

# **2000 SERIES CAST IRON TRANSMISSION ADDENDUM**



## SECTION 5

### 2000 Series

#### Transmission Housings And Axle Shaft Shims

Several combinations of transmission housings and internal components (including bearings, axles, and washers) were used for 2001 production. These changes can be identified by the first number of the transmission serial number.

Transmissions with a serial number beginning with the number 2 were not updated from year 2000 production.

Transmissions with serial numbers beginning with the number 3 will have model year 2000 transmission housings, 2001 updated internal components, and three .030 flat washers (part number 736-0615) on each axle. See Note.

Transmissions beginning with serial number 4 will have a model year 2000 right hand transmission housing, an updated 2001 left hand housing, updated 2001 internal components, and only one .060 flat washer (part number 736-0745) on each axle.

Transmissions with a serial number beginning with the number 5 will have updated right and left hand housings, updated internal components, and one .060 flat washer on each axle shaft.

**NOTE:** If the transmission serial number begins with the number 3, when replacing either transmission housing, remove two of the six .030 flat washers (one from each axle). See Figure 1.

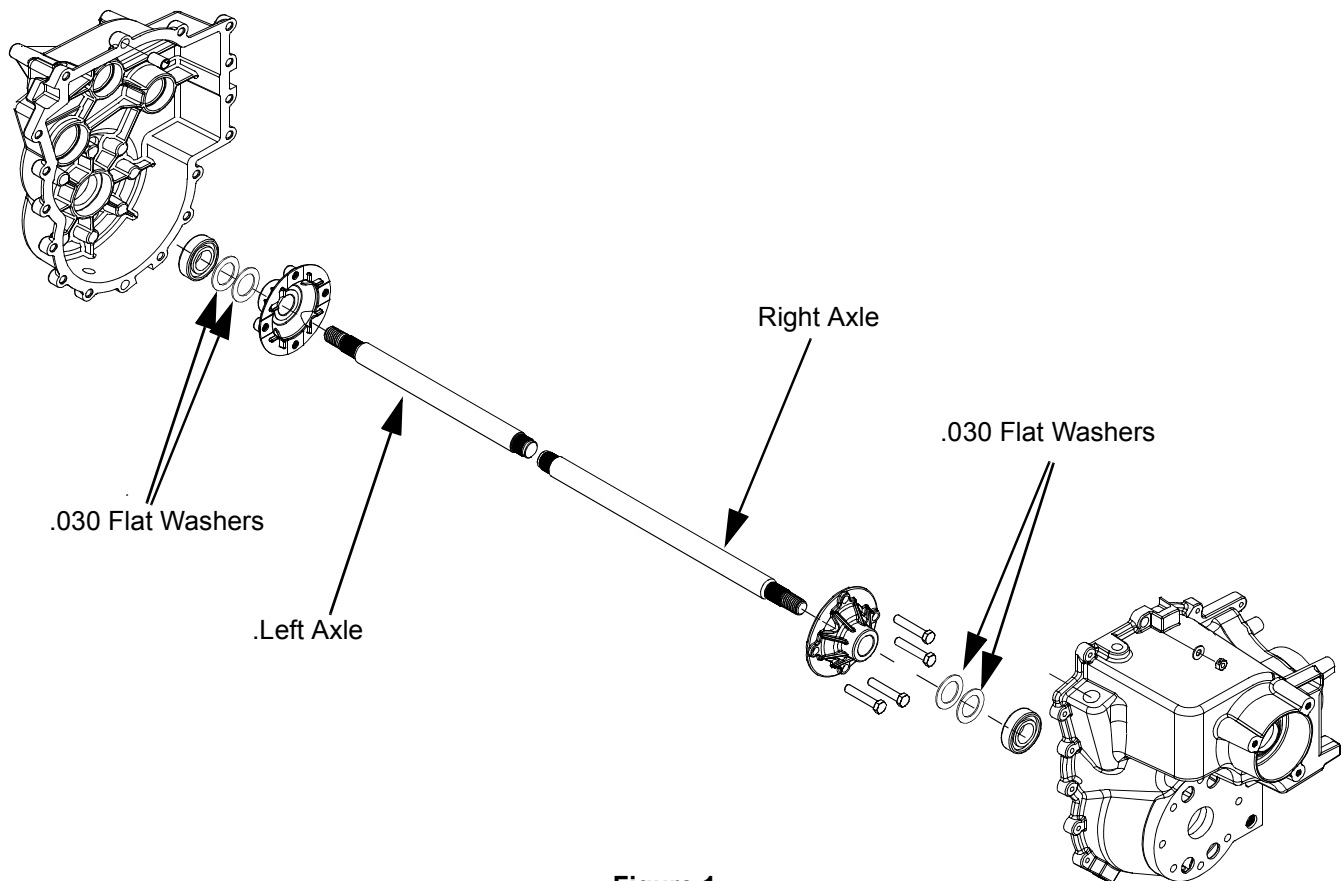


Figure 1

## 2000 Series

### Cast Iron Transmission Housings

For 2002 production, the 2000 series transmissions housings will be cast iron.

### Transmission Disassembly

**NOTE:** Prior to performing this section, drain all the fluid from the transmission assembly.

1. Remove the oil drain plug and set it aside using a 16mm socket. See Figure 1.

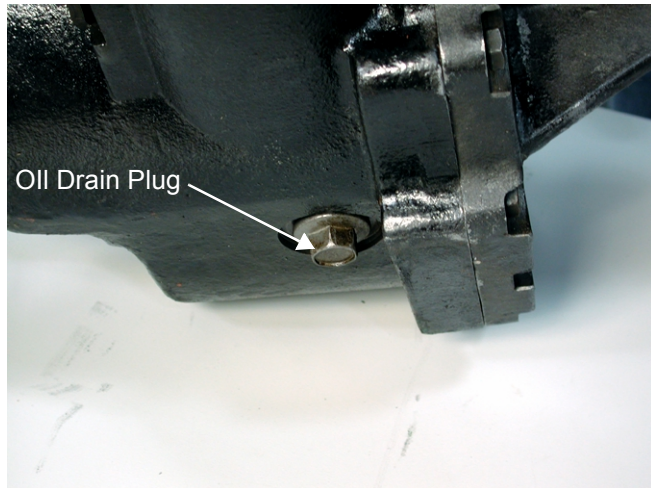


Figure 1

**NOTE:** The oil drain plug must be removed to remove the internal components.

2. Remove the flair fitting securing the hydraulic pick up tube to the back of the BDU-10L using two 11/16 in. wrenches. See Figure 2.

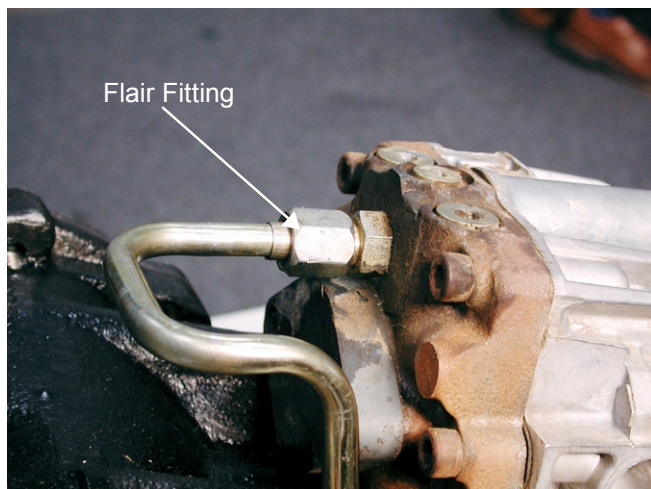


Figure 2

3. Remove the hex cap screw securing the hydraulic pick-up tube clamp and tube to the right transmission housing using a 7/16 in. socket. See Figure 3. See Figure 3.

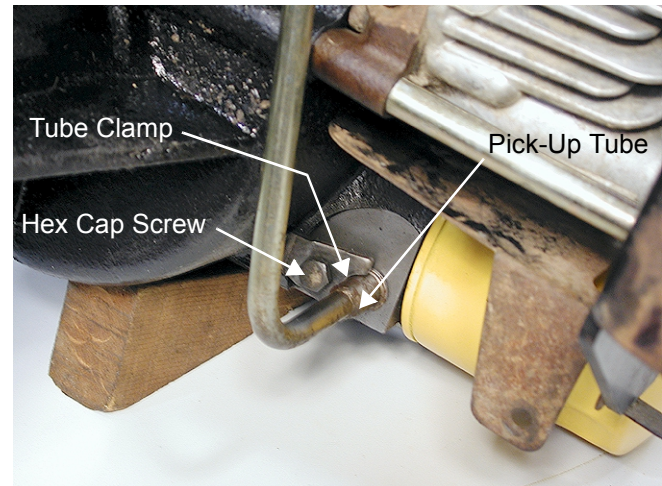


Figure 3

4. Inspect the o-ring at the end of the hydraulic pick up tube. See Figure 4.

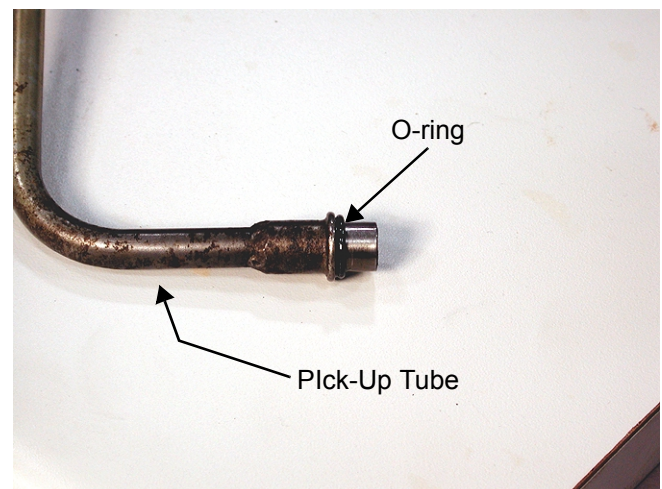


Figure 4



5. Remove both hex washer head screws securing the brake assembly to the right transmission housing using a 3/8 in. socket. See Figure 5.

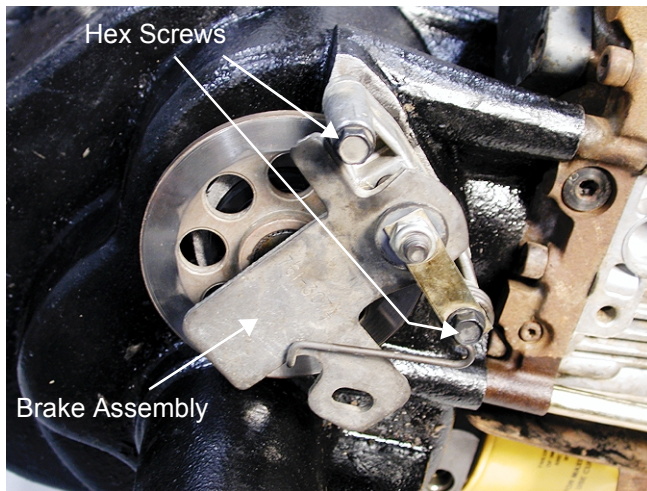


Figure 5

6. Remove the brake disk from the output shaft. See Figure 6.

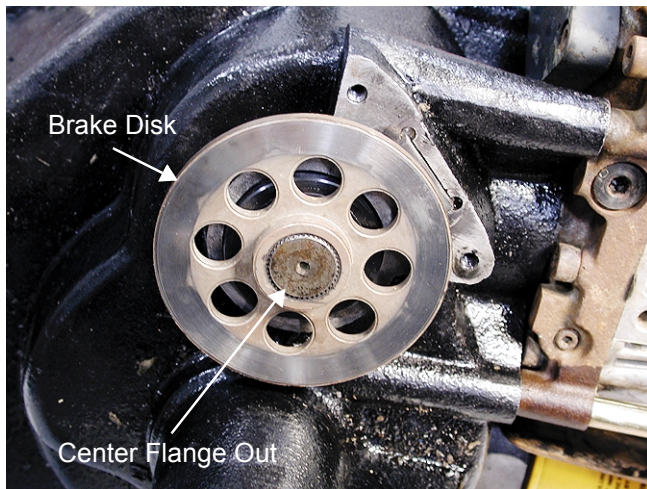


Figure 6

**NOTE:** The center flange of the brake disk faces outward.

7. Disassemble the brake assembly using a 1/2 in. socket. See Figure 7.

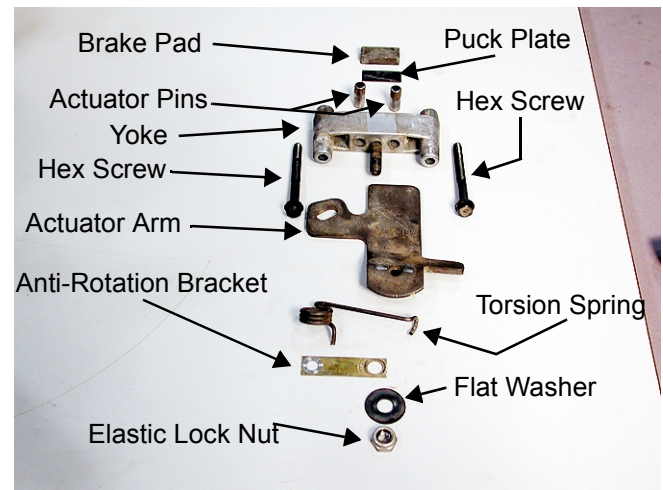


Figure 7

8. Inspect all the components of the brake assembly for damage or wear: brake pads, puck plate, actuator pins, actuator arm, anti-rotation bracket, yoke, torsion spring, flat washer and locking hex nut.

**NOTE:** The center stud is molded into the brake yoke.

9. Remove the output shaft seal from the right transmission case using a flat blade screwdriver. See Figure 8.

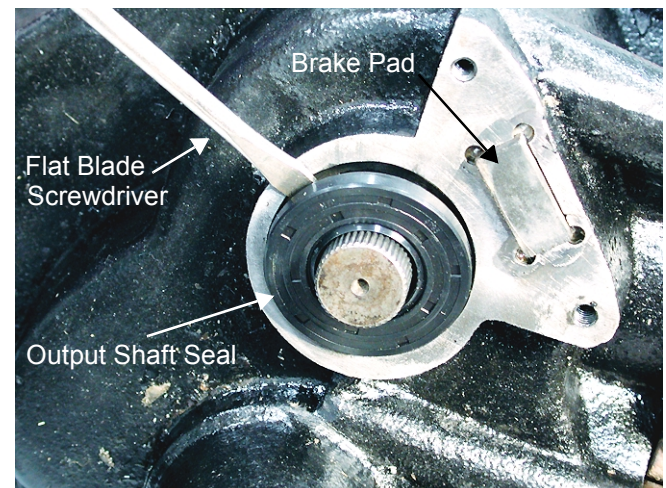


Figure 8

**NOTE:** Replace the output shaft seal.

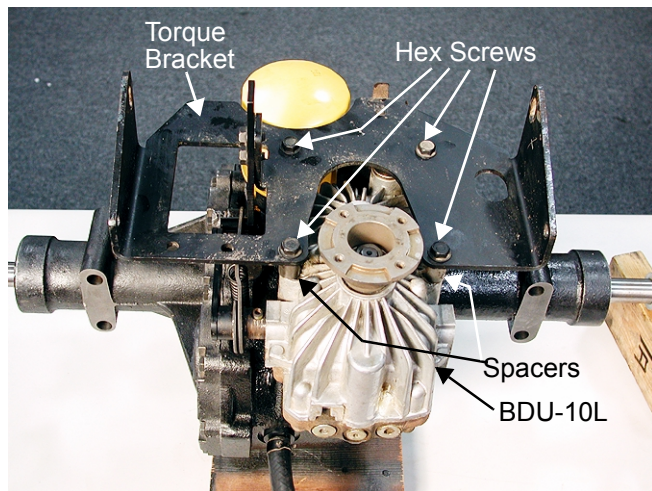


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10. Remove the inside brake pad from the right transmission housing.

**NOTE:** The factory glues the inside brake pad to housing during assembly.

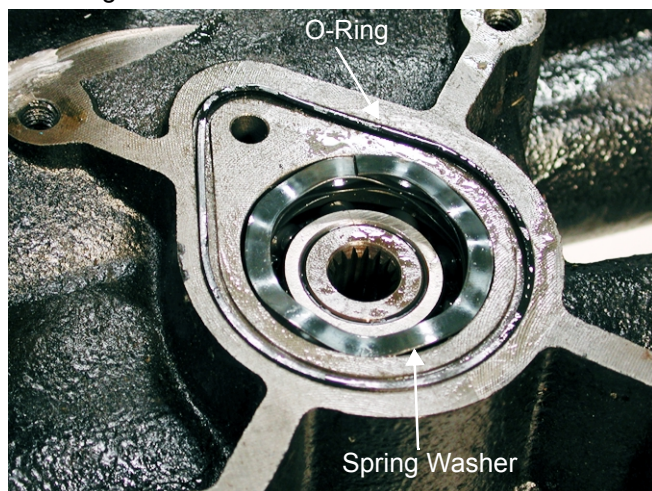
11. Remove all four hex washer head screws securing the front torque bracket, spacers and BDU-10L to the right transmission housing using a 1/2 in. socket. See Figure 9.



**Figure 9**

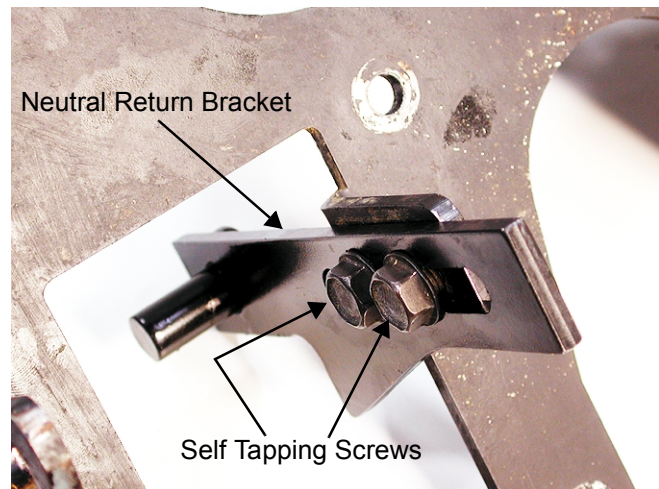
**NOTE:** The 3/4 in. spacers are located at the top, and the 3-1/2 in. spacers are located at the bottom.

12. Remove the front torque bracket, spacers and the BDU-10L hydrostatic transmission from the right transmission housing.
13. Remove the spring washer and the gland seal o-ring from the right transmission housing. See Figure 10.



**Figure 10**

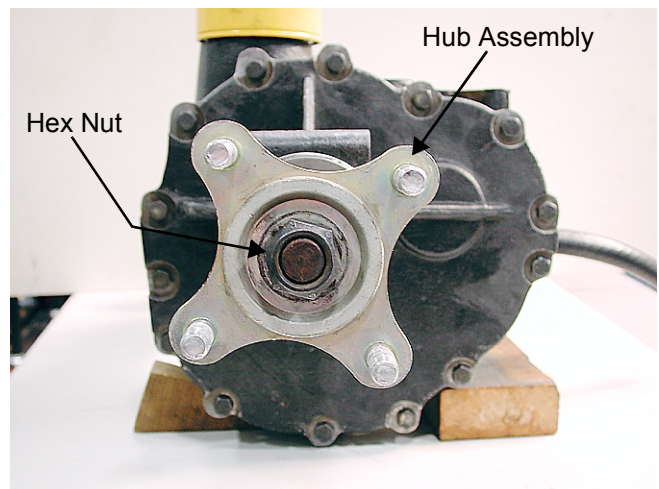
14. Inspect the self tapping screws securing the neutral return bracket assembly to the front torque bracket. See Figure 11.



**Figure 11**

**NOTE:** Neutral return adjustment will be necessary after the transmission assembly and installation sections have been performed.

- 14.1. Remove both large hex lock nuts securing the hub assemblies to the axles using a 1-1/8 in. socket. See Figure 12.



**Figure 12**



15. Clean the smooth exposed surface of the axles with fine emery cloth. See Figure 13.

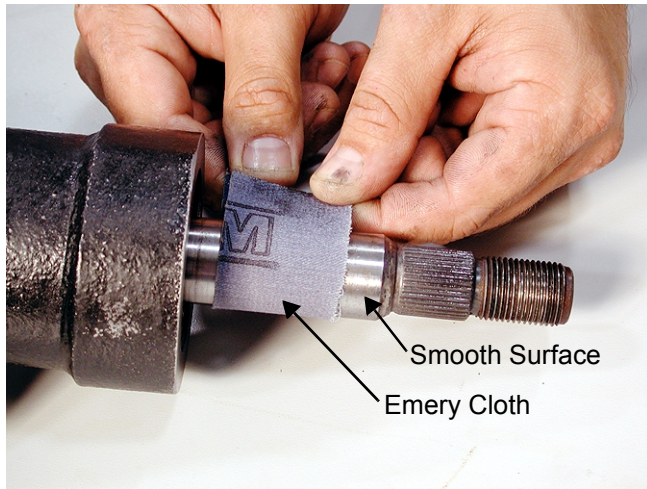


Figure 13

17. Remove the left transmission housing from the right transmission housing. See Figure 15.

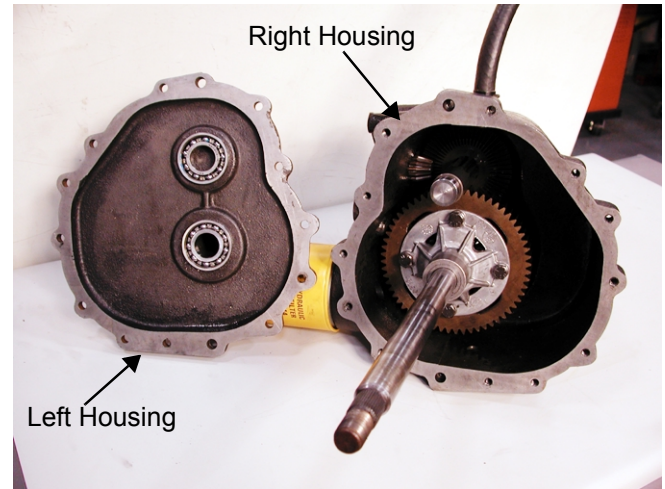


Figure 15

16. Remove all fourteen hex head cap screws securing the left transmission housing to the right transmission housing, in a cross pattern, using a 1/2 in. socket. See Figure 14.



Figure 14

18. Remove the 13T input pinion and ball bearing from the right transmission housing using a wooden dowel. See Figure 16.

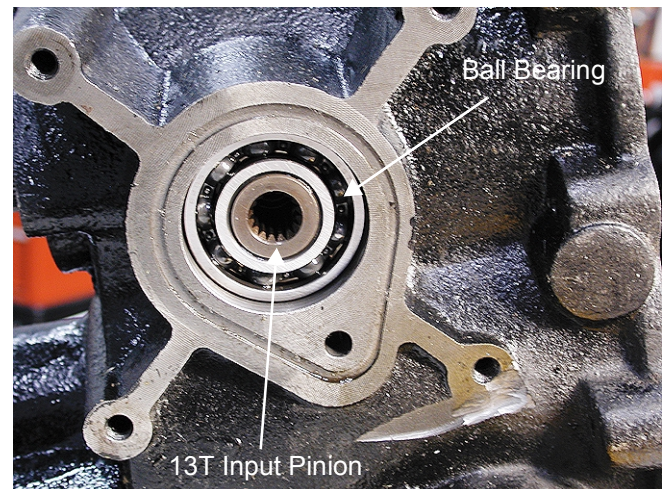


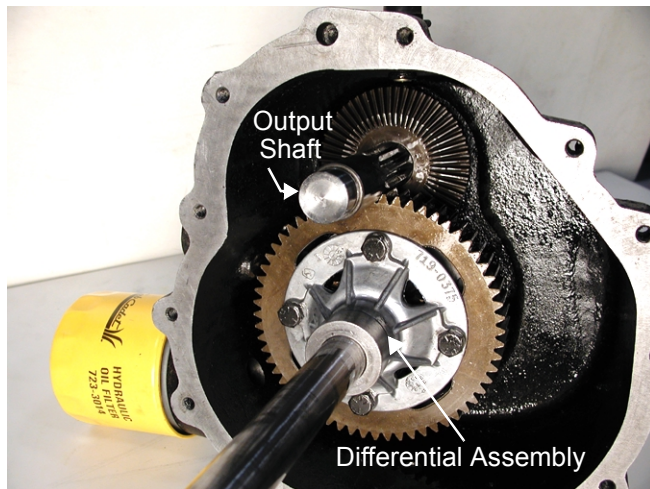
Figure 16

**NOTE:** The 13T input pinion is pressed into the ball bearing.



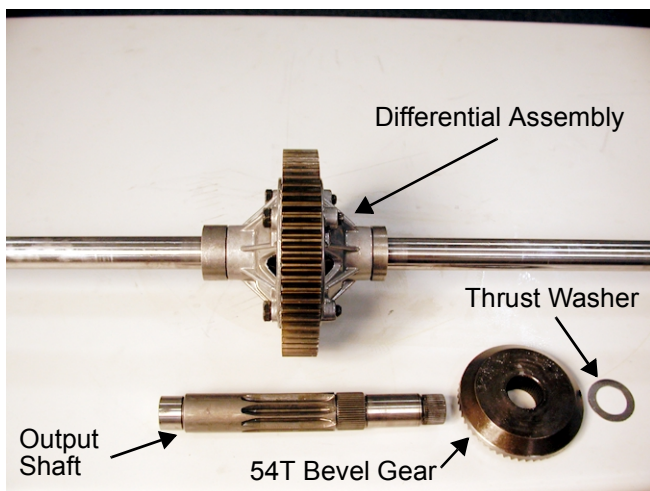
## 2000 Series

19. Grasp the differential assembly and the output shaft. See Figure 17.



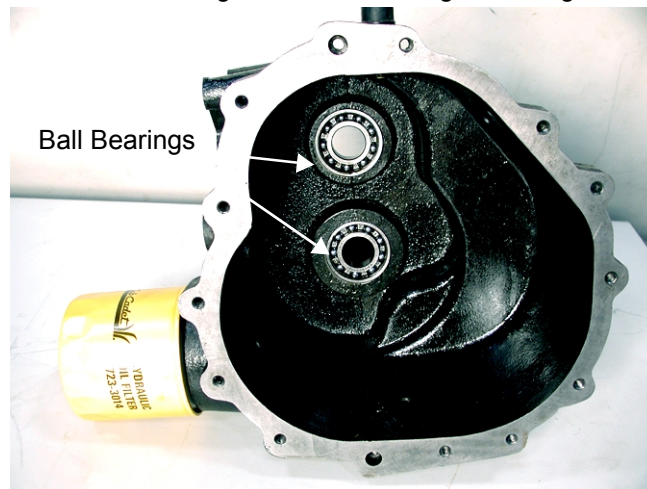
**Figure 17**

20. Slowly pull the differential assembly and the output shaft out of the right transmission housing until the 54T bevel gear and thrust washer can be removed from the output shaft.
21. Remove the 54T bevel gear and thrust washer from the 9T output shaft.
22. Continue removing the differential assembly from the right transmission housing. See Figure 18.



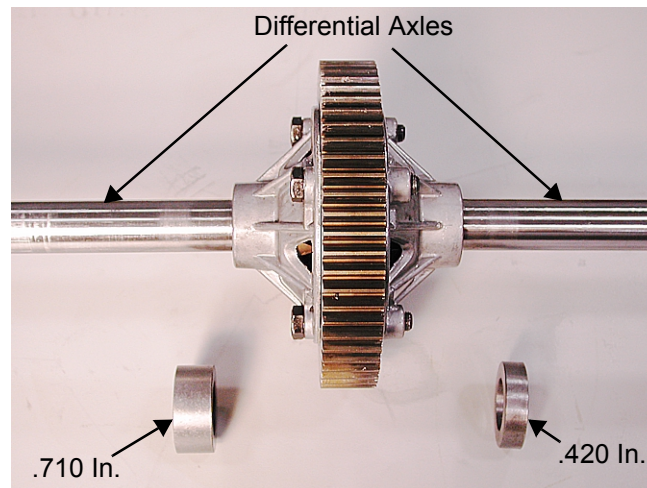
**Figure 18**

23. Inspect both ball bearings in the right transmission housing for wear or damage. See Figure 19.



**Figure 19**

24. Remove the spacers from the differential axles. See Figure 20.



**Figure 20**

**NOTE:** The short .420 in. spacer goes on the long axle towards the right housing, and the longer .710 in. spacer goes on the short axle towards the left housing.



25. Secure the 60T spur gear in a soft jawed vice. See Figure 21.

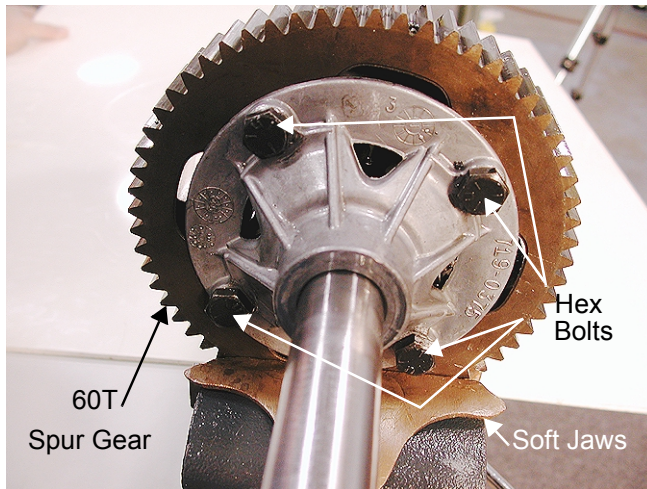


Figure 21

26. Loosen all four hex bolts securing the differential assembly together using a 9/16 in. socket.
27. Secure the differential assembly in the vertical position, in the soft jaws of a vice, with the hex bolts facing up. See Figure 22.

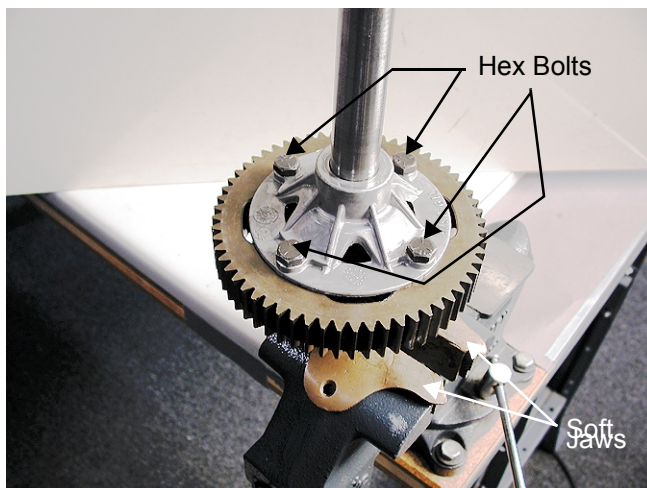


Figure 22

28. Continue removing the hex bolts securing the differential assembly together using a 9/16 in. socket and a shop rag.

- 28.1. Remove the left axle, differential threaded housing, 14T miter gear and the spiral lock snap rings from the differential housing assembly. See Figure 23.

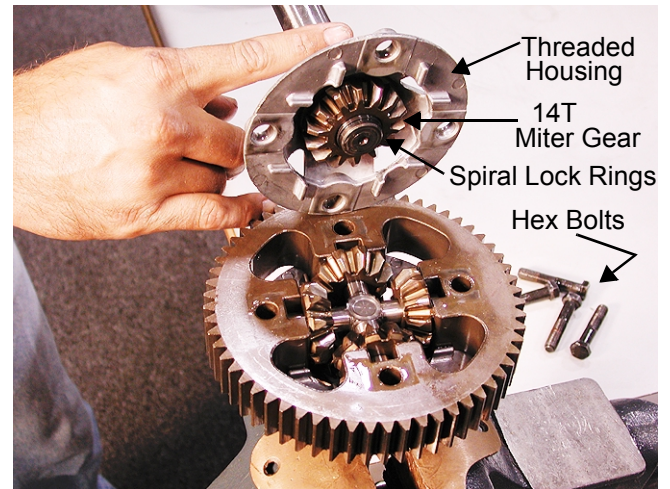


Figure 23

29. Separate the differential assembly components and inspect for damage or wear: spur gear, 10T miter gears and solid cross-shaft. See Figure 24.

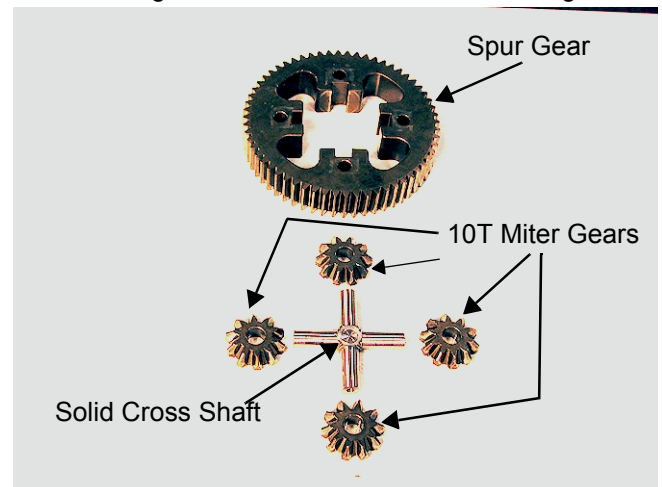
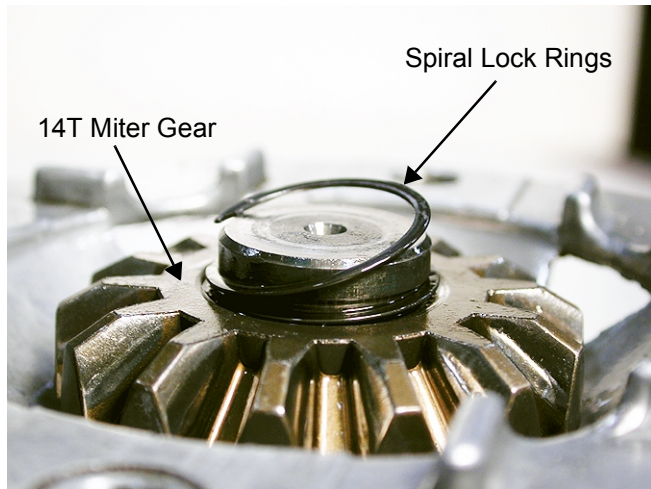


Figure 24

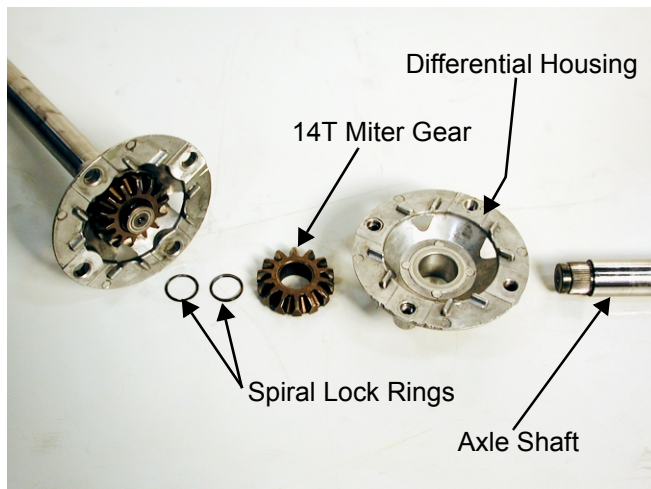
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30. Remove both spiral lock snap rings securing the 14T miter gear to the right axle using a small screwdriver. See Figure 25.



**Figure 25**

31. Remove the 14T miter gear and right differential housing from the right axle shaft. See Figure 26.



**Figure 26**

32. Remove the oil filter from the right transmission housing using an oil filter wrench. See Figure 27.



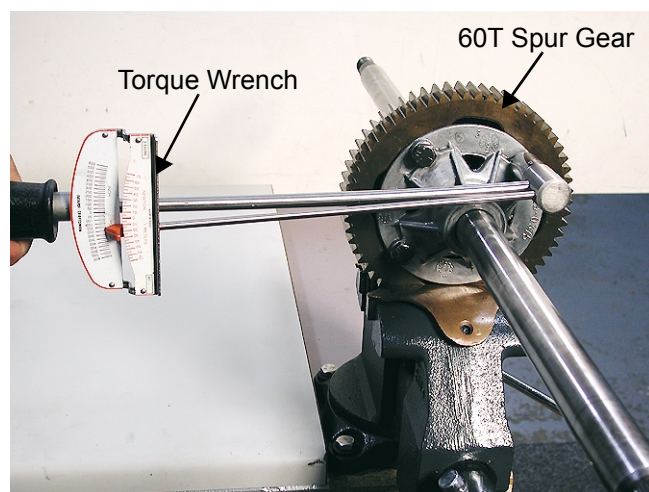
**Figure 27**

33. Inspect all components for damage or wear.



## Transmission Assembly

1. Install a new oil filter onto the right transmission housing. See Figure 27.
2. Secure the right axle, spiral retainer groove facing up, in the soft jawed vice.
3. Set the threaded differential housing over the right axle, cup facing up.
4. Place the 14T miter gear onto the right axle.
5. Secure the 14T miter gear to the axle with both spiral retaining rings.
6. Set the 60T spur gear in position on top of the threaded differential housing.
7. Assemble the differential assembly: cross-shaft and 10T miter gears.
8. Set the differential assembly into the 60T spur gear.
- NOTE:** There is no particular orientation for the differential assembly to be installed.
9. Set the left axle assembly onto the differential assembly.
10. Secure the left axle assembly to the right axle assembly with four hex cap screws using a 9/16 in. socket.
11. Secure the 60T spur gear in the soft jawed vice. See Figure 1.



**Figure 1**

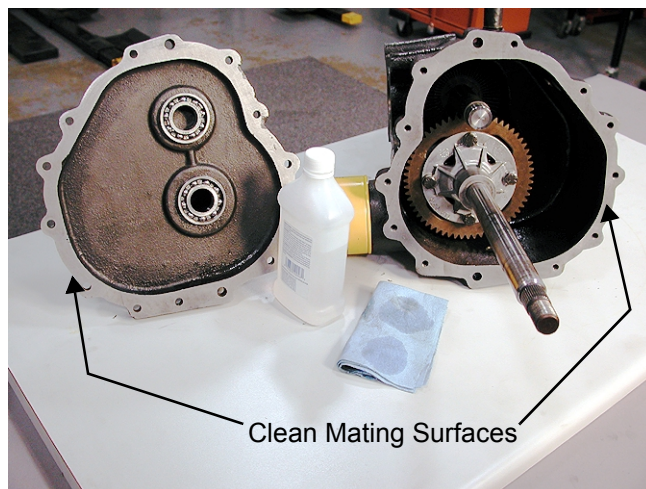
12. Torque all four of the hex cap screws securing the differential housings together using a 9/16 in. socket and torque wrench.

**NOTE:** Differential hex cap screw torque is 220 to 280 In. Lbs.

13. Install the axle spacers up against the differential housing.

**NOTE:** The short .420 in. spacer goes on the long axle towards the right housing, and the longer .710 in. spacer goes on the short axle towards the left housing.

14. Begin to insert the differential assemblies right axle (long axle) into the right transmission housing.
15. Place the 54T bevel gear and thrust washer onto the 9T output shaft.
16. Insert the output shaft, 54T bevel gear and thrust washer behind the differential assembly.
17. Slide the differential assembly and the output shaft assembly into the right transmission housing and into their respective ball bearings.
18. Remove any excess sealant from the transmission housings mating faces.
19. Clean the mating faces of the transmission housings using a shop rag and alcohol. See Figure 2.

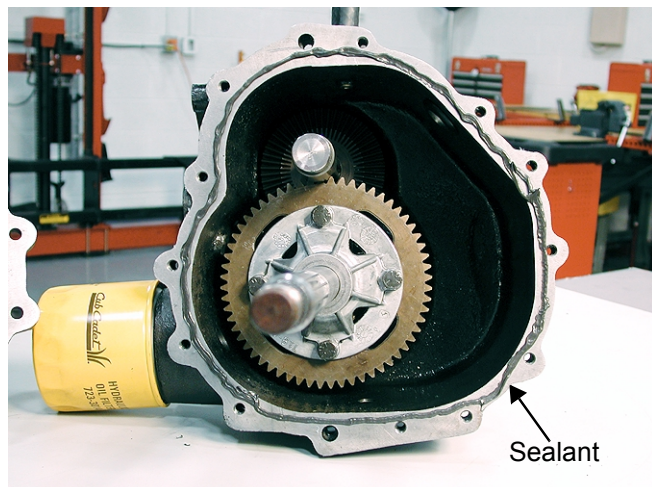


**Figure 2**



## 2000 Series

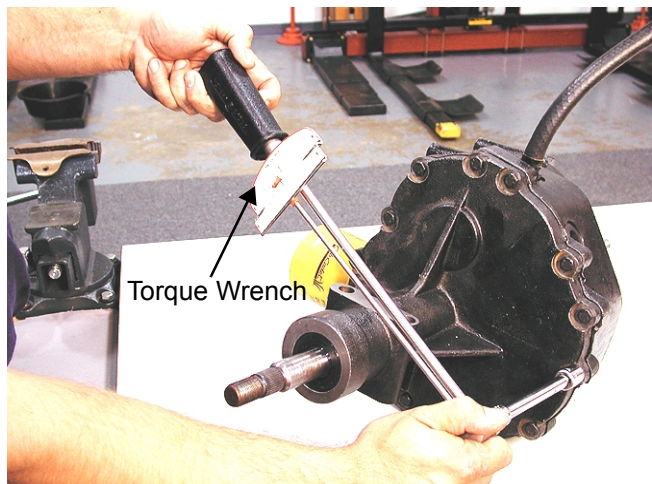
20. Place a bead of sealant around the perimeter of the right housing mating face. See Figure 3.



**Figure 3**

**NOTE:** Loctite™ Ultra Black silicone gasket maker 59875 is used during factory assembly.

21. Slide the left transmission housing over the left axle assembly and set it into position, aligning the mounting holes with the threads.
22. Secure the transmission housings together with the fourteen hex cap screws using a 1/2 in. socket.
- NOTE:** Loctite™ the hex cap screws.
23. Torque all the hex cap screws securing the transmission housing together in a cross pattern. See Figure 4.



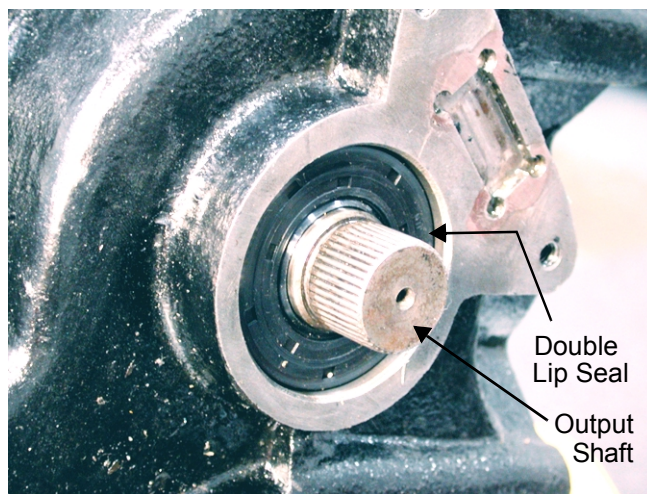
**Figure 4**

**NOTE:** Transmission housing hex cap screw torque is 180 to 220 Ft. Lbs.

24. Secure the wheel hub assemblies to the axles with a large locking hex nut using a 1-1/8 in. socket.

**NOTE:** The large wheel hub locking hex nut torque is 200 to 250 Ft. Lbs.

25. Install the output shaft double lip seal using a seal pusher and hammer. See Figure 5.



**Figure 5**

26. Apply anti-seize to the actuator pin contact surface of the brake actuation arm.
27. Reassemble the brake assembly as follows: yoke, actuation arm, torsion spring, flat washer, anti-rotation plate, lock nut, hex cap screws, actuation pins, puck plate and brake pad.
28. Secure the brake assembly together using tape.
29. Insert the brake pad into the right transmission housing.
30. Slide the brake disk over the output shaft.
- NOTE:** The center shoulder of the brake disk faces outward.
31. Secure the brake assembly to the right transmission housing with the hex cap screws using a 3/8 in. socket.
- NOTE:** Brake assembly hex cap screw torque is 80 to 100 In. Lbs.
32. Insert a .012 in. feeler gauge between the inside brake puck and the brake disk.
33. Tighten the center lock nut until the .012 in. feeler gauge is snug using a 1/2 in. socket.
34. Remove the feeler gauge from the brake assembly.

35. Rotate the transmission so the filter is facing up.
36. Insert the 13T input pinion, ball bearing and spring washer.
37. Lubricate the seal gland o-ring and insert it into the right transmission housing.

**NOTE:** Grease the o-ring and the o-ring groove.

38. Set the BDU-10L and front torque bracket in position, aligning the mounting holes.
39. Insert two 5-1/2 in. hex bolts through the front torque bracket, short spacers, BDU-10L and into the right transmission housing.
40. Insert two 5-1/2 in hex cap screws through the front torque bracket, long spacers, BDU-10L and into the right transmission housing.
41. Tighten all four of the 5-1/2 in. hex bolts using a 1/2 in. socket.

**NOTE:** The BDU-10L 5-1/2 in. hex bolt torque is 180 to 200 In. Lbs.

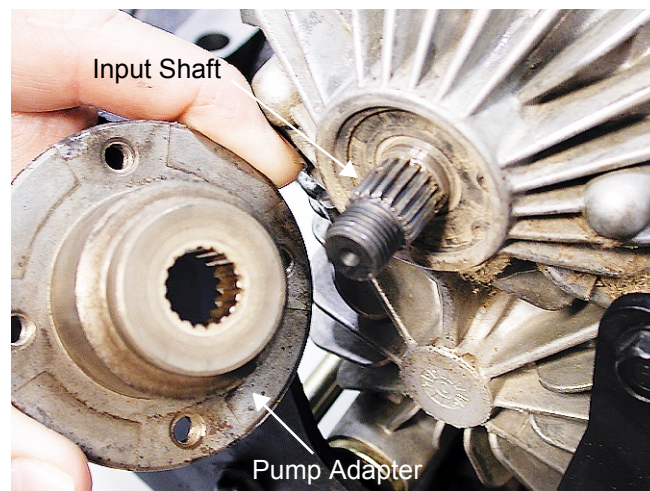
42. Lubricate the hydraulic inlet tube o-ring.

**NOTE:** Grease the o-ring.

43. Set the hydraulic inlet tube into position.
44. Secure the flare fitting of the hydraulic inlet tube to the BDU-10L. by hand.
45. Pivot the hydraulic inlet tube to the outlet port of the right transmission housing.
46. Loosely secure the hydraulic tube clamp and the lower end of the hydraulic inlet tube to the right transmission housing using a 7/16 in. socket.
47. Tighten the flair fitting of the hydraulic inlet tube to the BDU-10L using an 11/16 in. wrench.
48. Tighten the hex bolt securing the hydraulic tube clamp.
49. Install the oil drain plug with a 16mm socket.

## BDU-10L Splined Pump Adapter

50. For 2002 production, the pump adapter will be splined to match the splined input shaft of the BDU-10L. See Figure 6.



**Figure 6**

## Fender Removal

1. Lower the cutting deck to the lowest cutting height.
2. Remove the hex screw securing the forward hydrostatic pedal to the cross shaft using a 9/16 in. socket. See Figure 1.



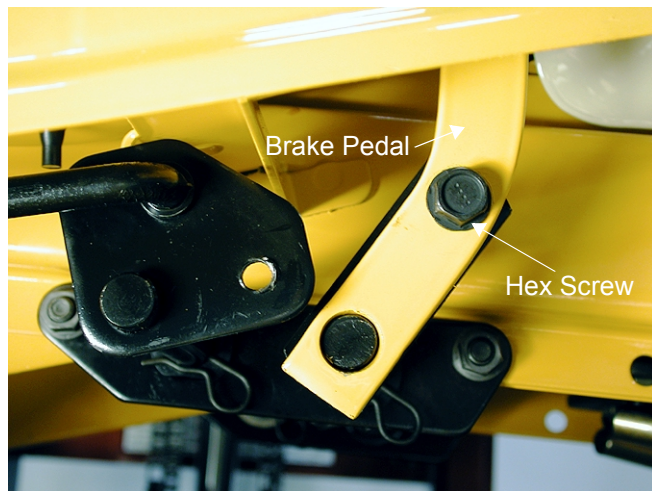
**Figure 1**

3. Remove the forward hydrostatic pedal.



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4. Remove the hex screw securing the brake pedal to the cross shaft using a 9/16 in. socket. See Figure 2.



**Figure 2**

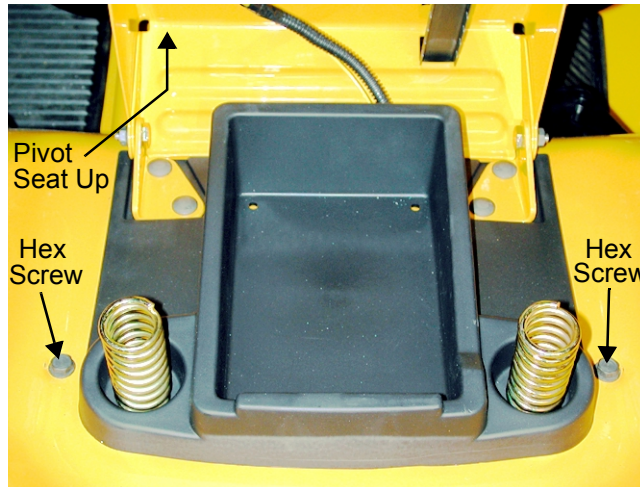
5. Remove the brake pedal.
6. Remove the right and left rubber foot pads from the foot boards. See Figure 3.



**Figure 3**

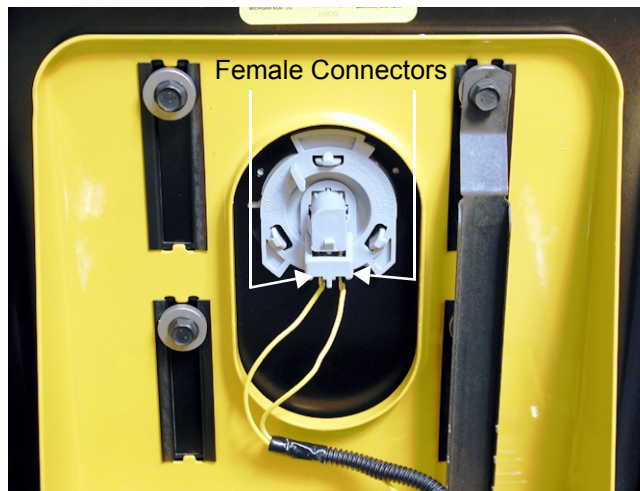
7. Remove all four hex screws securing the foot boards to the tractor frame using a 1/2 in. socket.

8. Pivot the seat forward. See Figure 4.



**Figure 4**

9. Remove both hex screws securing the fender assembly to the seat supports using a 1/2 in. socket.
10. Remove both female connectors securing the wiring harness to the seat safety switch. See Figure 5.



**Figure 5**

**NOTE:** Make certain the wiring harness is re-installed to the seat safety switch during assembly.

11. Remove the gas cap from the fuel tank inlet.
12. Raise the cutting deck lift handle to the highest cutting position.



13. Carefully remove the fender and seat assembly.  
**NOTE:** You will need to work around the deck lift handle to remove the fenders.

### BDU-10L Removal

**NOTE:** Prior to performing this section, perform the Fender Removal section.

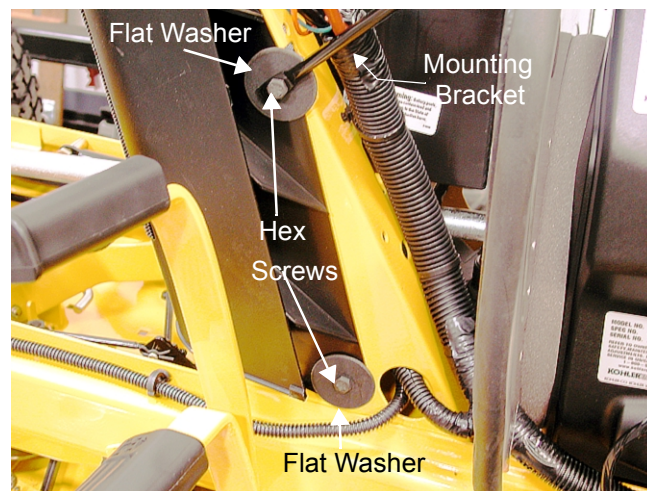
1. Remove the steering wheel insert.
2. Remove the hex center lock nut and bell washer securing the steering wheel to the steering shaft using a 1/2 in. socket. See Figure 1.



**Figure 1**

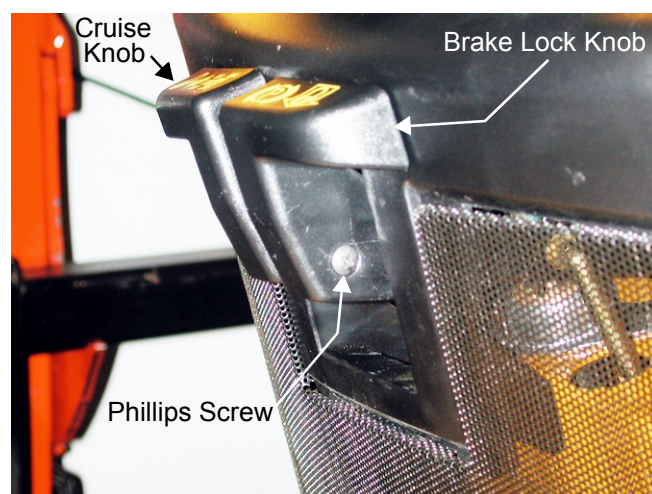
3. Remove the steering wheel and steering gasket.
4. Loosen the plastic wing nuts securing the side panels in position.
5. Remove the side panels from the tractor.

6. Remove both hex cap screws and large flat washers securing the right dash panel and right mounting bracket to the tractor frame using a 7/16 in. socket. See Figure 2.



**Figure 2**

7. Remove both hex cap screws and large flat washers securing the left dash panel and left mounting bracket to the tractor frame using a 7/16 in. socket.
8. Remove the Phillips screws securing the cruise knob and the brake lock knob in position using a Phillips screwdriver. See Figure 3.



**Figure 3**

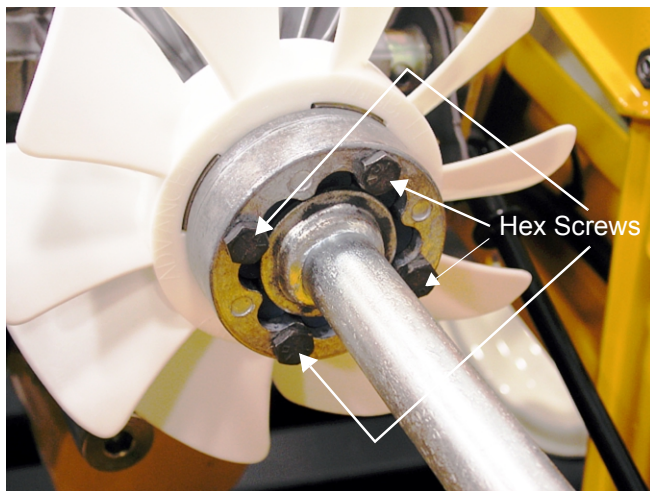
9. Raise and pivot the dash panel, and all the component secured to it, up and towards the front of the tractor.

**NOTE:** Do not remove all the components from the dash panel.



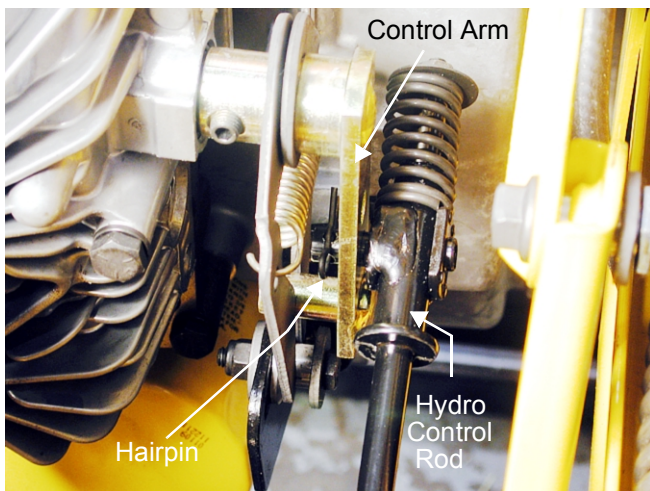
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10. Remove all four hex patch screws securing the drive shaft assembly to the pump adapter using a 7/16 in. socket. See Figure 4.



**Figure 4**

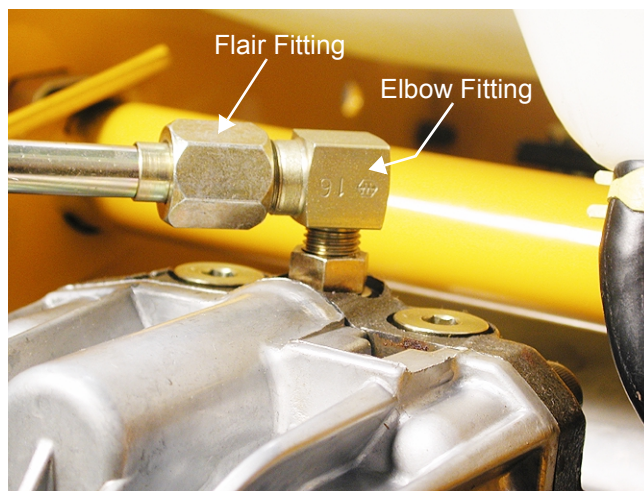
11. Remove the cooling fan from the pump adapter.
12. Remove the hairpin securing the hydro control rod assembly to the BDU-10L's control arm assembly using needle nose pliers. See Figure 5.



**Figure 5**

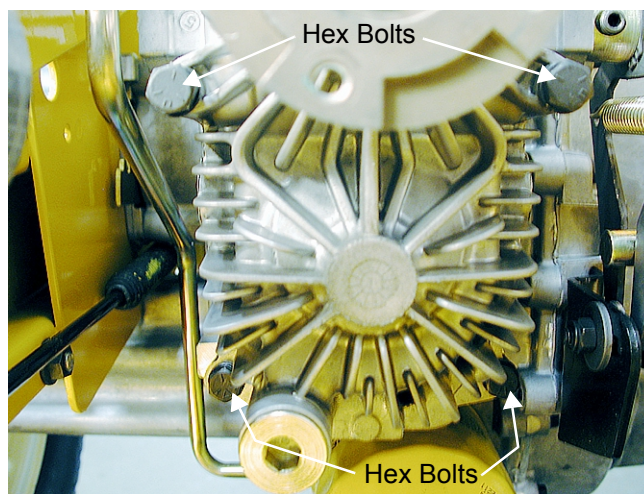
13. Place a suitable hydraulic fluid drain container under the BDU-10L.

14. Remove the flair fitting from the 90° elbow fitting, at the top of the BDU-10L, using an 11/16 in. and a 5/8 in. wrench. See Figure 6.



**Figure 6**

15. Remove all four hex cap screws and lock washers securing the BDU-10L to the transmission assembly using a 1/2 in. socket. See Figure 7.



**Figure 7**

16. Remove the BDU-10L from the transmission assembly.

**NOTE:** Make certain the wave washer is accounted for.



17. Replace the o-ring. See Figure 8.

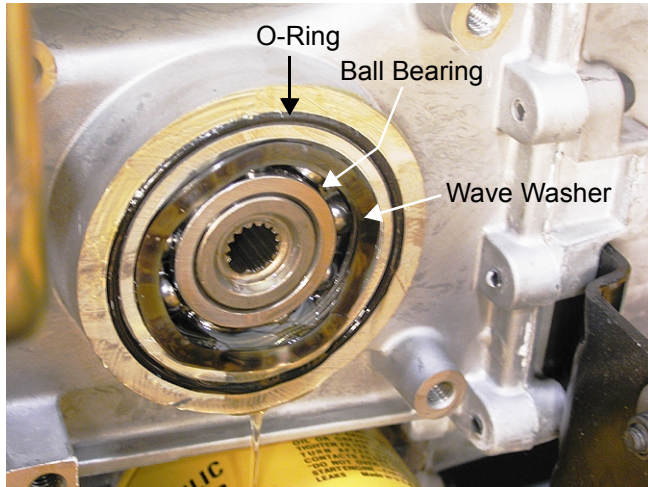


Figure 8

### Cruise Control Adjustment

**NOTE:** Prior to performing this section, the cutting deck must be removed. Also, the following procedure should be performed from below the tractor.

1. Loosen both self tapping hex screws securing the cruise bracket to the tractor frame using a 3/8 in. socket and extension. See Figure 1.

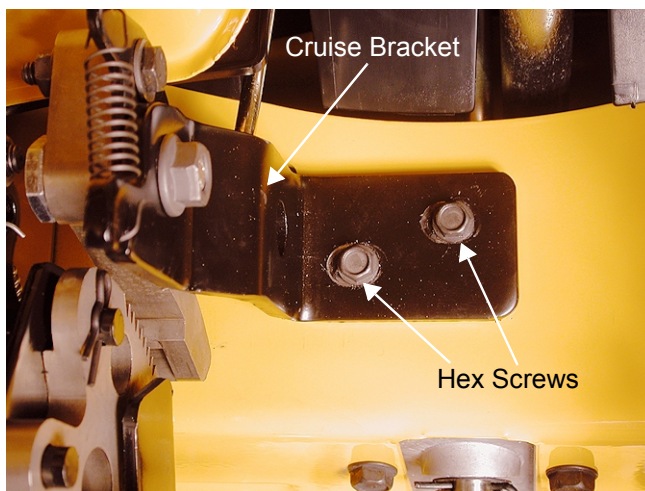


Figure 1

2. Align the cruise latch so it is parallel to the disengagement plate assembly. See Figure 2.

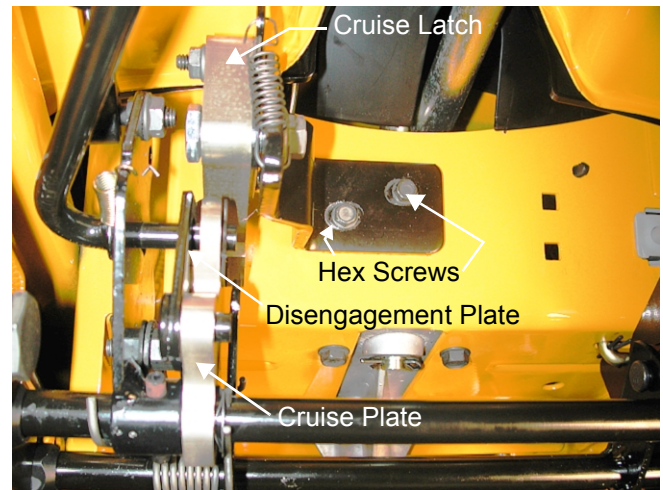


Figure 2

3. Tighten both of the self tapping hex screws and secure the cruise bracket in position using a 3/8 in. socket.
4. Loosen the hex cap screw and flange lock nut securing the rod adjustment plate and cruise latch in position using a 7/16 in. socket and a 7/16 in. wrench. See Figure 3.

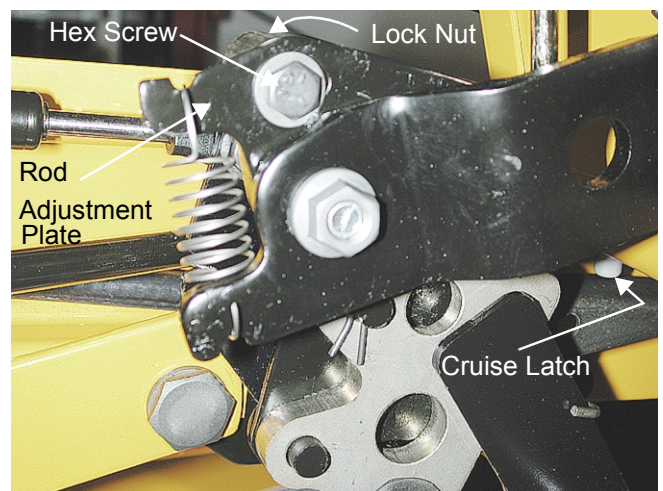


Figure 3



## 2000 Series

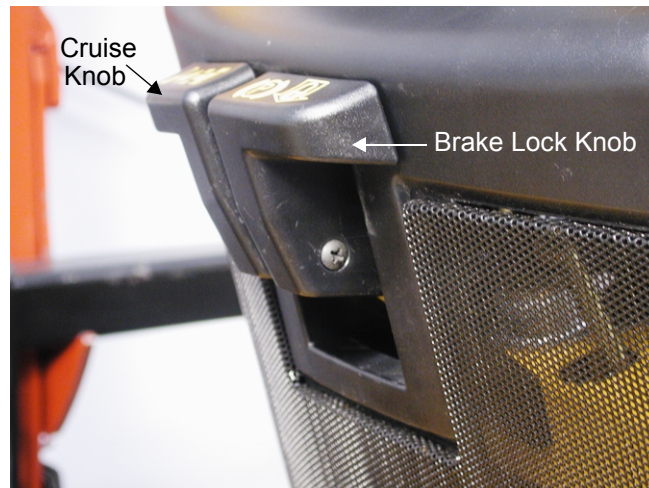
5. Pull the forward pedal down all the way.
6. Pull down on the cruise latch and make certain the teeth are fully engaged.
7. Pull the cruise rod down as far as it will go.  
**NOTE:** The cruise knob will bottom out on the dash, only allowing the cruise rod to drop to a preset level.
8. Snug the hex cap screw and flange lock nut securing the rod adjustment plate and cruise latch in position using a 7/16 in. socket and a 7/16 in. wrench.
9. Release the cruise latch. See Figure 4.



**Figure 4**

**NOTE:** The cruise latch should stop up against the tractor frame.

10. Slowly push the cruise rod up until the cruise knob is even with the brake lock knob, at the dash, using a large flat blade screwdriver. See Figure 5.

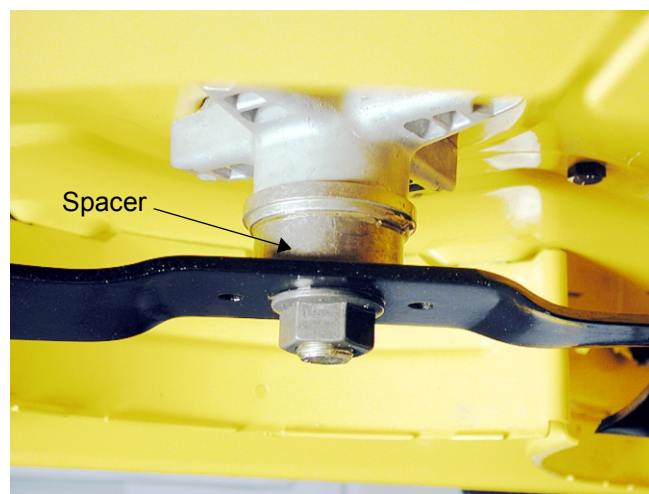


**Figure 5**

- 10.1. Tighten the hex cap screw and flange lock nut securing the rod adjustment plate and cruise latch in position using a 7/16 in. socket and a 7/16 in. wrench.
- 10.2. Test run and adjust.

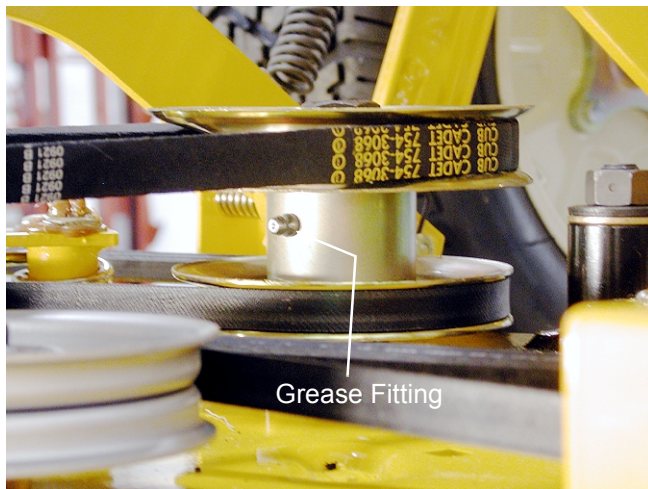
## 44" Deck Information

1. Spacers have been added above each blade to increase vacuum. See Figure 1.



**Figure 1**

2. A grease fitting has been added to the double stack pulley to increase bearing life. See Figure 2.



### Figure 2