Transfer Case

Special Tool(s)

- Collet (1-Inch to 1-1/4-Inch) 303-D621 (D90L-100-S) or equivalent
- Handle 205-153 (T80T-4000-W)
- Holding Fixture, Drive Pinion Flange 205-126 (T78P-4651-A)
- Holding Fixture, Transmission 307-003 (T57L-500-B)
- Installer, Drive Pinion Oil Seal 205-304 (T80T-4676-A)
- Installer, Input Shaft Bearing 308-085 (T83T-7025-C)
- Installer, Needle Bearing 308-089 (T83T-7127-A)
- Installer, Shaft Bearing Cone 308-166 (T88T-7025-B)
- Installer, Transmission Output Shaft Flange 205-495
- Installer, Valve Stem Oil Seal 303-367 (T90P-6510-AH)
- Installer, Wheel Hub Bearing Cup 204-026 (T73T-1202-A)
- Plate, Bearing Oil Seal 205-095 (T75L-1163-B)
- Puller, Bearing 205-D664 (D84L-1123-AI or equivalent)
Material

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
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<tr>
<td>Motorcraft® Transfer Case Fluid XL-12</td>
<td>ESP-M2C166-H</td>
</tr>
<tr>
<td>Ultra Silicone Sealant TA-29</td>
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Disassembly

Transfer Case Disassembled View
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<tr>
<th>Item</th>
<th>Part Number</th>
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<tr>
<td>1</td>
<td>7050</td>
<td>Front adapter</td>
</tr>
<tr>
<td>2</td>
<td>7B215</td>
<td>Oil seal (also part of 7050)</td>
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<tr>
<td>3</td>
<td>—</td>
<td>Spiral pin (part of 7050)</td>
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<td>4</td>
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<td>Front adapter (part of 7050)</td>
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<tr>
<td>5</td>
<td>7917</td>
<td>Snap ring (also part of 7050)</td>
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<tr>
<td>6</td>
<td>7917</td>
<td>Snap ring</td>
</tr>
<tr>
<td>7</td>
<td>7025</td>
<td>Bearing</td>
</tr>
<tr>
<td>8</td>
<td>7A385</td>
<td>Thrust washer</td>
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<tr>
<td>9</td>
<td>7C122</td>
<td>Snap ring</td>
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<tr>
<td>10</td>
<td>7B066</td>
<td>Thrust plate</td>
</tr>
<tr>
<td>11</td>
<td>7D063</td>
<td>Sun gear</td>
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<td>12</td>
<td>7017</td>
<td>Input shaft assembly</td>
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<td>Snap ring</td>
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<tr>
<td>14</td>
<td>7D164</td>
<td>Lockup hub</td>
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<td>15</td>
<td>7D126</td>
<td>Sleeve return spring</td>
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<td>7106</td>
<td>Lockup collar</td>
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<td>7177</td>
<td>Drive sprocket</td>
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<td>7065</td>
<td>Sleeve bearing (also part of 7017)</td>
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<td>7120</td>
<td>Needle bearing (also part of 7017)</td>
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<td>Input shaft (part of 7017)</td>
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<td>Pinion thrust washers (part of 7A398)</td>
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<td>22</td>
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<td>Needle roller bearings (part of 7A398)</td>
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<td>Pinion needle spacer (part of 7A398)</td>
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<td>Pinion gear (part of 7A398)</td>
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<td>7A398</td>
<td>Complete carrier assembly</td>
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<td>26</td>
<td>—</td>
<td>Planet pinion pin (part of 7A398)</td>
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<td>27</td>
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<td>Planet carrier (part of 7A398)</td>
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<tr>
<td>28</td>
<td>7A443</td>
<td>Bolt (6 required)</td>
</tr>
<tr>
<td>29</td>
<td>7034</td>
<td>Breather barb</td>
</tr>
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</table>
1. Remove the transfer case from the vehicle. For additional information, refer to Transfer Case Removal in this section.

2. Attach the transfer case to the Transmission Holding Fixture.
3. **NOTE:** Index-mark the rear output shaft and the flange.

**NOTE:** The nut has a self-locking feature. Discard the nut and the washer after removing.

Use the Drive Pinion Flange Holding Fixture to prevent the flange from turning. Remove and discard the flange nut and the washer.

4. Using a suitable puller and the Drive Pinion Flange Holding Fixture, remove the flange.

5. Remove and discard the oil seal if it remains on the rear output shaft.

6. Using the Oil Seal Remover, remove and discard the rear output shaft seal.

7. Remove the spacer.
8. Remove the shift motor bracket bolt and the 3 shift motor bolts.

9. Remove the coil wire from the shift motor electrical connector.
   1. Remove the inner retainer from the electrical connector.
   2. Lift up on the lock tab and remove the wire from the electrical connector.

10. Remove the 9 transfer case cover bolts.

11. **NOTE:** Position the assembly so that the front of the transfer case is facing downward.
    Using the pry bosses, separate the transfer case cover from the transfer case.

12. Remove the snap ring that retains the bearing in the case.
13. Using the Stator Bearing Remover with the Slide Hammer, remove the bearing.

14. Using the Collet with the Slide Hammer, remove the needle bearing.

15. Remove the following:
   1. Shift collar hub.
   2. Return spring.
   3. Lockup collar and the lockup fork as an assembly.
   4. Electric shift cam assembly.
   5. Shift rail.

16. Remove the lockup hub snap ring.

17. Remove the lockup hub and the sleeve return spring from the lockup collar.
18. Remove the snap ring and the spacer.

19. Remove the drive chain, driven sprocket, and the drive sprocket as an assembly.

20. Remove the magnet and the oil strainer from the slot in the transfer case.

21. Remove the rear output shaft and the pump assembly as an assembly.

22. Rotate the pump assembly to align the keyway in the cover and the spring pin in the rear output shaft and separate the pump from the shaft.
23. **NOTE:** The height of the oil pump spring pin must be measured before removal so that during assembly, it can be installed at the correct height so that the oil pump shaft rotates with the rear output shaft.

Using a micrometer, measure and record the pump drive pin height above the diameter of the rear output shaft. Remove the drive pin from the rear output shaft.

24. **NOTICE:** Do not let the front output shaft assembly fall out of the case while removing the snap ring or damage to the component may occur.

Remove the snap ring. Discard the snap ring if it was damaged during removal.

25. Remove the front output shaft.

26. Remove the reduction fork and the reduction hub as an assembly.

27. Remove the 6 bolts retaining the front adapter to the case.
28. Remove the front adapter, input shaft and the complete carrier as an assembly.

29. Using snap ring pliers, expand the tangs of the large snap ring and remove the complete carrier and the input shaft from the front adapter.

30. Remove the large snap ring from the front adapter.

31. Using a suitable tool, remove and discard the oil seal from the front adapter.

32. Remove the snap ring retaining the input shaft to the planet carrier.
33. Using the Bearing Puller and a suitable press, remove the bearing.

34. Remove the thrust washer and the input shaft.

35. Remove the snap ring, the thrust plate and the sun gear.

36. **NOTE:** Remove and discard both the sleeve bearing and the needle bearing if either one is worn/damaged.

   Using the Input Shaft Bearing Remover, Shaft Bearing Cone Installer, Bearing Oil Seal Plate and a suitable press, remove the needle bearing and the sleeve bearing from the input shaft.

37. Using a suitable tool, remove and discard the oil seal.
38. Remove the snap ring retaining the bearing to the case.

39. Using the Stator Bearing Remover with the Slide Hammer, remove the bearing.

40. Using a suitable tool, remove and discard the oil seal.

41. Remove the shift fork facings.

42. Remove the electric shift cam from the shift shaft.
43. **WARNING:** Keep fingers away from spring ends when releasing the spring. Spring ends are under tension and will unwind with force. Failure to follow this instruction may result in injured fingers.

Remove the torsion spring and the spacer from the shift shaft.

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**Assembly**

**NOTICE:** Prior to assembly, lubricate all parts with transfer case fluid. Failure to lubricate the parts may cause damage to the components.

1. Using the Wheel Hub Bearing Cup Installer with the Handle and a suitable press, install the bearing.

2. Install the snap ring.

3. Using the Drive Pinion Oil Seal Installer, install a new oil seal.

4. **NOTICE:** Do not damage the needle bearing when installing or component damage may occur.

   Using the Input Shaft Bearing Installer with the Handle and a suitable press, install a new needle bearing.
5. Using a suitable tool and a suitable press, install a new sleeve bearing.

6. **NOTE:** The recessed face of the sun gear must face the rear of the transfer case.
   Install the sun gear, thrust plate and the snap ring.

7. **NOTE:** The stepped face of the thrust washer must face upward.
   Install the input shaft and the thrust washer.

8. **NOTE:** Install the bearing on the input shaft so that the snap ring groove in the bearing is closest to the top of the planet carrier.
   Using a suitable press, install the bearing.

9. Install the snap ring on the input shaft.

10. Using the Drive Pinion Oil Seal Installer, install a new oil seal.

11. Install the large snap ring in the groove in the front adapter.
12. **NOTICE:** Install the front adapter within 15 minutes of applying the silicone sealant or it will be necessary to apply new sealant. If possible, allow one hour before filling the transfer case with lubricant to allow the silicone sealant to cure.

Apply a 3 mm (1/8 in) bead of silicone sealant to the front adapter mounting surface of the transfer case.

13. Position the front adapter on the transfer case and install the 6 bolts.
   - Tighten to 34 Nm (25 lb-ft).

14. Install the input shaft and the complete carrier as an assembly.
   - Align the pinion gears gear teeth and the ring gear teeth. Expand the snap ring and push inward on the planet carrier until the input shaft seats fully in the front adapter. Verify that the snap ring engaged the assembly by holding the front adapter and lightly tapping the face of the input shaft against a wooden block.

15. Attach the front case to the Transmission Holding Fixture.

16. Install the new shift fork facings. Verify that they snap securely into place.
17. Install the reduction hub and the reduction fork as an assembly.

18. **NOTE:** The oil pump spring pin must be installed at the correct height so that the oil pump shaft rotates with the rear output shaft.

**NOTE:** If a measurement was not taken during disassembly, install the pin to the correct height specification using a micrometer.

Press the pin into the rear output shaft pin hole to the previously measured height.

19. **NOTE:** Do not remove the plastic insert from the bore of a new pump assembly. Discard it after it slides out of the bore during the pump assembly installation on the rear output shaft.

**NOTE:** Align the keyway in the cover and the spring pin in the rear output shaft and fully seat the pump assembly on the shaft. The shaft will rotate freely in the pump assembly when the pump assembly is fully seated. If the pump assembly does not turn freely, realign the keyway and the spring pin and shake the pump assembly until it seats fully and rotates freely on the shaft.

Install the pump assembly on the rear output shaft.

20. Prime the pump assembly.

- Submerge the pump in a container full of clean transfer case fluid.

21. Install the rear output shaft and the pump assembly.

22. Install the oil strainer and the magnet in the slot in the case.
23. Install the front output shaft.

24. Install the snap ring.

25. Install the drive chain, drive sprocket and the driven sprocket as an assembly.

26. Install the spacer and the snap ring.
27. Install the shift rail through the reduction shift fork. Verify that the shift rail seats in the case bore.

28. Slide the spacer and the torsion spring on the shift shaft and position it beneath the drive tang.

29. **WARNING:** Keep fingers away from spring ends when releasing the spring. Spring ends are under tension and will unwind with force. Failure to follow this instruction may result in injured fingers.

Position the first spring tang to the left of the drive tang.

30. **WARNING:** Keep fingers away from spring ends when releasing the spring. Spring ends are under tension and will unwind with force. Failure to follow this instruction may result in injured fingers.

Wind the second spring tang clockwise past the drive tang, and push the torsion spring and sleeve in as far as it will go.

31. Install the electric shift cam and slide the drive tang between the torsion spring tangs as far as it will go.

32. **NOTICE:** Do not bend the cam during installation. This will damage the locating pin on the end of the shift shaft.

Install the pin on the end of the shift shaft into the hole in the case.
33. Position the torsion spring tangs so that they point toward the top side of the case and just touch the reduction shift fork.

34. Assemble the lockup assembly.

35. Press downward on the lockup hub and install the snap ring.

36. Install the lockup fork and the lockup collar as an assembly.

37. **NOTE:** The triangular shaft will be in the 2WD position (2H) at final assembly.

Verify that the cam roller is resting on the top surface of the electric shift cam and not into an inside track after the lockup fork is released.
38. Lift upward on the lockup fork slightly while holding down on the shift rail and rotate the electric shift cam track into the cam roller by turning the shift shaft.

39. Install the shift collar hub and the return spring.

40. **NOTICE:** Do not damage the needle bearing or damage to components may occur.

   Using the Needle Bearing Installer with the Handle and a suitable press, install the needle bearing.

41. Using the Wheel Hub Bearing Cup Installer with the Handle and a suitable press, install the bearing.

42. Install the snap ring that retains the bearing to the transfer case cover.
43. Using the Valve Stem Oil Seal Installer, install a new oil seal.

44. **NOTICE:** Assemble the cases within 15 minutes of applying the silicone sealant or it will be necessary to apply new sealant. If possible, allow one hour before filling the transfer case with lubricant to allow the silicone sealant to cure.

   Apply a 3 mm (1/8 in) bead of silicone sealant to the mating surface of the front case.

45. **NOTE:** Align the output shaft, the shift shaft and the return spring to their respective bores in the transfer case cover.

   Assemble the cases.

46. Install the 9 transfer case cover bolts.
   - Tighten to 34 Nm (25 lb-ft).

47. Install the spacer on the rear output shaft.

48. Using the Drive Pinion Oil Seal Installer, install a new oil seal.
49. **NOTE:** Align the index marks made during disassembly.

**NOTE:** Verify the oil seal is not on the shaft before installing the shaft.

Position the flange on the rear output shaft. If necessary, reseat the oil seal in the flange.

50. Install a new oil seal in the flange.

51. Using the Transmission Output Shaft Flange Installer, install the flange. Tighten the nut on the Transmission Output Shaft Flange Installer to 54 Nm (40 lb-ft) to seat the flange on the shaft.

52. Use the Drive Pinion Flange Holding Fixture to prevent the flange from turning. Install a new washer and a new flange nut.
   - Tighten to 210 Nm (155 lb-ft).

53. **NOTICE:** Install the motor within 15 minutes of applying the silicone sealant or it will be necessary to apply new sealant. If possible, allow one hour before filling the transfer case with lubricant to allow the silicone sealant to cure.

Apply a thin coat of silicone sealant to the base of the motor housing.

54. **NOTE:** If the shift shaft will not stay in the 4H position, rotate the shift shaft clockwise to the 2H position. During motor assembly installation, rotate the motor counterclockwise until the motor aligns with the mounting holes.

Position the motor assembly. Install the 3 shift motor bolts and bracket bolt.
   - Tighten to 10 Nm (89 lb-in).

55. Install the coil wire to the shift motor electrical connector.
   1. Insert the wire into the electrical connector.
   2. Install the inner retainer into the electrical connector.
56. Install the transfer case. For additional information, refer to Transfer Case Installation in this section.