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DSEULTRA[®]

DSE6000 Quick Start Guide

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DSE Model 6000 series Control and Instrumentation System Operators Manual

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Amendments since last publication

Amd. No.	Comments

Clarification of notation used within this publication.

 NOTE:	Highlights an essential element of a procedure to ensure correctness.
 CAUTION!	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING!	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

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1 BIBLIOGRAPHY

This document refers to and is referred to by the following DSE publications which can be obtained from the DSE website www.deepseapl.com

1.1 INSTALLATION INSTRUCTIONS

Installation instructions are supplied with the product in the box and are intended as a 'quick start' guide only.

DSE PART	DESCRIPTION
053-059	6110 installation instructions
053-060	6120 installation instructions
053-061	6130 installation instructions

1.2 TRAINING GUIDES

Training Guides are produced to give 'handout' sheets on specific subjects during training sessions.

DSE PART	DESCRIPTION
056-005	Using CTs with DSE products
056-010	Overcurrent protection
056-022	Breaker Control
056-029	Smoke Limiting
056-030	Module PIN codes

1.3 MANUALS

DSE PART	DESCRIPTION
057-004	Electronic Engines and DSE wiring manual
057-100	6000 Series Configuration Suite manual

2 INTRODUCTION

This document details the installation and operation requirements of the DSE6000 Series modules, part of the DSEUltra® range of products.

The manual forms part of the product and should be kept for the entire life of the product. If the product is passed or supplied to another party, ensure that this document is passed to them for reference purposes.

This is not a *controlled document*. You will not be automatically informed of updates. Any future updates of this document will be included on the DSE website at www.deepseapl.com

The **DSE 6100 series** module has been designed to allow the operator to start and stop the engine/generator, and if required, transfer the load.

The user also has the facility to view the system operating parameters via the LCD display.

The **DSE 6100** module monitors the engine, indicating the operational status and fault conditions, automatically shutting down the engine and giving a true first up fault condition of an engine failure. The LCD display indicates the fault.

The powerful microprocessor contained within the module allows for incorporation of a range of enhanced features:

- *Text based LCD display*
- **True RMS** Voltage monitoring.
- *Engine parameter monitoring.*
- *Fully configurable inputs for use as alarms or a range of different functions.*
- *Engine ECU interface to **electronic engines** (specify on ordering)*
- *Magnetic pickup interface for engine only applications (specify on ordering)*

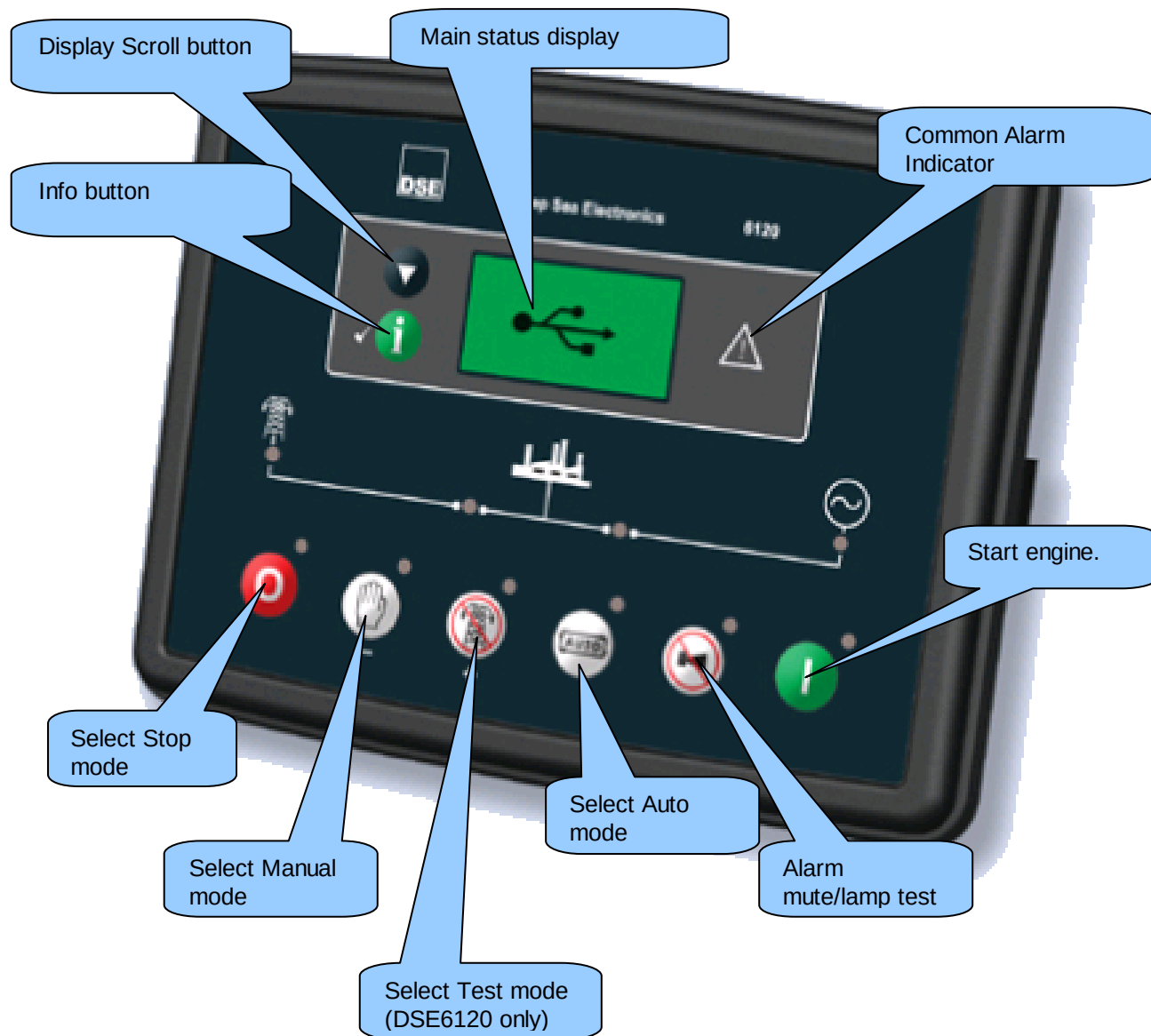
Using a PC and the 6000 series configuration software allows alteration of selected operational sequences, timers and alarm trips.

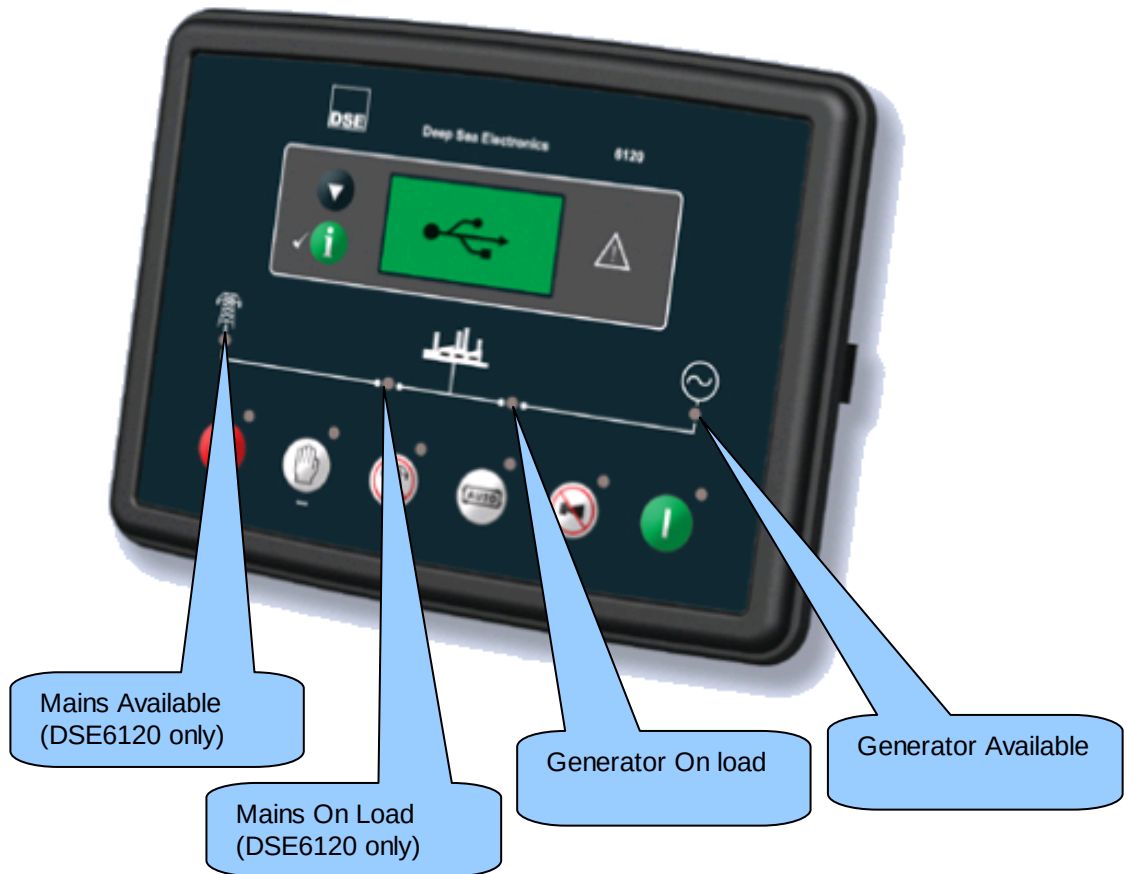
Additionally, the module's integral fascia configuration editor allows adjustment of this information.

A robust plastic case designed for front panel mounting houses the module. Connections are via locking plug and sockets.

3 DESCRIPTION OF CONTROLS

The following section details the function and meaning of the various controls on the module.

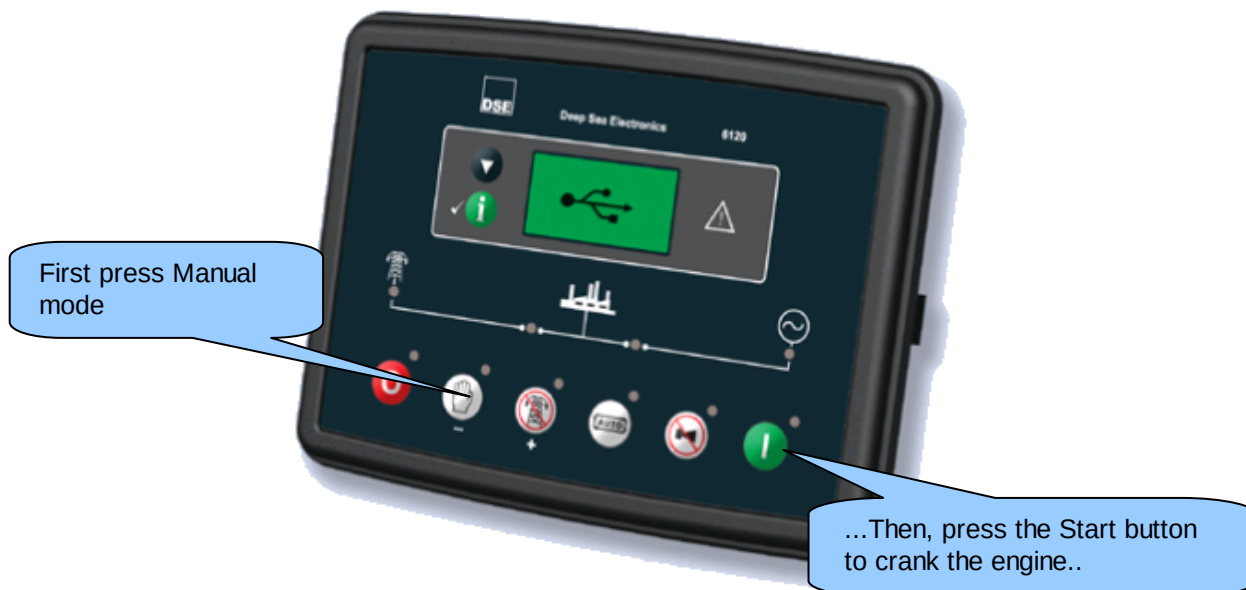




3.1 QUICKSTART GUIDE

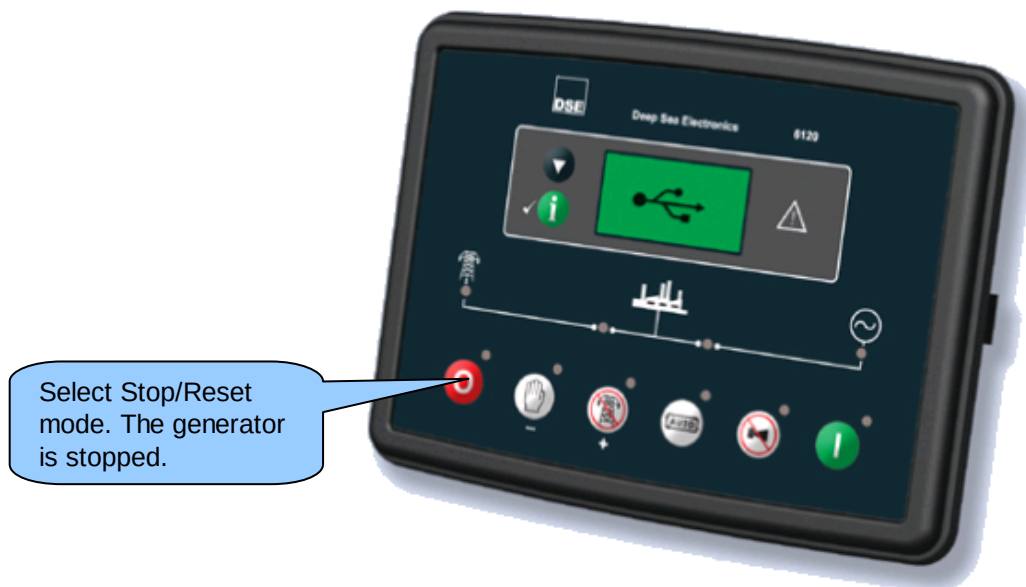
This section provides a quick start guide to the module's operation.

3.1.1 STARTING THE ENGINE



NOTE:- For further details, see the section entitled 'OPERATION' elsewhere in this manual.

3.1.2 STOPPING THE ENGINE



NOTE:- For further details, see the section entitled 'OPERATION' elsewhere in this manual.

3.2 VIEWING THE INSTRUMENTS

It is possible to scroll to display the different pages of information by repeatedly operating the scroll button .

Once selected the page will remain on the LCD display until the user selects a different page or after an extended period of inactivity, the module will revert to the status display.

When scrolling manually, the display will automatically return to the Status page if no buttons are pressed for the duration of the configurable *LCD Page Timer*.

If an alarm becomes active while viewing the status page, the display shows the Alarms page to draw the operator's attention to the alarm condition.

Metering: Generator Voltage, 3-phase, L-L and L-N
 Generator Amps L1, L2 and L3 (On/Off selectable in software)
 Generator Frequency
 Mains Voltage, 3-phase, L-L and L-N
 Battery Voltage
 Engine hours Run
 Oil Pressure Gauge
 Engine Temperature Gauge
 Fuel Level
 Fail to Start

Indicators:
 Fail to Stop
 Low Oil pressure
 High Engine Temperature
 Under/Over-speed
 Under/Over voltage – Warning, Shutdown or Electrical Trip
 Emergency Stop
 Failed to reach loading voltage
 Failed to reach loading frequency
 Charge Fail
 Over Current – Warning, Shutdown or Electrical Trip
 Low DC Voltage
 + AMF indications
 + CAN diagnostics

At power up, the display will display the software version, then display the default display screen, which will display Generator Frequency.

4 OPERATION

4.1 ECU OVERRIDE

 **NOTE:-** ECU Override function is only applicable to the CAN variant of the 6100 series controller.

 **NOTE:-** Depending upon system design, the ECU may be powered or unpowered when the module is in STOP mode. ECU override is only applicable if the ECU is unpowered when in STOP mode.

When the ECU powered down (as is normal when in STOP mode), it is not possible to read the diagnostic trouble codes or instrumentation. Additionally, it is not possible to use the engine manufacturers' configuration tools.

As the ECU is usually unpowered when the engine is not running, it must be turned on manually as follows :

- Select STOP  mode on the DSE controller.
- Press and hold the START  button to power the ECU. As the controller is in STOP mode, the engine will not be started.
- Continue to hold the start button for as long as you need the ECU to be powered.
- The ECU will remain powered until a few seconds after the START button is released.

This is also useful if the engine manufacturer's tools need to be connected to the engine, for instance to configure the engine as the ECU needs to be powered up to perform this operation.

4.2 AUTOMATIC MODE

NOTE:- If a digital input configured to *panel lock* is active, changing module modes will not be possible. Viewing the instruments and event logs is NOT affected by panel lock.

Activate auto mode by pressing the  pushbutton. The  icon is displayed to indicate Auto Mode operation if no alarms are present.

Auto mode will allow the generator to operate fully automatically, starting and stopping as required with no user intervention.

4.2.1 WAITING IN AUTO MODE

If a starting request is made, the starting sequence will begin. Starting requests can be from the following sources :

- Mains failure (DSE6120 only)
- Activation of an auxiliary input that has been configured to *remote start*
- Activation of the inbuilt exercise scheduler.

4.2.2 STARTING SEQUENCE

To allow for 'false' start requests, the *start delay* timer begins.

Should all start requests be removed during the *start delay* timer, the unit will return to a stand-by state.

If a start request is still present at the end of the *start delay* timer, the fuel relay is energised and the engine will be cranked.

NOTE:- If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows  **Fail to Start**.

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 3000 series configuration software).

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).

NOTE:- If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

4.2.3 ENGINE RUNNING

Once the engine is running and all starting timers have expired, the animated  icon is displayed.

DSE6110 - The generator will be placed on load if configured to do so.

 **NOTE:-The load transfer signal remains inactive until the Oil Pressure has risen. This prevents excessive wear on the engine.**

If all start requests are removed, the *stopping sequence* will begin.

4.2.4 STOPPING SEQUENCE

The *return delay* timer operates to ensure that the starting request has been permanently removed and isn't just a short term removal. Should another start request be made during the cooling down period, the set will return on load.

If there are no starting requests at the end of the *return delay* timer, the load is removed from the generator to the mains supply and the *cooling* timer is initiated.

The *cooling* timer allows the set to run off load and cool sufficiently before being stopped. This is particularly important where turbo chargers are fitted to the engine.

After the *cooling* timer has expired, the set is stopped.

4.3 MANUAL MODE

 **NOTE:-** If a digital input configured to *panel lock* is active, changing module modes will not be possible. Viewing the instruments and event logs is NOT affected by panel lock.

Manual mode allows the operator to start and stop the set manually, and if required change the state of the load switching devices. Module mode is active when the  button is pressed.

4.3.1 WAITING IN MANUAL MODE

To begin the starting sequence, press the  button. If 'protected start' is disabled, the start sequence begins immediately.

If 'Protected Start' is enabled, the  icon is displayed to indicate Manual mode and the manual LED flashes. The  button must be pressed once more to begin the start sequence.

4.3.2 STARTING SEQUENCE

 **NOTE:-** There is no *start delay* in this mode of operation.

The fuel relay is energised and the engine is cranked.

 **NOTE:-** If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows  **Fail to Start.**

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 3000 series configuration software).

Additionally, rising oil pressure can be used disconnect the starter motor (but cannot detect underspeed or overspeed).

 **NOTE:-** If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

4.3.3 ENGINE RUNNING

In manual mode, the load is not transferred to the generator unless a 'loading request' is made. A loading request can come from a number of sources.

- Detection of mains failure (DSE6120 only)
- Activation of an auxiliary input that has been configured to *remote start on load*
- Activation of the inbuilt exercise scheduler if configured for 'on load' runs.

 **NOTE:-The load transfer signal remains inactive until the Oil Pressure has risen. This prevents excessive wear on the engine.**

Once the load has been transferred to the generator, it will not be automatically removed. To manually transfer the load back to the mains either:

- Press the *auto mode*  button to return to automatic mode. The set will observe all auto mode start requests and stopping timers before beginning the *Auto mode stopping sequence*.
- Press the *stop button* 
- De-activation of an auxiliary input that has been configured to *remote start on load*

4.3.4 STOPPING SEQUENCE

In manual mode the set will continue to run until either :

- The *stop button*  is pressed – The set will immediately stop
- The *auto button*  is pressed. The set will observe all auto mode start requests and stopping timers before beginning the *Auto mode stopping sequence*.

4.4 TEST MODE OF OPERATION



NOTE:- Test Mode is only applicable to DSE7220/DSE7320 controllers.



NOTE:- If a digital input configured to *panel lock* is active, changing module modes will not be possible. Viewing the instruments and event logs is NOT affected by panel lock.

Activate test mode by pressing the  pushbutton. An LED indicator beside the button confirms this action.

Test mode will start the set and transfer the load to the generator to provide a **Test on load** function.

4.4.1 WAITING IN TEST MODE

When in test mode, the set will not start automatically.

To begin the starting sequence, press the  button.

4.4.2 STARTING SEQUENCE

The set begins to crank.



NOTE:- If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows **Fail to Start**.

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 7000 series configuration software).

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).



NOTE:- If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

4.4.3 ENGINE RUNNING

Once the engine is running, the *Warm Up* timer, if selected, begins, allowing the engine to stabilise before accepting the load.

Load will be automatically transferred from the mains supply to the generator.

 **NOTE:-The load transfer signal remains inactive until the Oil Pressure has risen. This prevents excessive wear on the engine.**

In test mode, the set will continue to run *on load* until either:

- The *stop button*  is pressed – The set will immediately stop
- The *auto button*  is pressed. The set will observe all auto mode start requests and stopping timers before beginning the *Auto mode stopping sequence*.

