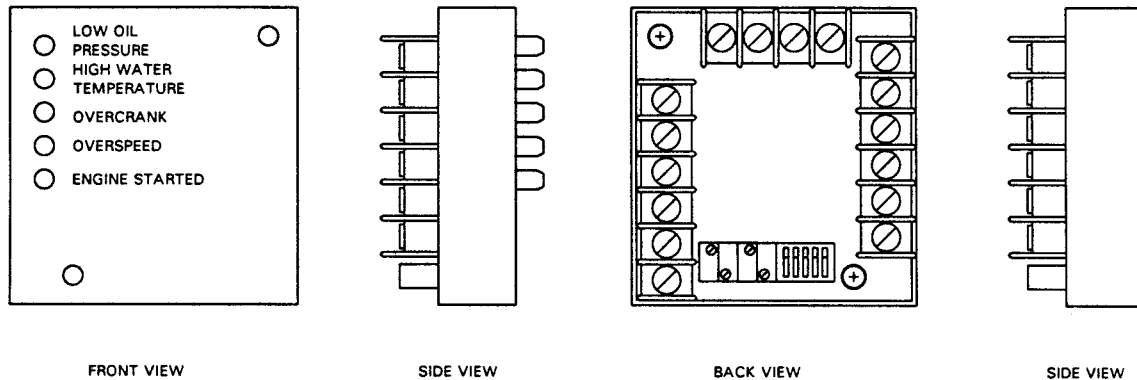


ECU[®]-57N / ECU[®]-88L / ECU[®]-88N INSTRUCTION MANUAL

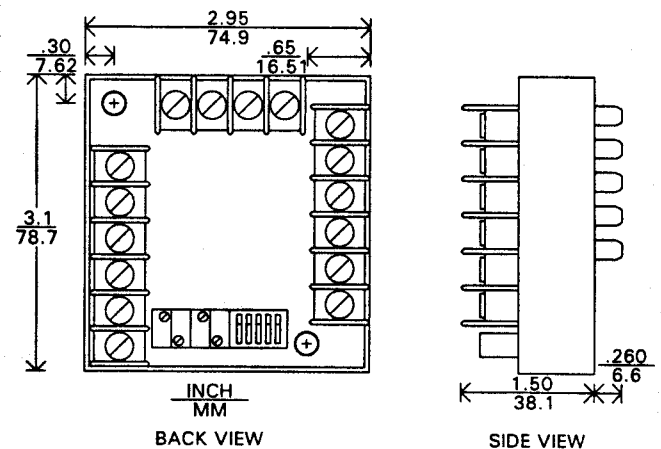


These units are the most advanced, rugged and compact engine control modules we have ever built. They are simple to use but this manual will assist both engineer and mechanic alike in the installation and operation of these controls. The following pages have in order: wiring and operation, expansion, adjustment, specifications, physical drawing, drilling guide and warranty information.

SPECIFICATIONS

Temperature Range	-40 TO +85 C
Voltage Range	9 to 28 VDC
Vibration	10 G 's
Standby Current	0 Amps
Operating Current	200 mA
Maximum life cycles	50,000
Starter and Fuel Output	5 Amps
Signal outputs (total)	1 Amp
Speed input voltage range	2 to 15 Volts
Input Impedance	5 kohms
Weight	12 oz.
Crank Cycle Time Single	2 sec to 15 min
Crank Cycle Time Multi	2 to 60 sec
Crank attempts	1 to 8
Low oil pressure delay	1 to 60 sec
Crank disconnect trip	250 Hz to 8500 Hz
Overspeed trip	250 Hz to 8500 Hz
Verify mode	87% of set point

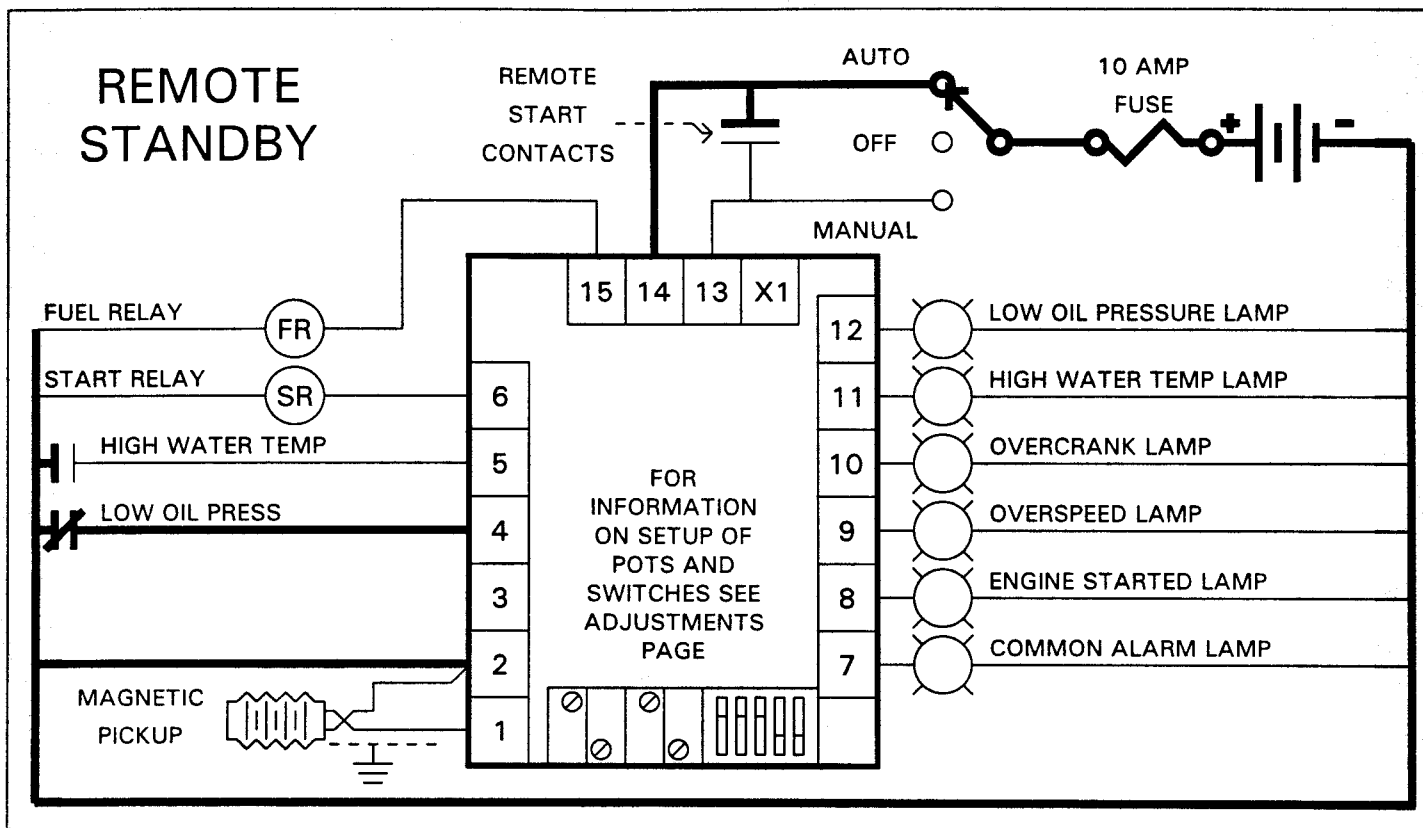
PHYSICAL DRAWING



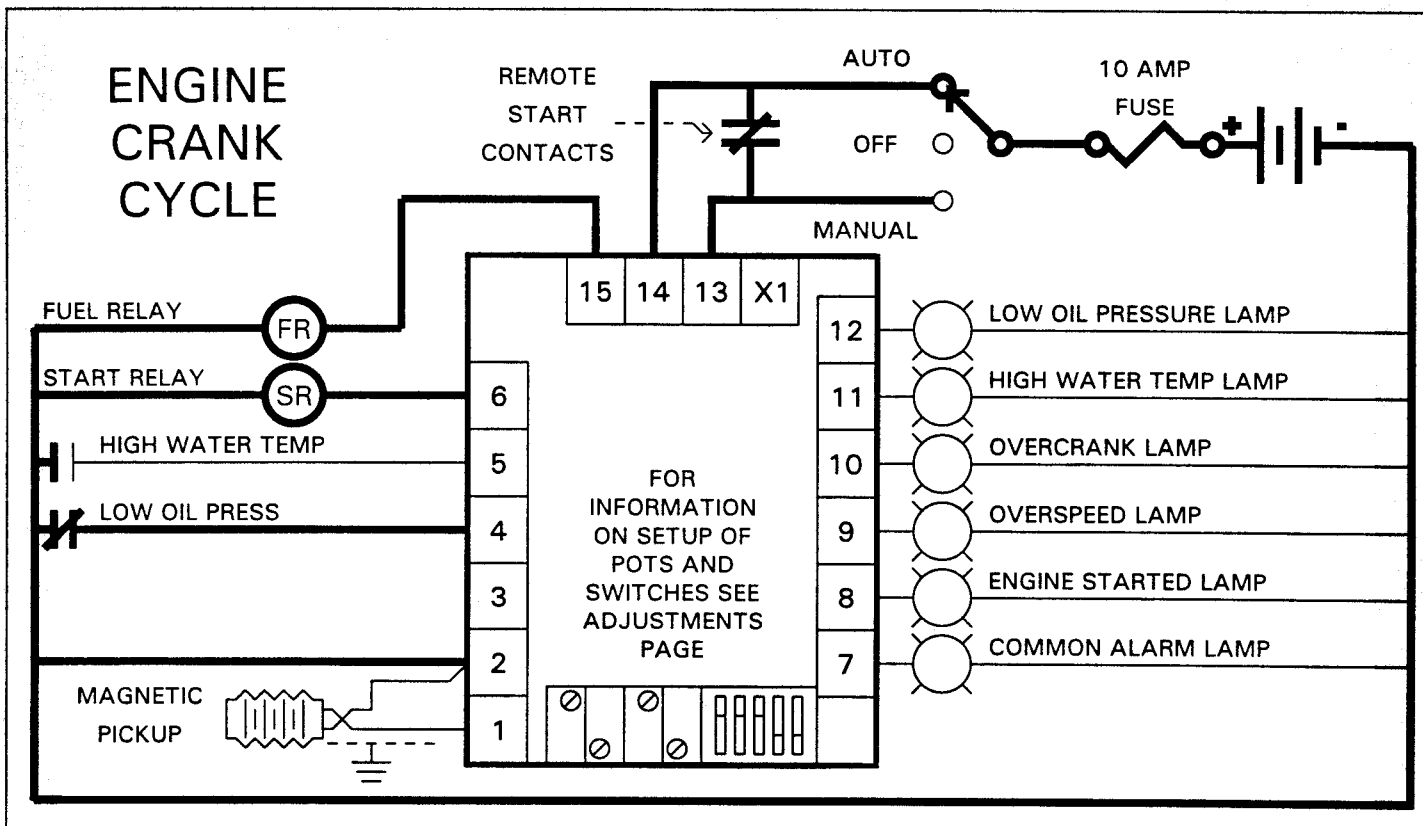
Mounting holes will accept No. 8 or No. 6 screws.

All specifications are subject to change without notice.

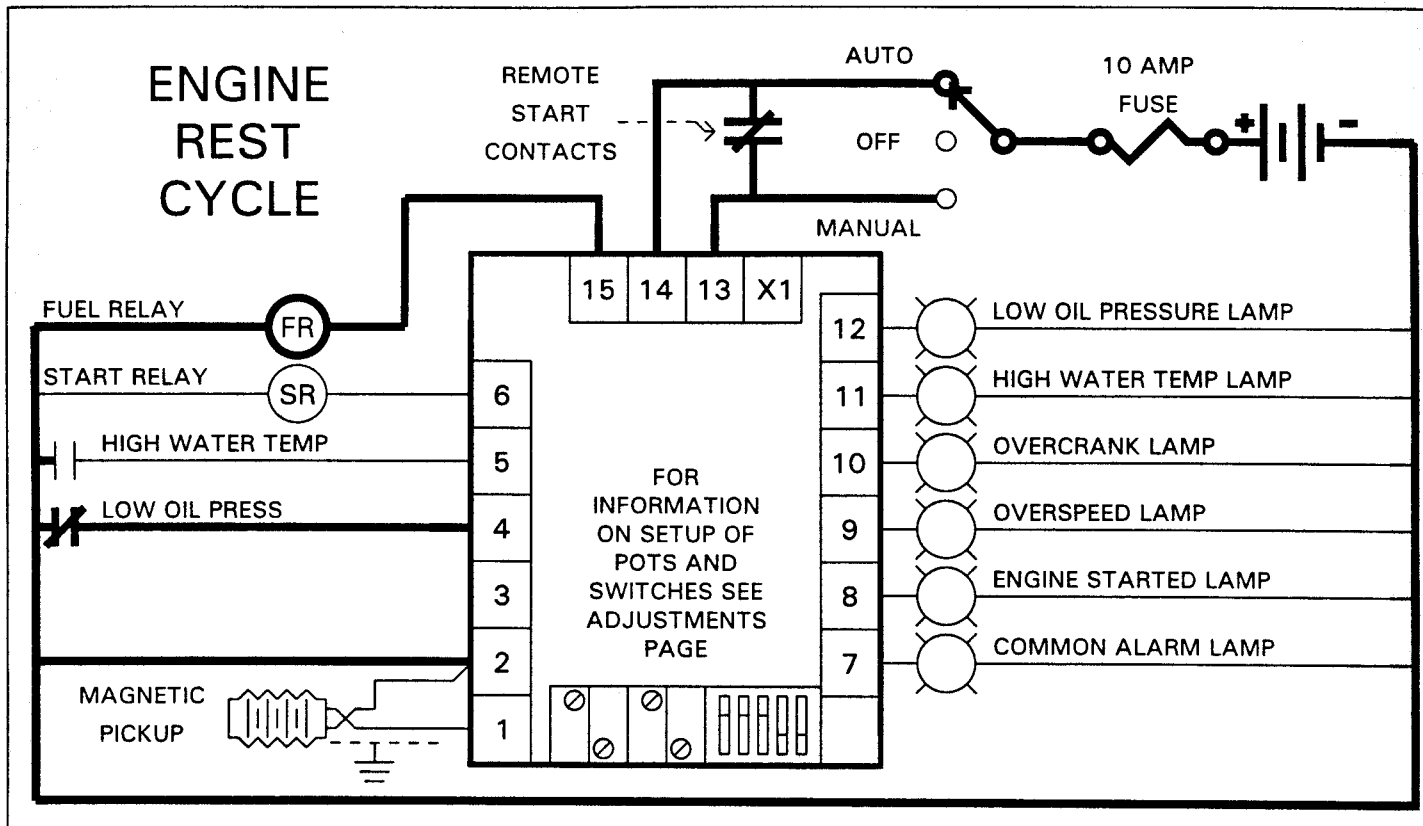
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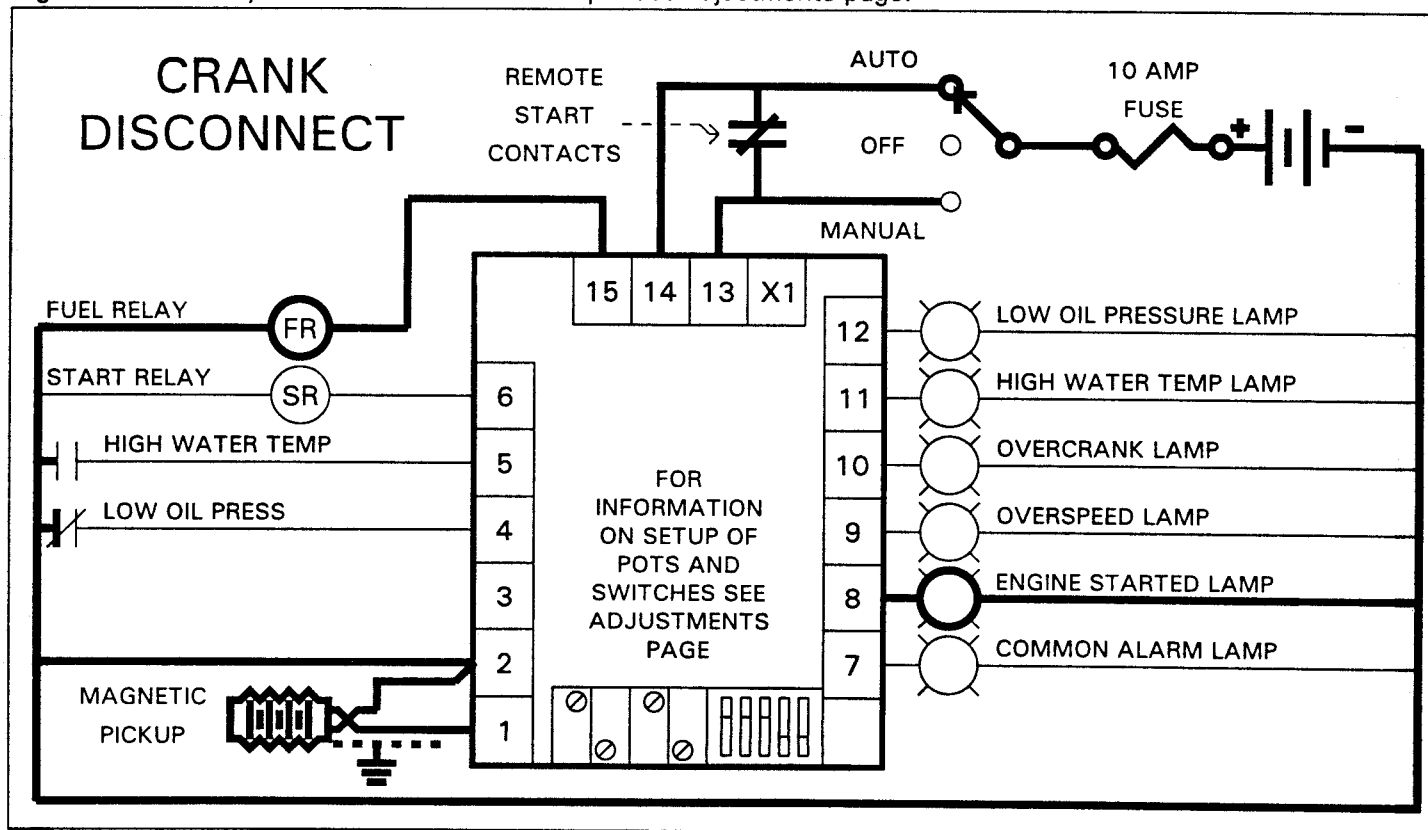
In the Standby mode the Engine Control Switch is in the Auto position as the module monitors the Remote Start Contacts. All that is required for cranking to begin is the closure of the Remote Start Contacts shown connected across terminals 13 and 14.



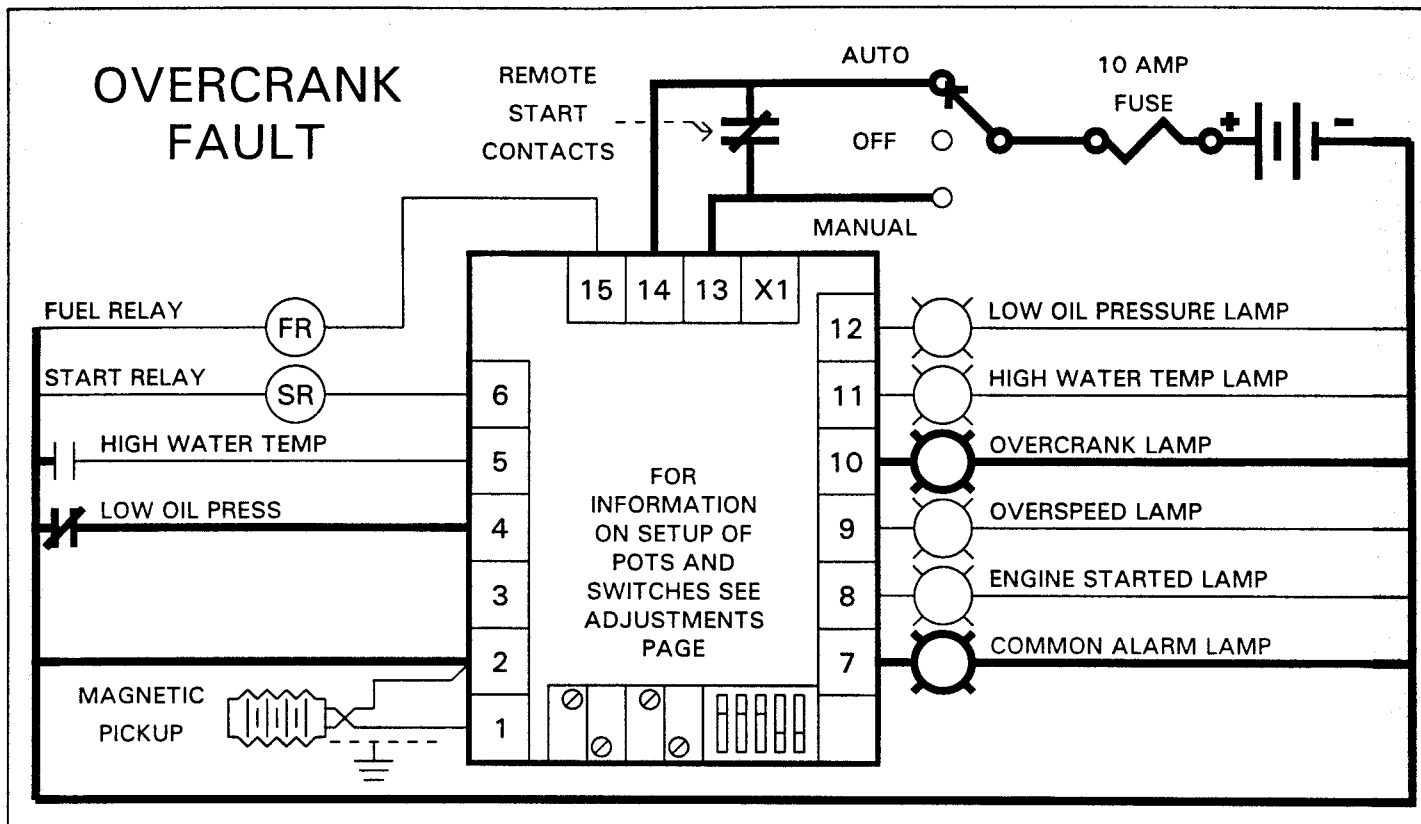
Closure of the Remote Start Contacts while in AUTO initiates the Crank mode. The Fuel Relay and Starter Relay are energized causing the engine to begin cranking. The Crank mode will continue for the duration of the settings of the Crank Cycle Adjust and the Dip Switch, unless Overcrank occurs first. During the Engine Crank Cycle the Low Oil Pressure Switch is ignored. To set Cycle Time and Crank Attempts see adjustments page.



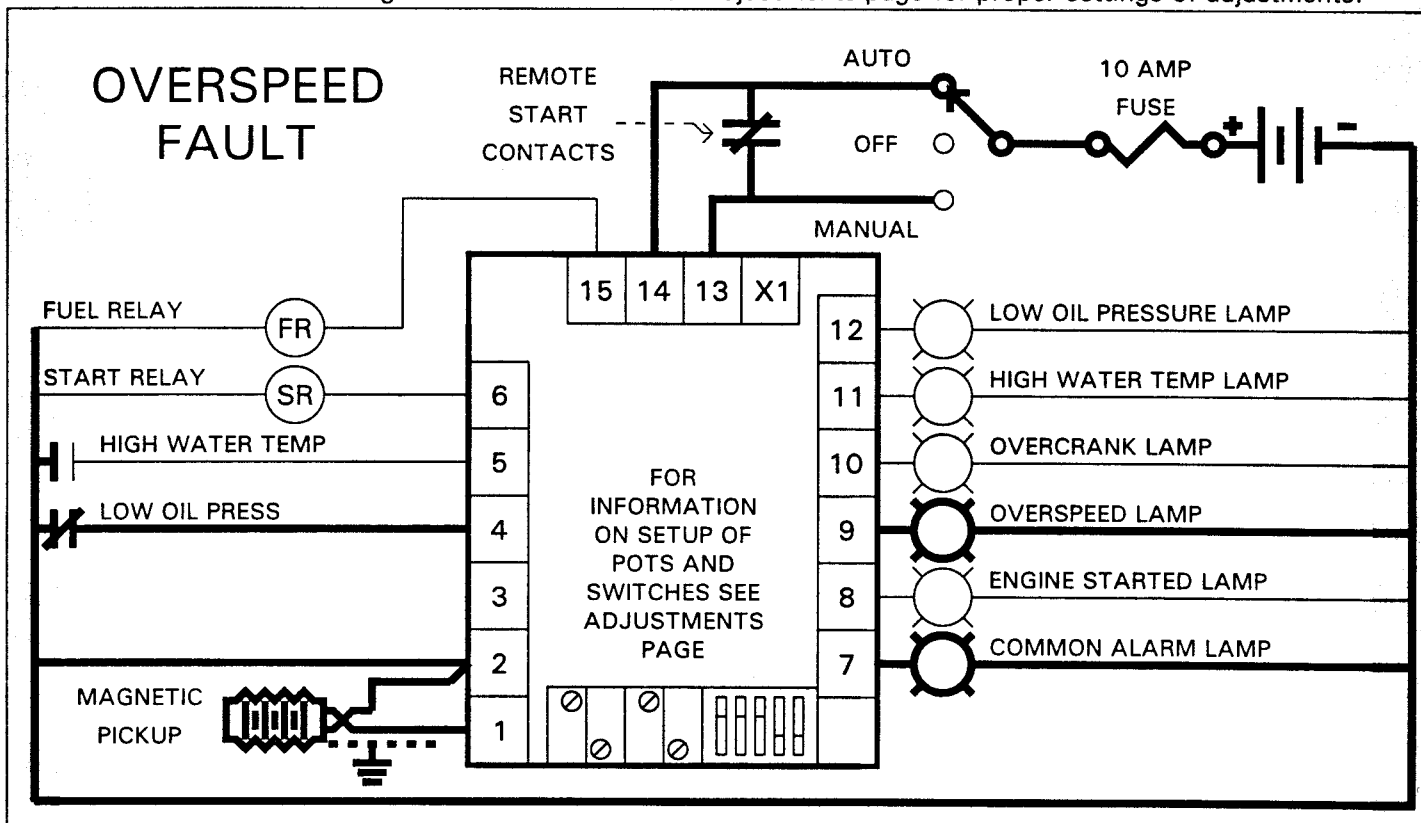
The REST cycle is a pause in the cranking sequence and only applies if Dip Switch 4 on the module is in the Off position. In this mode Fuel is still applied to the engine but the Starter Relay signal is turned off. The cycle continues for the duration of the Cycle time Adjustment Setting. The Low Oil Pressure fault signal input is ignored. To set Cycle Time and Crank Attempts see adjustments page.



If the internal speed switch detects a speed equal or above the Crank Disconnect Adjustment Setting the starter relay signal turns off, the Low Oil Pressure delay timer is initiated and the appropriate signals indicate as shown. The LED versions indicate via an LED also. This is a latched condition and must be reset by placing the Engine Control Switch in the Off position. The internal speed switch uses the Magnetic Pickup for speed detection.

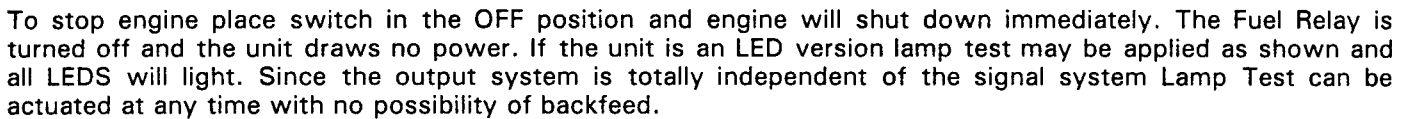


If the engine does not start in the allotted time, as determined by the Crank Cycle Adjust and the Dip Switch settings, the Overcrank Fault occurs. The Fuel and Start relays are turned off and the appropriate signals indicate as shown. The LED versions indicate via an LED also. The Overcrank condition is a latched condition and must be reset via the Engine Control Switch. See Adjustments page for proper settings of adjustments.



The Overspeed fault is armed at engine cranking. If the internal speed switch detects a speed equal or above the Overspeed Adjustment Setting the engine is shutdown immediately. The internal speed switch uses the Magnetic Pickup for speed detection. The Fuel Relay is turned off, the Low Oil Pressure switch is locked out and the appropriate signals indicate as shown. The LED versions indicate via an LED also. The Engine Switch must be placed in OFF for reset. See Adjustments page for speed adjustments.

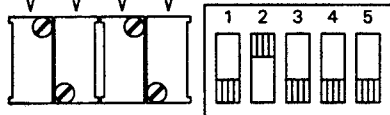
LAMP TEST 88L/88N ONLY



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graph TD
    A[LOW OIL PRESSURE] --- B[OVER SPEED]
    A --- C[CRANK DISCONNECT]
    C --- D[CRANK CYCLE]
  
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POTS ARE 25 TURN AND CAN NOT BE DAMAGED BY EXCESS TURNS

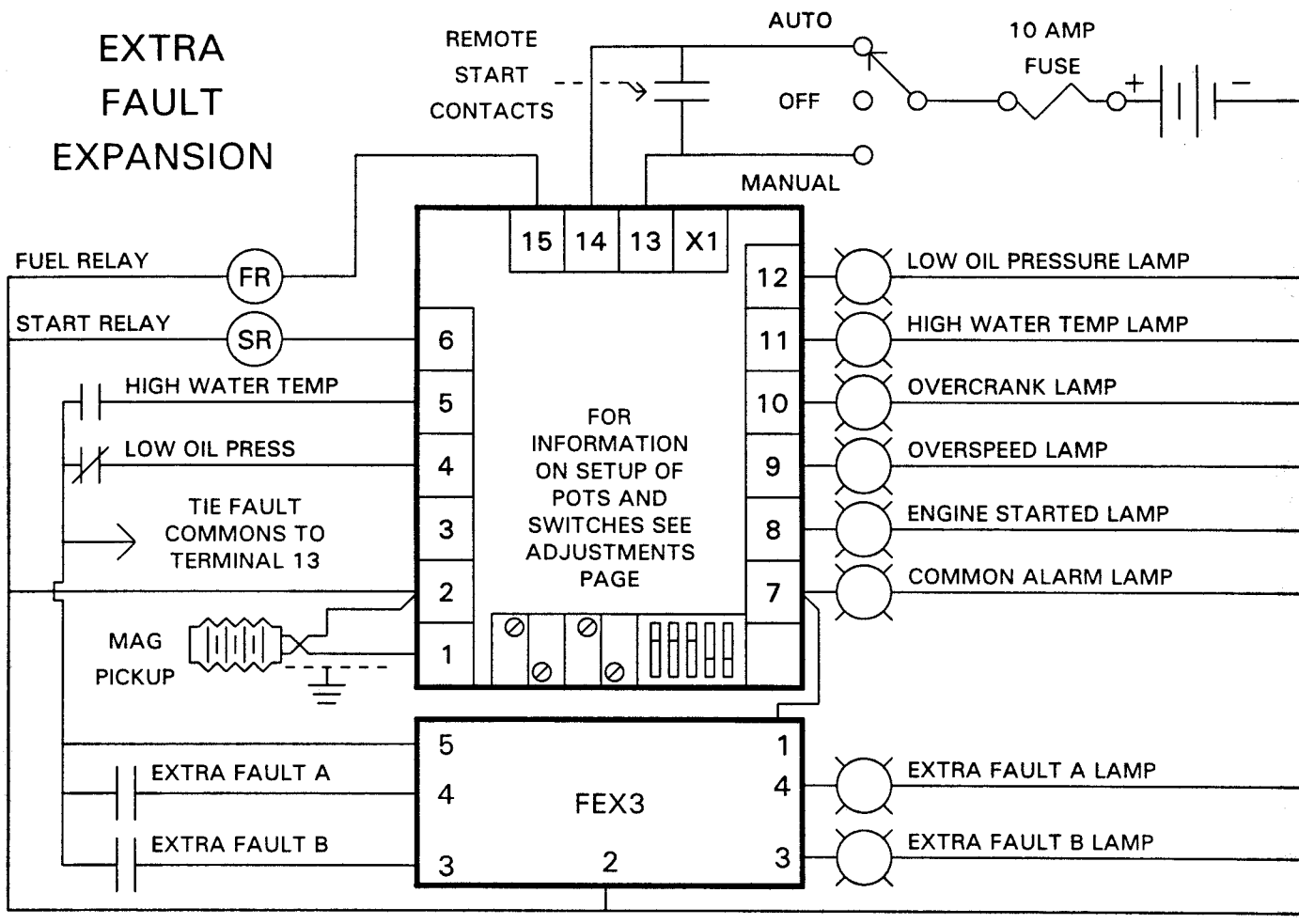


**SWITCH 5 ON FOR
OVERSPEED VERIFY
REDUCES TRIP SPEED
BY 13 PERCENT**

SWITCH 4
OFF - CYCLE CRANK
ON - SINGLE CRANK

[illegible]

EXTRA FAULT EXPANSION



The FEX3 is shown expanding the control to 6 total engine faults. The FEX3 provides both the fault combining signal circuits and the latch circuits. Placing voltage on terminal 7 will place unit in shutdown but it will not latch. See FEX3 literature for more information.

MANUFACTURER'S WARRANTY

Engineering Concepts Unlimited, Inc. warrants and guarantees that its automatic engine starting controls are free from any defects in workmanship and/or materials for one (1) year from date of shipment from its factory, and if they are found defective by the factory, they will be replaced, F.O.B. Fishers, IN. This warranty does not cover incidental and consequential damages, nor does this warranty cover defects caused by misuse, faulty installation, alteration, accident, or any labor charges, service charges, or anything else except the replacement of the product. THIS IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED.

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