MINIMAX HELPING-HAND™

Multiplex Diagnostic Manual

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November 2019

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1 Introduction

As technology grows in both complexity and importance, the use of electrical and electronic systems has increased substantially in recent years. In fact, the electrical and electronic components are now more reliable and efficient than ever. Today, they are used to reduce the operating costs, improve productivity, protect investments, enhance operational safety and increase energy efficiency.

As one of the leaders in manufacturing equipment for the solid waste industry in North America, Labrie Enviroquip Group made the decision to take advantage of this ever-evolving technology and all the benefits it brings in terms of performance and efficiency by implementing the Multiplex System into many of its platforms.

The Multiplex System used by Labrie is a CAN-based system that integrates a monitor display, a control panel and a number of electronic modules. This whole system has been designed to help you operate your unit in an efficient and easy way and to make the collection process more friendly-oriented.

The Multiplex System is used to electronically monitor all systems that are onboard the truck. It monitors the use of the automated arm, the tailgate and the waste body. It also monitors the multicycle function of the packing system, the oil temperature inside the hydraulic system and the number of carts emptied into the hopper.

The Multiplex System also informs the operator of anything that may go wrong in the truck and provides adequate solutions to operational problems. See *Labrie's Multiplex System* on page 9 for a complete description of that system.

Finally, the Multiplex System is equipped with an onboard diagnostic tool, which makes the troubleshooting process more orderly and manageable. See *Multiplex Diagnostic Guide* on page 55.

The purpose of this publication is to clearly explain the Multiplex System and to provide troubleshooting information and guidelines to the maintenance personnel as well as in-the-field technicians.

How the Multiplex System Works

The control modules that are part of the Multiplex System controls/monitors every logical function of the truck (packing, raising/lowering tailgate, interlocks, lights, automated arm, etc.). Because all functions are now integrated into one system, the number of wires and harnesses has drastically decreased without changing anything in the procedures and operating principles of the waste collection. The Multiplex System now replaces old, complex monitoring systems that were formerly used in our trucks. With this system, no more relays are needed to perform all the logical functions of the truck.

One of the many benefits that stem from the Multiplex System is that new functions can be added quickly and easily. All that is needed to do is to reprogram the system.

The control modules also allow in-the-field or remote diagnostics of the electronic system with the help of a computer (proper software must be installed first). The status of all inputs and outputs can thus be seen on the computer screen. To simplify troubleshooting even more, the Multiplex System can display error codes on the monitor, which may indicate the cause of a problem.

Because it integrates several control modules, the Multiplex System is a network with modules interacting with each other. These modules transmit data to one another using a communication protocol and a receiver/transmitter chip. To be received and interpreted by the appropriate module, the data should indicate where they come from, and their relevance and final destination. That is why each module has been assigned a node number (see *Module Locations* on page 27). The data that are transmitted may relate, for example, to the position of the tailgate or to the number of cycles the packer has performed.

Benefits of the Multiplex System

The Multiplex System installed on the truck has many benefits. Here are some of them:

- It replaces the old relay logic.
- It needs less electrical wiring. Only a few harnesses are needed to make this system work.
  - The system is less complicated to operate and maintain and the related costs are reduced.
- It makes troubleshooting easier and faster.
- The system is programmable to allow presetting functions that were not possible with the relay logic.
  - Adding new functions is easy;
  - Modifying truck logic can easily be done at Labrie Enviroquip Group or at the distributor's or customer's facility.
- All inputs and outputs are tied to a computerized module.
  - Remote diagnostic is possible;
  - All electrical inputs and outputs can be seen on a computer screen;
  - Reduced number of fuses.

NOTE: The Multiplex System does not change interlocks nor the theory of operation of the truck.

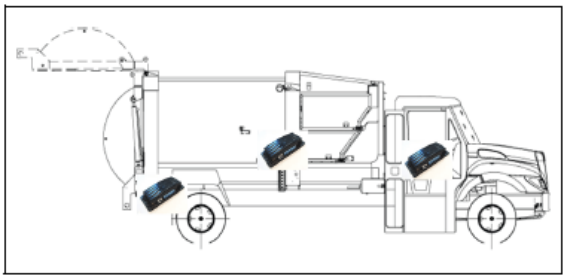
Location of the Control Modules

The Multiplex System is comprised of various control modules that make up the electronic network through which information is distributed. These modules can be found at different locations on the truck:

- in the cab console;
- at the rear end of the vehicle;
- on each side of the vehicle; and
- on the chassis under the body.

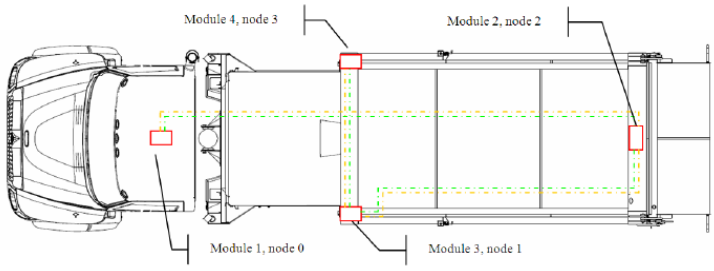
Figure 1-1 Control module

Figure 1-2 Possible module locations



To know exactly where the control modules are located on the truck, refer to the schematics provided with the configuration sheets.

Figure 1-3 Example of schematic indicating location of modules



To Contact Labrie Plus

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Parts and warranty:	During business hours, 8:00 AM to 6:00 PM Eastern Standard Time
Technical Support Service:	Available 24 hours

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Toll Free:	1-877-831-8250
Telephone:	1-418-831-8250
Service Fax:	1-418-831-1673
Parts Fax:	1-418-831-7561
Parts and warranty:	During business hours, 8:00 AM to 5:00 PM Eastern Standard Time
Technical Support Service:	Available 24 hours
Website:	www.labriegroup.com
E-mail:	sales@labriegroup.com

IMPORTANT: For technical support and parts ordering, the serial number of your vehicle is required. Therefore, Labrie Enviroquip Group recommends to keep record of the information found on the VIN plate, which is located in the cab.

2

Safety

Safety should always be given highest priority when doing maintenance on any type of equipment. Service technicians and maintenance personnel must take all precautions to avoid damages to the equipment and personal injuries. In this section, you will find general safety information/instructions that you should take into account when performing your tasks.

Conventions

Danger!

Indicates a hazardous situation which, if not avoided, ***will*** result in serious injury or death.

Warning!

Indicates a hazardous situation which, if not avoided, ***could*** result in serious injury or death.

Caution!

Indicates a hazardous situation which, if not avoided, may result in ***minor or moderate injury.***

Basic Safety Instructions

NOTE: It is important to point out that the safe use of the vehicle remains the user's responsibility. He must heed all safety instructions explained in this manual and on the decals affixed to the vehicle.

Danger!

Always be aware of the vehicle's surroundings to make sure that no pedestrians, passersby, bystanders, or other people or vehicles are in any way exposed to any danger caused by the use of the vehicle.

Danger!

Never enter the hopper area when the engine is running.
Only authorized personnel may do so following a lockout/tagout procedure. See the *Operator's Manual* for more information on this procedure.

Warning!

Do not operate the automated arm until you have been fully trained, and have read and understood both the *Operator's Manual* and the *Maintenance Manual* supplied with this unit.

Warning!

Make sure that all people and obstructions are sufficiently cleared from the automated arm before moving it. Failure to do so may result in unit and/or property damages, personal injury or death.

Warning!

Make sure there is enough clearance between raised container and overhead power lines. The automated arm or the container must not come in direct contact with the electrical cables for the power to go through the unit. If the unit comes in contact with a power line, stay in the cab and keep away from any metal parts.

Danger!

Never drive this vehicle if the lifting arm is not fully retracted to its home position. The unit would be simply too wide to be driven safely. Failure to fully retract the arm will result in unit and /or property damages, severe injury or even death. Warning red lights on dashboard flash when the arm is not completely retracted to its home position.

Warning!

Remove all control levers from the proportional valve. These levers should be used only for maintenance purposes.

Warning!

Units with two driving positions: Prior to changing driving position, stop vehicle, apply parking brake, push emergency button and stop engine. Properly adjust mirrors and set driving control switches including arm control joystick (if applicable) to the new driving position before restarting the engine. This will ensure that the automated arm is completely inoperative.

IMPORTANT: Read and thoroughly understand this manual before performing any adjustment. Thorough understanding of the *Operator's Manual* is also mandatory before operating the vehicle.

Responsibilities

Safety is the responsibility of both the employer and the employee. Each must play their part to create a work environment that is safe and secure.

Employer Responsibilities

It is the responsibility of the employer:

- To ensure that the vehicle is operated in accordance with all safety requirements and codes, including all applicable regulations, the Occupational Safety and Health Act (OSHA), and the American National Standards Institute (ANSI).
- To ensure that employees are qualified for operating the vehicle and its equipment, and that they all take safety measures before using them.
- To properly maintain all mobile equipment to meet all provincial/state and federal safety standards.
- To supply adequate instructions and training for the safe use of the vehicle and its equipment before assigning an employee to such vehicle/equipment.
- To keep the vehicle maintained and properly adjusted to meet the manufacturer's standards and recommendations. For help or for more information, please contact the manufacturer or any of its authorized representatives.
- To keep records of all vehicle breakdowns and malfunctions, as well as any inspection and maintenance.
- To ensure that all failures or malfunctions that may be affecting the safe use of the vehicle are repaired before the vehicle is put back into operation.
- To meet the appropriate lighting requirements for night shift work (if permitted).
- To regularly accompany the vehicle operator and take measures to ensure the smooth and safe operation of the vehicle.
- To make sure that the backup alarm works properly when the vehicle is in reverse.
- To take necessary measures to correct any damage or malfunction reported by any employee.
- To establish a "lockout/tagout" procedure and ensure its application any time inspection, repair or maintenance is performed on the vehicle, regardless of whether it takes place on the road or in the garage.

Employee Responsibilities

It is the responsibility of the employee:

- To enforce all safety measures to meet the requirements established by the employer.
- To operate the vehicle only after having received instructions and training.
- To make sure that nobody is near the vehicle before activating any of the controls, and to be prepared to stop at any indication of possible danger.
- To immediately report any damage or malfunction of the vehicle to the employer or supervisor.
- To wear a grounding bracelet when manipulating control modules. Static electricity can damage the inputs and outputs.

- To take all the necessary precautions to protect the battery box before performing any welding on the chassis or body. Welding tools can produce electrical spikes on the ground circuit, which can damage control modules.

IMPORTANT: Do not use damaged equipment.

Things to Do

- Make sure that the area is clear of people and obstructions.
- Inspect for overhead hazards (e.g. power lines) prior to raising tailgate.
- Obey all warning and operation stickers.

Things to Avoid

- Do not operate any vehicle while under the influence of alcohol, narcotics or other intoxicants.
- Do not leave the vehicle before it is brought to a complete stop and the work brake or parking brake is applied.
- Do not enter the hopper or main body unless the engine is shut off, the key is removed and there is an out-of-service tag on the steering wheel. Refer to the lockout/tagout procedure in the *Operator's Manual*.

General Precautions

- Read and make sure that you fully understand the *Operator's Manual* and all safety decals before operating this vehicle. Maintenance personnel must also read and understand the *Maintenance Manual* for this vehicle. In case of doubt, ask a supervisor for clarifications.
- Before activating the automated arm, operators shall make sure that people and obstructions are far away from the vehicle. Operators must be able to stop the arm at all times.
- Do not operate this vehicle if there are any signs of damage or incomplete repairs.
- Report any doubts that you might have and any safety service requirements regarding this vehicle to a supervisor.
- *Never* drive this vehicle with the tailgate unlocked.
- Before opening and closing the tailgate, make sure no one is behind the vehicle.
- Do not enter the hopper compartment or try to repair anything behind the packer when it is moving or when the hydraulic pump is still running. Personnel authorized to enter the hopper *must* first lock out and tag out the vehicle, as required by the employer. For more information, refer to the lockout/tagout procedure in the *Operator's Manual*.
- *Never* stand near or underneath a raised arm or grabber, since no arm cylinder is equipped with a holding valve.
- *Never, under any circumstances* (maintenance or otherwise), stand underneath a *loaded* body.

3

Controls and Indicators

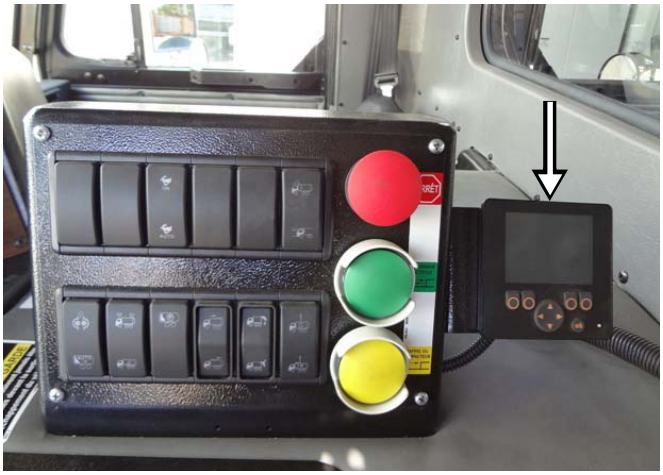
The MINIMAX™ has a series of controls and indicators that allow easier operation of the different functions that come with the vehicle. These controls and indicators are mainly located on the in-cab control panel and on the dashboard.

Labrie's Multiplex System

Labrie has equipped your MINIMAX™ unit with a CAN bus-based multiplexed system, which integrates a monitor, a control panel, a joystick, and a set of electronic controllers. This whole system has been designed to help you operate your unit in an efficient and easy way. Labrie's multiplexed system is reliable and safe and it requires less wiring harnesses to operate. It can also monitor various function status of the body and display warning and caution messages.

Through its monitor (see Figure 3-1), Labrie's multiplexed system informs you of any malfunctions that may occur during the operation of the truck. Various caution and warning messages can be displayed on the monitor, depending on the seriousness of the situation. Yellow-highlighted messages indicate that caution should be used while red-highlighted messages indicate a warning situation that must be dealt with quickly.

Figure 3-1 Monitor



Each time the operator turns the ignition key on, a complete bit test of the multiplex system is conducted. This test takes about 5 seconds to complete.

NOTE: A flashing green light on the monitor indicates that the power is on. This light should be blinking steadily at 2 Hz during normal operation. If it blinks at a faster rate, it is a sign of a problem with the monitor. A flashing red light on the monitor is also a sign of a problem. Call Labrie*Plus* for support.

The logo of Labrie Enviroquip Group appears momentarily on the monitor screen at the start of the system (see Figure 3-2).

Figure 3-2 Labrie logo on the monitor display

NOTE: If the Welcome Screen with the Labrie logo stays on continuously, there may be a communication problem between the monitor and the master control module. Report this problem to the maintenance personnel.

NOTE: The monitor screen works even if the engine is not started. All it needs is electrical power. However, if you start the engine, the monitor will reboot to reflect the changes caused by the starting of the truck.

Main Page

The next page that comes up after the Welcome Screen is the Main Page (see Figure 3-3). Here you will find a link that will give you access to the Main Menu (see *Main Menu* on page 17). Any warning or error messages that may occur while the truck is being operated are also displayed on this page. The following optional indicators, when provided, are also found on the Main Page : Cart Counter, Time and Date Indicator and Hydraulic Oil Temperature Indicator.

Cart Counter (optional)

This indicator tells you how many carts have been emptied so far. If your vehicle is equipped with two arms, the number of carts emptied is shown for each of these arms (right and left counters).

Figure 3-3 Main page

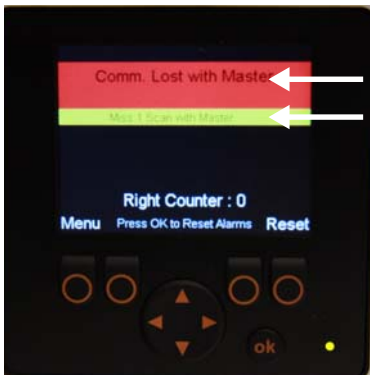
Press the far right button to reset the counter display to zero.

Time and Date Indicator (optional)
A time and date indicator may be found on the upper left-hand side corner of the screen. The availability of this indicator is based on the chassis on which the body is mounted. If the chassis provides real-time clock information through J1939 bus, time and date will appear on the screen. To set the Time and Date indicator, go to the Main Menu and choose Time Adjust.

Hydraulic Oil Temperature Indicator (optional)
This optional indicator, when provided, shows you the current hydraulic oil temperature. This indicator is found on the upper right-hand side corner of the screen.

Warning and Caution Messages
On the monitor screen, yellow-highlighted messages indicate that caution should be used and red-highlighted messages indicate a warning situation that must be dealt with quickly.

Figure 3-4 Warning and caution messages on monitor



See Table 1 for a list of warning and caution messages. Please note that this list is not exhaustive.

Table 1 Warning messages

Warning and Caution Messages	Solution
Arm Up:Crusher Not Raised	Raise Crusher Panel
Arm:Auxiliary Deadman ON	Release Auxiliary Deadman
Arm:External Control Selected	Deactivate External Control
Arm:Hopper Door Not Close	Close Hopper Door
Arm:Pump Not Started	Engage Pump
Arm:Tailgate Unlocked	Lock Tailgate
Buzzer:Arm Not Stow	Retract Arm to Stowed Position
Buzzer:TailGate Unlocked	Lock Tailgate
Crusher:Arm Too High	Lower Arm
Crusher:External Control	Deactivate External Control
Crusher:Hopper Door Not Closed	Close Hopper Door
Crusher:Packer Not Retracted	Retract Packer
Crusher:Pump Not Started	Engage Pump
ESTOP: Right Emergency Stop	Pull Out Right EStop Button
ESTOP:Aux Cab EStop	Pull Out Aux Cab EStop Button
ESTOP:Cab Emergency Stop	Pull Out Cab EStop Button
ESTOP:Left Emergency Stop	Pull Out Left EStop Button
ESTOP:Left Panic Bar	Release Left Panic Bar
ESTOP:Right Panic Bar	Release Right Panic Bar
FullEject:Cab EStop	Pull Out Cab EStop Button
FullEject:Ext. Control Selected	Deactivate Ext. Control
FullEject:Packer Not Retracted	Retract Packer
FullEject:Pump Not Started	Engage Pump
Gripper Open:Arm Too High	Lower Arm
High Hydraulic Oil Temp.	Turn Off Engine and Refer to your Maintenance Personnel
Low Hydraulic Oil	Add Hydraulic Oil

Table 1 Warning messages (cont'd)

Warning and Caution Messages	Solution
Packer Extend:Air Weigh Signal	Unload Body
Packer:Already Extended	Refer to Maintenance Personnel or Labrie*Plus*
Packer:Already Retracted	Refer to Maintenance Personnel or Labrie*Plus*
Packer:External Control	Deactivate External Control
Packer:Pump Not Started	Engage Pump
Packer:Tailgate Not Fully Open	Open Tailgate Completely
Pump Not Started: Aux Cab EStop	Pull Out Aux Cab EStop Button
Pump Not Started:Cab EStop	Pull Out Cab EStop Button
Pump Not Started:Left Estop	Pull Out Left EStop Button
Pump Not Started:Left Panic Bar	Release Left Panic Bar
Pump Not Started:Right Estop	Pull Out Right EStop Button
Pump Not Started:Right Panic Bar	Release Right Panic Bar
Pump Not Started:RPM Too High	Lower Engine Speed Below 900 RPM
Pump:Aux. AutoDump Switch ON	Release Aux. AutoDump Switch prior to Engaging Pump
Pump:Aux. CloseGripper Switch ON	Release Aux. CloseGripper Switch prior to Engaging Pump
Pump:Aux. Deadman Switch ON	Release Aux. Deadman Switch prior to Engaging Pump
Pump:Aux. OpenGripper Switch ON	Release Aux. OpenGripper Switch prior to Engaging Pump
Pump:CrusherDown Switch ON	Release CrusherDown Switch prior to Engaging Pump
Pump:CrusherUp Switch ON	Release CrusherUp Switch prior to Engaging Pump
Pump:J1 AutoDump Switch ON	Release J1 AutoDump Switch prior to Engaging Pump
Pump:J1 CloseGripper Switch ON	Release J1 CloseGripper Switch prior to Engaging Pump

Table 1 Warning messages (cont'd)

Warning and Caution Messages	Solution
Pump:J1 Deadman Switch ON	Release J1 Deadman Switch prior to Engaging Pump
Pump:J1 OpenGripper Switch ON	Release J1 OpenGripper Switch prior to Engaging Pump
Pump:J2 AutoDump Switch ON	Release J2 AutoDump Switch prior to Engaging Pump
Pump:J2 CloseGripper Switch ON	Release J2 CloseGripper Switch prior to Engaging Pump
Pump:J2 Deadman Switch ON	Release J2 Deadman Switch prior to Engaging Pump
Pump:J2 OpenGripper Switch ON	Release J2 OpenGripper Switch prior to Engaging Pump
Pump:Left EStop	Pull Out Left EStop Button
Pump:Left Panic Bar	Release Left Panic Bar
Pump:Packer Extend Switch ON	Release Packer Extend Switch prior to Engaging Pump
Pump:Packer Retract Switch ON	Release Packer Retract Switch prior to Engaging Pump
Pump:PTO Not OK	Refer to Maintenance Personnel or Labrie*Plus*
Pump:Right EStop	Pull Out Right EStop Button
Pump:Right Panic Bar	Release Right Panic Bar prior to Engaging Pump
Pump:RPM Too High	Lower Engine Speed Below 900 RPM
Pump:TailgateDown Switch ON	Release TailgateDown Switch prior to Engaging Pump
Pump:TailgateUp Switch ON	Release TailgateUp Switch prior to Engaging Pump
Pump:Trans. Not OK	Refer to Maintenance Personnel or Labrie*Plus*
Tailgate Up:Truck Moving	Bring Truck to a Standstill
Tailgate:External Control Selected	Deactivate External Control

Table 1 **Warning messages (cont'd)**

Warning and Caution Messages	Solution
Tailgate:Packer Not Retracted	Retract Packer
Tailgate:Pump Not Started	Engage Pump
Wrong Driver Position	Change Driver Position Switch to Correct Position

Table 2 **Error messages**

Error Messages	Solution
Button Pack 12 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Button Pack 13 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Button Pack 14 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Button Pack 15 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
CAN Error Level 1	Refer to Labrie*Plus*
CAN Error Level 2	Refer to Labrie*Plus*
CAN Error Level 3	Refer to Labrie*Plus*
Comm. Lost with Master	Refer to Maintenance Personnel or Labrie*Plus*
Module 11 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Module 11 not Connected	Refer to Maintenance Personnel or Labrie*Plus*
Module 20 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Module 20 not Connected	Refer to Maintenance Personnel or Labrie*Plus*
Module 30 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*

Table 2 Error messages (cont'd)

Error Messages	Solution
Module 30 not Connected	Refer to Maintenance Personnel or Labrie*Plus*
Module 50 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Module 50 not Connected	Refer to Maintenance Personnel or Labrie*Plus*
Module 60 is disconnected	Refer to Maintenance Personnel or Labrie*Plus*
Module 60 not Connected	Refer to Maintenance Personnel or Labrie*Plus*

Should the system issue a warning or caution message, it will appear on the Main Page.

For example, if the following caution message "Pump Not Started: Main Air Pressure" is issued by the system, it will appear on the Main Page of the monitor. An action that could be taken by the operator, when faced with such a situation, would be to wait until the required main air pressure level is reached.

For a specific problem or condition that requires special attention, the multiplexed system can alert the operator to a possible cause, which appears in bold and large print on the monitor screen (active cause). The operator should check if the problem stems from the highlighted or active cause. One possible cause is highlighted at a time. What is shown in light and small print in the lower part of the screen are causes that have already been dealt with (non active causes) [see Figure 3-5].

Figure 3-5 Example of a possible cause

NOTE: If the system detects a problem, a beep will sound and a message will appear on the monitor screen.

NOTE: To go back to the Main Page or Main Menu, press "Esc" as needed until the desired page is displayed.

Main Menu

To access the Main Menu, press the far left button when the Main Page is displayed.

When the Main Menu is displayed, you can have access to the following sections:

- Multicycle
- I/O Status
- Password (optional)
- Program Version
- Pump Usage (optional)
- Time Adjust (available according to chassis)

Displayed in the lower center of the screen is an indicator that monitors traffic on the network. This indicator is called Network Load, and it shows values that reflect such traffic.

NOTE: The higher the network load value is, the heavier the traffic is on the network.

To exit this page and return to the Main Page, press "Esc". To choose a section from the Main Menu, highlight the desired section using the up/down arrows and press the "OK" button.

Multicycle

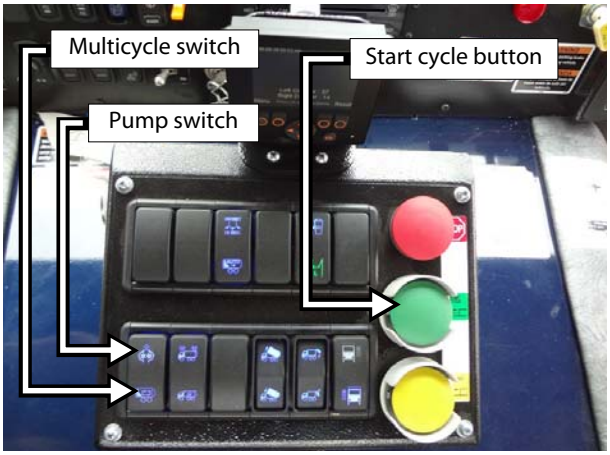
The monitor used in Labrie's multiplexed system is user-friendly. Say you want to change the multicycle settings of the packer. All you have to do is select MAIN MENU by pressing the corresponding button at the bottom left corner of the monitor. From the displayed menu, choose the option SELECT THE NUMBER OF CYCLES. If need be, use the arrow to choose that option and press "OK". The multicycle settings can be changed from two to eight cycles. Choose the desired number of cycles and press "OK". It could not be easier!

Figure 3-6 Multicycle page

NOTE: The packer multicycle function has been preset at the factory to carry out three cycles.

When the MULTICYCLE switch on the control panel is on and the packer is activated, the packer will move according to the default number of cycles (that is 3) or to the number of cycles you chose (up to 8 cycles).

Figure 3-7 Control panel



To test the new settings of the packer:

1. On the control panel press the MULTICYCLE switch and the green START CYCLE button.
2. Once the packer has completed its cycles and come to a stop, switch off the hydraulic pump and turn OFF the engine.

The number of cycles needs to be adjusted depending on the type of collection route used by the vehicle. For example, in a residential area, if the houses are numerous and close one to another, it may be required to increase the number of cycles. This will allow the hopper to be clear for the next house pickup.

Each time the packer completes a full cycle, the proximity switch located on the right-hand side, behind the packer, sends a signal to the electronic controller. The controller then counts the amount of cycles that the packer does, and will stop the packer after the preset amount of cycles has been reached.

I/O Status

In this section, you will find helpful information to troubleshoot body-related problems that you may face during your day-to-day tasks. These problems can be of any nature, from hydraulic to mechanical, electrical or pneumatic.

Select the control module corresponding to the part of the truck that needs to be checked.

For example, if you want to check all functions that are found in the cab, choose module #10. For all functions that pertain to the chassis, choose module #20, etc.

To choose a particular module, use the up/down arrows to select it and press “OK”.

NOTE: Pressing “OK” can be done two ways: either press the far right button or the “OK” button.

Press “Esc” to return to the preceding page.

Figure 3-8 Module I/O Status page

Input Status

The Input Status page is accessible from the Module I/O Status page. After selecting the desired module and pressing "OK", the Input Status page of the selected module is displayed (see Figure 3-9).

Figure 3-9 Input Status page

The Input Status page contains a set of rectangles. Each of these rectangles represents input elements, which in turn correspond to a particular function of the truck. For example, if you select rectangle I00, a short description appears in the lower part of the screen, which indicates that this rectangle relates to the input element coming from the service brake pressure switch.

NOTE: Each rectangle is numbered and relates to a specific function of the truck. However, for a given number, the related function may vary from truck to truck.

Table 3 Colored rectangles

Rectangles (inputs)	Function Status
Blue	Inactive
Green	Active

Press “Esc” to return to the preceding page.

Press the “Output” button to display the Output Status page.

Output Status

The Output Status page (see Figure 3-10) is accessible from the Input Status page.

Figure 3-10 Output Status page

The rectangles on this page are used to check the status of different outputs.

NOTE: Each rectangle is numbered and relates to a specific function of the truck. However, for a given number, the related function may vary from truck to truck.

Table 4 Colored rectangles

Rectangles (outputs)	Function Status
Blue	Inactive
Green	Active
Red	Closed short-circuit
Yellow	Open circuit

Press “Esc” to return to the preceding page.

Press the “Force” button to display the Force page.

NOTE: To go back to the Main Page or Main Menu, press “Esc” as needed until the desired page is displayed.

Force

The Force page is accessible from the Output Status page. Just press the corresponding button to access the Force page.

But before the Force page is displayed, a warning message appears on the monitor screen (see Figure 3-11).

Figure 3-11 Warning message

This message stays on for 15 seconds. Then an "OK" prompt appears on the lower right-end corner of the screen.

IMPORTANT: It is very important to read this message entirely before accessing the next page.

Figure 3-12 Warning message w/ "OK" prompt

Press "OK" to go to the Force page or "Esc" to return to the preceding page.

After pressing "OK", the Force page appears on the screen.

Figure 3-13 Force page (input)

As no input function can be forced to be active or inactive, the operator must press the “Output” button to go to the following page (see Figure 3-14).

Figure 3-14 Force page (output)

The Force page allows the operator to force a function to be overridden, that is, to make an inactive function active and an active function inactive.

This page contains a set of rectangles. Each of these rectangles is numbered and corresponds to a specific function of the truck.

Colors are used to indicate whether the corresponding function is active or not:

- a blue rectangle means the corresponding function is inactive
- a green rectangle means the corresponding function is active

Also:

- a red rectangle means there is a closed short-circuit
- a yellow rectangle means there is an open circuit

A white-bordered rectangle means that this rectangle is selected. Use the directional arrows to select a specific rectangle or function. When a rectangle is selected, a short description of the corresponding function appears at the bottom of the screen.

After selecting a rectangle:

- press “ON” to activate the corresponding function (rectangle turns from blue to green)
- press “OFF” to deactivate the corresponding function (rectangle turns from green to blue)
- press “RESET” to have the software control the status of the corresponding function

NOTE: To cancel changes made in this page and restore the default values, all you have to do is cut power to the multiplexed system by turning the ignition key off.

NOTE: To go from a module to another (e.g. from module 10 to 20), the operator has to go back to the Module I/O Status page (see Figure 3-8) and select module 20.

Press “Esc” to return to the preceding page.

Joystick

The Joystick page is accessible from the Module I/O Status page (see Figure 3-8). From that page select "Joystick" using up/down arrows and press "OK". The Joystick page opens (see Figure 3-15).

Figure 3-15 Joystick page

The Joystick page allows the operator to check if all functions of the joystick are working correctly. If one joystick is installed on your vehicle, it will be represented on the monitor screen by joystick 127. However, if two joysticks are installed on your vehicle, any of the two joystick numbers (127 and 72) can represent either joystick on the screen.

If you press a joystick button, the corresponding button on the monitor will turn green. If nothing happens, there may be a communication problem between the joystick and the master control module. Refer to the maintenance personnel or Labrie*Plus*.

Also, if you move the joystick backwards, forwards or sideways, you should see the values under the illustration changing. If no change occurs when moving the joystick, a communication problem between the joystick and the master control module may be the cause. Refer to the maintenance personnel or Labrie*Plus*.

Press "Esc" to return to the preceding page.

J1939

The J1939 page is useful when you need some specific information (e.g. current gear, road speed, brake status).

Figure 3-16 J1939 page

Your vehicle is equipped with 2 different CAN-based communication buses:

- the **J1939 bus**, which is used for the chassis equipment; and
- the **CANopen bus**, which is used for the body.

These 2 communication buses are completely independent of one another, except for some specific data that are transferred from the chassis J1939 bus to Labrie's multiplexed system, where they are used. These specific data are the following:

- selected gear
- current gear
- road speed
- engine RPM
- brake
- parking brake

Press "Esc" to return to the preceding page.

Managing Passwords (optional)

With this optional feature, data protection passwords can be added to the IFM Multiplexed System display. This feature can also be used to change or remove already saved passwords.

Data that can be protected by passwords relate to the following features: Output Force, Multicycle and J1939 baudrate.

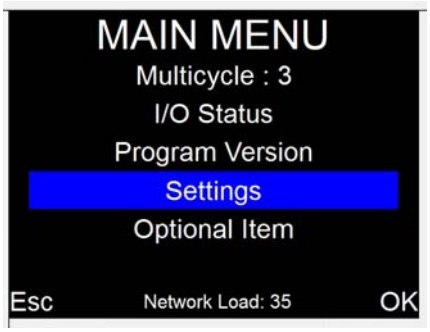
NOTE: Only adjustable data in Output Force, Multicycle and J1939 Baudrate can be protected by passwords.

The **Password Menu** is available through the **Settings Menu**. An associated menu, **Locked Features**, is also available, allowing you to choose among the features that can be "locked".

After creating a new password, write it down in a safe place for reference. You will be required to provide it to gain access to a locked adjustable feature when logging on anew (after the sign out and back on).

To create, change or remove a password, do the following:

1. Go to the Main Menu.
2. Select "Settings".



3. Select "Password".

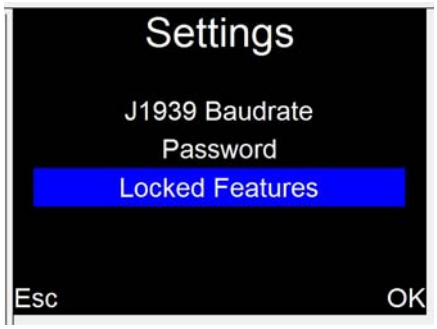
4. If no password has been created, enter a password using the arrow keys.
   Press ESC to quit or OK to set password.

5. If a password already exists, enter it using the arrow keys.
   Press ESC to quit or OK to erase the password.

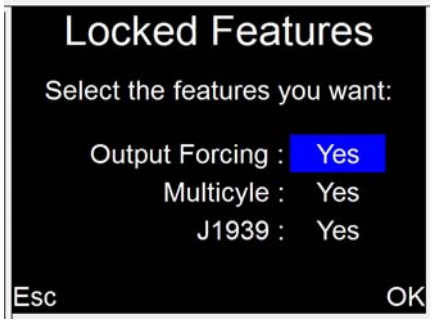
6. Enter a new password using the arrow keys.
   Press ESC to quit or OK to create a new password.

NOTE: Entering a new password with only zeros as the number, such as "000000", will result in deactivating the password function.

7. Go back to the Settings Menu by pressing ESC.
8. In the Settings Menu, select Locked Features.



9. Select the feature(s) that you want to lock using the password created or saved.



NOTE: If you have forgotten your password, please contact the Labrie*Plus* Service Department.

Module Software Version
On the Module Software Version page, you will find the software version currently used by each of the modules installed on the truck and by the master control module.

Figure 3-17 Software Version page

With the information on this page it is possible for the operator or maintenance personnel to determine the electrical schematic number pertaining to a specific vehicle. Looking at Figure 3-17 above you will notice the following digit string 8-6-5-1 between, for example, 10 and R1. As all Labrie electrical schematics begin with ZS00, you simply add those digits to that base number to get the corresponding electrical schematic number. So, in this case, the electrical schematic number is ZS008651.

Press “Esc” to return to the preceding page.

Pump Usage
This section contains an optional hour meter that tracks pump usage for maintenance purposes.

Press “Esc” to return to the preceding page.

Time Adjust
This section allows you to set the Time and Date indicator.

Press “Esc” to return to the preceding page.

NOTE: To go back to the Main Page or Main Menu, press “Esc” as needed until the desired page is displayed.

Module Locations

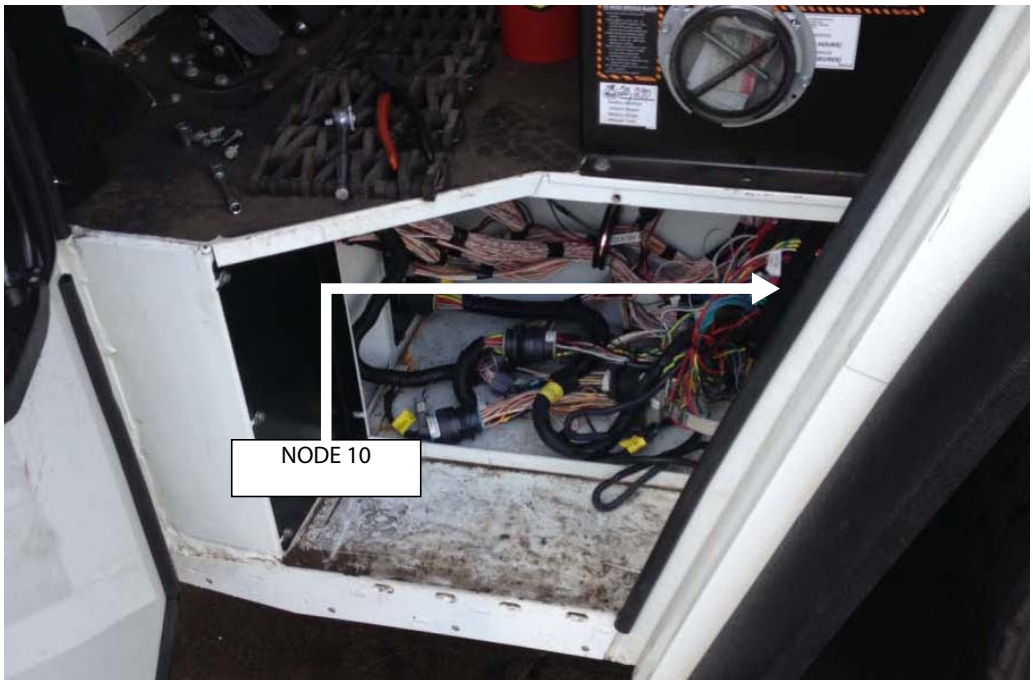
The multiplex control system used on all Labrie & Wittke models have multiple control modules located throughout the unit. At times, it may be necessary to access these to perform maintenance or diagnostic procedures.

On the MINIMAX™, the control modules are located at various points on the chassis and body. Please refer to the following pages for exact module locations.

Node 10 Module Location

The module will always be located in cab. On the Mack LEU chassis, the module will typically be located under the left (street) side foot well. On the Autocar & Peterbilt chassis, a black console box is mounted on the doghouse by the back window. Please note that the Autocar & Peterbilt also use IFM modules for the chassis-based controls; ensure that the module in question is connected to the Labrie electrical system.

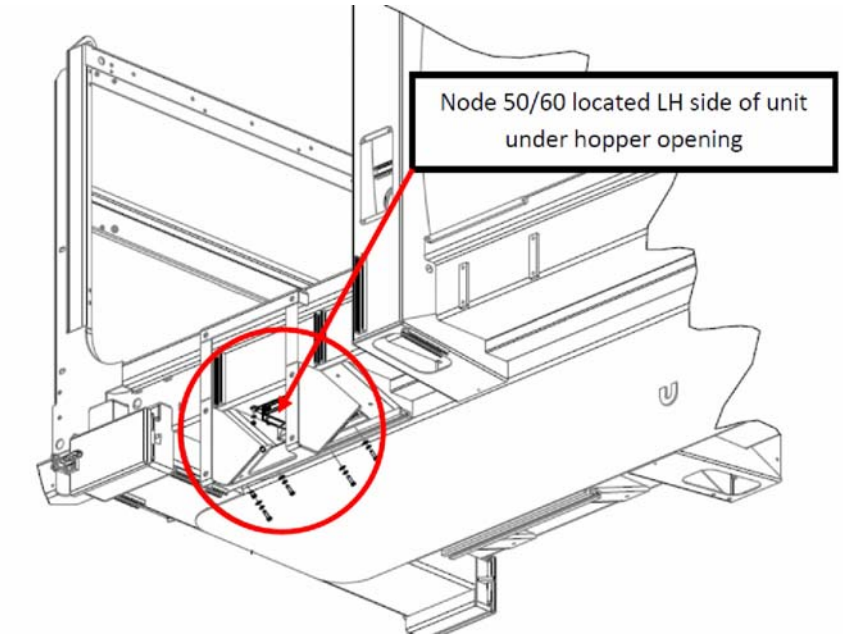
Figure 3-18 Module location on a Mack LEU chassis



Node 50/60 Module Location

Module 50/60 is located under the hopper outer structure, on the LH side of the unit.

Figure 3-19 Node 50/60 module location



Connections and Module Condition

An item of importance on the multiplex control system is good, reliable connections at the multiplex modules. The following pages provide guidance on properly checking the connections and module condition.

When diagnosing multiplex module connectivity issues (fault "Node XX Disconnected" on the display) on Labrie MINIMAX™, basic checks must be made.

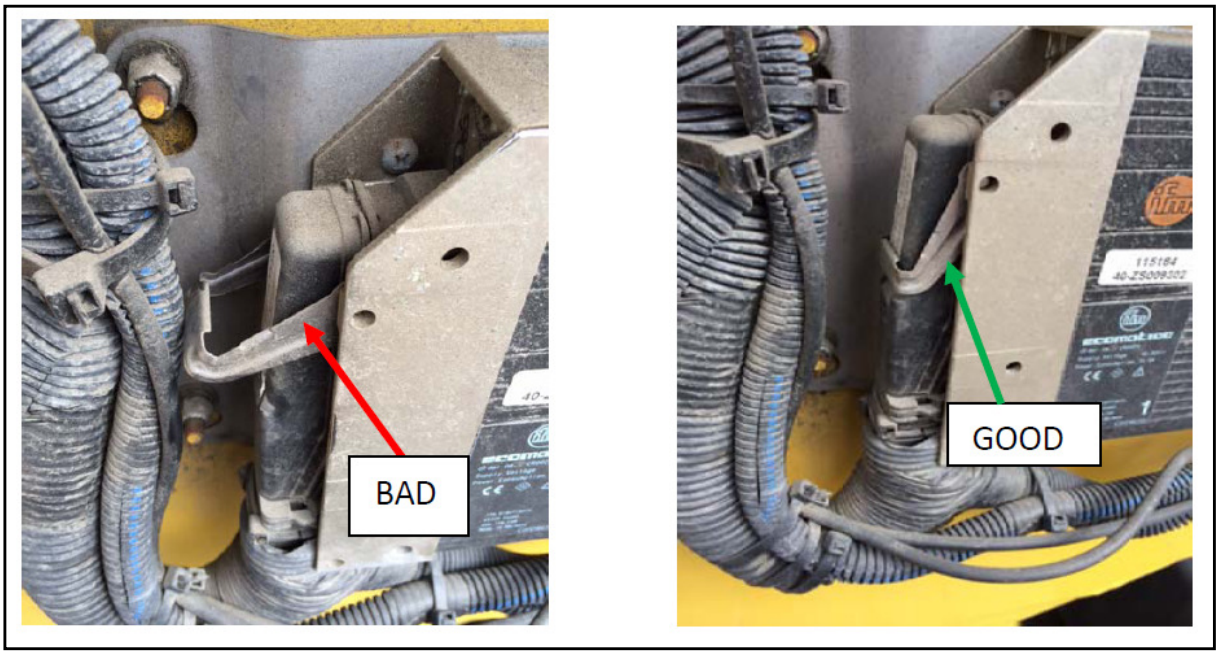
Verify that the module is correctly receiving/sending inputs and outputs; locate the LED light near the wire connector; a module operating correctly will have a green, blinking light (commonly referred to as a "heartbeat") [see Figure 3-20]. If solid green light exists, not blinking, the module is not running and will need to be restarted. If there is a fast-paced green blinking light, then the module has lost its firmware and will need to be reprogrammed. If there is no light present, then the module is not powering up/communicating, and further diagnostics on the wire routing will be required.

Figure 3-20 LED light on module

Once module light status condition has been verified, the connector condition should be checked:

1. Check for proper connection to module

Figure 3-21 Connection status

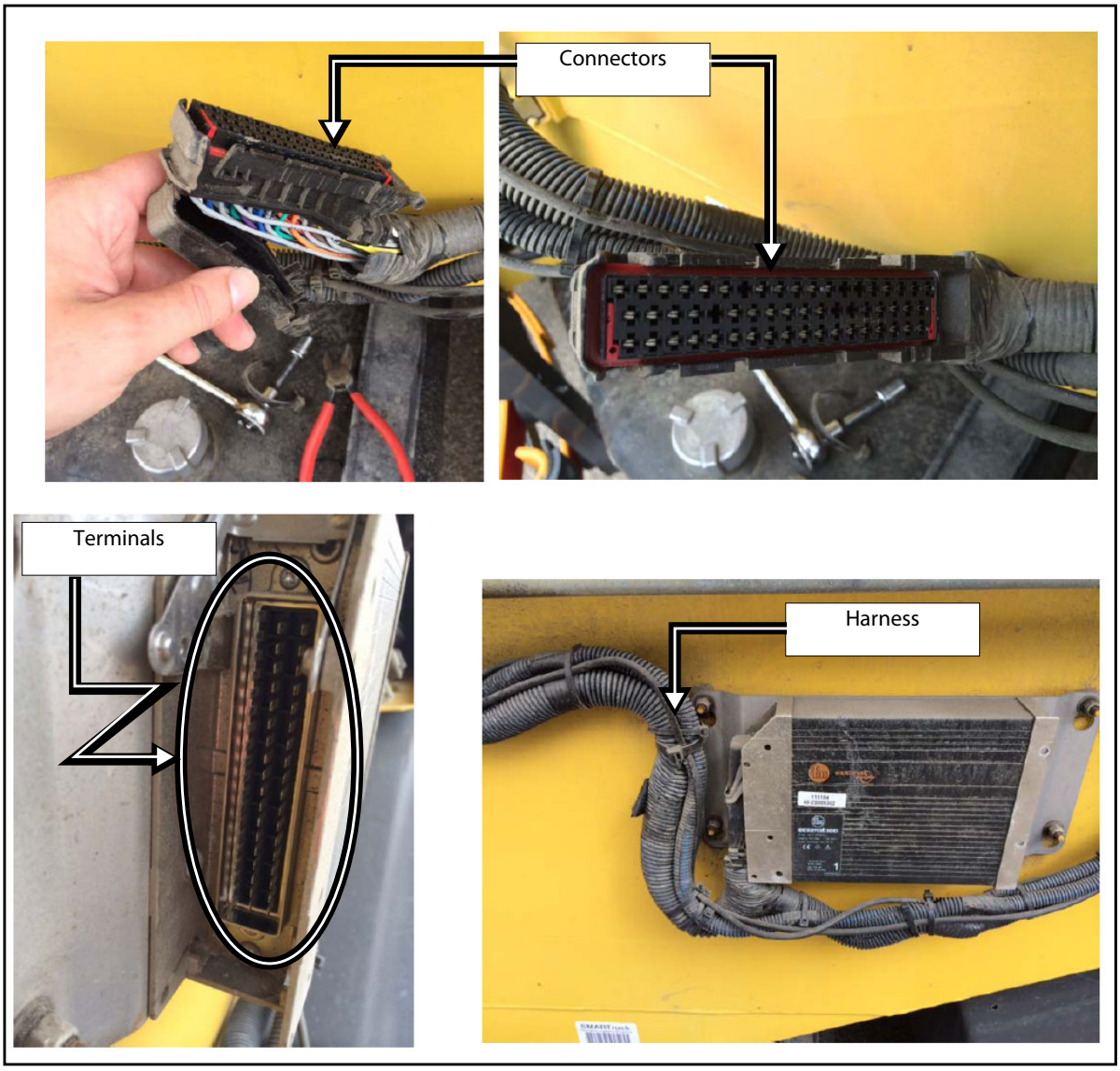


2. Check for any moisture or corrosion in the connector or on the module terminals.

It is highly recommended that dielectric grease be applied to connector.

3. Check the condition of the harness and ensure that it is not secured too tight with tie-wraps, which may pull the wires back within the connector.

Figure 3-22 Connectors, terminals and harness



4. Check all ignition (power) and grounds to the module and also check the CAN_H & CAN_L side to the module.

   4 a. Verify all power supplies (IGN) to the module, if there is a suspicion that power is intermittent check the ignition relay, which is located next to the battery box.

   4 b. Verify that grounds are good to the module. Need to isolate and check the resistance on the individual grounds.

   4 c. Check the CAN_H & CAN_L wires and verify that there is 60 ohms resistance. If there is not, this will cause connectivity issues to the specific module.

Cab Console

The cab console is located in the middle of the cab for easy access during collection and operation.

This console has different control buttons and switches on it. Because the truck is equipped with a complete multiplex system, a **multiplex switch actuator module** is found on the console. Also, a multiplex monitor display, a set of packer operating buttons and a tailgate lighting system are provided on the console.

Figure 3-23 Cab console

The following are switches specifically located on the multiplex switch actuator module (Figure 3-24).

Figure 3-24 Multiplex switch actuator module

NOTE: Switches and buttons found on the cab console may vary according to the options installed on the truck.

Pump Switch

The pump switch, which is also called PTO switch, engages and disengages the hydraulic pump, all the body functions (packer, tailgate, crusher panel) and the joystick that controls the automated arm.

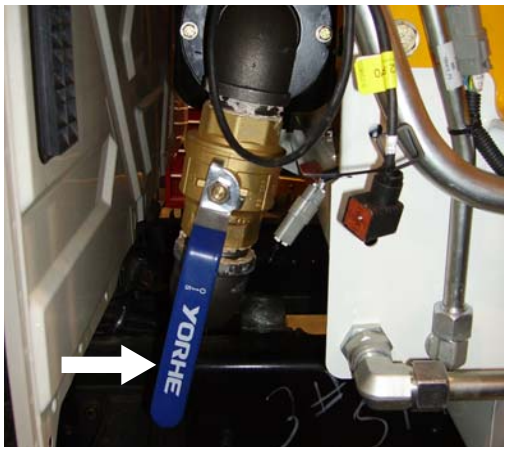
- Press this switch to engage the hydraulic pump (switch turns from blue to green).

- Press this switch again to disengage the hydraulic pump (switch turns from green to blue).

Figure 3-25 Pump switch

NOTE: Do not close the main valve (ball valve) on the suction line even if the PTO switch is turned off. The pump is always turning whatever the engine RPM. It is very important not to let the pump run dry or without oil. Otherwise, the pump will be seriously damaged or even destroyed.

Figure 3-26 Main valve on suction line



IMPORTANT: In case of a leak in the hydraulic system, call maintenance facility and refer to the Maintenance Manual.

Tailgate Up Switch

This control switch is used to raise the tailgate. Press and keep down this switch to raise the tailgate to the desired height.

Before using this switch, make sure that the truck is parked on safe level ground.

Figure 3-27 Tailgate Up switch

IMPORTANT: Remove tailgate-locking pins before using this control switch.

Warning! Do not drive the vehicle when the tailgate is not fully closed.

When the tailgate is unlocked, both Tailgate Up and Tailgate Down switches flash red and a buzzer sounds.

Tailgate Down Switch

This control switch is used to lower the tailgate. Press and keep down this switch to completely close the tailgate or to lower it until it rests on the tailgate safety prop.

Figure 3-28 Tailgate Down switch

IMPORTANT: When the tailgate is completely closed, put the tailgate-locking pins back to their place.

When the tailgate is unlocked, both Tailgate Up and Tailgate Down switches flash red and a buzzer sounds.

Danger!

Always use safety prop while performing maintenance under a raised tailgate. Failure to do so may result in severe injury or even death.

Hydraulic Alarm Switch (optional)

When this switch is engaged (green-lighted), the system continually monitors hydraulic oil temperature and level. If the oil temperature gets too high or the level of hydraulic oil gets too low, the hydraulic alarm switch will turn red, meaning that a correction must be applied quickly.

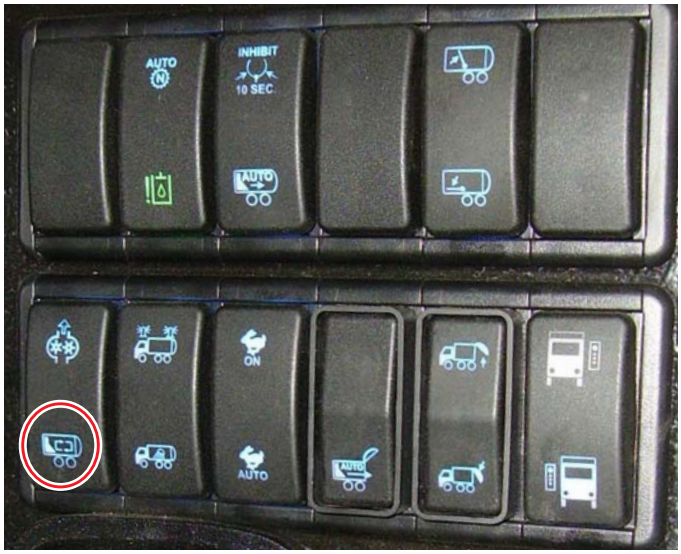
Figure 3-29 Hydraulic alarm switch

NOTE: This switch should always be engaged.

Packer Multicycle Control Switch

This switch allows the packer to run a preset number of cycles (from 2 to 8, 3 being the default setting) by pressing the green push-button once. Cycles can be stopped anytime by pressing the red emergency stop button or by turning off the multicycle control switch. When turning off this switch, the packer completes the ongoing cycle in order to get back to the fully retracted position, and then stops.

Figure 3-30 Multicycle control switch



Auto-Neutral Switch

The auto-neutral system is available on units equipped with an Allison electronic transmission. The auto-neutral allows the operator to shift from “Drive” to “Neutral” automatically without touching the shifter lever. For more information on this, refer to the chassis manufacturer’s manual.

Figure 3-31 Auto-neutral switch

10-Second Inhibit Switch

This switch, also known as grabber auto-close override, allows the operator to open the grabber when it is in the hopper in order to drop the grabbed object directly into it. It also allows the operator to pick up elevated carts.

Figure 3-32 10-second inhibit switch

When pressing this switch, the grabber opens for 10 seconds, then closes automatically.

To enable this feature, press the inhibit switch. This switch will then turn from blue to green.

A blue-lighted switch means that the corresponding feature is disabled.

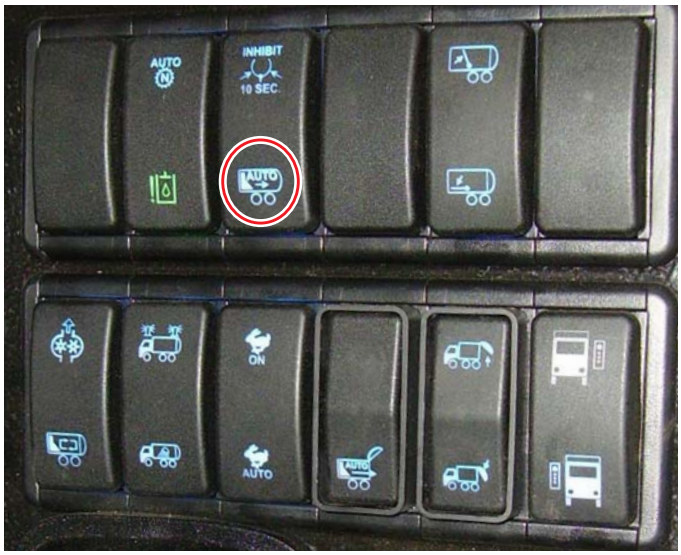
Caution!

The inhibit feature overrides all safety features. The operator must be aware of all applicable safety instructions and all potential consequences related to its misuse. Major equipment damage and/or injury may occur.

Auto-Packing Switch

The auto-packing switch (see Figure 3-33) enables the packer to automatically start cycling 2 seconds after the grabber reaches the mid-height position on its way up. If the packer is cycling at the time the arm moves a container towards the hopper, the packer retracts immediately to its fully retracted position no matter where it was in the hopper. This is to prevent waste from being dumped onto the packer. The only exception is that the packer will not retract if, for 3 consecutive packer cycles, the fully extended limit switch is not reached.

Figure 3-33 Auto-packing switch



When the auto-packing feature is used simultaneously with the multicycle feature (see Page 16), the packer will run the preset number of cycles until the arm lifts a new container towards the hopper. The multicycle feature is then reset.

When a cycle has been interrupted and the packer has returned to its home position, cycling resumes 2 seconds after the grabber reaches the mid-height position on its way up.

A blue-lighted switch means that the corresponding feature is disabled.

A green-lighted switch means that the corresponding feature is enabled.

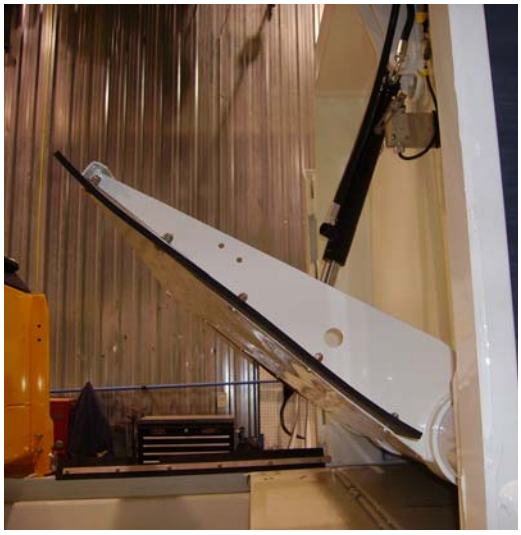
Crusher Panel Down Switch (optional)

Press and keep down this switch to lower the crusher panel. When pushed, this switch becomes green-lighted.

Figure 3-34 Crusher panel down switch

The crusher panel is an option that may be installed on a MINIMAX™ vehicle. If your unit is equipped with this option, we suggest you to use it only for bulky items. In many cases, unnecessary use will slow down the operation. Bulky items can be maintained in place with the crusher panel while the packer crushes them.

Figure 3-35 Crusher panel



The crusher panel can be lowered upon the refuse to prevent it from popping up in front of the packing ram, thus increasing the compaction effect during the load breaking sequence.

Crusher Panel Up Switch (optional)

Press and keep down this switch to raise the crusher panel. When pushed, this switch becomes green-lighted.

Figure 3-36 Crusher panel up switch

Strobe Light Switch

This switch activates and deactivates strobe lights and amber flashing lights.

Figure 3-37 Strobe light switch

- Press this switch once to turn on strobe lights and amber flashing lights (switch turns green).
- Press this switch again to turn off strobe lights and amber flashing lights (switch turns blue).

Figure 3-38 Strobe light and amber flashing lights

Work Light Switch

This switch activates and deactivates all work lights installed on the truck.

Figure 3-39 Work light switch

- Press this switch once to turn on all work lights (switch turns green).
- Press this switch again to turn off all work lights (switch turns blue).

Figure 3-40 Work lights

Speed-Up “On” Control Switch

In auto-neutral mode, this switch enables the engine to run at a predetermined RPM. This can be useful when operating the full-eject feature.

Figure 3-41 Speed-up “On” control switch

- Press this switch to activate this function (switch turns green).
- Press this switch again to deactivate this function (switch turns blue).

Speed-Up “Auto” Control Switch

In auto-neutral mode, this switch will allow the engine to run at a predetermined RPM when operating any function of the truck.

Figure 3-42 Speed-up "Auto" control switch

- Press this switch to activate this feature (switch turns green).
- Press this switch again to deactivate this feature (switch turns blue).

Packer Selector Switch

This switch is divided into two sections: the lower section controlling the right-hand side packer control station, and the upper section controlling the left-hand side packer control station (if installed).

In order to use the right-hand side packer control station, the operator must press the lower section of this switch.

Figure 3-43 Packer selector switch (lower section)

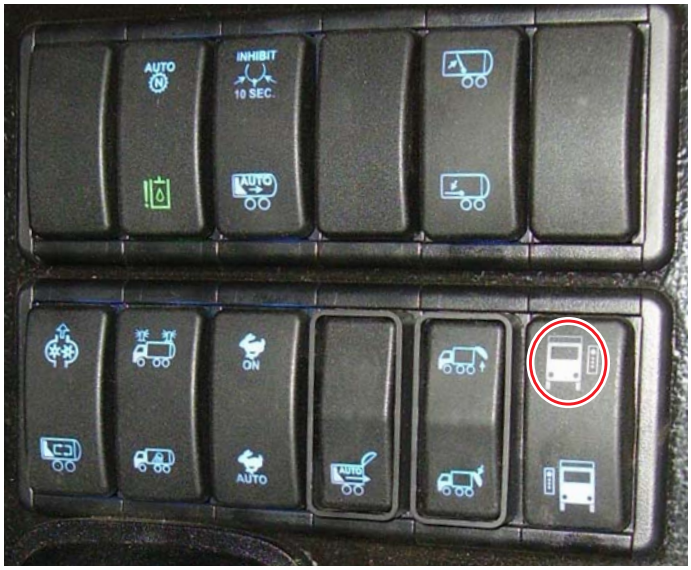
- Press the lower section of this switch in order to use the right-hand side packer control station. This section of the switch will turn green.
- Press the lower section of this switch again to deactivate this feature. This section of the switch will then turn blue.

NOTE: If this section of the switch is engaged (green-lighted), the in-cab packer control station and the left-hand side packer control station (if installed) are not operational.

NOTE: The in-cab joystick and packer control station are operational only when none of the sections of the packer selector switch is engaged.

In order to use the left-hand side packer control station (if installed), the operator must press the upper section of the packer selector switch.

Figure 3-44 Packer selector switch (upper section)



- Press the upper section of this switch in order to use the left-hand side packer control station (if installed). This section of the switch will turn green.

- Press the upper section of this switch again to deactivate this feature. This section of the switch will then turn blue.

NOTE: If no left-hand side packer control station is installed on the truck, this section of the switch is not operative.

NOTE: If this section of the switch is engaged (green-lighted), the in-cab packer control station and the right-hand side packer control station are not operational.

NOTE: The in-cab joystick and packer control station are operational only when none of the sections of the packer selector switch is engaged.

Auto-Eject Switch

During the unloading process at landfill, this switch is used to open the tailgate and eject the load.

Figure 3-45 Auto-eject switch

Press and keep down this switch in order to eject packed refuse out of the body at landfill. This switch must be kept down for the unloading process to continue. Releasing it will stop the process immediately no matter what function was active.

The first function to be active when pressing down this switch is the opening of the tailgate, followed by the ejection of the load. While the tailgate is open and until its complete closure, both Tailgate Up and Tailgate Down switches continually flash red and a buzzer sounds.

The following are the conditions that must be met for the unloading process to work properly:

- Both tailgate safety pins must be removed and placed in storage position.
- Pump must be engaged.

- All external packer control stations must be disengaged.

  The operator must be inside the cab.
- Packer must be fully retracted to its home position.

If anything prevents the unloading process from getting underway, then look at the multiplex monitor display, located on the cab console (Figure 3-46), for instructions or solutions.

NOTE: During the process of unloading packed refuse carried in the vehicle, the packer performs several short strokes before the complete and final stroke. This is done this way to prevent waste or refuse from piling up on the follower panels, which would ultimately fall behind the packer. The number of short strokes made by the packer during the unloading process is set at the factory.

Once the unloading process is complete, the operator must press the yellow push-button on the control station (see Figure 3-51) to retract the packer to its home position. Then, the operator must close the tailgate by pressing the Tailgate Down switch on the control panel (see Figure 3-28) and keeping it down until the tailgate is closed completely.

NOTE: The packer must first be retracted to its home position before closing the tailgate. A lockout feature prevents the tailgate from being lowered when the packer is not in its home position.

IMPORTANT: Both tailgate safety pins must be placed back in locking position once the tailgate is closed.

Monitor Display

Through its monitor display (Figure 3-46), Labrie's multiplex system informs you of the various functions being carried out or of any malfunctions. Various caution and warnings messages can be displayed on the monitor, depending on the seriousness of the situation. Messages in yellow blocks indicate that caution should be used; messages in red blocks indicate a warning situation that must be dealt with quickly.

Figure 3-46 Multiplex monitor display

Each time the operator turns the ignition key on, a complete bit test of the multiplex system is conducted. This test takes about 5 seconds to complete.

NOTE: A flashing yellow light on the monitor indicates that the display power is on.

The monitor display can also inform the operator of the number of carts dumped in the hopper during his complete run or part of it. This information is always available on the monitor display during waste collection process (see Figure 3-47).

Figure 3-47 Cart counter page

Light Bar Control Pad (optional)

The light bar control pad allows the operator to activate and deactivate the light bar mounted on the tailgate.

Figure 3-48 Light bar control pad (left), light bar (right)

In-Cab Packer Control Station

The MINIMAX™ has a single packer control station located on the cab console. This control station is made up of 3 control buttons.

Here is a brief description of these buttons:

Stop Push Button (red)

The Emergency Stop button will stop all hydraulic functions on the truck (tailgate, crusher panel, etc.). By pressing this button, the packer and the automated arm will stop where they are. The red button has to be manually pulled up to reactivate the hydraulic system.

Figure 3-49 Stop Push Button

Pack Push Button (green)

The packer start cycle button activates the packer for one complete cycle. A complete cycle takes about 12 seconds.

Figure 3-50 Pack Push Button

Retract Push Button (yellow)

The packer retract button will retract the packer to the beginning of its stroke. This control is useful when the body is full and the material prevents the packer from reaching the end of its stroke. Manual retraction of the packer is necessary to bring back the packer.

Figure 3-51 Retract Push Button

NOTE: The in-cab packer control station is operational when both multiplex packer selector switches are off (blue-lighted). See Figure 3-43 and Figure 3-44.

Joystick Controls

Arm Joystick

The joystick is used to control the Helping Hand™ arm installed on the MINIMAX™. It is located near the console at the center of the cab.

Figure 3-52 Joystick

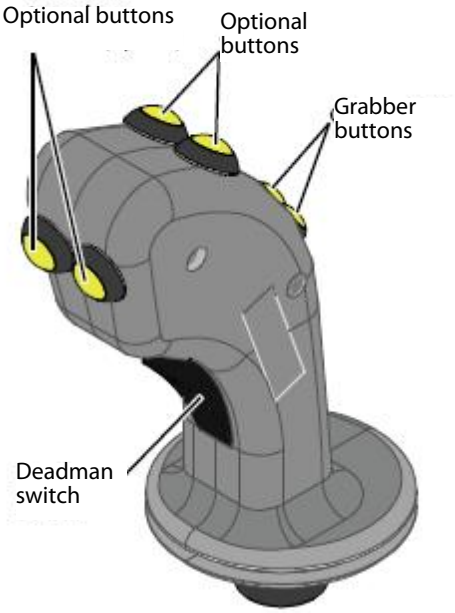
The controls on the joystick are the handle, the buttons on the front, top and backside of the handle, and the deadman switch (see Figure 3-53).

- The handle is used to control the horizontal and vertical movements of the arm's two main components.
- The backside buttons are used to control the opening and closing of the grabber: the right button is used to open the grabber, the left button to close it.
- The top and front buttons are optional or customized buttons.

The deadman switch is used as a safety device to ensure that every movement of the arm is absolutely wanted and controlled by the operator. That is, if the operator is not pressing the deadman switch while trying to move the arm with the joystick, no movement will occur. With such a safety feature, an accidental movement of the joystick will not be transmitted to the arm.

Joysticks operate at 45° and 90° angles. As a result, you can perform two functions at the same time; for example, you can move the arm and the grabber simultaneously.

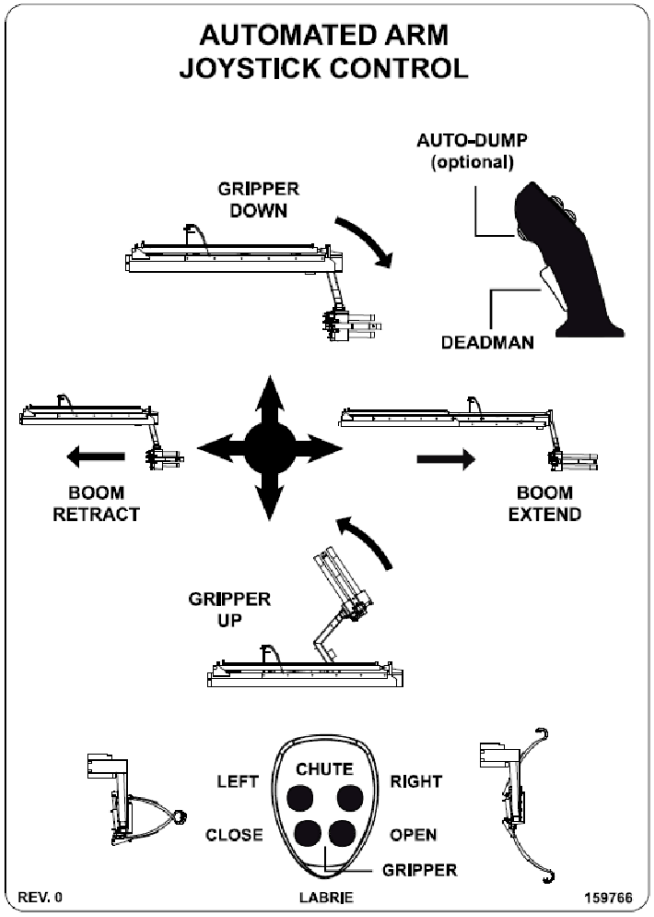
Figure 3-53 Automated arm joystick



IMPORTANT: Deadman switch must be depressed to activate in/out and up/down commands.

- Shift the joystick forward at 90° toward the grabber down lettering (see Figure 3-54) to lower the grabber.
- Shift the joystick forward at 45° between the grabber down and arm extend lettering to lower the grabber and extend the arm.
- Shift the joystick toward the streetside at 90° to the arm retract lettering to retract the arm only.
- Shift the joystick backward at 45° between the grabber up and arm retract lettering to raise the grabber and retract the arm at the same time.
- Shift the joystick backward at 90° to the grabber up lettering to raise the grabber only
- Shift the joystick toward the curbside at 90° to the arm extend lettering to extend the arm only.

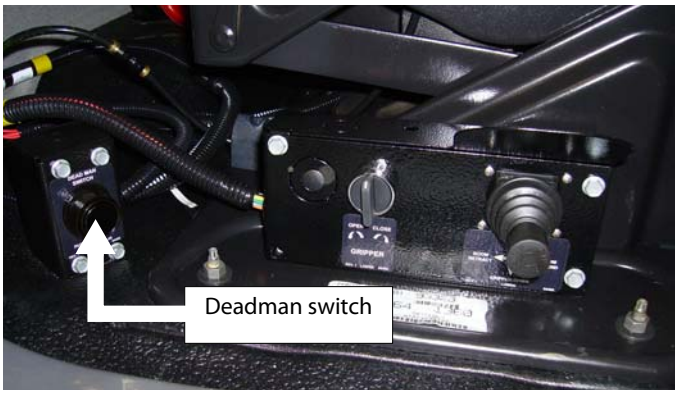
Figure 3-54 Automated arm joystick control decal



Auxiliary Arm Controls

Some trucks are equipped with auxiliary arm controls under the right-hand side seat. These arm controls may vary according to truck model.

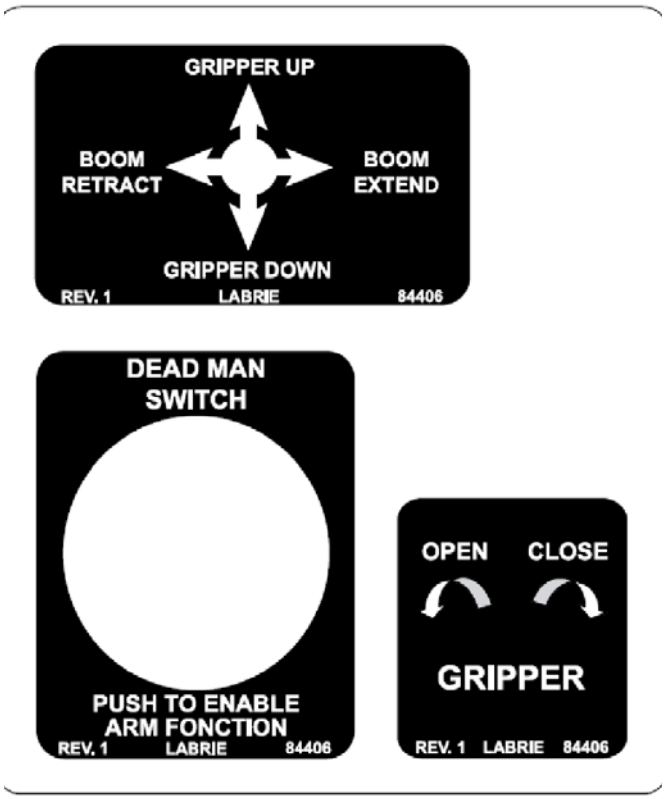
Figure 3-55 Auxiliary arm controls



Auxiliary arm controls have the same functions as does the joystick. They allow the operator to control the arm and the grabber from outside the cab. To use these auxiliary arm controls, simply press and hold the deadman switch (see Figure 3-55).

Below are decals that show the functions of each of these controls.

Figure 3-56 Auxiliary arm control decals



Cab Dashboard

The following is a description of the controls and buttons found on the dashboard.

Parking Brake

The parking brake must be used every time the MINIMAX™ is stopped on idle position except at regular traffic stops.

Figure 3-57 Parking brake

Arm Extended Warning Light

A warning light is mounted on the dashboard. This light, when flashing, alerts the operator that the arm is out. Do not move the vehicle until the arm is completely retracted and the warning light stops flashing.

Danger!

Never drive this vehicle if the automated arm is not parked alongside the truck. The unit would be too high or too wide to be driven safely. Failure to retract the arm will result in unit and/or property damage, personal injury or even death. Warning lights on dashboard start flashing as soon as the arm begins to extend.

Figure 3-58 Arm extended warning light

Right-Hand Side Control Station

The MINIMAX™ has another control station besides the one in the cab. It is located on the right-hand side of the truck near the hydraulic tank. This control station not only has the red, green and yellow buttons for the packer, it also has a speed-up switch and both crusher panel up/down switches.

To use the right-hand side control station, the operator must press the multiplex right-hand side control station switch on the cab console (see Figure 3-43). This switch turns from blue to green after being pressed. The packer, the crusher panel and the speed-up feature can now be operated from the outside.

To deactivate the right-hand side control station, just press the multiplex right-hand side control station switch again (see Figure 3-43). This switch will then turn from green to blue, indicating that the outside control station is deactivated.

Figure 3-59 Right-hand side control station

4

Multiplex Diagnostic Guide

The following Multiplex Diagnostic Guide has been developed to facilitate the resolution of problems with Labrie's Multiplex System, whether in the field or at a repair facility. It includes ways to troubleshoot diagnostic codes that may appear on the monitor display (see Figure 3-1).

Each code relates to a particular warning or caution message that is issued by the Multiplex System. Use the Multiplex Diagnostic Guide to learn how to correct the situation that generated such message. Follow the procedure that is provided to guide you through the resolution process.

Arm: Wrong Driver Position

This code indicates that Node 10 of the Labrie Multiplex System is not seeing feedback via a voltage (DC) signal from the chassis on wire 140i. (i_DriverPosition_Switch).

Due to the wide variety of available chassis options for controlling this system, step by step can only be taken as far as the Labrie system typically continues.

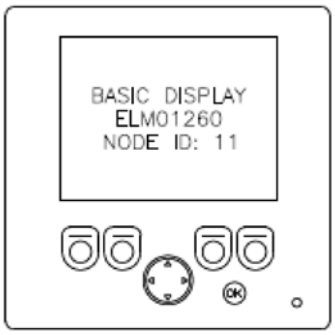
For further assistance in diagnostic information, contact Labrie*Plus*.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 10 (cabine)

   IN13 Wire 140i (i_DriverPosition_switch)



   Is the input highlighted in green?

   1 a. YES, go to STEP 3.

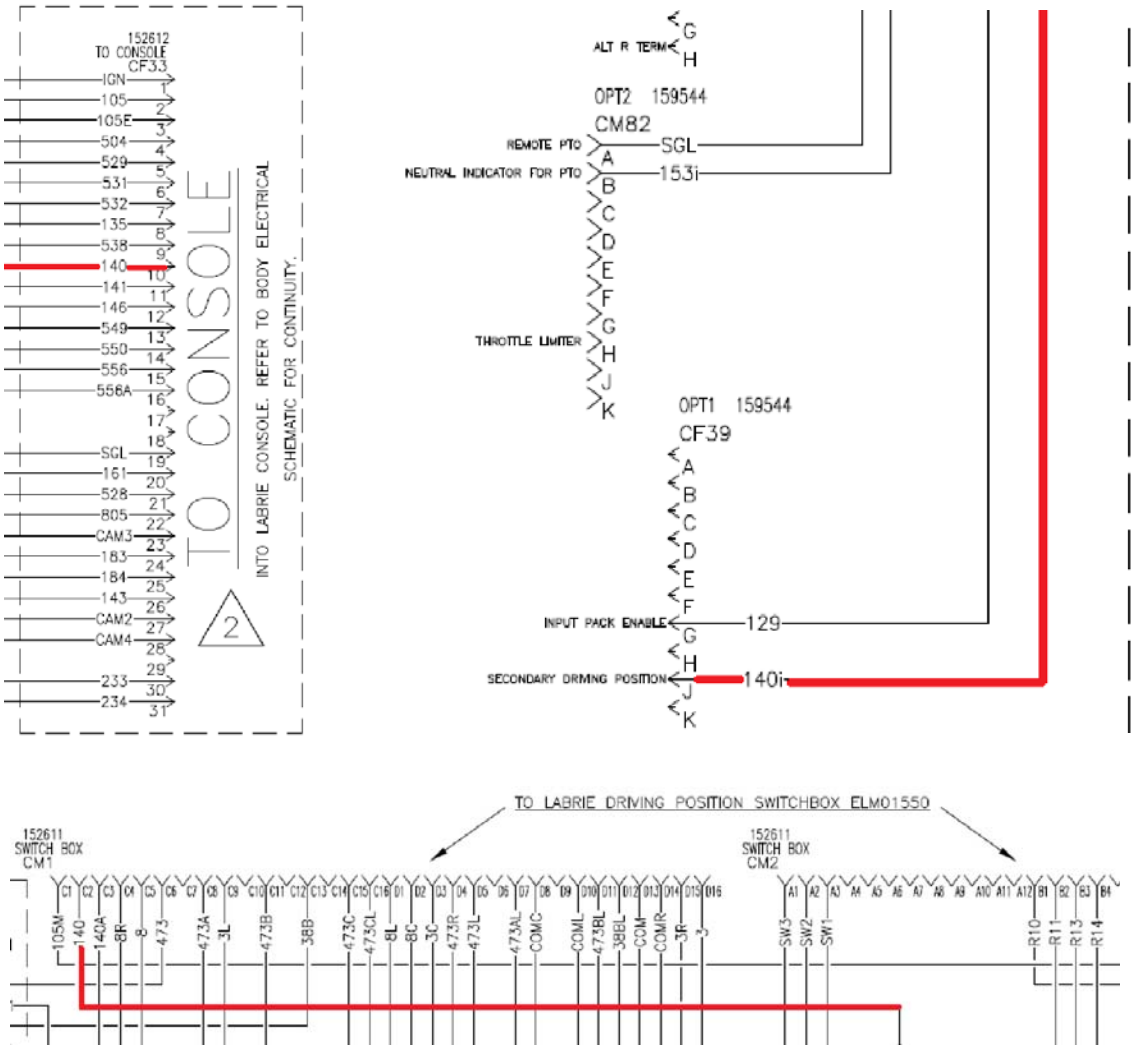
   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following tests as outlined below:

NOTE: Typical connector locations for circuit are on page 1 and 3 of the Labrie schematic to trace up to the chassis connections.

Red lead on pin location for wire 140i (may vary dependant on type of chassis specified by customer).

Black lead on dedicated battery ground.



Do you have 12VDC?

2 a. YES, go to STEP 3.

2 b. NO, contact Labrie*Plus*.

3. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements as listed below:

Red lead on connector X10 at Node 10 pin 14.

Black lead on dedicated battery ground.

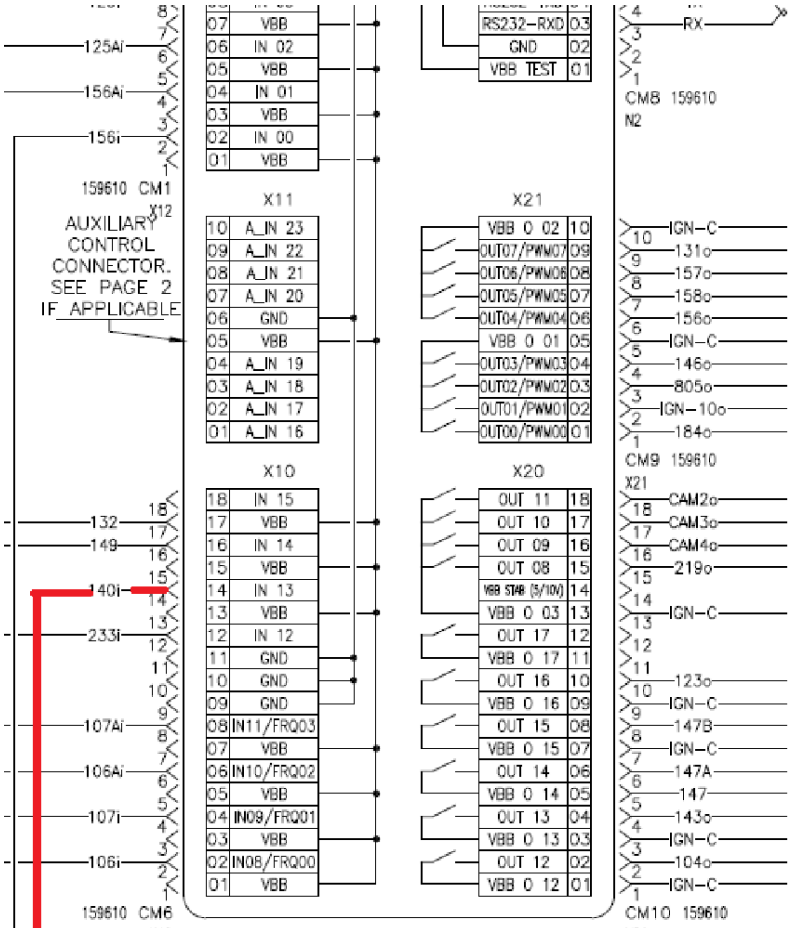
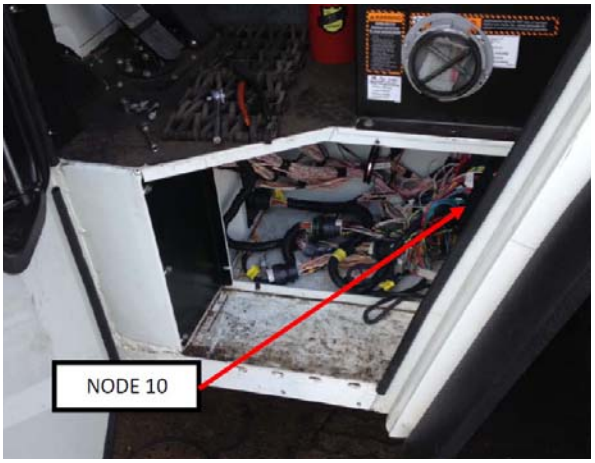


Figure 4-1 Example of a Mack chassis node 10 installation



Do you have 12VDC?

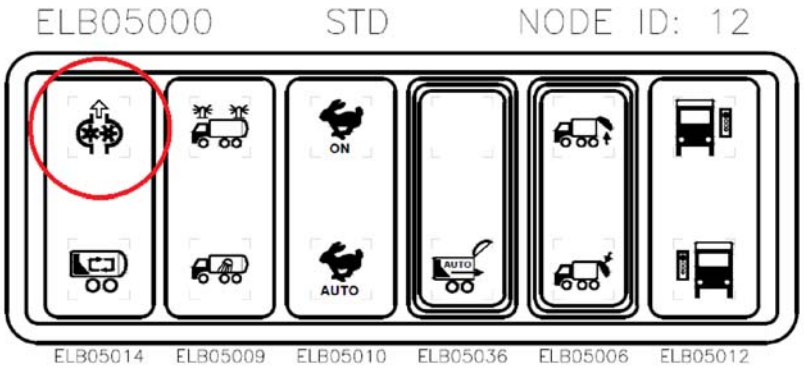
3 a. YES, contact Labrie*Plus*.

3 b. NO, using the Labrie wiring diagram, locate and/or repair open/broken wire issue with wire 140i.

Arm: Pump Not Started

This code indicates that the deadman or arm aux controls are being commanded prior to the pump circuit being engaged or activated.

When this warning is present, attempt to engage the pump by depressing the pump button on switchpack (Node) 12 and note if any of the accompanying warnings are present which would prevent the pump from being activated.



Additional failure modes which could prevent the pump from activating are:

a) PUMP NOT STARTED: LEFT ESTOP (see *Pump Not Started: Left EStop/Pump: Left EStop* on page 88)

b) PUMP NOT STARTED: LEFT PANIC BAR (see *Pump Not Started: Left Panic / Pump: Left Panic Bar* on page 94)

c) PUMP NOT STARTED: RIGHT ESTOP (see *Pump Not Started: Right EStop / Pump: Right EStop* on page 91)

d) PUMP NOT STARTED: RIGHT PANIC BAR (see *Pump Not Started: Right Panic / Pump: Right Panic* on page 97)

e) PUMP NOT STARTED: CAB ESTOP (see *Pump Not Started: Cab EStop* on page 100)

f) PUMP NOT STARTED: AUX CAB ESTOP (see *Pump Not Started: Aux Cab EStop* on page 105)

g) PUMP NOT STARTED: RPM TOO HIGH (see *Pump Not Started: RPM Too High / Pump: RPM Too High* on page 103)

h) PUMP: PTO NOT OK (see *Pump: PTO Pressure Not OK* on page 108)

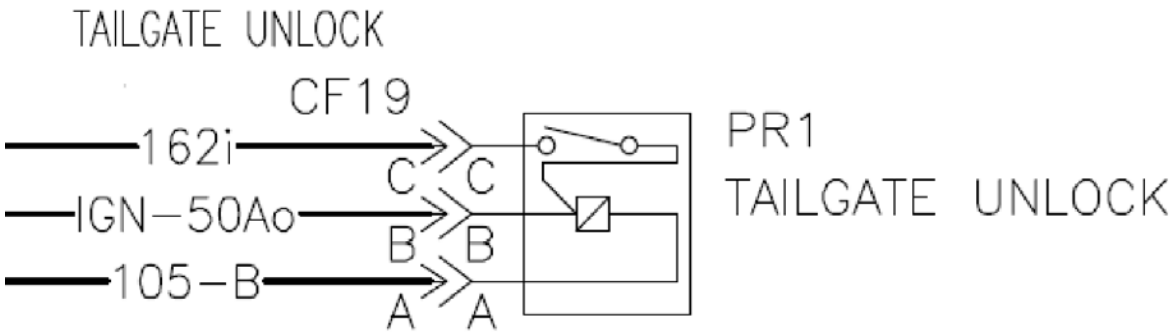
i) PUMP: TRANSMISSION NOT OK (see *Pump: Trans Not OK* on page 112)

Consult the appropriate page of this chapter to diagnose each above item.

Arm: Tailgate Unlocked

This code indicates the Labrie multiplex system has identified a command to move the arm while the tailgate is unlocked. This prevent the operator from being able to dump into the hopper while the body is unsecure.

Node 60 (side #2) of the dual module, receives a signal from wire 162i, (i_TGUnlocked_sensor). While Node 60 is the module receiving the signal, ignition power from Node 50 is what supplies the switch.



Prior to performing the below diagnostics, ensure the tailgate is in fact in the locked position and that no obstruction could be allowing the switch to close.

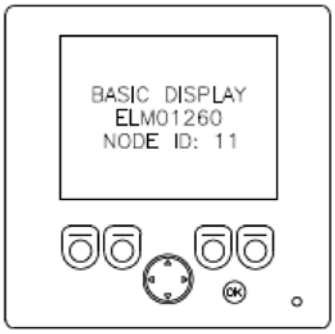
Also, verify the ground wire to the proximity switch has continuity to battery ground.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

Module (Node) 60

I46 Wire 162i (i_TGUnlocked_sensor)



Is the input highlighted in green?

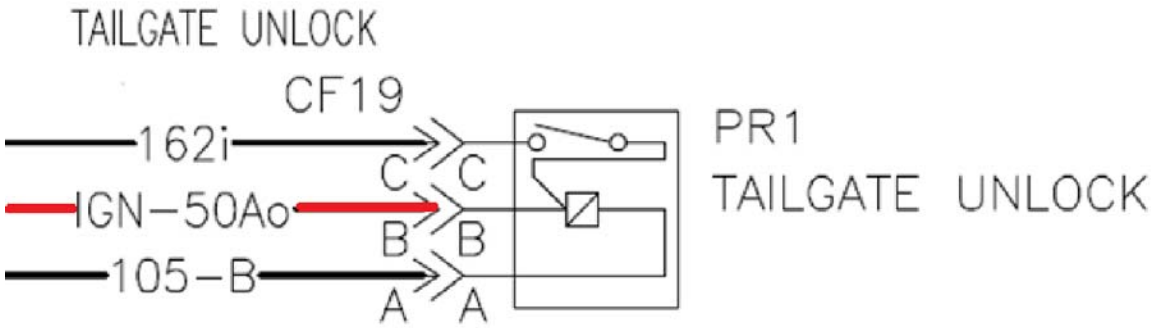
1 a. YES, go to STEP 4.

1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location.

Red lead on connector CF19, pin B, wire IGN-50Ao.

Black lead on a dedicated battery ground.



Do you have 12VDC?

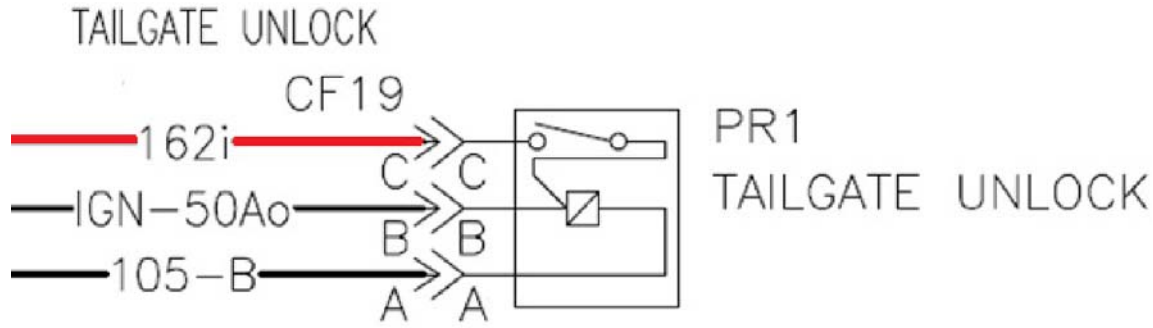
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location.

Red lead on connector CF19, pin C, wire 162i.

Black lead on a dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

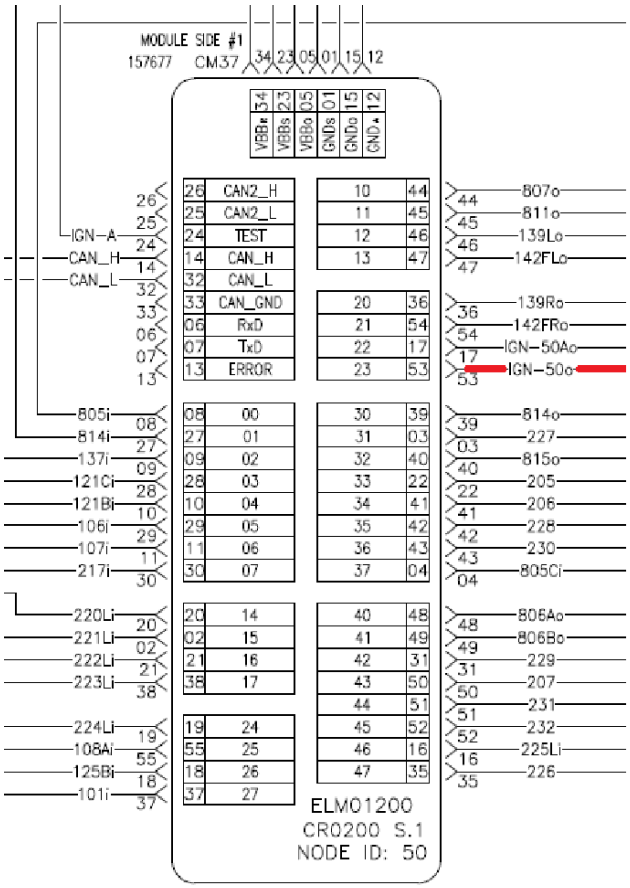
3 b. NO, repair/replace defective tailgate unlock sensor.

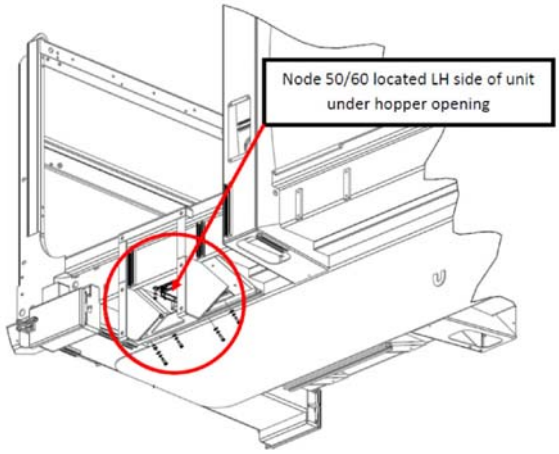
4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location.

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.





Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and tailgate unlocked sensor.

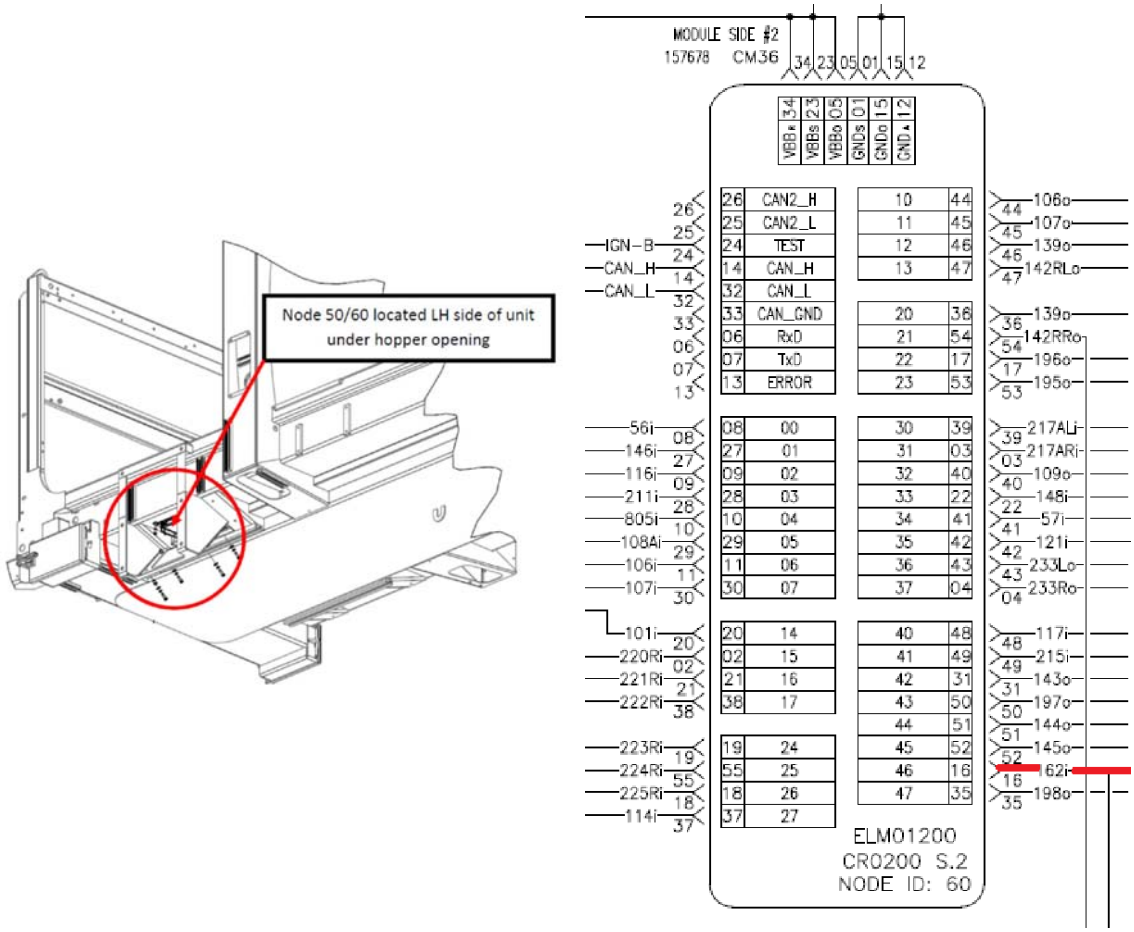
4 b. NO, contact Labrie*Plus*.

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location.

Remove connector backshell from CM36.

Red lead on connector CM36, pin 16, wire 162i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

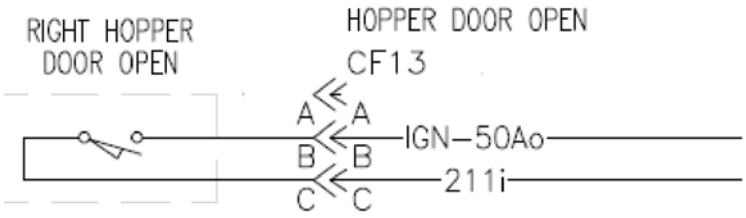
5 b. NO, using Labrie wiring diagram repair open/damaged circuit between Node 60 and tailgate unlocked sensor wire 162i.

Arm: Hopper Door Not Opened

This code indicates the Labrie multiplex system has identified a command to move the arm while the hopper door is closed. This prevents the operator from being able to dump into the hopper while the door is closed.

Node 60 (side #2) of the dual module, receives a signal from wire 211i, (i_RHDoorOpen_sensor).

While Node 60 is the module receiving the signal, ignition power from Node 50 is what supplies the switch with ignition power.



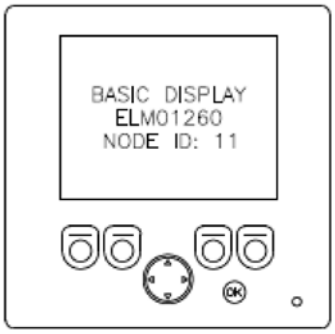
Prior to performing the below diagnostics, ensure the hopper door is in fact in the open position and that no obstruction could be allowing the switch to close.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I03 Wire 211i (i_RHDoorOpen_sensor)



   Is the input highlighted in green?

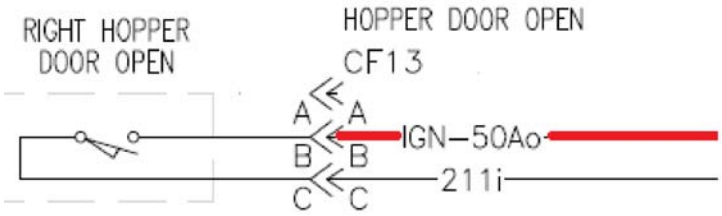
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location.

   Red lead on connector CF13, pin B, wire IGN-50o.

   Black lead on dedicated battery ground.



Do you have 12VDC?

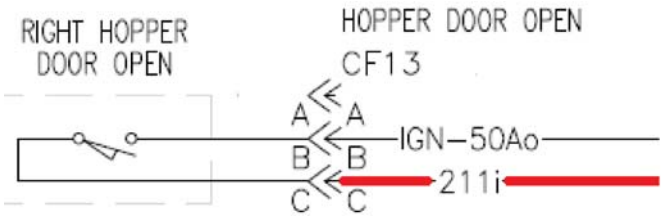
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using digital multimeter set to the voltage (DC) scale, perform the test as outlined in the following location:

Red lead on connector CF13, pin C, wire 211i.

Black lead on dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

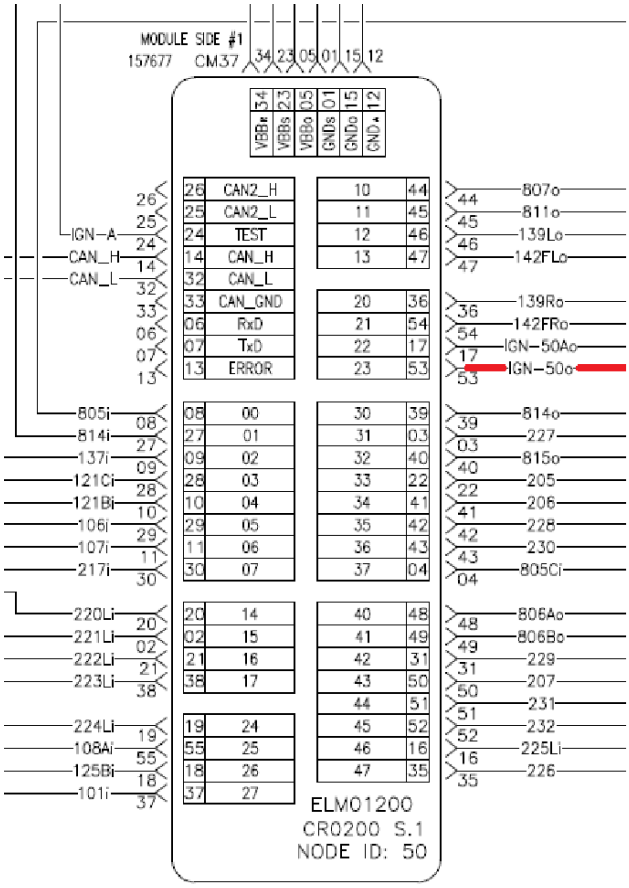
3 b. NO, repair/replace defective hopper door open switch.

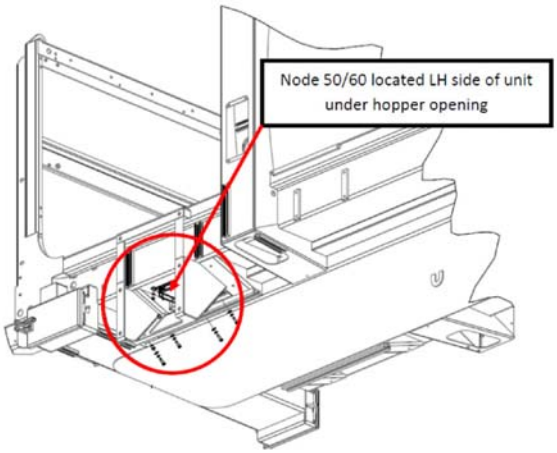
4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location.

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.





Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and tailgate unlocked sensor.

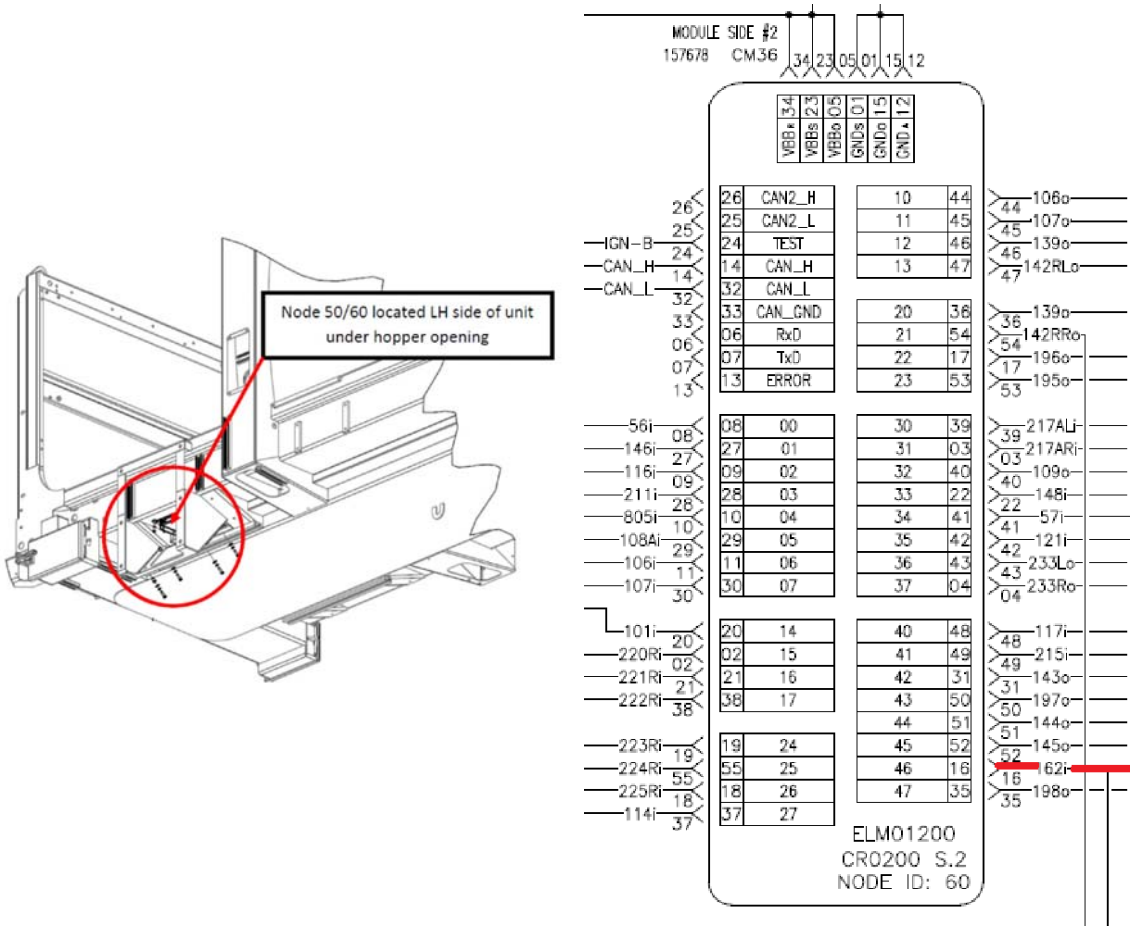
4 b. NO, contact Labrie*Plus*.

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location.

Remove connector backshell from CM36.

Red lead on connector CM36, pin 16, wire 162i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 60 and tailgate unlocked sensor wire 162i.

Arm Up: Crusher Not Raised

This code indicates the Labrie multiplex system has identified a command to move the arm to the raised position while the crusher panel is lowered. This prevents the operator from being able to dump atop the crusher panel.

Node 60 (side #2) of the dual module receives a signal from wire 215i, (i_CrusherRaised_sensor).

While Node 60 is the module receiving the signal, ignition power from Node 50 is what supplies the switch with ignition power.

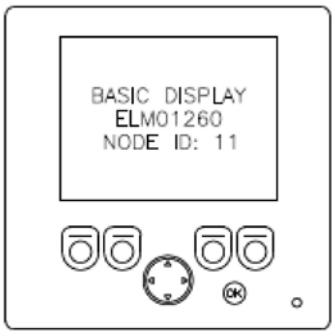
Prior to performing the below diagnostics, ensure the hopper door is in fact in the open position and that no obstruction could be allowing the switch to close.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I41 Wire 215i (i_CrusherRaised_sensor)



   Is the input highlighted in green?

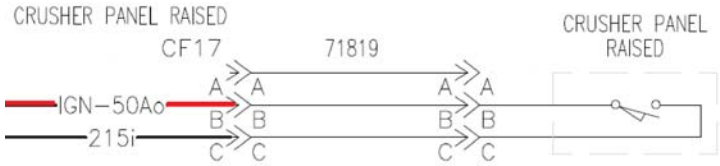
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

   Red lead on connector CF17, pin B, wire IGN-50o.

   Black lead on dedicated battery ground.



Do you have 12 VDC?

2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

Red lead on connector CF17, pin C wire 215i.

Black lead on dedicated battery ground.

Do you have 12VDC?

3 a. YES, go to STEP 5.

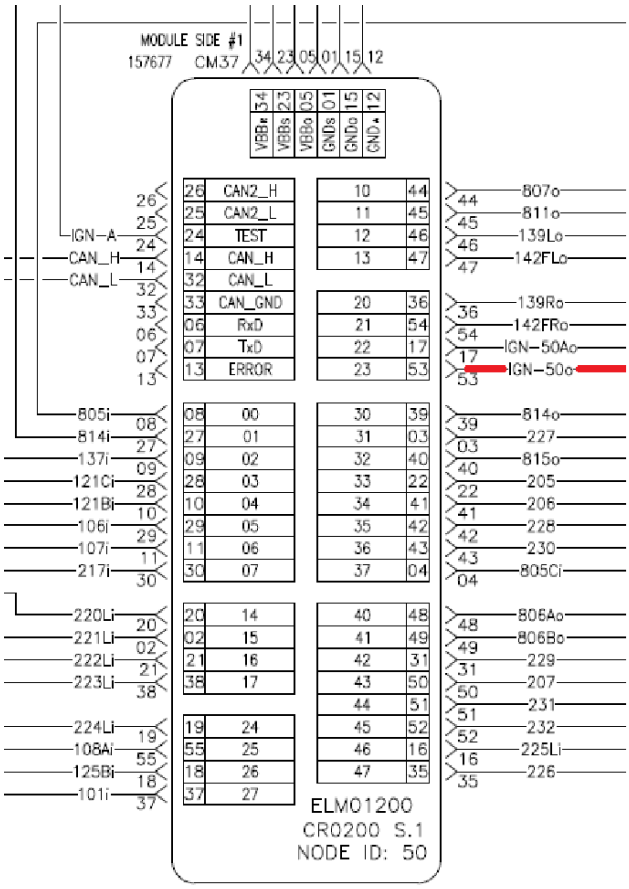
3 b. NO, repair/replace defective crusher panel raised switch.

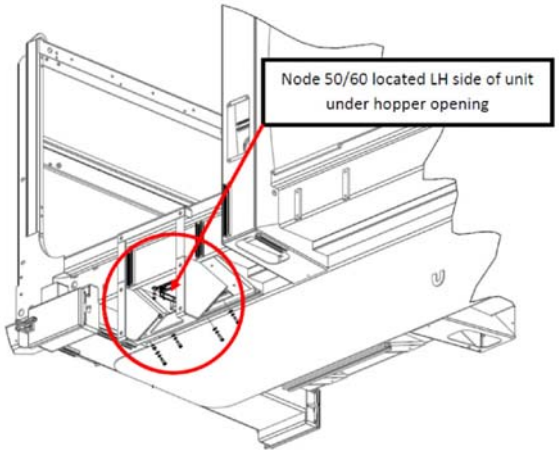
4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outilined at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.





Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and the crusher raised sensor connector.

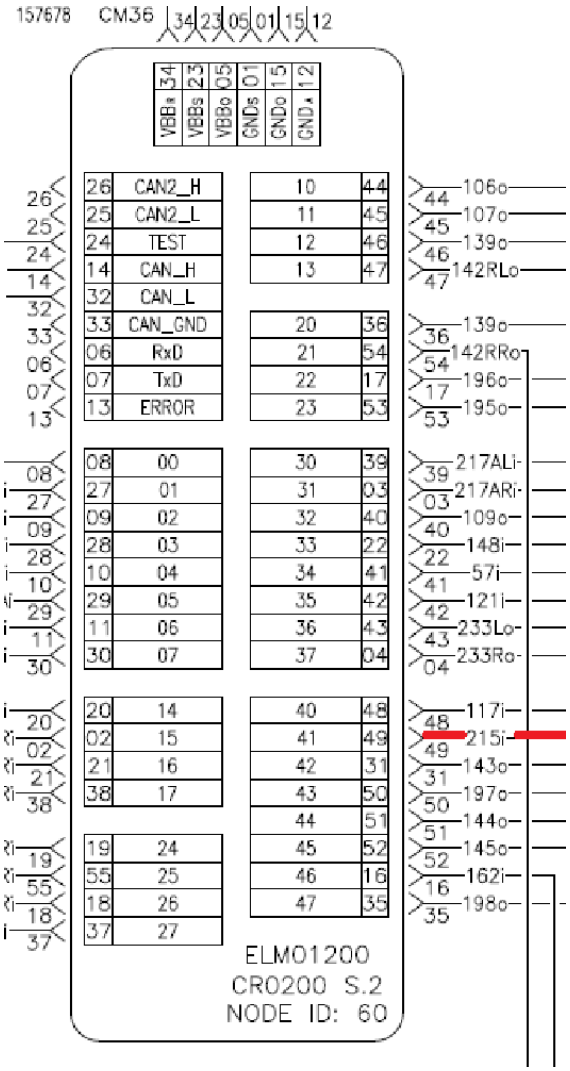
4 b. NO, contact Labrie*Plus*.

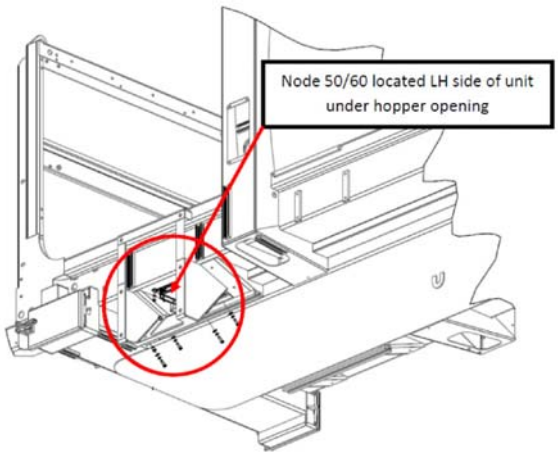
5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location:

Remove connector backshell from CM36.

Red lead on connector CM36, pin 49, wire 215i.

Black lead on dedicated battery ground.





Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

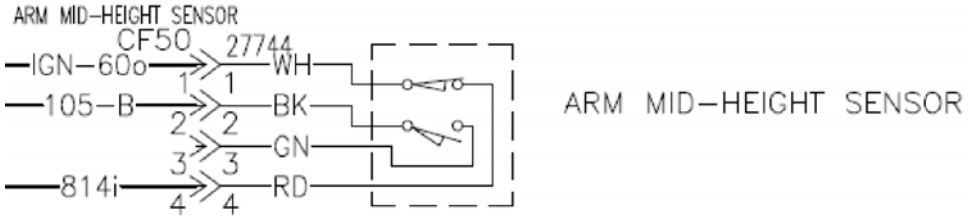
5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 60 and tailgate unlocked sensor wire 162i.

Crusher: Arm Too High

This code indicates the Labrie multiplex system has identified a command to move the crusher to the lower position while the arm is above mid-height. This prevents the operator from being able to contact the arm if gripper assembly is within the hopper with the crusher panel.

Node 50 (side #1) of the dual module receives a signal from wire 814i (i_ArmMidHeight_sensor).

Node 50 is the module receiving the signal and supplying ignition power.



Prior to performing the below diagnostics, ensure the arm is in the fully lowered position and that no obstruction could be allowing the switch to function.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I01 Wire 814 i (i_ ArmMidHeight _sensor)

   Is the input highlighted in green?

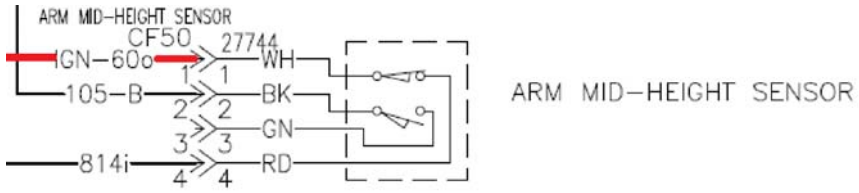
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

   Red lead on connector CF50, pin 1, wire IGN-50o.

   Black lead on dedicated battery ground.



Do you have 12VDC?

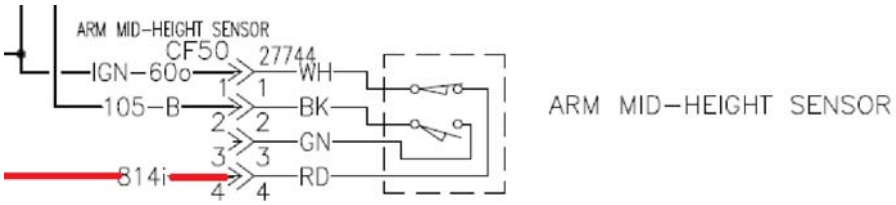
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using digital multimeter set to the voltage (DC) scale, perform the test as outlined in the following location:

Red lead on connector CF50, pin 4, wire 814i.

Black lead on dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

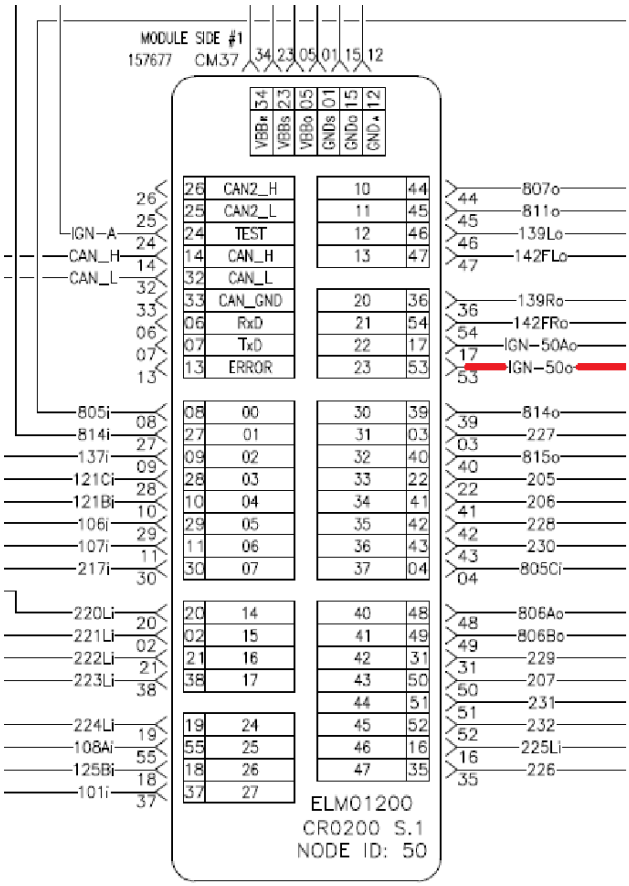
3 b. NO, repair/replace defective crusher panel raised switch.

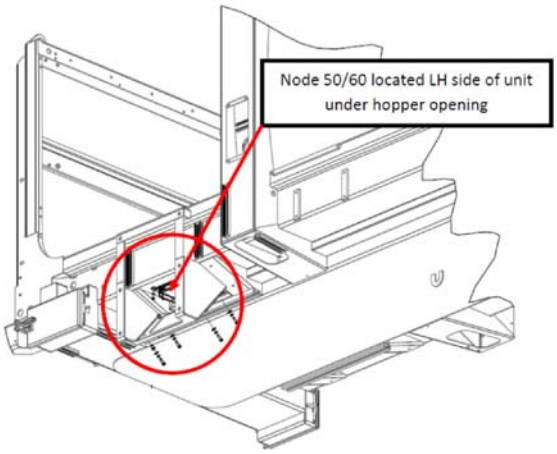
4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.





Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and the arm mid-height sensor connector.

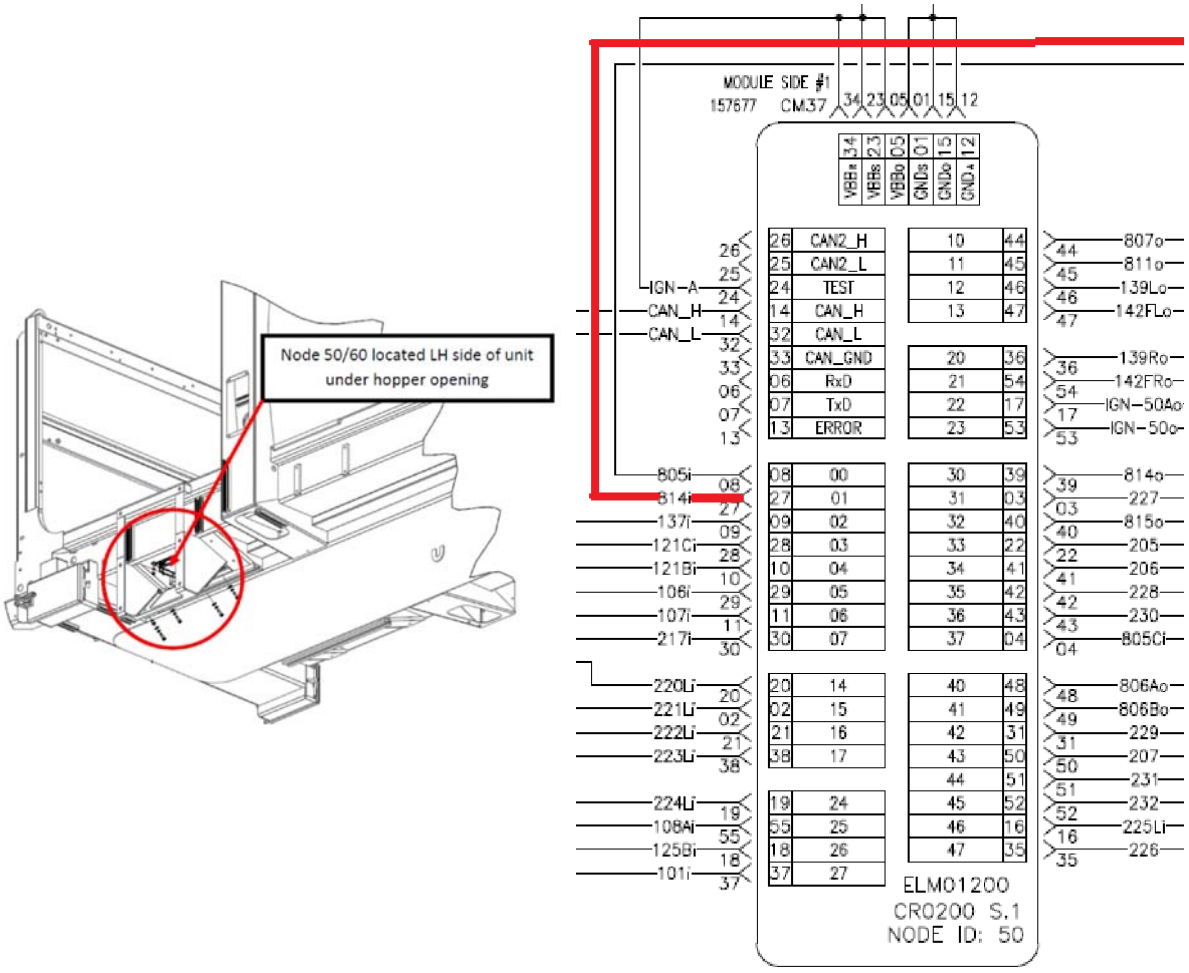
4 b. NO, contact Labrie*Plus*.

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location:

Remove connector backshell from CM36.

Red lead on connector CM37, pin 27, wire 814i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

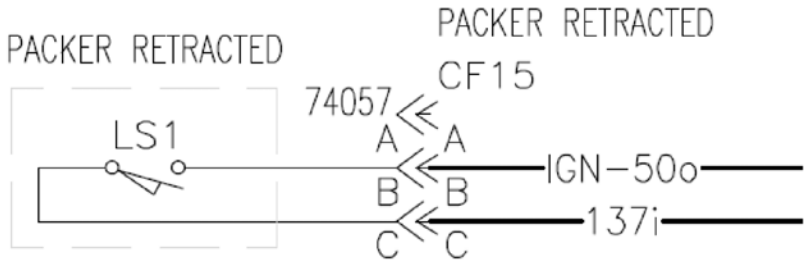
5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and arm mid-height sensor wire 814i.

Crusher: Packer Not Retracted

This code indicates the Labrie multiplex system has identified a command to move the crusher to the lower position while the packer panel is not in the home position. This prevents the operator from being able to damage the crusher panel if refuse is atop the packer.

Node 50 (side #1) of the dual module receives a signal from wire 137i, (i_PackerFullyRetracted_sensor).

Node 50 is the module receiving the signal and supplying ignition power.



Prior to performing the below diagnostics, ensure the packer is in the fully retracted position and that no obstruction could be allowing the switch to function.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I02 Wire 137i (i_ PackerFullyRetracted _sensor)

   Is the input highlighted in green?

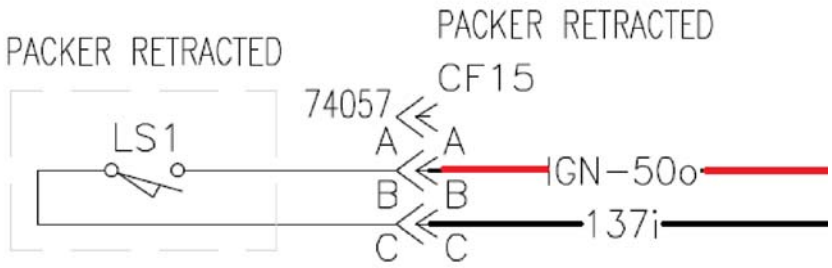
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

   Red lead on connector CF15, pin B, wire IGN-50o.

   Black lead on dedicated battery ground.



Do you have 12VDC?

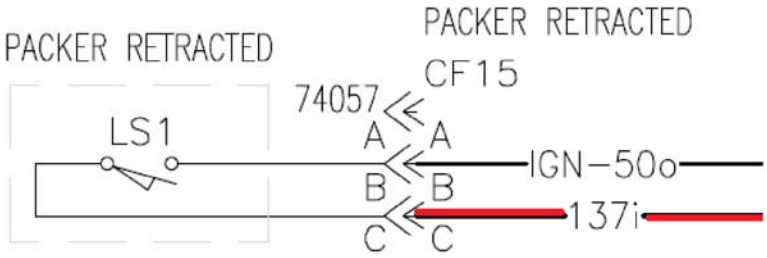
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using digital multimeter set to the voltage (DC) scale, perform the test as outlined in the following location:

Red lead on connector CF15, pin C, wire 137i.

Black lead on dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

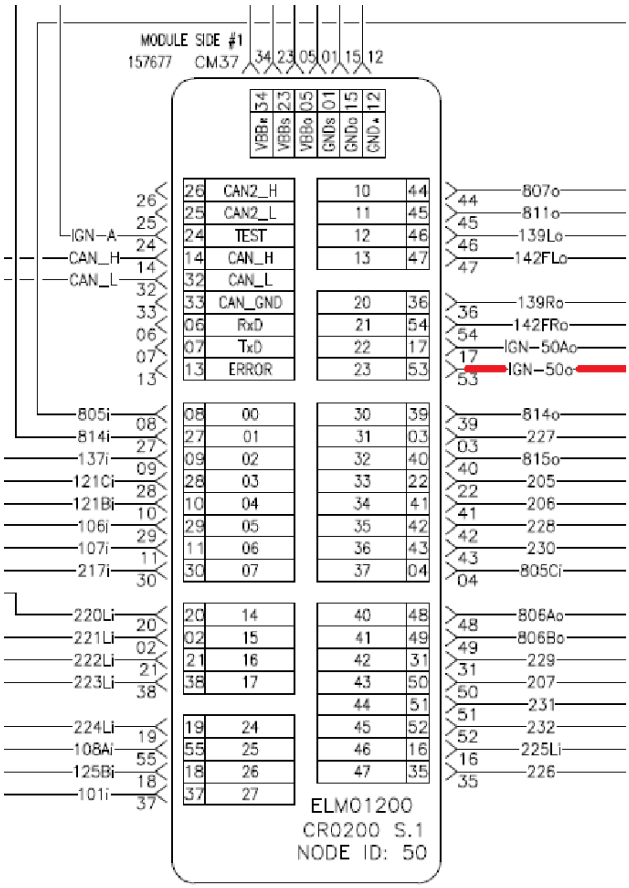
3 b. NO, repair/replace defective packer fully retracted switch.

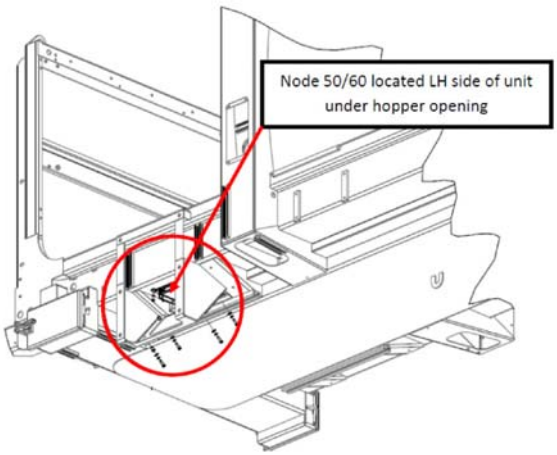
4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.





Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and the arm mid-height sensor connector.

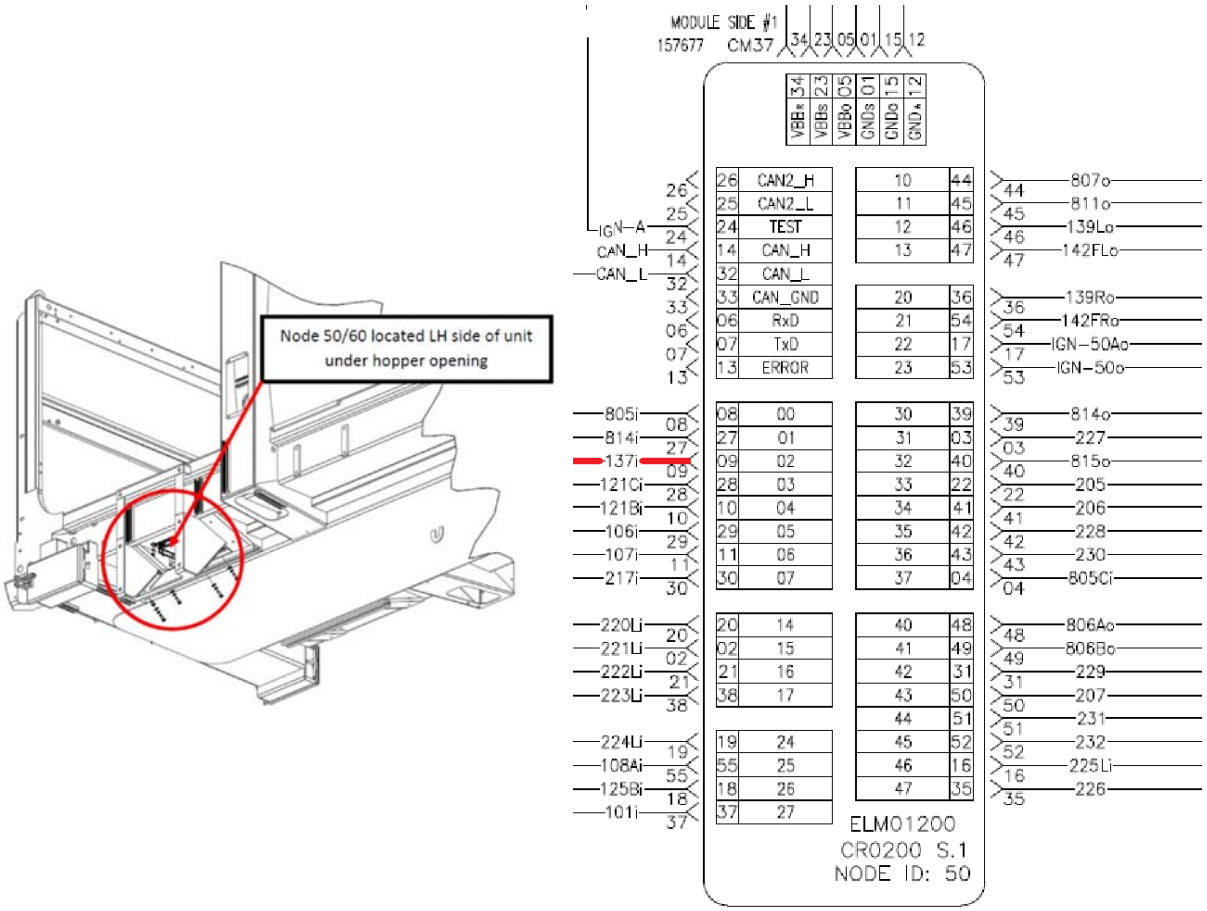
4 b. NO, contact Labrie*Plus*.

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 09, wire 137i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and packer fully retracted sensor wire 137i.

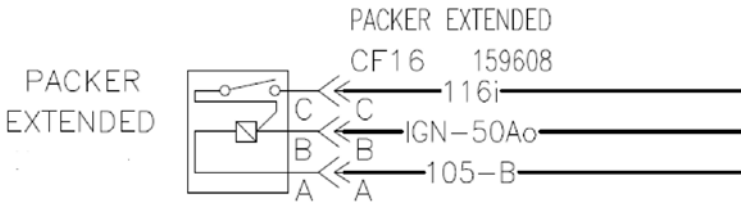
Packer: Already Extended

This code indicates a voltage command has been sent to module (Node) 10 requesting the packer to extend and pack the load while the fully extended switch is already met.

Performing this action will cause the above failure code as well as prevent the Labrie multiplex system from activating the packer extend MACS valve.

Prior to beginning these diagnostic steps, verify that the packer panel is in fact in the fully retracted position and not mechanically binding. Also ensure integrity of packer extend sensor is functional and acceptable. Ensure no foreign material is triggering the switch to believe the packer is extended.

Also verify 105 ground wire has good continuity prior to continuing.



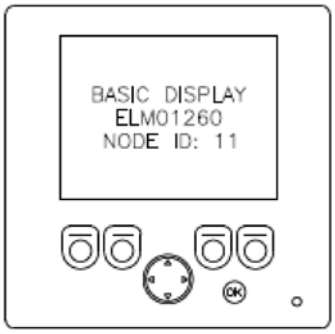
This circuit operates via ignition voltage provided by Node 50 while Node 60 receives the feedback signal via voltage on wire 116i.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I02 Wire 116i (i_ PackerFullyExtended _sensor)



   Is the input highlighted in green?

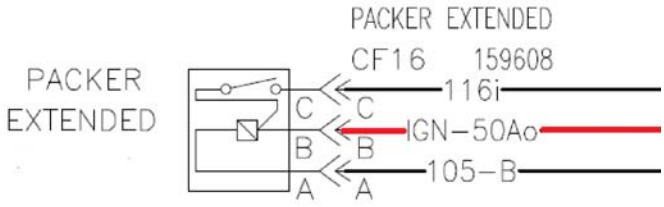
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

   Red lead on connector CF16, pin B, wire IGN-50Ao.

   Black lead on dedicated battery ground.



Do you have 12VDC?

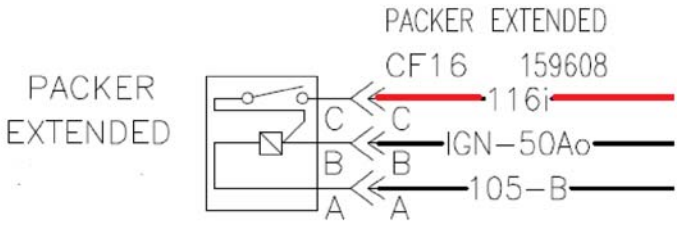
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using digital multimeter set to the voltage (DC) scale, perform the test as outlined in the following location:

Red lead on connector CF16, pin C, wire 116i.

Black lead on dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

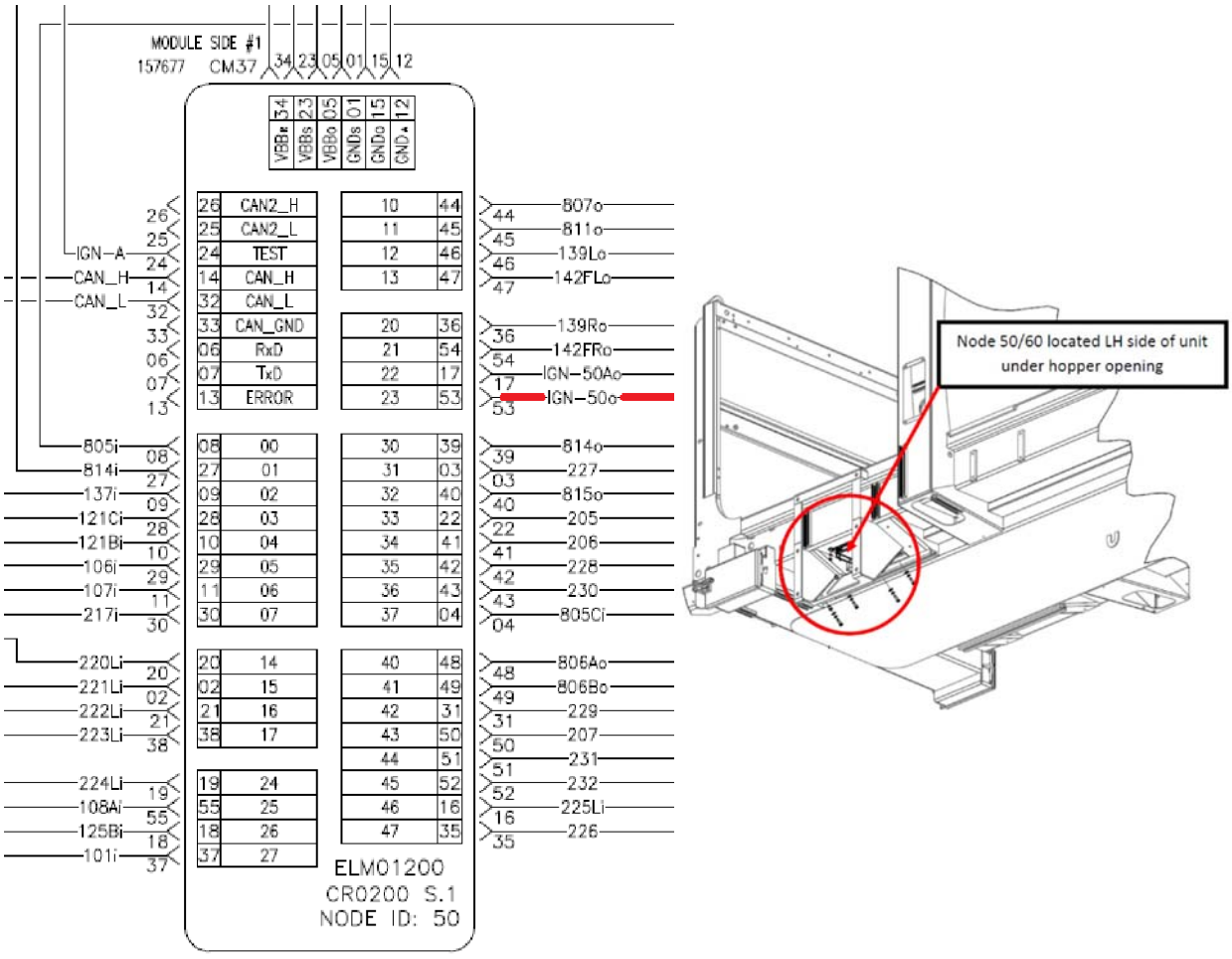
3 b. NO, repair/replace defective packer fully extended switch.

4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.



Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and the arm mid-height sensor connector.

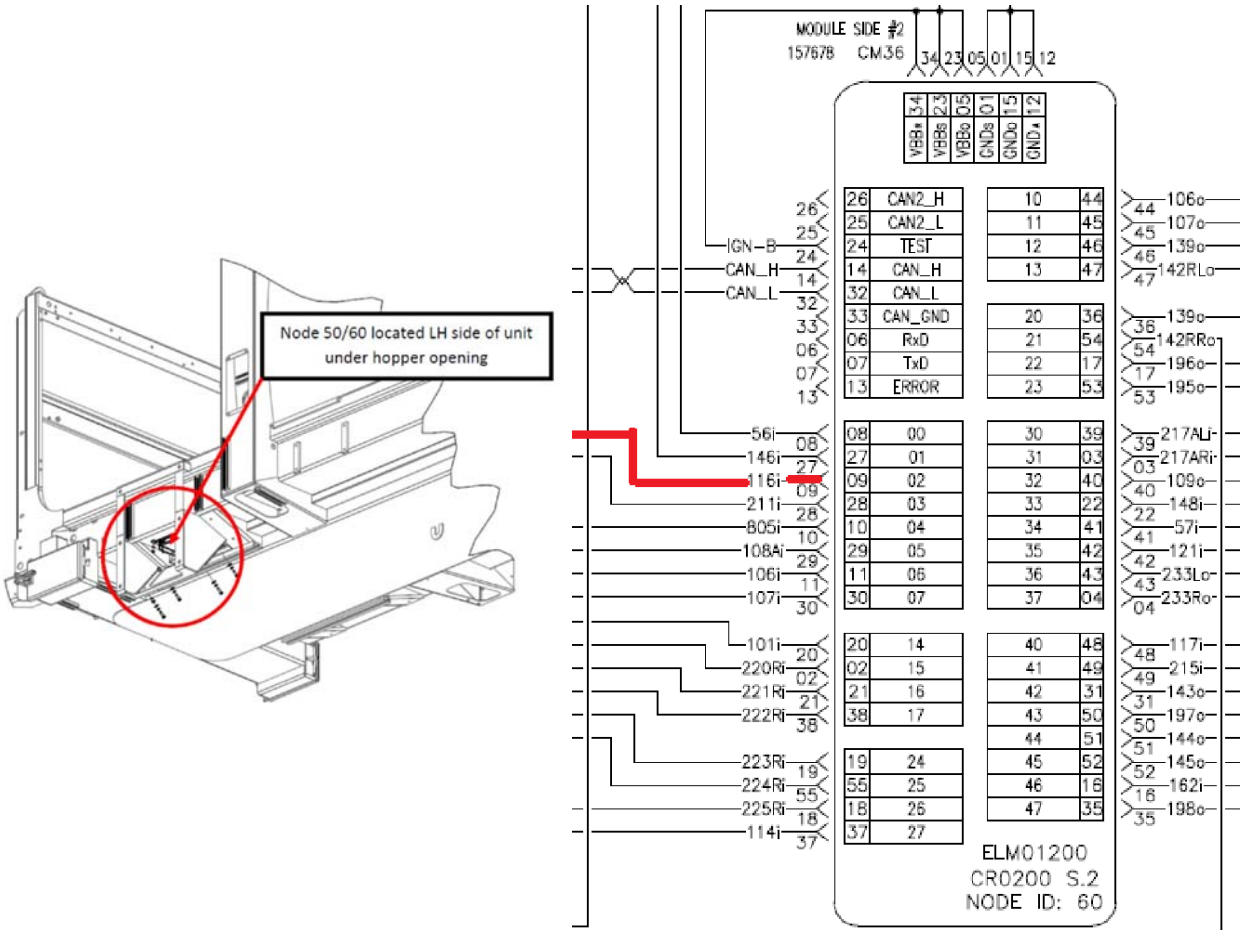
4 b. NO, contact Labrie*Plus*

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location:

Remove connector backshell from CM36.

Red lead on connector CM36, pin 09, wire 116i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and packer fully retracted sensor wire 137i.

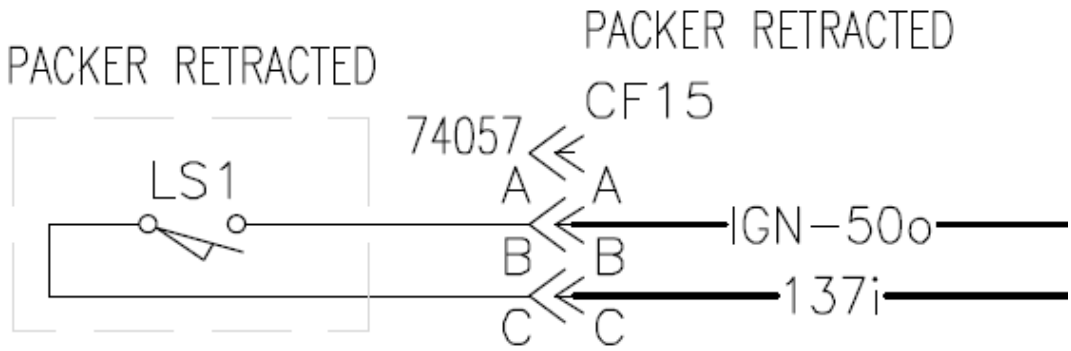
Packer: Already Retracted

This code indicates a voltage command has been sent to module (Node) 10 requesting the packer to retract and return while the fully retracted switch is already met.

Performing this action will cause the above failure code as well as prevent the Labrie multiplex system from activating the packer retract MACS valve.

Prior to beginning these diagnostic steps, verify that the packer panel is in fact in the fully retracted position and not mechanically binding. Also ensure integrity of packer retract sensor is functional and acceptable. Ensure no foreign material is triggering the switch to believe the packer is extended.

Also verify 105 ground wire has good continuity prior to continuing.



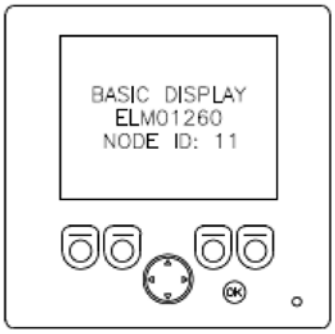
This circuit operates via ignition voltage provided by Node 50 and Node 50 also receives the feedback signal via voltage on wire 137i.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I02 Wire 137i (i_ PackerFullyRetracted _sensor)



   Is the input highlighted in green?

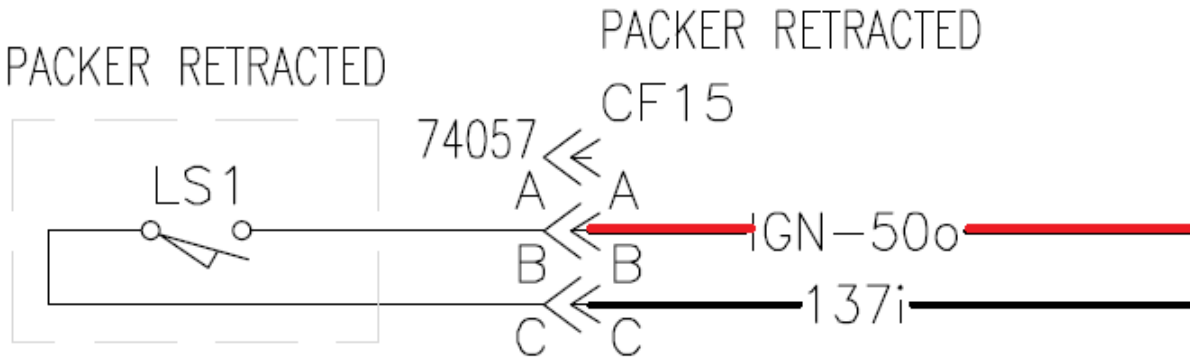
   1 a. YES, go to STEP 4.

   1 b. NO, go to STEP 2.

2. Using a digital multimeter set to the voltage (DC) scale, perform the following test as outlined in the following location:

Red lead on connector CF15, pin B, wire IGN-50o.

Black lead on dedicated battery ground.



Do you have 12VDC?

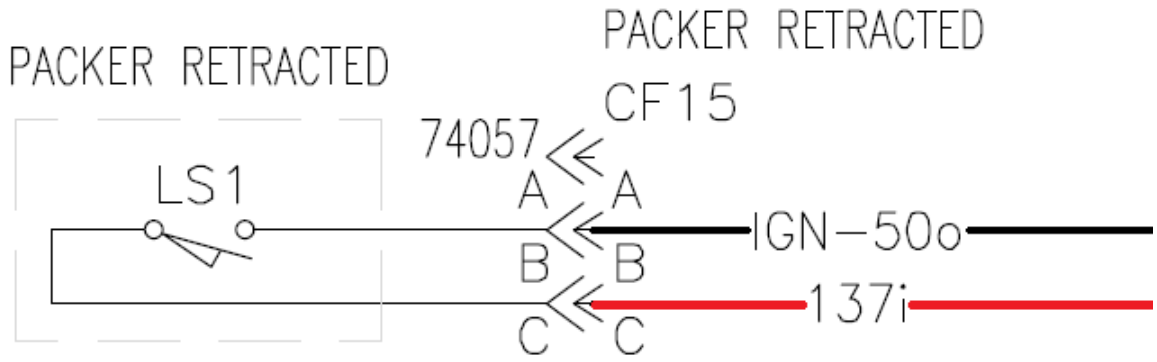
2 a. YES, go to STEP 3.

2 b. NO, go to STEP 4.

3. Using digital multimeter set to the voltage (DC) scale, perform the test as outlined in the following location:

Red lead on connector CF15, pin B, wire 137i.

Black lead on dedicated battery ground.



Do you have 12VDC?

3 a. YES, go to STEP 5.

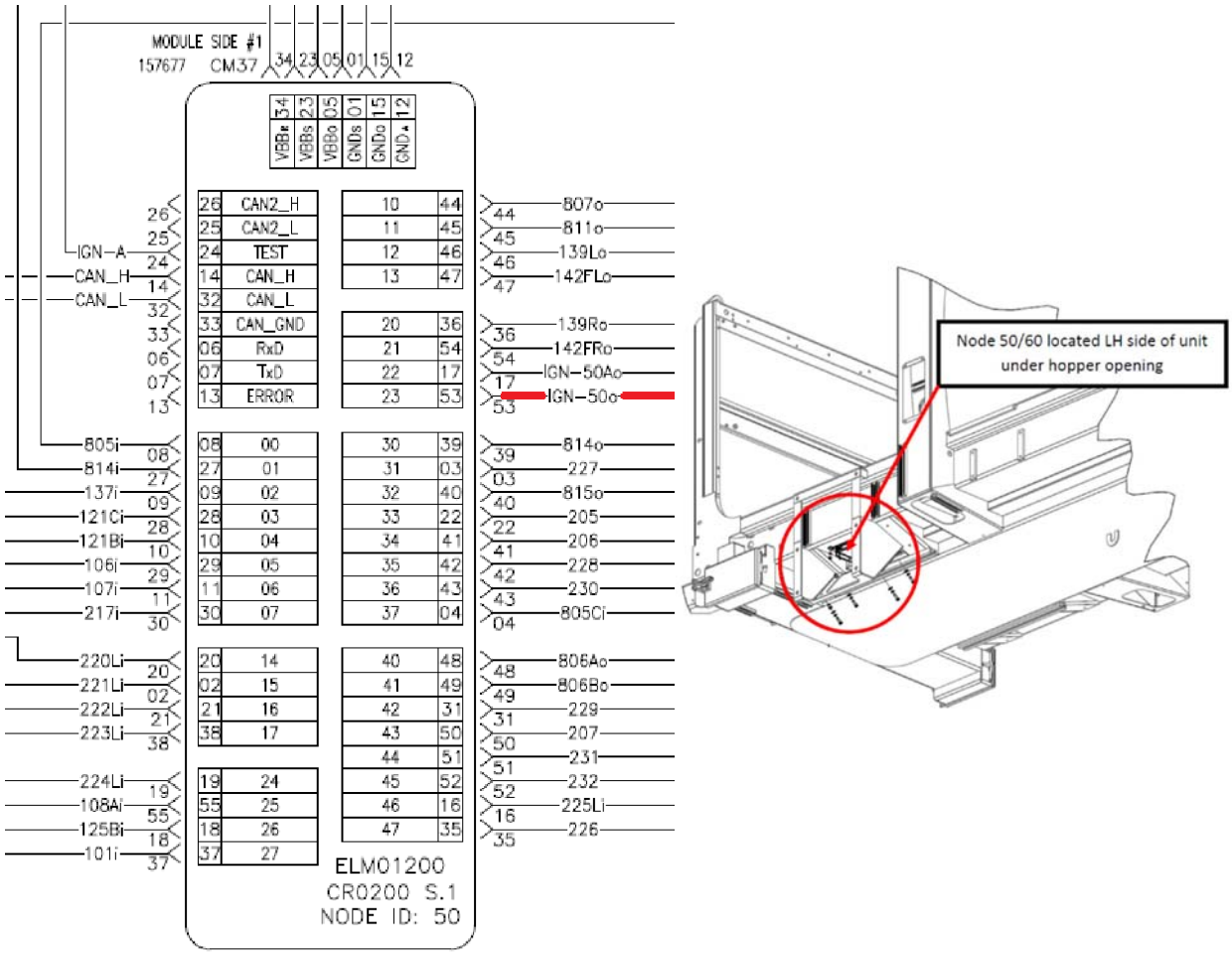
3 b. NO, repair/replace defective packer fully extended switch.

4. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 53, wire IGN-50o.

Black lead on dedicated battery ground.



Do you have 12VDC?

4 a. YES, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and the arm mid-height sensor connector.

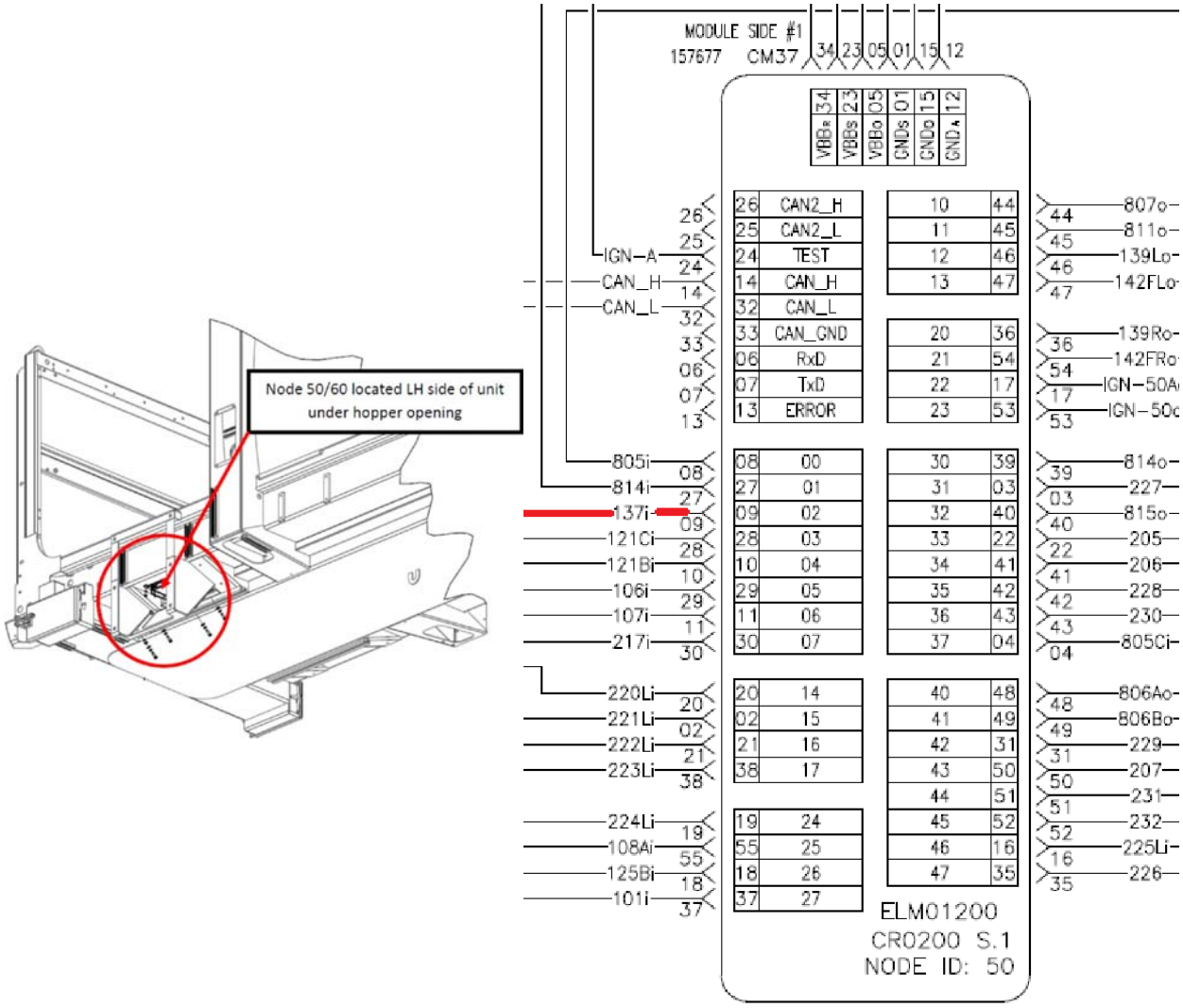
4 b. NO, contact Labrie*Plus*.

5. Using a digital multimeter set to the voltage (DC) scale, perform the test as outlined below at the following location:

Remove connector backshell from CM37.

Red lead on connector CM37, pin 09, wire 137i.

Black lead on dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/damaged circuit between Node 50 and packer fully retracted sensor wire 137i.

Pump Not Started: Left EStop/Pump: Left EStop

This code indicates a situation where the input signal for Node 50 is not being received from the external EStop.

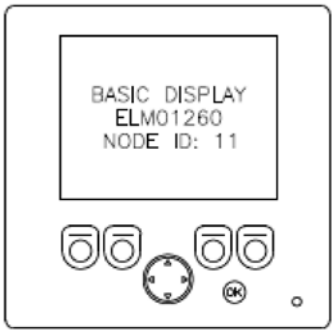
The first code, PUMP NOT STARTED:LEFT ESTOP will trigger when the pump is requested to engage when the outside emergency stop is pushed in or disengaged.

PUMP:LEFT ESTOP sets in situations where the pump was previously engaged and the emergency stop was pushed in or disengaged.

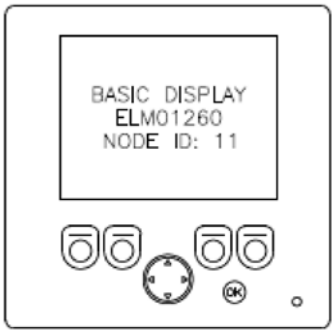
IMPORTANT: Prior to beginning this troubleshooting tree, please verify emergency stop at outside location is not pushed in or depressed.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:
   Module (Node) 50
   I14 Wire 220Li (i_LeftEmergency_Switch)



   Is the input highlighted in green?
   - **1 a.** YES, go to STEP 5.
   - **1 b.** NO, go to STEP 2.
2. Using the Labrie multiplex display, verify you have the following output:
   Module (Node) 50
   I23 Wire IGN-50o (o_Power50_enable)



   Is the output highlighted in green?

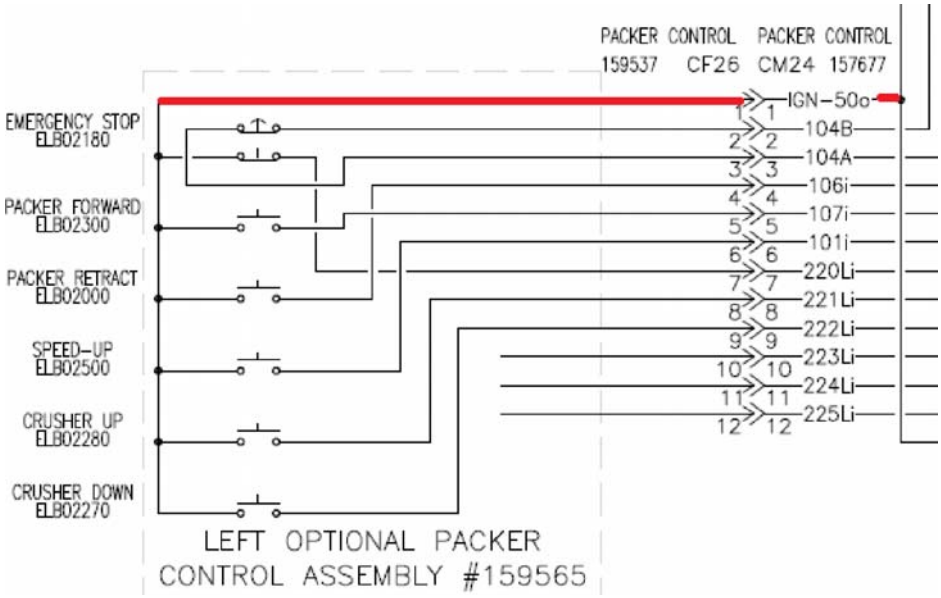
2 a. YES, go to STEP 3.

2 b. NO, contact LabriePlus.

3. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM24 pin 1.

Place your black lead on a designed battery ground.



Do you have 12VDC?

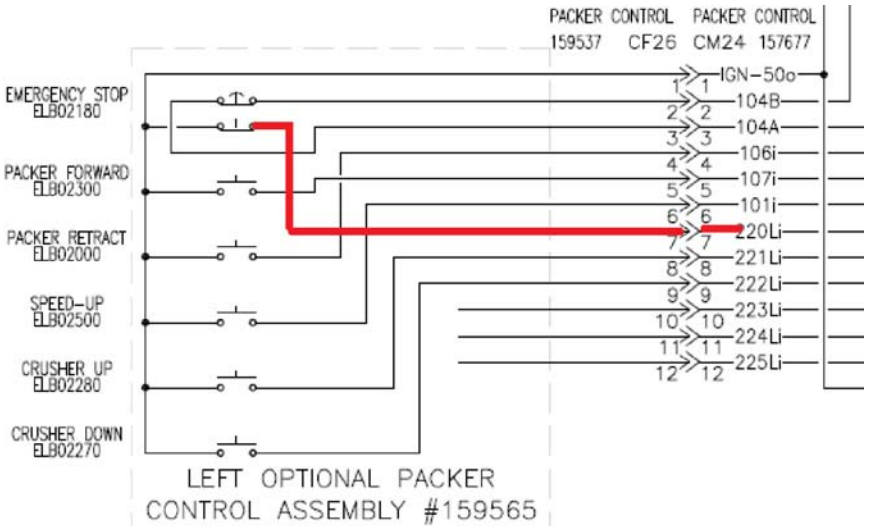
3 a. YES, go to step 4.

3 b. NO, using Labrie wiring diagram, correct open/broken wire between the Node 50 output wire (o_Power50_Enable) and the external emergency stop switch.

4. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CF24 pin 7.

Place your black lead on a designed battery ground.



Do you have 12VDC?

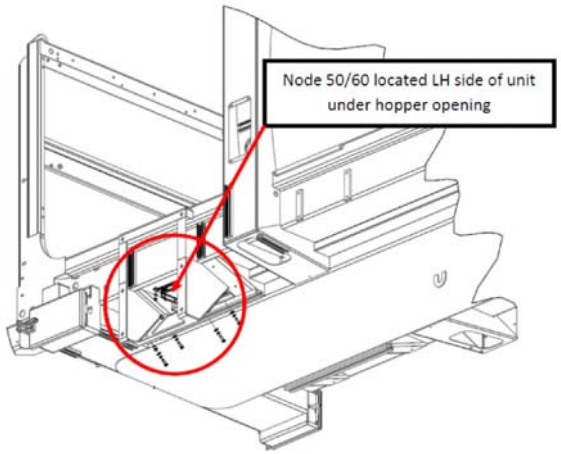
4 a. YES, go to STEP 5.

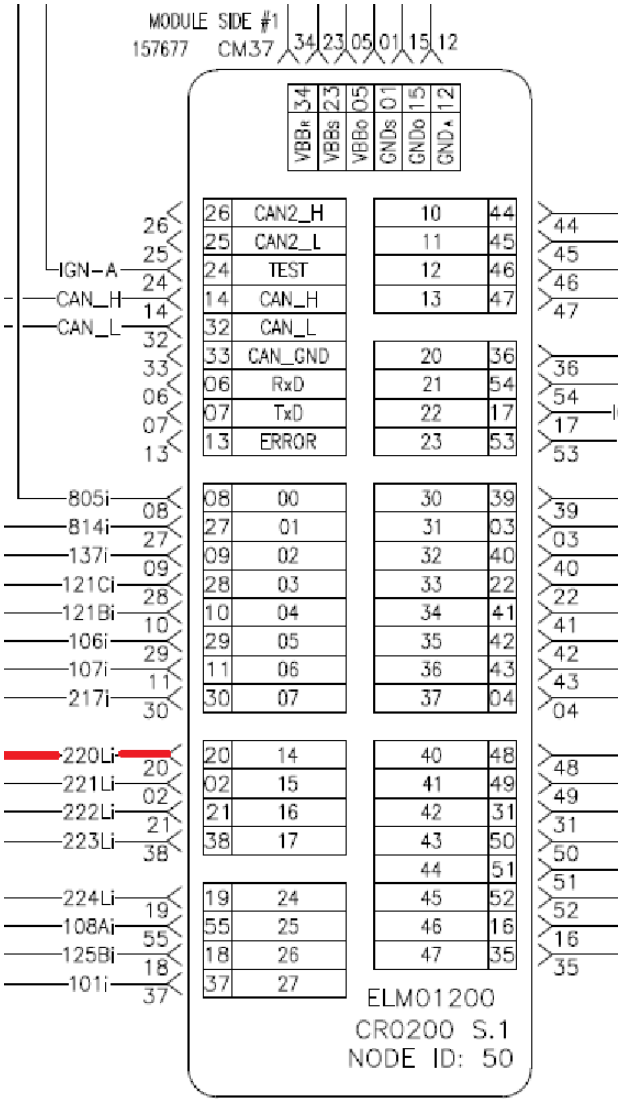
4 b. NO, replace defective external emergency stop switch.

5. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements at Node 50 which is in the following location:

Place the red lead in a backprobe position on pin 20 of the CM37 connector.

Place the black lead on a dedicated battery ground.





Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/broken connection between Node 50 wire 220Li and the external emergency stop switch.

Pump Not Started: Right EStop / Pump: Right EStop

This code indicates a situation where the input signal for Node 50 is not being received from the external EStop.

The first code, PUMP NOT STARTED:RIGHT ESTOP will trigger when the pump is requested to engage when the outside emergency stop is pushed in or disengaged.

PUMP:RIGHT ESTOP sets in situations where the pump was previously engaged and the emergency stop was pushed in or disengaged.

IMPORTANT: Prior to beginning this troubleshooting tree, please verify emergency stop at outside location is not pushed in or depressed.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:
   Module (Node) 60
   I15 Wire 220Ri (i_RightEmergency_Switch)

   Is the input highlighted in green?

   1 a. YES, go to STEP 5.

   1 b. NO, go to STEP 2.

2. Using the Labrie multiplex display, verify you have the following output;
   Module (Node) 50
   I23 Wire IGN-50Ao (o_Power50_enable)

Is the output highlighted in green?

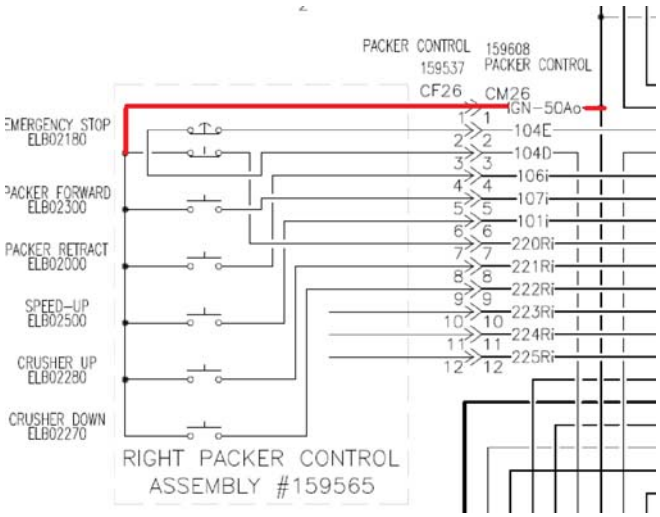
2 a. YES, go to STEP 3.

2 b. NO, contact Labrie*Plus*.

3. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM26 pin 1.

Place your black lead on a designed battery ground.



Do you have 12VDC?

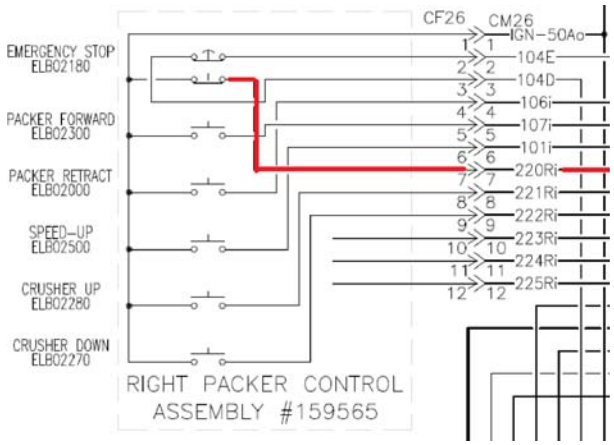
3 a. YES, go to step 4.

3 b. NO, using Labrie wiring diagram, correct open/broken wire between the Node 50 output wire (o_Power50_Enable) and the external emergency stop switch.

4. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CF24 pin 7.

Place your black lead on a designed battery ground.



Do you have 12VDC?

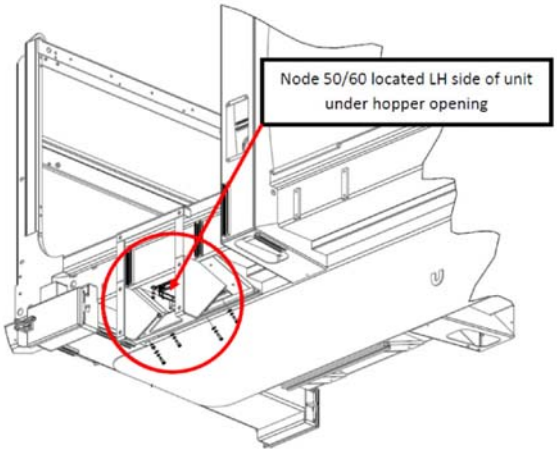
4 a. YES, go to STEP 5.

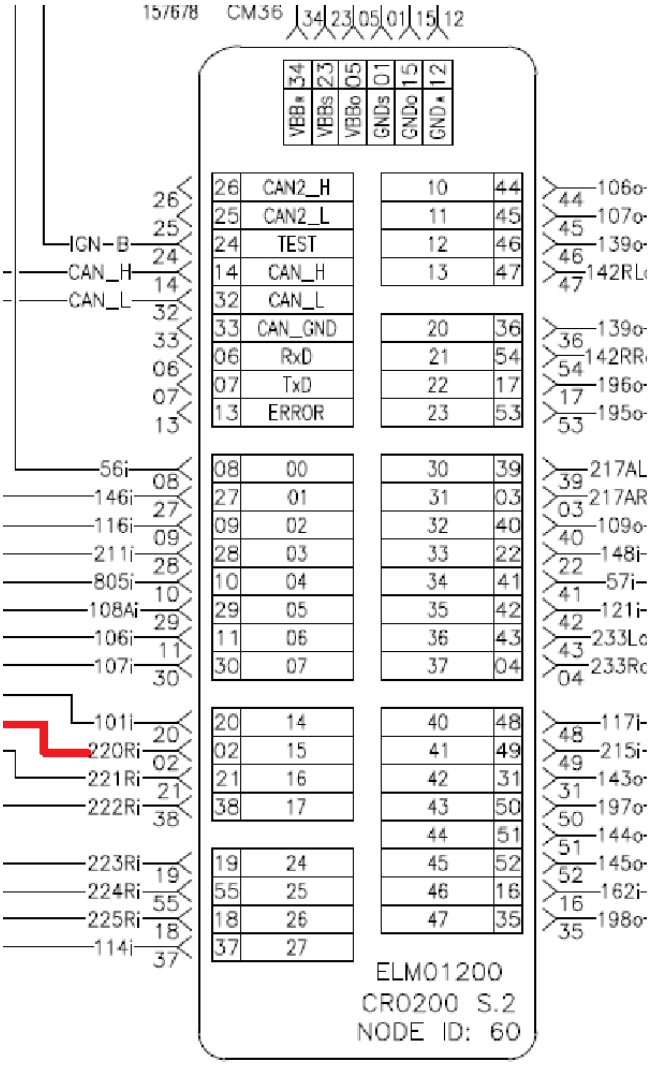
4 b. NO, replace defective external emergency stop switch.

5. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements at Node 50 which is in the following location:

Place the red lead in a backprobe position on pin 02 of the CM36 connector.

Place the black lead on a dedicated battery ground.





Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram repair open/broken connection between Node 60 wire 220Ri and the external emergency stop switch.

Pump Not Started: Left Panic / Pump: Left Panic Bar

This code indicates a situation where the input signal for Node 60 is not being received from the panic bar switch or jumper via wire 104 on the curb side.

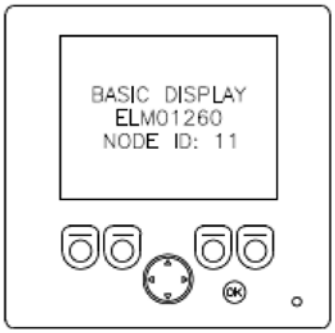
The first code, PUMP NOT STARTED:LEFT PANIC will trigger when the pump is requested to engage when the panic bar is activated or jumper is missing.

PUMP:LEFT PANIC BAR sets in situations where the pump was previously engaged and the panic bar was engaged or jumper signal was lost.

IMPORTANT: Prior to beginning this troubleshooting tree, please verify the panic bars are not depressed or activated, or the presence of the panic bar jumper.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:
   Module (Node) 60
   I40 Wire 117i (i_LeftPanicBar_switch)

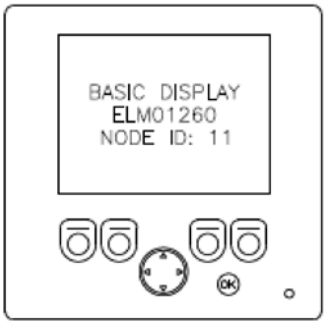


   Is the input highlighted in green?

   1 a. YES, contact Labrie*Plus*.

   1 b. NO, go to STEP 2.

2. Using the Labrie multiplex display, verify you have the following output:
   Module (Node) 50
   I23 Wire IGN-50o (o_Power50_Enable)



Is the output highlighted in green?

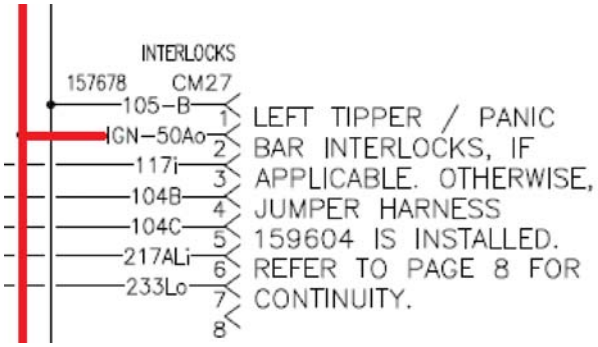
2 a. YES, go to STEP 3.

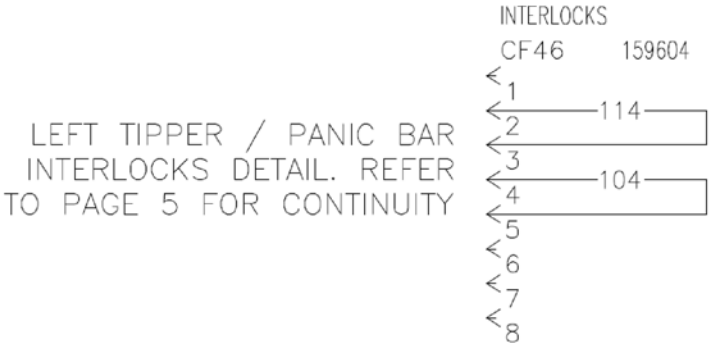
2 b. NO, contact Labrie*Plus*.

3. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM27 pin 2 (o_Power50_Enable).

Place your black lead on a designed battery ground.





Do you have 12VDC?

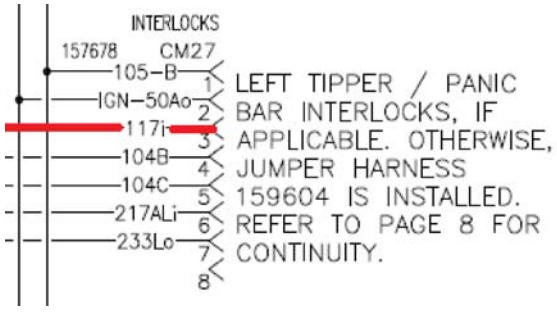
3 a. YES, go to step 4.

3 b. NO, using Labrie wiring diagram, correct open/broken wire between the Node 50 output wire (o_Power50_Enable) and the panic bar switch or the panic bar jumper.

4. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM73 pin 2 (iLeftPanicBar_Switch).

Place your black lead on a designed battery ground.



Do you have 12VDC?

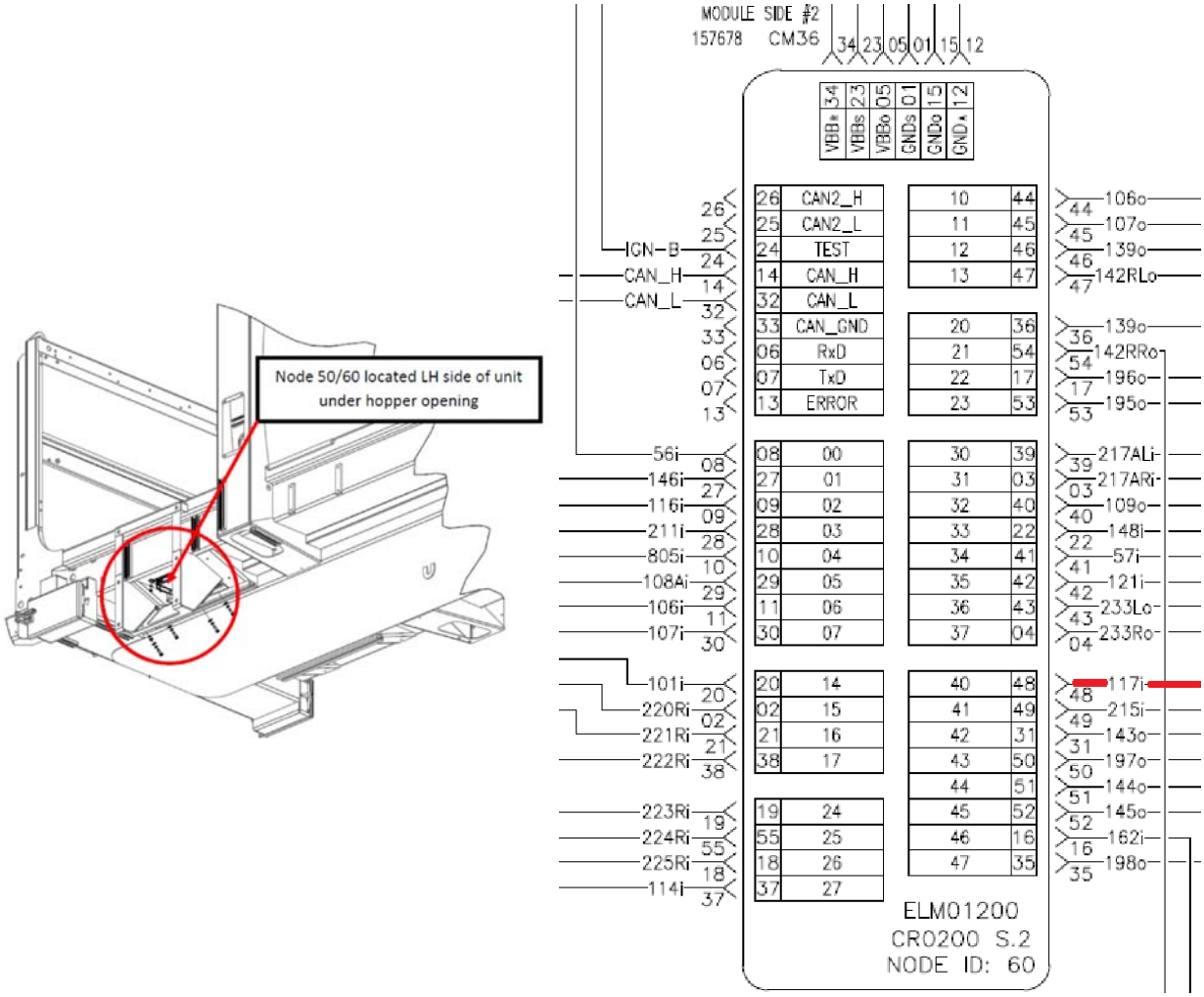
4 a. YES, go to step 5.

4 b. NO, replace the defectie panic bar jumper.

5. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements at Node 60 which is in the following location:

Place the red lead in a backprobe position on pin 48 of the CM36 connector.

Place the black lead on a dedicated battery ground.



Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/broken connection between Node 60 wire 117i and the panic bar switch or the panic bar jumper.

Pump Not Started: Right Panic / Pump: Right Panic

This code indicates a situation where the input signal for Node 60 is not being received from the panic bar switch or jumper via wire 104 on the curb side.

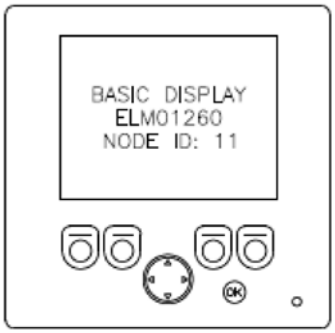
The first code, PUMP NOT STARTED:RIGHT PANIC will trigger when the pump is requested to engage when the panic bar is activated or jumper is missing.

PUMP:RIGHT PANIC BAR sets in situations where the pump was previously engaged and the panic bar was engaged or jumper signal was lost.

IMPORTANT: Prior to beginning this troubleshooting tree, please verify the panic bars are not depressed or activated, or the presence of the panic bar jumper.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:
   Module (Node) 60
   I27 Wire 114i (i_RightPanicBar_switch)

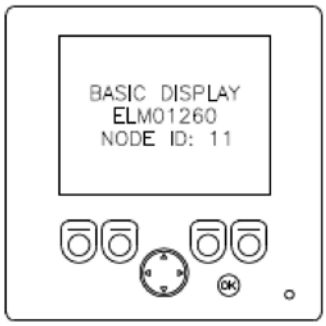


   Is the input highlighted in green?

   1 a. YES, contact Labrie*Plus*.

   1 b. NO, go to STEP 2.

2. Using the Labrie multiplex display, verify you have the following output:
   Module (Node) 50
   I23 Wire IGN-50o (o_Power50_Enable)



Is the output highlighted in green?

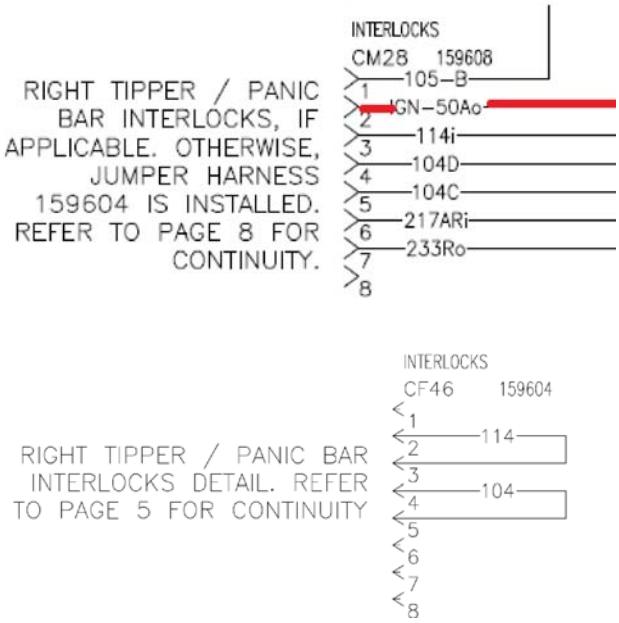
2 a. YES, go to STEP 3.

2 b. NO, contact Labrie*Plus*.

3. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM28 pin 2 (o_Power50_Enable).

Place your black lead on a designed battery ground.



Do you have 12VDC?

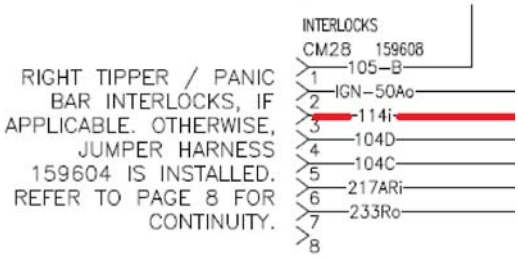
3 a. YES, go to step 4.

3 b. NO, using Labrie wiring diagram, correct open/broken wire between the Node 50 output wire (o_Power50_Enable) and the panic bar switch or the panic bar jumper.

4. Using a digital multimeter set to voltage (DC), perform the following test as described:

Place your red lead on connector CM28 pin 3 (i_RightPanicBar_Switch).

Place your black lead on a designed battery ground.



Do you have 12VDC?

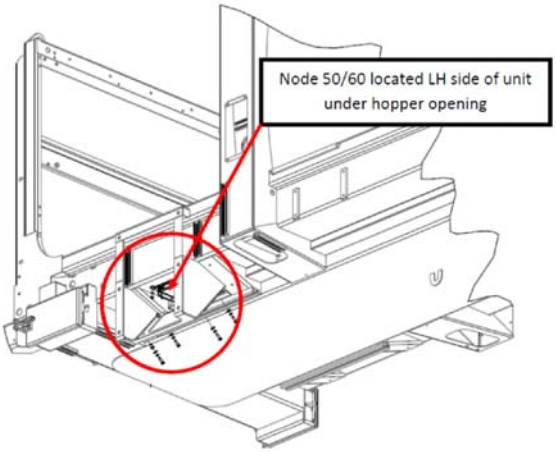
4 a. YES, go to step 5.

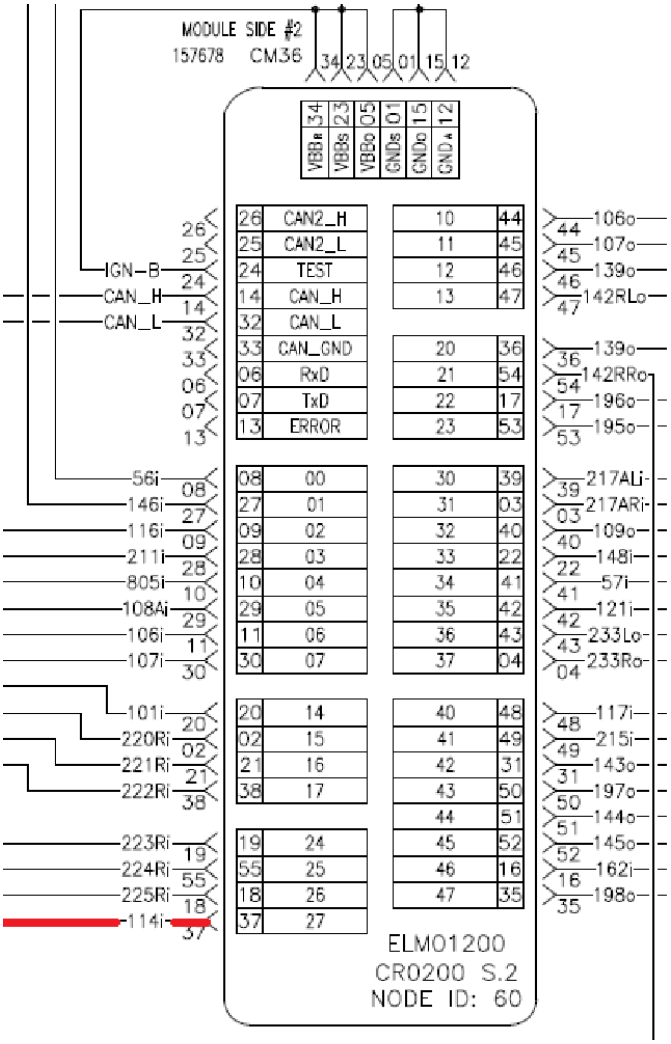
4 b. NO, replace the defective panic bar jumper.

5. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements at Node 60 which is in the following location:

Place the red lead in a backprobe position on pin 37 of the CM36 connector.

Place the black lead on a dedicated battery ground.





Do you have 12VDC?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using Labrie wiring diagram, repair open/broken connection between Node 50 wire 114i and the panic bar switch or the panic bar jumper.

Pump Not Started: Cab EStop

This code indicates that the input voltage (DC) from the emergency stop switch is not returning back to Node 10 via wire 125i.

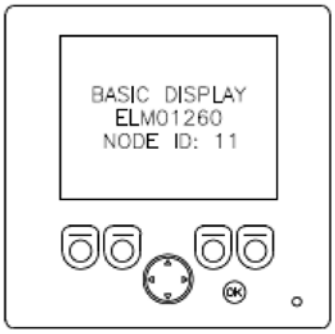
IMPORTANT: Prior to troubleshooting steps below, ensure the cab EStop is pulled up or engaged.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 10

   IN03 Wire 125i (i_EStop_Switch)



   Is the input highlighted in green?

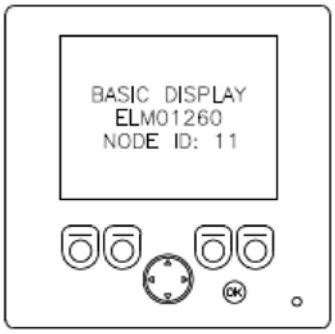
   1 a. YES, go to STEP 5.

   1 b. NO, go to STEP 2.

2. Using the Labrie multiplex display, verify you have the following output:

   Module (Node) 10

   OUT01 Wire IGN-10o (o_Power10_Enable)



   Is the output highlighted in green?

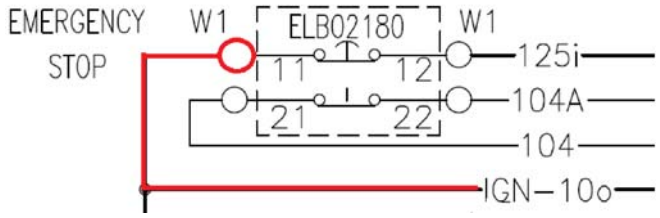
   2 a. YES, go to STEP 3.

   2 b. NO, contact Labrie*Plus*.

3. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

   Red lead on terminal 11 of the cab EStop switch.

Black lead on a designated battery ground.



Do you have 12(VDC) present?

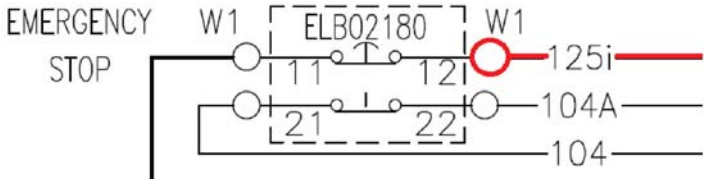
3 a. YES, go to STEP 4.

3 b. NO, using Labrie wiring diagram, repair open between Node 10 output wire IGN-10o, and the cab emergency stop switch.

4. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

Red lead on terminal 12 of the cab EStop switch.

Black lead on a designated battery ground.



Do you have 12(VDC) present?

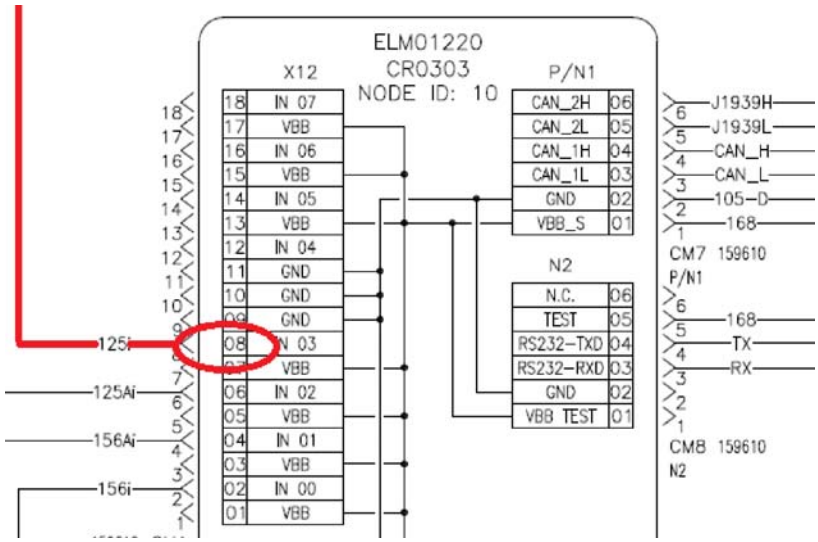
4 a. YES, go to STEP 5.

4 b. NO, replace defective EStop switch.

5. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

Red lead packprobed into Node10, IN03, Wire 125i, Connector X12.

Black lead on designated battery ground.



Do you have 12VDC present?

5 a. YES, contact Labrie*Plus*.

5 b. NO, using the Labrie wiring diagram, repair open in wire 125i between the cab EStop and Node 10.

Pump Not Started: RPM Too High / Pump: RPM Too High

This code is generated when the engine is sending an RPM signal to the Labrie system via J1939 at too high a value.

Using Node 11, we can view J1939 data incoming from the chassis to the Labrie multiplex system using the I/O screen.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify which value you have coming in.

   a) Go to I/O status screen of multiplex display.

   b) Using the directional pad, navigate to highlight the J1939 screen option and depress ok.

   c) Verify engine RPM value coming in from the chassis to the Labrie multiplex system.

Is the value below 900 RPM?

1 a. YES, contact Labrie*Plus*.

1 b. NO, lower RPM to correct speed "OR" contact Labrie*Plus*.

Pump Not Started: Aux Cab EStop

This code indicates that the input voltage (DC) from the auxiliary emergency stop switch is not returning back to Node 10 via wire 125Ai.

IMPORTANT: Prior to troubleshooting steps below, ensure the auxiliary cab EStop is pulled up or engaged.

Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 10

   IN02 Wire 125Ai (i_AuxEStop_switch)

   Is the input highlighted in green?

   1 a. YES, go to STEP 5.

   1 b. NO, go to STEP 2.

2. Using the Labrie multiplex display, verify you have the following output:

   Module (Node) 10

   OUT01 Wire IGN-10o (o_Power10_Enable)

   Is the output highlighted in green?

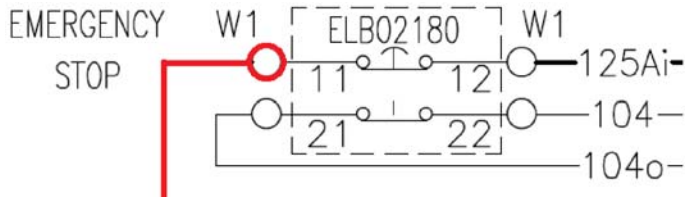
   2 a. YES, go to STEP 3.

   2 b. NO, contact LabriePlus.

3. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

Red lead on terminal 11 of the auxiliary cab EStop switch.

Black lead on a designated battery ground.



Do you have 12(VDC) present?

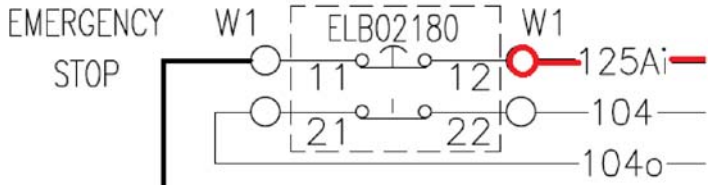
3 a. YES, go to STEP 4.

3 b. NO, using Labrie wiring diagram, repair open between Node 10 output wire IGN-10o and the cab emergency stop switch.

4. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

Red lead on terminal 12 of the auxiliary cab EStop switch.

Black lead on a designated battery ground.



Do you have 12(VDC) present?

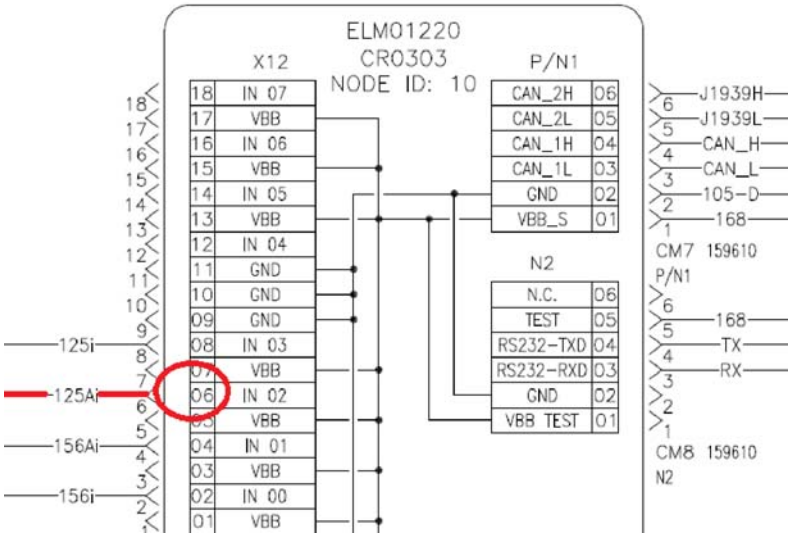
4 a. YES, go to STEP 5.

4 b. NO, replace defective EStop switch.

5. Using a digital multimeter, set to the (DC) scale, perform the following checks at the specified location:

Red lead packprobed into Node10, IN02, Wire 125Ai, Connector X12.

Black lead on designated battery ground.



Do you have 12VDC present?

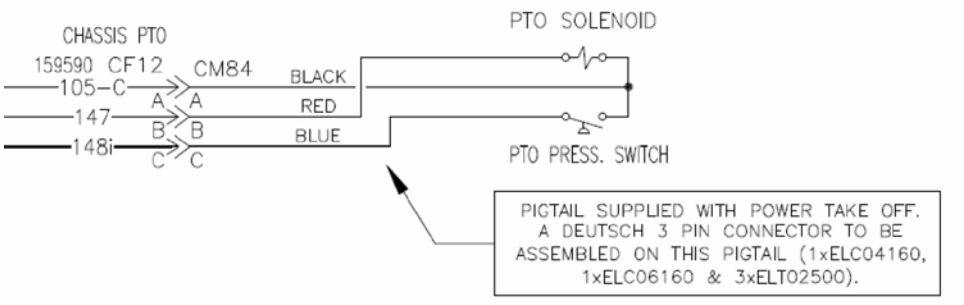
5 a. YES, contact Labrie*Plus*.

5 b. NO, using the Labrie wiring diagram, repair open in wire 125Ai between the cab auxiliary EStop and Node 10.

Pump: PTO Pressure Not OK

This code indicates an issue is present with the PTO circuit pertaining directly to the PTO solenoid activation feedback input wire 148i to Node 60.

NOTE: This is not to be confused with the sister code PUMP: TRANS NOT OK.

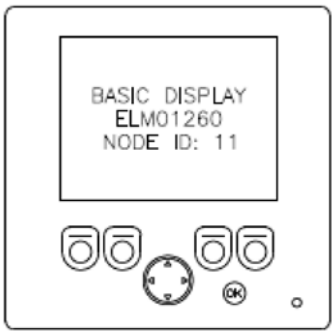


Diagnostic Procedure:

1. Using the Labrie multiplex display, verify you have the following input:

   Module (Node) 60

   I33 Wire 148i i_PTOPressureNotOK_Switch



   Is input status green?

   1 a. YES, contact Labrie*Plus*.

   1 b. NO, go to step 2.

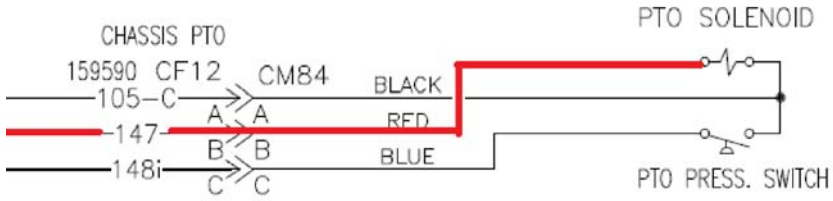
2. Using a digital multimeter set to the voltage (DC) scale, perform the following measurements as outlined in the steps below:

   Connector CF12

   Pin B wire 147

   Red lead on pin B

   Black lead on dedicated battery ground.



Do you have at least 12VDC?

2 a. YES, go to Step 3.

2 b. NO, using Labrie wiring schematic, repair open in wire 147 from pump relay to connector CF12.

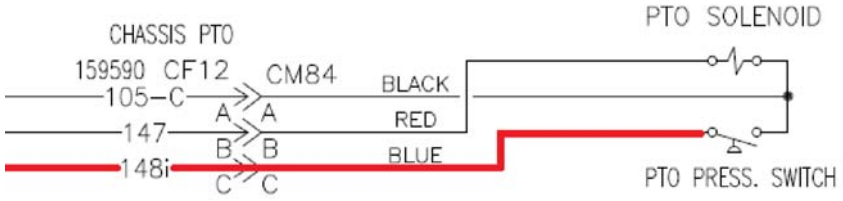
3. Using a digital multimeter set to the resistance (OHMS) scale, perform the following measurement as outlined in the steps below:

Connector CF12

Pin c wire 148i

Red lead on pin C

Black lead on a dedicated battery ground



Do you have good continuity?

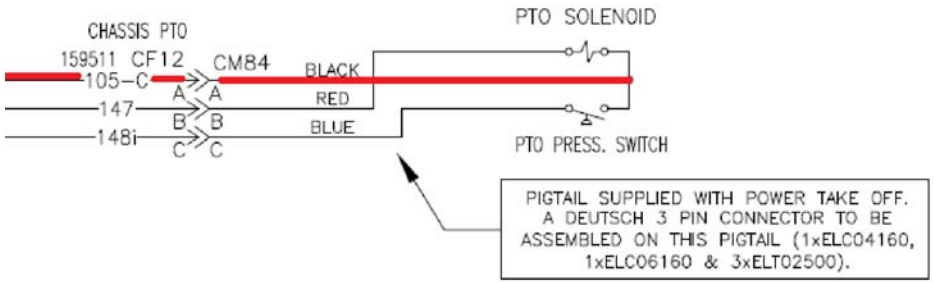
3 a. YES, go to STEP 4.

3 b. NO, repair or replace defective PTO pressure switch.

4. Using a digital multimeter set to the resistance (Ohms) scale, perform the following measurement as outlined in the steps below:

Red lead on pin A wire 105-C.

Black lead on a dedicated battery ground.

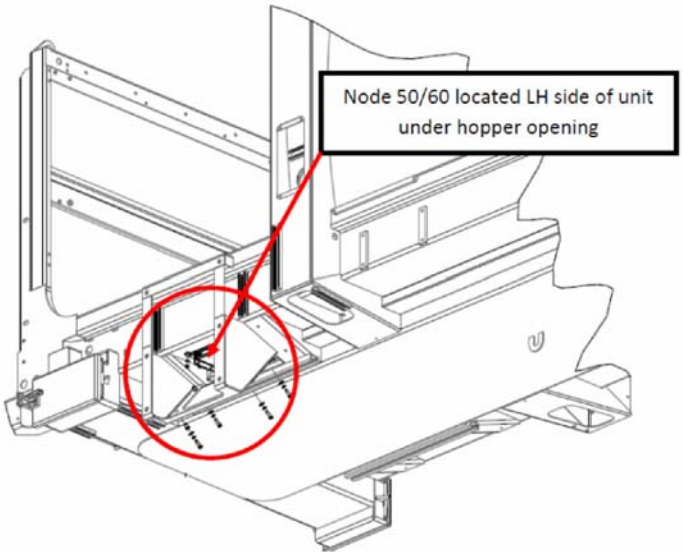


Do you have between 0-2 Ohms?

4 a. YES, go to STEP 5.

4 b. NO, using Labrie wiring diagram, repair damaged ground wire 105-C.

5. Locate Node 60 module at the following location:

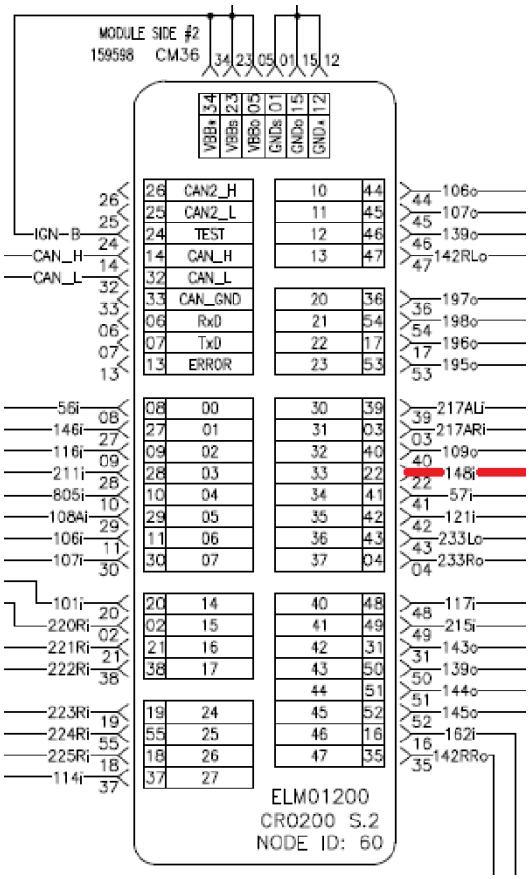


6. Using a digital volt multimeter, locate connector CM36 (Node 60 module connector) and perform tests as outlined below:

With your multimeter, set to the resistance (OHMS) scale.

Red lead backprobed into Node 60 CM36 connector, pin 22, wire 148i.

Black lead on dedicated battery ground.



Do you have 12VDC?

6 a. YES, contact Labrie*Plus*.

6 b. NO, using Labrie wiring schematic, repair open wire between PTO pressure switch and Node 60 via wire 148i.

Pump: Trans Not OK

This code indicates a breakdown in one of the two portions of the pump circuit.

NOTE: This is not to be confused with the sister code PUMP: PTO NOT OK.

While a variety of input and outputs are required to operate the pump circuit, only two wires can cause this specific failure: wire 104o and wire 149i. Wire 104o originates at Node 10. When the pump switch is depressed, voltage is sent out through wire 104o. Wire 104o is used to sense that all safety features are met and terminates as an input into the Transmission Control Module as "Pump Request Chassis". The 104 circuit acts as a simple request circuit to ask the chassis for a return signal after stating the body is safe to allow pump engagement.

When the transmission parameters are met, a return signal via wire 149i sends voltage to two specific locations. The first 149i runs to is Node 10 as input "Pump Running Chassis" and the second location is spade location 1 of the pump relay.

A breakdown in either of these circuits will cause this error code to manifest.

IMPORTANT: It should be noted, specifically with wire 149i, the system may believe the pump is engaged but due to a broken splice or other fault the relay may not latch. This situation would prevent voltage from passing through the relay to the dump valves thus preventing hydraulic function despite the fact that Node 10 is seeing power on wire 149i. This scenario would not result in a "PUMP: TRANS NOT OK" code.

The method outlined below can be used in conjunction with the unit specific diagnostic manuals. Only basic tools are needed for this troubleshooting: a quality multimeter (preferably used with back probe leads), assorted screwdrivers, and a set of cutting pliers (for removing zip ties).

NOTE: Accurate diagnostic information will require use of the body serial number specific electrical schematics. This ensures correct connection information as connector/wire numbers are dependent on chassis manufacturer as well as whether or not a Labrie cab conversion has been performed.

Diagnostic Procedure:

1. With the engine running, attempt to engage the pump and verify the complaint.

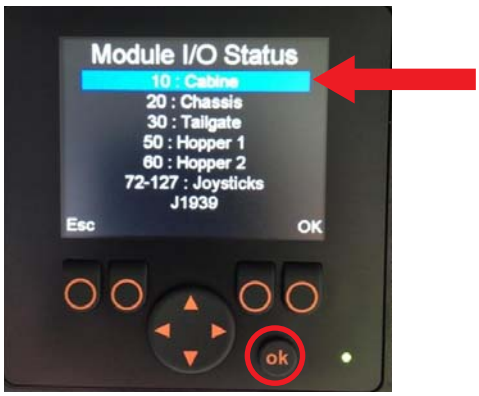
   If the display screen shows "PUMP: TRANS NOT OK", continue to step #2.

2. Cycle the key "OFF" and to the "ON" position only.

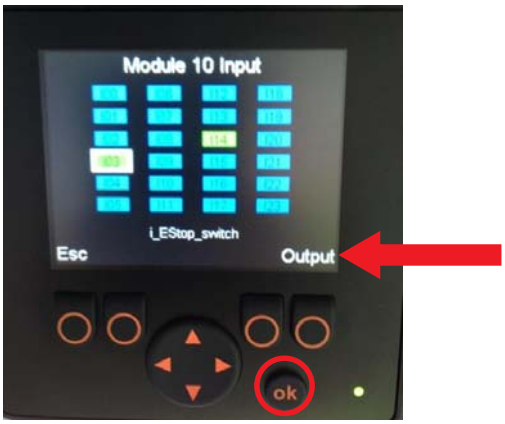
   Starting the engine is not necessary. Utilizing the Labrie multiplex display, perform the following steps:

   2 a. Depress "MENU", then select "I/O status".

2 b. Select the top most Module: “10_cabine”



2 c. Once in the Module 10 screen, depress the “OUTPUT” button.



2 d. After entering the Output screen, select the “Force” feature.

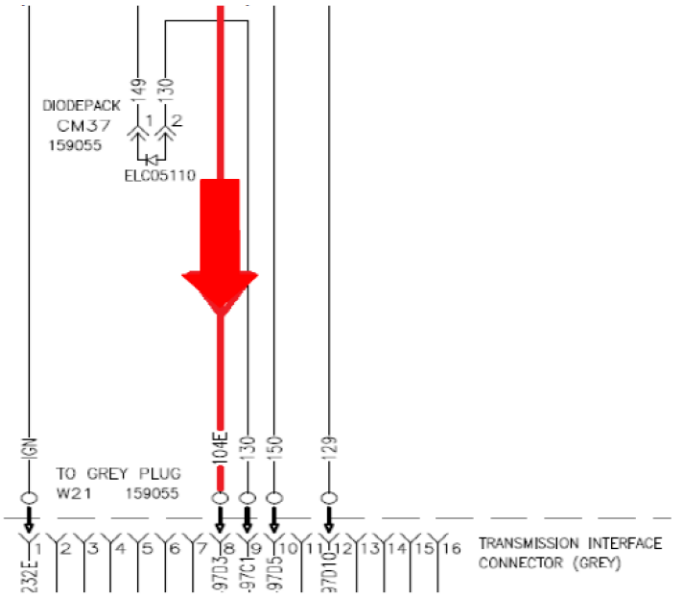
After selecting "Force" a countdown will begin.

2 e. At the end of the countdown, depress the "OK" button to enter the Force menu.

Note the addition of "Force Active" in the center of the screen. This makes the technician aware that force mode has been entered successfully. Also note the buttons on the far right have become an "ON" and "OFF" toggle.

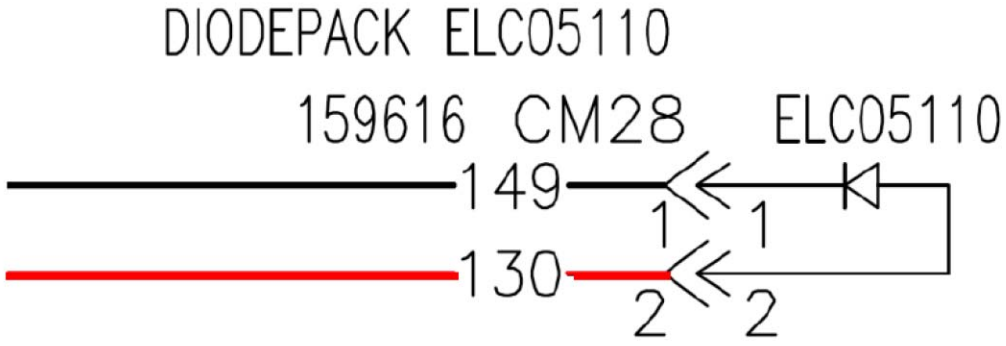
3. Locate output "OUT 12" and force it "ON". With this output forced, move to the appropriate Labrie/chassis interface connector (see body serial number specific drawings for exact connector number). Measure voltage on the pump trans request wire (104E). **If voltage is present**, proceed to step #4.

   If no voltage is present, verify that voltage is leaving Node 10, wire 104o, pin 02, connector X20. **If voltage is not** leaving the module then Node 10 is defective/damaged: replace it. **If voltage is** leaving the module then there is one of two issues: either a break in the wiring caused by an Emergency stop switch/panic bar or an outside fault (such as an abraded/cut wire, corrosion/water in a connector, etc.) is present. Repair the 104 wire before proceeding to step #4.

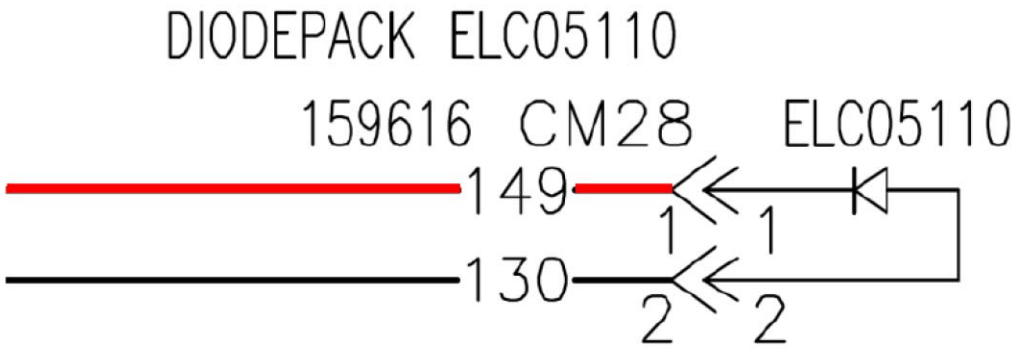


4. Locate wire 130 on the same chassis interface connector and check for voltage. **If no voltage** is present then the transmission's parameters for pump engagement are not met. Service the transmission and/or TCM. **If voltage is** present on wire 130 then locate the diode pack that is located on wire 130 (where the wire number transitions to wire 149). Remove the diode and proceed to step #5.
5. Set multimeter to diode setting, place the red lead on pin 2 and the black lead on pin 1.

   An audible signal indicating continuity through the diode will sound.



Next place the red lead on pin 1 and black lead on pin 2. No audible signal indicating continuity for the diode should sound.



If the diode passed the above test proceed to step #6. **If the diode did not pass** the above test replace the diode and then proceed to step #6.

NOTE: Connector CM28 and wire 149 on the illustrations are for reference only; the specific connector and wire numbers may vary. To find the diode on the wiring schematic, locate wire #130 and trace it to the diode pack, typically on page 1.

6. Reconnect the diode onto wires 130 and 149. Check for voltage on wire 149.

   If voltage is not present then the diode continuity check was performed incorrectly. Replace the diode. **If voltage is present** on wire 149 then proceed to step #7.

7. Locate wire 149 at Node 10, connector X10, pin 16 AND spade location 1 of the pump relay. Check for voltage.

   If voltage is present then the node 10 is defective/damaged: replace it. **If no voltage is present** then the 149 wire is broken between the diode location and Node 10. Locate the break and repair.

Node XX Disconnected

This code is generated when a module (Node) XX on the Labrie system is failing to communicate with module (Node) 10 over the CAN (communication area network).

IMPORTANT: For Node Not Connected, use NODE XX NOT CONNECTED troubleshooting tree.

NOTE: Use the appropriate NODE ID below to follow correct module diagnostic steps.

Modules (Nodes) which can be affected by either above listed issue on the Wittke frontloader are:

- STANDARD

  10 (Cabine) Located inside the cab

  11 (Display) Located inside the cab next to main console.

  12 (Switch bank *primary*) Located inside the cab as part of the main console.

  50/60 (Body front) This is a dual module and is located on the front packer bulkhead of the body.
- OPTIONAL

  13 (Switch bank *secondary*) Located inside the cab as part of the main console.

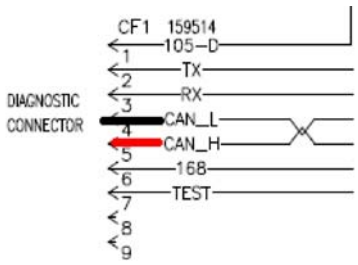
Node 10 Disconnected

Diagnostic Procedure:

1. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab:

   PIN 4 Wire CAN L (black lead)

   PIN 5 Wire CAN H (read lead)



   Do you have 60 Ohms resistance?

   1 a. YES, go to step 2.

   1 b. NO, go to step 3.

2. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab:

   a) PIN 4 Wire CAN L (red lead)

   b) BATTERY GROUND (black lead)

   Was any resistance indicated?

   2 a. YES, repair short to ground on CAN L wire.

   2 b. NO, continue to CAN H test.

   a) PIN 5 Wire CAN H (red lead)

   b) BATTERY GROUND (black lead)

   Was any resistance indicated?

   2 c. YES, repair short to ground on CAN H wire.

   2 d. NO, connect all previously disconnected connections and proceed to STEP 6.

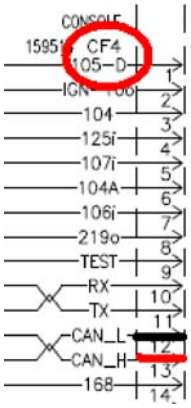
3. Using a digital multimeter set to the Ohms scale, perform the following checks:

   a) Locate connector CF4 (located inside the cab) and disconnect it.

   b) Connect your multimeter as follows:

      a. PIN 12 Wire CAN L (black lead)

      b. PIN 13 Wire CAN H (red lead)



Do you have 120 Ohms?

3 a. YES, proceed to STEP 4.

3 b. NO, proceed to STEP 5.

4. Using a digital multimeter set to the Ohms scale, perform the following checks:

NOTE: Connector CF4 from STEP 3 should still be disconnected.

a) Locate module (Node) 50 *dual module* and remove connector CM1.

b) Connect your multimeter as follows:

a. PIN 14 Wire CAN H (red lead)

b. PIN 32 Wire CAN L (black lead)

Do you have 120 Ohms?

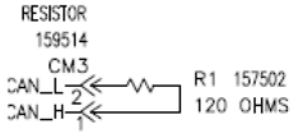
4 a. YES, connect all previously disconnected connections and proceed to STEP 6.

4 b. NO, continue to STEP 7.

5. Inside the cab, locate module (Node) 10 and locate connector CM3. Follow the outlined steps using a digital multimeter:

a) Disconnect end line resistor and measure using the Ohms scale of your multimeter.

b) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

5 a. YES, continue to STEP 4.

5 b. NO, replace terminating end line resistor.

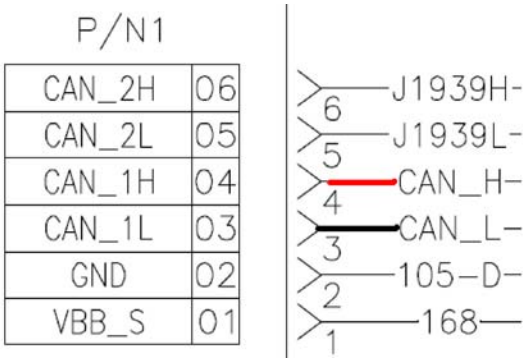
6. Locate module (Node) 10 and locate connector P/N1. Follow the outlined steps using a digital multimeter:

a) Disconnect connector P/N1.

b) Measure resistance (Ohms) placing the leads as follows:

a. PIN 4 CAN H (red lead)

b. PIN 3 CAN L (black lead)



Do you have 60 Ohms?

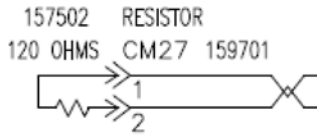
6 a. YES, contact Labrie*Plus*.

6 b. NO, repair open connection in harness.

7. Inside the body, locate module (Node) 30 and locate connector CM27. Follow the outlined steps using a digital multimeter:

c) Disconnect end line resistor (connector CM27) and measure using the Ohms scale of your multimeter.

d) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

7 a. YES, connect all previously disconnected connections and proceed to STEP 6.

7 b. NO, replace terminating end line resistor.

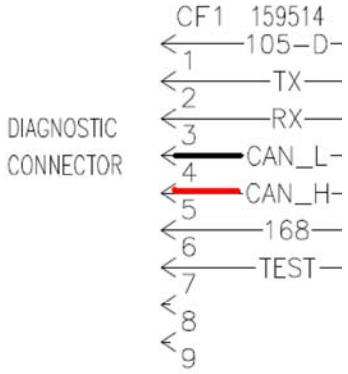
Node 11 Disconnected

Diagnostic Procedure:

1. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab on the console:

   PIN 4 Wire CAN L (black lead)

   PIN 5 Wire CAN H (red lead)



   Do you have 60 Ohms resistance?

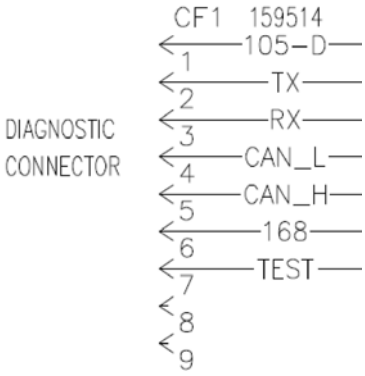
   1 a. YES, go to STEP 2.

   1 b. NO, go to STEP 3.

2. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab:

   c) PIN 4 Wire CANL (red lead)

   d) BATTERY GROUND (black lead)



   Was any resistance indicated?

   2 a. YES, repair short to ground on CAN L wire.

   2 b. NO, continue to CAN H test.

   c) PIN 5 Wire CAN H (red lead)

d) BATTERY GROUND (black lead)

Was any resistance indicated?

2 c. YES, repair short to ground on CAN H wire.

2 d. NO, connect all previously disconnected connections and proceed to STEP 6.

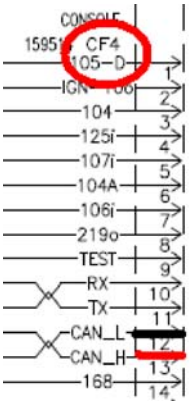
3. Using a digital multimeter set to the Ohms scale, perform the following checks:

c) Locate connector CF4 (located inside the cab) and disconnect it.

d) Connect your multimeter as follows:

a. PIN 12 Wire CAN L (black lead)

b. PIN 13 Wire CAN H (red lead)



Do you have 120 Ohms?

3 a. YES, proceed to STEP 4.

3 b. NO, proceed to STEP 5.

4. Using a digital multimeter set to the Ohms scale, perform the following checks:

NOTE: Connector CF4 from STEP 3 should still be disconnected.

c) Locate module (Node) 50 *dual module* and remove connector CM1.

d) Connect your multimeter as follows:

a. PIN 14 Wire CAN H (red lead)

b. PIN 32 Wire CAN L (black lead)

Do you have 120 Ohms?

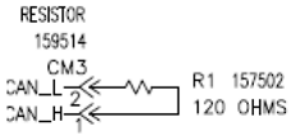
4 a. YES, connect all previously disconnected connections and proceed to STEP 6.

4 b. NO, continue to STEP 7.

5. Inside the cab, locate module (Node) 10 and locate connector CM3. Follow the outlined steps using a digital multimeter:

e) Disconnect end line resistor and measure using the Ohms scale of your multimeter.

f) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

5 a. YES, continue to STEP 4.

5 b. NO, replace terminating end line resistor.

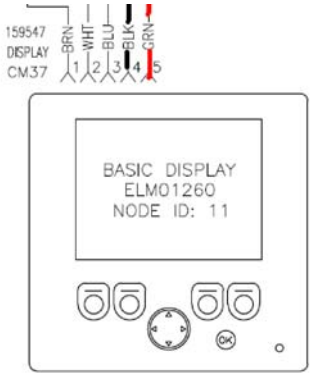
6. Locate module (Node) 11 and locate connector CM37. Follow the outlined steps using a digital multimeter:

c) Disconnect connector CM37.

d) Measure resistance (Ohms) placing the leads as follows:

a. PIN 4 CAN H (red lead)

b. PIN 5 CAN L (black lead)



Do you have 60 Ohms?

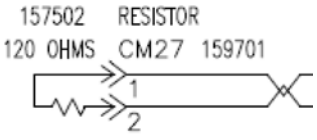
6 a. YES, contact Labrie*Plus*.

6 b. NO, repair open connection in harness.

7. Inside the body, locate module (Node) 30 and locate connector CM27. Follow the outlined steps using a digital multimeter:

g) Disconnect end line resistor (connector CM27) and measure using the Ohms scale of your multimeter.

h) *NOTE* this is not polarity sensitive!!!!



Do you have 120 Ohms?

7 a. YES, connect all previously disconnected connections and proceed to STEP 6.

7 b. NO, replace terminating end line resistor.

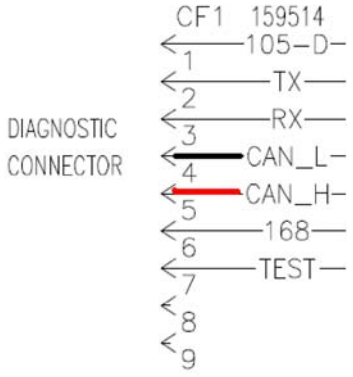
Node 12/13 Disconnected

Diagnostic Procedure:

1. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab on the console:

   PIN 4 Wire CAN L (black lead)

   PIN 5 Wire CAN H (red lead)



   Do you have 60 Ohms resistance?

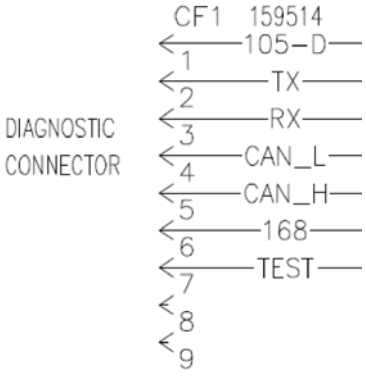
   1 a. YES, go to STEP 2.

   1 b. NO, go to STEP 3.

2. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab:

   e) PIN 4 Wire CAN L (red lead)

   f) BATTERY GROUND (black lead)



   Was any resistance indicated?

   2 a. YES, repair short to ground on CAN L wire.

   2 b. NO, continue to CAN H test.

   e) PIN 5 Wire CAN H (red lead)

f) BATTERY GROUND (black lead)

Was any resistance indicated?

2 c. YES, repair short to ground on CAN H wire.

2 d. NO, connect all previously disconnected connections and proceed to STEP 6.

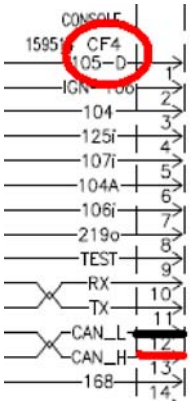
3. Using a digital multimeter set to the Ohms scale, perform the following checks:

e) Locate connector CF4 (located inside the cab) and disconnect it.

f) Connect your multimeter as follows:

a. PIN 12 Wire CAN L (black lead)

b. PIN 13 Wire CAN H (red lead)



Do you have 120 Ohms?

3 a. YES, proceed to STEP 4.

3 b. NO, proceed to STEP 5.

4. Using a digital multimeter set to the Ohms scale, perform the following checks:

NOTE: Connector CF4 from STEP 3 should still be disconnected.

e) Locate module (Node) 50 *dual module* and remove connector CM1.

f) Connect your multimeter as follows:

a. PIN 14 Wire CAN H (red lead)

b. PIN 32 Wire CAN L (black lead)

Do you have 120 Ohms?

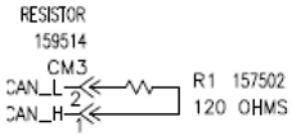
4 a. YES, connect all previously disconnected connections and proceed to STEP 6.

4 b. NO, continue to STEP 7.

5. Inside the cab, locate module (Node) 10 and locate connector CM3. Follow the outlined steps using a digital multimeter:

i) Disconnect end line resistor and measure using the Ohms scale of your multimeter.

j) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

5 a. YES, continue to STEP 4.

5 b. NO, replace terminating end line resistor.

6. Locate module (Node) 12/13 and locate the following connector:

- (Node 12) CM1
- (Node 13) CM2

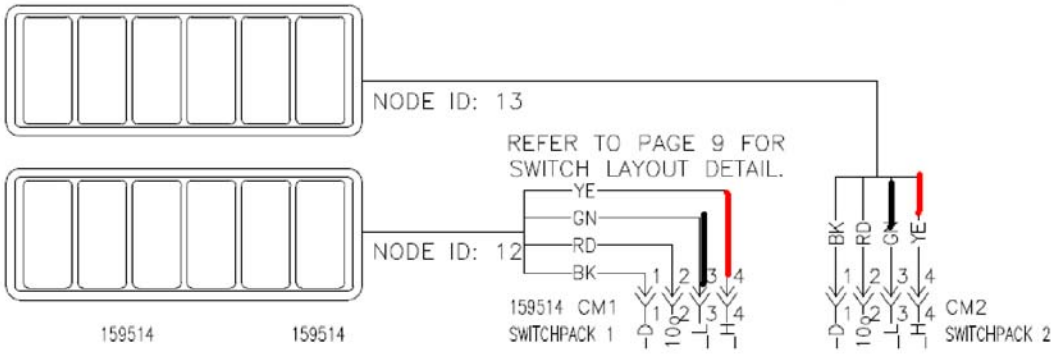
Follow the outlined steps using a digital multimeter:

e) Disconnect connector for appropriate Node.

f) Measure resistance (Ohms) placing the leads as follows:

a. PIN 4 CAN H (red lead)

b. PIN 3 CAN L (black lead)



Do you have 60 Ohms?

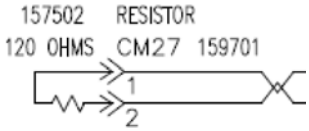
6 a. YES, contact Labrie*Plus.*

6 b. NO, repair open connection in harness.

7. Inside the body, locate module (Node) 30 and locate connector CM27. Follow the outlined steps using a digital multimeter:

k) Disconnect end line resistor (connector CM27) and measure using the Ohms scale of your multimeter.

l) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

7 a. YES, connect all previously disconnected connections and proceed to STEP 6.

7 b. NO, replace terminating end line resistor.

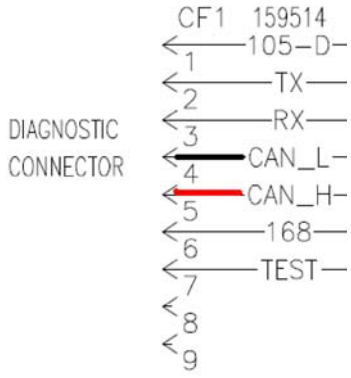
Node 50/60 Disconnected

Diagnostic Procedure:

1. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab on the console:

   PIN 4 Wire CAN L (black lead)

   PIN 5 Wire CAN H (red lead)



   Do you have 60 Ohms resistance?

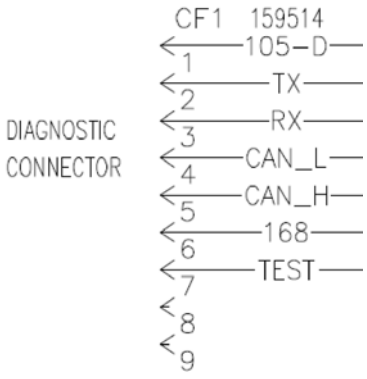
   1 a. YES, go to STEP 2.

   1 b. NO, go to STEP 3.

2. With the ignition and battery disconnect turned off (where applicable), use a digital multimeter set to the Ohms scale and measure as follows at the Labrie diagnostic connector located inside the cab:

   a) PIN 4 Wire CAN L (red lead)

   b) BATTERY GROUND (black lead)



   Was any resistance indicated?

   2 a. YES, repair short to ground on CAN L wire.

   2 b. NO, continue to CAN H test.

   c) PIN 5 Wire CAN H (red lead)

d) BATTERY GROUND (black lead)

Was any resistance indicated?

2 c. YES, repair short to ground on CAN H wire.

2 d. NO, connect all previously disconnected connections and proceed to STEP 6.

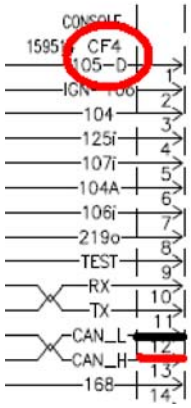
3. Using a digital multimeter set to the Ohms scale, perform the following checks:

a) Locate connector CF4 (located inside the cab) and disconnect it.

b) Connect your multimeter as follows:

a. PIN 12 Wire CAN L (black lead)

b. PIN 13 Wire CAN H (red lead)



Do you have 120 Ohms?

3 a. YES, proceed to STEP 4.

3 b. NO, proceed to STEP 5.

4. Using a digital multimeter set to the Ohms scale, perform the following checks:

NOTE: Connector CF4 from STEP 3 should still be disconnected.

a) Locate module (Node) 50 *dual module* and remove connector CM1.

b) Connect your multimeter as follows:

a. PIN 14 Wire CAN H (red lead)

b. PIN 32 Wire CAN L (black lead)

Do you have 120 Ohms?

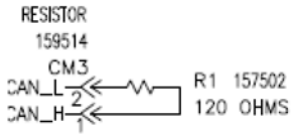
4 a. YES, connect all previously disconnected connections and proceed to STEP 6.

4 b. NO, continue to STEP 7.

5. Inside the cab, locate module (Node) 10 and locate connector CM3. Follow the outlined steps using a digital multimeter:

a) Disconnect end line resistor and measure using the Ohms scale of your multimeter.

b) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

5 a. YES, continue to STEP 4.

5 b. NO, replace terminating end line resistor.

6. Locate module (Node) 50/60 and locate the following connectors:

- (Node 50) CM1
- (Node 60) CM2

Follow the outlined steps using a digital multimeter:

a) Disconnect connector for appropriate Node.

b) Measure resistance (Ohms) placing the leads as follows:

a. PIN 14 CAN H (red lead)

b. PIN 32 CAN L (black lead)

Do you have 60 Ohms?

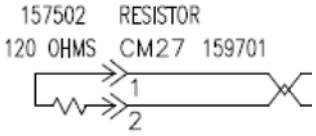
6 a. YES, contact Labrie*Plus*.

6 b. NO, repair open connection in harness.

7. Inside the body, locate module (Node) 30 and locate connector CM27. Follow the outlined steps using a digital multimeter:

a) Disconnect end line resistor (connector CM27) and measure using the Ohms scale of your multimeter.

b) *NOTE* this is <u>not</u> polarity sensitive!!!!



Do you have 120 Ohms?

7 a. YES, connect all previously disconnected connections and proceed to STEP 6.

7 b. NO, replace terminating end line resistor.

Node XX Not Connected

This code is generated when a module (Node) XX on the Labrie system is failing to communicate with module (Node) 10 over the CAN (communication area network) on the first 10 seconds of power up.

NOTE: For Node disconnected, use NODE XX DISCONNECTED troubleshooting tree.

IMPORTANT: Use the appropriate NODE ID below to follow correct module diagnostic steps.

Modules (Nodes) which can be affected by either above listed issue on the Wittke frontloader are:

- STANDARD

  10 (Cabine) Located inside the cab.

  11 (Display) Located inside the cab next to main console.

  12 (Switch bank *primary*) Located inside the cab as part of the main console.

  30 (Tailgate controller) Located inside the rear chassis frame rail.

  50/60 (Body front) This is a dual module and is located on the front packer bulkhead of the body.

- OPTIONAL

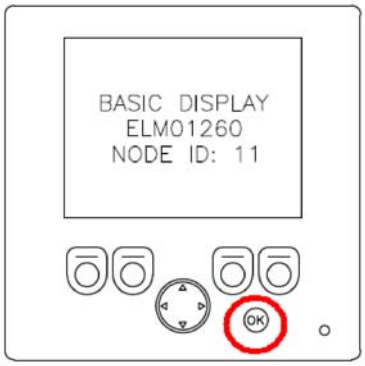
  13 (Switch bank *secondary*) Located inside the cab as part of the main console.

  25 (Switch bank *outside controls*) Located on side of unit outside the cab for external arm/ packer operation.

Use this one-step procedure listed for any and all modules displaying this code.

Procedure:

1. 10 seconds after power up, use the Labrie multiplex display to depress the “OK” button.



Code should disappear at this time.

Did all active codes clear from the display?

1 a. YES, issue resolved.

1 b. NO, contact Labrie*Plus*.

Reward!

To the first person to notify us of an error in any of our publications!

If you find what you believe to be an error in any of our publications please complete the requested information and return the form to us by email. If you are the first, you will receive a hat by return mail.

I believe I found an error:

In the _____ manual | Part No. _____ | Page(s) _____

It should say: _____

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labrie

THANKS FOR YOUR HELP!

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CERTIFIED BNQ ISO 9001:2008 SYSTEM

Part # 000000 (rev.00.00.0000)