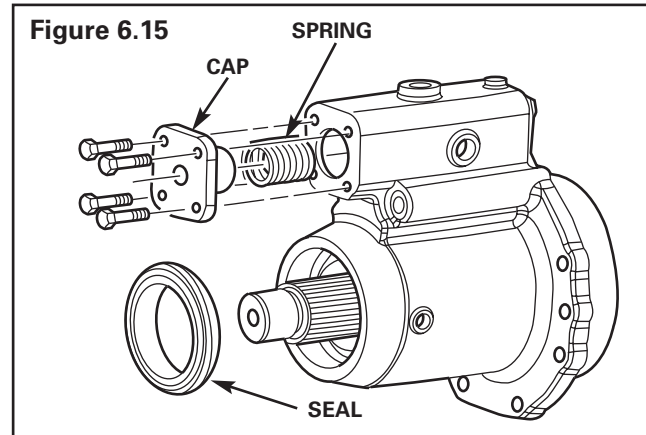
Section 6 Assembly



- J. Repeat the shaft and bearing assembly with the new spacer width installed. Recheck the end play after the yoke has been installed and the locking nut is tightened. If the end play is not within 0.001-0.003 inch (0.025-0.076 mm), replace the spacer and reassemble the shaft and bearing cone.
- K. Apply a light film of SAE 80W lubricant.
- L. Assemble the shift fork to the clutch collar. Install this unit into the bearing cage housing.
- M. Install the push rod into the housing and through the shift fork assembly. Lightly lubricate all parts including the piston and seal with SAE 80W lubricant.
- N. Apply 20-30 lbs (9-14 kg) of pressure to insert the piston into the housing. **Figure 6.14.**





- O. Install the cover plate with the O-ring seal in place.
- P. Lightly lubricate all parts with SAE 80W lubricant.
- Q. Install the 1/4-20 screws using Loctite 242 and tighten to 10-14 lb-ft (14-19 N•m). **T**
- R. Insert the spring into the housing over the push rod. **Figure 6.15.**

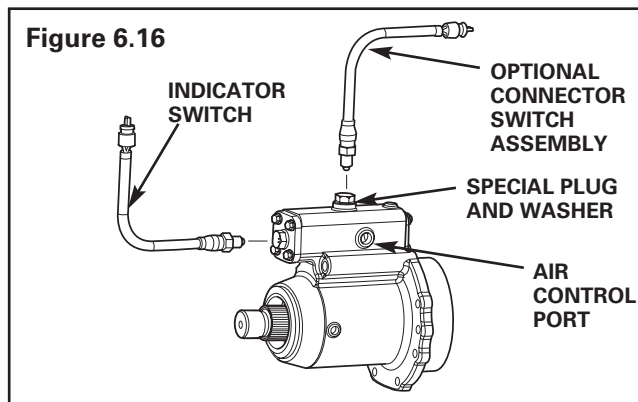


- S. Apply a thin film of Loctite 518 gasket material to the cap surface. Install the cap with the 1/4-20 screws using Loctite 242 and tighten to 10-14 lb-ft (14-19 N•m). **Figure 6.15.** **T**
 - T. Install the declutch shaft seal into the housing.
 - U. Press the seal into position until the seal is seated on the housing.
3. Install the declutch/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 inch diameter screws and washers using Loctite 277 and tighten to 60-75 lb-ft (81-102 N•m). **T**
 7. Check that the clutch engages and disengages properly.
 8. Pressure test the declutch housing for air leakage by performing the following steps.
 - A. With the proper fitting installed into the air control port, apply a pressure of 80-100 psi (5.5-6.9 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.

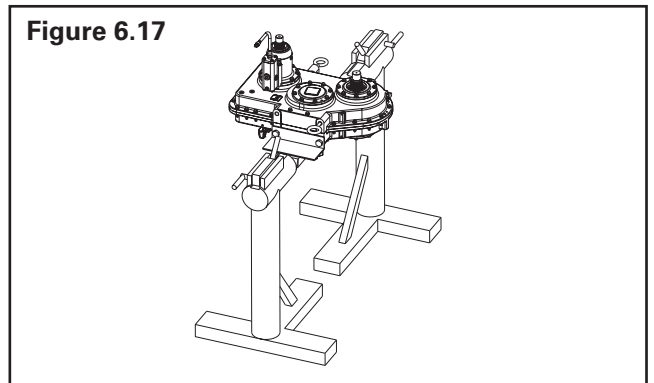
- C. Check for external leaks at the cover plate joint and fitting if the pressure decreases more than 5 psi (0.3 bar) in 10 minutes.
- **If the external joints are sealed and the leakage is still more than 5 psi (0.3 bar):** Remove the piston and inspect the O-ring and housing bore for damage. Repair parts as necessary.
9. Install the indicator switch. Tighten to 25-30 lb-ft (34-40 N•m). **Figure 6.16.** 
- **If a switch is not used:** Install the special plug and washer used to cap the access hole and tighten to 25-30 lb-ft (34-40 N•m). **Figure 6.16.** 



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

Front Output Declutch Assembly

Figure 6.17




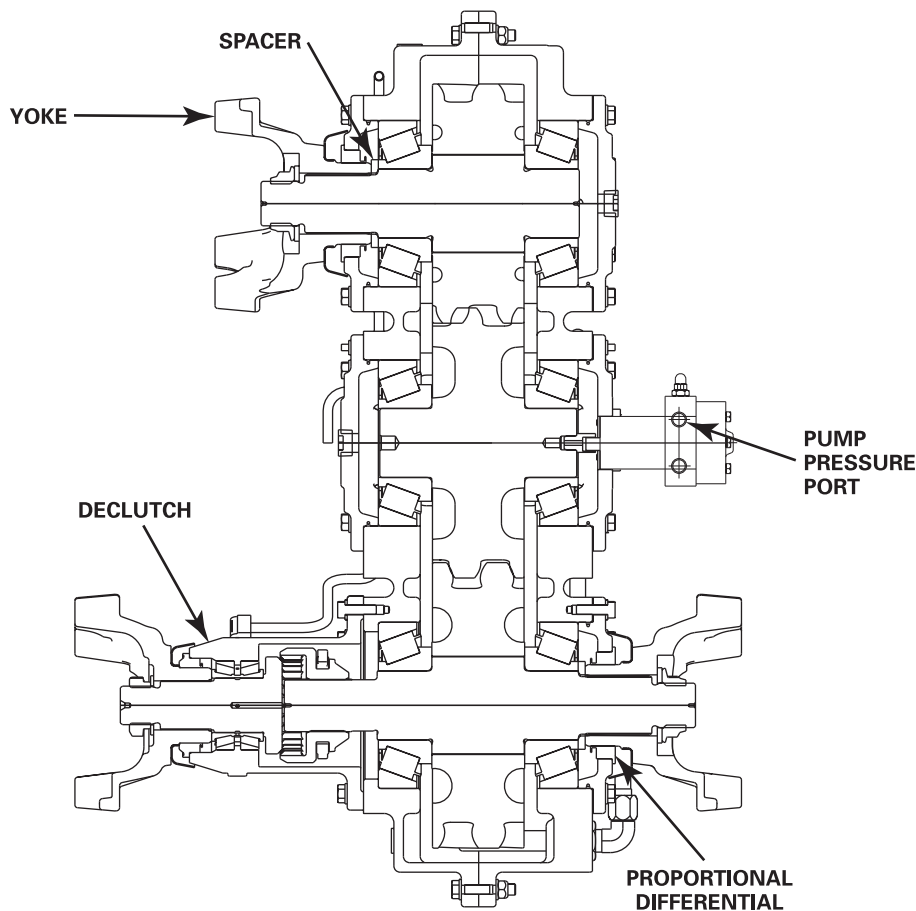

1. Rotate the transfer case in the repair stand so that the front output shaft is facing UPWARD.
2. Apply a 0.125 inch (3.18 mm) diameter continuous bead of Loctite 518 gasket material around the mounting surface on the declutch housing assembly. Also apply the gasket material around the edge of all the fastener holes.
3. Align the capscrew holes of the declutch housing with the transfer case. Use the matchmarks made at disassembly.
 - **If dowel pins are used:** Align the declutch with the dowel pins.
4. Install the capscrews. Tighten to 65-75 lb-ft (81-102 N•m). 

Figure 6.18




Front Output Shaft

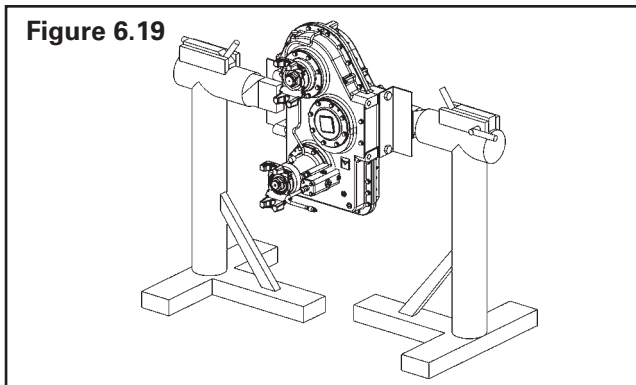
1. Rotate the transfer case in the repair stand so that the front output shaft is facing UPWARD.
2. Apply a 0.125 inch (3.18 mm) diameter continuous bead of Loctite 518 gasket material around the mounting surface on the declutch housing assembly. Also apply the gasket material around the edge of all the fastener holes.

3. Align the capscrew holes of the declutch housing with the transfer case. Use the matchmarks made at disassembly.
 - **If dowel pins are used:** Align the declutch with the dowel pins.
4. Install the capscrews. Tighten to 65-75 lb-ft (88-102 N•m). 

Yoke Installation

1. Insert the spacer onto the shaft.
2. Install the shaft seal into the bearing cage or cover.
3. Press the seal into position until the seal is seated on the cage or cover.
4. Install the yokes on the transfer case shafts.

5. Apply a 1/8 inch diameter bead of RTV 732 silicone gasket material completely around the end of the yoke spline.
6. Install the yoke washer and locknut onto the shafts. Use a yoke holder and tighten the nuts to 700-900 lb-ft (950-1220 N•m). **Figure 6.19.** 
7. Repeat Steps 1 through 6 for all of the yoke locations.



Pump Assembly and Tubing


1. Rotate the transfer case in the repair stand so that the cover that the pump is to be mounted to is facing UPWARD.
2. Install the pump drive button by pressing the button into the end of the shaft.

WARNING

Take care when you use silicone gasket materials to avoid serious personal injury. Follow the manufacturer's instructions to prevent irritation to the eyes and skin.

Small amounts of acid vapor are present when applying silicone gasket material. To prevent possible serious personal injury, make sure there is good ventilation in the work area. If the silicone gasket material gets in your eyes, flush your eyes with water for 15 minutes. Have your eyes checked by a doctor.

3. Apply a 0.125 inch (3.18 mm) diameter continuous bead of Loctite 518 gasket material around the mounting surface of the pump. Also apply the gasket material around the edge of all fastener holes.

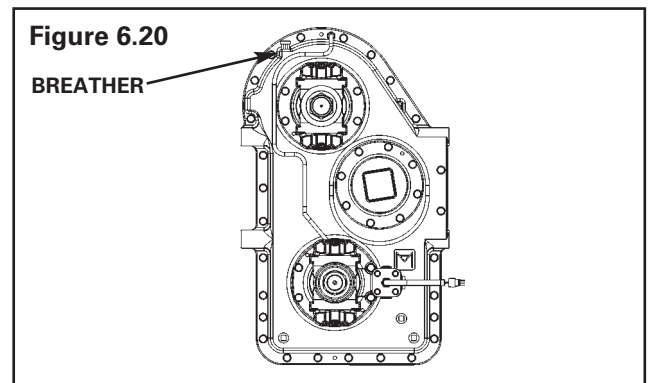
4. Align the capscrew holes of the pump housing to the bearing cage.
5. Install the capscrews and washers. Tighten the capscrews to 10-13 lb-ft (14-18 N•m). 
6. Connect all tubing in the original configuration.
7. Install all fittings using Loctite® 592. Apply a 0.125-inch bead to the first threads of the fitting.

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. **Figure 6.20.**



2. Check that the fittings are installed correctly.
3. With the proper fitting installed into the breather port, apply a pressure of 8-10 psi (0.55-0.69 bar).
4. Shut the air supply off.
 - If the pressure decreases by more than two psi (0.14 bar) in 10 minutes: Check for external leaks at the fittings.
5. Correct the leakage problem and retest.
6. Install the breather.

Section 7 Installation



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Installation

Transfer Case in Vehicle

WARNING

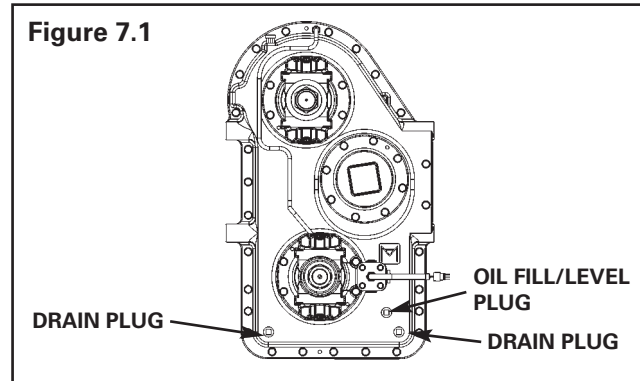
Support the transfer case with a lifting device before you move the transfer case. A transfer case that is not supported correctly can fall. Serious personal injury and damage to components can result.


1. With a lifting device, remove the transfer case from the repair stand to a hydraulic roller jack. If used, remove the temporary eyebolts and angle iron 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.
5. Fill the transfer case with proper quantity of specified lubricant. Allow time for the lubricant to flow through the rear output bearing into the proportional differential if the unit is so equipped. Refer to Maintenance Manual 1, Lubrication. To order this publication, refer to the Service Notes page at the beginning of this manual.

Check and Adjust Oil Level



1. Make sure the vehicle is parked on a level surface.
2. Clean the area around the fill plug. Remove the fill plug from the transfer case. **Figure 7.1.**

Figure 7.1



3. The oil level must be even with the bottom of the hole for the fill plug or to the top of the standpipe if used.
 - **If oil flows from the oil fill hole when the plug is loosened:** The oil level is high. Let the oil drain to the correct level.
 - **If the oil level is below the bottom of the hole of the fill plug:** Add the specified oil.
4. Install and tighten the fill plug to 35-50 lb-ft (47-68 N•m). 

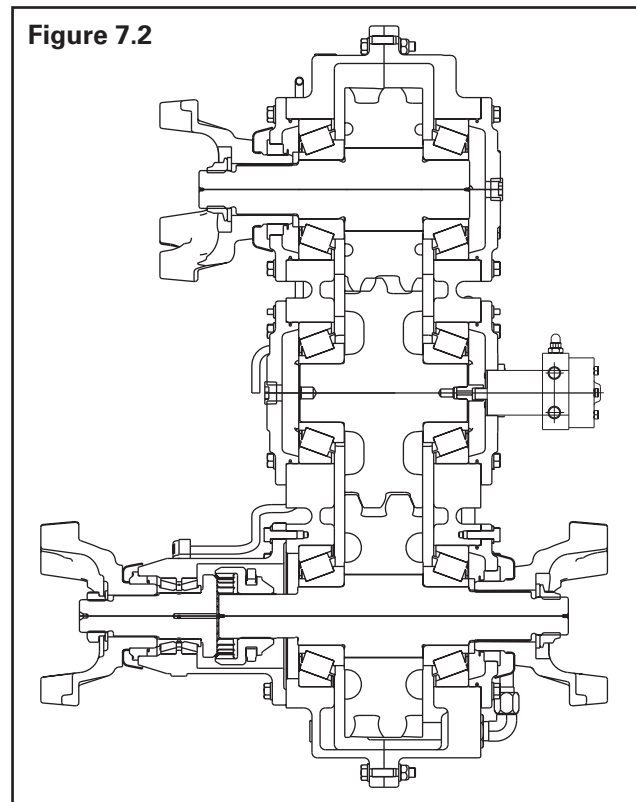
Replace the Oil

1. Remove the drain plug and drain the oil from the transfer case.
2. Reinstall and tighten the drain plug to 35-50 lb-ft (47-68 N•m). 
3. Clean the area around the fill plug. Remove the fill plug from the transfer case.
4. Add the specified oil until the oil level is even with the bottom of the fill plug hole or to top of standpipe if used.
5. Install and tighten the fill plug to 35-50 lb-ft (47-68 N•m). 

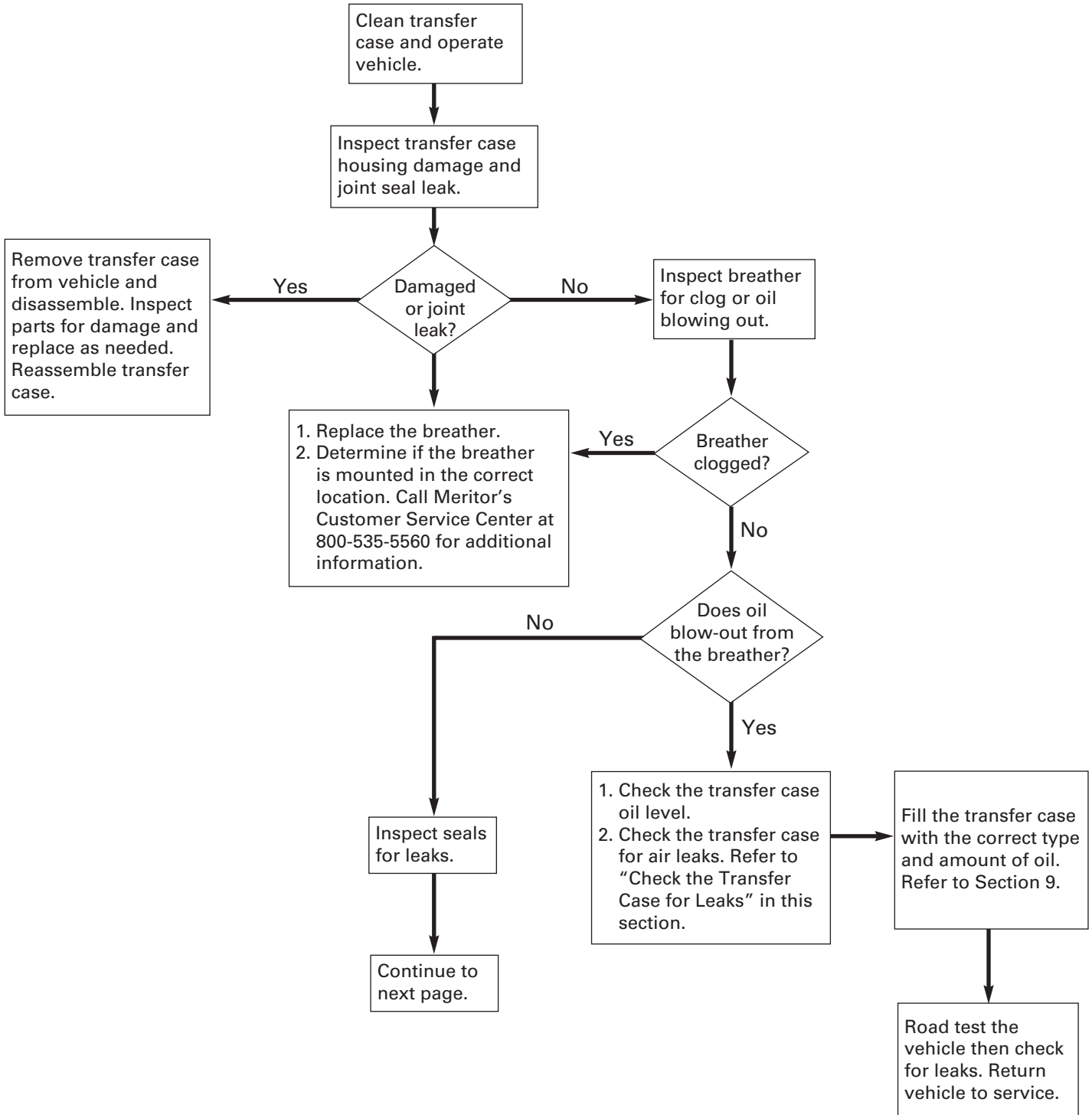
Check the Transfer Case Lubrication Pressure

The transfer case lubrication pressure should be 5-25 psi (0.34-1.72 bar) with the truck operating at 20-25 mph (32-40 km/h) and the oil warm. Replace the pump if the pressure is less than 5 psi (0.34 bar).

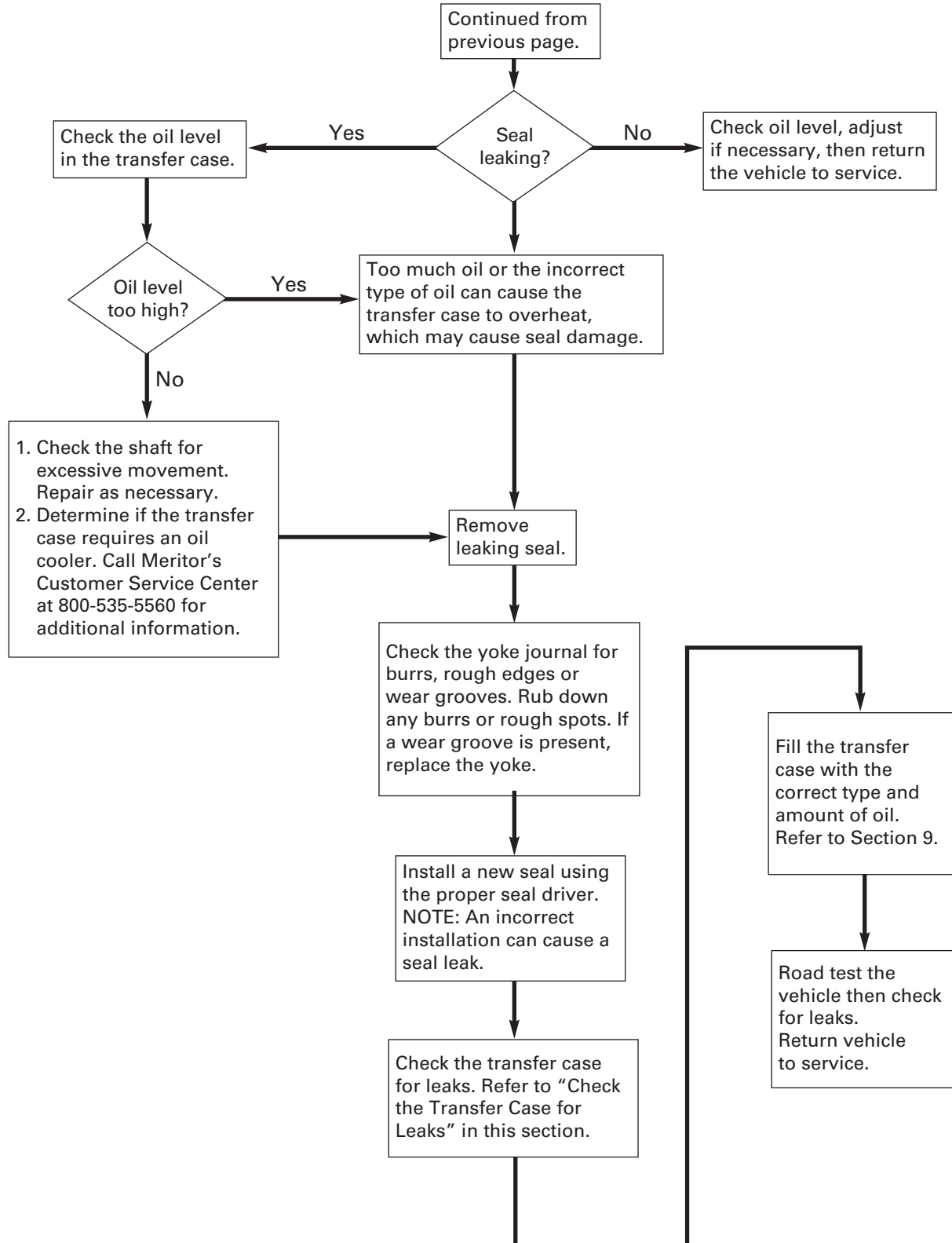
The lubrication pump relief pressure is 60 ± 5 psi (4.14 ± 0.34 bar).



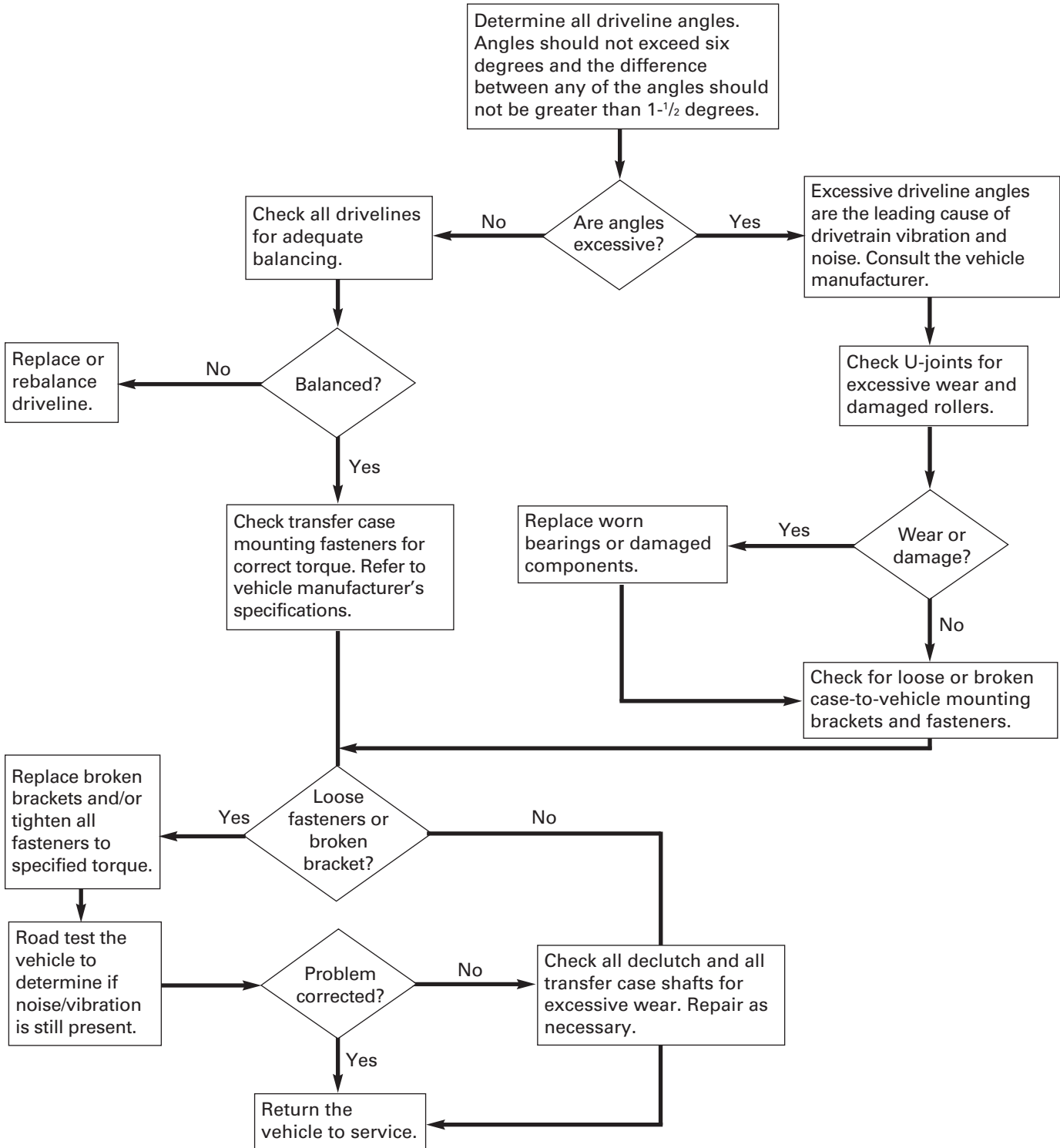
Transfer Case Lubrication Diagnostics



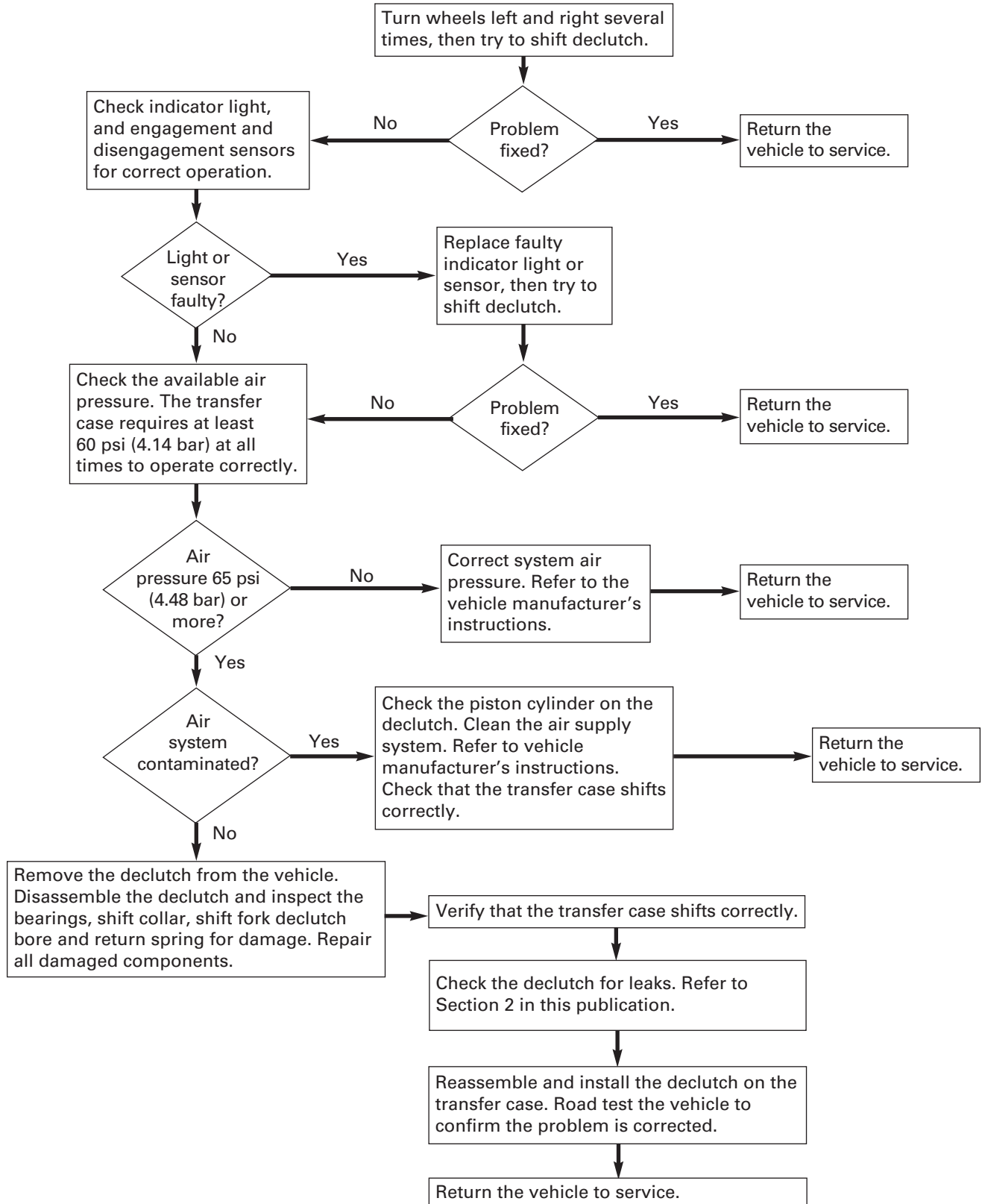
Transfer Case Lubrication Diagnostics



Excessive Noise and Vibration Diagnostics



Declutch/PTO Does Not Engage/Disengage Diagnostics



Section 9 Lubrication and Maintenance



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

For more information on lubricant standards and specifications refer to Meritor's Maintenance Manual 1, Lubrication.

Lubrication

Lubricant Temperatures

CAUTION

Do not use API GL-5 oils as transfer case lubricants. These oils contain extreme pressure additives which tend to form sludge at the operating temperatures of normal transfer cases. These additives may also be harmful to some internal transfer case components.

- A lighter viscosity oil can also be used if the transfer case operates in extremely cold climates.

CAUTION

Meritor transfer cases can operate at 225° F (107° C) without damage. However, if the oil temperature reaches 250° F (121° C) stop the vehicle immediately. Component damage can result.

- The transfer case oil sump should have a maximum continuous operating temperature of 225° F (107° C) and an absolute maximum temperature of 250° C (121° C). If the vehicle temperature reaches 250° F (121° C), stop the vehicle immediately and check for the cause of overheating.
- **If the transfer case continuous sump temperature is over 225° F (107° C) due to high input speeds with high ambient temperatures and poor air circulation**, use a lighter viscosity oil from the above recommended lubrication oils.

Oil Substitutes

Meritor does not approve the use of multi-viscosity motor oils. Multi-viscosity API GL-1 oils within the recommended viscosity range are acceptable but not suggested if another option is available.

Petroleum base and synthetic oils are both acceptable for Meritor transfer cases. However, the following rule must be followed:

CAUTION

Once one of these types of oil has been selected for usage, it must not be converted to the other type of oil for the lifetime of the transfer case. Oil seal damage can occur.

Operating Information

Magnets and Magnetic Drain Plugs

Most Meritor transfer cases are equipped with magnetic plugs having a minimum pick-up capacity of 20 ounces (0.57 kilograms) of low carbon steel.

NOTE: Meritor recommends replacing the magnetic drain plug each time the oil is changed. Use the correct part. Pipe plugs will leak if used as a drain plug. Component damage can result from a low oil level.

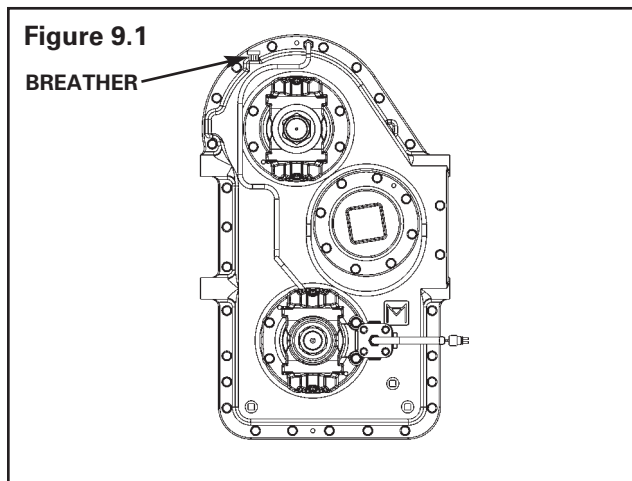
The magnetic drain plug can be reused if, after cleaning, the plug has a minimum pick-up capacity of 20 ounces (0.57 kilograms) of low carbon steel.

Breather

! CAUTION

Cover the breather when steam cleaning the housing. If the breather is not covered, water can enter the housing and contaminate the oil.

Breathers release pressure that builds up inside the transfer case during vehicle operation. **Figure 9.1.**



Seals

! CAUTION

Always use the correct tools and procedures when you replace a seal to ensure that you correctly install the seal. A seal that is not correctly installed can leak. Damage to components can result.

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.

Temperature Indicator

! CAUTION

Meritor transfer cases may operate above 190°F (88°C) without damage. However, if the oil temperature reaches 250°F (121°C), stop the vehicle immediately and check for the cause of overheating. Maximum continuous running oil temperature should not exceed 225°F (107°C). Damage to components can result.

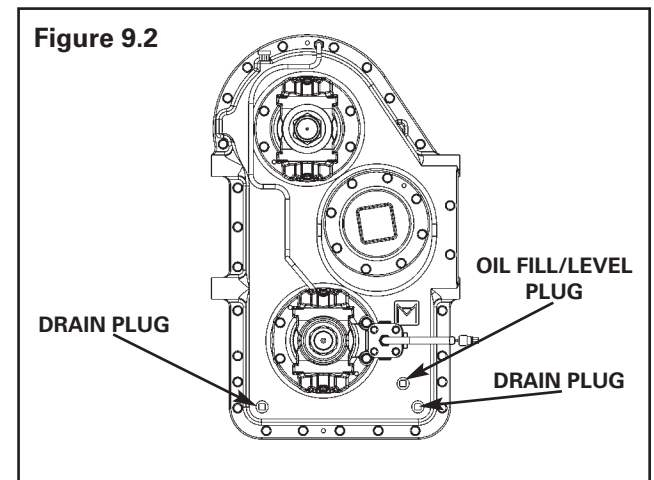
Check and Adjust the Oil Level

! CAUTION

Use only SAE Grade 80W oil, Meritor specification O-60, in the transfer case. Petroleum base oils and synthetic base oils can react against sealing materials. Damage to components can result.

Only use new lubricant when you change or adjust the oil in the transfer case. Do not reuse lubricant, which can contain metallic particles and other contaminants. Damage to components can result.

1. Park the vehicle on a level surface.
2. Clean the area around the fill plug/fill cap. Remove the fill plug/fill cap from the transfer case. **Figure 9.2.** The oil level must be even with the bottom of the fill plug hole or the top of the stand pipe.



- **If oil flows from the hole when you loosen the plug:** The oil level is high. Drain the oil to the bottom of the fill hole.
 - **If the oil level is below the bottom of fill/level plug hole or stand pipe:** Add the specified oil until oil is even with the bottom of the fill hole.
3. Install and tighten the fill plug to 35-50 lb-ft (47-68 N•m). **T**

Section 9 Lubrication and Maintenance



Drain and Replace the Oil

1. Park the vehicle on a level surface. Put a large container under the transfer case.
2. Remove the drain plug from the bottom of the transfer case. Drain and discard the oil correctly. Clean the plug. **Figure 9.2.**
3. Install and tighten the drain plug to 35-50 lb-ft (47-68 N•m).
4. Clean the area around the fill plug. Remove the fill plug from the transfer case.
5. Add the specified oil until the oil level is even with the bottom of the fill plug hole.
6. Install and tighten the fill plug to 35-50 lb-ft (47-68 N•m).
7. Run the vehicle for 1/4 mile (0.4 km), then top off the oil level by adding oil to the fill opening.
8. Reinstall and tighten the fill plug to 35-50 lb-ft.

Transfer Case Oil Change Intervals (Petroleum Oils)

Operation	On-Highway	Off-Highway
Check Oil Level	2,000 miles (3200 km)	40 operating hours
Initial Oil Change	2,500 miles (4000 km)	40-100 operating hours
Scheduled Oil Change	12,000-25,000 miles (19,300-40,200 km)	200-300 operating hours

Transfer Case Oil Specifications^{① ④ ⑤}

Oil Description	Meritor Specification	A.P.I. Specification	Military Specification	SAE Grade	Outside Temperature
Petroleum GL-1 Oil with Rust and Oxidation Inhibitor ^②	—	A.P.I. GL-1	—	90W 80W	Above 10°F (-12°C) Above -15°F (-26°C)
Heavy Duty Engine Oil ^②		A.P.I.-CD, CE, SF or SG ^⑥		50W 40W 30W	Above 10°F (-12°C) Above 10°F (-12°C) Above -12°F (-26°C)
Full Synthetic Oil ^③	081	—	—	50W	Above -40°F (-40°C)
A.P.I. GL-5 (Axle Lube) ^①	DO NOT USE IN TRANSFER CASES				

① Do Not use multi-viscosity (I.E. 80/90W) GL-5 Gear Oil (axle lube).

② 90W GL-1 or 50W motor oil is same viscosity and commonly used above 10°F (-12°C).

③ Meritor approved full synthetic oil for manual ZF Meritor 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 mix or switch oil types. Use the same oil that initially filled the transfer case.

⑤ Do not use multi-viscosity oils.

⑥ Current designations are acceptable.

Transfer Case Oil Change Intervals (Synthetic Oils)

Oil Grade	Meritor Spec	Initial Oil Change	Check Oil	Oil Change
SAE Grade 50 Full Synthetic Only	O-81	None	3,000 miles (4,800 km)	100,000 miles (160,900 km)

Transfer Case Oil Capacity

Transfer Case Model	Oil Capacity	
	Pints*	Liters*
T-2119	7.0	3.30

*The fill procedure for all transfer cases is referred to in "Check and Adjust Oil Level" in this section.

Dry Weight

Unit	Weight/lbs (kg)
Base Model	620 (281)
Declutch	65 (29.5)

*Dry weight does not include option, yokes and mounting hardware.

Section 10 Specifications and Applications



Driveline Application Guidelines

All of the options shown below may not be available for each transfer case configuration. The values given are for Meritor manufactured parts. If parts from other manufacturers are used, torque values may be different.

Wing Style Yokes	Max. Torque Rating/lb-ft (N•m)	Flange Style		
62N	5,000 (6779)	3WCS		
58WB	7,025 (9561)		3WCS 8 BOLT	5 WCS 12 BOLT
72N	7,080 (9599)			
82N	11,080 (15022)			
85WB	12,500 (16948)			
92N	23,000 (31184)			

Full Round (NYS) Easy Service (TYS) Style Yokes	Max. Torque Rating/lb-ft (N•m)	Flange Style		
131 NYS and TYS	1,950 (2644)	3WCS		
133 NYS and TYS	2,330 (3159)		3WCS 8 BOLT	5 WCS 12 BOLT
135 NYS and TYS	3,080 (4176)			
141 NYS and TYS	3,750 (5084)			
148 NYS and TYS	5,000 (6779)			
155 NYS and TYS	6,250 (8474)			
16 NYS and TYS	7,100 (9626)			
17 NYS and TYS	9,600 (13016)			
176 NYS and TYS	16,000 (21693)			
18 NYS and TYS	21,000 (28472)			

Driveline Length Guidelines

Smallest yoke sizes (131 Series): Maximum driveline length of approximately 48 inches (1.2 m).

Largest yoke sizes (92N Series): No more than an 80-inch (2.03 m) long driveline. Other maximum driveline lengths should fall between these values, increasing with relative size.

Maximum Driveline Angle Guidelines

Values shown below are guidelines only for two joint shafts without mismatch. For more detailed information on performing driveline calculations refer to Meritor publication. Final approval should be authorized by Meritor's driveline engineering department.

Driveline RPM	Maximum Operating Angle (DEG)
4000	4.25
3500	5.00
3000	5.85
2500	7.00
2000	8.65

Optional Equipment

- Full torque PTO – 10,000 lb-ft (13,500 N•m)
- Optional indicator switches are available for all (PTO/declutches) – two switches
- Meritor full round and easy service yokes or companion flanges are available as specified.

Declutch/PTO Torque Rating

Model	lb-ft	N•m
T-2119 D	10,000	13,500

Input Torque Rating

Ratio	Input Torque lb-ft (N•m)
1.0:1	20,000 (27,100)
1.21:1	16,500 (22,374)
0.83:1	20,000 (27,100)
Declutch/PTO Maximum	10,000 (13,500)

Ratios and Speeds*

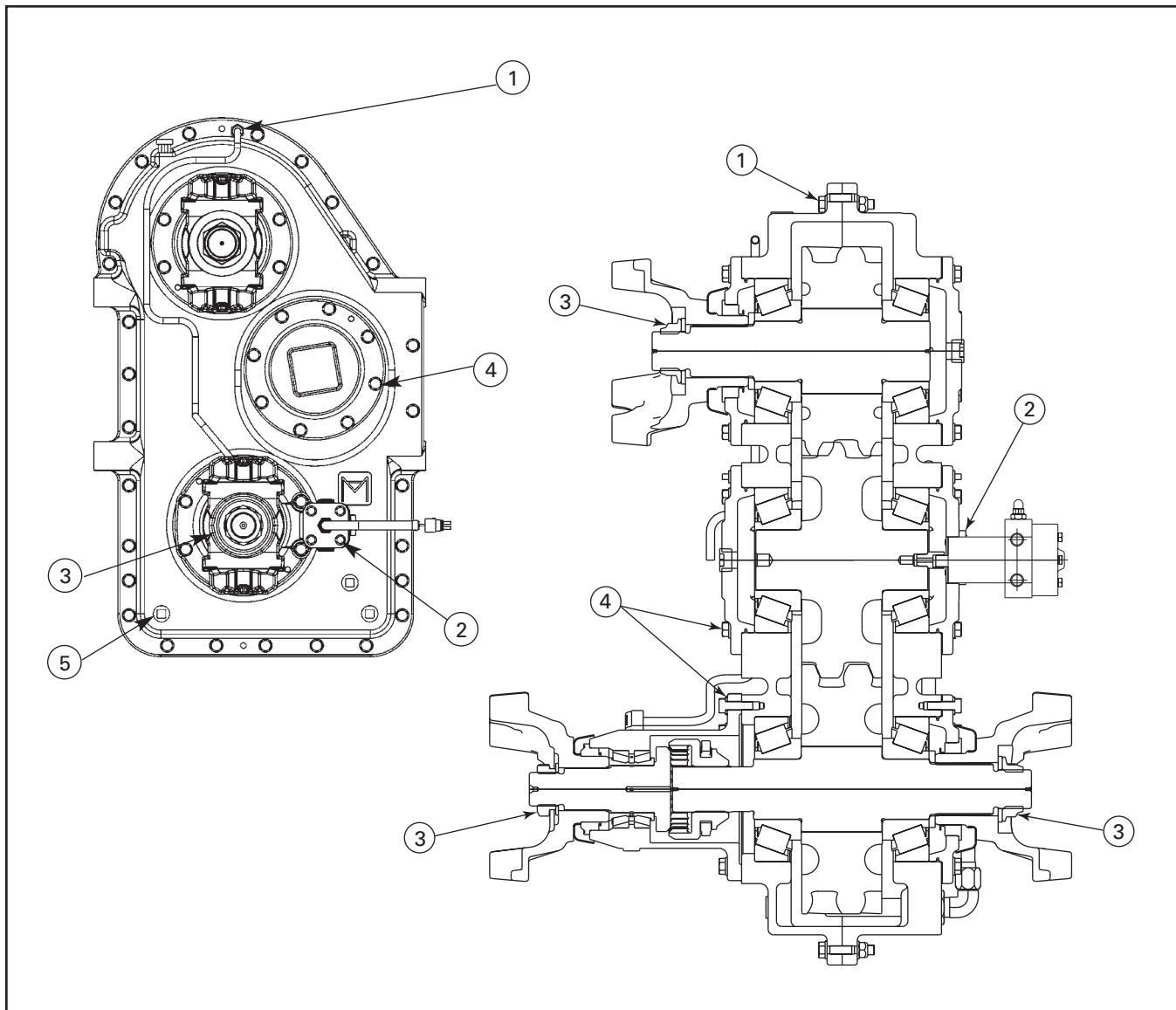
Model	Ratio	Recommended Input Speed (RPMs)
T-2119-D	1.00:1	2600 RPM
	1.21:1	2900 RPM
	0.83:1	2400 RPM

*Applications that exceed these recommended speed limits must be reviewed with Meritor's engineering applications department. Call Meritor's Customer Service Center at 800-535-5560.

Section 10 Specifications and Applications



Torque Chart



Item	Description	Torque/lb-ft (N•m)	Item	Description	Torque
1	Housing Capscrews	60-75 (87-102)	4	Bearing Cage Capscrews	60-75 (87-102)
2	Pump Capscrews	10-13 (14-18)	5	Drain and Fill Plugs	35 lb-ft (47 N•m) minimum
3	Yoke Nuts	700-900 (950-1220)			

Tire Mismatch

NOTE: Positive mismatch calculations indicate the front axle is PULLING. Negative mismatch calculations indicate the rear axle is PUSHING. A positive mismatch is the preferred condition for vehicle performance and stability.

The following calculation is based on tire mismatch at low speeds before tire expansion occurs. This is the normal usage of a transfer case as one axle, usually the front, will be disengaged at higher operating speeds.

$$\% \text{ Mismatch}_{LO} = \frac{[(LR_F) (R_{AR}) - (LR_R) (R_{AF})] * 100\%}{(LR_F) (R_{AR})}$$

- LR_F = Tire Loaded Radius - Front
- LR_R = Tire Loaded Radius - Rear
- R_{AR} = Axle Ratio - Rear
- R_{AF} = Axle Ratio - Front

The following calculation is for high speeds. A normal transfer case should have one drive output declutched in this condition. This calculation is mainly for transfer cases which include a differential.

$$\% \text{ Mismatch}_{HI} = \frac{[(TRPM_R) (R_{AR}) - (TRPM_F) (R_{AF})] * 100\%}{(TRPM_R) (R_{AR})}$$

- TRPM_R = Revs Per Mile of Rear Tires
- TRPM_F = Revs Per Mile of Front Tires

For special off-road low traction conditions, higher values may be acceptable. The allowable mismatch is increased in applications where the transfer case has excess torque capacity.

With through shaft between front and rear output	High speed mismatch: ± 1.5% Low speed mismatch: ± 1.0%
With declutch but no differential	High speed mismatch: ± 2.0% Low speed mismatch: ± 1.5%
With differential	High speed mismatch: ± 3.0% Low speed mismatch: ± 3.0%

Section 10 Specifications and Applications



Application Guidelines

The following is an outline of the current Meritor transfer case application formulas and usage guidelines.

Compare Torque Available at Transfer Case Input and Total Torque Slip at Transfer Case Input from the formulas shown in the following tables.

Compare T_A and $T_{S, TOT, HI}$ and take the lower of the two torque values. This torque must be less than the input torque rating of the selected Single Speed transfer case.

In special instances, transfer cases with optional ratios other than 1:1 may exist. In these cases the T_A and $T_{S, TOT, HI}$ comparison should be made with the $T_{S, TOT, HI}$ value calculated with these optional transfer case ratios.

Torque Available at Transfer Case Input	
	$T_A = (.92) (T_E) (R_{TL}) (R_{TC})$
Where:	T_A = Theoretical Torque Available at Transfer Case Input (lb-ft) T_E = Gross Engine Torque (lb-ft) R_{TL} = Forward Low Ratio Of Transmission (Use Reverse Low If High Torques Are Expected In Reverse) R_{TC} = Converter Stall Torque Ratio – Use 1.0 If No Converter Present

Total Torque Slip at Transfer Case Input	
	$T_{S, TOT, X} = T_{SF} + T_{SR}$
Where:	$T_{SF} = \frac{(GAWF)(SLRF)}{(16) (AR_F)(TC_X)}$
And:	$T_{SR} = \frac{(GAWR)(SLRR)}{(16) (AR_R)(TC_X)}$
With:	T_{SF} = Slip Torque of Transfer Case (lb-ft) – Front T_{SR} = Slip Torque of Transfer Case (lb-ft) – Rear SLRF = Static Loaded Radius of Tires (In) – Front SLRR = Static Loaded Radius of Tires (In) – Rear AR _F = Axle Ratio – Front AR _R = Axle Ratio – Rear GAWF = Gross Axle Weight (Lb) of Driving Units ONLY – Front GAWR = Gross Axle Weight (Lb) of Driving Units ONLY – Rear TC _X = Transfer Case Ratio

Meritor Heavy Vehicle Systems, LLC

2135 West Maple Road
Troy, MI 48084 USA
800-535-5560
meritor.com

Copyright 2008
Meritor, Inc.

Printed in USA

Revised 12-08
Maintenance Manual MM-01125 (16579/22882)



MERITOR®