G Series Installation Guide

Installation Overview

1.0 Introduction

The G Series Ignition Interlock is an electronic breath alcohol analyzer, it connects to the ignition and other control systems of a motor vehicle. The interlock measures the BAC of the intended driver and prevents the vehicle from being started if the BAC exceeds a preset limit.

The ignition interlock is comprised of a relay module and a detachable handset. The handset is available in two versions; a version with a wired connection to the relay module or a version with a wireless connection to the relay module. The interlock system is soldered to the vehicle in a tamper-resistant fashion during installation.

Note: G Series is intended for installation on vehicles with 12V or 24V electrical systems.

2.0 Part Lists

2.1 Parts and equipment available from Alcohol Countermeasure Systems

G Series Ignition Interlock relay module	(ACS # 79-007097)
G Series Ignition Interlock handset Wired	(ACS # 79-007174)
G Series Ignition Interlock handset Wireless	(ACS # 79-007090)
Plastic mouthpiece	(ACS # 95-000145)
Adhesive-backed Velcro® strips (hooks and loops)	(part of ACS # 95-000514)
#8 X 18 X 1/2 inch hex self-drilling screw	(part of ACS # 95-000514)
12 volt power bar	(part of ACS # 95-000514)
ACS Auto Calibration Unit	
15 watt, 8 ohm, 12 volt DC alarm horn	(ACS # 79-007157)
Computer communication cord	
Ethyl alcohol standard solution (50 mg%)	
Tamper-seal stickers	(part of ACS # 95-000514)

2.2 Power tools to be supplied by Installer

Portable reversible battery-operated drill with bits

Electric soldering gun and spool of rosin-core solder

Portable butane soldering gun

Heat-shrink gun

Industrial-strength battery charger

2.3 Hand tools and test equipment to be supplied by Installer

Wire stripper (16-22 gauge)

Diagonal side cutters

Scissors

12 volt test probe

Mechanic's Trouble Light with receptacles

Set of screwdrivers (Phillips, flathead, Robertson)

Socket/Ratchet set (metric and imperial)

Electrical tape

Utility knife

Digital voltmeter

Needle-nose pliers

Extension cord

2.4 Material to be supplied by Installer

Fender cover

Shop towels

Hand cleaner

Eight 6-inch tie straps

Heat-shrink tubing: 3/16", 1/4", 3/32", and 3/8" sizes as required

16-18 gauge wire (for tachometer)

Firewall probe

Methyl hydrate cleaner

3.0 Inspection

3.1 Inspecting the electrical system

In order for the G Series Ignition Interlock System to operate properly, it is essential that the vehicle's electrical system be in good operating condition. The key components that you must inspect are:

- Battery
- Charging system
- Starting system

If any of these components are found to be defective or inoperative, it is the client's responsibility to have the vehicle repaired *prior* to the installation.

3.2 Battery inspection

1. Visually inspect the battery for cracks, holes, leakage, and other damage.
2. Visually inspect the cleanliness of the battery case and posts.
3. Visually check the electrolyte level of the battery.
4. If a battery is detected to be fully discharged ("dead"), a charge or boost might be required to start the vehicle.

3.3 Charging system inspection

1. Visually inspect the condition of all wires and belts that connect to the starter, alternator (or generator/voltage regulator), and battery.
2. Visually check the status of the charging-system warning light, or check the voltmeter in the dash to make sure that there are at least 14 volts (for 12 V interlock) or 26 volts (for 24V interlock).

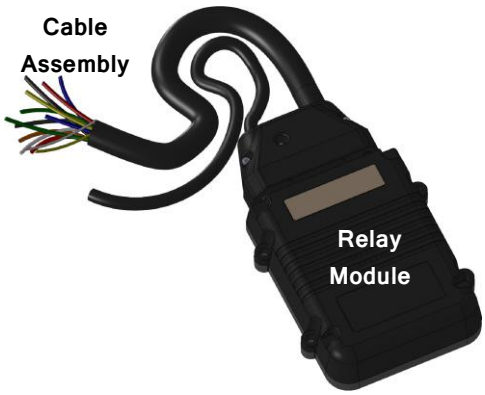
3.4 Starting system inspection

If you detect a starting problem, attach a voltmeter to the battery terminals, noting the voltage as the engine cranks. If the voltage is below 9V (for 12 V interlock), or below 19V (for 24V interlock), or there is no cranking, suggest that the starting system be inspected and repaired.

4.0 Relay Module installation

When you have tested the vehicle's electrical, charging, and starting systems, and found them in satisfactory condition, you can install the G Series Ignition Interlock system. Installation consists of these steps:

- Mounting the relay module in an appropriate location
- Mounting and connecting the alarm horn
- Locating and attaching the tachometer signal wire
- Connecting the cable assembly of the relay module
- Testing the installed system
- Connecting and mounting the handset



*As you install, remember that the system must one day be removed from the vehicle, and that the vehicle must be returned to the same condition as it was before the installation. You must, therefore, choose a location that permits installation with the smallest amount

of drilling/modification to the vehicle. Always try to use existing hardware and holes to minimize modification.

4.1 Mounting the Relay Module

1. Locate a convenient, easily accessible area to mount the relay module (preferably under the dashboard). It must not obstruct the functioning of the vehicle (e.g., keep it away from the brake and gas pedals). Wherever possible, use existing screws and holes. Be sure to position the module so that you can connect the handset cable securely.

   NOTE: You must position the module so that it does not interfere with the normal operation of the vehicle.

2. Mount the relay module with the cable assembly connector opening facing downwards. This is done so that the open part of the relay module case would be facing down (to defend the connector opening from the elements, i.e. water leakage, dust, etc.).
3. Use Velcro® or cable ties to attach the relay module in a secure location. If Velcro is used to mount the relay module, attach the loop half of the hook and loop tape to the back of the relay module, and attach the hook half to the vehicle. If cable tie wraps are used, put them around the relay module securely.
4. Securely tighten all hardware, and inspect the finished assembly.

   NOTE: Place the relay module in the correct mounting position. Run the wires to the relay module, ensuring that you can hide all of them after the installation.

4.2 Mounting and connecting the alarm horn

1. A wired or wireless version of the alarm horn is available. No connection between the relay module and the alarm horn is needed if the wireless alarm horn is used.
2. Remove the existing bracket from the alarm horn. Open the vehicle's hood, and attach the bracket to the firewall, fender well, or other suitable location.
3. As you mount the alarm horn to the bracket, make sure that there is enough clearance (i.e., closing the hood does not damage the hood or the alarm horn).
4. Attach the alarm horn wires (wired version) and tachometer wires to the probe. Feed them through the firewall, making sure that you leave sufficient slack under the dashboard.
5. Solder the connections to the alarm horn.
6. Tuck the alarm horn wire neatly under the vehicle's existing wiring. Wire-loom and cable-tie it away from vehicle components that move, or that are excessively hot.

4.3 Attaching the tachometer signal wire

1. Locate the tachometer signal.
2. Verify the tachometer signal (e.g., using the G Series Handset diagnostic feature in the Main menu).
3. To prevent tampering, the tachometer wire from the cable assembly must be soldered onto the tachometer signal wire from the vehicle, use electrical tape to tape off the connection and tamper-seal it.
4. Tuck the wire neatly under the vehicle's existing wiring. Wire-loom and cable-tie it away from vehicle components that move, or that are excessively hot.

4.4 Connecting the Relay Module cable assembly

The cable assembly consists of 14 coloured wires. You must connect nine of these wires to specific points in the vehicle's wiring system. Connect the other wire to the alarm horn (for wired alarm horn only). For the wireless alarm horn, the transmitter is in the relay module and does not need to be connected to the horn. The other four wires are for optional use.

Each connection must be as neat and secure as possible (through soldering and shrink-wrapping) to help ensure correct G Series operation. Use tamper-proof (*T*P*S*) shrink-wrap tubing on all solder connections (or, if necessary, a tamper seal).

NOTE: Do not use the vehicle's fuse box for the wire connections. In most cases, it is easily accessible and vulnerable to tampering.

***Section 4.4.1** has a step by step procedure to wire the relay module, and **section 4.4.2** has wiring diagrams which can be used as aids while the steps are being followed.

The wires that comprise the Relay Module cable assembly are:

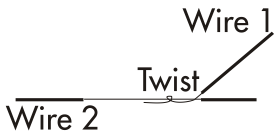
Wire #	Colour	Location
1	Red	+12 volts (main power)
7	Black	Ground
8	White	Ignition (+12 or +24 volts, switched-on position only)
5,13	Blue-Yellow	Starter (coming from the ignition switch)
6,14	Blue	Starter (going to the starter)
12	Brown	Alarm horn + (positive)
2	Green	Tachometer 1
3	Yellow	Tachometer 2

Optional Wire #	Wires	Optional use
9	Purple	Auxiliary
4	Orange	Auxiliary - Lamp
10	White (covered)	CANH-1
11	Red (covered)	CANL-1

4.4.1 Steps to connect the Relay Module cable assembly

1. Prepare the cable assembly by stripping back the wires approximately 1/2 inch. Apply heat-shrink tubing to all wires except Wires # 1, 7 and 8.

   NOTE: When connecting wires to each other, twist the wires onto each other for a secure connection.



2. Locate Wire # 7 in the cable assembly. Connect it to a ground point using a ring terminal and a tamper-proof screw.

   NOTE: To avoid damaging the relay module, connect the ground to the Interlock first.

3. Locate Wire # 1 in the cable assembly. Connect Wire # 1 to a continuous (unswitched) source of +12 or +24 volts (depending on the vehicle battery and interlock system's voltage) fused at 10 amperes (minimum) from the vehicle's main harness.

   Use the test probe to locate the appropriate source. Test it by moving the ignition switch through all positions (including the START and ACCESSORIES positions). The +12 or +24 volts must be present at all times.

   Use the strippers to expose 1/2 inch of the source wire. Twist the end of Wire # 1 around the +12 or +24 volt continuous source.

   NOTE: Do not solder until all wires have been attached, and the system has been tested.

4. Locate Wire # 8 in the cable assembly. Connect it to a source of +12 or +24 volts from the vehicle's main harness that is present only when the ignition switch is in the ON or START position.

   Use the test probe to locate the appropriate source. Test it by moving the ignition switch through all positions. The +12 or +24 volts must be present only when the ignition switch is in the ON or START position, and must be absent in all the other positions.

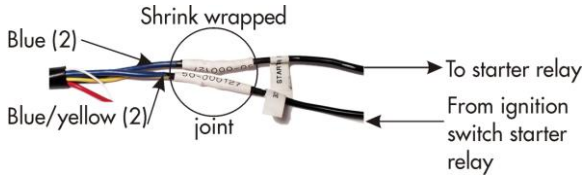
   Use the strippers to expose 1/2 inch of the source wire. Twist the end of Wire # 8 around it.

5. Locate Wires # 5,13 and Wires # 6,14 in the cable assembly. You must connect these wires in series to the wire running between the ignition switch and the starter relay or solenoid (depending on the make of the vehicle):

   Use the test probe to locate the wire coming from the ignition switch supplying the "start" signal.

   Clip the wire in half, and remove 3/4 inch of insulation from each end. Test the wire by moving the ignition switch to the Start position. The starter should not engage.

   Connect Wires # 5,13 to the wire coming from the ignition switch. Connect Wires # 6,14 to the wire going to the starter relay or solenoid.



6. Locate Wire # 12 in the cable assembly. You must connect this wire to the red wire coming from the alarm horn (wired), Wire # 12 is not connected if the wireless alarm horn is used:

   Attach Wire # 12 from the relay module to the "+" (positive, red) wire of the alarm horn.

   Attach the "--" (black, ground) wire of the alarm horn to the spot at which Wire # 7 connects.

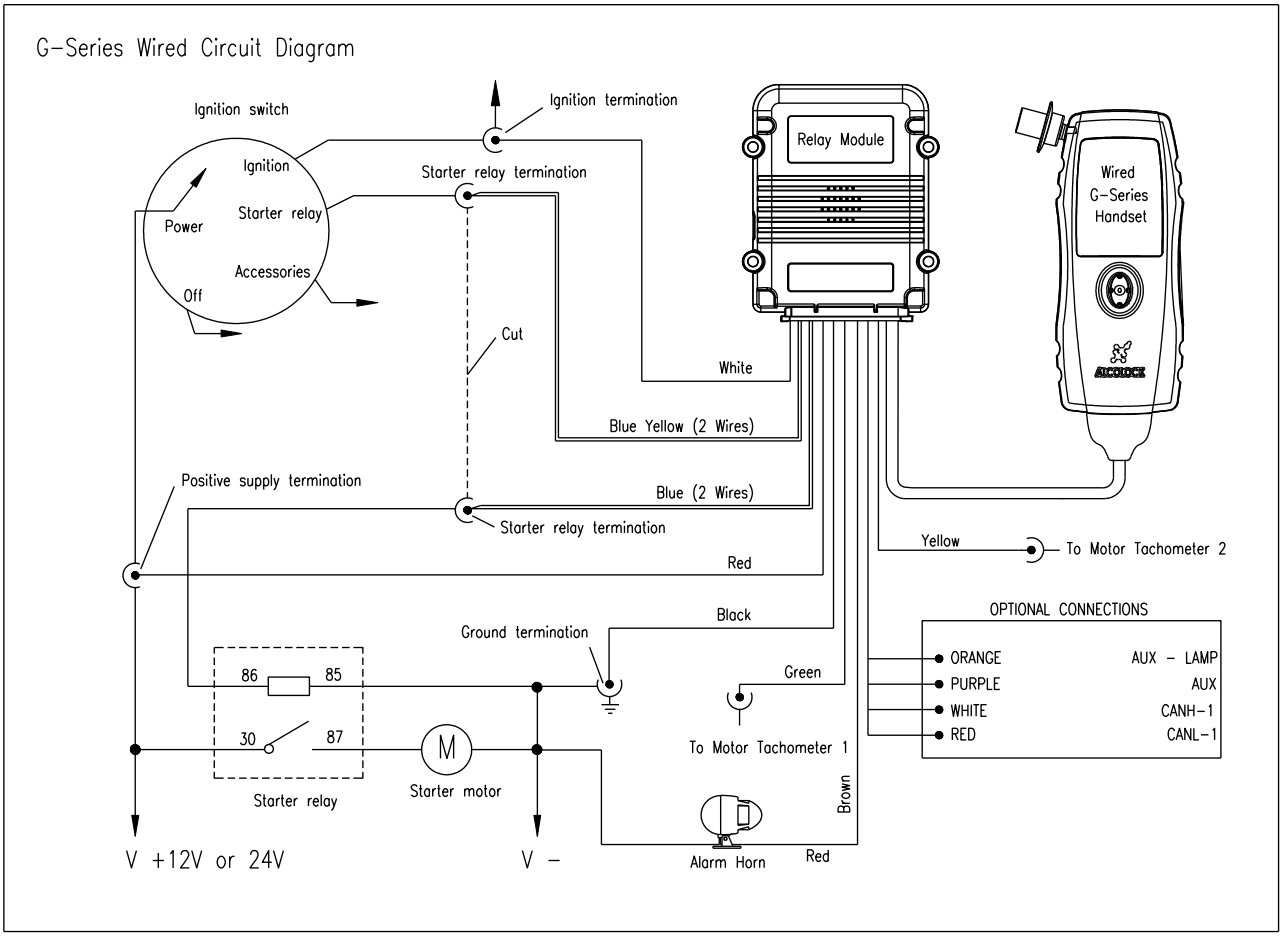
   If a wireless alarm horn is being used, connect the wireless alarm horn's red wire to a continuous (unswitched) source of +12 or +24 volts, and connect the alarm horn's black wire to the point where Wire # 7 connects (ground). The connections that are made to the wireless alarm horn are only made to supply it with power.

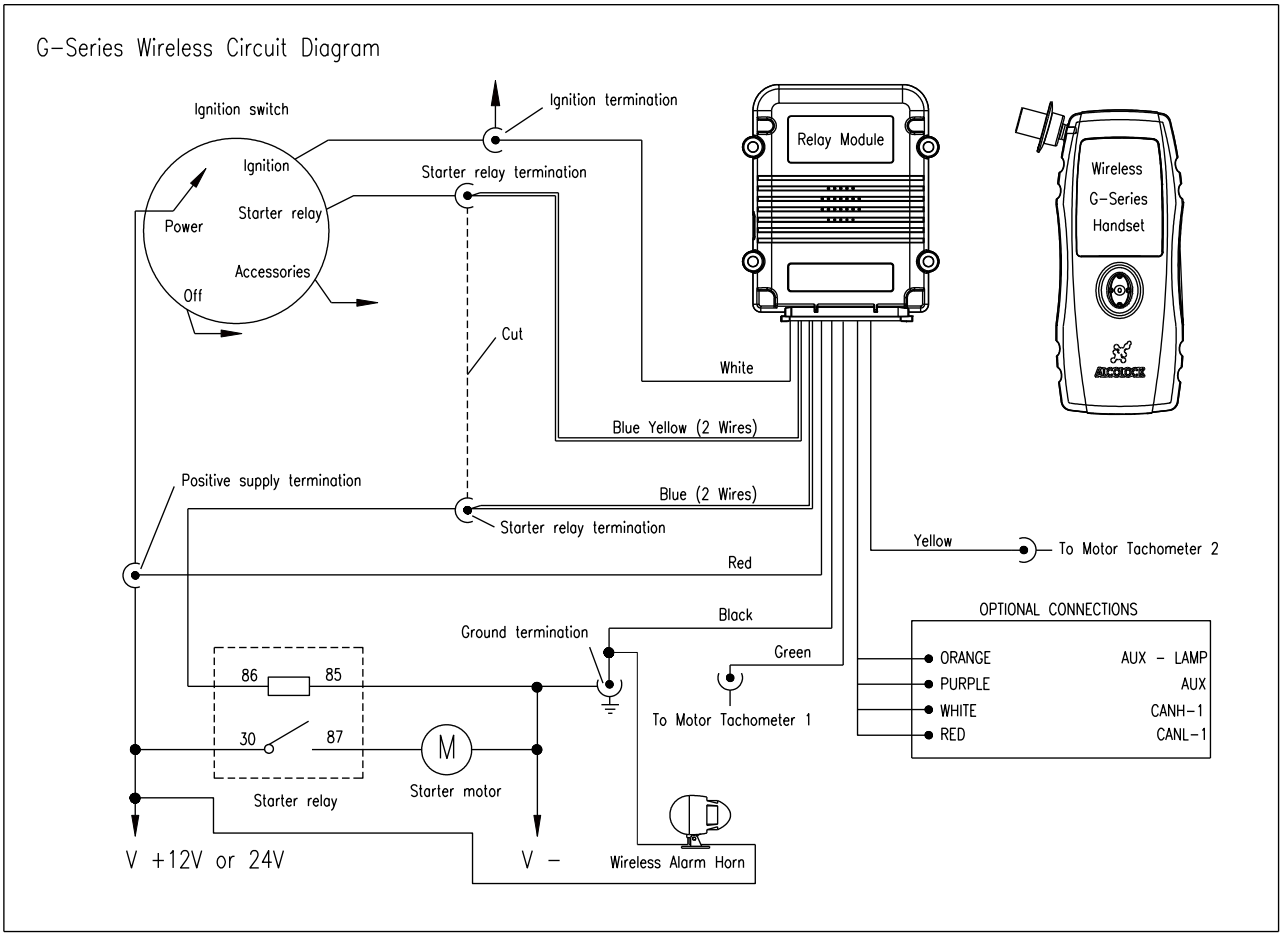
7. Locate Wire # 2 from the cable assembly. Attach it to the wire coming from the tachometer location under the hood.

8. Locate Wire # 3 from the cable assembly. Attach it to the wire coming from the tachometer location under the hood.

4.4.2 G Series Wiring Diagram

The following diagrams illustrate the wiring steps in section 4.4.1.


G-Series Wired Circuit Diagram
Ignition switch
Ignition
Power
Starter relay
Accessories
Off
Ignition termination
Starter relay termination
Cut
Relay Module
Wired
G-Series
Handset
White
Blue Yellow (2 Wires)
Positive supply termination
Blue (2 Wires)
Starter relay termination
Red
Yellow
To Motor Tachometer 2
Black
Ground termination
OPTIONAL CONNECTIONS
ORANGE
AUX - LAMP
PURPLE
AUX
WHITE
CANH-1
RED
CANL-1
Green
86
85
30
87
To Motor Tachometer 1
Starter relay
Starter motor
M
Brown
Alarm Horn
Red
V +12V or 24V
V -



4.5 Testing the installed system

If a wired version of the handset is being used, connect the handset cable between the relay module and the handset. Once **READY** is displayed on the screen, blow into the handset to perform a breath test. Then start the motor when the message is displayed on the handset.

If a wireless version of the handset is being used, hold the navigation button down to turn the handset on. If the handset power is already on but the handset is in sleep mode, once the power of the vehicle is turned on, the handset should automatically wake-up. Once **READY** is displayed on the screen, blow into the handset to perform a breath test. Then start the motor when the message is displayed on the handset.

The preceding procedures allow you to verify that the interlock has been installed correctly, and that all critical functions are performing within established limits.

After you have completed the testing sequence successfully:

1. Solder all connections. Shrink-wrap, tape, and neatly tie-strap them.
2. Apply tamper seals to the alarm horn and tachometer wires.
3. Reinstall all vehicle panels.
4. Perform a final visual inspection. Make sure that you have returned the vehicle to its original appearance.

4.6 Connecting and mounting the handset

1. Mount the handset clip fixture in an accessible location for the driver. The handset and its coiled cable (if handset is wired) must not obstruct the vehicle's controls, and must not hinder in any way the normal operation of the vehicle
2. The clip fixture can be mounted using Velcro hook and loop tape (attach the loop half of the hook and loop tape to the back of the clip fixture, and attach the hook half to the dashboard).
3. If handset is wired, plug the cable from the relay module into the handset.
4. Place the handset in the clip fixture.
5. After mounting the handset, perform a visual inspection to insure that the vehicle is back to its original appearance before the installation.

5.0 Relay Module Removal

To remove the interlock from the vehicle, first ensure that the vehicle is in the off ignition position.

1. Locate Wire # 3 from the cable assembly and disconnect it from the wire that is coming from the tachometer location under the hood.

   Use heat-shrink tubing on the tachometer wire to return its condition the same as before the installation.

2. Locate Wire # 2 from the cable assembly and disconnect it from the wire that is coming from the tachometer location under the hood.

   Use heat-shrink tubing on the tachometer wire to return its condition to the same as before the installation.

3. Locate Wire # 12 (only connected if using wired alarm horn) in the cable assembly. Disconnect Wire # 12, which goes from the relay module to the "+" (positive, red) wire of the alarm horn. Disconnect the "--" (black, ground) wire of the alarm horn from the spot where Wire # 7 connects.

If a wireless alarm horn is being used, disconnect the alarm horn's red wire from the continuous (unswitched) source of +12 or +24 volts, and disconnect the alarm horn's black wire from the point where Wire # 7 connects (ground).

Use heat-shrink tubing to return Wire # 12 to the same condition as before the installation.

4. Locate Wire # 5,13 and Wire # 6,14 in the cable assembly. Disconnect these wires from the wire that was cut during installation (Wire # 5,13 and Wire # 6,14 are connected in series with this wire), this wire was originally running between the ignition switch and the starter relay or solenoid (depending on the make of the vehicle):

   Reconnect the wire that was clipped in half during the installation. Test the wire by moving the ignition switch to the Start position, the starter should engage. Solder the wire back together and shrink wrap it once the connection is checked.

5. Locate Wire 8 in the cable assembly, disconnect it from +12 or +24 volts (source is only present when the ignition switch is in the ON or START position) source which was found during installation.

   Shrink wrap and seal the part of the +12 volts wire that was exposed during installation.

6. Locate Wire 1 in the cable assembly. Disconnect Wire # 1 from the continuous (unswitched) source of +12 or +24 volts that was found during installation.

   Use shrink wrap to cover the exposed part of the +12 or +24 volts source wire.

7. Locate Wire # 7 in the cable assembly. Disconnect the wire from the ground point (the connection to the ground point during installation was made using a ring terminal and a tamper-proof screw).

   NOTE: To avoid damaging the relay module, the ground point should be disconnected last.

8. Ensure that all the wires that were cut and reconnected are soldered together and heat-shrink tubing is used to reseal them.

   Use heat-shrink tubing to cover all the exposed parts of any of the wires.

6.0 Disposal of Interlock

Return to your service provider for removal of the interlock from your vehicle.

Following the removal, proper disposal of the interlock (relay module, handset, or both) at the end of its service life will be done by the manufacturer.

Contact Information

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ALCOHOL COUNTERMEASURE SYSTEMS

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