



SUBJECT: PTO SHAFT UPGRADE FOR PRE 1995 TRACTORS

In order to receive a longer life, BCS changed the PTO drive system in the tractor models listed below. This incorporates the PTO drive system used on model 745. This change greatly reduces the failures that have occurred when a 38" or 40" mower is attached to these models. This change should only be performed on those tractors that use a large mower deck and have had a PTO failure or the PTO disengages when in use.

Model #	Conversion Kit #
604	599.90701
605	599.90700
735	599.90701
737	599.90700
38" Mower	599.90702
40" Mower	599.90703

Following is the instruction sheet for the conversion kit #599.90700.

605/737 PTO Conversion Kit #599.90700
Instruction Sheet

1. Locate machine in a secure area. Remove spark plug lead from spark plug.
2. Disconnect all cables and wires going to the engine.
3. Remove the six nuts securing the engine to the transmission case.
4. Pull the engine from the transmission.
5. Remove the centering bolt from the main drive shaft in the transmission. This is the bolt securing the clutch assembly to the drive shaft.
6. Remove the clutch from the drive shaft.
7. Remove the roll pin (item 4) securing the PTO joint (item 5) to the PTO pin (item 6). Keep roll pin for later use.
8. Remove the other two roll pins connecting the PTO joint to the PTO pin, discard.
9. Remove the two roll pins (item 7) securing the slide lever (item 8) to the PTO pin, discard.
10. Pull out the PTO pin from the rear cover. Discard the PTO pin, ball, spring, "O" rings, slide lever, PTO coupling, and PTO joint.
11. Remove the eight bolts securing the rear cover (item 2) to the transmission case.
12. Using a rubber mallet, tap the rear cover loose from the transmission case. When the rear cover is loosened the oil will drain from the transmission case.
13. While the transmission is draining, start assembling the new components.
14. Remove parts from the new conversion kit.
15. Install the new PTO shaft seal (item 1) into the new rear cover (item 2). Make certain that the seal lip is pointed towards the transmission.
16. Go back to the machine and completely remove the original rear cover. The main drive shaft (item 12) will come out with the rear cover. The PTO shaft (item 13) will also come out with the rear cover. Using a rubber mallet, hit the sides of the rear cover towards the front of the tractor away from the engine. It will take several strong hits for the rear cover to come off completely.

17. Remove the bearing from the end of the PTO shaft using a gear puller. Reinstall the bearing in the transmission housing.
18. Remove the reverse slider (item 14) and the second gear (item 15).
19. Discard the reverse slider (item 14) and keep the second gear (item 15) for reinstallation.
20. Remove the main drive shaft (item 12) from the original rear cover by removing the large snap ring (item 24). Remove the main drive shaft and bearing (item 23) from the rear cover. Discard rear cover, large snap ring, and PTO shaft.
21. Remove the small snap ring securing the bearing to the main drive shaft. Remove bearing from main drive shaft. Keep the main drive shaft and small snap ring. Discard bearing and washer.
22. Install the new bearing (item 23) onto the main drive shaft and secure using the small snap ring you just removed.
23. Install the new bearing and drive shaft into the new rear cover. Secure the new bearing to the new rear cover using the new large snap ring (item 24).
24. Install the new PTO shaft (item 13) through the new rear cover. Make certain the bearing on the new PTO shaft seats completely into the rear cover. Place a piece of tape around the splines on the PTO shaft to prevent damage to the new seal.
25. Install the new reverse gear (item 9) onto the rear cover and secure using the two new bolts and spring washers (item 10 & 11). Locktite the two bolts.
26. Remove the two roll pins (item 18) securing the slider gear lever (item 16). Remove the sliding gear lever (item 16). Keep the roll pins (item 18) and the shoe (item 17) for later use. Discard the sliding gear lever (item 16).
27. Install the new sliding gear lever (item 16) and secure to the shaft using the two roll pins (item 18) you just removed. Install the shoe (item 17) onto the new sliding gear lever.
28. Install the new reverse gear (item 9) onto the rear cover and secure using the two new bolts and spring washers (item 10 & 11). Locktite the two bolts.
29. Place the new reverse slider (item 14) onto the original second gear (item 15).
30. Place the new reverse slider and the second gear into the transmission at approximately the location they will be after the PTO shaft (item 13) is installed through them. Make certain the shoe (item 17) is in the groove of the new reverse slider.

31. Install the rear cover, main drive shaft and PTO shaft into the transmission. The main drive shaft will enter the transmission first and should go in fairly easily. The PTO shaft will enter the transmission next. Use extra caution that the PTO shaft goes through the reverse slider (item 14) and the second gear (item 15) without dislodging the shoe (item 17) from the reverse slider. Continue to install the rear cover until the rear cover is tight against the transmission case. Use the rubber mallet to push the rear cover against the transmission case.
32. At this point the main drive shaft and the PTO shaft have secured all of the gears. Place the clutch onto the main drive shaft and turn the main drive shaft. Test the PTO shaft to be certain it is turning. Shift the gears into all of the drive speeds while turning the main drive shaft. This will allow the gears to mesh together and allow you to confirm that all the gears are working.
33. Secure the rear cover onto the transmission case using the eight bolts you removed earlier.
34. Rotate the PTO shaft until the hole in the PTO shaft for the detent ball (item 25) and spring (item 26) is pointed straight up.
35. Install the detent ball and spring into the PTO shaft. The detent ball will be located in one of the two holes in the PTO coupling.
36. Install the PTO shoe (item 21) onto the PTO lever (item 8) and position the shoe into the groove on the PTO coupling (item 20).
37. Install the PTO coupling, shoe and PTO lever onto the PTO shaft (item 13). The PTO shoe must be in the groove of the PTO coupling when the coupling is installed on the PTO shaft. While installing the PTO coupling you must also depress the detent ball into the PTO shaft to allow the coupling to be installed all the way.
38. Install the "O" ring (item 19) onto the PTO control pin (item 6).
39. Install the PTO control pin into the rear cover. Align the hole in the PTO lever (item 8) with the PTO control pin and push the PTO control pin through and into the other side of the rear cover.
40. Align the roll pin hole in the PTO lever (item 8) with the hole in the PTO control pin (item 6) and install the new roll pins (item 7).
41. Install the PTO control lever (item 5) into the PTO control pin (item 6) and secure using the roll pin (item 4) you removed earlier.
42. Engage and disengage the PTO to be certain it is working correctly.

43. Resecure the clutch onto the main drive shaft.
44. Reconnect the engine to the transmission case and secure using the nuts you removed earlier.
45. Reconnect the wires and cables to the engine.
46. Install the two new attachment studs onto the rear cover. Loctite studs.
47. Apply a liberal amount of grease around the PTO coupling.
48. Refill the transmission with SAE HP 80/90 gear oil.
49. Reconnect the spark plug lead.
50. Run machine to be certain it is performing correctly.

