



Doosan Infracore
Portable Power

ELECTRONIC SERVICE MANUAL

COMPRESSOR MODELS

P425WCU-EX-T2 (F66)
HP375WCU-EX-T2 (F67)
XP375WCU-EX-T2 (F65)
P425WCU-EX-T2 (G02)
HP375WCU-EX-T2 (G03)
XP375WCU-EX-T2 (G04)

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General Information

Operational Theory

The P425/XP375/HP375WCU-EX-T2 compressor has an electronic system using the Titan controller to provide discharge air pressure control and package monitoring functions. The electrical system connects all the necessary switches, sensors, and transducers to the Titan controller.

Titan Controller

The Titan controller is the heart of the compressor monitoring and control system and provides data collection, package monitoring, and control functions for compressor operations. The Titan controller is a microprocessor-based controller with analog and digital inputs and outputs.

The Titan controller is mounted on the liftbail in the middle of compressor.

The first function of the Titan controller is to scan all inputs at a fixed interval. The analog values are compared to preset minimum and maximum values and an ALERT or FAULT is issued when a value is out of range. The various ALERTS and FAULTS are listed in the Compressor Diagnostic Code Troubleshooting section.

The second function of the Titan controller is compressor discharge pressure control. The Titan monitors the regulation system air pressure and varies the engine throttle to maintain the setpoint discharge air pressure. The setpoint pressure is set by adjusting the pressure regulator.

The third function of the Titan controller is to communicate diagnostic and control information between the Titan, Micro-Port display, and other optional controllers via the J1939 CAN network.

Temperature Sensors and Pressure Transducers

The electronics system uses temperature sensors and pressure transducers to monitor the compressor operation. The temperature sensors used to measure compressor temperatures are thermistor type devices. The resistance output of the temperature sensor changes with a corresponding temperature change of the parameter being monitored. The Titan controller receives the resistance value of the sensor and converts it to a temperature value. The Titan uses the temperature value to ensure the parameter being monitored is within its operating limits and relays the value to the Micro-Port display for operator viewing.

The pressure sensors used to measure compressor pressures are transducer type devices. These sensors have an output signal range of 0.5 VDC to 4.5 VDC, where 0.5 VDC corresponds to 0 PSI and 4.5 VDC corresponds to the maximum PSI rating for a particular transducer. Pressure sensors are provided with 5 VDC excitation voltage from the Titan controller. Also, the sensor return or ground connects to the Titan controller. The output voltage of the pressure sensor changes with a corresponding pressure change of the parameter being monitored. The Titan controller receives the voltage of the sensor and converts it to a pressure value. The Titan uses the pressure value to ensure the parameter being monitored is within its operating limits and relays the value to the Service Air Pressure gauge display for operator viewing.

The Titan controller scans digital inputs such as switch contacts. Inputs are 24 VDC, 12 VDC, or 0 VDC. Digital inputs with 24 VDC or 12 VDC represent a closed switch contact. Digital inputs with 0 VDC represent an open switch contact.

The Titan controller provides 12 VDC digital outputs to control solenoids, relays, and other devices. Outputs are 12 VDC ON and 0 VDC OFF and are current limited and short circuit protected.

The Titan controller has 12 VDC digital (ON/OFF) type outputs.

Micro-Port Display

The Micro-Port displays compressor and engine operational information to the operator. The Micro-Port display can be navigated by using the UP, DOWN, and ENTER buttons on the Keypad.

The Micro-Port display is connected to the J1939 CAN network for communication with other devices on the network.

J1939 CAN Network

The J1939 CAN network is a twisted pair of wires located in the compressor and engine harnesses. These wires are the network link between all electronic control modules. The wires are color coded yellow and dark green. The yellow wire is referred to as CAN High (+) and the dark green wire is referred to as CAN Low (-). **Figure 1-2** shows the connection layout of the CAN network.

Located on each end of the J1939 CAN network are termination resistors (terminator). The terminators prevent reflections on the transmission line and must be in place for the network to function properly.

Electrical System

The electrical system consists of the wiring harnesses and associated electrical devices such as relays, switches, sensors, and solenoids. There are three wiring harnesses on this compressor:

- Compressor and Engine Harness
- Engine Intake Air Heater Harness

Figure 1-3 shows the connection layout of the harness system.

The electrical circuits are protected by fuses. A fuse should only be replaced with one of the same rating. Installing a larger rated fuse could lead to wiring harness damage.

Figure 1-2 : J1939 CAN BUS CONNECTION LAYOUT

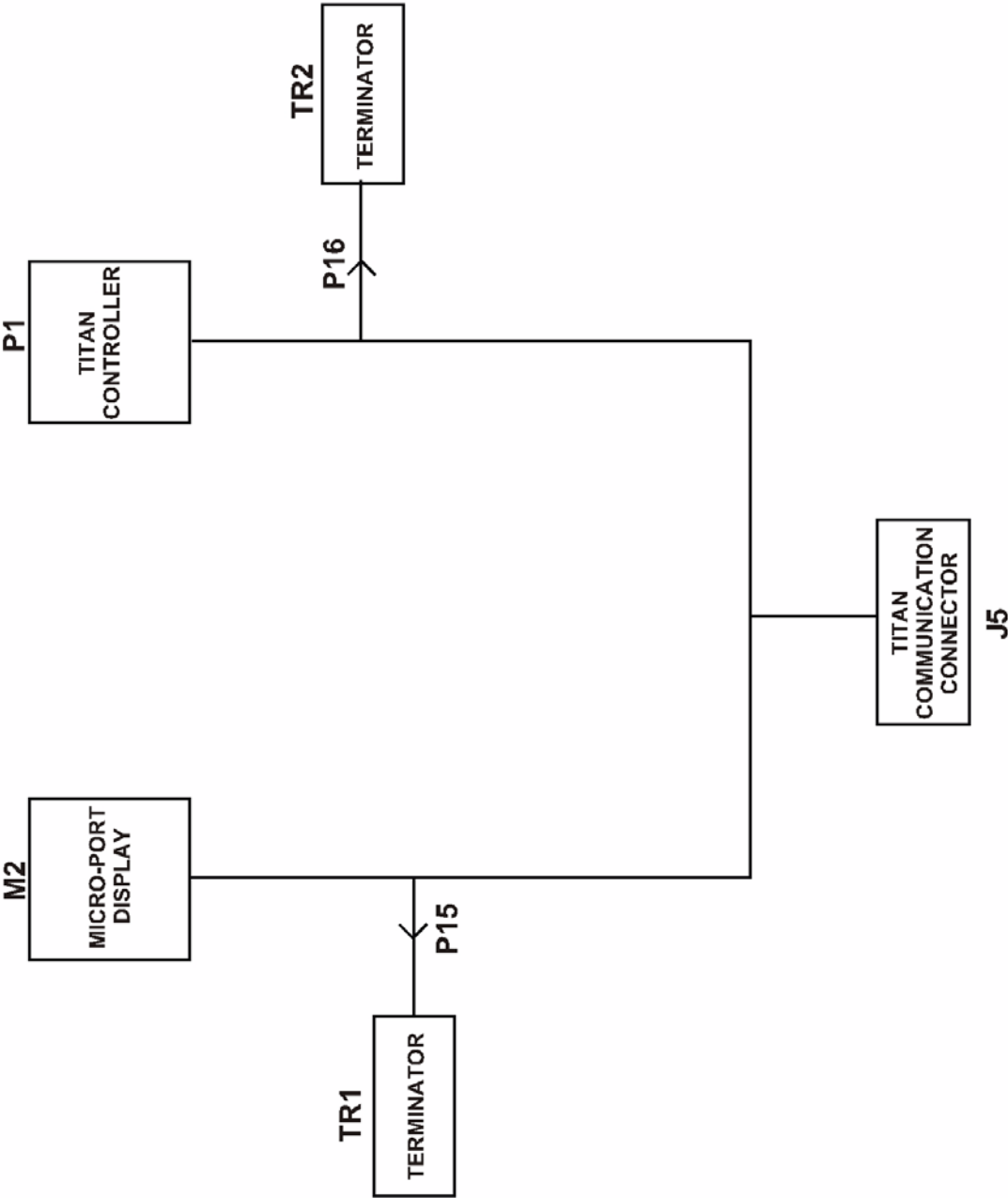
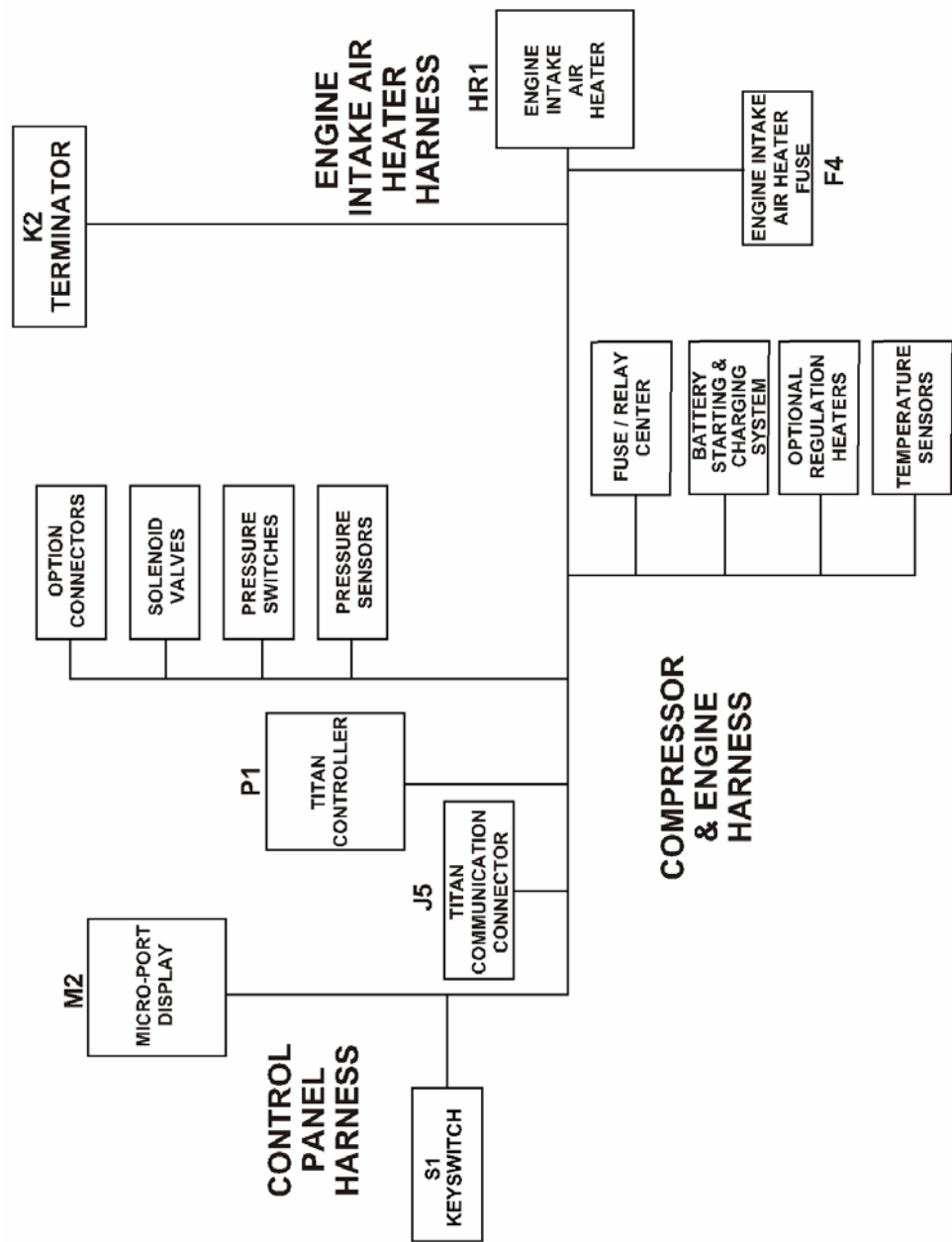


Figure 1-3 : HARNESS SYSTEM CONNECTION LAYOUT





Compressor Operation Sequence

Power On

When the Keyswitch is in the ON position:

1. Key ON/OFF signal (12 VDC) supplied to Titan controller.
2. Titan controller energizes Switched Power Relay (FB1-K3).
3. Micro-Port display and gauges will initialize.
4. Gauge backlights power ON.
5. Regulation heaters (if equipped) are energized ON if ambient temperature is below 45°F. Engine intake heaters are energized if ambient temperature is below 60°F.

Start

When the Keyswitch is in the START position:

1. Unloader Solenoid Valve (L2) is closed (de-energized).
2. Engine Starter is energized.

When the engine speed reaches 1000 RPM (engine start declared):

1. Engine starter is de-energized.
2. Engine speed is set to 1500 RPM.

When the engine speed is greater than 1100 RPM:

1. Unloader Solenoid Valve (L2) is opened (energized).

Loading

When the Start/Run Valve is pressed:

1. Engine speed is set to 2200 RPM.

Shutdown

Close the service valves(s). Allow the compressor to run at idle speed for 3 to 5 minutes to allow cool down. Do not use E-Stop (if equipped) to stop machine unless it is an emergency.

When the Keyswitch is moved to the OFF position:

1. Keyswitch signal (12VDC) from Titan is de-energized.
2. The engine will shut down.
3. The Titan controller and Switched Power Relay (FB1-K3) de-energize.
4. Micro-Port display, gauges, and Compressor Control System will turn OFF.



Compressor Diagnostic Code Troubleshooting

General

A thorough analysis of the problem is the key to successful troubleshooting. The more information known about a problem, the faster and easier the problem can be solved.

Troubleshooting charts are included to act as a guide to the troubleshooting process.

The charts are organized so the easiest and most logical things are performed first. It is not possible to include all the solutions to problems that can occur or list all possible problems.

The charts are designed to stimulate a thinking process that will lead to the solution of a problem.

Basic Troubleshooting Steps

- Collect all facts concerning the problem.
- Analyze the problem thoroughly.
- Relate the symptoms to the basic electrical/electronic systems and components.
- Consider any recent repairs that could relate to the problem.

General Measuring Guidelines

Since the electrical system uses sealed connectors and splices, access of test points can be difficult. It is recommended a test probe kit be used to access the signals to prevent damage to wires and connectors. Back-probing connectors and insulation piercing test probes can cause damage that can cause future failures.

Measuring Voltage

A digital voltmeter is recommended to make measurements. Voltage measurements are made by connecting the Red (+) lead to the desired signal and the Black (-) lead to the common. The test lead connections must be secure or incorrect readings will result. Do NOT use chassis ground or other metal connection. Circuit common will be any of the brown wires or battery Negative.

IMPORTANT INFORMATION

DO NOT USE MACHINE FRAME, SHEET METAL, PIPING, OR OTHER METAL COMPONENTS AS COMMON OR GROUND WHEN MAKING VOLTAGE OR FREQUENCY MEASUREMENTS.

Measuring Resistance

Extra care must be taken when making resistance measurements. Test probe connections are crucial to correct readings. Ensure the test probe makes a solid connection with the wire(s) or connector pin(s) under test. The test probe kit may help with these types of measurements. Electrical system must be powered OFF while making resistance measurements.

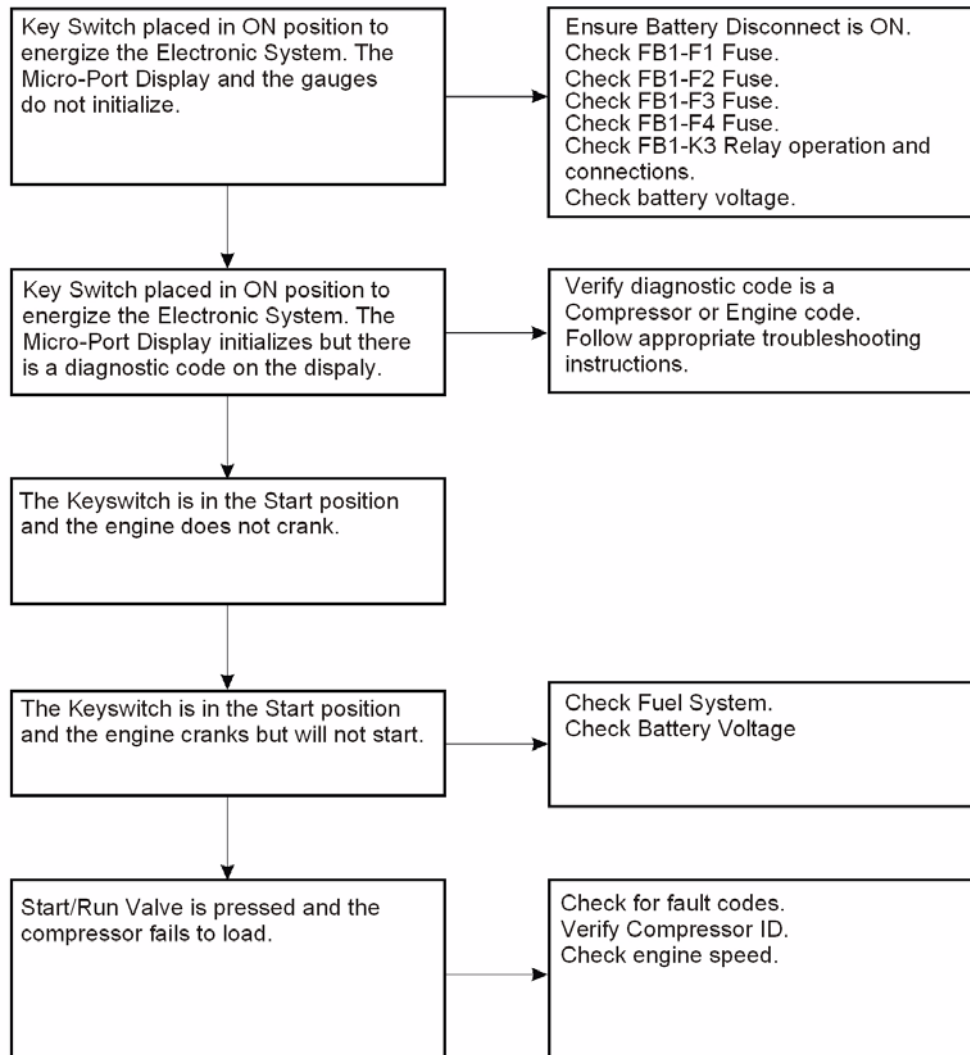
Measuring Frequency

Frequency is measured in the same manner as voltage, but the meter is set for HZ or frequency. Good connections are important or false readings will occur.

Measuring Duty Cycle

To measure duty cycle, set up the meter as if measuring frequency or voltage. Select the % or duty cycle function and take the measurements.

Troubleshooting Flow Chart



Compressor Diagnostic Codes

LCD Display	Display Name	Description	Code Type
CPR CODE 1 LOW ENGINE SPEED	Low Engine Speed	Engine speed less than 1100 RPM for 30 seconds.	FAULT
CPR CODE 2 HIGH ENGINE SPEED	High Engine Speed	Engine speed greater than 2350 RPM for 30 seconds.	FAULT
CPR CODE 3 WAIT 30 SEC RETRY START	Engine Crank Timeout	Engine crank attempt longer than 15 seconds above 50°F or longer than 30 seconds below 32°F.	FAULT
CPR CODE 4 OUT OF FUEL	Out of Fuel	Fuel level in tank below usable limit.	FAULT
CPR CODE 12 FUEL LEVEL LOW	Low Fuel Level	Fuel level in tank approaching empty.	ALERT
CPR CODE 16 HIGH ENGINE TEMP	High Engine Temperature	Engine coolant temperature greater than 212°F (Engine derate begins).	ALERT
CPR CODE 17 HIGH ENGINE TEMP	High Engine Temperature (Shutdown)	Engine coolant temperature greater than 215°F in 3 seconds (Engine Shutdown).	FAULT
CPR CODE 18 LOW OIL PRESSURE	Low Oil Pressure	Low engine oil pressure. Open for 3 seconds.	FAULT
CPR CODE 29 ENGINE SHUTDOWN?	Engine Shutdown Unknown	Engine stopped without an engine diagnostic code.	FAULT
CPR CODE 30 HIGH AIREND TEMP	High Airend Discharge Temperature	Airend discharge temperature greater than or equal to 251°F. 3 seconds.	FAULT
CPR CODE 32 AIREND DISC TEMP SENSOR	Airend Discharge Temperature Sensor	Airend Discharge Temperature Sensor reading out of range.	FAULT
CPR CODE 33 SEP TANK PRES SENSOR	Separator Tank Pressure Sensor	Separator Tank Pressure Sensor reading out of range.	FAULT
CPR CODE 34 HIGH PRES AT START	High Separator Tank Pressure At Start	Separator tank pressure greater than 20 psi at crank attempt.	ALERT

Electronic Service Manual Compressor Diagnostic Code Troubleshooting

LCD Display	Display Name	Description	Code Type
CPR CODE 36 SAFETY VALVE OPEN	Safety Valve Open	Safety relief valve on separator tank opened.	FAULT
CPR CODE 38 AIR FILTERS RESTRICTED	Intake Air Filters Restricted	Intake filters restricting air flow.	ALERT
CPR CODE 39 LOW SYSTEM VOLTAGE	Low System Voltage/ Alternator Not Charging	Electrical system voltage below 13.3 VDC for 30 seconds or more.	ALERT
CPR CODE 42 FUEL LEVEL SENSOR	Fuel Level Sensor	Fuel Level Sensor reading out of range.	ALERT
CPR CODE 50 HIGH SEP TANK TEMP	High Separator Tank Temperature	Separator tank temperature greater than or equal to 251°F. for 3 seconds.	FAULT
CPR CODE 51 COMPRESSOR ID INVALID	Compressor ID Invalid	The Titan controller and Engine Tachometer with MidPort display do not have a valid compressor ID.	FAULT
CPR CODE 52 IQ FILTERS RESTRICTED	IQ Filters Restricted	IQ filters restricted past usable level. 3 seconds.	FAULT
CPR CODE 53 SEP TANK TEMP SENSOR	Separator Tank Temperature Sensor	Separator Tank Temperature Sensor reading out of range.	FAULT
CPR CODE 58 AMBIENT TEMP SENSOR	Ambient Temperature Sensor	Ambient Temperature Sensor reading out of range.	ALERT
CPR CODE 73 AUTOSTART CTRL COMMS	AutoStart Controller Communication	Communication between Titan controller and AutoStart controller not functional.	ALERT
CPR CODE 76 CPR CTRL COMMS	Compressor Controller Communication	Communication between Titan controller and Engine Tachometer with MidPort display not functional.	ALERT

COMPRESSOR CODE 1**Low Engine Speed****Explanation**

The Titan controller has received an engine speed value less than 1100 RPM for 30 seconds from the engine.

Effect

Code 1 is a FAULT condition and will shut down the compressor. CPR CODE 1 LOW ENGINE SPEED will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check Micro-Port display for active engine diagnostic codes.</p>	<p>If active engine diagnostic codes are present, resolve the issues.</p>
<p>Step 2:</p> <p>Start and run the compressor at idle. Check Micro-Port display to verify the engine target (RPM). If the engine coolant temperature is below 100°F, the engine target (RPM) will be 1500 RPM. If the engine coolant temperature is 100°F or above, the engine target (RPM) will be 1400 RPM.</p>	<p>If the engine target (RPM) is 1500 for cold idle or 1400 for hot idle, the electronic system is commanding the engine to run at the correct speed. Proceed to Step 3.</p>
<p>Step 3:</p> <p>Check the engine fuel system for restrictions.</p>	<p>If the fuel filters are dirty or have not been changed during regular service, replace fuel filters.</p> <p>If dirty fuel has been used, add clean fuel and replace fuel filters.</p> <p>If air has gotten into the fuel system, bleed the fuel system.</p> <p>If fuel hoses are damaged, replace fuel hoses.</p>

Electronic Service Manual Compressor Diagnostic Code Troubleshooting

Action	Result
Step 4: If Steps 1 thru 3 checkout OK, refer to the engine manufacturer service dealer.	

COMPRESSOR CODE 2**High Engine Speed****Explanation:**

The Titan controller has measured an engine speed value greater than 2350 RPM for 30 seconds.

Effect:

Code 2 is a FAULT condition and will shut down the compressor. CPR CODE 2 HIGH ENGINE SPEED will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Check Micro-Port display for active engine diagnostic codes.	If active engine diagnostic codes are present, resolve the issues.
Step 2: Start and run the compressor at idle. Press the Start/Run Valve after warmup of engine for 3 minutes or reaching engine coolant temperature of 150°F. Check Micro-Port display to verify the engine target (RPM) is 2200.	If the engine target (RPM) is 2200, the electronic system is commanding the engine to run at the correct speed. Proceed to Step 3.
Step 3: If Steps 1 and 2 checkout OK, refer to the engine manufacturer service dealer.	

COMPRESSOR CODE 3

Engine Crank Timeout

Explanation:

The electronic system has attempted to start the compressor longer than 15 seconds above 50°F ambient or longer than 30 seconds below 32°F ambient.

Effect:

Code 3 is a FAULT condition and will prevent further cranking. CPR CODE 3 WAIT 30 SEC RETRY START will be shown on the Micro-Port display. Operator must wait 30 seconds before electronic system will allow another start attempt.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Wait 30 seconds before attempting to start compressor.</p>	<p>After 30 seconds, the electronic system will allow another 15 or 30 second start attempt depending on ambient temperature.</p>
<p>Step 2:</p> <p>Check the engine fuel system for restrictions.</p>	<p>If the fuel filters are dirty or have not been changed during regular service, replace fuel filters.</p> <p>If dirty fuel has been used, add clean fuel and replace fuel filters.</p> <p>If air has gotten into the fuel system, bleed the fuel system.</p> <p>If fuel hoses are damaged, replace fuel hoses.</p>
<p>Step 3:</p> <p>If ambient temperature is below 10°F, verify Cold Weather Kit is functioning (if equipped).</p>	<p>If Cold Weather Kit is not functioning, repair as needed.</p> <p>If Cold Weather Kit is not installed, it is required to start compressor in ambient temperatures below 10°F.</p>

COMPRESSOR CODE 4**Out Of Fuel****Explanation:**

The Titan controller has detected a condition from U1 Fuel Level Sensor indicating the fuel level in the tank is below a usable limit.

Effect:

Code 4 is a FAULT condition and will shut down the compressor. CPR CODE 4 OUT OF FUEL will be displayed on the Micro-Port display.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check fuel level in tank.</p>	<p>If the fuel level is low, add fuel.</p>
<p>Step 2:</p> <p>Check all harness connections between Titan and U1 Fuel Level Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 3:</p> <p>Remove fuel level sensor from fuel tank. With the fuel level sensor connected to the harness, turn the sensor upside down so float will go to the top. Turn the Keyswitch to the ON position to energize the compressor electronic system. Verify the fuel level on the gauge is FULL and CPR CODE 4 clears from the Micro-Port display.</p>	<p>If CPR CODE 4 clears and the fuel level gauge shows FULL, the fuel level sensor is operating properly.</p> <p>If CPR CODE 4 does not clear and the fuel level gauge shows EMPTY, replace U1 Fuel Level Sensor.</p>
<p>Step 4:</p> <p>With the fuel level sensor still removed from the tank and the compressor electronic system energized, tilt the fuel sensor so the float will move down. Verify the fuel level gauge is moving down the scale.</p>	<p>If the float in the fuel level sensor appears to be sticking while moving, replace U1 Fuel Level Sensor.</p>

Electronic Service Manual Compressor Diagnostic Code Troubleshooting

Action	Result
Step 5: If Steps 1 thru 4 checkout OK, replace Titan controller.	

COMPRESSOR CODE 12**Low Fuel Level****Explanation:**

The Titan controller has detected a condition from U1 Fuel Level Sensor indicating the fuel level in the tank is approaching empty.

Effect:

Code 12 is an ALERT condition and will not shut down the compressor. CPR CODE 12 FUEL LEVEL LOW will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Check fuel level in tank.	If the fuel level is low, add fuel.
Step 2: Check all harness connections between Titan and U1 Fuel Level Sensor.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Remove fuel level sensor from fuel tank. With the fuel level sensor connected to the harness, turn the sensor upside down so float will go to the top. Turn Keyswitch to the ON position to energize the compressor electronic system. Verify the fuel level on the gauge is FULL and CPR CODE 12 clears from the Micro-Port display.	If CPR CODE 12 clears and the fuel level gauge shows FULL, the fuel level sensor is operating properly. If CPR CODE 12 does not clear and the fuel level gauge shows EMPTY, replace U1 Fuel Level Sensor.
Step 4: With the fuel level sensor still removed from the tank and the compressor electronic system energized, tilt the fuel sensor so the float will move down. Verify the fuel level gauge is moving down the scale.	If the float in the fuel level sensor appears to be sticking while moving, replace U1 Fuel Level Sensor.

Electronic Service Manual Compressor Diagnostic Code Troubleshooting

Action	Result
Step 5: If Steps 1 thru 4 checkout OK, replace Titan controller.	

COMPRESSOR CODE 29**Engine Shutdown Unknown****Explanation:**

The engine has shut down for any reason without user input and the Titan did not detect an Engine Diagnostic Code.

Effect:

Code 29 is a FAULT condition and will shut down the compressor. CPR CODE 29 ENGINE SHUTDOWN?? will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check the engine fuel system for restrictions.</p>	<p>If the fuel filters are dirty or have not been changed during regular service, replace fuel filters.</p> <p>If dirty fuel has been used, add clean fuel and replace fuel filters.</p> <p>If air has gotten into the fuel system, bleed the fuel system.</p> <p>If fuel hoses are damaged, replace fuel hoses.</p>
<p>Step 2:</p> <p>Check battery Positive and Negative connections to the engine, starter and engine alternator.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 3:</p> <p>Turn the Keyswitch to any ON position to energize the compressor electronic system. Using a multimeter, measure the Engine Keyswitch signal voltage at P1-2.</p>	<p>Voltage measured should be 12 VDC at P1-2.</p> <p>If not, check all harness connections in the keyswitch signal circuit from Titan to engine.</p>
<p>Step 4:</p> <p>If Steps 1 thru 4 checkout OK, refer to the engine manufacturer service dealer.</p>	

COMPRESSOR CODE 30

High Airend Discharge Temperature

Explanation:

The Titan controller has detected a temperature from RT2 Discharge Air Temperature Sensor that is greater than or equal to 251°F for 3 seconds or more.

Effect:

Code 30 is a FAULT condition and will shut down the compressor. CPR CODE 30 HIGH AIREND TEMP will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check the coolers for air flow restrictions.</p>	<p>If the air flow through the coolers is being restricted, correct the issue.</p>
<p>Step 2:</p> <p>Check all harness connections between Titan and RT2 Discharge Air Temperature Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 3:</p> <p>Disconnect RT2 from harness and plug Thermistor Simulator (Part No. 22073878) into the RT2 harness connector. Turn Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Airend Temperature value is between -3°F and -13°F.</p>	<p>If temperature value on Micro-Port display is not between -3°F and -13°F, check for defective harness connections.</p> <p>If temperature value on Micro-Port display is between -3°F and -13°F, replace RT2 Discharge Air Temperature Sensor.</p>
<p>Step 4:</p> <p>If Steps 1 thru 3 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 32**Airend Discharge Temperature Sensor****Explanation:**

The Titan controller has detected an out of range reading from the RT2 Temperature Sensor.

Effect:

Code 32 is a FAULT condition and will shut down the compressor. CPR CODE 32 AIREND DISC TEMP SENSOR will be shown on the Micro-Port display.

RT2 Temperature Sensor Circuit:**Circuit Description:**

The RT2 Temperature Sensor connects to the Titan controller as illustrated in the circuit diagram. RT2 is a 10K ohm thermistor type temperature sensor. The yellow wire is the sense line to the Titan. The brown-white wire is the sensor ground.

Component Location:

RT2 Temperature Sensor is located in the discharge of the Airend.

COMPRESSOR CODE 32

Troubleshooting Steps

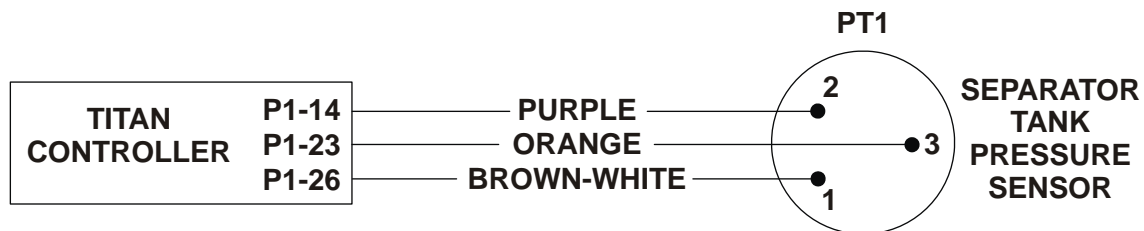
Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and RT2 temperature sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect RT2 from harness and plug thermistor simulator (Part No. 22073878) into the RT2 harness connector. Turn Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Airend Temperature value is between -3°F and -13°F.</p>	<p>If temperature value on Micro-Port display is not between -3°F and -13°F, check for defective harness connections.</p> <p>If temperature value on Micro-Port display is between -3°F and -13°F, replace RT2 temperature sensor.</p>
<p>Step 3:</p> <p>If steps 1 and 2 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 33**Separator Tank Pressure Sensor****Explanation:**

The Titan controller has detected an out of range reading from the PT1 Pressure Sensor.

Effect:

Code 33 is a FAULT condition and will shut down the compressor. CPR CODE 33 SEP TANK PRES SENSOR will be shown on the Micro-Port display.

PT1 Pressure Sensor Circuit:**Circuit Description:**

The PT1 Pressure Sensor connects to the Titan controller as illustrated in the circuit diagram. The purple wire is the 5 VDC excitation supply from the Titan. The orange wire is the signal output to the Titan with a range of 0.5 to 4.5 VDC. The brown-white wire is the sensor ground. The pressure range of PT1 is 0 psig (0.5 VDC) to 225 psig (4.5 VDC).

Component Location:

PT1 Pressure Sensor is located on top of the Separator Tank.

COMPRESSOR CODE 33

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and PT1 Pressure Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect PT1 connector from the harness. Turn the Keyswitch to the ON position to energize the compressor electronic system. Using a multimeter, measure the voltage between PT1-1 and PT1-2.</p>	<p>Voltage measured should be 5 VDC between PT1-1 and PT1-2.</p> <p>If voltage measured is not 5 VDC, check for defective harness connections.</p>
<p>Step 3:</p> <p>Disconnect PT1 connector from the harness and P1 connector from the Titan. Using a multimeter, measure resistance between PT1-1 and P1-26.</p> <p>Using a multimeter, measure resistance between PT1-2 and P1-14.</p> <p>Using a multimeter, measure resistance between PT1-3 and P1-23.</p>	<p>Continuity should be shorted between PT1-1 and P1-26.</p> <p>Continuity should be shorted between PT1-2 and P1-14.</p> <p>Continuity should be shorted between PT1-3 and P1-23.</p> <p>If not, check for defective harness connections.</p>
<p>Step 4:</p> <p>Disconnect PT1 from harness and plug Pressure Transducer Simulator (Part No. 22168868) into the PT1 harness connector. Turn the Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Air Presssure value is between 80 psi and 90 psi.</p>	<p>If pressure value on Micro-Port display is not between 80 psi and 90 psi, check for defective harness connections.</p> <p>If pressure value on Micro-Port display is between 80 psi and 90 psi, replace PT1 Pressure Sensor.</p>
<p>Step 5:</p> <p>If Steps 1 thru 4 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 34

High Separator Tank Pressure At Start

Explanation:

The Titan controller has detected a pressure from PT1 Pressure Sensor that is greater than 20 psi at the time of engine start.

Effect:

Code 34 is a FAULT condition and will prevent starting until the Separator Tank pressure is below 20 psi. CPR CODE 34 HIGH PRES AT START will be shown on the Micro-Port display.

COMPRESSOR CODE 34

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Wait until air pressure is below 20 psi before trying to start the compressor.</p>	<p>If air pressure is not below 20 psi and the system continues to hold pressure, proceed to Step 2.</p>
<p>Step 2:</p> <p>Open the Manual Service Valve to ensure the system is completely blown down. Check the air pressure value on the Micro-Port display and the air gauge to verify the value is 0 psi.</p>	<p>If the air system is completely blown down and the air pressure value on the Micro-Port display is 20 psi or greater, proceed to Step 3.</p>
<p>Step 3:</p> <p>Check all harness connections between Titan and PT1 Pressure Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 4:</p> <p>Disconnect PT1 from harness and plug Pressure Transducer Simulator (Part No. 22168868) into the PT1 harness connector. Turn the Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Air Pressure value is between 80 psi and 90 psi.</p>	<p>If pressure value on Micro-Port display is not between 80 psi and 90 psi, check for defective harness connections.</p> <p>If pressure value on Micro-Port display is between 80 psi and 90 psi, replace PT1 Pressure Sensor.</p>
<p>Step 5:</p> <p>If Steps 1 thru 4 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 36**Safety Valve Open****Explanation:**

The Titan controller has detected an open contact from S14 Pressure Switch indicating the Safety Valve has opened.

Effect:

Code 36 is a FAULT condition and will shut down the compressor. CPR CODE 36 SAFETY VALVE OPEN will be shown on the Micro-Port display.

S14 Pressure Switch Circuit:**Circuit Description:**

The S14 Pressure Switch connects to the Titan controller as illustrated in the circuit diagram. S14 is a normally closed pressure switch that opens when the pressure rises above 12 psi. When the switch opens, the 12 VDC input to the Titan is removed. The purple-white wire is the switch common supply voltage (12 VDC). The light-blue wire is the input to the Titan.

Component Location:

S14 Pressure Switch is located in the Safety Valve on the Separator Tank.

COMPRESSOR CODE 36

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Verify that the Safety Valve is operating properly.</p>	<p>If the Safety Valve is not operating properly, replace the Safety Valve.</p>
<p>Step 2:</p> <p>Check all harness connections between Titan and S14 Pressure Switch.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 3:</p> <p>Disconnect S14 connector from the harness. Using a multimeter, check resistance across pins 1 and 2 of the pressure switch to verify the switch is closed.</p>	<p>If there is no continuity across the pressure switch terminals, replace S14 Pressure Switch.</p>
<p>Step 4:</p> <p>Disconnect S14 connector from the harness. Turn Keyswitch to the ON position to energize the compressor electronic system. Using a multimeter, measure the voltage between S14-1 and battery Negative.</p>	<p>Voltage measured should be 12 VDC between S14-1 and battery Negative.</p> <p>If voltage measured is not 12 VDC, check for defective harness connections.</p>
<p>Step 5:</p> <p>Disconnect P1 connector from the Titan. Ensure S14 Pressure Switch is connected to the harness. Using a multimeter, check resistance between P1-15 and P1-28.</p>	<p>Continuity should be shorted between P1-15 and P1-28.</p> <p>If not, check for defective harness connections.</p>
<p>Step 6:</p> <p>If Steps 1 thru 5 checkout OK, replace Titan controller.</p>	

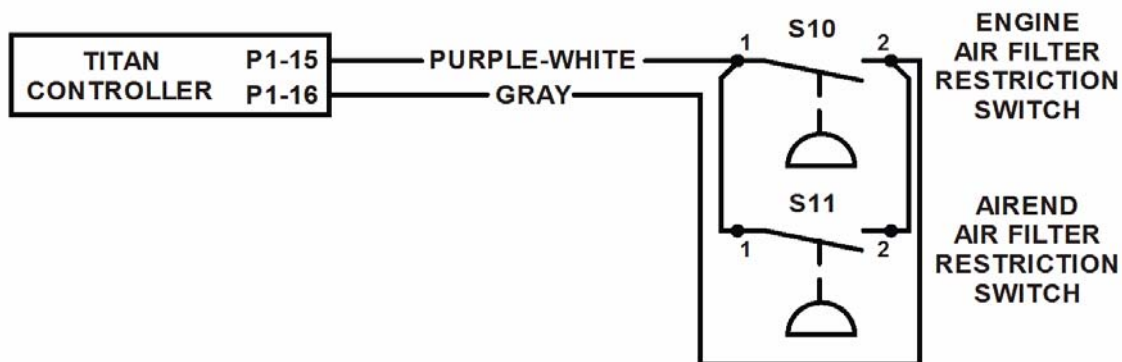
COMPRESSOR CODE 38**Intake Air Filters Restricted****Explanation:**

The Titan controller has detected a closed contact from S10 (Engine Air Filter) and/or S11 (Airend Air Filter) pressure switch indicating the filter(s) is restricted.

Effect:

Code 38 is an ALERT condition and will not shut down the compressor. CPR CODE 38 AIR FILTERS RESTRICTED will be shown on the Micro-Port display.

S10 and S11 pressure switch circuit:

**Circuit Description:**

The air filter restriction switches connect to the Titan controller as illustrated in the circuit diagram. S10 and S11 are normally open pressure switches that close when the air filter restriction reaches 20 inches of water. When S10 and/or S11 switch contacts close, a 12 VDC input is sent to the Titan. The purple-white wire is the switch common supply (12 VDC). The gray wire is the input to the Titan.

Component Location:

S10 Air Filter Restriction Switch is located behind the Engine Air Filter housing.
S11 Air Filter Restriction Switch is located behind the Airend Air Filter housing.

COMPRESSOR CODE 38

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check the engine and airend filters.</p>	<p>If the filters are dirty or clogged, replace filters as needed.</p>
<p>Step 2:</p> <p>Check all harness connections between Titan and S10 Engine and S11 Airend Filter Restriction Switches.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 3:</p> <p>Disconnect the harness from S10 and S11 air filter restriction switches. Using a multimeter, check resistance across S10 and S11 switch terminals to verify the switches are open.</p>	<p>If there is continuity across S10 and/or S11 switch terminals, replace the bad pressure switch(s).</p>
<p>Step 4:</p> <p>Disconnect the harness from S10 and S11 air filter restriction switches. Turn the Keyswitch to the ON position to energize the compressor electronic system. Using a multimeter, measure the voltage from the purple-white wire at S10 and S11 to battery Negative.</p>	<p>Voltage measured should be 12 VDC between the purple-white wire at S10 and S11 to battery Negative.</p> <p>If voltage measured is not 12 VDC, check for defective harness connections.</p>
<p>Step 5:</p> <p>Disconnect P1 connector from the Titan. Ensure S10 and S11 filter restriction switches are connected to the harness. Using a multimeter, check resistance between P1-15 and P1-16.</p>	<p>Continuity should be open between P1-15 and P1-16.</p> <p>If not, check for defective harness connections.</p>
<p>Step 6:</p> <p>If Steps 1 thru 5 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 39**Low System Voltage****Explanation:**

The Titan controller has detected the system voltage during compressor operation has reached a level below 13.3 VDC for 30 seconds or more. While compressor is not in operation, the Titan controller has detected the system voltage has reached a level below 11.5 VDC for 30 seconds or more.

Effect:

Code 39 is an ALERT condition and will not shut down the compressor; however, if the system voltage reaches too low of a level the electronics will shut off and the compressor will shut down. CPR CODE 39 LOW SYSTEM VOLTAGE will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Check all harness connections between alternator and P1 (Titan controller)	If harness connections are loose or damaged, repair harness as needed.
Step 2: Check all harness connections between alternator and battery system.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Start and run compressor at idle. Using a multimeter, measure the voltage between the Alternator G1-POS and battery Negative.	Voltage measured should be 13.3 VDC or above between Alternator G1-POS and battery Negative. If voltage measured is less than 13.3 VDC, replace G1 Alternator.

COMPRESSOR CODE 39

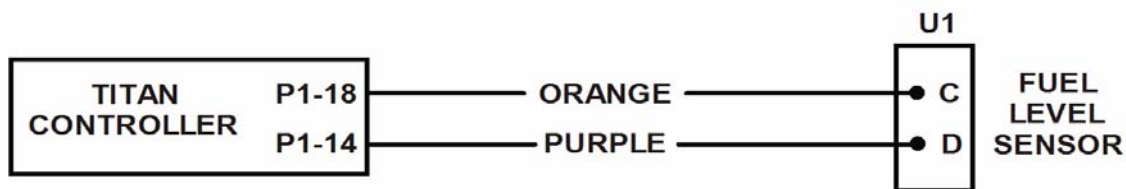
Action	Result
<p>Step 4:</p> <p>Start and run compressor at idle. Using a multimeter, measure the voltage between the Titan P1-1 and battery Negative.</p> <p>Using a multimeter, measure the voltage between P1-13 and battery Negative.</p> <p>Using a multimeter, measure the voltage between P1-24 and battery Negative.</p>	<p>Voltage measured should be 13.3 VDC or above at all 3 measured points.</p> <p>If voltage measured is not 13.3 VDC or above at all 3 measured points, check for defective harness connections.</p>
<p>Step 5:</p> <p>Disconnect battery cables from the batteries. Using a battery load tester, test each battery.</p>	<p>If the battery test bad using the load tester, replace the defective battery.</p>
<p>Step 6:</p> <p>If Steps 1 thru 5 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 42**Fuel Level Sensor****Explanation:**

The Titan controller has detected an out of range reading from the U1 Fuel Level Sensor.

Effect:

Code 42 is an ALERT condition and will not shut down the compressor; however, if the fuel level in the tank reaches a level below the pickup tube the compressor will shut down with no indication of reason. CPR CODE 42 FUEL LEVEL SENSOR will be shown on the Micro-Port display.

U1 Fuel Level Sensor Circuit:**Circuit Description:**

The U1 Fuel Level Sensor connects to the Titan controller as illustrated in the circuit diagram. The purple wire is the 5 VDC excitation supply from the Titan. The orange wire is the signal output to the Titan with a range of 0.5 to 4.5 VDC. The brown-white wire is the sensor ground. The level range of U1 is EMPTY (0.5 VDC) to FULL (4.5 VDC).

Component Location:

U1 Fuel Level Sensor is located in the Fuel Tank.

COMPRESSOR CODE 42**Troubleshooting Steps**

Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and U1 Fuel Level Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect U1 connector from the harness and P1 connector from the Titan.</p> <p>Using a multimeter, measure resistance between U1-D and P1-14.</p> <p>Using a multimeter, measure resistance between U1-C and P1-18.</p>	<p>Continuity should be shorted between U1-D and P1-14.</p> <p>Continuity should be shorted between U1-C and P1-18.</p> <p>If not, check for defective harness connections.</p>
<p>Step 3:</p> <p>Remove fuel level sensor from fuel tank. With the fuel level sensor connected to the harness, turn the sensor upside down so float will go to the top. Turn the Keyswitch to the ON position to energize the compressor electronic system. Verify the fuel level on the gauge is FULL and CPR CODE 42 clears from the Micro-Port display.</p>	<p>If CPR CODE 42 clears and the fuel level gauge shows FULL, the fuel level sensor is operating properly.</p> <p>If CPR CODE 42 does not clear and the fuel level gauge shows EMPTY, replace U1 Fuel Level Sensor.</p>
<p>Step 4:</p> <p>With the fuel level sensor still removed from the tank and the compressor electronic system energized, tilt the fuel sensor so the float will move down. Verify the fuel level gauge is moving down the scale.</p>	<p>If the float in the fuel level sensor appears to be sticking while moving, replace U1 Fuel Level Sensor.</p>
<p>Step 5:</p> <p>If Steps 1 thru 4 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 43**Low Separator Tank Pressure****Explanation:**

The Titan controller has detected a pressure from PT1 Pressure Sensor less than 40 psi after the compressor is loaded.

Effect:

Code 43 is a FAULT condition and will shut down the compressor. CPR CODE 43 LOW SEP TANK PRES will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Check for leaking air hoses and pipes.	If air hoses or pipes are found to be leaking, tighten or replace as needed.
Step 2: Check all harness connections between Titan and PT1 Pressure Sensor.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Disconnect PT1 from harness and plug Pressure Transducer Simulator (Part No. 22168868) into the PT1 harness connector. Turn the Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Air Pressure value is between 80 psi and 90 psi.	If pressure value on Micro-Port display is not between 80 psi and 90 psi, check for defective harness connections. If pressure value on Micro-Port display is between 80 psi and 90 psi, replace PT1 Pressure Sensor.
Step 4: If Steps 1 thru 3 checkout OK, replace Titan controller.	

COMPRESSOR CODE 50

High Separator Tank Temperature

Explanation:

The Titan controller has detected a temperature from RT1 Temperature Sensor that is greater than or equal to 251°F for 3 seconds or more.

Effect:

Code 50 is a FAULT condition and will shut down the compressor. CPR CODE 50 HIGH SEP TANK TEMP will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and RT1 Temperature Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect RT1 from harness and plug Thermistor Simulator (Part No. 22073878) into the RT1 harness connector. Turn Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Separator Tank Temperature value between -3°F and -13°F.</p>	<p>If temperature value on Micro-Port display is not between -3°F and -13°F, check for defective harness connections.</p> <p>If temperature value on Micro-Port display is between -3°F and -13°F, replace RT1 Temperature Sensor.</p>
<p>Step 3:</p> <p>If Steps 1 and 2 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 51**Compressor ID Invalid****Explanation:**

The Titan controller and the Micro-Port display do not have a valid compressor ID. Code 51 will occur only when a new Titan and a new Engine Tachometer with Micro-Port display are installed at the same time. The compressor ID defines the proper operational profile of the compressor. Absence of Code 51 does not ensure the compressor ID is correct.

Effect:

Code 51 is a FAULT condition and will prevent any operation of the compressor. CPR CODE 51 COMPRESSOR ID INVALID will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Use the Micro-Port display to verify the correct Compressor ID is loaded.	If the correct compressor ID is not loaded, refer to the section Entering Compressor ID in the Operation and Maintenance Manual.

COMPRESSOR CODE 52**IQ Filters Restricted****Explanation:**

The Titan controller has detected a pressure from S7 IQ Filter System Differential Pressure Switch indicating the IQ Filters are restricting air flow past a usable level.

Effect:

Code 52 is a FAULT condition and will shut down the compressor. CPR CODE 52 IQ FILTERS RESTRICTED will be shown on the Micro-Port display.

Troubleshooting Steps

Action	Result
Step 1: Replace IQ Filters.	If replacing the IQ Filters does not correct the problem, proceed to Step 2.
Step 2: Check all harness connections between Titan and S7 Differential Pressure Switch.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Disconnect S7 from harness and plug Pressure Transducer Simulator (Part No. 22168868) into the PT100 harness connector. Turn the Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify IQ Differential Pressure value is between 114 psi and 124 psi.	If pressure value on Micro-Port display is not between 114 psi and 124 psi, check for defective harness connections. If pressure value on Micro-Port display is between 114 psi and 124 psi, replace PT100 Differential Pressure Sensor.
Step 5: If Steps 1 thru 4 checkout OK, replace Titan controller.	

COMPRESSOR CODE 53

Separator Tank Temperature Sensor

Explanation:

The Titan controller has detected an out of range reading from the RT1 Separator Element Temperature Sensor.

Effect:

Code 53 is a FAULT condition and will shut down the compressor. CPR CODE 53 SEP TANK TEMP SENSOR will be shown on the Micro-Port display.

RT1 Temperature Sensor Circuit:



Circuit Description:

The RT1 Separator Element Temperature Sensor connects to the Titan controller as illustrated in the circuit diagram. RT1 is a 10K ohm thermistor type temperature sensor. The yellow wire is the sense line to the Titan. The brown-white wire is the sensor ground.

Component Location:

RT1 Temperature Sensor is located in the top of the Separator Tank.

COMPRESSOR CODE 53

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and RT1 Separator Element Temperature Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect RT1 from harness and plug Thermistor Simulator (Part No. 22073878) into the RT1 harness connector. Turn Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Separator Tank Temperature value between -3°F and -13°F.</p>	<p>If temperature value on Micro-Port display is not between -3°F and -13°F, check defective harness connections.</p> <p>If temperature value on Micro-Port display is between -3°F and -13°F, replace RT1 Separator Element Temperature Sensor.</p>
<p>Step 3:</p> <p>If Steps 1 and 2 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 58**Ambient Temperature Sensor****Explanation:**

The Titan controller has detected an out of range reading from the RT3 Ambient Air Temperature Sensor.

Effect:

Code 58 is an ALERT condition and will not stop the compressor. CPR CODE 58 AMBIENT TEMP SENSOR will be shown on the Micro-Port display.

RT3 Temperature Sensor Circuit:**Circuit Description:**

The RT3 Ambient Air Temperature Sensor connects to the Titan controller as illustrated in the circuit diagram. RT3 is a 10K ohm thermistor type temperature sensor. The yellow wire is the sense line to the Titan. The brown-white wire is the sensor ground.

Component Location:

RT3 Ambient Air Temperature Sensor is mounted on a bracket located on top of the Separator Tank.

COMPRESSOR CODE 58

Troubleshooting Steps

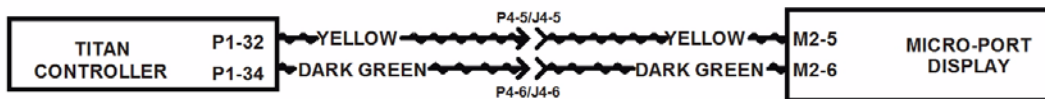
Action	Result
<p>Step 1:</p> <p>Check all harness connections between Titan and RT3 Temperature Sensor.</p>	<p>If harness connections are loose or damaged, repair harness as needed.</p>
<p>Step 2:</p> <p>Disconnect RT3 from harness and plug Thermistor Simulator (Part No. 22073878) into the RT3 harness connector. Turn Keyswitch to the ON position to energize the compressor electronic system. Check Micro-Port display to verify Ambient Temperature value is between -3°F and -13°F.</p>	<p>If temperature value on Micro-Port display is not between -3°F and -13°F, check for defective harness connections.</p> <p>If temperature value on Micro-Port display is between -3°F and -13°F, replace RT3 Temperature Sensor.</p>
<p>Step 3:</p> <p>If Steps 1 and 2 checkout OK, replace Titan controller.</p>	

COMPRESSOR CODE 76**Titan Controller Communication****Explanation:**

The Micro-Port display cannot communicate with the Titan controller via J1939 CAN BUS network.

Effect:

Code 76 is an ALERT condition and will not stop the compressor. CPR CODE 76 CPR CTRL COMMS will be shown on the Micro-Port display.

Micro-Port display to Titan controller J1939 CAN BUS circuit:**Circuit Description:**

The twisted pair yellow and dark green wires are the communications link (J1939 CAN BUS) that connects the Micro-Port display and the Titan controller together as illustrated in the circuit diagram. The yellow wire is referred to as J1939 CAN High (+). The dark green wire is referred to as J1939 CAN Low (-).

Component Location:

P1 connector is connected to the Titan controller and the M2 connector is connected to the Micro-Port display.

COMPRESSOR CODE 76

Troubleshooting Steps

Action	Result
<p>Step 1:</p> <p>Disconnect P1 connector from the Titan. M2 Connector from the Micro-Port display, and any other devices connected to the J1939 CAN BUS. Using a multimeter, measure the resistance between P1-32 and P1-34.</p>	<p>Resistance value measured should be 60 ohms across P1-32 and P1-34.</p> <p>If resistance value measure is not 60 ohms, measure resistance value of each terminator (120 ohms) and/or check for defective harness connections.</p>
<p>Step 2:</p> <p>If Step 1 checks out OK, replace Titan controller.</p>	



Electrical Circuit Troubleshooting

Electrical Circuit Troubleshooting

Introduction

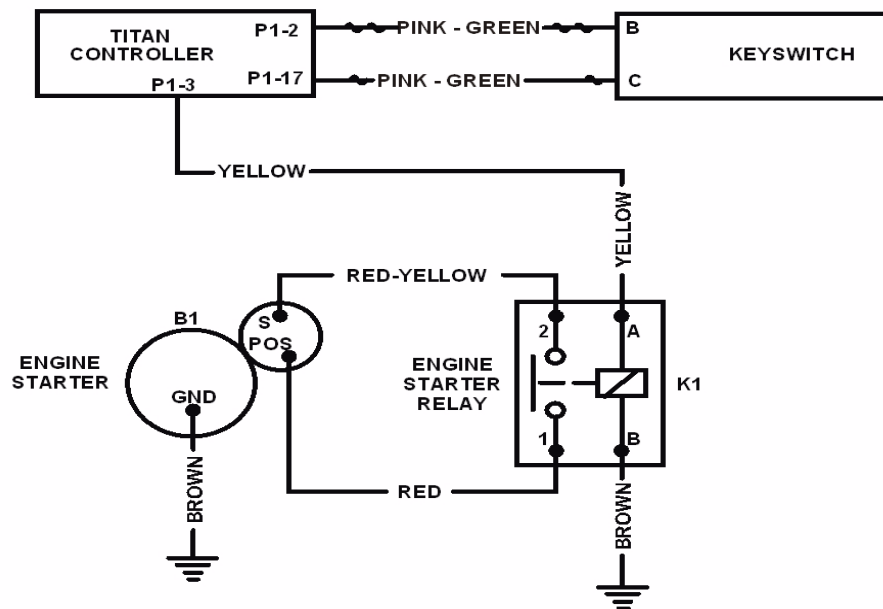
All electrical circuits throughout the compressor do not have a Compressor Diagnostic Code for when a problem arises. This section includes troubleshooting steps to help resolve some common electrical circuit problems. It is not possible to include all the solutions to problems that can occur or list all possible problems. A thorough analysis of the problem is the key to successful troubleshooting. The more information known about a problem, the faster and easier the problem can be solved. Start with simple troubleshooting first and then work up to the more complex troubleshooting methods.

Engine Starter Relay Circuit

Operation Description:

The Engine Starter Relay provides Positive battery voltage to the Engine Starter for cranking the engine. When the compressor electronic system is energized and the Start Button on the Keypad is pressed, a signal is sent to the Titan controller over the J1939 CAN BUSS requesting the engine to start cranking. The Titan will attempt to crank the compressor for 15 seconds above 50°F ambient or 30 seconds below 32°F. The Titan controls starter protection by energizing and de-energizing the Engine Starter Relay once the compressor is declared started.

K1 Engine Starter Relay Circuit:



Engine Starter Relay Circuit

Circuit Description:

The Engine Starter Relay connects to the Titan controller as illustrated in the circuit diagram. The Key Switch connects to the Titan by J1939 CAN BUS. The yellow wire is the output control (12 VDC) from the Titan to the K1 Relay Coil. The red-yellow wire is the output from the relay to the Engine Starter Solenoid.

Component Location:

K1 relay is located on the cross member of the lift bail above the airend. S1 Key Switch is located on the Control Panel.

Troubleshooting Steps

Action	Result
Step 1: Check Micro-Port display for active diagnostic codes.	If active diagnostic codes are present, resolve the issues.
Step 2: Check all harness connections throughout engine start circuit.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Check the condition of the compressor batteries.	If the batteries are discharged or not able to be charged, replace batteries.

Engine Starter Relay Circuit

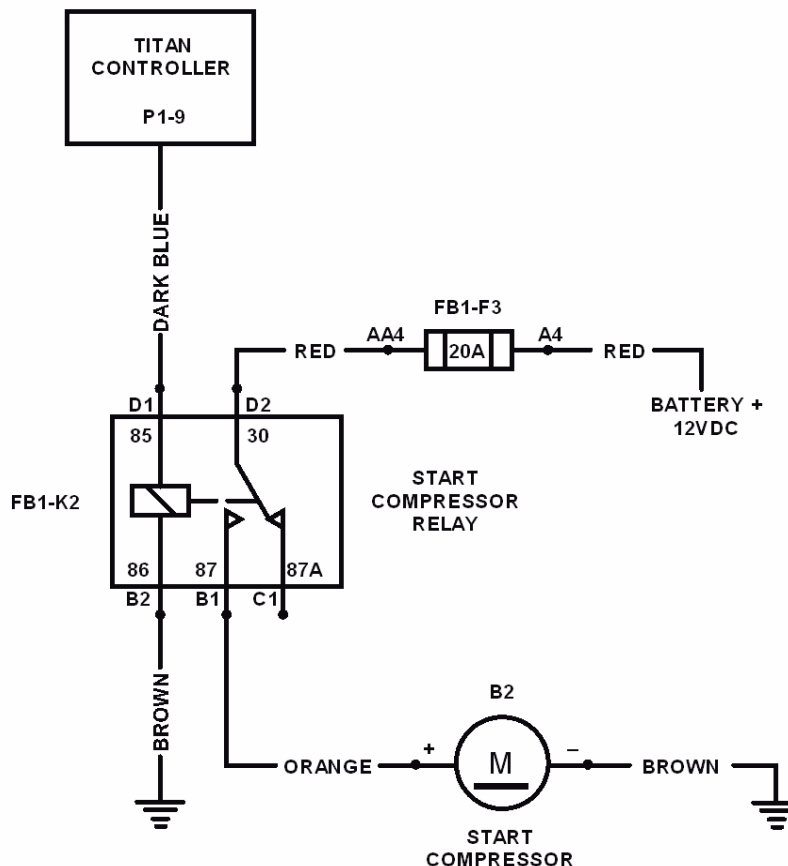
Action	Result
<p>Step 4:</p> <p>Turn the Keyswitch to the ON position to energize the compressor electronic system. Turn the Keyswitch to the START position. Using a multimeter, complete the following measurements:</p> <ol style="list-style-type: none"> 1. Voltage between P1-3 and battery Negative. 2. Voltage between K1-1 and battery Negative. 3. Resistance between K1-B and battery Negative. 4. Voltage between K1-A and battery Negative. 5. Voltage between K1-2 and battery Negative. 6. Voltage between B1-S and battery Negative. 	<ol style="list-style-type: none"> 1. Voltage measured should be 12VDC. If not, replace Titan controller and or Keypad. 2. Voltage measured should be 12VDC. If not, check for defective harness connections. 3. Continuity should be shorted. If not, check for defective harness connections. 4. Voltage measured should be 12VDC. If not, check for defective harness connections. 5. Voltage measured should be 12VDC. If not, replace K1 engine starter relay. 6. Voltage measured should be 12VDC. If not, check for defective harness connections. If 12VDC is measured, replace B1 engine starter.

Start Compressor Circuit

Operation Description:

The B4 Start Compressor provides air to close the Airend Unloader Valve for ease of engine starting. The Titan controls the start compressor by energizing and de-energizing the Start Compressor Relay. When the Keyswitch is moved to the ON position, the start compressor will be energized for 10 seconds. The start compressor will de-energize after 10 seconds if no engine start is initiated. When the Keyswitch is moved to the START position, the start compressor will be energized and remain energized until the engine speed reaches 1450 RPM. If the engine start is not successful, the start compressor will de-energize after 10 seconds or when the Keyswitch is moved to the OFF position.

B2 Start Compressor Circuit:



Circuit Description:

The B2 Start Compressor connects to the Titan controller as illustrated in the circuit diagram. The dark blue wire is the output control (12 VDC) from the Titan to the FB1-K2 Relay Coil. The orange wire is the output from the relay to the B2 Start Compressor. The start compressor and relay contacts are protected by FB1-F3 (20 amp) Fuse.

Start Compressor Circuit

Component Location:

B2 Start Compressor is located on top of the Fuel Tank beside the Airend. FB1-K2 Relay and FB1-F3 fuse are located in the FB1 Fuse/Relay center mounted above the fuel tank.

Troubleshooting Steps

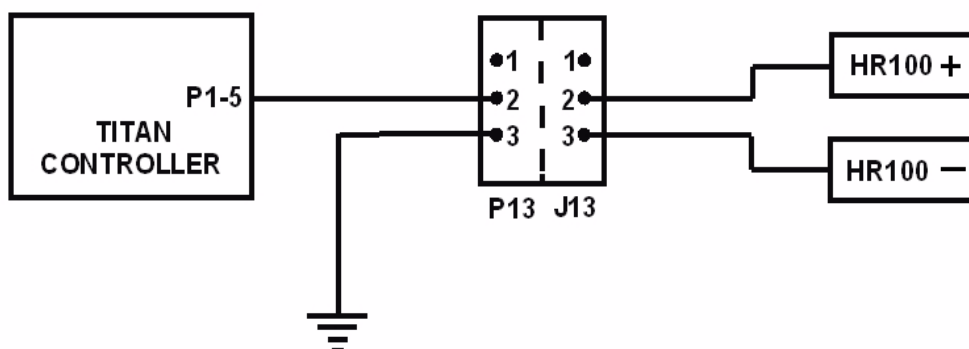
Action	Result
Step 1: Check B2 Start Compressor FB1-F3 Fuse.	If fuse is blown, replace FB1-F3 Fuse.
Step 2: Check all harness connections throughout start compressor circuit.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Move the Keyswitch to the START position. Start compressor output will only be on for 10 seconds. Using a multimeter, complete the following measurements:. 1. Voltage between P1-9 and battery Negative. 2. Voltage between K2-D2 and battery Negative. 3. Resistance between K2-B2 and battery Negative. 4. Voltage between K2-D1 and battery Negative. 5. Voltage between K2-B1 and battery Negative. 6. Resistance between B4 - and battery Negative. 7. Voltage between B4+ and battery Negative	1. Voltage measured should be 12VDC. If not, replace Titan controller. 2. Voltage measured should be 12VDC. If not, check fuse and or defective harness connections. 3. Continuity should be shorted. If not, check for defective harness connections. 4. Voltage measured should be 12VDC. If not, check for defective harness connections. 5. Voltage measured should be 12VDC. If not, replace K2 relay. 6. Continuity should be shorted. If not, check for defective harness connections. 7. Voltage measured should be 12VDC. If not, check for defective harness connections. If 12VDC is measured, replace B4 Start Compressor.

Regulation Heater Circuit

Operation Description:

The regulation heater provides heat to orifices and regulators that may freeze during cold weather. The Titan controls the regulation heater directly. When the Keyswitch is turned to the ON position to energize the compressor electronic system and the ambient temperature is below 45°F, the regulation heaters will be energized. The heaters remain energized, even if the compressor is running, as long as the ambient temperature is below 45°F. When the ambient temperature is above 45°F, the heaters are de-energized.

HR2, HR3, HR4, and HR100-HR103 Regulation Heaters Circuit:



Regulation Heater Circuit

Circuit Description:

The regulation heaters connect to the Titan controller as illustrated in the circuit diagram. The black wire is the output control (12VDC) from the Titan to the regulation heater. The ground to the regulation heaters.

Component Location:

HR100 is located on the pressure regulator mounted on top of the Separator Tank.

Troubleshooting Steps

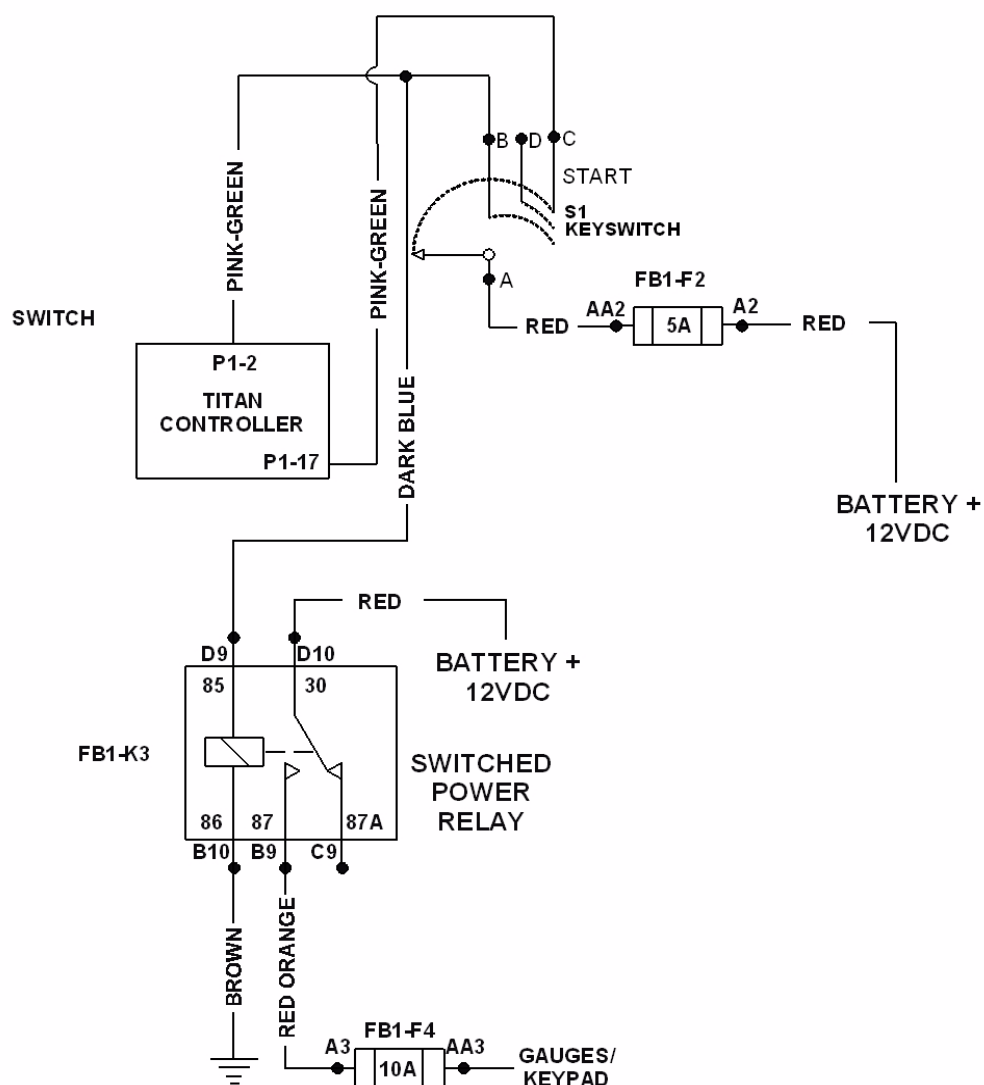
Action	Result
Step 1: Check all harness connections throughout heater circuit.	If harness connections are loose or damaged, repair harness as needed.
Step 2: Check Micro-Port display to verify ambient temperature. If the ambient temperature is below 45°F the heaters will be energized. If the ambient temperature appears abnormal given the outside temperature is below 45°F, the RT3 Ambient Temperature Sensor or circuit could be bad.	If temperature value on Micro-Port display is 45°F or below, then proceed to Step 3. Follow troubleshooting steps for Compressor Code 58 to determine if RT3 Ambient Temperature Sensor or circuit is bad.
Step 3: Turn the Keyswitch to the ON position to energize the compressor electronic system. Ensure the ambient temperature on the Micro-Port display is 45°F or below with or without the use of Simulator Plug (Part No. 22073878). Using a multimeter, complete the following measurements: 1. Voltage between P1-5 and battery Negative. 2. Resistance between HR100 Pin 3 and battery Negative. 3. Voltage between HR100 Pin 2 and battery Negative.	1. Voltage measured should be 12VDC. If not, replace Titan controller. 2. Voltage measured should be 12VDC. If not, check fuse and/or defective harness connections. 3. Voltage measured should be 12VDC. If not, replace FB1-K1 relay. 4. Continuity should be shorted. If not, check for defective harness connections. 5. Voltage measured should be 12VDC. If not, check for defective harness connections. If 12VDC is measured at HR100 Pin 2, replace bad heater(s).

Switched Power Relay Circuit

Operation Description:

The Switched Power Relay provides Positive battery voltage to the Control Panel and Accessory option. When the Keyswitch is in the ON position, the Titan energizes the Switched Power Relay. The Switched Power Relay will remain on until the Keyswitch is turned to the OFF position turning the compressor electronic system off. Also after 3 minutes (15 mins. < 45°F), without turning the Keyswitch to the START position, the Titan will de-energize the Switched Power Relay and itself which will turn off the compressor electronic system.

FB1-K13 Switched Power Relay Circuit:



Switched Supply Relay Circuit

Circuit Description:

The Switch Supply Relay connects to the Titan as illustrated in the circuit diagram. The pink-green wire is the power On signal (12VDC) from the Keyswitch to the Titan. The dark blue wire is the output from the Titan to energize the Switch Supply Relay. The Key Switch is protected by FB1-F2 (5 amp) fuse. The Switched Supply Relay common contact terminal 30 is connected directly to battery + (12VDC).

Component Location:

The S1 Key Switch is located on the Control Panel. K3 relay, F4 fuse, F2 fuse, are located in the FB1 Fuse/Relay center.

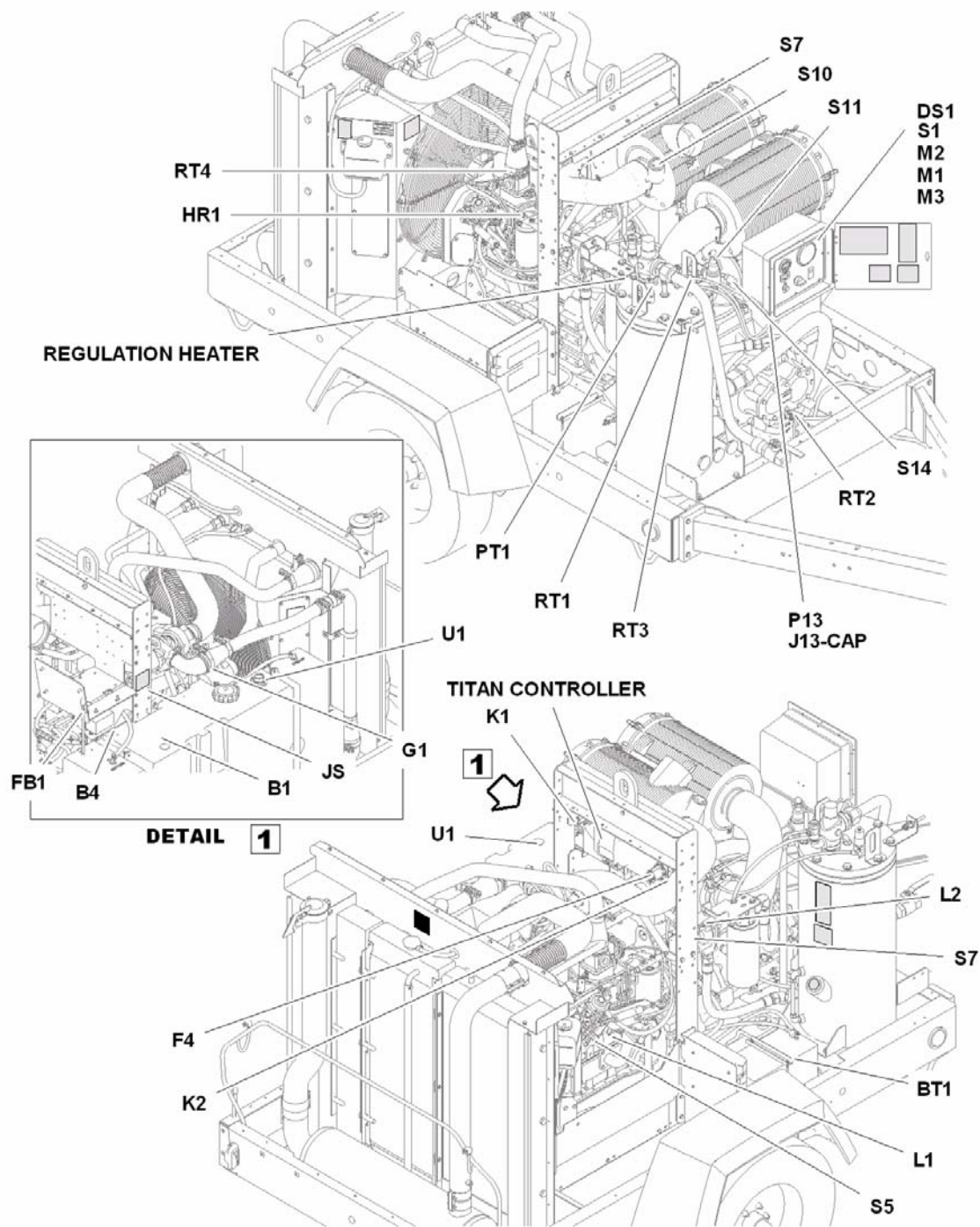
Troubleshooting Steps

Action	Result
Step 1: Check Power Switch Fuse FB1-F4.	If fuse is blown, replace FB1-F2 Fuse.
Step 2: Check all harness connections throughout Switched Power Relay circuit.	If harness connections are loose or damaged, repair harness as needed.
Step 3: Press the Power Switch to energize the compressor electronic system. Using a Multimeter, complete the following measurements: 1. Voltage between S1-A and battery Negative. 2. Voltage between S1-B and battery Negative. 3. Voltage between P1-2 and battery Negative. 4. Voltage between P1-10 and battery Negative. 5. Voltage between K3-D9 and battery Negative. 6. Resistance between K3-B10 and battery Negative.	1. Voltage measured should be 12VDC. If not, check FB1-F2 fuse and or check for defective harness connections. 2. Voltage measured should be 12VDC. If not, replace S1 Keyswitch. 3. Voltage measured should be 12VDC. If not, check for defective harness connections. 4. Voltage measured should be 12VDC. If not, replace Titan controller. 5. Voltage measured should be 12VDC. If not, check for defective harness connections. 6. Continuity should be shorted. If not, check for defective harness connections.

Action	Result
7. Voltage between K3-D10 and battery Negative.	7. Voltage measured should be 12VDC. If not, check for defective harness connections.
8. Voltage between K3-B9 and battery Negative.	8. Voltage measured should be 12VDC. If not, replace K3 switched power relay.



Electrical Component Locations



Harness Connector Locations

P1: 35-pin connector that connects to the Titan controller.

P15: 2-pin connector located behind control panel for termination resistor TR1 on J1939 CAN BUS.

P16: 2-pin connector located near Titan controller for termination resistor TR2 on J1939 CAN BUS.

P13 / J13-CAP: 3-pin connector system located on top of separator tank, connects to regulation heater option harness to the compressor harness.

P2B/P2A: 2 quick disconnects located on the engine harness used for optional accessory harness.



Electrical Parts List

Compressor and Engine

Reference Designator	Description	Part Number
	Titan Controller	46667050
	Engine-Frame Ground Strap 350mm	22132153
	Battery Positive Cable	35583582
	Battery Negative Cable	35610856
	Engine And Compressor Harness	46667054
	Intake Air Heater Harness	46668453
	Trailer Harness	46546339
S5	Engine Oil Pressure Switch	54757935
S14	Safety Valve Pressure Switch	46568519
TR1	J1939 CAN Bus Terminating Resistor	23091804
TR2	J1939 CAN Bus Terminating Resistor	23091804
PT1	Seperator Tank Pressure Sensor	54496773
RT1	Seperator Tank Temperature Sensor	23294820
RT2	Discharge Air Temperature Sensor	46626400
RT3	Ambient Air Temperature Sensor Option	23294838
RT4	Engine Coolant Temperature Sensor	22806004
L1	Fuel Solenoid Valve	Cummins Part
L2	Unloader Solenoid Valve	36843142
U1	Fuel Level Sender	46635099
B1	Engine Starter	22656367
B4	Start Compressor	22907125
G1	Engine Alternator	22656417
K1	Engine Starter Relay	36856250
K2	Engine Intake Air Heater Relay	22903595
HR1	Inlet Heater One	22656383
BT1	Battery, 12 VDC	36844975
D2	Diode	35376169
FB1	Fuse/Relay Center Replacement	46556356
FB1	Fuse/Relay Center Replacement Cover	23366172

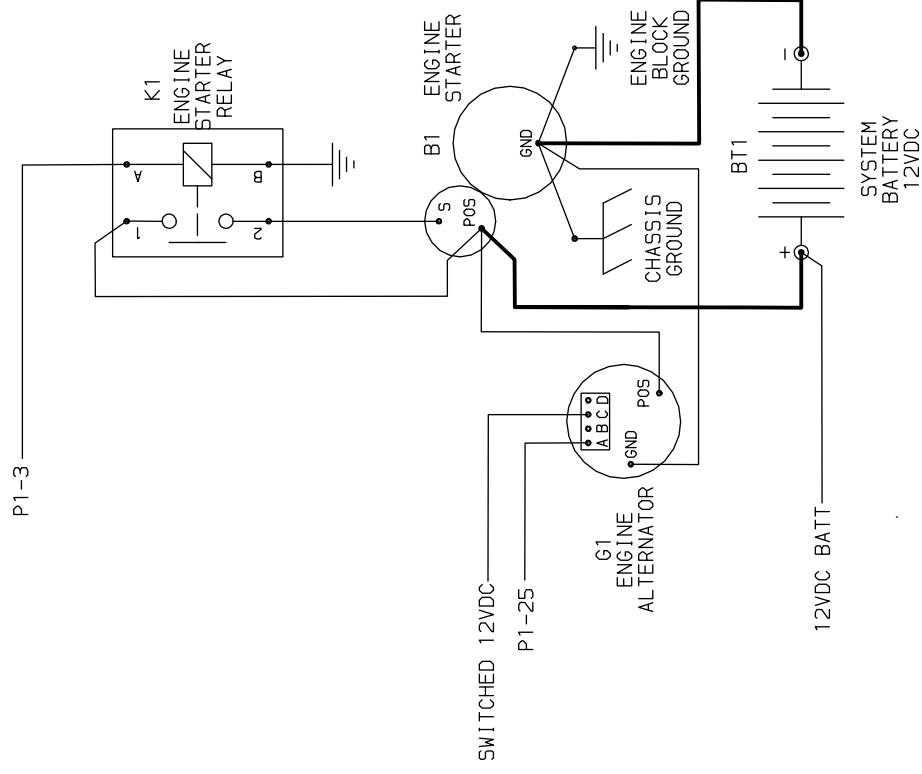
Reference Designator	Description	Part Number
FB1-F1	Titan Controller Fuse 10 Amp	23091812
FB1-F2	Key Switch Fuse 5 Amp	23326069
FB1-F3	Start Compressor Fuse 20 Amp	23091838
FB1-F4	Switched Power Fuse 10 Amp	23091812
FB1-K2	Start Compressor Relay	46666988
FB1-K3	Switched Supply Relay	46666988
F4	Inlet Heater Fuse 150 Amp	46556477
S1	Key Switch	22127385
FB1	Fuse/Relay Center Decal Outside Cover	46574381
FB1	Fuse/Relay Center Decal Inside Cover	46671866

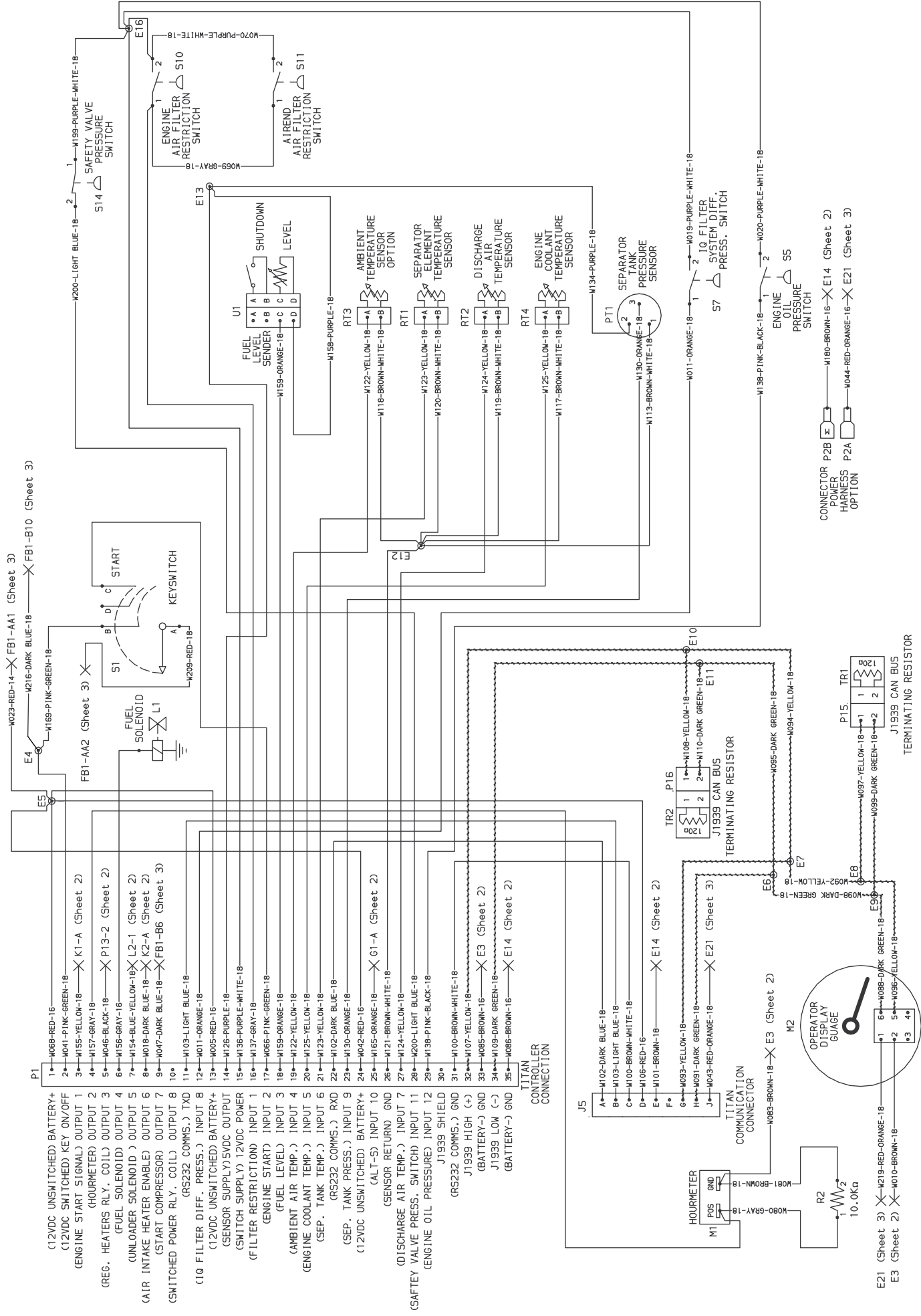
Gauge Panel

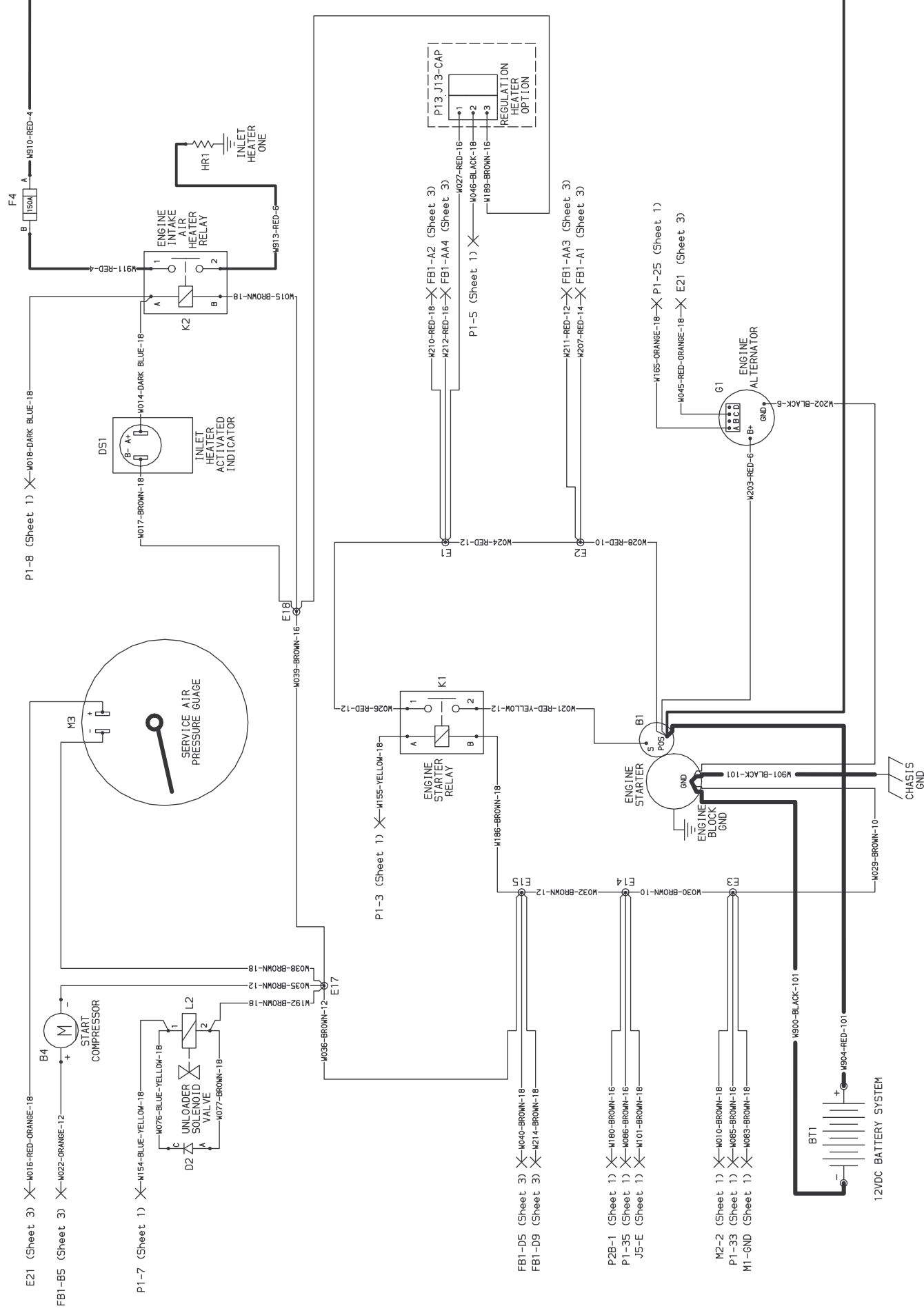
Reference Designator	Description	Part Number
M1	Hourmeter	46557109
M2	Operator Display Gauge	46673584
M3	Service Air Pressure Gauge	46558799
DS1	Inlet Heater Active Indicator	23207228



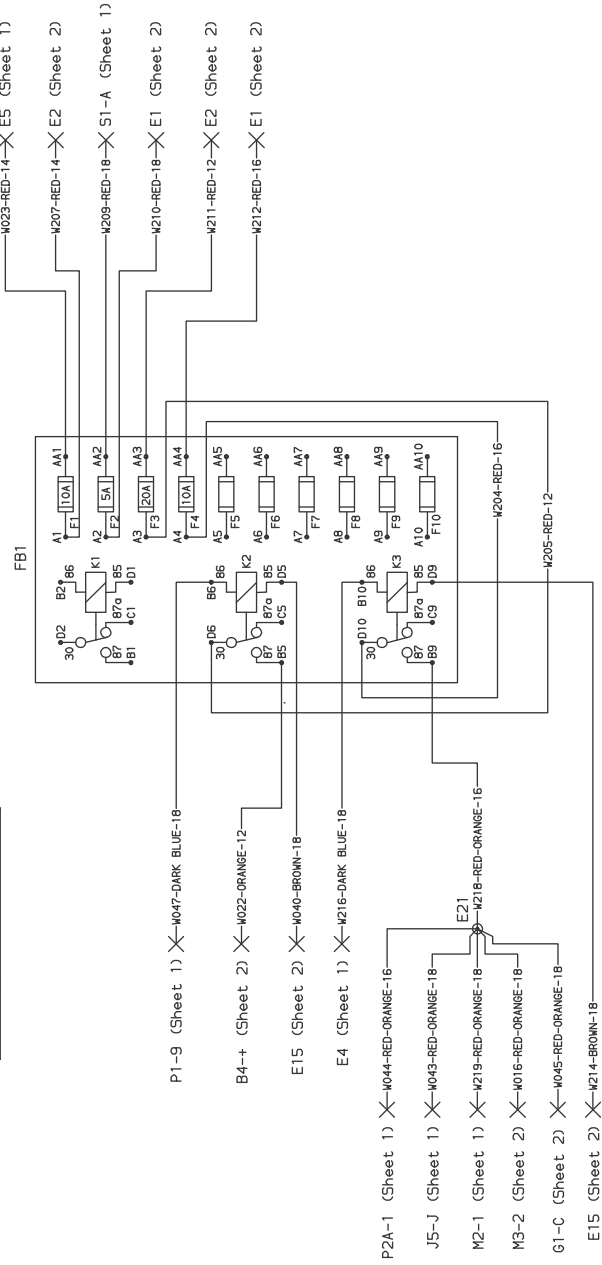
System Schematics and Wiring Diagrams

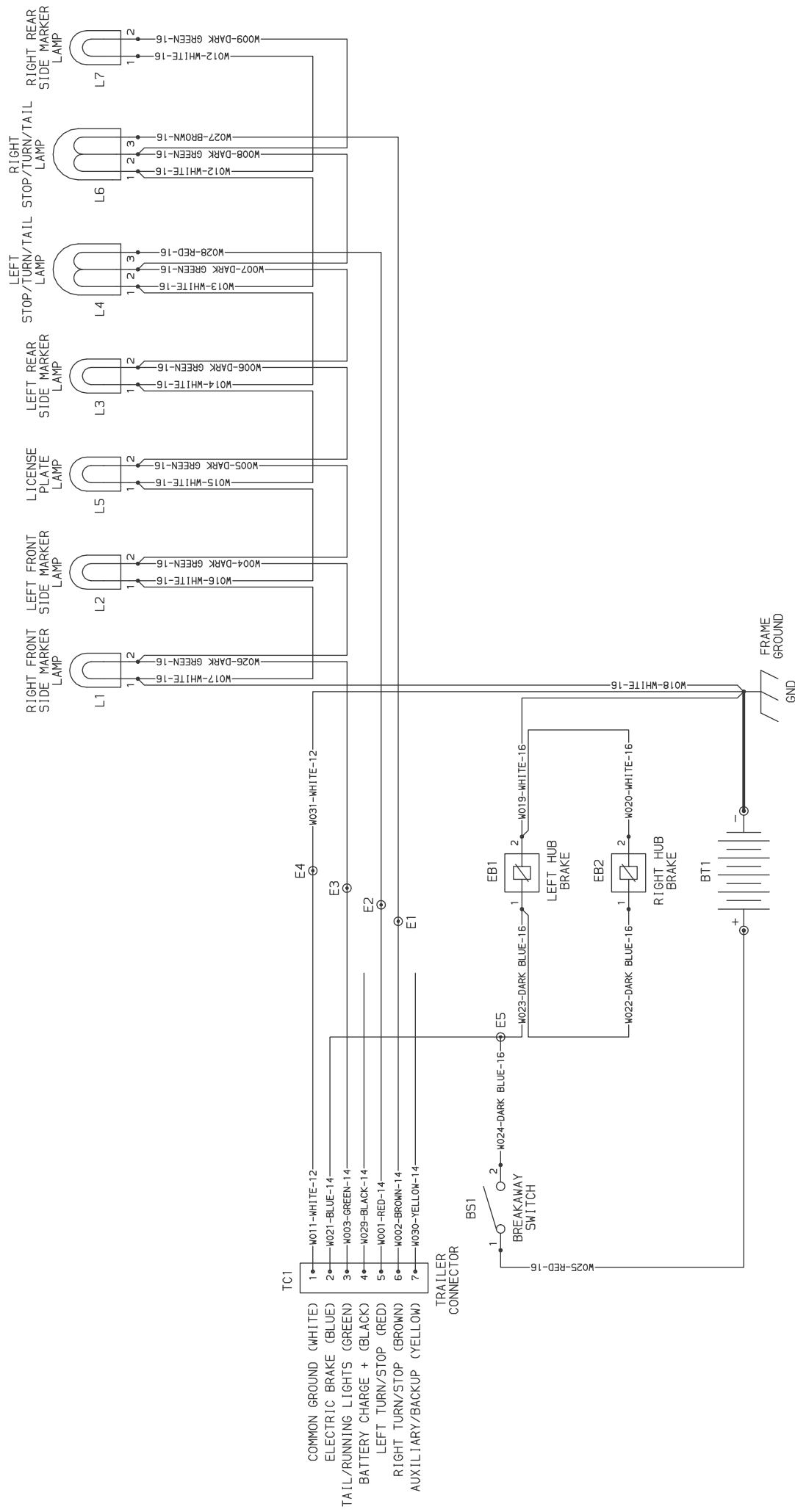






FUSE/RELAY	DESCRIPTION
FBI-F1	TITAN CONTROLLER
FBI-F2	REVERSE SWITCH
FBI-F3	START COMPRESSOR
FBI-F4	NOT USED
FBI-F5	SWITCHED POWER
FBI-F6	NOT USED
FBI-F7	NOT USED
FBI-F8	NOT USED
FBI-F9	NOT USED
FBI-F10	NOT USED
FBI-F11	NOT USED
FBI-F12	START COMPRESSOR
FBI-K3	SWITCHED SUPPLY





Revision History

[illegible]



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