



REBUILD INSTRUCTIONS

D2 SPINDLE

• QD INSERT STYLE • DOC#15-2003 •

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Note: Reference the parts book for parts lists and exploded views. The following instructions are for assembling a direct drive spindle. Reverse these instructions for disassembly, with the exception of pressing on the shaft for disassembly (as opposed to pressing on the bearings for assembly.)



Note: Specialized tooling is needed for several spindle assembly applications; see the Spindle Maintenance Tools section for specialized tooling.



Spindle Assembly:

1. Pack the (2) bearings with #2 lithium based grease on both sides as illustrated *(see Figure 1.)*
2. Place the snap ring and bottom plate onto the spindle as illustrated *(see Figure 2.)*

3. Place the lower seal into the recess of the bottom seal plate, and lightly tap *(evenly all the way around)* until the lower seal is fully seated *(see Figure 3.)*

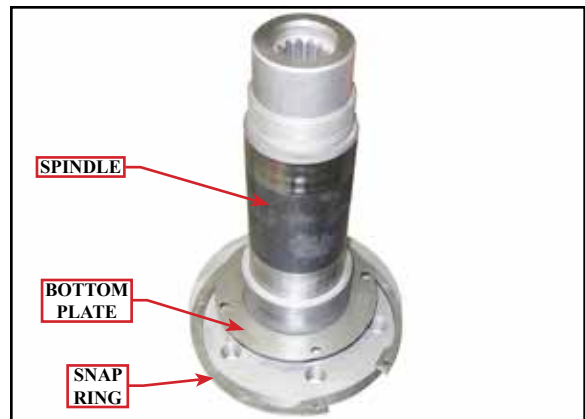


Note: The lettering on the lower seal should be facing UP (so it can be read,) when seating the seal in the bottom seal plate *(see Figure 3.)*

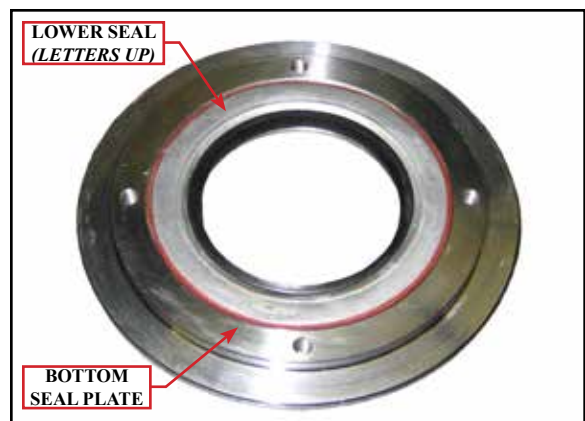
4. Press the bottom seal plate/seal assembly down around the spindle shaft all the way down until it no longer can move, as illustrated *(see Figure 4.)*



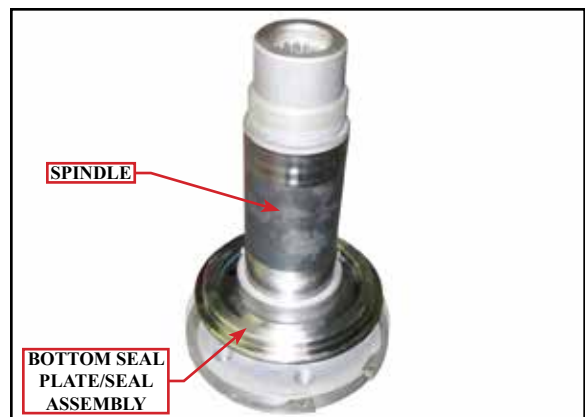
(figure 1)



(figure 2)



(figure 3)



(figure 4)

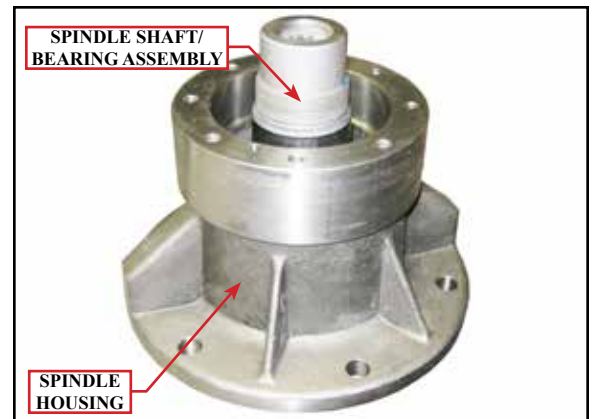


- 5.** Press the bearing down around the spindle shaft all the way down until it no longer can move, as illustrated (see Figure 5.)



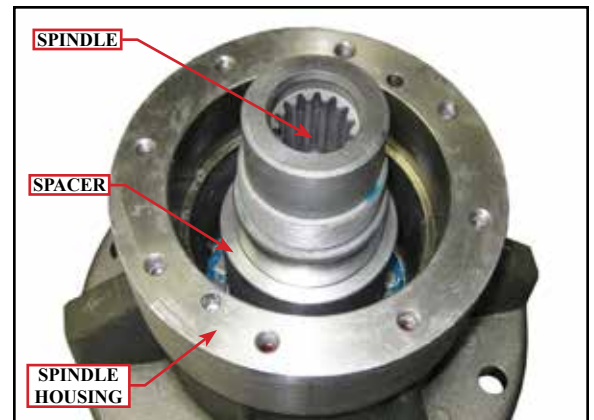
(figure 5)

- 6.** Place the spindle housing down around the spindle shaft/bearing assembly until it has been fully seated. It may be necessary to flip the assembly and lightly tap the spindle shaft/bearing assembly until the grease catch is fully seated into the spindle housing. When tapping, tap evenly around the perimeter of the spindle shaft/bearing assembly, so that the assembly will move down evenly (*straight.*) Use caution when tapping the assembly down to avoid damaging the assembly (see Figure 6.)



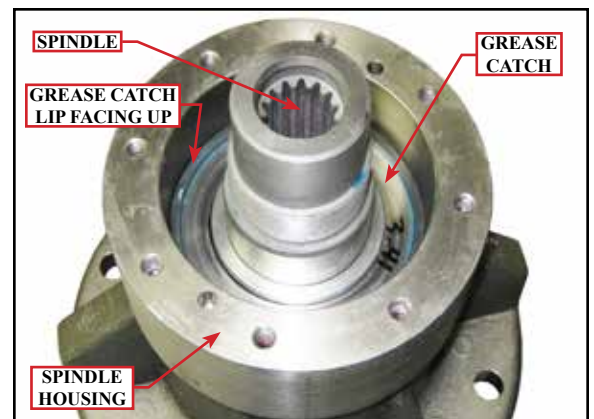
(figure 6)

- 7.** Flip the assembly right side up as illustrated, and slip the spacer down around the spindle shaft until fully seated as illustrated (see Figure 7.)

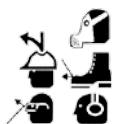


(figure 7)

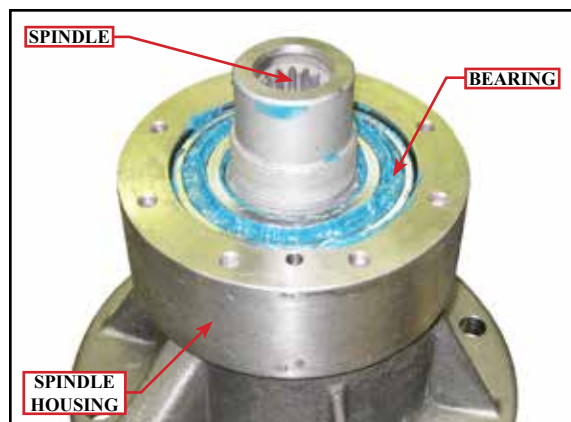
- 8.** Place the grease catch (lip facing up) down around the spindle shaft until it has been seated against the spacer placed around the spindle shaft in the previous step (see Figure 8.)



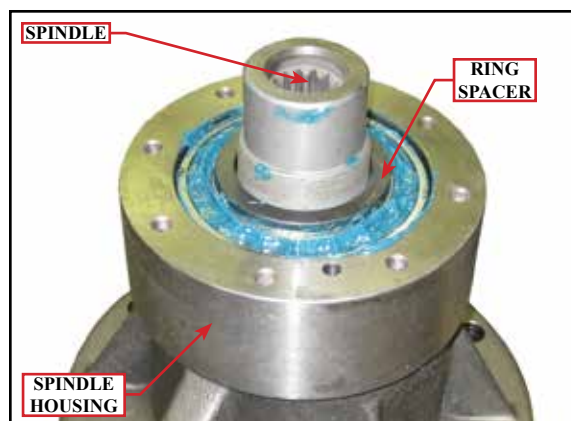
(figure 8)



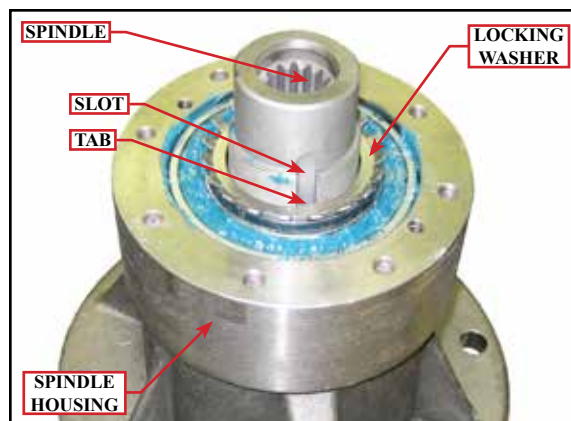
- 9.** Place the bearing around the spindle shaft, and press it into place as shown in the illustration at right *(see Figure 9.)*

*(figure 9)*

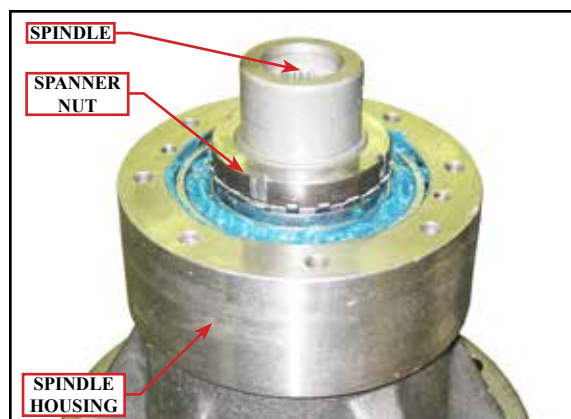
- 10.** Place the ring spacer down around the spindle shaft until it is resting on the bearing raceway as illustrated *(see Figure 10.)*

*(figure 10)*

- 11.** Place the locking washer down around the spindle shaft until it is resting on top of the ring spacer placed around the spindle shaft in the previous step. Make sure the tab of the locking washer is placed inside of the slot on the spindle shaft *(see Figure 11.)*

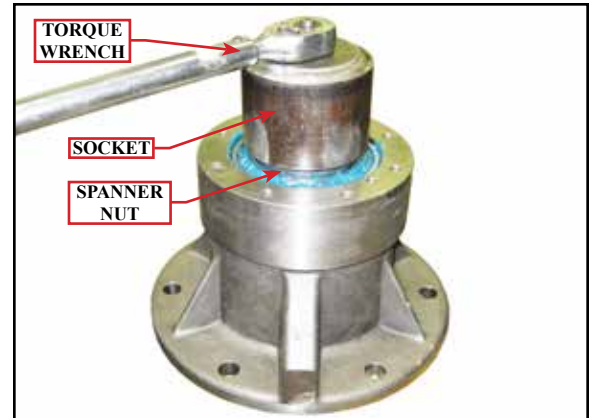
*(figure 11)*

- 12.** Thread the spanner nut down onto the spindle shaft until it contacts the locking washer, and tighten as far as possible by hand *(see Figure 12.)*

*(figure 12)*

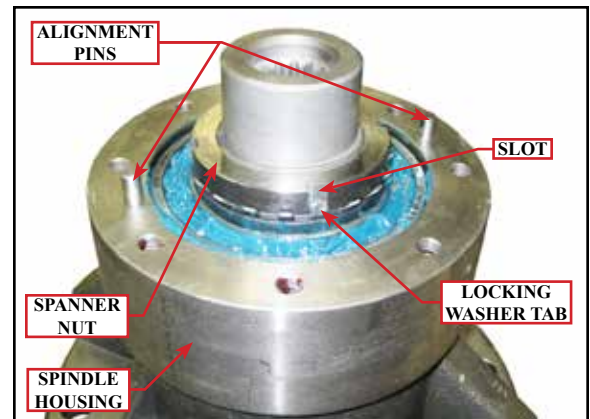


13. Using a torque wrench and socket fitting the spanner nut, torque the spanner nut down @ 250 ft/lbs (see Figure 13.)



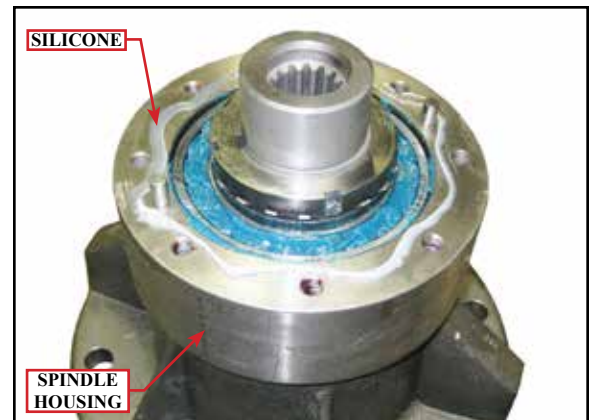
[figure 13]

14. Lock the spanner nut into place by tapping one or more of the locking washer's tabs into one or more of the slots on the spanner nut. The spanner nut may be tightened further slightly to allow one of its slots to line up with a tab on the locking washer if necessary. Next, place the (2) alignment pins into their respective recesses within the spindle housing, gently tapping them in if necessary to insure they are fully seated (see Figure 14.)



[figure 14]

15. Run a thin bead of silicone caulking (after cleaning off any grease/debris) on the top surface of the spindle housing. You may spread it evenly around with your finger or flexible putty knife if desired (see Figure 15.)

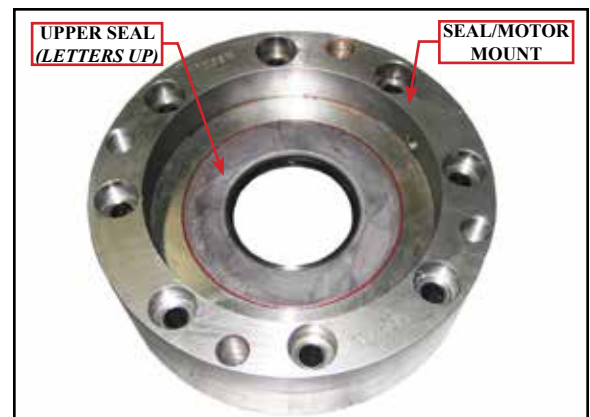


[figure 15]

16. Place the upper seal into the recess of the seal/motor mount, and lightly tap (evenly all the way around) until the upper seal is fully seated (see Figure 16.)



Note: The lettering on the lower seal should be facing UP (so it can be read,) when seating the seal in the seal/motor mount (see Figure 16.)



[figure 16]



17. Place the seal/motor mount assembly onto the spindle housing assembly, by first lining up the alignment pin recesses on the underside of the seal/motor mount assembly with the alignment pins on the spindle housing, then pushing it down to fully seat them together (see Figure 17.)

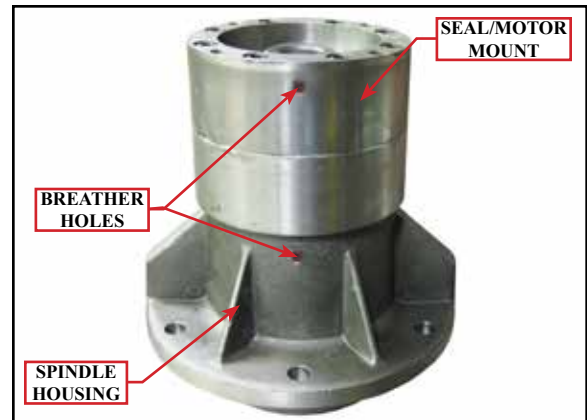


Note: When seating the seal/motor mount assembly onto the spindle housing, make sure the breather hole on each assembly are lined up together (see Figure 17.)

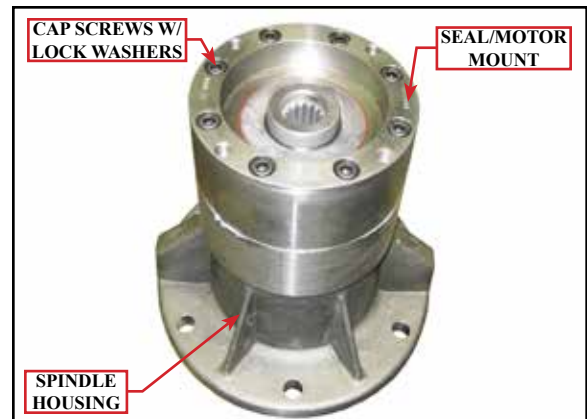
18. Secure the seal/motor mount assembly to the spindle housing assembly with (8) 3/8" cap screws and lock washers. Torque the cap screws down evenly (first one, then the other on the opposite side) to 30ft/lbs (40.1Nm) (see Figure 18.)

19. Screw the (2) breathers into the spindle housing in the locations shown, making sure they are threaded in as far as they can go in as illustrated (see Figure 19.)

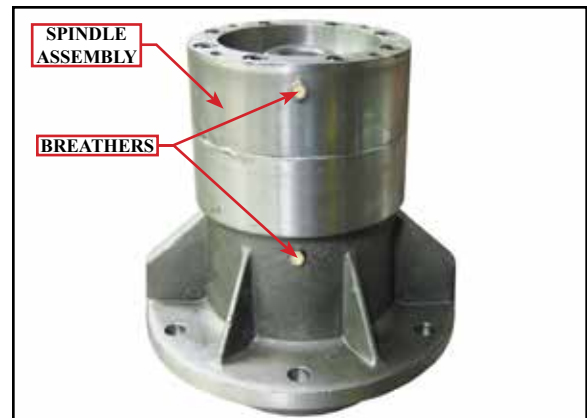
20. Screw the (2) 90° grease zerks into the spindle housing in the locations shown, making sure they are threaded in as far as they can go in and also that they are pointed up as illustrated (see Figure 20.)



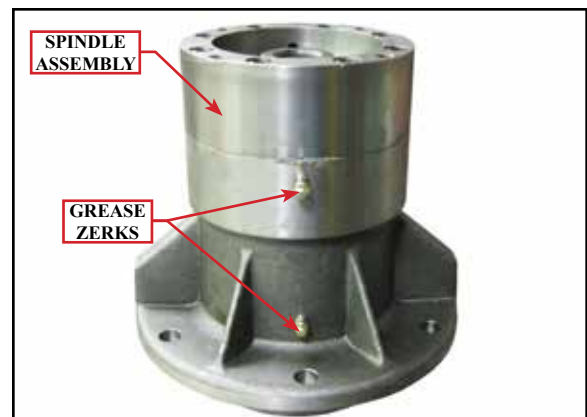
(figure 17)



(figure 18)



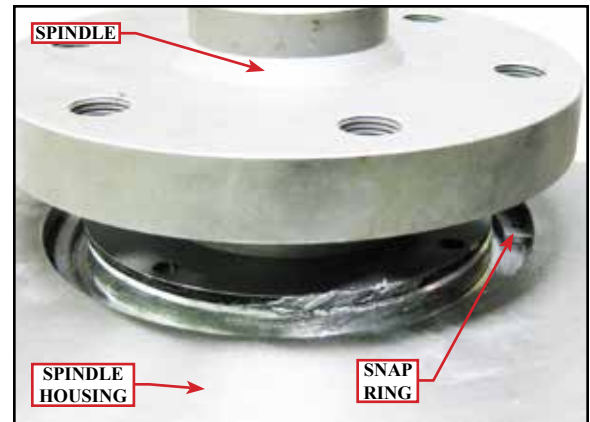
(figure 19)



(figure 20)

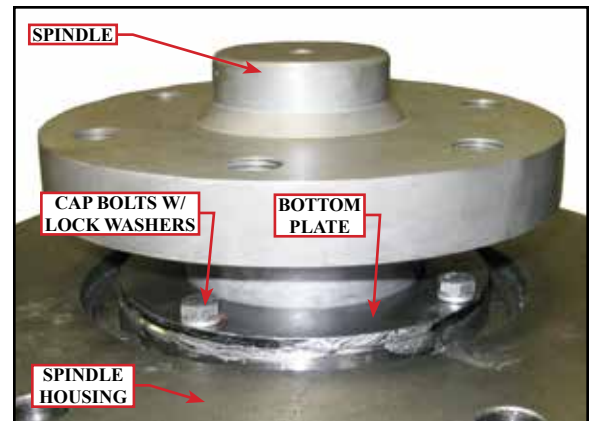


21. Secure the bottom seal plate assembly to the spindle housing using snap ring pliers to place the snap ring into place in its recess as illustrated (see Figure 21.)



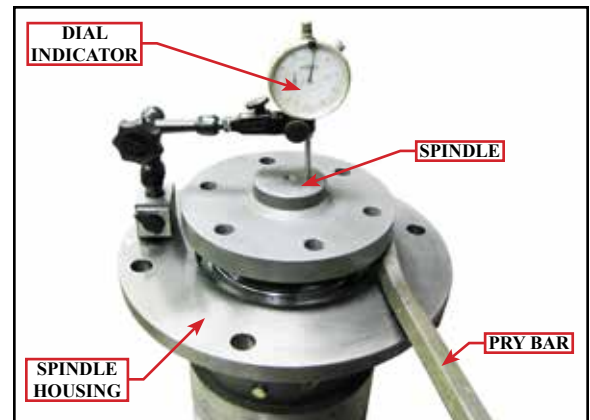
[figure 21]

22. Secure the bottom plate to the bottom seal plate with the (4) cap bolts with lock washers, making sure to torque them to 8in/lbs (10.7Nm) (see Figure 22.)



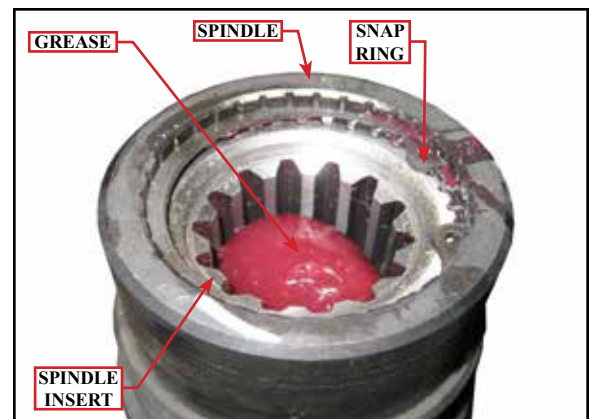
[figure 22]

23. Place a dial indicator on the spindle assembly as illustrated. Using a pry bar as illustrated, pry the spindle up/down against the spindle housing, and check the end play with the dial indicator. The end play should be between .015 inches to .045 inches. If necessary, strike the center of the spindle (where the dial indicator is touching in the illustration) with a heavy mallet and a section of wood between the mallet and spindle (to protect the spindle) sharply, and then recheck the end play (see Figure 23.)



[figure 23]

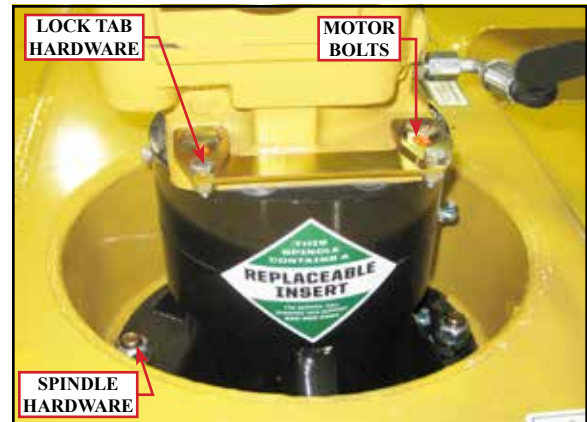
24. Insert the splined spindle insert into the spindle as illustrated, and then secure it into place with the snap ring. Grease the interior of the splined spindle insert heavily with Chevron Delo HD EP2 grease as illustrated at right (see Figure 24.)



[figure 24]



25. Reassemble the spindle to the deck; apply Loctite 262 to the bolt threads before attaching the nuts. Torque the spindle hardware to 230ft/lbs (307Nm) in an alternating pattern. Reassemble the motor to the spindle with the cap bolts and U-shaped tabs and torque the hardware to 120ft/Lbs (160Nm). Assemble the lock tabs to the U-shaped tab over the cap bolts with their hardware (*tighten the cap bolts slightly as needed to allow the U-tab and lock tabs to be fastened together*) and torque the lock tab hardware to 75in/Lbs (8.5Nm) (see Figure 25.)



(figure 25)