

Amel Isolated Ground (12DC Negative) Engines and Generators

All automotive engines and many marine engines and generators have the 12VDC negative permanently connected to the engine block. It is easy to spot these because oil and temperature sensors have only one wire connected to the sensor. In the normal 'grounded' system the battery negative flows through the engine block. In the case of a vehicle it often flows through the vehicle body as well. All Amel engines and generators have a 'two wire' system which, under normal circumstances, prevents currents flowing through extraneous items.

The function of the Amel Isolated Ground System is to totally isolate both the positive and negative poles of the 12VDC starting battery from the engine block and from other devices and systems attached to the engine or generator. With this Amel Isolated Ground System, the battery negative connections are fully isolated from the engine and generator, except when starting and running. The purpose for using this system is to help prevent electrolysis and protect the C-Drive.

To meet this requirement all the electrical components attached to the engine or generator must be fully insulated so that neither the positive or negative poles are connected to the body of the component. Unfortunately, a few items are either not available fully insulated, or are so prohibitively expensive and difficult to obtain that arrangements have to be made to use standard case-grounded components.

Starter motor: If an insulated motor is not readily available the grounded motor is used (most all cases). It must be isolated from 12VDC negative when not in use and devices must be wired on a two wire system. The system is connected to 12VDC only during the starting. Isolating solenoid relays are used and it is very important that the battery negative lead is connected in the correct place.

Pre-Heat devices: These are seldom available in an insulated form and must therefore be operated through the engine block. Again, an isolating relay must be used to connect to battery negative only when they are in use. Often this can be the same relay as used for the starter motor.

Electric Devices and Instruments: All switches, senders, fuel solenoids, charging alternators, panels, etc must be fully insulated two wire units with no connection to 12VDC negative through their bodies.

How to check that your Amel main engine is fully Isolated:

- 1. Start Battery:** Use a 12volt bulb in a small test lead arrangement, similar to what is shown. Check between the start battery negative post and any Amel Bonding Connection such as the engine block. If the bulb lights you have a start battery positive fault. Then check between battery positive and the same location as above, if the bulb lights you have a start battery negative fault.
- 2. House Bank:** Use a 24 volt bulb in a small test lead arrangement, similar to what is shown. Check between the negative post on the battery compartment negative block and any Amel Bonding Connection such as the engine block. If the bulb lights you have a battery bank positive fault. Then check between battery compartment positive block and the same location as above, if the bulb lights you have a battery bank negative fault.

