JETCO
Superduty EX Series Electronic Torque Wrench Calibration Procedures
Rev. 10/5/05
Overview:
The stated accuracy of the EX series of torque wrenches is +/- 2% of reading from 10-100% of full scale.

The procedure for calibrating the electronic torque wrench is comprised of pressing a special sequence of keys to enter the calibration mode and then inputting 8 pre-defined torque reference values into the wrench (with a loader or with dead weights). The resulting accuracy of the wrench is determined by how accurately you can apply these 8 torque values and the accuracy of your torque testing system. The eight points are: 0%, 10%, 50% and 100% of full scale in EACH direction. For example, if the full scale range of the wrench is 250 ft-lb. you must be able to apply 0, 25.0, 125.0 and 250.0 ft.-lb. of torque in each direction. You must calibrate the wrench in both directions, you cannot calibrate the wrench in just one direction.

It is very important that you load the wrench three times to full scale in the direction of calibration prior to inputting the zero torque value for that direction (see item 2 below). This will compensate for zero shifts due to Hysteresis; Hysteresis is a naturally occurring phenomenon in all materials and is compensated for, electronically, with this procedure.

The procedure ALWAYS starts with the clockwise direction and ends with 100% full scale in the Counterclockwise direction. You MUST load the wrench to full scale three times in the direction to be calibrated when switching directions.

With practice the complete calibration procedure can take as little as 3 minutes however it is essential that you follow the procedures exactly and that you have a means to load and hold the wrench to the predefined torque values.

When TESTING the wrench for accuracy you must have the wrench in Track mode (see the operation manual for details on how to enter the Track mode).

Calibration Procedure

1. With the wrench NOT installed in the loader (no torque applied) and the Power OFF, push and HOLD the Power/Clear and target + buttons <u>simultaneously</u> until you get into the calibration mode. The display will show C..0 (this means the wrench is “waiting” to take a zero CW torque calibration reading).

2. Install the wrench in a loader and make sure the wrench is being loaded in the Clockwise direction. Load wrench 3x to full scale
(as shown on the torque tester display) in the CW direction. Remove the wrench from the loader.

3. With the wrench removed from the loader (to remove ALL torque applied) press the UNITS button to accept the zero CW torque calibration value. The wrench will hesitate for a few seconds while it takes the reading (don't apply torque during this time). The display should now read C..10 (this means the wrench is ready for the 10% of full scale CW torque input value).

4. Install the wrench in the loader and load the wrench to exactly 10% of full scale in the Clockwise direction (as shown on the tester). When the torque applied is stable squeeze the UNITS button to accept the 10% torque reading. After you press the UNITS button the wrench will hesitate for a few seconds while it takes readings from the strain gages on the drive. Hold steady the 10% torque value with the loader until the wrench display shows C..50. IMPORTANT: When you press the UNITS button on the wrench you should squeeze the UNITS button between the bottom of the torque tube and the button itself with your thumb and index finger. If you push down on the key without squeezing the opposite side of the wrench you may push on the wrench and induce side loads that may affect the accuracy of the calibration point.

   Now increase the torque input to 50% of full scale and squeeze the UNITS button when the torque input is stable at 50%. The wrench will hesitate while it takes a reading and will then show C.100. Once the wrench shows C.100 load the wrench to 100% of full scale and press the UNITS key as you did for the other points.

   After 100 % of scale has been done in CW direction the wrench will show C..0 and the CCW icon will show. This means you now need to start the calibration cycle in the CCW direction. Which includes loading the wrench to full scale in the CCW direction 3 times before entering the zero calibration point:

5. While the wrench shows C..0 and the CCW icon is on, make sure the wrench is being loaded in the Counterclockwise direction. Load wrench 3x to full scale CCW (as shown on the torque tester display. Remove the wrench from the loader.

6. With the wrench removed from the loader (to remove ALL torque applied) Press the UNITS button to accept the CCW zero torque calibration value. The wrench will hesitate for a few seconds while it takes the reading (don't apply torque during this time). The display should now read C..10 (this means the wrench is ready for the 10% of full scale, CCW torque input value).

7. Install the wrench in the loader and load the wrench to exactly 10% of full scale in the Counterclockwise direction (as shown on the tester). When the torque applied is stable squeeze the UNITS button to accept the 10% CCW

torque reading. After you press the UNITS button the wrench will hesitate for a few seconds while it takes readings from the strain gages on the drive. Hold steady the 10% torque value until the wrench display shows C..50. IMPORTANT: When you press the UNITS button on the wrench you should squeeze the UNITS button between the bottom of the torque tube and the button itself with your thumb and index finger. If you push down on the key without squeezing the opposite side of the wrench you may induce side loads that may affect the accuracy of the calibration point.

Now increase the torque input to 50% of full CCW scale and squeeze the UNITS button when the torque input is stable. The wrench will hesitate while it takes a reading and will then show C.100. Make sure the applied torque is steady while the wrench takes the 50% reading. Once the wrench shows C.100 load the wrench to 100% of full scale and press the units key.

8. After completing the 100% of full scale value in CCW direction the wrench will go directly in Track Mode and will display the actual torque value applied (should be full scale in the CCW direction, because you just completed this value).

9. When you test the wrench for accuracy always put the wrench in Track mode (see the operation manual for how to put the wrench in track mode) so when the torque value on the torque tester changes you can see the same change on the wrench. This is not possible when in Peak mode where you always need to press the clear button to update the display because the wrench holds the peak value, not the applied torque.

10. After you have tested the wrench put it in Peak Hold mode for normal operation.

Troubleshooting:

1. If, after you calibrate the wrench, the wrench display is "stuck" on full scale you calibrated the wrench in the wrong direction. In other words you loaded the wrench in the counterclockwise direction when you should have loaded it in the clockwise direction. Repeat the calibration procedure starting in the clockwise direction.
2. If you find that there is a linear offset in the wrench readings through the complete range of readings then you may have induced a zero offset in the wrench during calibration. Turn the wrench off and then on again with no torque applied to the drive (the wrench does an automatic zero tare when it is turned on). Re-test the wrench and re-calibrate if necessary.
3. If you test the wrench and find that the wrench is not accurate between 10-50% of full scale but is accurate between 50-100% of full scale you most

likely made a mistake when entering the 10 or 50% calibration point. During normal use the wrench uses independent calibration curves depending on whether you are above or below a calibration point. For example the wrench uses one calibration curve when below 10%, one calibration curve when used between 10% and 50% and another calibration curve when between 50% and 100%. For this reason if you make a mistake at one point during the calibration cycle it will only effect the curve that uses that calibration point.

Please call JETCO at 626-359-2881 if you need further assistance