PROVISO™ PLUS

Simple Troubleshooting

Dec 2023

Proviso™ Plus P200M-EM

Simple Troubleshooting

The Proviso™ Plus P200M-EM, also called the P200M, is a Control System for a Self-Steering Lift Axle on a Truck

Produced by:

WHEEL MONITOR® INC.
TECHNOLOGY FOR SAFE TRANSPORTATION

Safety Notices

IMPORTANT: WHEEL MONITOR, INC. (WMI) cannot anticipate every possible circumstance that might involve a potential hazard. Therefore, the warnings and cautions in this manual are not all inclusive. Use care and good judgment in the installation, removal, and operation of the equipment. Always take precautions to protect yourself and others. Follow all applicable national, local, and industry-specific safety regulations and standards. Always follow your company's safety procedures when installing, removing, operating, or troubleshooting this equipment.

⚠ CAUTION	**Read this manual carefully before attempting troubleshooting. Be sure that you understand all instructions before you begin.**

Important Notice

This manual describes the current recommended troubleshooting procedures for Proviso™ Plus P200M-EM from WHEEL MONITOR, INC. (WMI) at the time of printing and are subject to change without notice or liability.

Scope

This document is to assist in the troubleshooting of a Proviso™ Plus P200M-EM Control System. It will explain the solution to problems we have seen in the field.

Basic Principle

The Proviso™ Plus P200M-EM (also referred to as the P200M-EM) is a control system for a self-steering lift axle on a truck. The P200M-EM controls the position of the lift axle, UP or DOWN. It also controls the pressure/weight the lift axle is carrying.

Tools Needed

Multi-Meter and/or test light

Troubleshooting Procedure

When a truck with the P200M-EM has been brought in for service, information from the operator will be important, including:

- What exactly is happening? (Axle is not lifting, axle is not lowering)
- When is the issue happening? (Empty, loaded, both?)
- Does it always happen or is it intermittent?
- How long has the issue been happening?
- Has the system worked correctly for some time before this issue?

Basic Troubleshooting Procedure

The Proviso™ Plus P200M-EM is equipped with a diagnostic Light Emitting Diode (LED). The LED is located on the bottom-left corner of the control module.

Figure 1: Proviso™ Plus P200M-EM's LED

Locate the P200M-EM Suspension Controller Module and visually identify the colour and the pattern of the LED. The LED may be dim, shading the area around the LED may help.

The P200M-EM's LED can be used determine if the module is detecting any problems. The LED colour code is:

FLASHING GREEN—The module has power and is not detecting wheel movement.

SOLID GREEN—The module has power and is detecting wheel movement.

FAST FLASHING RED—The module has an internal fault and needs to be replaced.

FLASHING RED AND YELLOW (ORANGE)—The module has detected a fault external to the module.

Locate the P200M-EM Sensor Interface Module and visually identify the colour and the pattern of the LED. The LED may be dim, shading the area around the LED may help.

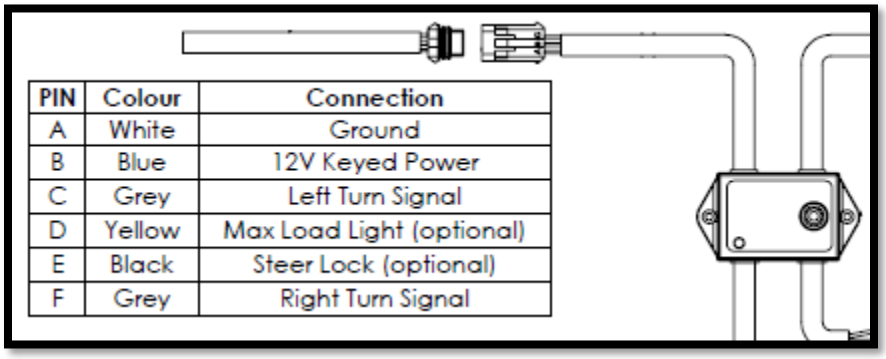
Figure 2: Sensor Interface Module's LED

The P200M-EM Sensor Interface Module's LED. The LED colour code is:

SOLID GREEN—The module has power.

OFF— The module does not have power or is damaged.

If the LED on the P200M-EM module is not coming on at all, make sure the module is receiving 12-volt power (Blue Wire) and the ground (White Wire) is properly grounded on the truck side of the 6-pin connector.



PIN	Colour	Connection
A	White	Ground
B	Blue	12V Keyed Power
C	Grey	Left Turn Signal
D	Yellow	Max Load Light (optional)
E	Black	Steer Lock (optional)
F	Grey	Right Turn Signal

Figure 3: Connector Wiring Colour Chart

If the LED on the Interface module is not coming on at all, make sure the two modules are connected to each other. Also, make sure the P200M-EM module is supplying 5V on the Red Wire and ground on the Black Wire.

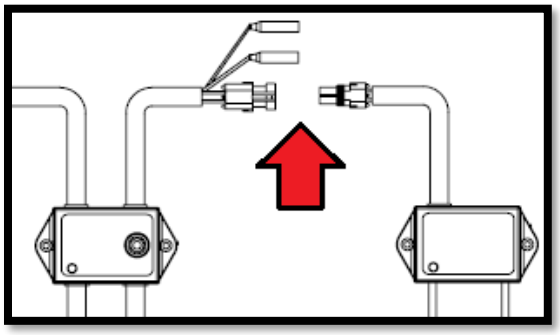


Figure 4: Connector

If the LEDs are not **GREEN** when the truck's power is ON, the module has detected an issue. First try restarting the truck to see if the problem returns. If the problem returns, use the Wheel Monitor Inc. (WMI) Communication software and cable to communicate with the P200M-EM control module. The software will show the cause to the LED colour and helpful messages to resolve the issue.

If you do not have access to the software, locate a service center equipped with the Wheel Monitor Communication Software. Contact Wheel Monitor to help locate a service center near you.

Scenarios

If the LEDs are both **GREEN** and there is still an issue, the following scenarios will cover the most likely causes and solutions.

Scenario #1: The lift axle will not lift in reverse but lifts when going forward (but works backwards).

Check the wheel sensor installation.

1. Locate which wheel the sensor is installed on and inspect the sensor. In most cases, this involves pulling the wheel and brake assembly to get access to the sensor.
2. First, check the sensor alignment.
    - The molded point on the back of the sensor should be pointing away from the center of the axle.
    - If the sensor is mounted in the 12 o'clock position on the axle, the molded point should also be pointed in the 12 o'clock position.

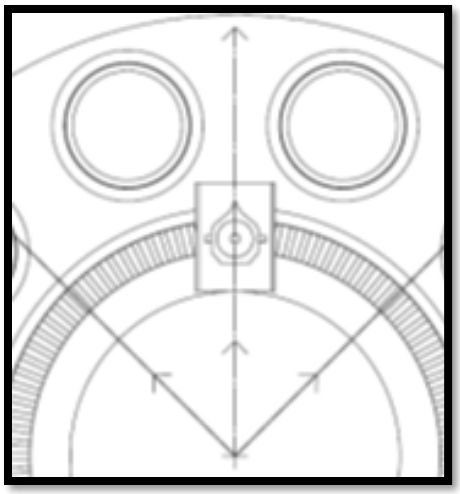


Figure 5: Position of the Wheel Sensor

3. Second, check the spacing between the sensor and the tone ring.

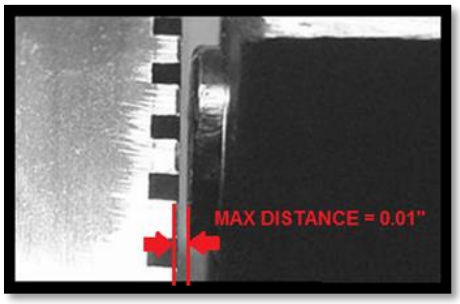


Figure 6: Distance between the Sensor and Tone Ring

4. Third, check that the sensor block is centered on the tone ring.

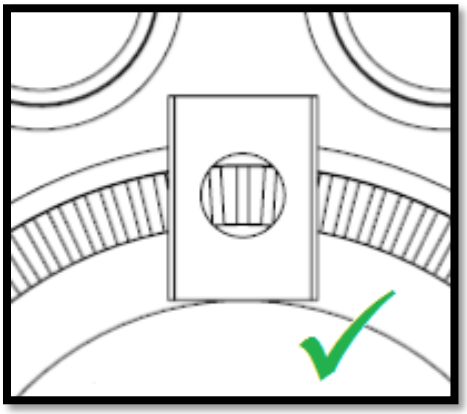


Figure 7:Correct Location of Center Block

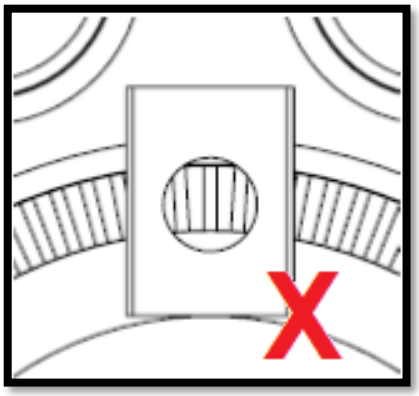


Figure 8: Example #1 of Incorrect Location of the Center Block

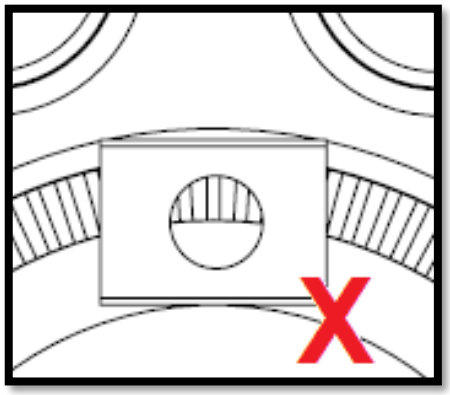


Figure 9: Example #2 of Incorrect Location of the Center Block

Scenario #2: The lift axle will not lift in reverse or forward.

1. Use the LED to determine if the wheel sensor is detecting any speed or direction.
   a. Locate which wheel the sensor is installed on and rotate the wheel.
   b. Watch the LED while the wheel is rotating.
      - If the LED becomes **SOLID GREEN** while rotating and **FLASHES GREEN** while stopped, the sensor is detecting a partial signal. Refer to Scenario #1 to check the sensor installation.
      - If the LED continues to **FLASH GREEN** while the wheel rotates, continue to step 2.
2. Test the P200M-EM Module.
   a. Verify the P200M-EM module is correctly supplying power to the sensor.
   b. Disconnect the wheel sensor connector from the sensor and measure the pins/sockets on the P200M-EM side of the connection.

      Red = Battery voltage

      Black = Ground

      White = 10V approx.

      Green = 10V approx.
3. Check for bent pins on the wheel-sensor connector, both the P200M-EM and sensor side of the connection.
4. Trace the wheel sensor cable from the P200M-EM to the sensor, checking for damage along the cable.
5. Refer to Scenario #1 to check the sensor installation.
6. If all of the previous steps do not solve the issue, replace the wheel sensor. In extreme cases, the P200M-EM module may need to be replaced.

Scenario #3: The lift axle will not lift with the Emergency Lift Axle Override.

This scenario is most likely caused by a wiring issue or misunderstanding of how the feature works.

1. Test the 4-way signal inputs from the truck.
    a. Turn the 4-way signals in the truck ON.
    b. Measure the signals on the yellow and green wire of the 6-pin connector on the truck side.
    c. Verify that both wires are turning ON and OFF at the same rate as the 4-way signals.
    d. Check that the Emergency Lift Axle Override Switch is ON, as it will cut-off one of the signals when OFF.
2. Inspect the 6-pin connector for any signs of corrosion or damage to either side.
3. Ask the user to explain how the feature works. The correct way to activate is:
    a. Drive between 0.3-60km/h (it doesn't work while stopped)
    b. Turn on both the Emergency Lift axle Override Switch and the 4-way Flasher Switch.

Note: If the user describes a different activation process, clear up the misunderstanding

4. Verify that the P200M-EM is connected to the lift-axle control valve. The Brown wire on the P200M-EM should be connected to a solenoid for controlling the lift axle position.
5. If all of the previous steps show no sign of issues, advanced troubleshooting is recommended using the Wheel Monitor Communication software.

Note: The P200M-EM may be configured to use the 4-way sequence or enable switch methods. Use the communication software to determine which setting the system is using.

Scenario #4: The lift axle will not lift when the truck is EMPTY.

This scenario is most likely caused by a calibration issue or a pneumatic issue.

1. Attempt the Reset procedure using the Reset Light or Switch. Restart the truck after the procedure is completed.

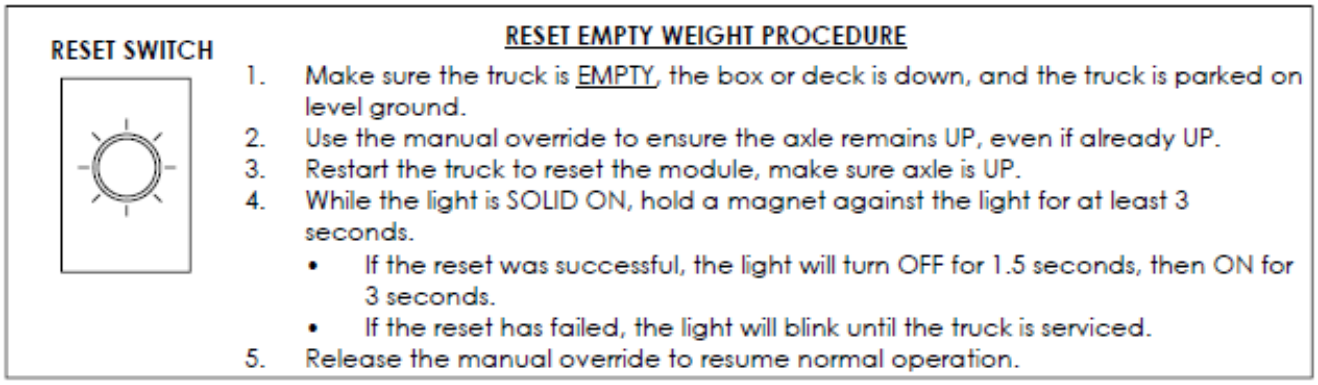


Figure 10: Magnetic-Style Reset Switch

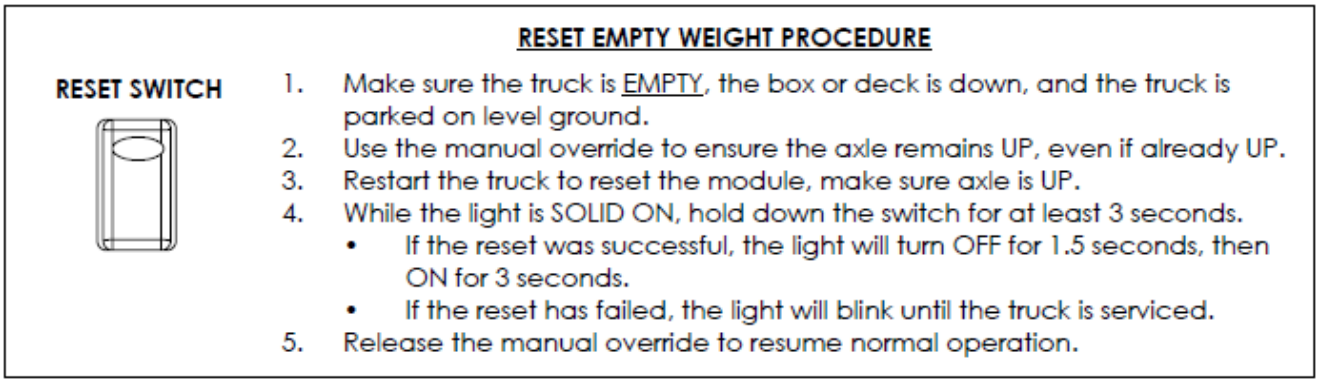


Figure 11: Rocker-Style Reset Switch

2. While the truck is empty, measure the voltage on the Brown Wire connected to the lift solenoid.
   a. If the Brown wire has 12V, check that the White wire connected to the solenoid is grounded. If both connections are good, the valve or solenoid is likely stuck.
   b. If the Brown wire does not have 12V, continue to step 3.
3. Use the Communication software to determine what is causing the axle to remain down while empty.

Scenario #5: The lift axle will not lower when the truck is LOADED.

1. Verify that the manual override on the control valve is NOT ON.

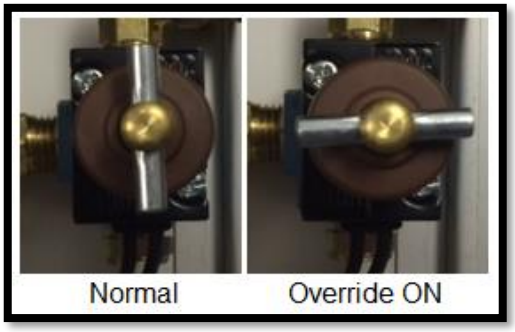


Figure 12: Override ON

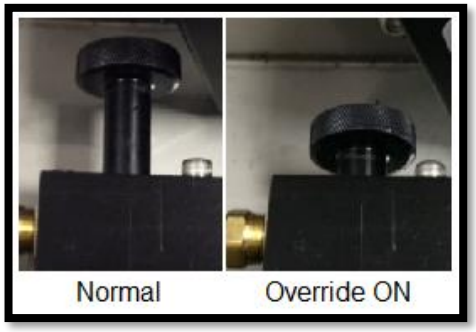


Figure 13: Override ON

2. Attempt the reset procedure using the reset light or switch. Refer to scenario #4 and make sure the truck is empty.
3. Use the Communication software to determine what is causing the axle to remain up while loaded.

Scenario #6: The lift axle lowers randomly when the truck is EMPTY.

This scenario is most likely caused by intermittent power loss or a wiring issue.

1. Test the power and ground connection.
    a. Using a multi-meter, measure the Blue and White Wires on the truck side of the 6-pin connector.
    b. Look for signs of voltage drops or fluctuating readings.
    c. Trace the wires back to the source looking for signs of corrosion or loose connections.
2. Verify that the P200M-EM is connected to the lift-axle control valve.

    Note: The Brown wire on the P200M-EM should be connected to a solenoid for controlling the lift-axle position.
3. Test the lift-axle solenoid using a battery to verify the valve is correctly functioning.
4. If all of the previous steps show no sign of issues, advanced troubleshooting is recommended using the Wheel Monitor Communication software.

Scenario #7: The lift axle lifts randomly when the truck is LOADED.

This scenario is most likely caused by the wheel sensor detecting reverse. In some cases, this can be caused by the user rolling back enough to trigger the reverse detection. In other cases, it can be a sign of wheel sensor alignment issues or a malfunction.

1. Trace the wheel sensor cable, checking for damage along the cable.
2. Check the wheel sensor installation. Refer to scenario #1.
3. If all of the previous steps show no sign of issues, advanced troubleshooting is recommended using the Wheel Monitor Communication software.

Contact Us

If you have any questions or comments, feel free to contact us at:

Wheel Monitor Inc.

360 York Rd., C4, N-O-T-L, Ontario, L0S 1J0, Canada
Phone: 1-905-641-0024
Fax: 1-905-641-0038
Toll Free: 1-877-943-3566

If it is after hours, call 905-359-8319 or 905-359-5613.

Website: www.wheelmonitor.ca
Email: tech@wheelmonitor.com