

PRODUCT INFORMATION

OVERCRANK PROTECTION CONTROLLER

Part No. 11966

Operation and Use

The overcrank protection controller will allow the operator to crank the vehicle for a maximum of 30 seconds (adjustable) after which the output is turned off. If the crank time exceeds 10 seconds (adjustable), there is a lockout period of 60 seconds (adjustable) before it can be cranked again. An LED (usually mounted in the instrument panel) will illuminate during this time to indicate that the start circuit is in lockout.

The overcrank protection controller also incorporates an optional frequency input that can be calibrated to ensure cranking cannot occur if the engine has already started. If the engine speed exceeds 1000 Hz (adjustable) for longer than the engine settling time of two seconds (adjustable), the cranking output will be automatically disabled. Once the controller detects that the engine has started, it will disable the starting circuit

The attempt lockout feature is another option that can be enabled which will allow the operator to crank the engine for a set number of consecutive attempts, after which the starting circuit will be locked out. If the attempt lockout feature is enabled, on the third (adjustable) attempt exceeding the nominal crank time, the user will be locked out from making another crank attempt. The LED indicator will flash continuously to indicate that the user is locked out.

The cranking attempts counter is reset when any of the following conditions are met:

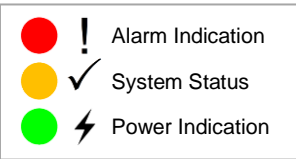
- when the bypass switch is toggled
- when the controller detects that the engine is running (via the optional engine rpm input)
- when power is removed from the controller

Failure to provide an engine running frequency input when the attempt lockout feature is enabled will mean that after three crank attempts, the start circuit is locked out.

The bypass switch functionality has been designed so that maintenance staff can perform tasks without being inhibited by the overcrank protection controller. When the bypass switch is on, the controller will allow the operator to crank the vehicle for as long as necessary.

The timings mentioned above are the default time settings. Refer to the *Calibration* section of this manual if you require different time settings.

Controller Status Indicator Operation

State	Indicator Sequence
Battery Power-up	<ul style="list-style-type: none"> ■ All indicators will turn on. ■ All indicators will turn off. ■ After power-up, the controller will revert to normal operation.
Status Indicator in Operation 	Red – Fault. <ul style="list-style-type: none"> ■ If outputs have problems, this will turn on. ■ Outputs 1 & 2 – high current outputs: checked for over current. ■ Output 3 – not checked as it is a low side driver. ■ Output 4 – checked for correct output voltage. ■ Temperature – checked for board temperature exceeding 80 °C.
	Yellow – Pulses during normal operation, indicates system OK. <ul style="list-style-type: none"> ■ Flashes on and off at one-second intervals (on for one second, off for one second).
	Green – On for normal operation.

Installation Guide

Warning

A relay is required in this system as a fail to safe circuit. Failure to include a relay in the circuit may result in damage to the engine and/or components.

1. Install the control unit, relay and bypass switch in a suitable location, preferably in the cabin.
2. Refer to the following wiring connections table and external wiring diagram to connect the controller. It is recommended that the wiring is installed alongside the OEM wiring ensuring that it is secured at regular intervals; this will provide protection from heat and abrasion, and any other excess damage that may occur with extended vehicle operation. When securing the wiring to the OEM wiring, ensure that the loom is away from moving vehicle parts, which could lead to loom damage.
3. Mount the LED in a suitable location that is visible to the operator.
4. (Optional) Connect an engine rpm signal to the white engine rpm frequency input (pin 5). Isolate this wire if this feature is not connected.
5. Remove the engine start/crank wire from the ignition switch and connect it to terminal 87 of the relay.
6. Connect the yellow wire (pin 8) to terminal 30 of the relay, run a second wire from the engine start/crank terminal of the ignition switch and connect the other end to terminal 30 of the relay. There should now be two wires connected to terminal 30 of the relay.
7. Connect the yellow/blue wire (pin 3) to terminal 86 of the relay.

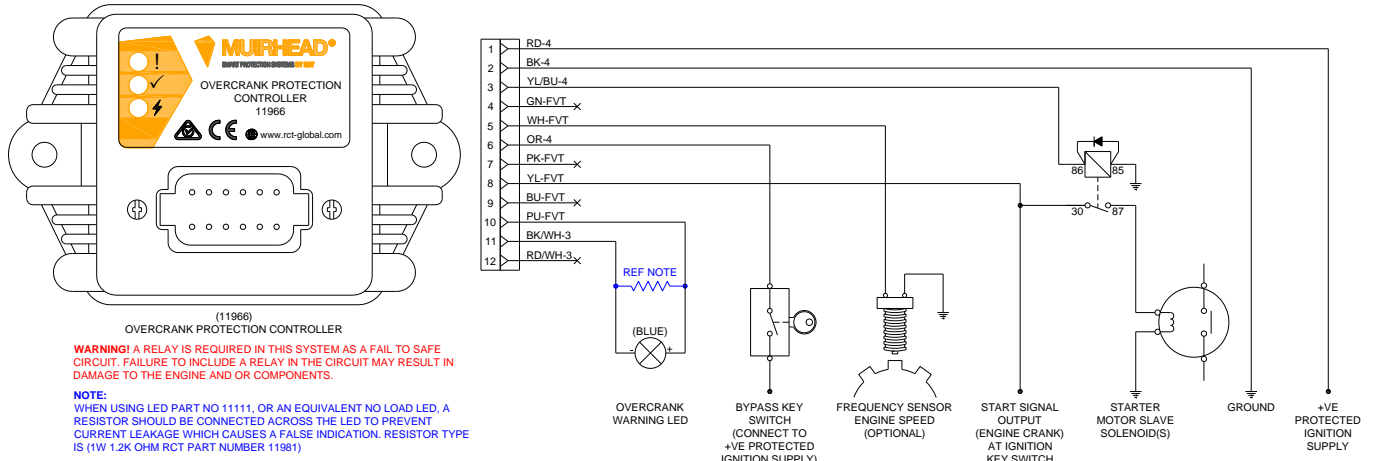
Note

It is recommended that a suppression diode be fitted across all inductive loads

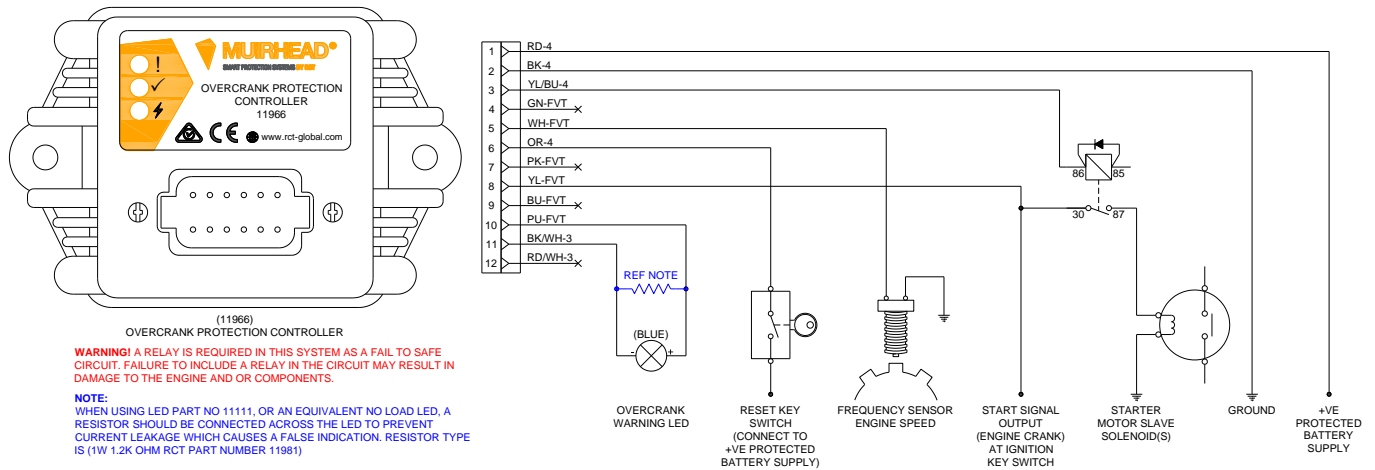
Wiring Connections

No.	Colour	Function	Description
1	Red	Ignition +VE	Connect to the permanent battery supply at the key switch (supply 12-24 Vdc).
2	Black	Ground	Earth (ground).
3	Yellow/Blue	Output 1 (ignition output)	Engine start/crank output (10 A continuous output).
4	Green	Output 3	Not used.
5	White	Input 1	Engine rpm frequency input
6	Orange	Input 3	Bypass key.
7	Pink	Input 4	Not used.
8	Yellow	Input 2	Engine start/crank input.
9	Blue	Output 4	Not used.
10	Purple	Output 2	Positive terminal of overcrank warning LED
11	Black/white	- VE	Ground terminal of overcrank warning LED
12	Red/white	Battery +VE	Not used.

External Wiring Diagram – Overcrank Protection Controller (501d)



External Wiring Diagram – Overcrank Protection Controller with Attempt Lockout Feature (694k)



For detailed product information, please contact your local RCT branch for a copy of the product manual [M0879](#). For configuration settings and adjustment, please contact your local RCT branch to purchase the Muirhead® Programming Utility, part number 13647.

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