

Michigan Scientific Wheel Force Transducer Set-up & Installation

Quick Guide for LW-2T-60K-S Dual Wheel Installation

Rev 1.0
9/17/21

1. Install tires onto Rim Adapters with balance beads inside tires
Dual Wheel
2. Roll Outer rim and tire onto forks of forklift. Then roll the Inner rim and tire onto forks of forklift
3. Align pilots and holes of outer rim adapter and inner rim adapter.
4. Place WFT into outer rim adapter, align holes of both rim adapters with threaded holes of WFT.
5. While holding in place have someone install the initial two M20 x 90mm bolts (with **washer plates under the bolt heads and a little anti-seize on the threads**) through both rim adapters and into threaded WFT. These initial bolts will hold the assembly together while remaining bolts can be installed.



6. Install the remaining M20 x 90mm bolts (with **washer plates under the bolt heads and a little anti-seize on the threads**). A battery impact driver can be used if the clutch is set to the lowest setting, but bolts should be started by hand.



7. Insert the hub adapter into the transducer as shown and install 24 M20 x 45mm bolts with a small of anti-seize.



8. Use a ratchet strap over the top of the tires and secure it to the forklift forks. This will react the torque applied to the bolts while tightening.



9. Use a $\frac{1}{2}$ " Drive Torque wrench with Torque Multiplier OR $\frac{3}{4}$ " Drive Torque wrench to tighten all the Rim Side bolts to 450 N.m. Use a square pattern for tightening the bolts equally. If using Torque Multiplier the arm of the Torque Multiplier can rest against the forks as shown.

11. Install installation cones onto 3 of the truck wheel studs. These will help guide the WFT assembly into place.



12. Install the dual wheel assembly onto Truck Axle. A Tire dolly, or pallet jack can be used to move the WFT assembly into place.



13. Once some wheel nuts have been installed. Remove the installation cones, install remaining wheel nuts, and tighten all wheel nuts to the manufacturer's specifications.

14. For dual wheel installation, install Amplifier Stand-offs to the transducer. Look for dowel pins & holes, as they can only be installed one way. Install $\frac{1}{4}$ -20 x 1.125" bolts provided with a small amount of anti-seize. Use provided washers under the heads of the bolts. Tighten with provided T-handle wrench.



15. Install Amplifier Bar to the Amplifier Standoffs. Look for dowel pins & holes, as they can only be installed one way. Install $\frac{1}{4}$ -20 x 0.75" bolts provided with a small amount of anti-seize. Use provided washers under the heads of the bolts. Tighten with provided T-handle wrench.



16. For non-steer wheels, mount Slip ring Stator rod vertical with magnetic restraint package (MVSr). Use tape to re-enforce magnet. Sometimes a custom anti-rotation bracket is required.



17. For Steering wheels, use SAC, fabricate over the wheel bracket, or perform correction with steer Stator Rod Correction Equations in the manual. Slip Ring Stator should be vertical. (If vertical is not possible, measure the angle and enter into CT2 webpage.)



17. Route slip ring cables into cab and connect to CT2s.

18. Connect CT2s to 9-36 VDC, and stack CT2s. (White wire is power high. Black wire is power ground.) Only 1 power cable is required for a stack of CT2s.
19. Exercise the WFTs. This can be done by driving the vehicle in a figure 8 maneuver and performing and least two hard brake stops. This is to set the WFT to adapter boundary condition and just needs to be done when the WFT and adapters are first bolted together.
20. Power on CT2, press MODE button to enter SET-UP mode, and set Position button on each CT2 according to location of WFT on vehicle
21. Press SHUNT button to perform shunt calibration of WFT. Fault light should not come on.
22. Hoist vehicle, press ZERO button, and rotate each WFT 2 revolutions to zero WFTs. Perform Zero on SAC if using SAC. (Press and hold SAC button 2 seconds while stator rod is vertical and wheels are straight ahead.)
23. Switch CT2 to RUN mode. Connect Ethernet cable between any CT2 and laptop. Change computer static IP address to 192.168.0.100. Open web browser (Chrome preferred) and enter webpage 192.168.0.28. CT2 embedded webpage should open.
24. Enter desired Measurement Origin. Enter value "a" to move measurement origin to tire center or hub face. Leave RR as "0". Hit update at bottom of page. For identical measurement origin change for all 4 wheels, check 'Update All' box before hitting Update.
25. Select desired Coordinate System. Right Hand Rule is usually preferred.
26. For CAN signal output, set-up .dbc file in CT2 webpage. Enter Baud Rate (should be 1,000,000 Mbps). Enter desired Output rate (sample rate). Select desired units (Metric or English). Select proper CAN termination (one box checked per CAN Bus). Ensure all Message IDs are unique. Click Update button. Then 'SAVE TO DISK' and save to laptop. If 'SAVE TO DISK' button does not appear, copy .dbc file text, paste into Notepad application and save to laptop. Then change file extension to .dbc
27. For CAN outputs, in data acquisition, load .dbc file into data acquisition. Ensure sample rate and Baud rate are set the same as in CT2. Make sure termination resistor is turned on in data acquisition.
28. For Analog signal outputs set-up data acquisition according to Quick Reference Calibration Sheets provided.

Troubleshooting:

If all signals are at zero, just rotate the wheels by rotating them on hoist or driving the vehicle. All WFT signals are held at zero until encoder index pulse is seen by CT2 (this will happen if CT2 power is cycled).