

AllmandTM MAX AIR 185

SERIAL NUMBER 19-000001 AND UP

<u>Max Air 100</u>	<u>SN# 28-****</u>	<u>"6E1"</u>	<u>Kubota 1005 E4B</u>
<u>Max Air 185</u>	<u>SN# 19-****</u>	<u>"6E1"</u>	<u>Yanmar 4TNV88</u>
<u>Max Air 375 DP</u>	<u>SN# 29-****</u>	<u>"6B5"</u>	<u>Kubota V3800</u>
<u>Max Air 400</u>	<u>SN# 20-****</u>	<u>"6B1"</u>	<u>Isuzu DD-4BG1</u>
<u>Max Air 400</u>	<u>SN# 20-****</u>	<u>"6B5"</u>	<u>Kubota V3800</u>

- DPF- The Diesel Particulate filter is a filter in the exhaust system to collect the particulate matter in the exhaust fumes for a cleaner emission from the engine..
 - To clean the DPF filter the ECU will fire the injectors on the exhaust stroke to heat the fumes to burn out the carbon caught in the filter.
 - This process is called regeneration.
 - Do Not operate units while in Regen mode.
 - The burnt carbon leaves ash in the filter, this ash left in the filter can eventually clog the filter.
 - If the DPF is clogged the customer will have to send it to the engine dealer to be cleaned.
- Important: The air coming out of the compressor is Grade D air and is **NOT** breathable. The compressor cannot be used in Oxygen only applications. Air contains too much oil. Not rated for grade "D" applications.

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- Unit will lose 1 ml of oil per 20 Hrs or operation. It would take 650 hours to fill one water bottle.

Error Codes:

- A1- Discharge Temp High, 239 Degrees (*Warning*)
- A2- Water Temp High, 221 Degrees (*Warning*)
- A5- Charge, Belt Loose/Bad Connection (*Warning*)
- E1- Discharge Temp, 248 Degrees (Emergency)
- E2- Water Temp, 230 Degrees (Emergency)
- E3- Engine Oil Pressure, Below 7.3 PSI (Emergency)
- E6- Discharge Temp Sensor Disconnected (Emergency)
- E7- Water Temp Sensor Disconnected (Emergency)

Oil is seeping out of the Air Filter:

- If oil is starting to come out of the Air filter or if the Element is starting to get saturated with compressor oil then the issue could be below in the Unloader.
- Check the unloader and unloader piston for any damage.
- Unloader piston could be sticking and not functioning properly. Check and replace if the problem persists.
- You can also use a clean cloth to wipe any debris that may be keeping the unloader piston from properly sealing

Oil is leaking out of the main Air valve in the back of unit:

- If compressor oil is leaking out the main Air valves, then this is an indication that the Oil separator filter is dirty.
- Replace Oil separator filter and O-ring if filter is dirty.
- Check Banjo fitting and ensure the screen inside the fitting is clean. If the screen is dirty or worse, then replace it.

Low Air pressure or No Air pressure on "6E1 units:

- Air Oil separator has an air regulator with diaphragm to adjust PSI. If the pop off valve keeps popping, then clean the valve.

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- The Pressure regulator may have also been too far adjusted. You can re-adjust, lowering the pressure by turning the screw counterclockwise, or increase the pressure by turning it clockwise.
- If the problem persists then check the diaphragm in the regulator.

Compressor Air pressure is high in Temp/Hot:

- If the compressor air temperature is too HOT, then check the Oil return line & line from the receiver tank to oil cooler. You should have a 30 degree difference between the lines.
- The oil separator filter could also be clogged causing this issue.
- **Note:** Always use Air gun to clean or blow out any debris that may be in the Oil cooler.

Allmand PDS Electrical System:

To be able to troubleshoot any system, you first need to understand how the system works! Engine starts, runs approximately 8 seconds then shuts off.

Here is a brief description of how the Allmand Compressor Emergency Stop system functions (PDS 90 – 130 – 185 all basically work the same way). There are 3 senders that control the emergency stop system: hot engine coolant, hot air discharge, low engine oil pressure. If any of these senders are activated, they will cause the engine to shut down. The hot engine coolant and hot air discharge senders are normally closed switches. This means the switches are closed until the temperature reaches 235 degrees. At that point the switch opens which causes the engine to shut off. The low engine oil pressure switch is normally an open switch. This means, the switch is open until the engine oil pressure reaches 10 psi. At that point, the pressure closes the switch. To prevent the engine from not starting, due to the engine oil switch being open while the starter is engaged, there is a timer in the circuit that deactivates the emergency stop system for 8 seconds. Each sender works through a relay and diode located in the relay/fuse box. There are warning lights mounted in the dash to indicate which system caused the engine to shut down after the 8-second delay. The light that glows just before or immediately after the engine stops running, indicates which circuit caused the fuel stop solenoid to shut the engine down.

To troubleshoot the Emergency Shutdown system you will need to use the correct electrical diagram, a volt/ohm meter, a 12 volt test light along with some small hand tools.

Unit cold, first start of the day.

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If the unit starts and then stops or stops when it is switched from the “Start” to the “Run” position with NO emergency warning lights lit, the problem is in the regulation or fuel systems (see troubleshooting the regulation or fuel system).

If a warning light (hot engine coolant, hot air discharge or low engine oil pressure) does not go out the unit will stop after the 8-second timer runs out. This will be the circuit you need to check. Unit has been operating for a period of time and cuts off.

Check to see which warning light is staying on. If someone did not see which warning light (indicating which sender) shut the unit off, you will need to restart the unit and let it run under load until it shuts down, to determine which circuit is causing the shut down. If the unit shuts down with no warning light, the problem will be in the regulation or fuel system (see troubleshooting the regulation or fuel systems).

Troubleshooting the Hot Engine Coolant and Hot Air Discharge Emergency Shutdown Circuits:

First, you must determine if the problem is electrical or mechanical! Use the same method to test these two circuits.

Hot Engine Coolant light is on -- check for mechanical problems first.

1. First check to see if coolant is at the proper level.
2. Check the fan belt for proper adjustment.
3. Inspect the unit for coolant leaks: hoses, water pump, radiator and radiator cap sealing gasket.
4. Check the thermostat for proper operation.
5. Check for bubbles in the radiator. Remember compression leaks usually will let coolant into the engine oil.
6. Inspect the fan, oil cooler and radiator for blockage. The openings in the oil cooler are larger than the opening in the radiator. Trash will pass through the oil cooler and stop-up the radiator. To properly check this you may have to remove the radiator.

Hot Air Discharge light is on -- check for probable mechanical cause.

1. Low oil level in compressor receiver tank.
2. Inspect oil for: air bubbles, water mixing in oil, forming, and dark color or burnt smell.
3. Wrong type of oil used, or wrong oil added to top-off oil level (different types of oils don't mix).
4. Compressor oil filter is restricted -- change oil and filter.
5. Oil cooler stopped up: check oil temperature in and out of the cooler. There should be an 8 to 12 degree difference in the temperatures.
6. Thermo Bypass valve not working properly.

If no mechanical problems are found, then the electrical circuit will need to be tested.

Testing the Hot Engine Coolant and Hot Air Discharge Electrical Circuits

Unit cold, the hot engine coolant light or hot air discharge light stays on.

The hot engine coolant sender is located on the left side of the thermostat housing; it has two wires going to the sender. Check wires for loose connections, unplug the two wires, use the Ohmmeter to check the switch, it should be closed. This means you should read maximum Ohms. If the sender reads "open" it should be replaced.

The hot air discharge sender is located under the compressor on the air discharge manifold. The sender is best seen from the left side, by looking just behind the battery. You can test the sender without removing the battery. To replace the sender remove the battery. Test sender same as above.

If the senders check Okay, you need to check the fuses located at the rear of the compressor. Remove the fuse box cover located on the side of the fuse/relay box and inspect the fuses. Replace as needed. Extra fuses are supplied in the fuse box. The top fuse is a 20 amp, for the glow plug system. The second fuse, 10 amps, protects the stop solenoid relay. The third fuse, 10 amps, protects the

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Electrical fuel pump and the magnet safety switch plus the alternator charge circuit.

Four screws retain the fuse/relay box to the rear firewall. The electrical cable is long enough to allow the box to lie on the fender to test the relays and diodes. Always check wires for loose or corroded connections, this will cause faulty reading. The compressor can be tested before reinstalling the fuse/relay box in the unit.

Testing the Stop Relays and Diodes:

There are 3 relays used in the shutdown circuit. All three function the same way. Two are located at the bottom center and the third is located on the bottom right side of the relay box. If you think a relay is bad, you can swap it with another in the emergency stop circuit to see if your

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findings are correct; the problem will change to the other circuit. To test a relay, remove it from the circuit. Use two jumper wires to connect the relay to a power source. Hook the positive lead to #1 terminal and the ground to #2 terminal. You should feel or hear the relay click. If not, hook the Ohmmeter across terminal #3 and terminal #5. You should get a continuity reading on the Ohmmeter. It not check terminals #3 and #6, if you get a reading here the relay is bad.

There are 4 diodes used in the system. Two work with the emergency shut down circuit one works with the charge circuit and the fourth is in the electric fuel pump circuit. A diode prevents a back feed of voltage. To test a diode you can use an Ohmmeter. You should read continuity in one direction and very high resistance in the other direction. Also, you could use a diode tester. If you read continuity in both directions the diode should be replaced.

Troubleshooting the Low Engine Oil Pressure Sender and Timer Relay

The low engine oil pressure sender is normally an “open” switch until oil pressure (10 psi) closes the switch. This is the reason an 8-second timer is incorporated in the circuit to allow the engine oil pressure to increase during cranking and first start-up.

Before checking for an electrical problem with this circuit, check for a mechanical problem.

1. Check engine oil level and condition of the oil and filter.
2. Remove the sender and hook-up a gauge to check oil pressure, use a 150 psi gauge.

The low engine oil pressure sender is located on the right side of the engine under the fuel injection pump. There are two wires connected to the sender, power and ground.

Three lights on the dash will light up when the starter switch is turned on, low engine oil pressure, charge system and glow plug. If the low engine oil pressure sender is not functioning correctly, the light for low engine oil pressure will not glow and should be replaced. If the sender is not working properly, the circuit will not shut down the engine if oil pressure is low.

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Test the sender by removing it from the engine. Hook it up to air pressure (100 psi). Use the Ohmmeter to see if the oil sender is first “open” and “closed” when air pressure is applied. If working properly and engine oil pressure checks Okay, test the relay as instructed above. Be sure to check for loose or corroded wires.

The Emergency Stop Timer Relay is located on the left side under the fuse box in the fuse/relay panel (see picture of fuse/relay box above). The unit’s parts book will assist in the location of the items in the fuse/relay box.

Testing the Timer

If the timer malfunctions, several items are affected. The timer supplies power to the 10 amp fuse in the fuse box for the Stop Relay and Stop Solenoid. Check the power in, on the second fuse with a 12-volt test light or voltmeter. If the Stop Solenoid does not energize the engine cannot start.

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The engine oil pressure light continues to shine when cranking the unit

It should go out as soon as you start to crank the engine because the cranking section of the starter switch activates the timer relay. Replace the Timer Relay if either of these problems occurs.

The Stop Solenoid is located on the right side of the engine hooked to the fuel injection pump. The two-stage solenoid is activated by a relay in the fuse/relay panel. The first section pulls the plunger in with 18 amps and the second section holds the plunger in with ½ amp. If the main section of the solenoid fails it will not pull the plunger in, to allow the engine to start. If you can mechanically push the plunger in and it stays energized by the second electrical section, then you know the solenoid relay is working properly. You need to change the Stop Solenoid.

Be sure to adjust a new stop solenoid correctly, or it will fail. The injector pump fuel arm should be .040" away from its stop when the solenoid is fully engaged. In other words, the solenoid MUST bottom out BEFORE the fuel arm bottoms out.

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Models involved – PDS185S

Generally, the fuel shut-off solenoid fails due to improper adjustment. A solenoid that is not able to go to full stroke will draw a continuous high current (16 ~ 18 amps) until such time that it burns out.

To avoid this problem we recommend the following installation procedure:

1. Install the solenoid in the mounting frame. Do not tighten the retainer bolts because you need to be able to move the solenoid for adjustment purposes.
2. Hook up the wire plug.
3. Push the plunger into the solenoid by hand and hold it while someone turns the key switch to the run position.
4. Push the fuel pump stop lever down (by hand) until it stops.
5. Move the solenoid until you can hook the link into the hole in the fuel pump lever.
6. Slightly tighten the solenoid mounting bolts so that the solenoid stays in place.
7. Adjust the activated solenoid so that the fuel pump stop lever still has a .0040" (about 1mm) gap between it and the stop screw.
8. Tighten the solenoid mounting bolts.
9. Confirm the engine starts and shuts off normally

List of service filters per model:

100 CFM "6E1" KUBOTA 1005-E4B				
AIR FILTER (ENGINE)	104070	28-	"6E1"	100
AIR FILTER (COMPRESSOR)	110634	28-	"6E1"	100
COMPRESSOR OIL CARTRIDGE	110578	28-	"6E1"	100
ENGINE OIL FILTER	16271-32092	28-	"6E1"	100
FUEL FILTER	114361	28-	"6E1"	100
PRE FUEL FILTER	43541-02600	28-	"6E1"	100
SEPARATOR FILTER	110611	28-	"6E1"	100

185 CFM "B4-6E1" YANMAR TNV88				
AIR FILTER (ENGINE)	110634	19-	"6E1"	185
AIR FILTER (COMPRESSOR)	110739	19-	"6E1"	185
COMPRESSOR OIL CARTRIDGE	110578	19-	"6E1"	185
ENGINE OIL FILTER	110524	19-	"6E1"	185
FUEL FILTER	110559	19-	"6E1"	185
PRE FUEL FILTER	112816	19-	"6E1"	185
SEPARATOR FILTER	110611	19-	"6E1"	185

375-DP "6B5" KUBOTA V3800 T4F				
AIR FILTER (ENGINE) OUTER 6"	110877	29-	"6B5"	400
AIR FILTER (ENGINE) INNER 5"	116433	29-	"6B5"	400
FUEL FILTER MAIN	116463	29-	"6B5"	400
OIL FILTER (ENGINE)	116464	29-	"6B5"	400
SEDIMENTER (PRE FUEL)	112825	29-	"6B5"	400
AIR FILTER (COMPRESSOR) OUTER 4"	110880	29-	"6B5"	400

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AIR FILTER (COMPRESSOR) INNER 3"	32143-12400	29-	"6B5"	400
COMPRESSOR OIL FILTER	110796	29-	"6B5"	400
SEPARATOR FILTER	34200-03500	29-	"6B5"	400

400S CFM "6E1" KUBOTA V3800 T4F				
AIR FILTER (ENGINE)	112898	20-	"6B1"	400
AIR FILTER (COMPRESSOR)	110880	20-	"6B1"	400
COMPRESSOR OIL CARTRIDGE	110796	20-	"6B1"	400
ENGINE OIL FILTER	111752	20-	"6B1"	400
FUEL FILTER	114351	20-	"6B1"	400
PRE FUEL FILTER	112815	20-	"6B1"	400
SEDIMENTER	112825	20-	"6B1"	400
SEPARATOR FILTER	34200-06200	20-	"6B1"	400

400S CFM "SC-6B5" KUBOTA V3800 T4F				
AIR FILTER (ENGINE) OUTER 6"	110877	20-	"6B5"	400
AIR FILTER (ENGINE) INNER 5"	116463	20-	"6B5"	400
FUEL FILTER MAIN	116463	20-	"6B5"	400
OIL FILTER (ENGINE)	116464	20-	"6B5"	400
SEDIMENTER (PRE FUEL)	112825	20-	"6B5"	400
AIR FILTER (COMPRESSOR) OUTER 4"	110880	20-	"6B5"	400
AIR FILTER (COMPRESSOR) INNER 3"	32143-12400	20-	"6B5"	400
COMPRESSOR OIL FILTER	110796	20-	"6B5"	400
SEPARATOR FILTER	34200-03500	20-	"6B5"	400

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400 CFM "B4-6B1" ISUZU DD-4BG1TRC-01				
AIR FILTER (ENGINE)	110877	20-	"6B1"	400
AIR FILTER (COMPRESSOR)	110880	20-	"6B1"	400
COMPRESSOR OIL CARTRIDGE	110796	20-	"6B1"	400
ENGINE OIL FILTER		20-	"6B1"	400
FUEL FILTER		20-	"6B1"	400
PRE FUEL FILTER	110965	20-	"6B1"	400
PRE FUEL FILTER	111656	20-	"6B1"	400
SEPARATOR FILTER	110863	20-	"6B1"	400

**Check engine operators manual for specific recommended lubricants.*

**Additional warranty information & claim forms can be obtained on Allmand.com.*

**Please contact Allmand Tech line for additional help and troubleshooting @ (308) 995-3431 / Parts (800) 562-1373.*