Quad Sensor Kit

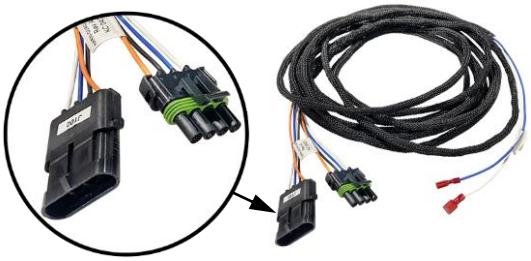
Item Included in the Kit

Unpack the Quad Harness (only one harness included in a kit). It has the connector ends specific to your truck—either for McNeilus or Con-Tech.

One of the following truck specific harnesses:

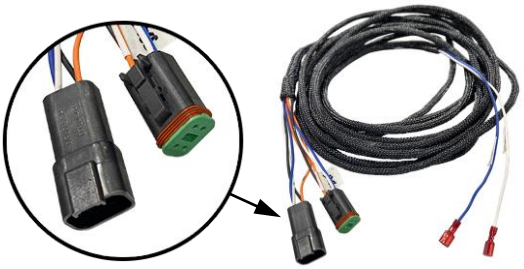
Quad Harness (for McNeilus)
Straight Port Connector
DF Part Number: **HARN-QUAD-001**

(connectors/terminal ends are preinstalled)



Quad Harness (for Con-Tech)
Square Port Connector
DF Part Number: **HARN-QUAD-002**

(connectors/terminal ends are preinstalled)



Tools for the Job (not included)

- Phillips screwdriver (or screw gun with bits)

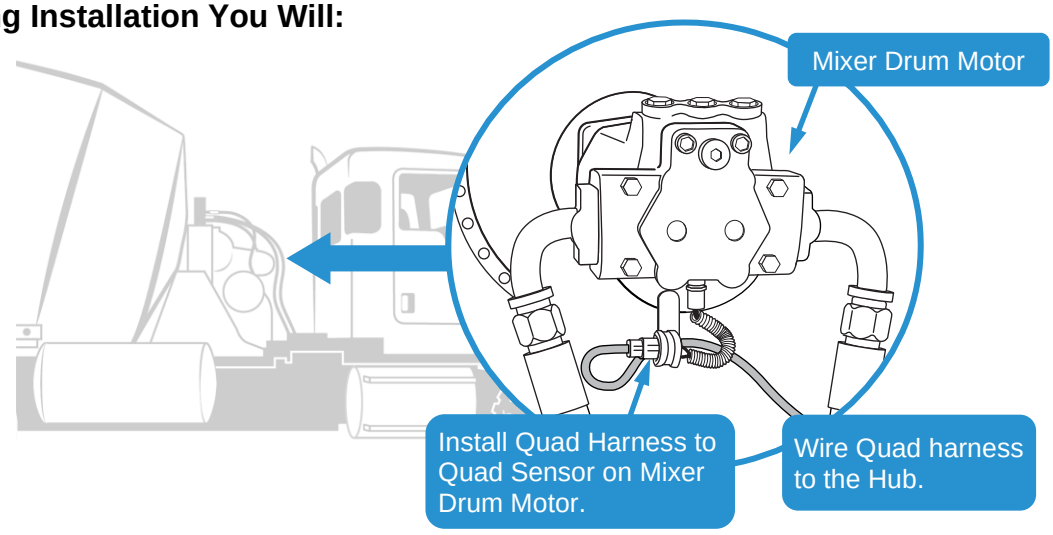
Additional Items Needed (not included)

- Grommets, bushings, hole plugs (to pass wiring through dash/firewall)
- Wire ties
- Colored tape (to mark cables)

Installation – Quad Sensor Kit

The Quad harness plugs into the truck's built-in Quad Sensor (on the drum mixer motor) to relay drum direction and speed to Digital Fleet's drum auto-status system.

During Installation You Will:



INSTALLATION

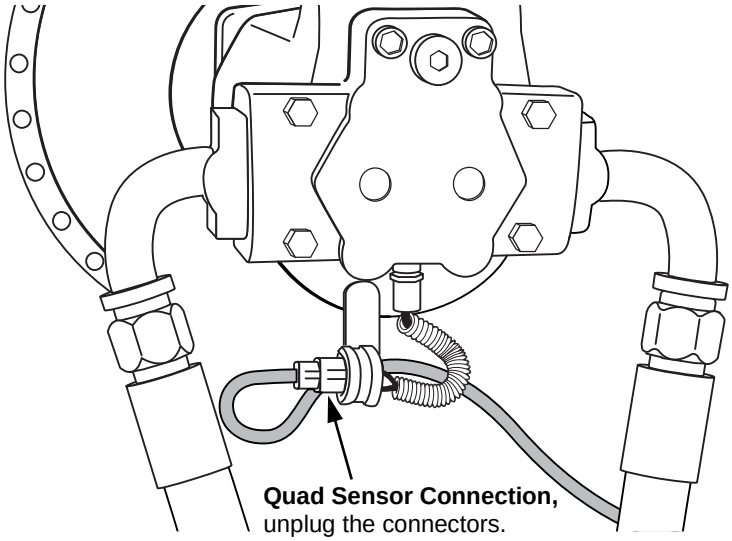
Step 1. Engine must be off, but leave battery connected.

Step 2. Start installation at the hydraulic motor that moves the drumhead.

Step 3. Locate the Quad Sensor wire connection on underside of drum motor, see image below.

3.1. Unplug the sensor connection for the motor to the truck.

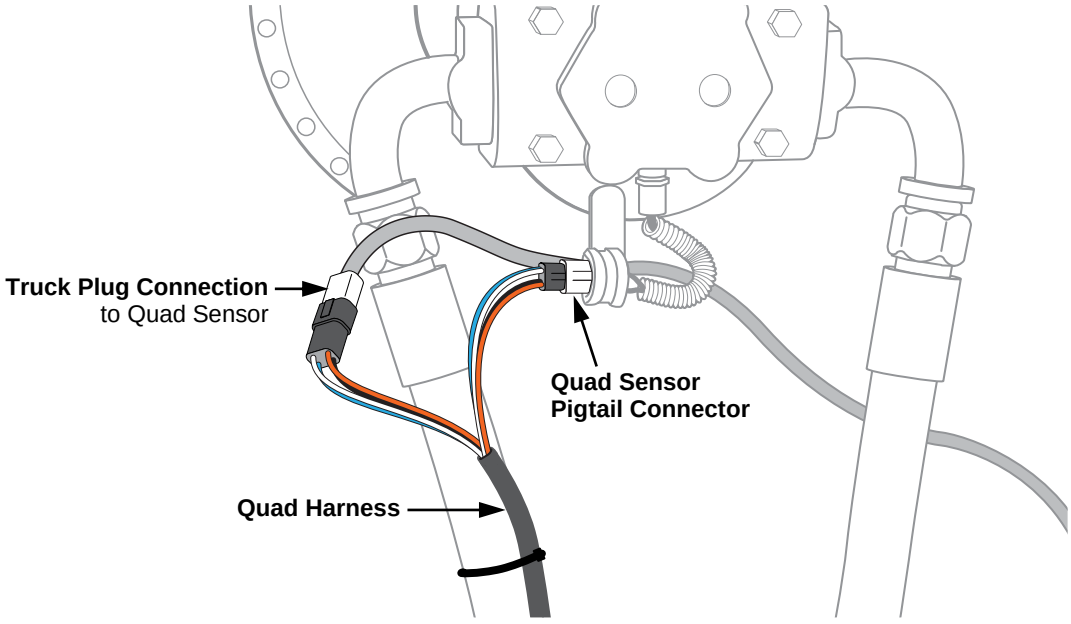
3.2. Check the plug pins on each side—make sure they can make a good, clean connection to the harness (no corrosion, paint, or other foreign matter on the pins; rework the end if needed before installing the Quad harness).



Step 4. Connect the Quad Harness provided in the kit—you will have either a HARN-QUAD-001 (for McNeilus), or HARN-QUAD-002 (for Con-Tech).

4.1. Plug in the harness end that matches the Quad sensor connector, see image below.

4.2. Plug in the remaining harness end that matches the truck plug connection.



QUAD SENSOR WIRING

To connect the sensor wiring, you need access to the Hub. Generally, the Hub is located in the dash (Rear Discharge Mixers) or on the back cab wall (Front Discharge Mixers).

Route Quad Sensor Harness and Connect it to the Hub

STOP If you have additional sensors to install, route the cables together, then zip tie them to the frame as a group whenever possible.

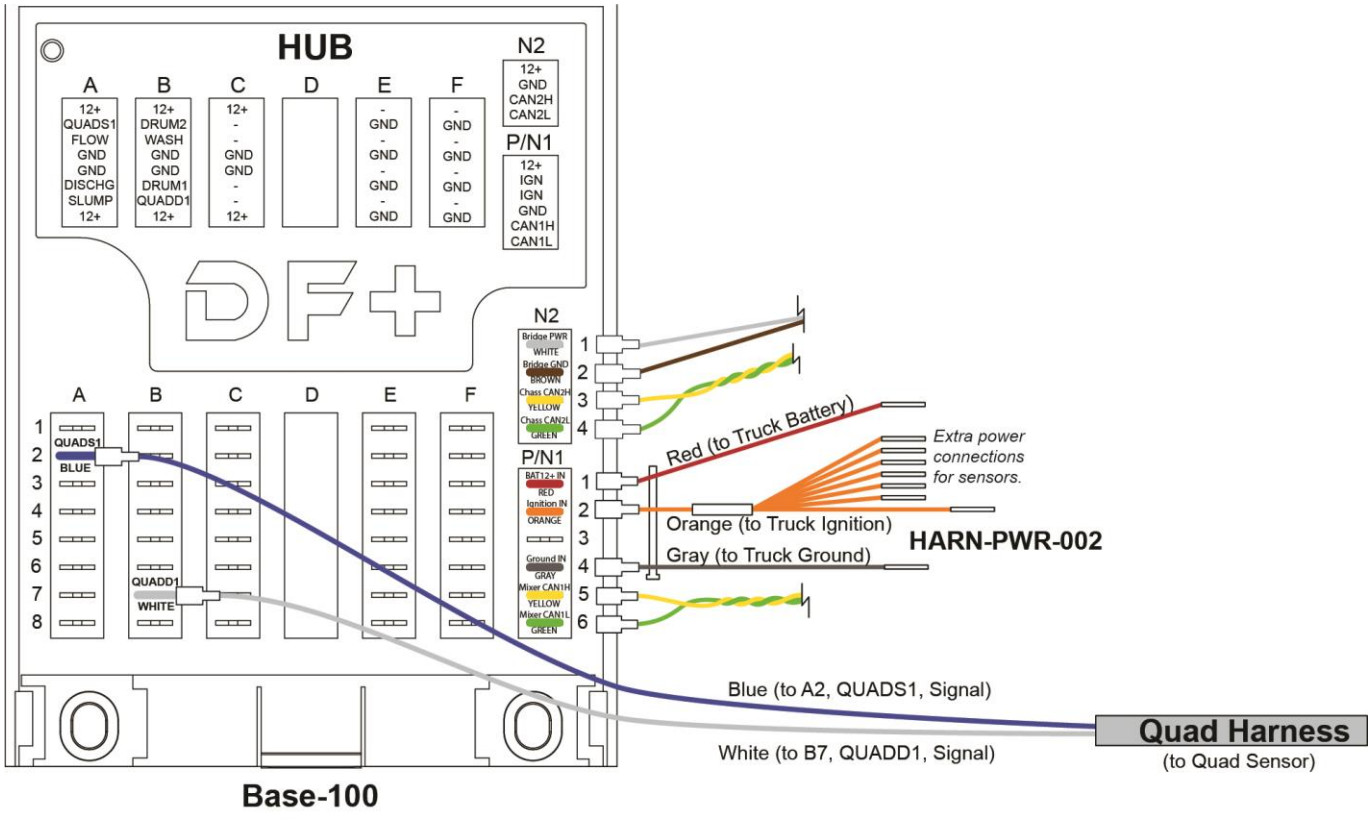
Step 1. Route Quad harness along with other sensor cable(s) to the Hub—fasten cables approx. every foot.

Important: Route harness/cables safely—avoid moving parts, pinch points, and sharp edges. Use a grommet or bushing on pass-thru holes as needed.

Rear Discharge Mixers: Run harness/cables through the frame rails, under the cab, through a hole in the firewall, and into the dash to connect to the Hub.

Front Discharge Mixers: Run harness/cables through the frame rails, up the back cab wall, and pass it thru a hole into the cab to connect to the Hub.

Step 2. Connect Quad Harness to Hub—plug blue and white wires into Hub, see image below.



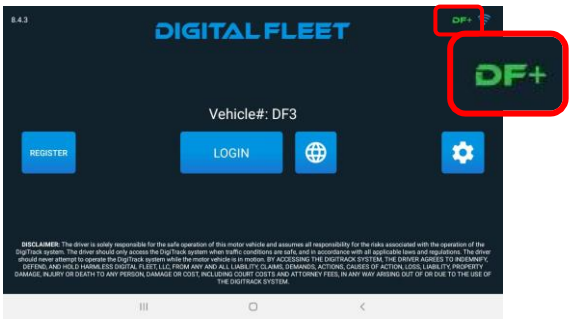
Step 3. Double check that all wiring connections are securely fastened.

STOP If applicable, complete any additional sensor wiring to the Hub before testing each sensor (refer to the wiring instructions in each sensor's section).

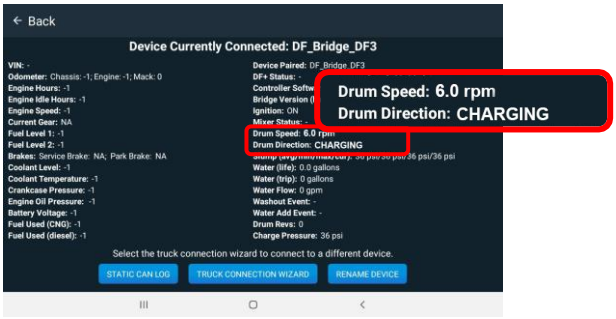
Installer Verification

Step 4. Verify the tablet shows correct drum speed and direction:

Note: The sensor kit is truck specific; all parameters are preset for the truck by Digital Fleet.



4.1 **Press DF+ icon** to navigate to the DF+ diagnostic screen.



4.2 **On diagnostic screen**—observe drum speed and direction during the following tests:

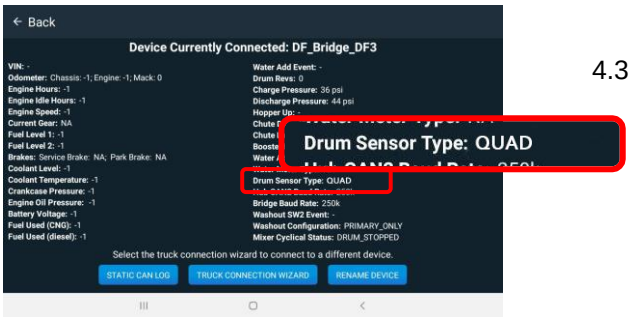
Spin the drum in charge at full displacement while the truck is at an idle.

- **Drum Speed** should show 6-7 rpm *(If speed shows 0.0 rpm, go to step 4.3, and make sure the parameter shows QUAD. If parameter is correct, reference Incorrect Drum Speed in Quad Sensor Trouble-shooting table, for additional help.)*
- **Drum Direction** should show CHARGING *(If incorrect, reference Incorrect Drum Direction in Quad Sensor Troubleshooting table.)*

Spin the drum in discharge at full displacement while the truck is at an idle—be careful, there may be material in drum, and it can make a mess.

- **Drum Speed** should show 6-7 rpm *(If speed shows 0.0 rpm, reference Incorrect Drum Speed in Quad Sensor Troubleshooting table.)*
- **Drum Direction** should show DISCHARGING *(If incorrect, reference Incorrect Drum Direction in Quad Sensor Troubleshooting table.)*

If both tests above are correct, Quad Sensor verification, is complete.



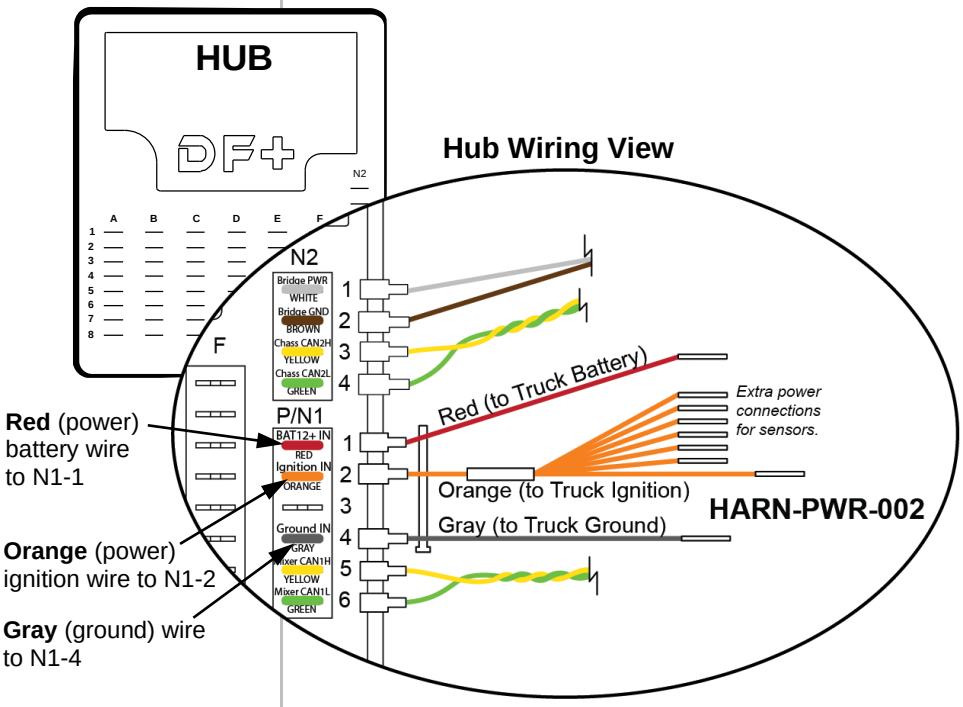
4.3 **Parameter setting—**scroll down on diagnostic screen to observe drum sensor type, it should read QUAD *(If incorrect, call DF+ Support.)*

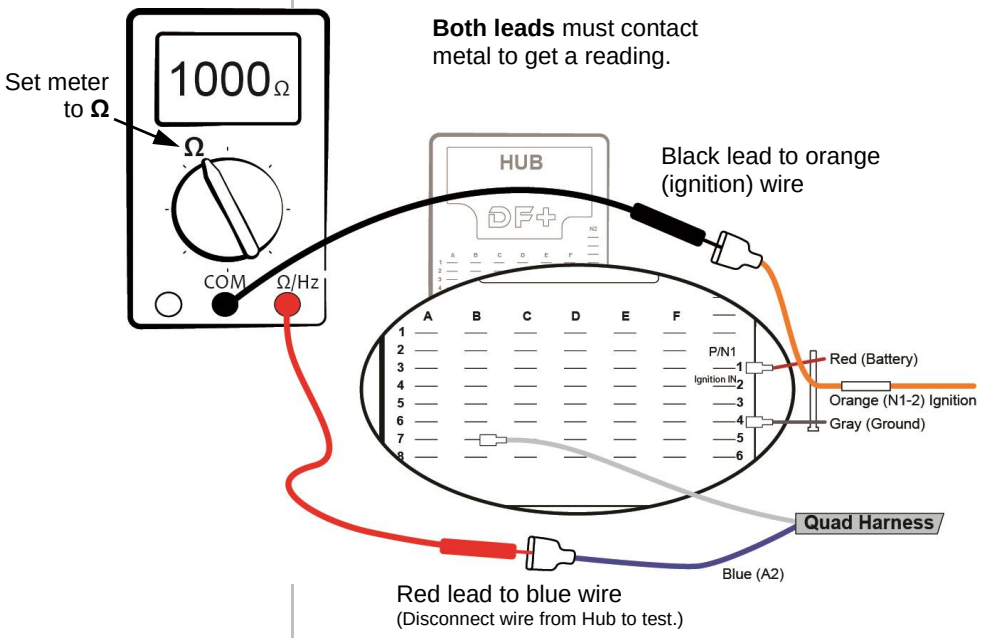
QUAD SENSOR TROUBLESHOOTING

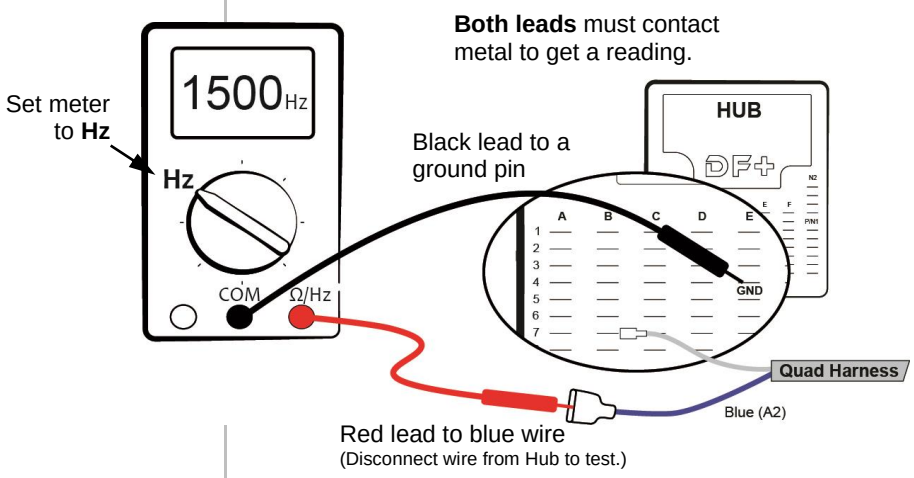
Issue	Possible Cause	Potential Solution
Incorrect Drum Speed (or speed shows 0.0 rpm)	Parameter setting on tablet (most likely)	Check Drum Sensor Type shown on diagnostic screen—it should read QUAD (reference Quad Sensor Kit, Installer Verification section, Step 4.3). Sensor type must match the truck type for it to read drum information. **If incorrect,** contact DF+ Support to change the parameter.
	Open circuit/short circuit (bad pin connection)	Check Quad harness connections at drum motor: • Make sure **both** harness ends securely "Y" into Quad sensor (reference Quad Sensor Installation, Step 4). • Check for bad pin connection—remove any corrosion, paint, or other foreign matter on the pins. For sensor plug or wire damage, DF+ recommends reworking the connector, if possible. If unfixable, replace the Quad sensor. (Refer to the OEM Mixer Service Manual for sensor replacement instructions. Make sure you set the sensor depth properly during installation—**DO NOT** bottom out the sensor.)
	Open circuit/short circuit (speed wire)	Check drum speed connection (S1, blue wire) on Hub—if unplugged or in wrong location, drum speed will show 0.0 rpm (reference Quad Sensor Wiring section, Step 2). Make sure blue wire connects to A2 (QUADS1, speed signal) on Hub.
	Gearbox not P7300	Check the drum motor label plate (on side of motor gearbox) to find the gearbox model number. The drum sensor reads the gear teeth inside the gearbox to determine drum speed and direction. The Quad parameter must match the gearbox number. The default parameter is preset for the most common P7300 gearbox. **If your gearbox is not P7300,** contact DF+ Support to change the parameter.
	Other wiring/sensor issues	If troubleshooting items above check ok, but drum speed still shows 0.0 rpm, see troubleshooting sections below Damaged Harness or Wiring, and Testing the System.

Issue	Possible Cause	Potential Solution
Incorrect Drum Direction (or direction does not show at all)	Parameter setting on tablet (most likely)	Check Drum Sensor Type shown on diagnostic screen—it should read QUAD (reference Quad sensor's Installer Verification section, Step 4.3). Sensor type must match truck type for it to read drum information. **If incorrect,** contact DF+ Support to change the parameter.
	Direction Wire issues (D1, white wire) • Direction does not show at all, or it always shows one direction • Direction always reads opposite	Direction wire issues generally cause one of the following conditions: If Sensor Type parameter is correct, but tablet still does not show drum direction, check white wire connection on the Hub—if unplugged or in wrong location, no reading will show (reference Quad Sensor Wiring section, Step 2). Make sure white wire connects to B7 (QUADD1, drum direction signal) on Hub. If direction always reads backwards (when charging, it shows discharging or when discharging, it shows charging), contact DF+ Support to invert the parameter. There are possible gearbox configurations which cause inverted readings (i.e., 90-degree gearbox which adds an extra gear), contact DF+ Support to have parameter inverted.
	Other wiring/sensor issues	If troubleshooting items above check ok, but drum direction still shows incorrect, see troubleshooting sections below Damaged Harness or Wiring, and Testing the System.
Damaged Harness or Wiring	Open circuit/short circuit	Visually inspect the harness length for damage—make sure it is not pinched, nicked, or damaged in any way. **Check for any type of damage, for example:** **Frayed** harness or wire  **Pinched** wire or harness  **Cut** or exposed wire  **Burned or hot wire** (discolored or distorted covering)  For any damage to the harness wiring or plug ends, replace the Quad harness (reference Quad Sensor Kit, Installation section).

Issue	Possible Cause	Potential Solution
Testing the System	**Using a Multimeter**	
	Before Testing	Make sure the truck's ground and power supply are connected to the Hub, as shown below.
	Test for drum speed issues	If other troubleshooting causes for the speed wire (S1, blue) check ok, but reading still shows 0.0 rpm when drum is spinning, use a multimeter to test the following: 1. Test speed wire 1k pullup resistor for harness issues, see **Pullup Resistor—Continuity Test (Ω)** on next page. 2. Test speed wire for sensor issues, see **Speed Wire—Frequency Test (Hz).**
	Test for direction issues	If other troubleshooting causes for direction wire (D1, white) check ok, test the sensor for failure, see **Direction Wire—Continuity Test (Ω)** at the end of this section.



Issue	Possible Cause	Potential Solution
	Pullup Resistor—Continuity Test (Ω)	
	Speed wire (S1, blue)	**Test continuity** (resistance, ohms [Ω]) of speed wire for a bad harness. 1. **Make sure** Hub is connected to truck's ground and power supply. *Reference Using a Multimeter section (Hub Wiring View) on previous page.* 2. **Test with ignition OFF.** 3. **Setup multimeter** as shown below.  4. **If continuity is between 900–1100 ohms(Ω),** the harness tests ok. Go to Speed Wire—Frequency Test to check for a sensor issue. **If continuity is out of range** (lower than 900 or higher than 1100 Ω): a) Recheck wiring—check for bad pin connection and make sure connectors are fully plugged in (clean pins or rework plugs ends if needed). b) If wiring checks ok, replace the Quad harness (reference Quad Sensor Kit, Installation section, Step 4). 5. **After testing**—reconnect all wiring securely.

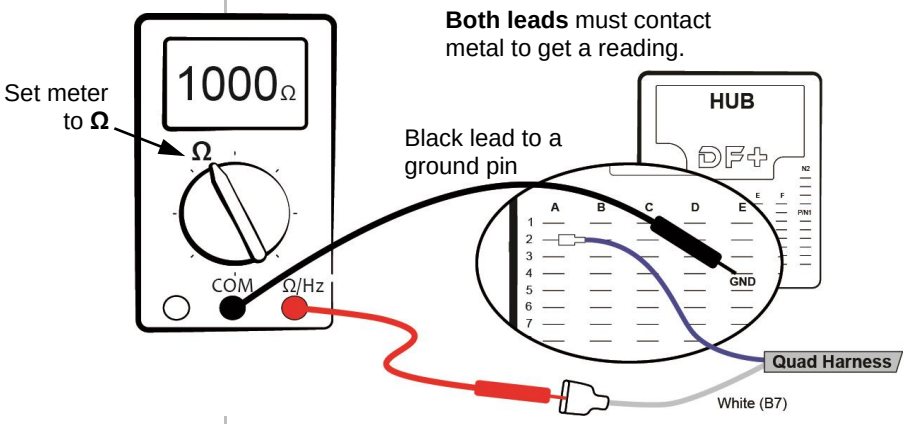
Issue	Possible Cause	Potential Solution
	Speed Wire—Frequency Test (Hz)	
	Speed wire (S1, blue)	**Test frequency** (Hz) of speed wire for sensor failure. 1. **Make sure** Hub is connected to truck's ground and power supply. *Reference Using a Multimeter section (Hub Wiring View) at the beginning of this section.* 2. **Turn ignition ON.** 3. **Setup multimeter** as shown below.  4. **Spin the drum at charge or discharge:** **If frequency is above 0.0 Hz** when drum is spinning, the speed wire tests ok. Reading will vary depending on gear ratio (how fast the drum is spinning)—it should **not** show 0.0 Hz. **If frequency shows 0.0 Hz** when drum is spinning: 00.0 Hz a) Recheck wiring—check for bad pin connection and make sure connectors are fully plugged in (clean pins or rework plugs ends if needed). b) Check sensor's depth setting—sensor must be able to read the gear teeth properly. Refer to the OEM Mixer Service Manual for setting the depth—**DO NOT** bottom out the sensor during adjustment. c) If wiring and sensor depth check ok, replace the Quad sensor. Refer to the OEM Mixer Service Manual for sensor replacement instructions. Make sure you set the sensor depth properly during installation—**DO NOT** bottom out the sensor. 5. **After testing**—reconnect all wiring securely.

Issue	Possible Cause	Potential Solution
	Direction Wire—Continuity Test (Ω)	
	Direction wire (D1, white)	**Test continuity** (resistance, ohms [Ω]) of direction wire for sensor failure.

1. **Make sure** Hub is connected to truck's ground and power supply.

   Refer to the Hub wiring view in Using a Multimeter section at the beginning of this section.

2. **Turn ignition ON.**
3. **Setup multimeter as shown below.**



4. **You must test BOTH drum directions** to know if you have a failure or if continuity is normal.

   4.1 Spin the drum at **charge**, note the reading. Meter should show 0–1 Ω (no more than 1000 Ω).

   4.2 Spin the drum at **discharge**, note the reading. Meter should read "OL" (∞).

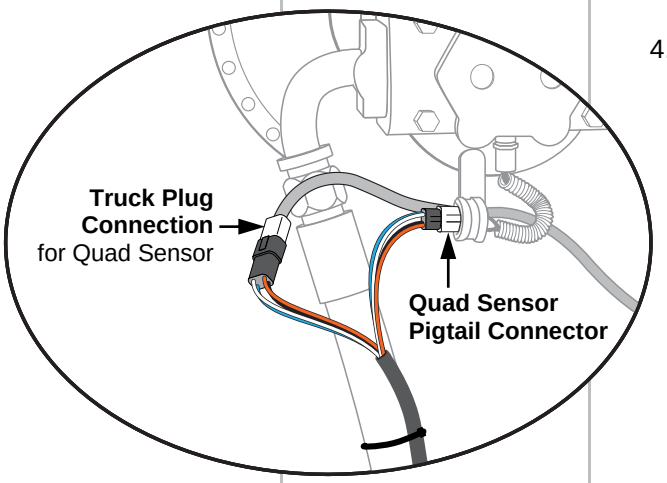
   4.3 If **either** reading is out of normal range:

   a) Make sure the harness is plugged into the truck plug connection (see image)—make sure plug has a good connection.

   b) Recheck wiring—check pins for a good connection and make sure connectors are fully plugged in (clean pins or rework plugs ends if needed).

   c) If wiring and sensor depth check ok, replace the Quad sensor. Refer to the OEM Mixer Service Manual for sensor replacement instructions. Make sure you set the sensor depth properly during installation—**DO NOT** bottom out the sensor.

5. **After testing**—reconnect all wiring securely.



For installation or troubleshooting questions, please call DF+ Support at 630.518.4606.