MINITRON

Fuel Pump Safety Module

User Manual

A fuel pump safety device for your classic vehicle.

MINITRON Fuel Pump Safety Module User Manual

Version 1

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General Features

- Automatically switches off the electric fuel pump when the engine is not running. Choice of Oil Pressure sensor or Tachometric ignition sensor models.
- Restores fuel pump operation immediately when engine starts.
- Float bowl prime function.
- Automatic detection of positive and negative earth 12V vehicles.
- Seamlessly integrates with the MINITRON Immobiliser (if fitted as a combined unit).

Gives you:

- Increased safety in the event of an accident.
- Helps avoid costly repairs.
- Peace of mind.

Fig. 1 MINITRON Fuel Pump Safety Module.

Contents

1. Introducing the MINITRON Fuel Pump Safety Module

Many classic vehicles have an electric fuel pump which operates from the ignition switch of the vehicle electrical system. Unfortunately, this can lead to a situation where if the engine stalls, and with the ignition still switched on, the fuel pump will continue to pump fuel which leads to an increased risk of fire in and around the vehicle in the event of an accident.

The MINITRON Fuel Pump Safety Module is a device which automatically switches off the vehicle's electric fuel pump when the engine is not running. There is an initial time delay that gives the fuel pump an opportunity to prime the carburetter float bowl when the ignition is first turned on.

The intended function of the device is to act as a safety device.

All the necessary relays are built into the Module and do not have to be purchased and installed separately.

There are two separate models available. One uses engine oil pressure for monitoring engine status via the vehicle's oil light pressure switch; the other uses the ignition pulse (tachometric) at the CB side of the ignition coil.

Basic operation is:

- Detects when the engine is not running and turns of the fuel pump.
- Float bowl prime period 10 seconds when ignition is first turned on.
- Restores operation of the fuel pump when engine is started.
- LED indicator for fuel pump status.

The following are some of the design features the MINITRON Fuel Pump Safety Module:

- OEM quality wiring and internal components.
- Automatic detection of positive or negative earth vehicles.
- No cutting of factory wiring required.

- Natural grey aluminium metal enclosure designed to look like a factory fitment rather than an added accessory.

MINITRON Fuel Pump Safety Module is a high-quality product made from trusted brand-name industrial-grade electronic components and materials.

Such is our confidence in this product, MINITRON Fuel Pump Safety Module is warranted for **three years** from date of purchase.

Prerequisites

- 12V positive or negative earth electrical system.
- Connection to a switched battery feed terminal (can be at the fuse box or ignition switch) and vehicle earth.
- Connection to the engine oil pressure switch (via piggyback spade terminal supplied). Or,
- Connection to CB terminal of the ignition coil.

Note: An oil pressure switch is not supplied with the Minitron. An electrical oil pressure gauge sender unit cannot be used; the sensor must be an oil pressure switch of the type that normally activates the oil pressure warning light on or off.

The MINITRON Fuel Pump Control module may also be integrated with the MINITRON Immobiliser by purchasing a combined unit.

2. Operating the MINITRON Fuel Pump Safety Module

2.1 Operation

The MINITRON Fuel Pump Safety Module is entirely automatic. There are no set or reset buttons or switches to operate manually. An indicator LED on the Module indicates when the fuel pump is disabled.

Note: When integrated with the MINITRON Immobiliser, the Immobiliser LED on the dashboard flashes orange when the engine stalls.

The MINITRON Fuel Pump Safety Module only operates when the ignition is turned on. When the ignition is turned off, the fuel pump is connected in the normal manner to the vehicle's electrical system. When the ignition is turned on, and the engine is not started, then the prime delay period begins within which the fuel pump is operational. The fuel pump is disabled if there is no oil pressure or no ignition pulse (depending on the model fitted) after the prime delay period.

2.2 Testing

With the ignition turned on, but the engine not running, the indicator LED should illuminate after a 10 second delay. The fuel pump (should it be pumping) should stop. If the fuel pump is not pumping due to the float bowl being full, then it will still be deactivated and will not begin to pump should the float bowl level then fall due to evaporation while the engine is not running.

After starting the engine and oil pressure or ignition pulse detected, the indicator LED should extinguish, and the fuel pump resume normal operation.

> **Note**: When the engine starts, the fuel pump may not begin pumping immediately due to float bowl fuel level, but it will be functional in the normal manner.

3. General Features

The MINITRON Fuel Pump Safety Module is suitable for both positive and negative earth operation and automatically detects vehicle polarity.

> **Note:** The connection wires of the MINITRON unit are coloured according to standard Lucas specifications. The White wire goes to the vehicle switched battery feed and the Black wire goes to vehicle Earth – for both positive and negative earth vehicle systems.

The MINITRON requires connection to the switched battery feed, vehicle earth, fuel pump wire at the fuse box, and to the oil pressure switch, or coil CB (Contact Breaker) terminal on the engine.

4. Specifications

The MINITRON draws 11mA when inactive, and 57mA when the fuel pump relay is activated.

The internal relay that controls the fuel pump has contacts rated at 10A.

The 18 AWG white wires to and from the MINITRON relay contacts are rated at 7.5A continuous use and are to original Lucas equipment specification.

The circuitry inside the MINITRON Controller is protected against reverse polarity, over-voltage, and short circuits.

5. Fitting Instructions

5.1 General

When installing the MINITRON, please take your time to do a good job. A rushed job will result in frustration, poor appearance, and a possible dangerous situation with the risk of a short circuit and unreliable function. Please follow these instructions carefully. Allow about 1 hour for installation.

The MINITRON Fuel Pump Controller may be installed as a stand-alone device, or in conjunction with the MINITRON Immobiliser. If it is installed with the Immobiliser, then the fitting instructions for the MINITRON Immobiliser should be followed for mounting of the controller module since in the combined product, the Fuel Pump control circuitry is inside the Immobiliser module case.

Electrical connections to the oil pressure switch and the fuel pump wiring are given in this document.

If the MINITRON Fuel Pump Controller is being installed as a stand-alone device, then the controller module can be mounted in the engine compartment if it is in a protected position from water splash and excessive heat but ideally should be mounted inside the vehicle if possible. The circuitry is sealed against water ingress, but there openings in the side to allow wires to pass through and this opening should face downwards.

These instructions apply to a Morris 850, positive earth, with an electric fuel pump. The procedure for other vehicles should be very similar to those described here.

5.2 Installation

Mount the controller module in a convenient position, preferably near the vehicle fuse box, or under the parcel shelf inside the vehicle. If installing inside the vehicle cabin, then the wires for the fuel pump and oil pressure switch will require routing through the speedometer access hole in the dash panel.

The MINITRON Fuel Pump Control module may be fitted in the engine compartment as long as not placed in a position near sources of excessive heat or vibration such as near the exhaust system or on the engine itself and that the opening in the side for cable attachment is pointing downwards to avoid water ingress.

> **Note:** Disconnect the vehicle battery before starting work on the wiring to avoid the possibility of short circuits and other problems.

At the fuse box, remove the plastic cover to allow easy access to the terminals.

In the standard Lucas wiring loom, there are three white wires at one of the multi-connector tab terminals of the fuse box. The wires are identical in appearance. One comes from the switched battery feed (from the ignition

switch); one goes to the electrical fuel pump; and the other goes to the SW terminal of the primary side of the ignition coil.

The white wire going to the ignition coil can be identified using an ohmmeter or a circuit tester after removing the connections at each end.

The white wire coming from the ignition switch can be identified by removing it from the fuse box and then turning on the ignition. If the oil light does not come on, but the generator light does glow, then this is the switched battery feed.

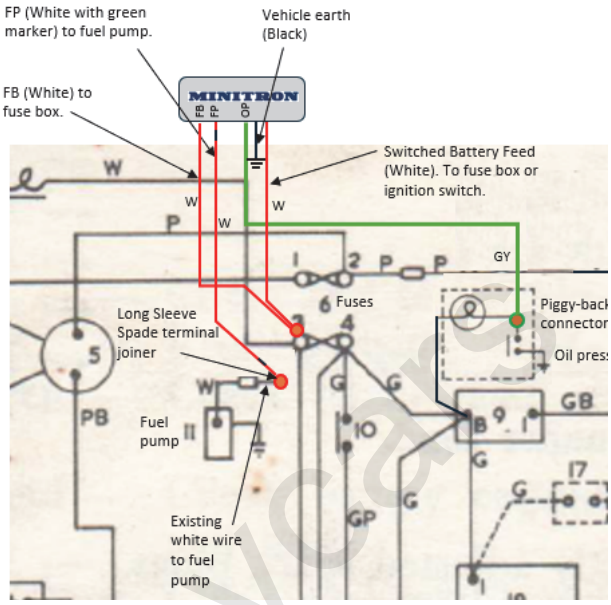

Fig. 2 Connection circuit for Fuel Pump Safety Module.

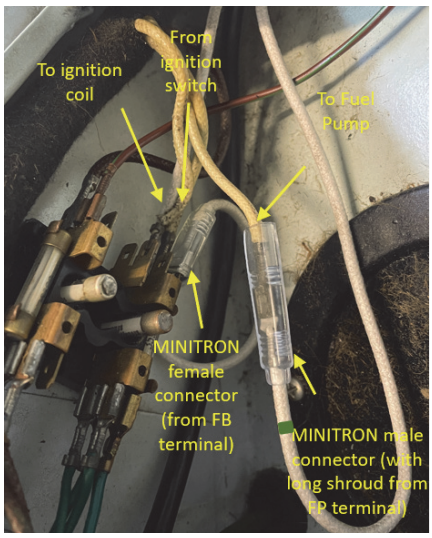

Fig. 3 Fuse box wiring.

The white wire going to the electric fuel pump is identified by elimination from those above.

Once the existing three white wires are identified at the fuse box, installation can proceed.

For the MINITRON power cables (for stand-alone installation), the white power wire can be attached to one of the spare switched battery tab terminals on the fuse box. Use the unfused side of the fuse box terminal (where the white wires are connected).

> **Note**: The electrical fuel pump is usually powered from an unfused switched battery feed circuit. There is internal short circuit protection inside the MINITRON unit (auto-resetting polymer fuse).

The MINITRON black power wire is connected to vehicle earth.

> **Note:** If you inadvertently connect the black wire to the vehicle switched battery feed and the white wire to earth, then no damage will be done, but the device will operate opposite to that which is expected. That is, the fuel

pump will be turned off after the prime delay period and once oil pressure is achieved. To ensure proper operation, connect the white wire to switched battery feed and black wire to vehicle earth no matter what the polarity of the vehicle might be. The case of the MINITRON unit does not have to be earthed, but the black wire has to be connected to vehicle earth. These colours apply to both positive and negative earth vehicles. Black wire always to vehicle earth. White wire always to switched battery feed.

The MINITRON Fuel Pump Controller relay wires are supplied with spade terminals and insulation sleeves. They are also white to conform with standard Lucas colours. If longer wires are needed, then additional extension pieces need to be prepared. Do not cut or alter the original MINITRON wires.

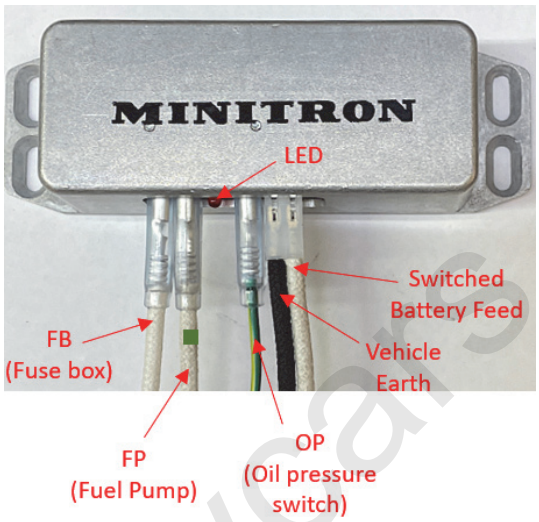

Fig. 4 Wire connections at the Fuel Pump Safety Module.

Note: The white wire with the long plastic sleeve and male connector at one end connects the wire from the fuel pump to the FP terminal at the relay. This wire has a green marking on each end to aid in identification. The white wire with the short sleeves and female connectors at both ends connects to the fuse box terminal where the original white wire for the fuel pump was

connected. The other end of this wire connects to the FB terminal of the relay.

Essentially there are two white wires connected to the switched battery circuit of the vehicle. One for powering the MINITRON module, the other connected to the MINITRON relay FB terminal. For safety and clarity, the two wires are not internally connected inside the MINITRON module.

At the fuse box, plug the original white wire from the fuel pump into the male connector of the MINITRON wiring and make sure the lengthened plastic housing is pushed forward to cover both terminals. The MINITRON FP wire has a green marker on it for identification. When pushing the plastic connector forward, make sure the female connector is not disengaged from the male connector.

Plug the female MINITRON FB wire onto the fuse box terminal that you removed the fuel pump wire from.

Reconnect the other two factory white wires (switched battery feed and ignition coil SW) to the fuse box terminals if they have been previously disconnected for testing.

5.2.1 Oil Pressure model

The Green/Yellow oil pump wire OP passes through existing clips and follows the engine bay harness to the oil pressure switch. A piggy-back blade connector is then used to attach the oil pump signal wire to the switch alongside the existing oil pressure warning light wire.

Refit the fuse box cover and dash panel insulation and carburetter air filter. This completes the under-bonnet installation.

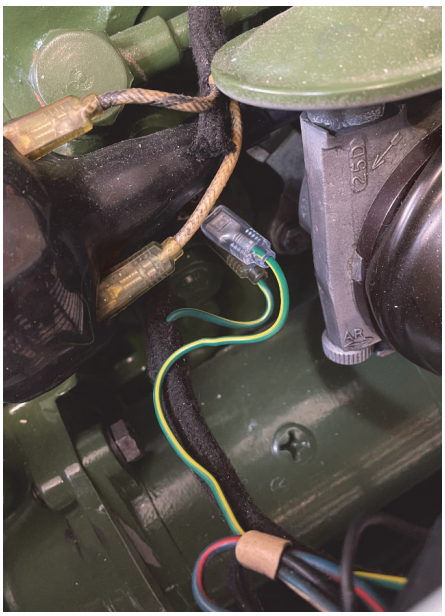

Fig. 5 Terminal fitment for oil pressure switch.

5.2.2 Tachometric model

In this model, engine run status is sensed by electrical pulses on the CB side of the vehicle's ignition coil. These pulses are of reasonably high voltage (up to 300V) due to the inductive "kick back" from the action of the points in switching the DC load through the coil.

In this case, the sensor lead is coloured White with Black stripes in accordance with LUCAS specifications. To make the connection, the wire is piggy-backed onto the CB terminal of the coil – the wire that connects the coil to the distributor.

4. Testing

Once all the wiring is in place and you are satisfied that everything is neat and tidy, reconnect the vehicle battery.

Turn the vehicle ignition on but do not start the engine. The electrical fuel pump should be heard to operate if the float bowl requires filling.

After the preset time period, the LED indicator will glow signifying no oil pressure. If the LED does not glow, then it is possible that the oil pressure switch is faulty, or that the signal wire (Green/Yellow) is not correctly connected.

Start the engine.

The LED indicator should extinguish almost immediately as oil pressure is established. The electric fuel pump should operate in the normal manner.

6. Trouble Shooting

The MINITRON is designed for normal vehicle 12V operation but will operate with as low as 10 volts.

> **Note**: In standard form, the electrical fuel pump is powered from an unfused switched battery circuit (e.g. Morris Mini range). The power to the MINITRON unit can be taken from either an unfused or fused switched battery feed circuit but there are consequences for using a fused circuit. If power is taken from a fused sourced, then if that fuse should blow due to some short circuit downstream of the fuse (which may happen in the event of an accident) then the MINITRON controller will not activate and not turn off the fuel pump. If power is taken from an unfused circuit, then the MINITRON Safety Module will control the fuel pump as intended. Note that there is internal short circuit protection inside the MINITRON unit (auto-resetting polymer fuse). There is also a 10 A non-resettable fusible link inside the unit protecting the main relay contact and wiring from short circuits.

7. Questions

1. Is it suitable for both **positive and negative earth** vehicles? Yes. The black power wire goes to the vehicle earth, the white wire to the vehicle switched battery feed no matter what the vehicle polarity.

2. Is there a **Warranty**? Yes. MINITRON is warranted to be free from defects arising from manufacture for a period of **3 years** if the installation and operating instructions are followed. Faulty units are to be returned at Purchaser's expense and will be examined and warranty status advised. Repaired or replaced units will be returned at our expense. Repairs arising from any damage arising from incorrect installation, misuse, water ingress, is not covered under warranty but a repair cost will be quoted.

8. Warranty

The Manufacturer hereby warrants this MINITRTON Fuel Pump Safety Module to be free from defects in materials and/or workmanship for a period of 3 years from date of purchase by the original purchaser.

Our obligation under this Warranty is limited to repairing or replacing faulty parts or materials and does not extend to consequential loss, damage or injury arising from the use of the device.

This Warranty does not cover faults that are due to misuse, abuse, negligence, accident. Also excluded are faults arising from unauthorised repair, installation and use not according to instructions, and normal wear and tear.

Returns under Warranty must be freight-prepaid and must be accompanied by proof of the purchase date.

The rights and conditions under this Warranty are additional to any rights that may be conferred under the Consumer law.

9. Disclaimers

Great care has gone into the design and manufacture of the MINITRON Fuel Pump Safety Module so as to provide the best possible safety for your vehicle. However, due to the wide range of operating conditions and circumstances that might be encountered during service, the manufacturer

or retailer does not guarantee your car against fire or malfunction even if the MINITRON is fitted and functioning correctly.

10. Conditions

The fitting and usage instructions must be followed.

Any vehicle system controlled by the MINITRON internal relay contact terminals are the owner's responsibility and no responsibility for any consequences of the use and application of these circuits will be accepted by the Manufacturer.

Altering the System or not adhering to the fitting instructions will void the warranty.

Fitment and use of the MINITRON signifies your acceptance of the above conditions.

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Designed and manufactured in Australia by:

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