

Static Brake Test Theory and Practice

The Static Brake Test (SBT) is a means for ensuring that the drawworks brakes meet rated capacity. This document applies to the Commander Drawworks, models 2000 and 3000. The SBT involves a sequence of steps to test the holding capacity of each caliper set. Canrig Commander Drawworks installed on PACE B, S, X, and M800 rigs have two brake caliper sets. The status of each step of the SBT is displayed on the HMI. The Static Brake Test (SBT) is a feature of the Canrig Drawworks Control System, and it is recommended that the brakes are tested every 12 hours. The test should take less than 3 minutes.

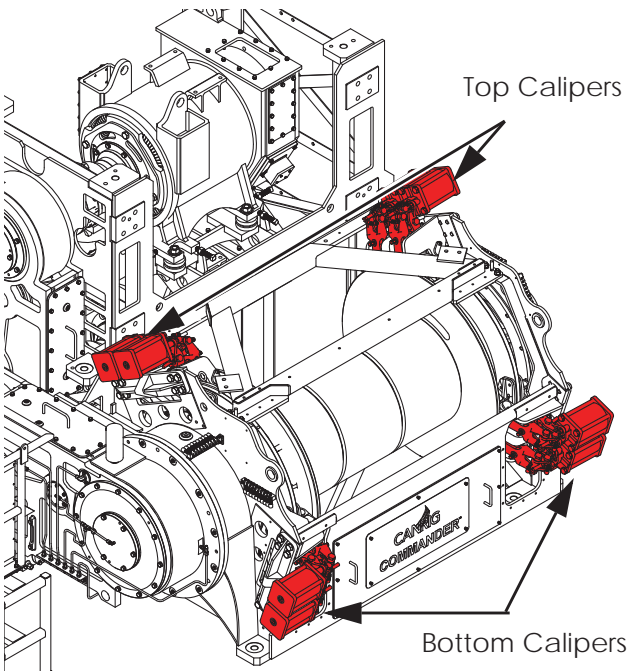


Figure 1: DW2000 Brake Caliper Locations

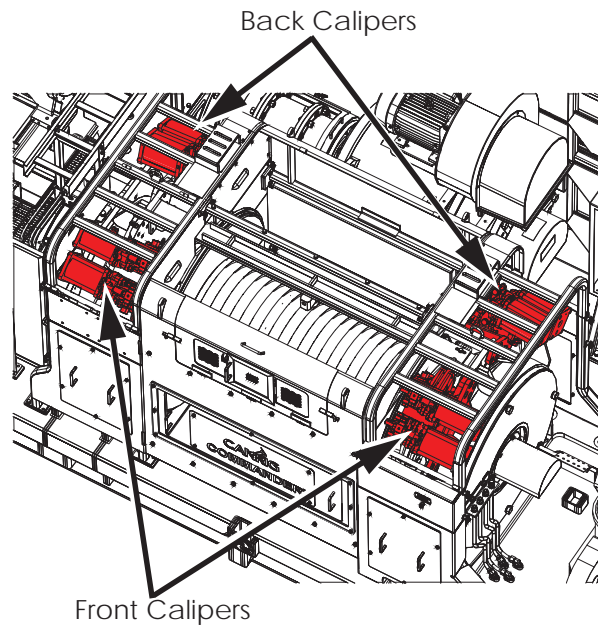


Figure 2: DW3000 Brake Caliper Locations

Troubleshooting

If the drawworks fails any portion of the SBT, refer to the following common troubleshooting steps to correct common problems:

1. Verify that the brake pad gap is no more than 3/16". Ensure that the rotor and brake pads are clean and check the pad condition. See Figure 3, "Air Gap Between Brake Pad and Brake Surface," on page 2.



Figure 3: Air Gap Between Brake Pad and Brake Surface

2. When the air gap exceeds $\frac{3}{16}$ " the air gap should be adjusted back to $\frac{1}{8}$ " total air gap. See Figure 4.



Figure 4: Adjusting the Air Gap Using Two $\frac{1}{16}$ " Shims

3. Check pressure gauges on the Brake HPU accumulators. Accumulators should be set to 650 psi. See Figure 5, "Check Accumulator Brake Pressure," on page 3 for accumulator gauge locations.
 - a. Bleed system pressure down by opening the three valves on the HPU. Turn the valve handle so it is in perpendicular with the line to relieve the pressure, see Figure 6, "Valve Handles," on page 3.

- b. If accumulator pressure is below 600 psi, nitrogen should be added until the gauge reads 650 psi.

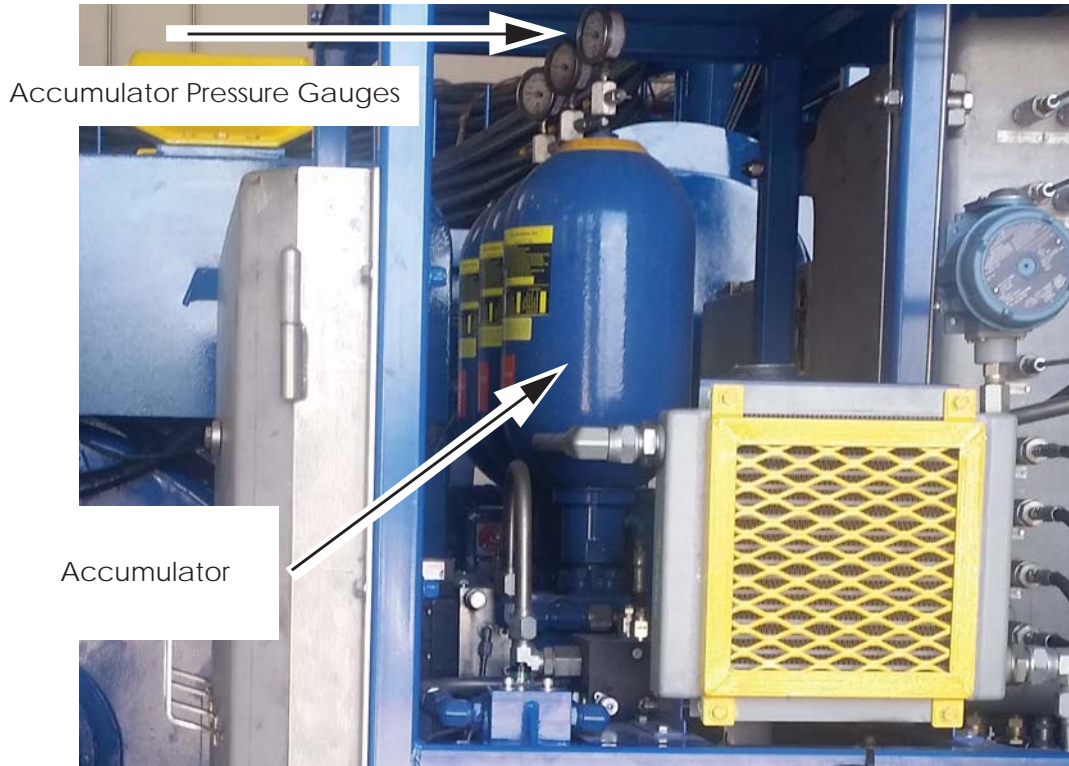


Figure 5: Check Accumulator Pressure

- c. After filling the accumulator, ensure that all valve handles are turned in line with the hydraulic line, and the test should be run again.

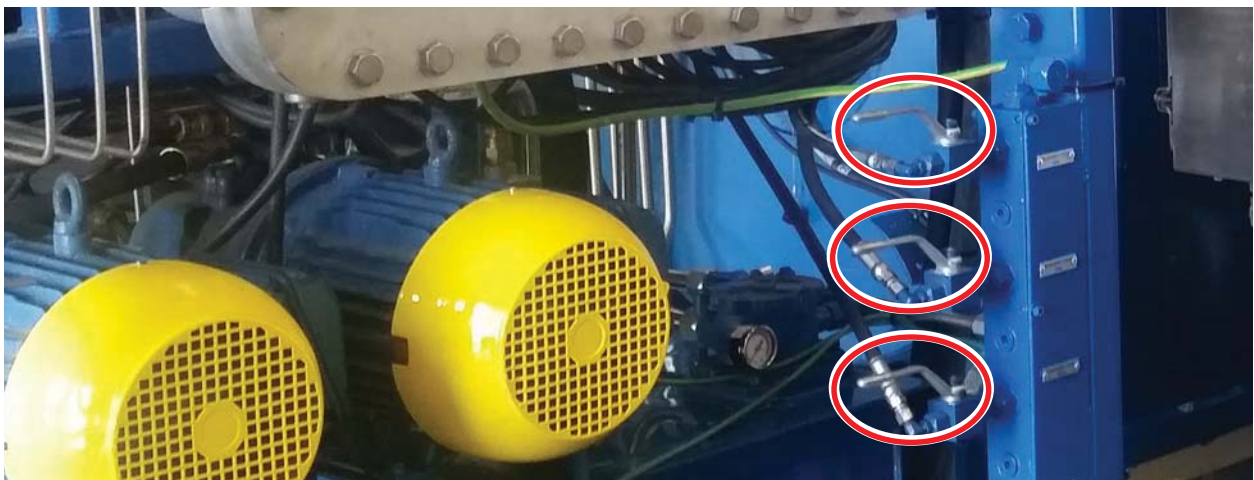


Figure 6: Valve Handles

4. Check the encoder tether. Verify that the tether and encoder are not twisted, loose, or broken. If the tether is loose, tighten the tether. If the tether is broken, replace the tether. See Figure 8.

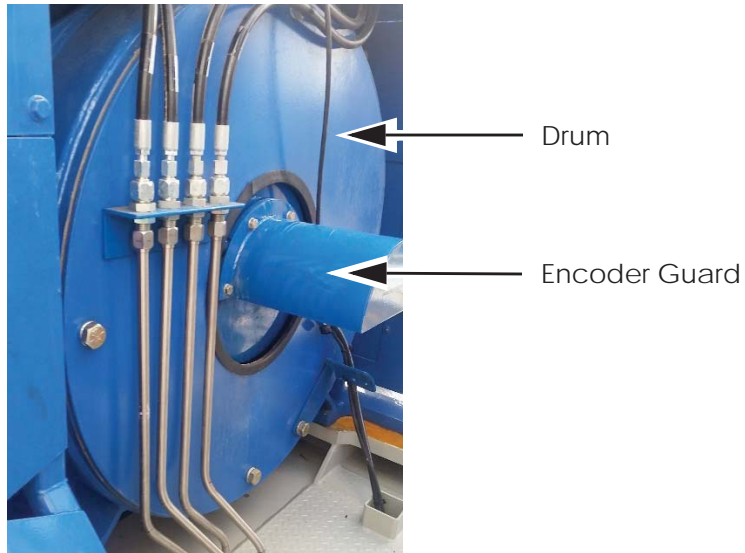


Figure 7: Drum Encoder Location

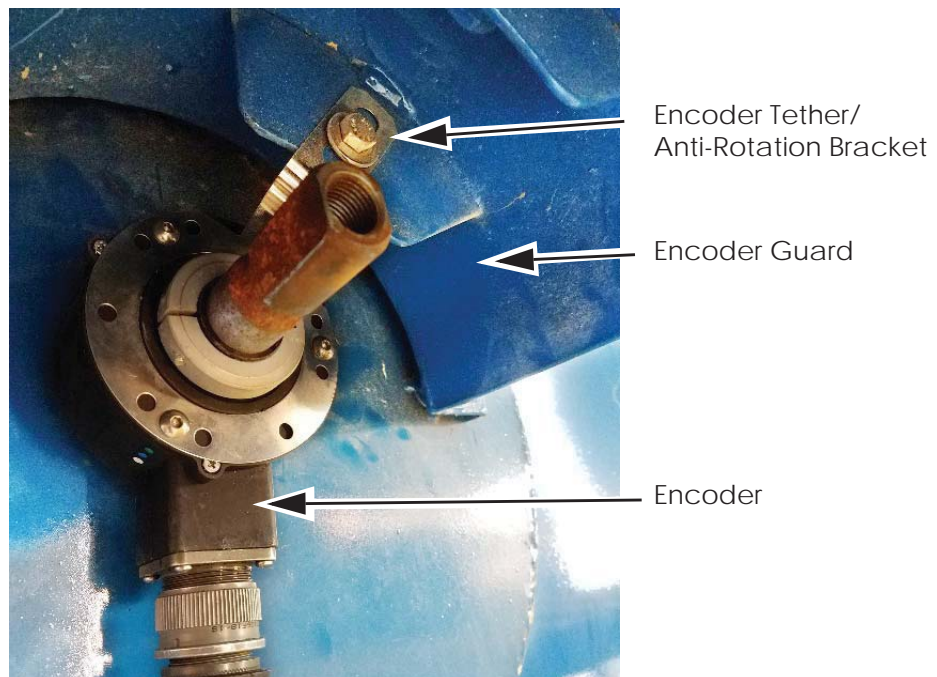


Figure 8: Encoder Bracket and Tether

5. If all adjustments are correct and the pads and rotor appear to be clean and in good operating condition, RIGLINE 24/7™ Support should be contacted so burnishing can be done by a Canrig Technician.

Procedure

The status of each step of the STB is displayed on the HMI. At the end of the test, the system will display the maximum recommended hookload for the drawworks. See "Troubleshooting" on page 1 for common procedures to correct problems identified in the test.

SBT has three tests:

1. **Test 1:** Both Brake Caliper sets are closed, and all brake caliper sets are tested.
2. **Test 2:** Brake Calipers Set 1 (the lower caliper set) is closed, and brake caliper set 2 is released. Brake Caliper set 1 is tested.
3. **Test 3:** Brake Caliper Set 1 is released, and Brake Caliper Set 2 (the upper caliper set) is closed. Brake Caliper Set 2 is tested.

Starting the Static Brake Test (SBT)

1. The block should be empty with only the top drive and traveling block weight. Do not attach the Drill String.
2. The block should be positioned between 20 and 40 feet.
3. Start the drives and ensure that the drawworks is ready to run.
4. Joystick control will be suspended for the duration of the test. The test should take less than three minutes.
5. Select **Drawworks » Parameter » Static Brake Test**, and follow the on-screen instructions.

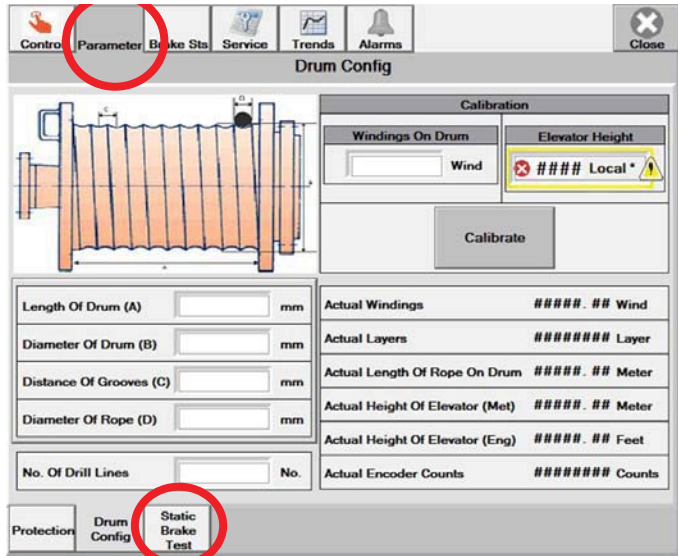


Figure 9: Drawworks HMI Parameter Screen

- When prompted, release the drawworks brake to come out of parking state.
- Press **RUN** on the HMI to start the testing sequence. The test will run only if the pre-conditions have been met. Pre-conditions that have not been met will be displayed on the HMI.

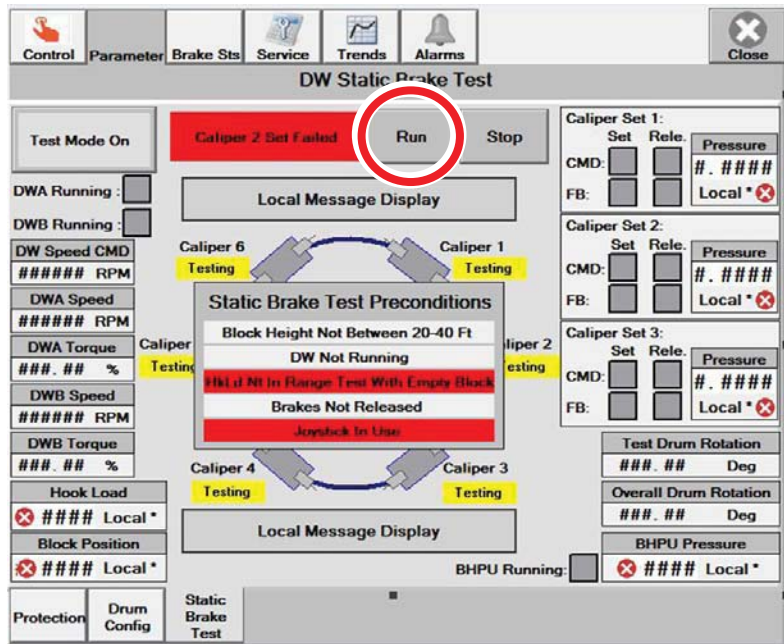


Figure 10: Drawworks HMI Static Brake Test Screen

Testing Process

The SBT process is as follows:

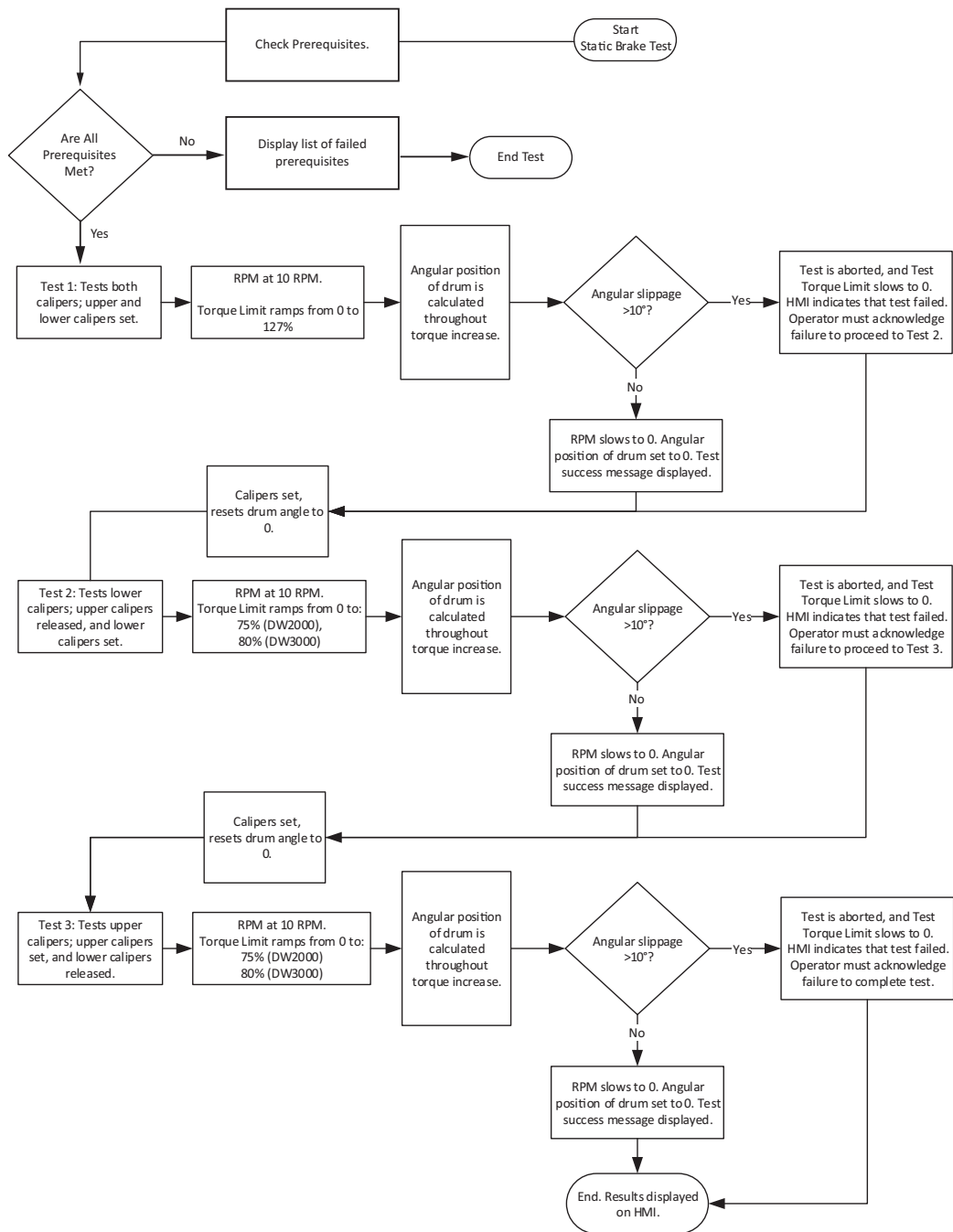


Figure 11: SBT Testing Process