INTRODUCTION

The separator clutch and main shaft transmit power to the separator of the combine. Power is transmitted from the engine, through the power band belt, A, (Figure 4-1 for the TR98 and TR97; Figure 4-2 for the TR99), to the separator clutch sheave, B. The power band belt also transmits power to the hydrostatic pump drive sheave. On the TR96 and TR97 models, the separator clutch is engaged and disengaged manually using a lever in the cab. On the TR99 model, the clutch is electrically engaged and disengaged. With the separator clutch disengaged, the clutch sheave simply rotates around the main shaft. When the separator clutch is engaged, it turns the main shaft. The main shaft transmits the power from the left side of the machine to the right side and drives the separator.

SEPARATOR CLUTCH

Removing the Separator Clutch

1. Remove the cotter pin from the castellated nut, C, Figure 4-1 or Figure 4-2.
2. Engage the separator clutch, then loosen the castellated nut.
3. Remove the tension from the power bend belt by loosening spring A. (Figure 4-3 for the Caterpillar powered TR86; Figure 4-4 for the Ford powered TR86/TR87/TR88).

NOTE: The belt does not have to be removed to service the clutch.
4. Remove the mounting bolts, B, from shock absorber, A. This allows enough slack in the belt so it can be removed from the sheave.

5. On the TR96 and TR97, remove anchor bolt retaining pin, A, and top link retaining pin, B.

6. For the TR98, remove bolt, A, to disconnect the electric actuator and remove top link retaining pin, B.
NOTE: The figures used for the disassembly of the separator clutch show the TR96 and TR97. The TR98 is disassembled in the same manner.

7. Remove the castellated nut and washer and remove sleeve, A, from the throw-out bearing.

8. Use the fork to pull separator clutch assembly, A, off the main shaft.

CAUTION: THE SEPARATOR CLUTCH ASSEMBLY IS HEAVY AND CARE MUST BE USED WHEN REMOVING THE ASSEMBLY FROM THE SHAFT.

NOTE: If the clutch will not move, it may be disassembled on the machine as described in Steps 9 through 14.

9. To disassemble the clutch on the machine, remove the cotter pins and drive cut pins, B. Watch for spring wave washers, C, at the links. The fork and bearing can then be removed.

10. Depress pin, A, and remove the spanner nut, B.

11. Remove pressure plate, C.

12. Remove pin, A, and spring from the pressure plate.
13. Remove outer clutch disc, A, Figure 4-11, center clutch plate, A, Figure 4-12, and inner clutch disc, A, Figure 4-13.
14. Two 3/8" bolts with long threads can be screwed into hub at A, to push the hub off the shaft.

15. Remove key, A.

NOTE: There is a spacer located at B, and a seal, C.

Disassembling the Separator Clutch

1. Remove throw-out bearing assembly, A, by removing pins, B. The throw-out bearing is serviced by removing snap rings, C, then D. 

NOTE: Watch for spring wave washers at B.
2. Depress pin, A, and remove the spanner nut, B.

3. Remove pressure plate, A.
4. Remove pin, B, and spring.
5. Remove outer clutch disc, A, Figure 4-19; center clutch plate, A, Figure 4-20; and inner clutch disc, A, Figure 4-21.
Separator Clutch Layout

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fork and bearing assembly</td>
</tr>
<tr>
<td>B</td>
<td>Pressure plate</td>
</tr>
<tr>
<td>C</td>
<td>Clutch disc</td>
</tr>
<tr>
<td>D</td>
<td>Clutch plate</td>
</tr>
<tr>
<td>E</td>
<td>Drive hub</td>
</tr>
<tr>
<td>F</td>
<td>Cotter pin, 1/8&quot; x 1-3/4&quot;</td>
</tr>
<tr>
<td>G</td>
<td>Castle nut 1&quot;</td>
</tr>
<tr>
<td>H</td>
<td>Washer</td>
</tr>
<tr>
<td>I</td>
<td>Spanner nut</td>
</tr>
<tr>
<td>J</td>
<td>Sleeve</td>
</tr>
<tr>
<td>K</td>
<td>Fork retaining pins</td>
</tr>
<tr>
<td>L</td>
<td>Pins, spring washers, and cotter pins</td>
</tr>
<tr>
<td>M</td>
<td>Lockpin and spring</td>
</tr>
<tr>
<td>O</td>
<td>Square key, 3/8&quot; x 3&quot;</td>
</tr>
</tbody>
</table>

Parts Inspection

1. Check the bearing in the fork for wear. Replace if necessary.
2. Check all pins and linkages for wear. Replace if necessary.
3. Inspect the clutch disc teeth for wear. Replace if worn. The plates should be flat within 0.010"-0.015" (0.254 mm-0.381 mm).
4. If the pressure plate or hub is warped or cracked, it should be replaced.
Assembling the Separator Clutch

1. Install inner clutch disc, A, on the drive hub.

2. Install center clutch plate, A, and then outer clutch disc, B.

3. Install pressure plate, A. Coat pin, B, with antiseize compound. Install spring, C, and then the pin as shown.
4. Depress pin B, and install spanner nut A. Screw it on until it is flush with the end of the hub.

NOTE: Coat the threads with anti-seize compound prior to installation.

5. Install the fork assembly on the pressure plate with the three pins at A (two shown). Coat the pins with anti-seize compound. Use a wave spring washer on each side of the links.

NOTE: The heads of the pins at A should be on the driving side of the sheave, i.e., when facing the clutch assembly, the pins should be "pointing" in a clockwise direction.
6. If the throw-out bearing was removed from the housing, reinstall it and secure with snap ring, A. Slide the bearing and housing over the hub and secure with snap ring, B.

7. If the forks on the bearing housing were removed, reinstall them using three 3/8" x 2-1/2" cap screws, lock washers, nuts, and spacers at C. Use one 3/8" x 2" full-threaded bolt and three nuts at D and E. Tighten nut, D, against the arm. Tighten outside nut, E, until the forks contact the bearing housing. Tighten the nut one more flat. Tighten inside nut, E.

NOTE: On the TR86 and TR97 models, the longer adjusting rod, B, attaches to the end of the fork at an angle. This is the bottom of the clutch assembly.
Installing the Separator Clutch

1. Install the 3/8" x 3" square key, A, on the main shaft.

2. Align the keyway on the clutch hub with the square key on the shaft and slide the assembled clutch onto the main shaft. The clutch teeth will have to be aligned to slide into the drive ring.

3. Install sleeve, A.

4. Install flat washer, A, and castellated nut, B. Turn the nut on hand-tight.

   NOTE: If the unloading auger drive belt was removed, it should be reinstalled at this time.

5. Install the separator drive belt.
5. On the TR96 and TR97, attach the upper rod, A, and lower rod, B. Note the orientation of the forks. The longer adjusting rod goes to the bottom.

6. For the TR98, attach upper rod, B, and install bolt, A, to connect the electric actuator. The wider end of the forks are on the bottom.

7. Install the mounting bolts, B, for shock absorber, A.
9. Tension the drive belt by tightening spring, A, (Figure 4-35 for the Caterpillar powered TR96; Figure 4-37 for the Ford powered TR96/TRA97/TRA98), to the spring gauge.

10. Torque the nut on the end of the shaft to 250 ft. lbs. - 350 ft. lbs. (339 N-m - 475 N-m) and install the cotter pin. If the sheave continues to turn, engage the clutch to finish tightening the nut.

Adjusting the Separator Clutch (TR96 and TR97)

IMPORTANT: Failure to maintain correct clutch adjustment can result in damage to the clutch components.

NOTE: If new clutch discs or cable have been installed, check the clutch adjustment every 10-15 hours for the first 50 hours.

1. Adjust the length of upper rod, A, to 8-3/4" (222 mm) from pin center to pin center.

2. Adjust the length of lower rod, B, to 12-1/4" (311 mm) from pin center to the brace.
3. Attach a belt tension gauge 1" (25 mm) down from the top of the separator clutch handle, A. The clutch should require 32 lbs. (14.5 kg) of force to engage.

![Figure 4-39](image1)

**CAUTION: THE ENGINE MUST BE STOPPED WHILE MAKING THIS ADJUSTMENT.**

4. If the proper engagement pressure is not obtained, depress pin, A, and rotate the spanner nut, B. Turning the ring one notch will change the engaging force by approximately 5 lbs. (2.3 kg). Turning the ring clockwise will increase pressure. Turning the ring counterclockwise will decrease pressure.

5. Disengage the clutch. Check for a minimum 7/8" (22 mm) between the ear on the throw-out bearing and the spanner nut as shown at C. To obtain this dimension, adjust lower rod, B, Figure 4-39.

6. If the separator clutch handle hits the stop bolt before the clutch engages, adjust upper rod, A, Figure 4-39.

7. If either rod was adjusted in the previous steps, recheck the clutch setting.

**NOTE:** When adjusting the clutch with new discs, engage the clutch four or five times with the engine at full throttle prior to making final adjustments.

![Figure 4-40](image2)
Adjusting the Separator Clutch (TR96)

IMPORTANT: Failure to maintain correct clutch adjustment can result in damage to the clutch components.

NOTE: If new clutch discs have been installed, check the clutch adjustment every 10-15 hours for the first 50 hours.

1. If performing initial adjustment after clutch assembly or if proper adjustment cannot be obtained, perform the following:

   a. Engage clutch and make sure clearance between the end of the actuator and the fork block is 3/8" ± 1/8" (8.5 mm ± 3.2 mm) as shown in Figure 4-41. Adjust inner limit switch, C, Figure 4-42, to obtain correct dimension. Loosen setscrew to move switch.

   b. Turn outer nut, I, to end of bolt, D.

   c. Disengage clutch by turning inner nut, J, against round, B, until clutch disengages, then turn inner nut, J, back in so it will not contact round, B, when clutch is engaged.

   d. Tighten outer nut, I, against round B, until clutch goes over center.

   e. Tighten inner nut, J, against round B. The arms of the fork, E, should not be extremely tight.

   f. Complete clutch adjustment as described in the following steps.

2. Engage the clutch. Remove cap screw, H, Figure 4-42, to disconnect the electric actuator from the fork.

3. Place torque wrench into either square hole, A, Figure 4-42, at the bottom of the fork arms, E. Pull torque wrench to disengage the clutch.
CAUTION: THE ENGINE MUST BE STOPPED WHILE MAKING THIS ADJUSTMENT.

4. Set torque wrench to 135 ft. lbs. (183 N-m). Place torque wrench in line with the fork, E, Figure 4-42, and push torque wrench to check clutch setting. The clutch should go over center as the torque wrench breaks away at 135 ft. lbs. (183 N-m).

NOTE: The torque value is based on using an 18" long torque wrench, with the shaft of the wrench being in-line with the fork. Any other alignment will result in an improper clutch adjustment.

5. To adjust the clutch, depress pin A, and rotate the spanner nut B. Turning the ring clockwise will increase pressure. Turning the ring counterclockwise will decrease pressure.

NOTE: When adjusting the clutch with new discs, engage the clutch four or five times with the engine at full throttle prior to making final adjustments.

6. Install cap screw H, Figure 4-42, and disengage the clutch. Check for a minimum 7/8" (22 mm) between the ear on the throw-out bearing and the spanner nut as shown at C. To obtain this dimension, adjust outer limiter switch G, Figure 4-42. Loosen setscrews to move switch.

7. If proper adjustment cannot be obtained, perform step 1.