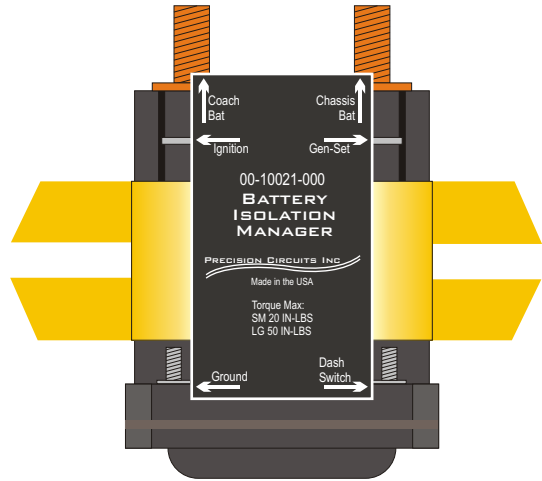


Battery Isolation Manager Operation

Overview:

The Battery Isolation Manager (BIM) monitors the Battery Voltage of both the Chassis and Coach Batteries over long periods of time. If it senses a charging voltage, it connects the two batteries together. If the charging system is drastically overburdened, the batteries will be isolated, however, if the BIM sees a long term charging of both batteries it will allow the batteries to remain connected and allow the charging system to do its job. Once the batteries have reached a Float Charge state for one hour, the BIM will isolate the batteries to prevent overcharging, and will only reconnect the batteries for charging if one of the Battery drops to approximately 80% charge, and the other is being charged. If the batteries are not being charged, BIM isolates the two batteries to prevent an electrical draw in one system from depleting the other battery. The long term monitoring of the batteries prevents the annoying Relay clicking that exists in simpler Isolation Modules today.



Key Features:

1. Control is integral to Isolator Relay for simpler installation
 - a. Waterproof, IEC 60529, IP66 IP67, Salt Spray ASTM B 117 96 Hours Salt Spray
 - b. Approved for use in Battery Compartments
 - c. 225 Amps Continuous
2. Microprocessor based
 - a. Monitors battery state over long periods of time
 - b. Not just simply voltage dependent
3. Bi-Directional Charging
 - a. Charge Coach Battery when Alternator is charging Chassis Battery
 - b. Charge Chassis Battery when Converter is charging Coach Battery
4. Isolate Batteries to prevent discharging or overcharging of Batteries, or when neither battery is being charged
5. Prevents
 - a. Equalization cycles from Damaging Chassis Battery, by isolating at voltages over 15.5Volts
 - b. Annoying clicking of Isolator Relay by monitoring battery state over longer periods of time, not just simply voltage dependent. (Present controls that turn on at 13.3V and turn off at 12.8V cycle every 20 seconds when the charger goes into float mode)
 - c. Overcharging of Coach Battery during long drives by shutting down every hour and only turning back on when Coach Battery needs charging
 - d. Overcharging of Chassis Battery during long periods of Shore Power by shutting down every hour and only turning back on when Chassis Battery needs charging.
 - e. Generator/Charger and Alternator Interference by shutting down when Ignition and Generator are sensed.
6. Provides Emergency Start with Dash Switch
7. Runs Cooler using Less Power.
 - a. 100°F cooler than competition.
 - b. Uses only 4Watts of power versus 25Watts.

Detailed Operation:

- 1) Relay is turned on if:
 - a) Ignition is on for 20 seconds &
 - i) 2 minutes have passed since Relay last turned off & Coach Battery less than 12.6V & Chassis Battery is greater than 13.2 & Chassis Battery is Less than 15.5V & Generator is off
 - b) Ignition is off &
 - i) 10 minutes have passed since Relay last turned off & Chassis Battery less than 12.6V, & Coach Battery is greater than 13.0V & Coach Battery is less than 15.5V
 - c) Generator is On & Ignition is On then the Alternator and Battery charger are fighting each other and Relay should be turned off.
- 2) Relay is turned off if:
 - a) Ignition goes from on to off state
 - b) Relay has been on for 1 hour
(prevent overcharging and allow to view separate voltages)
 - c) Anytime Ignition and Generator are both on.
 - d) Anytime either Battery goes above 15.5 volts for 30 seconds
 - e) (Coach battery charge can drop to support the engine, in start and stop situations)
While the Ignition is on, the time the Relay will remain on is Voltage dependent
 - i) High end of time 12.8volts = 40 minutes
 - ii) Time is scaled between above and below values
 - iii) Low end of time 11.8 volts = 5 seconds
 - f) (Thou shalt never discharge Chassis battery for Coach functions)
While the Ignition is off, the time the Relay will remain on is Voltage dependent and shorter than while the Ignition is On
 - i) High end of time 12.8 volts = 10 minutes
 - ii) Time is scaled between above and below values
 - iii) Low end of time 11.8 volts = 5 seconds
- 3) Relay Coil will be driven with approximately 4Volts DC. The Solenoid will be turned on hard with full battery voltage, and then the voltage will be throttled back to reduce battery power and Relay heat.

