

Alternator Thermal Overload Safety Switch w/ Manual Override

The desire to charge auxiliary batteries from a vehicle alternator places a heavy load on the uncontrolled and variable capacity vehicle electrical system. Overloading the system causes alternator overheating, possibly to failure. Factors affecting safe alternator operation are neither measured nor controlled. Overheating is more likely when;

- 1) Excess alternator capacity varies with driving conditions:
 - Low engine speed/vehicle speed provides poor alternator cooling.
 - High engine bay temperatures reduce alternator cooling ability such as when climbing hills, or at high ambient temperatures.
 - High vehicle demand such as when operating headlights, heating or A/C system, wipers, seat heaters, etc. reduce excess capacity.
- 2) There is no means of measuring alternator output or temperature.
- 3) There is no means of measuring or limiting optional load demand even if conditions or capacity were known.

This device adds a thermal switch to the alternator that cycles the 'optional' device on and off based on alternator temperature. It shuts off above 120C/248F alternator temperature and turns on at ~100C/212F, preventing the alternator from being over heated.

(Optional) Adding a manual (and optionally illuminated) override switch allows the driver to disable charging in special circumstances; charging is not needed such as when solar is expected to meet needs or when climbing hills or passing vehicles

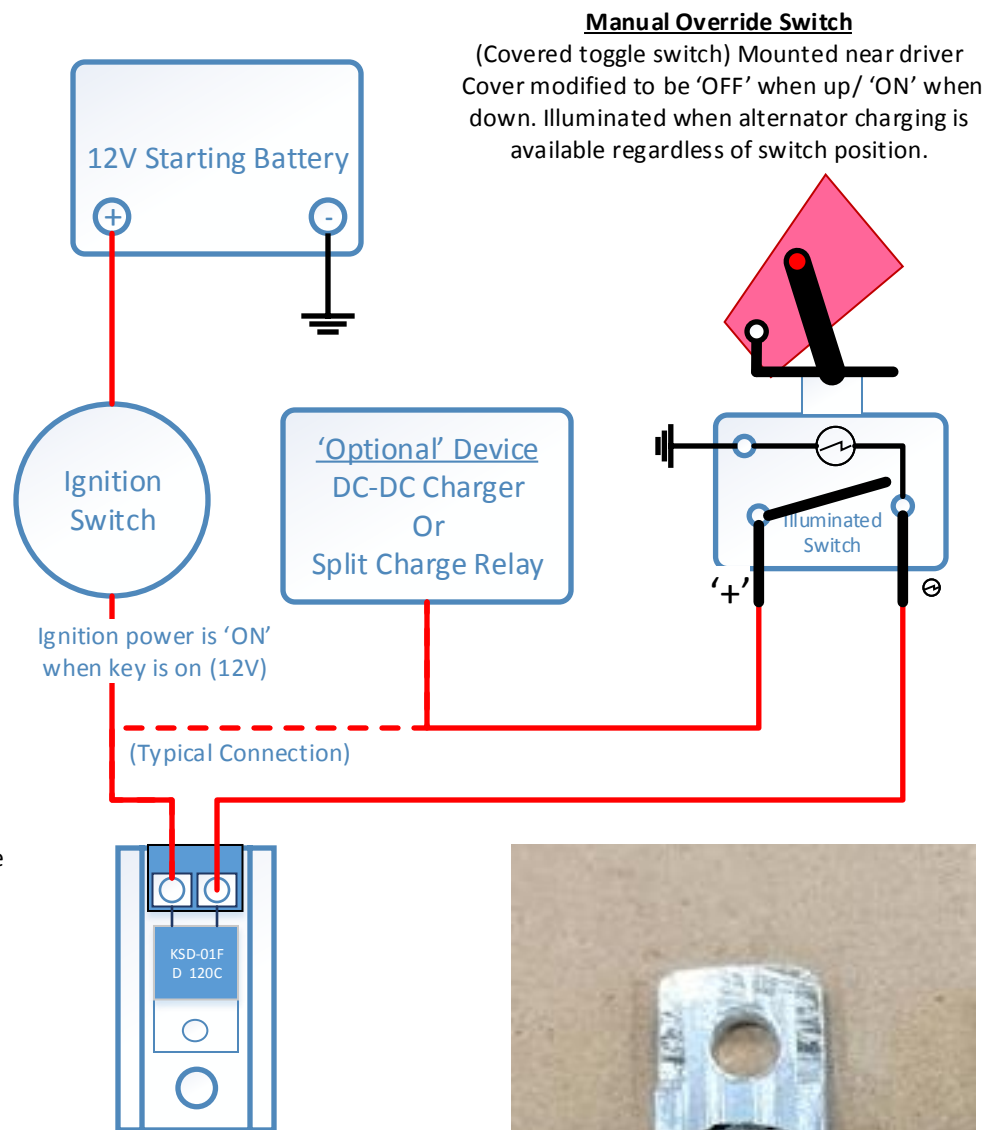
1) Normal Operation (override switch 'ON'): The normal switch position is recommended to be installed with the cover down being 'ON' (protected). Ignition power flows from the ignition switch, through the thermal switch and manual override switch to signal the optional device to operate. The indicator light visible through the cover and is illuminated any time the alternator is less than 120C/248F indicating auxiliary power is 'available'.

2) Manual Override (override switch 'OFF'): When the manual override switch is up/'OFF', ignition power is cut to the optional device, turning it OFF. If the indicator light is illuminated, power is passing through the thermal switch indicating the alternator is below 120C/248F showing charging is available.

3) Thermal Override (switch not illuminated): If the alternator temperature exceeds 120C/224F, (regardless of override switch position), the thermal switch opens, interrupting the ignition signal which prevents operation of the optional device. When alternator temperature reduces below ~100C, the thermal override will close, the indicator light will illuminate and if the manual override is down/'ON', optional equipment will resume.

NOTE:

- 1) At no time will alternator power be disrupted to vehicle systems. This ONLY reduces the load on the alternator by shutting off the optional equipment.
- 2) 'Load shedding' of large loads will cause some disturbance in the vehicle system but the starting battery and avalanche diodes in the alternator will damp reasonable disturbances.
- 3) If controlling a split charge relay, ALL operating DC equipment in the camper will experience voltage fluctuation between alternator voltage (~14V) and camper battery voltage. This is already a normal experience when starting and stopping the vehicle.



NC Thermal Override Switch

(attached to alternator case)
Opens(OFF) at 120C/248F
Closes(ON) ~100C/212F

