

Subject
Underhood “G” System Error Codes and Symptoms

## System or Parts affected

- Underhood70G (V90Gxxx)

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## Overview

General error codes, symptoms and trouble shooting.

## Identifying your System

If you need to call VMAC Technical Support we will ask for a System ID or Compressor Serial Number.

The System ID (**Preferred**) can normally be found on the Radiator Cross Member in front of the Air Filter Box. Figure 1

The Compressor Serial Number can normally be found on the compressor itself behind the clutch pulley. Figure 2



**Figure 1**



**Figure 2**

## Retrieving Logged Error Messages

### How to retrieve logged error messages:

- Key on the system but do not start. No error messages on the display box should be shown.
- Press the “NEXT” and “BACK” buttons for 5 seconds to enter Diagnostics Mode.
- Press the “NEXT” and “BACK” buttons to scroll to “VIEW LOGGED ERRORS”.
- Press the “ON/ENTER” button to view the errors.
- Use “NEXT” and “BACK” to scroll through the errors. Fill in all of the blank boxes on the following table.

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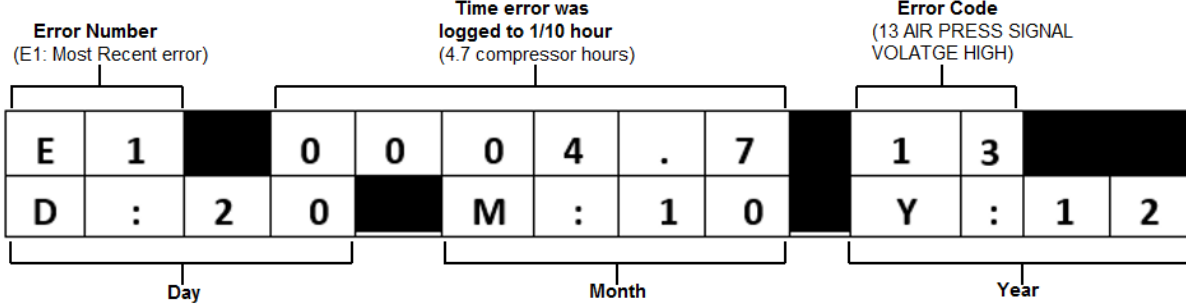


# Technical Support

## Subject

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The tables below represent the lines that will be shown on the control box display. Completely fill in all of the blanks on the following tables. (Figure 3 provides an example of an error message)



**Figure 3**

Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Date: \_\_\_\_\_

Phone#: \_\_\_\_\_  
 Email/Fax#: \_\_\_\_\_

E	1		0	0	0	4	.	7		13			
D	:	2	0		M	:	1	0		Y	:	1	2
E	2						.						
D	:				M	:				Y	:		
E	3						.						
D	:				M	:				Y	:		
E	4						.						
D	:				M	:				Y	:		
E	5						.						
D	:				M	:				Y	:		
E	6						.						
D	:				M	:				Y	:		
E	7						.						
D	:				M	:				Y	:		
E	8						.						
D	:				M	:				Y	:		
E	9						.						
D	:				M	:				Y	:		
E	10						.						
D	:				M	:				Y	:		

When you have reached the end, "NO SVC NEEDED" will be displayed.  
 Email completed sheet to [techsupport@vmacair.com](mailto:techsupport@vmacair.com) or fax to (250) 740-3202. A clear picture of this sheet can be emailed or faxed to us if this is easier.

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## Error Messages

**Error Message Table**

Error Code	Error Message Displayed	Cause
1	CLUTCH FAILED – OPEN	Clutch is unplugged or wire to control box has been cut. (<1.0A)
2	CLUTCH FAILED – SHORT	Clutch has shorted or wire to control box is shorted. (>10.0A)
3	CLUTCH CURRENT TOO LOW	Under-current reading on clutch. (1.0-2.0A)
4	CLUTCH CURRENT TOO HIGH	Over-current reading on clutch. (5.0-10.0A)
5	COMP TEMP SENSOR FAILED – OPEN	Temperature sensor on the compressor is unplugged or wire to control box has been cut.
6	COMP TEMP SENSOR FAILED – SHORT	Temperature sensor on the compressor is shorted.
7	COMP TOO COLD XX.X <sup>o</sup> F/XX.X <sup>o</sup> C	Compressor is too cold to start. The temperature is displayed. (<-40 C)
8	COMP TOO HOT XX.X <sup>o</sup> F/XX.X <sup>o</sup> C	Compressor is too hot to start. The temperature is displayed. (>130 C)
9	CAB TEMP SENSOR FAILED – OPEN	Accessory temperature sensor in the cab is unplugged, enabled but not installed, or wire to control box has been cut.
10	CAB TEMP SENSOR FAILED – SHORT	Accessory temperature sensor in the cab is shorted.
12	AIR PRESSURE SIGNAL VOLTAGE LOW	Low voltage reading on the air pressure transducer. (signal <0.5V)
13	AIR PRESSURE SIGNAL VOLTAGE HIGH	Over voltage reading on the air pressure transducer. (signal >4.6V)
14	AIR PRESSURE SENSOR TOO HIGH	Air pressure is higher than expected. (>180PSI)
14	AIRE PRESSURE XXX.X PSI	If the previous error is present, the air pressure is displayed.
22	PARK BRAKE NOT ENABLED	Park brake needs to be engaged.
26	ENGINE RPM TOO LOW TO START	Engine RPM is too low to start system.
27	ENGINE RPM DURING OFF STATE	Engine RPM detected during an OFF state.
34	ENGINE RPM NOT DETECTED	Engine RPM is not detected. Wire may be cut.
35	ENGINE CRANK TIME OUT	The engine did not start during the crank cycle.
41	DISPLAYCANBUS CONN ERROR	The truck’s hood is open. It must be closed when the unit is run.
-	DISPLAY CANBUS CONN ERROR	A CAN bus error between the Display box and Control box.
-	End of Errors OK to Retry	End of errors screen. Pressing ENTER will try to restart the system.

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### Additional Warning Message table

Listed below are additional messages, which may be displayed. If a message is present, the red WARNING LED will flash on and off. These messages appear in both the SYSTEM READY and SYSTEM RUNNING menus.

Error Code	Message Displayed	Cause
32	BATTERY VOLTAGE TOO LOW	The battery voltage is too low. <11.8V
-	200HR/6MTH SERV DUE IN xx HOURS	This warning will show up 10 hours before the 200 hour service interval.
54	COMPRESSOR SERV 200HR/6MTH	The system is due for a service. This warning will show after every 200 hours of running the compressor.  Clearing the compressor service reminder is required through the Diagnostic menu.
-	400HR/12MTH SER DUE IN xx HOURS	This warning will show up 10 hours before the 400 hour service interval.
55	COMPRESSOR SERV 400HR/12MTH	The system is due for a service. This warning will show after every 400 hours of running the compressor.  Clearing the compressor service reminder is required through the Diagnostic menu.
62	LOW BATT RESTART	The truck failed to start when requested to due to a low battery voltage condition.
63	CAB TEMP RESTART	The truck failed to start when requested to due to the cab temperature getting too cold.

### Problem Diagnostics / Troubleshooting

Problem diagnosis should follow sound, recognized practice. Quick, accurate diagnosis of problems should involve the following:

- Accurately identify the problem by operating the system yourself
- Determine possible causes for the problem by understanding how the system operates
- Isolate the potential causes by accurate testing using the correct, recognized procedures
- Perform proper repairs using the correct procedures and the recommended replacement parts
- Perform proper post-repair testing to ensure that the repairs were effective
- Do not use test practices that are potentially harmful to people or the equipment
- Electrical testing should be performed according to the processes described in the troubleshooting chart. For accurate diagnosis, refer to the electrical circuit diagram in the installation manual.



**Always ensure automatic transmissions are in park with the park brake applied before starting the engine or operating the system**

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SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Compressor does not run	Oil temperature too high	Turn compressor off, allow to cool for 30 minutes, retry.
	Oil level is too low.	Park on level ground, check level at sight glass, add as necessary
	Drive belt is broken.	Install new compressor belt. Check alignment of pulleys. Replace automatic tensioner.
	No power to the clutch.	Check for 12 V at the clutch, check fuse, check for broken wires or failed switch.
	Bad clutch ground.	With 12 V applied to the clutch check for voltage between the clutch stator housing and the engine. If voltage is present, ground the stator.
	Open clutch stator windings.	With compressor switch off and clutch wire disconnected, check resistance between the input wire and ground. Resistance (less lead resistance) should be 2.5 ohms to 3.0 ohms. If outside this range replace the stator.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Engine does not restart from Standby state	Disable Auto Restart Delay parameter setting	Modify Disable Auto Restart Delay parameter. Ensure it isn't at 'Always' or at a value smaller than desired time in STANDBY state before system disables the auto restart feature.
	Bad START relay (if equipped)	Replace system's START relay located on control box mount bracket.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Frequent over-temperature shutdowns.	Low oil level.	Check oil on level ground, add as required.
	Restriction in the compressor oil hoses.	Check for kinked or pinched oil hoses.
	Compressor oil filter plugged.	Replace oil filter.
	Heat exchanger not functioning or is fouled with deposits.	Remove and clean or replace heat exchanger.
	Engine cooling system failure (high engine temperature).	Correct engine cooling problems.
	Engine fan clutch slipping.	Replace fan clutch.
	High ambient temperatures.	Reduce duty cycle.
	Oil temperature probe failure.	Replace if defective.
	System needs service	Perform recommended service.

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SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Excessive air pressure	System Pressure parameter set too high.	Reduce System Pressure in User Setup Menu.
	System return line blocked or frozen	Clear or replace the line.
	Electrical inlet solenoid stuck closed.	With the system off, apply 12V and Ground to the red and black wires of the inlet solenoid. It should make an audible click and transition from normally open to close state when powered. If behavior not as described, replaced electrical inlet solenoid

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Engine stalls when compressor is activated	System is under pressure	Allow sufficient time for blow-down.
	Blow-down valve not working.	Replace blow-down valve.
	RPM setting too low or throttle not set correctly.	Re-adjust RPM and throttle settings for optimum operation.
	Throttle control not connected properly at foot pedal.	Check for proper connections.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Belt squeals when compressor switch is activated.	System is under pressure	Allow sufficient time for blow-down.
	Blow-down valve not working or muffler is plugged.	Replace blow-down valve or clean muffler.
	Improper belt tension.	Check belt tensioner.
	Belt is glazed.	Replace belt.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Frequent relief valve operation.	Electrical inlet solenoid stuck closed.	With the system off, apply 12V and Ground to the red and black wires of the inlet solenoid. It should make an audible click and transition from normally open to close state when powered. If behavior not as described, replaced electrical inlet solenoid.
	Pressure control line plugged or frozen.	Remove the pressure control line and clear any obstructions. (Blow out.)
	Relief valve defective.	Replace relief valve.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Power fuse blows.	Short to ground in the control circuit.	Locate and correct short or replace control panel.
	Incorrect fuse.	Install correct OEM fuse
	Incorrect wiring.	Repair wiring according to wiring diagram.

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<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Low air pressure.	Air flow is too high.	Reduce consumption.
	System Pressure parameter set too low.	Increase System Pressure in User Setup Menu.
	Throttle control set too low.	Increase maximum RPM settings.
	Electrical inlet solenoid stuck open.	With the system off, apply 12V and Ground to the red and black wires of the inlet solenoid. It should make an audible click and transition from normally open to close state when powered. If behavior not as described, replaced electrical inlet solenoid.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Engine RPM excessive on initial startup and during operation.	Maximum RPM setting is too high.	Reduce maximum RPM setting throttle control or reset cable nipple.
	Idle-down pressure is too high.	Reduce idle-down setting of the throttle control.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Objectionable noise level.	Excessive gear wear.	Contact the nearest dealer to replace compressor/gearbox assembly. Refer to the dealer.
	Maximum RPM setting higher than necessary to meet air demand requirements.	Reduce maximum RPM settings.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Engine RPM stays at base idle when compressor runs.	Throttle control not adjusted properly.	Adjust throttle controls.
	Poor electrical connections.	Test and correct connections.
	Throttle control not functioning.	Replace throttle control.
	Pressure sensor defective or disconnected.	Check connections or replace pressure sensor.

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Engine RPM overrevs when compressor is activated.	Throttle controls not connected properly.	Check and correct connections.
	Throttle control not setup properly.	Adjust high idle screw.
	Pressure sensor defective or disconnected.	Check connections or replace pressure sensor

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SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Engine RPM does not return to base idle.	Wiring fault.	Check and correct wiring according to wiring diagram.
	Throttle not properly adjusted.	Adjust idle down screw.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Engine RPM stays at maximum whenever the compressor is running.	Idle-down setting is too high.	Reset idle-down pressure.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Engine doesn't turn off in Standby state.	Bad STOP relay (if equipped)	Replace STOP relay located on the control box mount bracket.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Truck and VR system power off (fully) instead of entering STANDBY state	Bad HOT 12V relay.	Replace HOT 12V relay located on the control box mount bracket.
	Blown HOT 12V fuse.	Replace 3 Amp fuse. If fuse blows again, check for broken wires and failed parts to find source of fault.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Excessive oil in the air.	Failed coalescing separator element.	Replace element.
	Clogged scavenge line screen.	Clean or replace parts as required.
	High oil level.	Correct oil level.
	Poor fit between coalescing filter and tank – lack of seal at O-rings.	Replace parts as required.
	Vehicle is not within requirements of 15 degrees of level.	Level vehicle and check for oil in the air.
	Compressor was turned off while running at high speed.	Allow engine RPM to drop before turning the compressor off.
	Wing tank – volume shutting down under load.	Clean or replace parts as required.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Oil blows out of compressor air filter on compressor shutdown.	Shutting the engine off while running at high speed.	Allow engine to idle-down before shutting down the compressor. Turn off any air tools before shutting down compressor.

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SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Oil drips from clutch after shutdown.	Seal leaking.	Contact the nearest dealer to replace gearbox input shaft seal.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Cannot drive the vehicle after remote start operation	RAM truck – remote start drive interlock	Cycle the key to OFF position then use as desired.

## Modifying System Parameters

To modify a system parameter (such as Standby Delay):

- Turn the key ignition ON. Do not start the compressor system.
- Press and hold the NEXT and BACK buttons on the display box for 5 seconds to enter Setup/Diagnostics Menu.
- When display box shows USER SETUP, press ON/ENTER
- Use NEXT and BACK to scroll to STANDBY DELAY
- Press ON/ENTER.
- Use NEXT and BACK to change Standby Delay parameter value.
- Press ON/ENTER to select value, or EXIT to cancel change.
- Verify STANDBY DELAY screen shows desired parameter value.
- Press EXIT to return to USER SETUP.
- Press EXIT to exit Setup/Diagnostics Menu.

For details and an explanation for adjusting system parameters, see section 4.3.6 Setup/Diagnostic Menu in the UNDERHOOD 'G' Owners Manual.

**System Parameter Table**

Setting	Description	Adjustment	Default
Standby Delay	Delay time to standby	1, 2, 5, 10, 15, 30 minutes, Never	10 min
System Pressure	Operating System Pressure	80 to 175PSI @ 5PSI increments	150PSI
Top-up Pressure	PSI below system pressure to allow inlet to open and build pressure	1 to 10PSI @ 1PSI increments	5PSI
High Air Use Rate	Air rate set-point for pressure-based restart	0 to -30PSI @ 0.5PSI increments	-3.0PSI/sec
Restart Pressure PSI	Air pressure set-point for pressure-based restart	80 to 175PSI @ 5PSI increments	120PSI
Disable Auto Restart Delay	Timer for disabling automatic engine restart	Always, 30 min, 60 min, 90 min, 120 min, Never	30 min
Low Battery Restart	Controls if system will restart when battery voltage gets too low.	Enable/Disable	Enabled

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Setting	Description	Adjustment	Default
Batt Lower Thrs	Restart point for battery voltage	10.0 to 14.0V in 0.1V steps	12.1V
Batt Upper Thrs	Fully-charged set point for battery voltage	10.0 to 15.0V in 0.1V steps	12.8V
Low Batt Restart Delay	Time delay before going back to STANDBY after battery fully charged	2, 5, 10, 15, 20, 30 min	2 min
Cab Temp Restart	Controls if system will restart when cab temperature drops too low – Accessory kit required	Enable/Disable	Disabled
Cab Lower Thrs	Restart cab temperature	-10 C to +20 C in 0.1 C steps	10.0 C
Cab Upper Thrs	Fully warmed cab temperature	+10 C to +30 C in 0.1 C steps	20.0 C
Low Cab Restart Delay	Time delay before going back to STANDBY after warming cab	2, 5, 10, 15, 20, 30 min	5 min

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