



GENERAL

The EM-70D Electronic Monitor is a device designed to monitor several critical functions in the electrical system of a vehicle that operates on a 24 volt system. It will also monitor the 12 volt service when using a Vanner VoltMaster Battery Equalizer which supplies 12 volt service from a 24 volt source.

CHARACTERISTICS

The EM-70D can function in a variety of ways:

1. The monitor functions as an alternator monitor when the battery balance lamp output and +12 volt monitor input terminals are not in use.
2. The monitor functions as a device to control a field current relay, shutting down the field current if the voltage regulator fails in the full field mode. This function is accomplished by connecting the EM-70D as normal and installing a latching field current relay to the battery high lamp output terminal.

In all cases the lamp outputs in the EM-70D are designed to provide the ground connection for the lamps (or buzzers, beepers, relays) under a fault condition. The lamp outputs have also been designed so they may be paralleled should the installer wish to have fewer than three (3) indicator lamps in service. If this is done, the output current remains at 0.375 (375 milliamps). It is possible to install momentary light test switches (or just one (1) light test switch provided three (3) isolating diodes are installed) so as to enable the operator to check the lamps to determine if they are functioning.

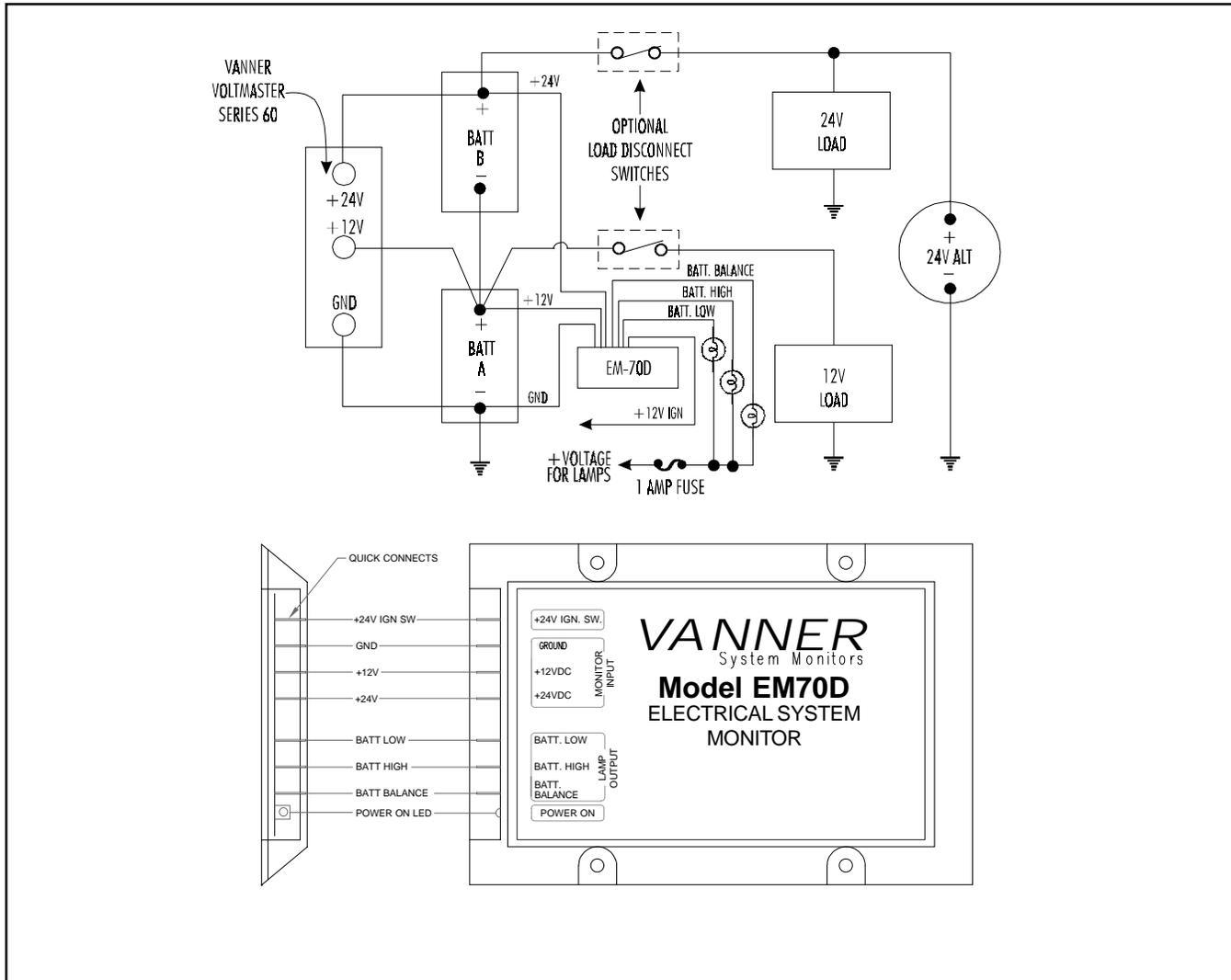
INSTALLATION

When installing the EM-70D, locate a dry, flat surface that will accommodate the four mounting holes. Even though the unit is potted and completely sealed, it is preferable to locate the monitor in as clean a location as possible. Since the current levels are in the milliamp range, it is permissible to use 18 gauge wire at all seven spade terminals. When connecting the three (3) monitor input leads to the system, it is important to note that the connections should be made to the wiring system as close to the battery terminals as possible. This will allow the EM-70D to monitor the condition of the wiring and terminals in the system and alert the operator if a problem develops. Should these three (3) wires be connected to the three terminals on the equalizer, the EM-70D will only monitor the equalizer voltages and will not respond to wiring or termination problems.

SPECIFICATIONS

IGNITION SYSTEM INPUT:	24 VDC (Minimum 18 VDC, Maximum 35 VDC)
WARNING LAMP TRIP LEVELS:	Battery System High - greater than 30 VDC Battery System Low - less than 24 VDC Battery Balance - greater than $\frac{INPUT}{2} + 6\%$ OR less than $\frac{INPUT}{2} - 6\%$
WARNING LAMP* OUTPUT:	Open collector style, 0.375 amps (375 milliamps) maximum *Also applies to buzzers, beepers, relays, etc.

INSTALLATION SCHEMATIC



WARNING LAMP DEFINITIONS—LAMPS WILL GLOW UNDER FOLLOWING CONDITIONS:

BATTERY LOW

- Battery voltage drops below 24 VDC
 - Check alternator output
 - Check alternator regulator
 - Check battery connections
 - Check battery cells
 - Check Battery Equalizer connections

BATTERY HIGH

- Battery voltage exceeds 30 VDC
 - Check alternator output
 - Check alternator regulator
 - Check battery connections

BATTERY BALANCE

- Batteries out of balance (greater than 1.5 volt difference between the two batteries)
 - Check circuit breaker on Battery Equalizer (if applicable)
 - Check Battery Equalizer connections
 - Check Equalizer cables for proper gauge
 - Check battery connections
- Demand for 12 volt power exceeding rated amperage output of Battery Equalizer; causing batteries to go out of balance
 - Reduce 12 volt loads
 - Install larger or additional Battery Equalizer
- Equalizer not functioning properly
 - Perform on-vehicle tests from troubleshooting guide (see Equalizer Owner's Manual).
 - If inoperable, replace Battery Equalizer and return inoperable unit to Vanner for repairs.



800- AC POWER

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