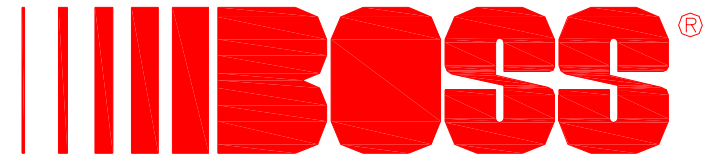


Reference Documents

BCU Decal

AIR COMPRESSORS		AIR COMPRESSORS	
FEATURES		TROUBLESHOOTING	
Check Oil Button	Displays oil level if held while truck is turned off.	OverTemp, OverPress, or Low Oil LED is Flashing.	Check corresponding sender. Use Reset feature. If problem still exists, call for support
Test Button	With compressor on, will activate LEDs and relays when held.	OverTemp, OverPress, or Low Oil LED on Solid.	Shutdown caused by indicating LED. Use Reset feature. If cause persists, call for support.
Emerg Stop Button	If pressed, shutdown will be activated until the Reset button is held.	Filter LED lit.	Filter replacement is needed. See manual for further instruction.
Reset Button	When held for 5 seconds, will clear faults and alarms.	Pressure Bar Graph flashing.	NVM error. Panel needs to be replaced.

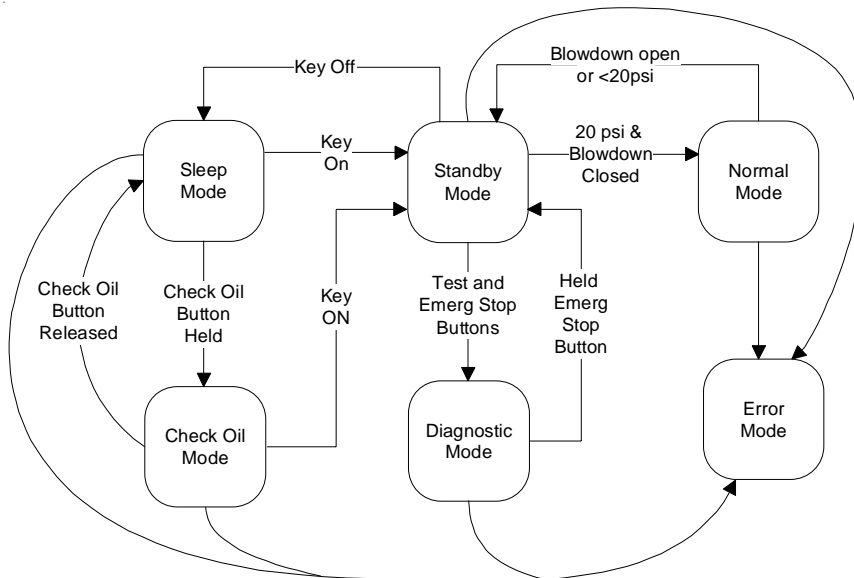
Phone Support : (219) 324-7776 www.bossair.com



AIR COMPRESSORS

Boss Control Unit

BCU State Diagram

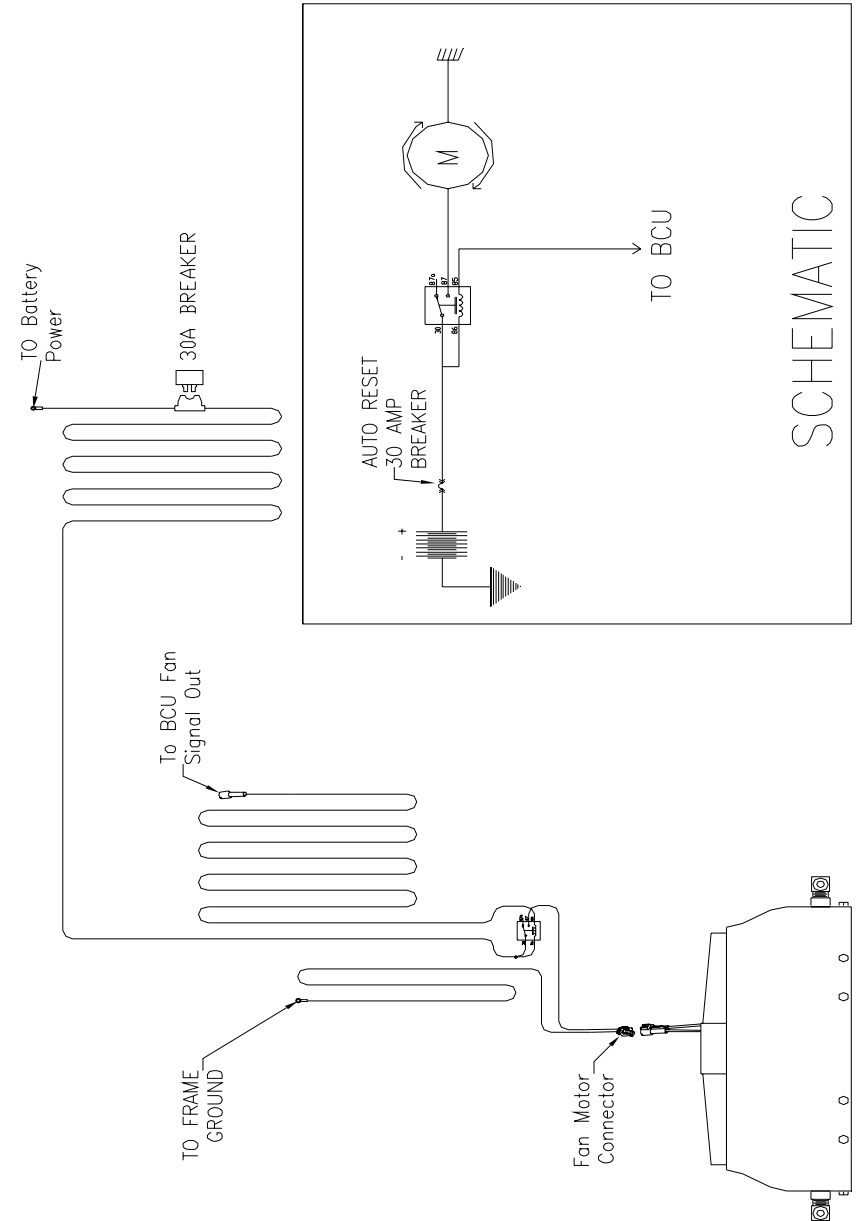


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Remote Cooler Fan Harness



35-Pin Amp Connector

WIRE	COLOR	GAUGE
1. TEMP SENDER PWR	GREEN	18
3. TRANS GND INPUT (TGI)	RED W/ WHITE STRIPE	18
7. TEMP SENDER GND	GREEN W/ WHITE STRIPE	18
11. SHUTDOWN OUTPUT GND	WHITE W/ RED STRIPE	18
12. FAN OUTPUT GND	WHITE W/ LIGHT GREEN STRIPE	18
13. N.C. BLOWDOWN PWR	DARK BLUE	18
15. IGNITION +, (SII) PWR	LIGHT BLUE	16
18. OIL LEVEL SENDER GND	ORANGE W/ WHITE STRIPE	18
22. WARNING OUTPUT GND	WHITE W/ YELLOW STRIPE	18
23. BATTERY -, (BGI) GND	BLACK W/ WHITE STRIPE	16
24. OIL LEVEL SENDER PWR	ORANGE	18
25. PRESS SENDER PWR	BROWN	18
27. FLOAT GND INPUT (FGI)	LIGHT BLUE W/ WHITE STRIPE	18
30. PRESS SENDER GND	BROWN W/ WHITE STRIPE	18
32. NC BLOWDOWN GND	DARK BLUE W/ WHITE STRIPE	18
33. REG PRESS PWR	PINK	18
34. SPEED CTRL OUTPUT GND	WHITE W/ BLUE STRIPE	18
35. BATTERY +, (BPI) PWR	RED	16



BOSS Control Unit

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WARNING



NEVER weld or use arcing tools with BCU connected.



Do not expose to direct sunlight for extended periods.



Do not install BCU or decals on or in front of airbags.



Do not cut or crimp wiring harness.



Only authorized personnel should service BCU and harness.



Always test safety procedures prior to usage.

Sender Resistance Information

Temperature	Resistance
-40	
60	1.4k
140	305 +/- 40
200	131 +/- 14
230	87 +/- 6
260	67 +/- 5

Pressure	Resistance
0	10.0 +/- 3
73	53.0 +/- 4
145	97.0 +/- 4
218	125.0 +/- 5
363	180.0 +/- 30

LED	Color	Oil Level	Resistance
1	R	-5 qts	20
2	Y	-2 qts	40
3	G		60
4	G		80
5	G		100
6	G		120
7	G		140
8	G		160
9	G		180
10	Y	+2 qts	200



Boss Industries Inc.
1761 Genesis Drive
LaPorte IN 46350
Ph. 219-324-7776
Fax. 219-324-7470
www.bossair.com

DIAGNOSTIC MODE

RESETTING FILTER INDICATORS

1. With truck key in the run position and PTO not engaged, press and hold Test button. While holding Test button, press and hold Emerg Stop button for 5 seconds. Temperature bar graph will flash 3 times signifying entering into Diagnostic Mode. Release Test and Emerg Stop button.
2. The Boss Control Unit will now have the OverTemp LED on solid. The unit is showing the number of hi-temp shutdowns. Cycle to the next display by pressing Emerg Stop button. There are 10 diagnostic conditions it will display:
 1. Number of over temperature alarms.
 2. Number of over pressure alarms.
 3. Number of low oil level alarms.
 4. Number of air filter alarms (using differential switch).
 5. Number of oil filter alarms (using differential switch).
 6. Number of air/oil coalescer alarms (using differential switch).
 7. Number of air filter in-service time alarms.
 8. Number of oil filter in-service time alarms.
 9. Number of air/oil coalescer in-service time alarms.
 10. Software revision number.

***Diagnostic information 4-6 are not currently installed on most units.

3. Cycle through to the corresponding “in-service time” alarm. Hold Reset button for 5 seconds.
4. The corresponding alarm has now been reset.
5. To exit Diagnostic Mode, let BCU sit idle for 30 seconds or hold Emerg Stop button for 7 seconds.

<u>Alarm</u>	<u>In-Service Alarm Time</u>
Air Filter	12 months
Oil Filter	6 months
Air/Oil Coalescer	12 months

Welcome

BOSS Control Unit

General Information

Thank you for choosing the most advanced gauge panel in the PTO air compressor industry. The BOSS Control Unit (BCU) uses the latest digital technology to monitor the BOSS Air Compressor System. Using senders and switches, the BCU utilizes safety circuits and embedded logic to ensure optimal compressor performance. Along with improved performance and safety, the BCU simplifies maintenance and troubleshooting. With filter service and wiring fault indicators, problems are quickly identified and repaired. When safety systems are activated, the BCU logs the shutdowns in memory so data can be reviewed at a later time. The BCU is simply the best and most advanced in the industry.



Important Information

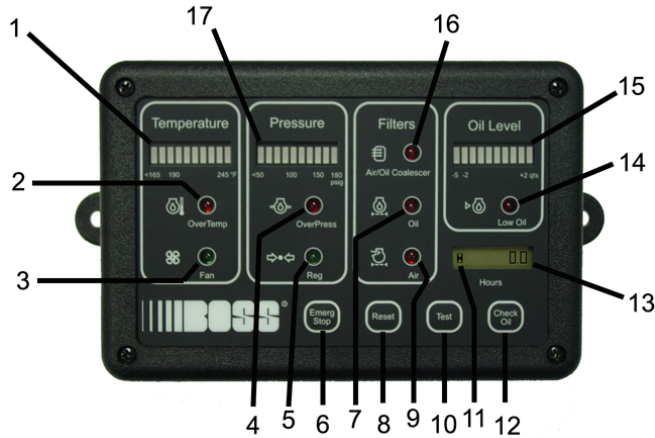
This document provides important information on the installation and operation of the BCU. It is intended as a guide for the Distributor of the equipment and should not be passed along to the customer for operation. The customer should be directed to the Operations Manual. Please read all information carefully prior to using the air compressor system, for the best performance and to prevent any damage to or misuse of the BCU. Any unapproved changes or modifications will void the warranty.

General Notice

It is important to understand the BCU is the brains behind the system’s controls and functions. The LED’s and outputs indicate information the BCU is receiving or sending to other components. It must be understood, just because a Fan LED is illuminated at the BCU, it does not insure the fan is running. For example, if the Fan LED is on, but the fan is wired incorrectly or the fan motor is bad, the fan will not run even though the BCU is indicating it should be. For this reason, it is of the utmost importance that wiring be checked and tested prior to placing the equipment into service, and during regular maintenance intervals.

BCU

Overview



1. **Temperature Gauge** - Displays the temperature of the air compressor system oil.
2. **OverTemp LED** - Indicates a high temperature shutdown or faulty temperature sender connection.
3. **Fan Signal LED** - Indicates the BCU is sending a signal to turn the fan on. This does not verify fan is running, only that a signal has been sent to turn it on.
4. **OverPress LED** - Indicates an overpressure shutdown or faulty pressure sender connection.
5. **Reg LED** - Indicates when system has reached regulated pressure.
6. **Emerg Stop Button** - Used for safety and used in Diagnostic Mode.
7. **Oil Filter LED** - Indicates Oil Filter needs to be replaced.
8. **Reset Button** - Used to clear alarms and faults. Also used in Diagnostic Mode.
9. **Air Filter LED** - Indicates Air Filter needs to be replaced.
10. **Test Button** - Used in test procedure and used in Diagnostic Mode.
11. **Hour Meter State Indicator** - Indicates if hour meter is running.
12. **Check Oil Button** - Used to show oil level when vehicle is turned off.
13. **Hour Meter** - Displays the total hours of air compressor use.
14. **Low Oil LED** - Indicates a low oil shutdown or faulty oil level sender connection.
15. **Oil Level Gauge** - Displays the oil level in the air compressor system.
16. **Air/Oil Coalescer LED** - Indicates the Air/Oil Coalescer needs to be replaced.
17. **Pressure Gauge** - Displays the air pressure in the system.

Diagnostic Mode

BOSS Control Unit



Exiting Diagnostic Mode

There are 2 different ways to exit out of Diagnostic Mode. One way is to simply let the BCU sit idle for 30 seconds. If nothing has been pressed, the BCU will return to Standby Mode. The quicker way to exit Diagnostic Mode is to press and hold the Emerg Stop for 5 seconds.



Step 1. Press and Hold Emerg Stop for 5 Seconds



Step 2. Panel will return to Standby Mode

The BCU, just like most digital devices, is a state driven system. There are 6 possible modes the BCU can be in: Sleep, Check Oil, Standby, Normal, Diagnostic, and Error mode.

Sleep Mode occurs when 12VDC unswitched battery power, and battery ground is hooked up. The best example of sleep mode is when the truck ignition is off. In this low power state, the panel wakes up periodically to update the in-service accumulators for diagnostic purposes. Shown on the right, nothing is displayed on the BCU during Sleep Mode.



Sleep Mode

Check Oil Mode can only be reached when the truck is turned off (Sleep Mode). While in Sleep Mode, if the Check Oil button is held, the Oil Level display will become illuminated, after about 5 seconds, indicating the amount of oil in the sump tank. The level is displayed only while the button is held. When the Check Oil button is released, if no faults or alarms occur, the BCU will return to Sleep Mode.



Check Oil Mode

Standby Mode happens when the unit is in Sleep Mode and 12VDC switched battery power is supplied. In most units, this is when the ignition switch is turned on. The truck does not have to be started, only the key in the “run” position. In Standby Mode, the BCU will activate the temperature, pressure, and oil level gauges. Along with those, the hour meter will show the total time used. On the left side of the hour meter state indicator. When the BCU is in standby Mode, the hour meter will be on solid. If any faults or alarms occur, the BCU will remain in Standby Mode until it has been reset.



Standby Mode

Normal Mode can only be reached if the BCU is in Standby Mode and no faults or alarms have occurred. There are 2 constraints that must be met for the panel to enter Normal Mode: 20 psi of air pressure in the system and the blowdown switch being closed. When the BCU has seen these 2 constraints have been met, the state indicator will begin to flash. This signal is very important in troubleshooting any problems that may occur. If at any time during Normal Mode an alarm or fault should occur, a safety signal will be sent by the BCU to either deactivate the PTO or kill the truck engine.



Normal Mode



Diagnostic Mode

Diagnostic Mode also can only be reached from Standby Mode. When in Standby Mode and a certain pattern of keys are pressed, the BCU will transfer into Diagnostic Mode. An LED sequence will flash signifying the entry was successful. Once in Diagnostic Mode, the BCU will display the number of alarms occurred by the system and the reason each one occurred. Also in this Diagnostic Mode is where the filter indicators can be reset once the filters have been changed. This feature is intended for maintenance and service personnel. On the left is a sample screen from Diagnostic Mode.

Error Mode is a state that occurs if the non-volatile memory becomes damaged. At this point the BCU is inoperable and will need to be replaced. To signify the BCU is in Error Mode, the Pressure Gauge will all flash together. If this does occur please contact BOSS as soon as possible so the air compressor system can be repaired. The air compressor system WILL NOT WORK if the BCU is in Error Mode.



Error Mode

Resetting Filter In-service Time

If a filter has been changed on the system, whether the LED was illuminated or not, the corresponding in-service time needs to be reset. Cycle through the Diagnostic Mode elements until the corresponding in-service LED is illuminated. Be sure the In-Service is displayed and not the alarms. Hold the Reset Button for 5 seconds. The reading on the gauges will reset to 0. Only reset the filter that has been changed. An example is shown of resetting the oil filter time.



Step 1. Press Emerg Stop until Oil In-Service Time



Step 2. Hold Reset for 5 Seconds



Step 3. Oil In-Service will reset to 0

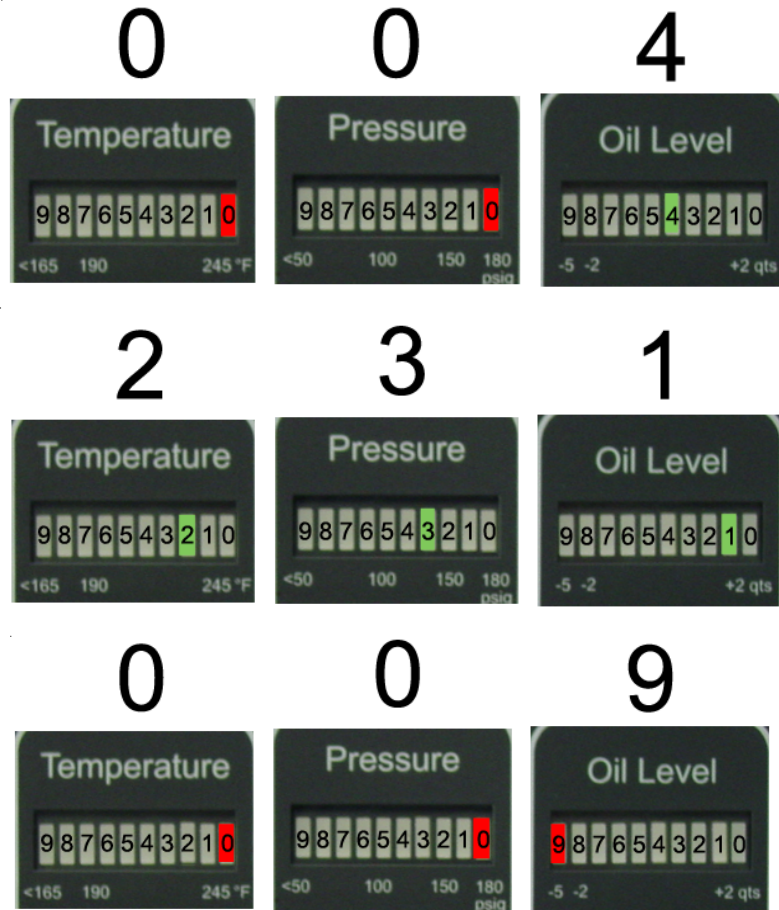


Step 4. Release Reset Button

Diagnostic Mode

Reading Diagnostic Information (cont.)

The 3 gauges display the number of alarms. The Temperature Gauge shows the hundreds, the Pressure Gauge shows the tens, and the Oil Level Gauge shows the ones. On each gauge there are 10 LEDs. The left most LED is 9 and the right most LED is 0. Here are some examples of the number of shutdown the gauges are displaying.



BCU

BOSS Control Unit



Inputs

The BCU is driven by inputs from numerous senders, switches, and signals. Without these inputs, the BCU would not be able to react in the manner in which it was intended to run. Safeties could fail if all of these inputs are not wired correctly.

Senders



Temperature Sender

Temperature Sender is used to provide an accurate reading of how hot the oil in the air compressor system is reaching. This sends a signal that is digitally displayed on the temperature gauge. The bar graph ranges from 165F to 245F. The temperature sender is located on the inlet side of the oil filter head.



Pressure Sender

Pressure Sender is used to supply a correct reading of air pressure in the system. The pressure sender is a transducer that works similar to the temperature sender. It sends a signal that is digitally displayed on the pressure gauge. The bar graph ranges from 50psi to 180 psi. This sender is located on the inlet side of the coalescer head.



Oil Level Float

Oil Level Sender informs the BCU on the amount of oil in the air compressor system. Just like the last two senders, the oil level sender sends a signal that is digitally displayed on the oil level gauge. The oil level gauge ranges from 5 quarts low to 2 quarts high. This oil level float is inserted into the top of the sump tank.

Switches

Blowdown Switch is an extremely important part of the air compressor system. Without this air pressure switch, the safeties in the BCU are not possible. The 5psi blowdown switch is normally closed, but when the switch opens, the system will vent air to atmosphere. The BCU checks for continuity between the two terminals on the switch and reacts accordingly. This switch is located in the pilot side of the blowdown valve.



Blowdown Switch



3-Way Regulated Pressure Switch

3-Way Regulated Pressure Switch is used to let the operator know the system has reached regulated pressure. This switch provides a 12VDC input to the BCU through the normally open branch of the 3-way switch. The normally closed branch of the 3-way switch is used for controlling the engine speed of the truck. This switch is located downstream of the regulator valve.

Signal Inputs

Transmission Ground Input (TGI) is used to let the BCU know whether the truck has a manual or automatic transmission. This is a very important safety feature which will be discussed in a later section. If the Transmission Ground Input is grounded, the truck has an automatic transmission. If it is left as an open circuit, the truck has a manual transmission.

Float Type Input (FTI) is used for cases in which the standard oil level float is not used on the system. In this case an external oil level float is used. When the Float Type Input is grounded, the system is using an external oil level float. This is easily recognized because there will be 2 green LEDs lit on the oil level gauge instead of 1 green LED when the system oil level is full.



External Oil Level Float

Diagnostic Mode

BOSS Control Unit

Reading Diagnostic Information

When the BCU enters into Diagnostic Mode, the BCU is displaying the number of Over Temperature alarms. This is signified by the OverTemp LED being on solid. This will always be the first information that is displayed

There are 10 diagnostic information elements that can be cycled through by momentarily pressing the Emerg Stop Button. Each one is indicated by the corresponding LED illuminating. They appear in the following order:



1. Over Temp Alarms



2. Over Pressure Alarms



3. Low Oil Alarms



4. Air Filter Alarms
(not used)



5. Oil Filter Alarms
(not used)



6. Coalescer Filter Alarms
(not used)



7. Air Filter In-Service



8. Oil Filter In-Service



9. Coalescer Filter In-Service



10. Software Revision

Diagnostic Mode

Diagnostic Mode

There are many digital gauge panels on the market today, but the BCU has one feature that stands out from all others: Diagnostic Mode. With Diagnostic Mode, maintenance personnel can easily figure out why a truck has been shutting down, and the scheduled maintenance that needs to be preformed.

Entering Diagnostic Mode

With the BCU in Standby Mode, press and hold the Test Button. While holding the Test Button, press and hold the Emerg Stop Button for 5 seconds. The Temperature Gauge will flash 3 times signifying the entrance into Diagnostic Mode. Release the Test and Emerg Stop Button.



Step 1. Press and Hold Test Button



Step 2. While holding Test, Press and Hold Emerg Stop



Step 3. Temperature Gauge will Flash 3 times



Step 4. Release Buttons, BCU in Diagnostic Mode

BCU

BOSS Control Unit



Signal Inputs (cont.)

Battery Ground Input (BGI) must always be hooked up for the BCU to work properly. This is the main grounding wire for the BCU. This input must be attached to a clean ground source. We strongly suggest running a direct connection to the negative post on the battery.

Battery Power Input (BPI) must always be hooked up for the BCU to work properly. This is the main power feed to the BCU. The input must be run to a 12VDC unswitched power supply. We strongly suggest running a direct connection to the positive post on the battery.

Switched Ignition Input (SII) is the main driver for the logic in the system. This power feed needs to come from a 12VDC switched power. In most cases, power comes from the key switch or key switch harness.

The other 4 inputs the system has are the Emerg Stop, Reset, Test, and Check Oil Buttons. They are all momentary buttons. The uses of these will be explained in the following pages.

Harness and BIM

We have simplified the wire harness to insure the BCU is receiving all the inputs it needs. Every connector on the harness is unique and can only be connected to its appropriate mating connector. This main harness runs to the Boss Interface Module (BIM). The BIM is a prewired chassis & system specific device. Using relays, a timer, and terminal strips, the signals from the BCU all have a common truck interface. Along with the BIM transferring signals to the BCU; the BIM also is used as the point of transferring outputs from the BCU to the truck engine and transmission. Each BIM is built specifically for the order. In the event the vehicle, engine, or transmission are different from the one labeled on the BIM, DO NOT USE. Call BOSS Industries at 1-800-635-6587 for additional instructions. Using a BIM designed for a different vehicle than labeled will void the warranty and may cause erratic operation of the compressor, vehicle, or transmission possibly creating safety concerns.



BIM & Harness

Outputs

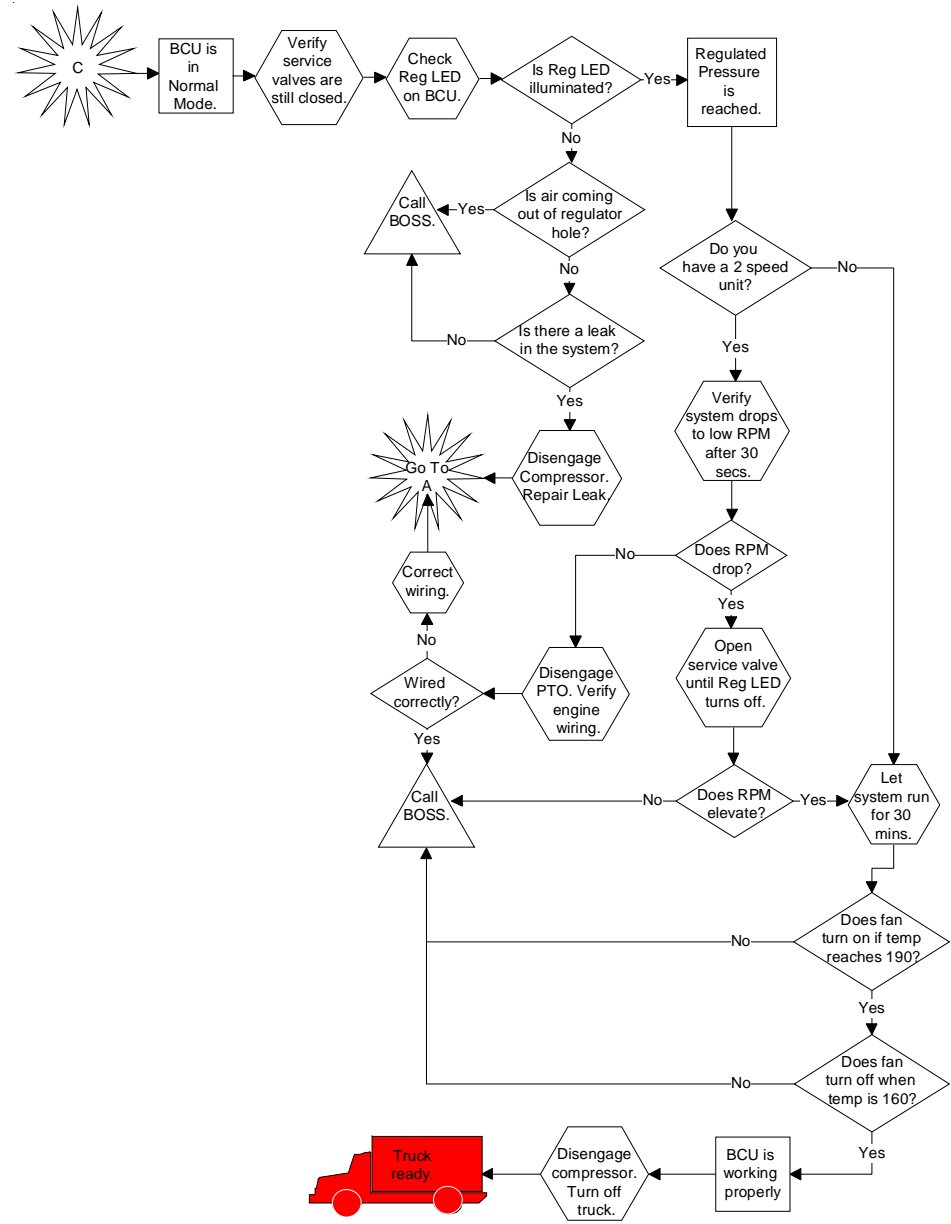
The BCU is constantly monitoring the operation of the compressor. During this process, it displays information on the gauges and LEDs providing “Visual” indicators of how the equipment is working. In addition, the BCU will send “Signal” outputs to the relays in the BIM providing safety, warning, speed control and other important compressor functions.

Signal Outputs

Shutdown Signal - This signal is the safety control signal that prevents injury to the operator and equipment in the unlikely event the equipment is operating in excess of standard conditions. This signal is used to “shutdown” or stop the compressor operation when excessive temperatures, pressures, or dangerously low oil levels are present in the system. The Emerg Stop button on the BCU also uses this signal to stop compressor operation. At a predefined point on each respective gauge (temperature, pressure, or oil level), the LED associated with the preset safety limit lights up and immediately tells the BCU to send a shutdown signal to the shutdown relay in the BIM (see gauge description for detailed information). On vehicles equipped with automatic transmissions, this signal will disengage the PTO. The vehicle will still be drivable but the shutdown will remain active preventing further operation of the compressor until the problem is fixed and the BCU has been reset. On vehicles with manual transmissions, this signal is only sent out long enough to kill the engine. The operator will have to manually disengage the PTO. The compressor system unit needs to be serviced and problem resolved prior to operation. Once the engine has been restarted, the BCU will automatically reactivate the shutdown signal if the BCU has not been reset and the PTO is engaged.

Warning Signal is not necessary or required for the safe operation of the compressor. It is used to provide an additional warning prior to the shutdown of the compressor. This signal can be tied into the BIM to activate a relay sounding a horn or a strobe light on the vehicle. The horn or strobe light is not supplied with the standard equipment, but the BCU and BIM support their use. The warning signal is sent out when the LED prior to the shutdown LED illuminates (see gauge descriptions for detailed information).

Speed Control Signal is used to tell the truck engine to increase RPMs through the BIM. This function is directly linked to Normal Mode. When the BCU is in Normal Mode, the speed control signal is active. With the speed control signal active, the state indicator will be flashing. For reference, the 2 main constraints for Normal Mode are the blowdown switch closed and 20 psi of air pressure in the system.



Visual Outputs (cont.)

Reg LED notifies the user the system has reached regulated pressure. The 12VDC input through the 3-way regulated pressure switch activates the green Reg LED. This LED is important when troubleshooting a vehicle problem.



Air/Oil Coalescer LED is an indicator to informing the compressor coalescer needs to be changed. This flashing red LED notifies the end user the air/oil coalescer needs to be replaced. Using the BCU's internal clock, this LED is activated every 12 months. After the coalescer has been changed, the LED has to be reset in Diagnostic Mode. A qualified maintenance personnel will be able to perform this operation.



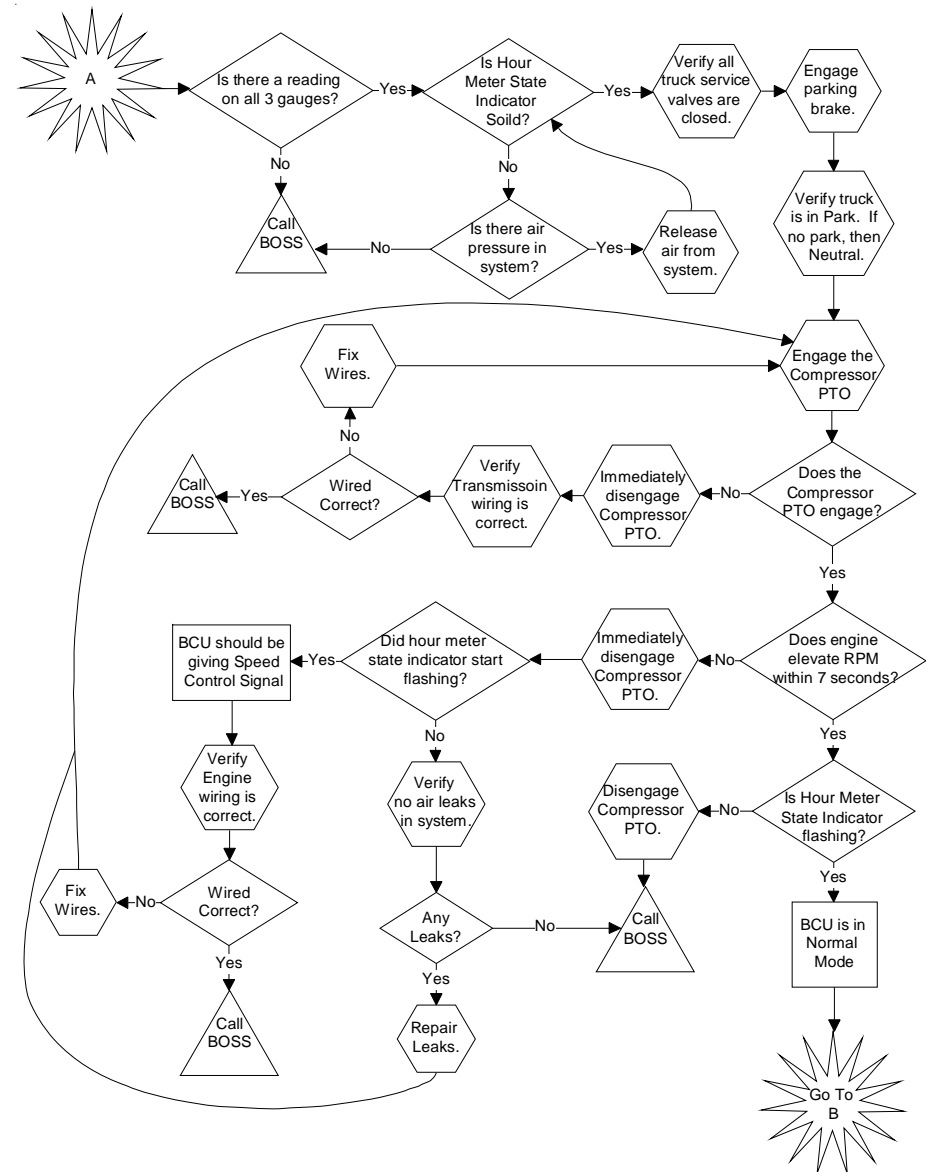
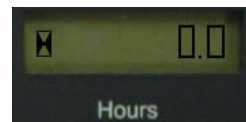
Oil LED is an indicator the compressor oil filter needs to be changed. This flashing red LED notifies the end user the oil filter needs to be replaced. Using the BCU's internal clock, this LED is activated every 6 months. After the oil filter has been changed, the LED has to be reset in Diagnostic Mode. A qualified maintenance personnel will be able to perform this operation.



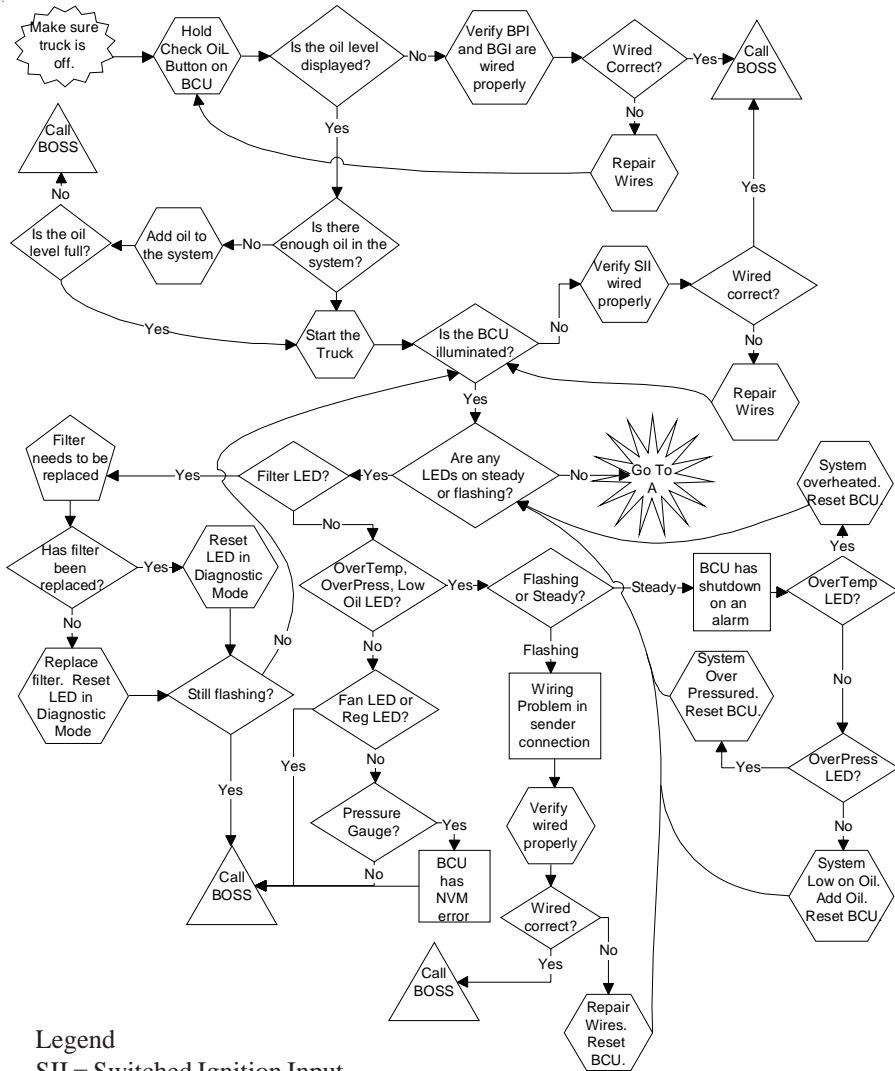
Air LED is an indicator the compressor air filter needs to be changed. This flashing red LED notifies the end user the air filter needs to be replaced. Using the BCU's internal clock, this LED is activated every 12 months. After the air filter has been changed, the LED has to be reset in Diagnostic Mode. A qualified maintenance personnel will be able to perform this operation.



Hour Meter is used to show the number of total hours on the air compressor system. The Hour Meter records usage whenever the BCU is in Normal Mode.



System Flowchart

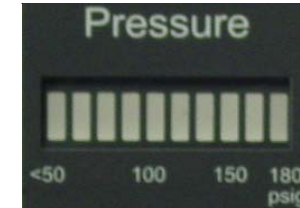
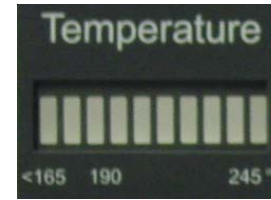


Legend

SII = Switched Ignition Input
 NVM = Non-Volatile Memory
 BPI = Battery Power Input
 BGI = Battery Ground Input
 TGI = Transmission Ground Input

Visual Outputs (cont.)

Hour Meter State Indicator - The main purpose is to let users know when the hour meter is recording usage. The state indicator will flash when the hour meter is recording, and will stay solid when it is idle. Because we know the BCU is in Normal Mode when hours are being recorded, the state indicator will also give very important information when troubleshooting any problems that may arise during installations.

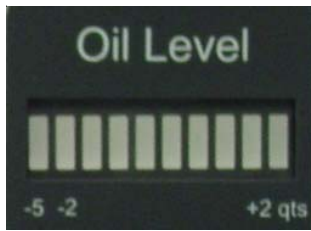


Temperature Gauge shows the oil temperature of the air compressor system. The LED colors of the temperature gauge reveal helpful information to the user. The first bar on the left hand side of the range is yellow; indicating the temperature in the system is below 165F. The next 7 LEDs are green. This covers the range from 165F to 230F. This signifies optimal operating temperatures for the compressor system. Within this range, the remote cooler fan may be active. At 190F, the Fan Signal will be activated by the BCU. When the Fan Signal is active, the Fan LED will also be illuminated. Remember, the Fan LED only indicates the Fan Signal is on, and does not verify the remote cooler fan is actually running. The remote cooler fan will run once activated, until the oil temperature drops to 165F. The 9th LED is yellow; warning the system is becoming too hot. This range is about 230F to 240F. When the warning LED is on, the BCU will activate the Warning Signal output. The last LED is red; signifying the system is overheating. At 245F, the BCU will activate the Shutdown Signal to stop the system. Should this occur, the red OverTemp LED will illuminate solid and the BCU will change to Standby Mode.

Pressure Gauge shows the air pressure in the compressor system. The LED colors of this gauge are also helpful information for the user. The first bar on the left hand side of the range is yellow, indicating the air pressure is less than 50 psi. The next 7 LEDs are green. This covers the range from 50 psi to 160 psi. This signifies probable operating pressures for the compressor system. The 9th LED is yellow; warning the system is becoming very high pressure. This range is about 160 psi to 170 psi. When the warning LED is on, the BCU will activate the Warning Signal output. The last LED is red; signifying the system pressure is too high. At 175 psi, the BCU will activate the Shutdown Signal. Should this occur the red OverPress LED will illuminate solid and the BCU will change to Standby Mode.

Visual Outputs (cont.)

Oil Level Gauge shows the level of oil in the air compressor system. Once again the LED colors of this gauge are informative. The first bar on the left hand side of the range is red, indicating the oil level is 5 quarts low. The BCU will activate the Shutdown Signal. Should this occur the red Low Oil LED will illuminate solid and the BCU will change to Standby Mode. The 2nd LED is yellow; warning the system is becoming low on oil. When the warning LED is on, the BCU will activate the Warning Signal output. This range is 2 to 4 quarts low. The next 7 LEDs are green. This covers the range from 1 quart low to 1 quart high. This signifies probable operating levels for the compressor system. The 10th LED is yellow indicating the oil level is at least 2 quarts high. If oil is overfilled, the air coming out of the system may contain some oil.



Features

The BCU has other features that are important to know and use. These four features should be used everyday by the user to verify proper service and maintenance.

Emergency Stop

With the use of the BCU's shutdown signal, the air compressor system can be shut off with a touch of the Emerg Stop Button. This feature only works when the BCU is in Normal Mode. Otherwise, if the button was accidentally pushed while driving down the road in a vehicle with a manual transmission, the BCU would kill the truck engine. Like any other Shutdown Signal activation, the signal is active for 5 seconds with a manual transmission, and a held signal for automatic transmission. Either way, the BCU needs to be reset prior to engaging the compressor again.



Troubleshooting

F.A.Q.

Q: Why does my fan run when the truck is turned off?

A: Check your Battery Power Input and Battery Ground Input.

Q: When I press the Test Button with the compressor off, nothing happens, Why?

A: Test Button only works in Normal Mode. There must be 20 psi in the system, and the blowdown switch must be closed.

Q: Why does my Oil LED flash?

A: Your oil filter needs to be changed. Once it has been changed, qualified personnel must reset your oil filter in-service time.

Q: I engage the PTO on my Ford Super Duty, but the engine RPM does not elevate?

A: Verify the truck is in park, and the parking brake is set. Do not continue to run if engine does not elevate within 7 seconds.

Q: I keep shutting down on Over Temperature, but my Fan LED is illuminated. Why is it not cooling off?

A: Just because the Fan LED is illuminated, does not verify the fan is running. Once the oil has cooled down, engage the compressor and use the test circuit to verify the fan is actually running.

Q: The Hour Meter State Indicator is flashing but my truck is not elevating to high RPM?

A: Verify the Speed Control Relay on the BIM board is tripping. If it is, check the wiring from the BIM board to the truck.

Q: When I check the oil with the compressor shut off I have a green LED lit, but the compressor shuts down on low oil when I engage it. Why?

A: The oil level in the sump tank lowers when there is air pressure in the system. All the lines that are above the sump tank will drain back to the tank when the system is shut off, giving the impression of more oil in the system.



Start-up Procedure

Start-up Procedure

This routine should be followed every time prior to the use of the BOSS Air Compressor System. If the Initial Test Procedure has not been completed, execute that procedure prior to running the Start-up Procedure. The start-up procedure for every truck is different. Always verify the procedure with the start-up decal. Shown below is the Start-up procedure for a Ford Super-Duty with SEIC.

1. Verify there is enough oil in the compressor sump tank. This can be done using the Check Oil button prior to starting the truck, or reading the Oil Level Gauge in Standby Mode. If low, add oil.
2. Verify all service valves are closed.
3. Start the truck.
4. Engage Parking Break.
5. Place truck in Park.
6. Engage the compressor. Once the Hour Meter State Indicator begins to flash (Normal Mode), press the Emerg Stop button. The PTO should disengage. The Hour Meter State Indicator should be on solid (Standby Mode).
7. If Emerg Stop Button has worked properly, disengage the PTO. Hold Reset button for 5 seconds on BCU. The BCU has now been reset from the emergency stop.
8. Engage the compressor.
9. Open needed service valves.

Test Circuit

The BCU has a feature used to help test the air compressor system wiring. This feature only works when the BCU is in Normal Mode. If the Test Button is held in Normal Mode, the 8 single LEDs will illuminate. Along with the LEDs, the Fan Signal and the Warning Signal will activate. There are three main uses for this button: to check if the Warning Signal is wired correctly, to check if the remote cooling fan is wired correctly, and 3 to verify that all of the 8 of the LEDs are working.



Reset Feature

The BCU has many ways of letting users and installers know there is a problem. This is accomplished through the reset feature on the BCU. If there is a wiring fault or a shutdown alarm the BCU will not return to Sleep Mode when the truck is turned off until a reset occurs. To reset the BCU, simply hold the Reset Button for 5 seconds. This will clear the alarm, fault, or an emergency stop. There are certain displays that can only be cleared in Diagnostic Mode. For example, all filter in-service indicators cannot be cleared without entering Diagnostic Mode.



Check Oil Feature

This feature was added to the BCU so that before a vehicle is taken out for use, the oil level can be checked. While the BCU is in Sleep Mode, simply hold the Check Oil Button for 5 seconds. The oil level gauge will illuminate and display the level of oil. If the oil is too low, or the circuit is not wired correctly, the Low Oil LED will illuminate. Should this occur, when the Check Oil Button is released, the BCU will not return to Sleep Mode until it has been reset. Simply hold Reset Button for 5 seconds and the panel will shut off.



Test Procedure (cont.)

8. Next, engage the PTO again. The truck should again increase to high RPM. Once it has, and the Hour Meter State Indicator starts flashing again, hold the Test Button. All 8 LEDs should illuminate. Also, the Fan and Warning signal will be activated. If there is a remote cooler on the truck, verify the fan is running. Release the Test Button. If any of the above did not happen, disengage the PTO. Do not continue on. Refer to the Troubleshooting section.
9. If all of the Test Buttons worked correctly, check to see if Reg LED is illuminated. The system should reach regulated air pressure within 1 minute. If it has not, do not continue on. Refer to the Troubleshooting section.
10. If the truck is a 2 speed unit, verify the truck engine RPM has dropped to the low speed. This should occur within 45 seconds after the Reg LED became illuminated. If the truck has dropped to low speed, or the truck is a 1 speed unit, continue to next step. If it does not, do not go on. Refer to the Troubleshooting section.
11. Open truck service valve until the Reg LED turns off. The truck engine should accelerate to high RPM. If the truck accelerates, or is a 1 speed unit, continue on. If it does not, do not continue. Refer to the Troubleshooting section.
12. Let air compressor continue to run. The temperature of the oil in the system should start to rise. When the temperature reaches 190F, verify the Fan LED and remote cooling fan turns on. Remember the Fan LED does not confirm the remote cooling fan is on. If the fan does not turn on, do not continue on. Refer to the Troubleshooting section.
13. Let air compressor system run for 30 minutes. Verify there are no faults or alarms on the BCU. Disengage the compressor. Turn off the truck. Check underneath the truck for any oil leaks. Use caution as there will be many parts under the truck that will be very hot. If there are no leaks, the BCU and electrical system is working properly. Continue to BOSS Air Compressor Manual for any additional test that might need to be preformed.

Initial Test Procedure

Initial Test Procedure

After the BCU has been installed, there is a recommended initial test procedure to follow. These steps will also be helpful in troubleshooting the system to identify a problem's source quickly.

1. With the truck key out of the ignition, hold the Check Oil Button for 5 seconds. The BCU should enter Check Oil Mode and the Oil Level Gauge will illuminate. Verify there is enough oil (LED under the "v" in Oil Level) in the air compressor system. If this is not the case, do not continue. Refer to the Troubleshooting section.
2. Start the truck. Verify there is a reading on all 3 gauges. Check the Hour Meter State Indicator; it should be on solid signifying Standby Mode. Also there should be no illuminated LEDs, other than the 3 gauges. If this is not the case, do not continue on. Refer to the Troubleshooting section.
3. Verify all air service valves are closed. The system will not start if a valve is left open to atmosphere. Engage the parking break on the truck. Engage the compressor PTO. Once the PTO engages, about 1 to 3 seconds, the truck engine should elevate RPMs. If the engine does not elevate within 7 seconds, immediately disengage the PTO. Do not continue on. Refer to the Troubleshooting section.
4. If the truck engine has elevated to high RPM, verify the Hour Meter State Indicator is flashing signifying Normal Mode. If this is not the case, do not continue on. Refer to the Troubleshooting section.
5. If the Hour Meter State Indicator is flashing (Normal Mode), press the Emerg Stop button. The PTO should disengage if it is an automatic transmission, or if it is a manual transmission the truck engine should die. The Hour Meter State Indicator should be on solid (Standby Mode). If it does not, do not continue on. Go immediately to the Troubleshooting section, or call for technical support.
6. If Emerg Stop Button has worked properly, disengage the PTO. If manual transmission, restart the truck. Hold Reset button for 5 seconds on BCU. The BCU has now been reset from the emergency stop.
7. Check for possible air compressor system oil leaks under the truck. A visual inspection of the ground underneath the truck is the quickest check. If there are any spots, do not go on. Refer to the Troubleshooting section.

Installation

BOSS Control Unit

Installation

Read the BOSS Air Compressor System manual prior to installing any equipment on the truck. Verify the wiring diagrams that have been sent with the manual match the specifications of the truck. Install all components of the BOSS Air Compressor System prior to installing the BCU and other electrical components. The installation of the rest of the components is covered in the Air Compressor Manual.

Once the Boss Air Compressor has been installed, begin the installation of the BCU and electrical components. If at anytime there is a question that occurs, immediately go to the Troubleshooting section of this manual, or call for technical support. Once this equipment has been installed, do not weld or use high arcing tools on the chassis without disconnecting the BCU. No warranty coverage will be given for damaged created by welding or high arcing tool feed back.

1. Sender Connector Harness

The first step of installing the BCU, is attaching the sender connector harness. Install one side of harness to the sender and switch connectors. These connectors will only connect to their corresponding mate.



Temperature Sender Connection

Route the other end of the harness with the 2 6-pin connectors in the frame rail toward the intended location of the BIM.



Run Harness toward BIM Location

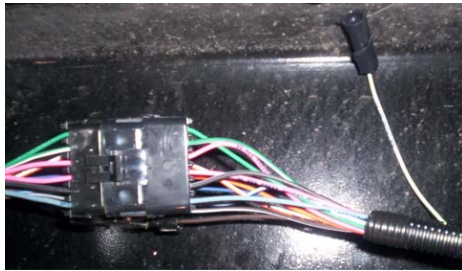


2 6-Pin Connectors from Sender Harness

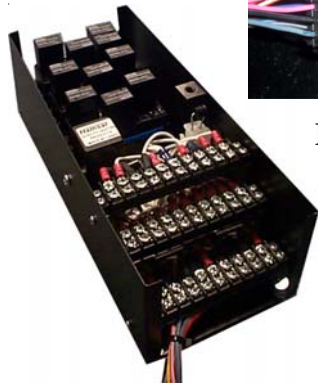
Installation

2. BIM Wiring

Once the sender harness has been installed, the next step is connecting the BIM harness to the Sender harness. On one end of the BIM harness is 2 6-pin Connectors and a single 1-pin connector. The 1-pin connector is used when a remote cooling fan is installed. This wire carries the low-side driver to the fan harness.



BIM Harness Connected with No Remote Cooling Fan



BIM with Cover Removed

Install BIM in desired location. Remove cover off BIM, so that wiring connections can be made. Connect the BIM to the BIM harness. The Sender harness and BIM harness should now all be connected. The only connector that has not been used yet is a 35-pin Amp connector that attaches directly to the BCU.



BIM with Step-By-Step Instructions

Using the step-by-step instructions in the cover of the BIM and the wiring diagrams found in the BOSS Air Compressor Manual, wire the necessary terminal strip connections. If there is a question on where any of these connections need to be made, call for technical support.

Installation

BOSS Control Unit

3. BCU

The final step is installing the BCU. First, install the BCU Bracket. Choose a location that will be out of direct sunlight, and in a dry area. The recommended location is beneath the seat on the passenger side of the vehicle within 6 feet of the senders.



BCU Bracket Installed



BCU Installed on Bracket

Install BCU onto the BCU Bracket. Be sure not to overtighten the BCU to the Bracket. Make sure there is enough clearance behind the BCU to attach the 35-pin Amp connector.

Attach the 35-pin Amp connector to the rear of the BCU. Make sure the connector seats fully.



Attach 35-pin Connector

AIR COMPRESSORS		AIR COMPRESSORS	
FEATURES		TROUBLESHOOTING	
Check Oil Button	Displays oil level if held while truck is turned off.	OverTemp, OverPress, or Low Oil LED is Flashing.	Check corresponding sender. Use Reset feature. If problem still exists, call for support.
Test Button	With compressor on, will activate LEDs and relays when held.	OverTemp, OverPress, or Low Oil LED on Solid.	Shutdown caused by indicating LED. Use Reset feature. If cause persists, call for support.
Emerg Stop Button	If pressed, shutdown will be activated until the Reset button is held.	Filter LED lit.	Filter replacement is needed. See manual for further instruction.
Reset Button	When held for 5 seconds, will clear faults and alarms.	Pressure Bar Graph flashing.	NVM error. Panel needs to be replaced.
Phone Support : (219) 324-7776 www.bossair.com			

Lastly, place the BCU decal in a location visible from the BCU for quick reference.

