



Instruction Bulletin

Fire Pump Controller *For Diesel Driven Fire Pumps* (Produced after April 2005)

Installation- Start Up - Service



This instruction is a guide for personnel involved with Maintenance, Engineering and approval of Fire Pump equipment. It provides an understanding of the Joslyn Clark controller operation, to aid in installing start-up.

Operation, Installation and test requirements are specified by the National Fire Protection Association, Publications NFPA 20, NFPA 70, NFPA 25 and Factory Mutual.

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INTRODUCTION GENERAL

This instruction bulletin provides an introduction to the Joslyn Clark Diesel Controller operation, to aid in installing and start-up; and later troubleshooting if necessary. Operation and safety features are specified by the National Fire Protection Association,

Publication "NFPA 20", NPFA 70 National Electrical Code; also, 'Factory Mutual System Handbook of Industrial Loss Prevention' Chapter 20. The entire installation must meet requirements outlined in these publications.

CONTROLLER INSTALLATION

Setting In Place

Install and operate where temperatures exceed 40°F (15°C) And Does Not Exceed 130°F (155°C). The controller must be located as close as practical and "within sight" of the engine it controls. It shall be located, or so protected that proper controller operation will not be injured or impaired by water escaping from pumps or pump connections.

Current-carrying parts of the controller shall not be less than 12 inches (305mm) above the floor level.

The controller is to be mounted in a substantial manner on a single non-combustible supporting structure at a height that allows convenient access to the controller. Rear access is not required. An elevated floor pad, by others, is recommended when the controller is floor mounted.

Before connecting to AC supply or batteries, check that all relays are firmly in their sockets. Operate push buttons and selector switch a few times to clean operating contacts from possible moisture or dust accumulation during shipment and installation work. Place selector switch in the "OFF" position. Remove packing from inside the pressure switch. Check the controller nameplate to assure that controller voltages are the same as the AC service supply and the engine starting circuits. Check that all wire connections are correct and properly tightened.

PREPARATION

The controller electrical terminal blocks are located for conduit entry at the bottom left side of the enclosure. Wire between the engine and controller terminal boards with stranded copper wire of the sizes recommended on the inter-connection diagram. Engine terminals "1" thru "11" or "2" thru "12" (depending on the engine type) are to be wired directly to the corresponding terminals in the controller. Connect the batteries to the engine as specified in the Engine Manufacturer's Manual.

Wire all other remote modifications to the controller terminal blocks with the recommended wire sizes listed on the interconnection drawing.

Ground the controller by connecting a #10 bare or green insulated wire between the controller ground connector located to the left of the lower terminal block strip and a good earth ground.

Standard controllers require a 120 volt, 50/60 Hz, AC supply from a reliable separate 20 ampere circuit. Use #10 stranded copper wire for connecting the supply to terminals L1 and N. For supply voltage other than 120 volt, 50/60 hertz, the controller must be ordered with the appropriate transformer modification.

Verify that each battery charger voltage selector switch is set for the system battery voltage, 12V or 24V. Also, verify that each charger is set for the correct line voltage, 115 VAC or 230 VAC. Selection of line voltage is made by Jumpers 1 and 2, ie, "J1", "J2" connected to the 115V or 230V tab, on the charger printed wiring board.

CONNECTIONS

WATER CONNECTIONS

The threaded connection of the pressure transducer, (1/4" NPT F) is flush with the bottom of the enclosure. See the dimensions drawing for the exact location. The pump start - stop pressure transducer (PT1) shall be connected to the system as per NFPA 20-2003, Chapter 12.5.2.1.1

The optional low suction pressure switch (PS2) shall be connected to the suction side of the system, following standard practice.

The controller is equipped with a solenoid valve that drains water to initiate weekly test.

The quantity of water drained may be large so it is recommended that it be piped to the floor drain. .

ELECTRICAL WIRING AND CONNECTIONS

ELECTRICAL WIRING

The electrical wiring between the power source and the diesel engine fire pump controller shall meet the NFPA 20-2003, Chapter 12.5.2.5 and 12.6.4, NFPA 70 National Electrical Code Article 695 or C22.1 Canadian Electrical Code, Section 32-200 or other local codes.

ELECTRICAL CONNECTIONS

A licensed electrician shall supervise the electrical connections.

Only watertight hub fittings shall be used when entering the cabinet to preserve the NEMA rating of the cabinet.

The installer is responsible for adequate protection of diesel engine fire pump controller components against metallic debris or drilling chips. Failure to do so may cause injuries to personnel, damage the controller and subsequently void warranty.

SIZING

For battery wiring (terminals 6, 8 and 11), stranded #10 AWG minimum wire must be used when distance between controller and batteries is less than 25'/7.6m. For distance between 26'/7.9m to 50'/15.2m stranded #6 AWG minimum size wire must be used.

For control wiring, stranded #14 AWG minimum size wire must be used.

For power supply wiring, stranded #14 AWG minimum size wire must be used.

INCOMING POWER CONNECTIONS

Diesel engine fire pump controller shall be powered by a dedicated source protected by a 15A max circuit breaker.

Incoming power is to be connected to terminals identified L1-N (120V) or L1-L2 (220-240V) located on the terminal strip.

IMPORTANT

Diesel engine fire pump controller shall not be used as a junction box to supply other equipment

TERMINAL STRIP DESCRIPTION

Refer to terminal diagram affixed inside the controller before connecting any terminals.

INCOMING POWER TERMINALS

Incoming power terminals are sized for #16 to #6 AWG wire. They are located on the bottom right and labeled L1–N for a 120VAC incoming voltage or L1–L2 for a 220–240VAC incoming voltage. The ground terminal is located beside L1 to connect the ground.

DIESEL ENGINE CONNECTIONS

Diesel engine terminals are sized for #16 to #6 AWG wire. They are located vertically on the bottom left and they are labeled 1 to 12. The terminals are numbered according to the engine standards:

- 1: fuel solenoid valve
- 2: engine run contact
- 3: engine over speed contact
- 4: engine oil pressure contact
- 5: engine coolant thermostat contact
- 6: battery #1 positive
- 8: battery #2 positive
- 9: start contactor #1
- 10: start contactor #2
- 11: engine ground
- 12: energized to stop fuel solenoid valve

FIELD CONNECTIONS

A terminal strip is located on the left side and is used to connect external contacts.

Low Fuel Level Switch

The “low fuel” float switch must be connected to terminal 23–24. The contact must close upon low fuel level. NFPA20–12.4.1.3(11) requests float switch is located at the two-thirds of tank capacity.

Deluge Valve

The deluge valve NC contact must be connected to terminal 23–25 and the J2 jumper must be removed to enable the function. Opening the contact will cause a starting sequence.

Low Reservoir

The “water reservoir low” float switch must be connected to terminal 23–26. The contact must close upon water reservoir low level.

Empty Water Reservoir

The “water reservoir empty” float switch must be connected to terminal 23–27. The contact must close upon water reservoir empty level.

Low Pump Room Temperature

The “low pump room temperature” thermostat must be connected to terminal 23–28. The contact must close upon low temperature condition.

High Fuel Level

The “high fuel level” float switch must be connected to terminal 23–29. The contact must open upon high fuel level condition. The J4 jumper must be removed to enable the function.

Low Suction Pressure

The “low suction” pressure switch must be connected to terminal 23–30. The contact must close upon low suction condition.

ALARM CONTACTS

Four standard alarm relays and two alarm contacts are located on the left side and are used to connect remote indicators. All contacts are rated 10A, 240Vac.

Except where mentioned, the normally open (NO) contacts are located on the relay socket itself (terminals 11–14 & 21–24) and the normally closed (NC) contacts are located on the relay socket itself (terminals 11–12 & 21–22)

Main Switch in Manual or in Off Position

A contact of the main switch is provided. The contact is connected to terminals Y1–Y2 and will close to signal that the main switch is in Manual or in Off position.

Main Switch in AUTO Position

A contact of the main switch is provided. The contact is connected to terminals Y3–Y4 and will close to signal that the main switch is in Auto position.

Engine trouble

Relay AR1: the NO contacts will close; the NC contacts will open to signal any engine trouble condition. (see page 20)

● Page 6
Engine RUN

Relay AR2 : the NO contacts will close; the NC contacts will open to signal that the engine is running.

Pump Room Alarm

Relay AR3 : the NO contacts will close; the NC contacts will open to signal any pump room alarm condition. (see page20)

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Controller Trouble

Relay AR4: the NO contacts will close; the NC contacts will open to signal any controller trouble condition. (see page 20)

OPTIONAL TERMINAL STRIP DESCRIPTION

Refer to the option diagram affixed inside the controller before connection. The terminal strip is vertically mounted and is located on the top left side in the enclosure.

Engine Alarm Relays

All relays have DPDT contacts rated for 10A, 240VAC.

The normally open (NO) contacts are located on the relay socket itself (terminals 11–14 & 21–24) and the normally closed (NC) contacts are located on the relay socket itself (terminals 11–12 & 21–22).

Weekly Test Alarm

Option A1

Relay AR5 : the NO contacts will close; the NC contacts will open to signal weekly test is running.

Overspeed Alarm

Option A2

Relay AR6 : the NO contacts will close; the NC contacts will open, to signal engine has failed on an over speed condition.

Low Oil Pressure Alarm

Option A3

Relay AR7 : the NO contacts will close; the NC contacts will open to signal engine has failed on a low oil pressure condition.

High Temperature Alarm

Option A4

Relay AR8 : the NO contacts will close; the NC contacts will open to signal engine has failed on a high temperature condition.

Fail to Start Alarm

Option A5

Relay AR9 : the NO contacts will close; the NC contacts will open, to signal engine did not start after the cranking sequence.

Battery #1 & #2 Failure Alarm

Option A6

Relays AR10 & AR11 :

The AR10 NO contacts will close; the AR10 NC contacts will open to signal a battery #1 failure condition.

The AR11 NO contacts will close; the AR11 NC contacts will open to signal a battery #2 failure condition.

Charger #1 & #2 Failure Alarm

Option A7

Relay AR12 & AR13 :

The AR12 NO contacts will close; the AR12 NC contacts will open to signal a charger #1 failure condition.

The AR13 NO contacts will close; the AR13 NC contacts will open to signal a charger #2 failure condition.

AC Failure Alarm

Option A8

Relay AR14 : the NO contacts will close; the NC contacts will open to signal AC power supply is not present.

Overpressure Alarm Relay

Option A9

Relay AR27 : the NO contacts will close, the NC contacts will open to signal system pressure is above overpressure threshold (see page 17).

Pump Room Alarm Relays

All relays have DPDT contacts rated for 10A, 240VAC.

The normally open (NO) contacts are located on the relay socket itself (terminals 11–14 & 21–24) and the normally closed (NC) contacts are located on the relay socket itself (terminals 11–12 & 21–22)

Low Fuel Level Alarm

Option B1

Relay AR15 : the NO contacts will close; the NC contacts will open to signal a low fuel level condition.

Low Water Reservoir Alarm

Option B2

Relay AR16 : the NO contacts will close; the NC contacts will open to signal a water reservoir low condition.

Water Reservoir Empty Alarm

Option B3

Relay AR17 : the NO contacts will close; the NC contacts will open to signal a water reservoir empty condition.

Low Pump Room Temperature Alarm

Option B4

Relay AR18 : the NO contacts will close; the NC contacts will open to signal a low pump room temperature condition.

High Fuel Level Alarm

Option B5

Relay AR19 : the NO contacts will close; the NC contacts will open to signal a high fuel level alarm condition.

Low System Pressure Alarm

Option B6

Relay AR20 : the NO contacts will close; the NC contacts will open to signal a low system pressure condition.

Low suction pressure Alarm

Option B7

Relay AR21 : the NO contacts will close; the NC contacts will open to signal a low suction pressure condition.

Pump ON Demand

Option B8

Relay AR22 : the NO contacts will close; the NC contacts will open to signal a pump on demand condition. Pump on demand is active if a start condition is present (remote start contact open, deluge valve open, pressure under cut out pressure when engine running)

External control signals

Lockout Circuit from Other Equipment (Fault Tolerant)

option C1

The lockout condition prevents the controller to start in response to a pressure drop in the system while in automatic position only. Manual, remote and deluge valve starting remains operational.

Option C1, Fault tolerant lockout circuit is so designed that the controller remains operational in case of failure in the lockout circuit (wires shorted or cut) in accordance with NFPA20–2003 12-5.2.5.2.

DPDT contacts of the lockout circuit alarm relay (AR22) are provided. Rated for 10A., 240V.

The normally open contacts are located on the relay socket itself (terminals 11-14 & 21-24) and will close when the controller is in lockout condition.

The normally closed contacts are located on the relay socket itself (terminals 11-12 & 21-22) and will open when the controller is in lockout condition.

Two (2) terminals labeled 60–62 are added on the terminal strip to receive the external signal.

The external signal must be a power source (voltage to be specified when ordering) activated by a lock out signal and connected to terminals 60–62. During a lock out, the power source activates the relay CR8 and the DEFPC is locked out. If the lock-out wires are shorted, the fuse FU1 blows and the lock-out function is inoperative. If the lock-out wires are cut, the relay CR8 cannot be energized and the lock-out function is again inoperative.

lockout circuit from other equipment (non-fault tolerant)

Option C1A

The lockout condition prevents the controller to start in response to a pressure drop in the system while in automatic position only. Manual, remote and deluge valve starting remains operational.

Option C1A, non fault tolerant lockout circuit can only be used if the circuit is not extending outside the fire pump room and all control conductors are protected against mechanical injury in accordance with NFPA20–2003 12-5.2.5.2.

Two (2) terminals labeled 23–31 are added on the terminal strip to receive the external contact.

When the external contact is closed, the controller is locked. The contact closure prevents automatic start.

When the external contact is open, the controller is unlock, automatic start is available.

Interlock Circuit to Other FPC

Option C2

Interlock circuit provides a 12VDC or 24VDC voltage on terminals 11–64 in order to prevent other equipment from starting. The condition of locking other equipment may vary from one application to another. The interlocking conditional contact must be connected to terminals 23–32 (depending of the application, those contacts may be connected by the manufacturer). The external circuit must be connected to terminals 11–64.

SPDT contacts of the interlock circuit relay (AR23) are provided. Rated for 10A, 240V.

The normally open contact is located on the relay socket itself (terminals 11-14) and will close when the controller is in interlock condition.

The normally closed contact is located on the relay socket itself (terminals 11-12) and will open to signal when the controller is in interlock condition.

Engine Block Heater Circuit

Option C7

This option provides power to feed an engine block heater. The block heater must be connected to terminals 50–51 in a 220–240VAC application (10A max.), or 50–N in a 120VAC application (15A. max.).

Foam pump controller

Option C8

Four terminals are added to connect an external starting circuit. Normally open contact

must be connected to terminals 23–72 and normally closed contact must be connected to terminals 23–73. The starting sequence occurs either upon contact closure or opening of these contacts.

Non-pressure Actuated Controller

Option C9

Two terminals are added to connect an external starting circuit. Normally open contact must be connected to terminals 23–72. The starting sequence occurs upon contact closure. Pressure line is removed.

CONTROL CIRCUIT PROTECTION

The two batteries that are continuously connected to individual battery chargers power the control circuit. The control circuit is protected by two circuit breakers (CB3 & CB4)

located in the top right of the enclosure. Those circuit breakers are not monitored and must both be left in the ON position.

CONTROLLER SEQUENCE OF OPERATION

Main Switch

The main switch is located on the controller door. It is behind a breakable and pad lockable cover.

Main Switch in OFF Position

This position shuts off the engine and prevents engine start. It also resets all alarm conditions.

Main Switch in Manual Position

This position provides for manual engine start by energizing the start fuel solenoid valve. Depressing the Crank #1 push button provides manual start with battery #1, depressing the Crank #2 push button provides manual start with battery #2.

By depressing both push buttons simultaneously, the batteries #1 and #2 are used in parallel to start the engine.

'Fail to start' and 'Fail when running' alarm signals are not operational in this position.

An 'Over speed' condition will stop the engine and sound the buzzer.

All other alarm signals are operational but have no influence on the engine operation.

Main Switch in AUTO Position

This position enables the engine to start when one of the following occurs:

- A system pressure drop sensed by the pressure transducer
- An artificial water pressure drop as a result of the activation of the water

solenoid valve (activated by the programmable weekly test or by the 'run test' push button).

- A remote start signal,
- A deluge valve,
- An AC power failure (optional).

Any of those conditions will initiate the automatic engine cranking cycle. The cranking cycle consists of energizing the fuel solenoid valve and cranking the engine for 15 seconds and then rest for 15 seconds, this sequence is repeated six (6) times. If the engine fails to start, then the controller will indicate an "Engine Fail to Start" alarm. The battery changeover is made automatically but if one battery is inoperative or missing, the cranking sequence locks out on the remaining battery.

WATER PRESSURE CONTROL

When the main switch is in Auto position, the engine will start automatically when the pressure transducer detects a low pressure, provided that the engine was not already started and the controller is not locked out by any other equipment (see lockout section – page 8).

The controller is supplied with the automatic shutdown provision factory defeated (to offer manual shutdown only), the engine can only be stopped by depressing the STOP push-button located on the controller after the pressure is re-established (above the cut out pressure adjustment).

If the controller is field converted to automatic shutdown, a running period timer of 30 minutes will automatically shutdown the motor after all starting causes have returned to normal. The engine can also be stopped by depressing the STOP push-button located on the controller provided all starting causes have returned to normal and system pressure is above the cut out pressure adjustment.

All engine alarm signals are operational but do not prevent the engine to run, except for the Overspeed signal that immediately stops the engine.

MANUAL ELECTRIC CONTROL AT REMOTE STATION

The engine can be started by the momentary opening of a remote contact independent of the pressure transducer and can only be manually stopped by depressing the STOP push-button located on the controller (provided that the system pressure is above the cut out pressure adjustment).

All engine alarm signals are operational but do not prevent the engine to run, except for the Overspeed signal that immediately stops the engine.

FIRE PROTECTION EQUIPMENT CONTROL

When a deluge valve is provided, the controller can be started by the opening of a normally closed contact (fail safe circuit) on the fire protection equipment (deluge valve) independent of the pressure transducer. The engine can only be manually stopped by the STOP push-button located on the controller but only after the fire protecting equipment contact has returned to normal (provided that the system pressure is above the cut out pressure adjustment).

All engine alarm signals are operational but do not prevent the engine to run, except for the Overspeed signal that immediately stops the engine.

WEEKLY TEST

The controller can be set for a weekly test. When the weekly test is enabled, the engine will start at the programmed start time and it will stop at the programmed stop time or after a 30 minute delay whichever is the shortest. The Stop push button is enabled and will stop the engine before expiration of the weekly test (provided that the system pressure is above the cut out pressure adjustment).

All alarm signals are operative. Low oil pressure, high temperature, overspeed, or fuel injection malfunction condition will immediately stop the engine to prevent damage.

Note: the weekly test activates the solenoid valve (if equipped). Water is drained from the exhaust pipe. A large amount of water may be flushed from the water system.

RUN TEST

Depressing the 'run test' push button located on the front panel simulates a pressure drop. The engine will stop automatically after 30 minutes or when the stop push button is pressed.

All alarm signals are operative. Low oil pressure, high temperature or overspeed condition will immediately stop the engine to prevent damage.

Note : the run test activates the solenoid valve (if equipped). Water is drained from the exhaust pipe. A large amount of water may be flushed from the water system.

AC FAILURE START

This feature is optional and can only be programmed at the factory. The engine will start automatically if the power supplied is absent for more than a preset time (standard value is 30 minutes). The engine will immediately stop when the AC power is reestablished.

SEQUENCE STARTING

In case of multiple pump application, it may be necessary to delay the starting of the engine in case of a water pressure drop to prevent simultaneous starting of all motors. Sequential start time is selectable (0, 5, 10, 15 sec).

LOCK OUT SIGNAL

When lockout signal is present, the controller is inhibited to start on water pressure drop detection, weekly test and run test. All other starting causes produce a starting cycle.

Operator Equipment STOP PUSH BUTTON

The red stop push button can be used to stop the engine only when the main switch is in automatic position and when the system pressure is above the cut out value provided that all starting causes have returned to normal (remote start and deluge valve)

Crank #1- crank#2 PUSH BUTTONS

Those push buttons can be used only when the main switch is in the manual mode. They are used to manually crank the engine using battery #1 or #2, or both if both push buttons are activated simultaneously.

STATUS DISPLAY AND ANNUNCIATOR ON CONTROLLER

STATUS DISPLAY

The top line shows the #1 battery and #1 battery charger status.

- The first group of digits indicates the battery voltage.
- The second group of digits indicates the current delivered by the charger to the battery.
- The third group of digits indicates the charger status.
 - "Bulk" indicates that the charger is delivering the maximum current for fast recovering of the battery charge
 - "Over" indicates that the charger is in overcharge mode to maximize the battery charge
 - "Float" indicates that the charger is maintaining the voltage of the battery
 - "AC Fail" indicated that the charger is not connected to power source
 - "no ans" indicates that the charger has lost the communication with the main electronic board

The second line shows the #2 battery and #2 battery charger status. See above for detail.

The third line shows the controller date and time or various alarm messages. The date (D/M/Y) and the time are always shown except when one or more alarms are present. When more than one alarm are detected, the line will scroll the different messages. The available messages are the following :

- "Low System Pressure" indicates that the system pressure is under 85% (this value can be adjusted at factory) of the cut in pressure value for more than 1 second.
- "Remote Start" indicates that the engine has been started by activation (opening) of the remote contact (21-13)
- "Automatic Start" indicates that the engine has been started by detection of a pressure drop (under cut in value)
- "AC Power Failure" indicates that the controller is powered only by batteries
- "RPT mm:ss" indicates the remaining time before automatic shutdown (automatic shutdown must be enabled)
- "Seq. Start Time :ss" indicated the remaining time before start sequence (sequential start timer must be enabled)
- "Press Line Failure" indicates that the solenoid valve has been activated but the

pressure drop has not been detected after a preset time

- "Low Fuel Level " indicates that the low fuel float contact (23-24) is closed for more than 1 second
- "Water Reservoir Low" indicates that the water reservoir low contact (23-26) is closed for more than 10 seconds
- "Water Reservoir Empty" indicates that the water reservoir empty contact (23-27) is closed for more than 10 seconds
- "Low Pump Room Temp" indicates that the low pump room thermostat contact (23-28) is closed
- "High Fuel Level" indicates that the high fuel float contact (23-29) is closed
- "Low Suction Pressure" indicates that the low suction pressure switch contact (23-30) is closed for more than 3 seconds
- "Weekly Test mm:ss" indicates the remaining time before the end of the weekly test. This feature requests a correct setting of the weekly test.
- "Lockout Signal" indicates that the controller is locked by other equipment and will not start automatically. This feature is optional.
- "Interlock On" indicates that the controller is supplying voltage to other equipment that must be locked. This feature is optional.
- "AC Failure Start mm:ss" indicates the remaining time before automatic start in case of detection of loss of power supply. This feature is optional and must be programmed at factory.
- "System overpressure" indicates that the system pressure is above the preset value (see page 17).
- "Altern. ECM pos." indicates that the contact 23-69 is closed. This indicates that ECM selector switch is in alternate ECM position (for engines with ECM only).
- "Fuel injection" indicates that the contact 23-70 is closed. This indicates a malfunction of the fuel injection system.
- Other messages may be displayed according to the factory settings of alarm messages.

The fourth line is dedicated for the pressure system status.

- The first group of digits shows the cut-out threshold.
- The second group shows the cut-in threshold.
- The third group shows the actual system pressure.

Note : 'O' means cut-Out which is the value where the pump will be able to stop after run period timer,
'I' means cut-In which is the value where the pump has to start.

ANNUNCIATOR PANEL

Sixteen indicators give the status of the controller and the engine. The indicators with (*) activate the alarm bell and must be reset by switching the main selector to the OFF position. The indicator with (§) activates the alarm bell and is auto resettable (see page22)

The indicators are lit up in the following conditions:

- "AC Power On": (green) indicates that the controller is connected to an external AC power source.
- "Main switch in Auto": (green) indicates that the controller main switch is in auto position.
- "Battery #1 Failure" (*) indicates that either one of the following conditions occurred
 - Battery #1 voltage drops below 50% of nominal battery voltage
 - Battery #1 does not reach appropriate voltage after 24 hours with 10Amp charging current
 - Battery #1 is connected in reverse polarity
- "Battery #2 Failure" (*) is same as Battery #1 Failure applied to battery #2
- "Charger #1 Failure" (*) indicates that either one of the following conditions occurred :
 - The Electronics board detects an internal fault.
 - The average current value reaches 15A.
 - Battery Charger is desynchronized with the AC source for more than 5min when the AC source is provided.
 - The current stay less than 0.5A in Bulk mode when battery is connected.
 - The charger #1 is not connected to the AC source although the charger #2 is connected to the AC source.
- "Charger #2 Failure" (*) is same as Charger #1 Failure applied to charger #2
- "Engine Low Oil Pressure" (*) indicates that the engine oil pressure contact has opened when the motor was running. This detects an abnormal pressure in the diesel engine oil pressure circuit. Note that the oil pressure must be reached no later than 8 seconds after the engine run signal input.
- "Engine High Temperature" (*) indicates that the engine high temperature contact has opened when the motor was running. This detects an abnormal temperature of the diesel engine coolant liquid.
- "Engine Overspeed" (*) indicates that the engine overspeed switch contact has closed
- "Engine run" indicates that the engine run contact is closed. This detects a running condition of the motor
- "Engine Fail to Start" (*) indicates that the starting sequence of six successive cranking period has been performed, but a closed engine run contact has not been detected
- "Fail When Running" (*) indicates that an open engine run contact has been detected even though the diesel engine controller demands a continuous running condition.
- "Pump Room Alarm" (§) indicates either low suction condition, low fuel level condition, water reservoir low condition, water reservoir empty condition, low pump room temperature condition, high fuel level condition, AC power failure condition, or factory programmed alarm conditions occurred.
- "Deluge Valve / Remote Start" indicates that the deluge valve contact is open or the remote start contact is open
- "Weekly Test" indicates that the weekly test is in progress
- "Controller Trouble" (*) indicates either a battery #1 failure, a battery #2 failure a charger #1 failure a charger #2 failure or a pressure line failure has occurred.

Push buttons

The two "Cut Out" and "Cut In" push buttons are used to modify the pressure threshold. See page 16 for detail.

The "Run Test" push button is used to release the pressure on the pressure transducer to simulate a drop of pressure.

The "Lamp Test/Silence" push button has two functions. First, it is used to test the display LED's and the audible alarm. When activated, the left column lights up for 1 second, then the right column for 1 second, then the alarm bell for 1 second. Secondly, it is used to silence the 'pump room' alarm, as well as the 'fail when running' alarm.

The "Print" push button is used to print a resume of the last seven-day events as well as the last seven-day pressure data.

The "Paper Feed" push button is used to feed paper through the printer slot in order to avoid tearing the printout.

PRINTER

GENERALs

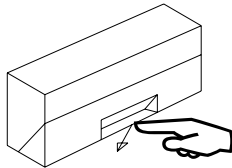
The printer is located behind a plastic cover. This cover protects the printer from humidity and dust. The cover must be lifted when printing. The printer works on demand only.

However, in order to prevent a paper drum deformation, the paper drum is activated automatically at regular intervals.

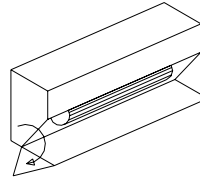
Paper replacement

The printer is a thermal type. The paper must be thermal paper and be correctly oriented. The following operations must be followed to replace the paper :

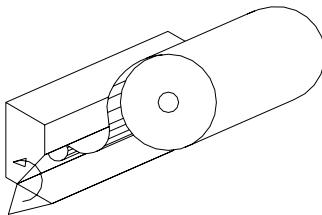
1. Remove the empty roll by removing the holder screw,



2. Release the drum by pushing down the drum holder



3. Drum holder must be fully swung open



4. Insert the thermal paper on the slot above the drum. The sensitive paper side must be oriented up

5. Fully close the drum holder

Printout description

Last Seven Day Resume.

When 'Print' push button is momentarily depressed, the thermal printer starts to print the last seven day resume as follows.

```

Diesel Controller
20409145 1/1
LAST FIFTEEN-DAY RESUME
-----
Day: Th, Oct 7, 04      Time: 10:59
Cut in : 100PSI
Cut out: 125PSI
Last Change : Th, Jan 7, 10:32

Pmin : 93PSI Th, Oct 7, 10:32
Pmax : 132PSI Th, Oct 7, 10:35

Weekly Test Start Time: Th, 10:50
Weekly Test Stop Time : Th, 10:51

Elapse Time: 0.5

Last Engine Run Signal: Th, Oct 7,05, 10:33

Automatic start: 1
Oct 7, 10:50

Manual start: 0

All pump start count: 2

Main switch in OFF Oct 7, 10:35
Overspeed reset Oct 7, 10:33
Engine run OFF Oct 7, 10:33
Overspeed ON Oct 7, 10:33
Crank #1 OFF Oct 7, 10:32
Engine run ON Oct 7, 10:32
Crank #1 ON Oct 7, 10:32
Sequential timer ON Oct 7, 10:32
Below cut-in Oct 7, 10:32
Main switch in Auto Oct 7, 10:32
-----

End of resume

Press. diff. 5 PSI / 34 KPA

Press PRINT to print pressure data's

```

Controller serial number

Actual date & time

Actual pressure adjustments with date & time of the last adjustment.

Minimum and maximum pressure applied to the controller during the last seven days with date & time of the event

Actual weekly test setting.
If weekly test is disabled, this line is not printed

Accumulative time of running engine. This value is non resetable.

Date and Time for last log of engine running signal.

Number of times during the last seven days the controller has started because of a pressure drop, with date & time

Number of times the controller has been manually started, with date & time

This information is based on the pressure chart and is informative to indicate how many times the jockey pump (or other pumps) has started. This information is helpful to indicate eventual leaks in the pressure system.

Event log with description and date & time of the event

Pressure interval of the pressure data recorder. (see page 19)

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Pressure Data's

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The pressure data is printed when the 'Print' push button is depressed in the 15 seconds following the end of the last seven day resumé printout.

The pressure data's can be either printed as a succession of pressure values or as a graph.

To have access to the type of printout settings, the following procedure must be followed :

Continuously depressed the 'print' push button until the 'printout' menu appears on the screen. The first menu appears after 6 seconds.

The scrolling between menus is made by depressing 'Run Test' while 'Print' push button is depressed.

When the screen 'Mode : text / graph' appears, push buttons must be released.

Depressing 'Print' push button selects the value to change.

Depressing 'Run Test' push button increases the value, or accepts the selection (SAVE or EXIT)

If SAVE is selected, the new setting is memorized. If EXIT is selected, the old setting is kept in memory.

Text mode

By selecting Text mode, the printout will be a successive pressure values with date & time. Other settings in the menu have no influence on the printout.

Depending on the pressure variation in the pressure system and the pressure interval (see page 16), this printout can be very long.

Printout starts by earliest data.

"End of pressure data's" indicates the end of the printout.

```
Press PRINT to print pressure data's

Pressure unit is : PSI
124 Oct 7, 10:35
Pump stop Oct 7, 10:35
127 Oct 7, 10:35
132 Oct 7, 10:35
125 Oct 7, 10:35
112 Oct 7, 10:35
Pump start Oct 7, 10:35
93 Oct 7, 10:32
Auto start Oct 7, 10:32
102 Oct 7, 10:00
104 Oct 7, 9:00
105 Oct 7, 8:00
109 Oct 7, 7:00
112 Oct 7, 6:00
116 Oct 7, 5:00
122 Oct 7, 4:28
123 Oct 7, 4:00
125 Oct 7, 3:00
127 Oct 7, 2:00
127 Oct 7, 1:00
128 Oct 6, 24:00
127 Oct 6, 23:00

End of pressure data's
```

Pressure value, month & date, time in hh:mm

Pump start or stop event with date & time

Graphic mode
By selecting Graphic mode, the printout will be a continuous graph that represents the pressure versus the time. The Y axis (vertical axis) is the pressure. The minimum and maximum can be adjusted to enlarge the

variation. The X axis (horizontal axis) is the time, and it can be selected for 1 hour or ¼ hour. A grid (horizontal line) axis can be added to facilitate the graph reading. In this graph printout, there is no pressure value added on the graph.

Set up

DIP Switch configuration

To have access to the dip switch, the door must be open. Two dip switches are located on the side of the electronic board mounted on the door. Dip switch S5 is on the top, Dip switch S10 is on the bottom. The factory settings are as follow :

S5

ON OFF

<input type="checkbox"/>	<input checked="" type="checkbox"/>	S5-4 for factory only
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S5-3 for factory only
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S5-2 langage
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S5-1 langage

S10

ON OFF

<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-8 test for factory use
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-7 pressure interval
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-6 pressure interval
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-5 pressure unit
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-4 sequential start timer
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-3 sequential start timer
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-2 run period timer
<input type="checkbox"/>	<input checked="" type="checkbox"/>	S10-1 pressure adjust. lock

Pressure adjustment S10-1

When On, the pressure adjustment push buttons are enabled. When Off, the adjustment of the pressure cut-in and cut-out are not permitted.

Run period timer S10-2

When On, the controller is set for automatic stop. The engine will stop 30 minutes after pressure is re-established (above cut out adjustment). When Off, the controller is set for manual stop, engine will stop only by depressing the stop push button provided the pressure is above cut out.

Sequential start timer S10-3&4

The controller delays the engine start cycle by 5,10 or 15 seconds upon a water pressure drop detection, a remote start or a deluge valve detection. All other starting causes activate the engine immediately. To modify the delay, the dip switch must be set according to the following table :

DIP	ON	OFF	Time
S10-4 OFF S10-3 OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0 second
S10-4 ON S10-3 OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5 seconds
S10-4 OFF S10-3 ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10 seconds
S10-4 ON S10-3 ON	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15 seconds

pressure unit S10-5

The pressure can be displayed in kPa (kilo Pascal note : 1 bar = 100kPa) or in psi (pound per square inch). When On, the pressure unit is kPa. When Off, the pressure unit is psi.

Pressure interval S10-6&7

The pressure data is recorded each time the pressure varies more than the pressure interval. The pressure interval can be adjusted to 1 psi, 2 psi, 5 psi or 10 psi.

Note : 1 psi = 6.895kPa = 0.06895 bar. To modify the pressure interval, set the dip switch according to the following table :

DIP	ON	OFF	PSI interval
S10-7 OFF S10-6 OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5 psi 34.475 kPa
S10-7 ON S10-6 OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10 psi 68.950 kPa
S10-7 OFF S10-6 ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1 psi 6.8950 kPa
S10-7 ON S10-6 ON	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 psi 13.790 kPa

Test mode S10-8

This dipswitch is reserved for factory use. It must remains always on OFF position.

Pressure adjustment

When selector switch in automatic position, if the system pressure drops below the cut-in pressure value, the controller initiates a pump starting sequence. When the system pressure reaches the cut-out value, the engine will stop when the stop push button is activated or will be stopped automatically if adjusted for an automatic stop (see run period timer – page 16).

It is important to adjust the cut out value first. This adjustment must be set below the maximum pressure of the pump otherwise the engine will never stop.

The cut in value must be adjusted at the system pressure.

Before adjusting the pressure set points, the adjustment dip switch (S10-1-) must be ON to enable the function.

A quick push on the push button will increase value by one. A long push will increase value by 10. The value only increases from minimum to maximum, and when the maximum is reached, the value return to the minimum value.

It is important to re-set the dip switch S10-1 to OFF to prevent unauthorized changes.

FIELD ADJUSTMENT Menu's

Generals

Seven (7) menu's give access to several parameters for field adjustment. To have access to menu's, the Print Push button must be depressed for several seconds and MAINTAINED until the desired menu appears. The first menu window opens after six (6) seconds, a Run Test push button action will give access to next menu. When the desired menu is on the screen, Print push button can be released.

To select value to change, press the "Print" push button.

To modify the value, press the 'Run Test' push button.

To save the modification and return to the "normal" display mode, select SAVE using the 'Print' push button and validate using the 'Run Test' push button.

To exit the menu without saving modification, select 'Exit' using the 'Print' push button and validate using the 'Run Test' push button

If no push button is depressed for 30 seconds, the modification is not save and the screen will return to normal mode.

Clock & Weekly test adjustment

The actual date and time are shown on the third line of the screen.

The controller can be set for a weekly test.

If the weekly test is enabled, at start time, the solenoid valve simulates a pressure drop on the sensor and the controller starts the engine.

The engine will stop at programmed stop time or after 30 minute whichever is the shortest.

The "Stop" push button is always enabled and it can be used to stop the engine before expiration of weekly test – provided the pressure is above the cut out setting.

Note : according to NFPA20, the weekly test must last at least 30 minutes per week. To respect this condition, the stop time must be set 30 minutes after the start time.

To adjust the clock and/or the weekly test, the 'Print' pushbutton must be depressed for 6

seconds until the clock/weekly test menu appears.

In this menu, the display shows on the first line the controller date and time, on the second line the weekly test activation (Y (yes) or N (no)), on the fourth line the day of the week when the weekly test will be performed with the start and stop time.

To select which value to change, press the "Print" push button.

To modify the value, press the 'Run Test' push button.

To save the modification and return to the "normal" display mode, select SAVE using the 'Print' push button and validate using the 'Run Test' push button. To exit the menu without saving modification, select 'Exit' using the 'Print' push button and validate using the 'Run Test' push button

In this menu, the type of printout can be selected.

If Text is selected, the printout will be successive lines of pressure values.

If Graph is selected, the printout will be a series' of small lines representative to the pressure. The scaling of the Y axis (pressure) can be adjusted by entering the Y max and Y Engines equipped with pressure limiting controls must indicate when the pressure is over 115 percent of total rated head pressure (NFPA20–2003,12.4.1.3(8))

This value must be programmed in the controller.

To have access to the overpressure settings, the following procedure must be followed :

Depressed the 'Print' push button continuously until the 'System Overpressure' menu appears on the screen.

The first menu appears after 6 seconds.

The scrolling between menus is made by depressing 'Run Test' while 'Print' push button is depressed.

When the screen 'MAX OVERPRESSURE' appears, push buttons must be released.

Depressing 'Print' push button selects the digit to change.

Depressing 'Run Test' push button increases the value of the digit, or accepts the selection (SAVE or EXIT)

If SAVE is selected, the new value is memorized. If EXIT is selected, the old value is kept in memory.

Timers

In this menu, three different timers can be adjusted :

Sequential start timer

The sequential start timer delays the starting cycle by the programmed value if S10-3 & S10-4 Dip switch are ON (See page **Error! Bookmark not defined.**)

Sequential start timer can be adjusted form 0 to 60 seconds.

min values. The scaling of the X axis (time) can be adjusted by selection between one hour or 15 minutes.

Dot lines (0 to 5) can be added to have a better graph reading.

overpressure adjustment

Run Period Timer

The engine shutdown will occurs after the timer is expired if the S10-2 Dip switch is ON (See page **Error! Bookmark not defined.**)

Note the timer is reset if pressure drops below cut out pressure.

The Run Period Timer can be adjusted from 1 to 60 minutes.

AC Fail Start

If programmed, the engine will start automatically under a AC failure. The AC fail Start timer can be adjusted from 0 to 255 minutes (note : if 0 is selected, 'No' appears on the screen that disables the function)

Pressure Sensor Calibration

This menu is more complex and is dedicated for pressure sensor calibration (See page **Error! Bookmark not defined.** for details)

Weak Battery voltage

In this menu, the threshold to declare a weak battery can be adjusted between 0,0 volt and 24,0 volts. By default, the value is adjusted to 6.0 Volts.

Memory purge

In this menu, the pressure data or the event memory can be erased individually.

Note : the elapse time meter and the last engine run can not be reset.

Battery charger

Each battery charger is equipped with its own individual power transformer, and circuit breakers.

The battery charger has a RS485 communication port to send data to the main electronic board.

The battery charger #1 is powered by the XTR1 transformer protected by the CB1 circuit breaker.

The battery charger #2 is powered by the XTR2 transformer protected by the CB2 circuit breaker. The breakers and the power transformers are located in the lower left of the enclosure.

NOTE : When operating in bulk mode, the power transformer reaches a very high temperature. **This temperature rise is normal.**

Battery chargers are equipped with indicators :

- “Logic power “ indicates electronic board is powered up. This indicator must always be on or flashing.
- “Bulk” indicates battery charger is in bulk mode. In this mode, the charger delivers its maximum rated current to the battery.
- “Overcharge” indicates battery charger is maintaining a constant voltage and regulating the delivered current in order to increase the gravity of the battery electrolyte.

- “Floating” indicates battery is fully charged and the battery charger is delivering the minimum current to maintain the battery charge.
- “Charger Failure” indicates a charger malfunction. This occurs when the microprocessor detects an internal fault, or when the average current value reaches 15A, or when the Battery Charger is desynchronized with the AC source for more than 5 minutes or when the current stays less than 0.5 amp in bulk or in overcharge mode.
- “Battery Failure” indicates a battery problem. This occurs when the battery voltage drops below 50% of the nominal battery voltage, or when battery does not reach the appropriate voltage after 24 hours in bulk mode, or when the battery is disconnected or connected in reverse polarity.
- “AC Present” indicates that the power transformer is feeding the battery charger.

The reset push button, located on the top right of the board, is used to restart the charger and to clear internal fault.

IMPORTANT : the fuse, located on the board, is a **SLO-BLO 3AG-32VDC-20A model**. It is very important to replace the fuse by the exact fuse model.

Engine trouble relay

The engine trouble relay is energized if one of the following conditions occurs :

- Low oil pressure
- Engine high temperature
- Engine fail to start after 6 cranking cycles
- Overspeed
- Fail when running.

Note : other external conditions may trigger this alarm depending of the factory settings – verify drawings affixed inside the cabinet.

The engine trouble relay can only be reset by switching the main switch to the OFF position.

Engine RUN relay

The engine run relay is energized when the motor is running.

Pump room alarm relay

The pump room alarm relay is energized if one of the following conditions is present :

- low suction (signal must be maintained more than 3 seconds)
- low fuel level (signal must be maintained more than 1 second)
- water reservoir low (signal must be maintained more than 10 seconds)
- water reservoir empty (signal must be maintained more than 10 seconds)
- low pump room temperature
- high fuel level
- AC failure (“AC power on” is not present)

Note : other external conditions may trigger this alarm depending of the factory settings – verify drawings affixed inside the cabinet.

If none of those conditions are present, the pump room alarm relay is reset.

controller trouble relay

The controller trouble relay is energized if any of the following conditions occurs :

- Battery #1 failure
- Battery #2 failure
- Charger #1 failure
- Charger #2 failure
- Pressure line failure
 - o Note : a pressure line failure is detected if weekly test or run test is performed but the drop of pressure is not detected by the pressure sensor or if the actual pressure is out of normal pressure range.

The controller trouble relay can only be reset by switching the main switch to the OFF position.

Weekly test relay (option A1)

The weekly test relay is energized when a weekly test is running.

Overspeed relay (option a2)

The overspeed relay is energized if an overspeed condition is detected.

The overspeed relay can only be reset by switching the main switch to the OFF position.

Note : overspeed alarm must also be reset on the engine itself.

Low oil pressure relay (option a3)

The low oil pressure is energized if the oil pressure contact is not closed in the first 8 seconds after an engine start, or if the oil pressure contact opens when the engine is running.

The low oil pressure relay can only be reset by switching the main switch to the OFF position.

High temperature relay (option a4)

The high temperature relay is energized when the engine water coolant temperature contact is closed.

High temperature relay can only be reset by switching main switch to the OFF position.

fail to start relay (option a5)

The fail to start relay is energized if the controller does not receive the engine run signal after 6 cranking cycles. A cranking cycle consists of a cranking period of 15 seconds followed by a rest period of 15 seconds.

The fail to start relay can only be reset by switching the main switch to the OFF position.

Battery #1 and #2 failure relay (option a6)

The battery failure relay is energized if one of the following conditions occurs :

when the battery is disconnected or connected in reverse polarity, or when the battery voltage is below 50% of the nominal battery voltage, or when the battery voltage is higher than 150% of the nominal voltage or when the battery does not reach the appropriate voltage after 24 hours in bulk mode. In this last condition, the battery is probably dead and must be replaced. Battery failure relay can only be reset by switching the main switch to the OFF position

charger #1 and #2 failure relay (option a7)

The Charger failure relay is energized in the following conditions :

- microprocessor detects an internal fault,
- average current value reaches 15A

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- Battery Charger is desynchronized with the AC source for more than 5 minutes
- current stays less than 0.5 amp in bulk or overcharge mode,
- AC source is present on one charger only (primary circuit breaker tripped)
- fuse is blown

NOTE : Under several conditions, the battery charger must be reset by depressing the reset push button located above the LED indicators (top right of the board)

The charger failure relay can only be reset by switching the main switch to the OFF position.

AC Failure relay (option a8)

The AC failure relay is energized when AC is not present.

low fuel level relay (option B1)

The low fuel level relay is energized when the low fuel level contact (normally closed float switch) is closed for more than 1 second; and it is reset when this contact opens.

water reservoir low relay (option B2)

The water reservoir low relay is energized when the water reservoir low contact (normally closed float switch) is closed for more than 10 seconds; and it is reset when this contact opens.

water reservoir empty relay (option B3)

The water reservoir empty relay is energized when the water reservoir empty contact (normally closed float switch) is closed for more than 10 seconds; and it is reset when this contact opens.

low pump room temperature relay (option B4)

The low pump room temperature relay is energized when the low pump room temperature contact (thermostat) is closed indicating that the temperature of the mechanical room is under preset temperature.

HIGH FUEL LEVEL relay (option B5)

The high fuel level relay is energized when the high fuel level contact (normally closed float switch) is open indicating that the high fuel level is reached.

Low system pressure relay (option B6)

The low system pressure relay is energized when the system pressure is under 85% of the cut in pressure for more than 1 second; and it is reset when system pressure reaches the cut in pressure. For example, the cut in pressure is

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adjusted at 130psi, the low system pressure will be energized when the pressure reaches 104psi; and be reset when the pressure reaches 130psi.

Low suction pressure relay (option B7)

The low suction pressure relay is energized when the suction pressure switch contact is closed for more than 3 seconds; and it is reset when the suction pressure switch contact opens.

Pump on demand (option B8)

The pump on demand relay is energized when the motor is running and a starting condition exists. In this condition, the engine will not stop if the stop push button is depressed.

lockout relay (option c1)

The lockout relay is energized when the controller is locked out by other equipment to prevent the engine from starting.

interlock relay (option c2)

The interlock relay is energized when the interlock signal contact is closed. This signal contact function depends on the application.

The alarm bell is activated under default condition. There are two types of defaults.

"Type 1" defaults

"Type 1" defaults are related to the engine and the controller. Those default are considered as major defaults. When a "type 1" default occurs, the alarm bell starts ringing. The only way to silence is to set the main switch onto OFF position.

"Type 1" defaults are :

- Engine Overspeed
- Engine Low oil pressure
- Engine High temperature
- Fail to start
- Charger #1 failure
- Charger #2 failure
- Battery #1 failure
- Battery #2 failure
- System overpressure

Note : other external conditions may trigger type 1 default depending of the factory settings – verify drawings affixed inside the cabinet

"type 2" defaults

"Type 2" defaults are related to accessories and are considered as various defaults. When a "type 2" default occurs, the alarm bell starts ringing. The bell can be silenced by depressing the "Lamp test / silence" push button.

When silenced, the alarm bell restarts ringing if a new default occurs.

The alarm bell automatically stops ringing if all "type 2" defaults are vanished.

"Type 2" defaults are :

- Pressure line failure
- Low suction pressure
- Water reservoir low
- Water reservoir empty
- Low fuel level
- High fuel level

Note : other external conditions may trigger type 2 default depending of the factory settings – verify drawings affixed inside the cabinet

event and pressure Data retrieving

The controller records events and pressure data's of the last seven days. The information is accessible either by using the printer (see page 14), the RS232 port (optional) or the modem (optional).

When provided with a printer, the events and the pressure data can be obtained by depressing the "print" push button.

When provided with a RS232 port, this port must be connected to a laptop and, using a communication software as "hyper terminal" (provided with Windows) the data's can be easily retrieved. (See appendix 1 – page 24)

When provided with a modem, the data's can be easily retrieved (see appendix 2 – page 26).

pressure sensor calibration

The pressure sensor is calibrated at factory before shipping, and it is not necessary to proceed any calibration.

If a pressure sensor calibration is needed due to a pressure sensor replacement, it is very important to calibrate the unit with a high accurate gauge.

To have access to the calibration menu, the following procedure must be followed :

Depressed the 'print' push button continuously until the 'calibration' menu appears on the screen.

The first menu appears after 6 seconds.

The scrolling between menus is made by depressing 'Run Test' while 'Print' push button is depressed.

When the screen 'current pressure' appears, push buttons must be released.

Depressing 'Print' push button selects the digit to change.

Depressing 'Run Test' push button increases the value of the digit, or accepts the selection (READ, COMPUTE or EXIT)

A high accurate reference gauge must be connected to the system where it is representative to the pressure applied to the sensor.

A low pressure must be applied to the system; the readout of the reference gauge must be entered in the menu after 'PRESS1' and the cursor must be moved to READ. The 'Run Test' push button must be depressed to record this value. A "*" appears at the right.

A high pressure must be applied to the system; the readout of the reference gauge must be entered in the menu after 'PRESS2' and the cursor must be moved to READ. The 'Run Test' push button must be depressed to record this value. A "*" appears at the right.

The cursor must be moved to 'COMPUTE' and the 'Run Test' push button must be depressed to calibrate the sensor.

The largest is the difference between the low and high pressures, better is the calibration.

If the calibration does not give satisfaction, the procedure can be repeated.

Appendix 1 : How to retrieve data from RS232 port

1. Connection between laptop computer and B10710 Fire Pump Controller

- a. Verify that your laptop computer has a RS232/DB9 communication port
- b. Connect your laptop computer communication port to the B10710 Fire Pump Controller using a DB9 male/female cable.

2. Opening Hyper Terminal

To communicate with the Fire Pump Controller, communication software is required. The latest versions of Windows come standard with Hyper Terminal software.

- a. Select from the Windows Toolbar : Start – Program – Accessories- (Communication) – Hyper Terminal
- b. If your Hyper Terminal software has not been configured, double click on hypertrm.exe. *Note : This procedure might not be available on certain versions of software*
- c. If your Hyper Terminal software has already been configured to communicate with a Fire Pump Controller, select this configuration and go to step 4. (In case you are experiencing problems, go to step 7)

3. Communication Configuration

To be able to communicate with the Fire Pump Controller, the communication parameters between the Fire Pump Controller and your laptop computer must be identical.

- a. In the « New Connection » window, enter a connection name.
Ex : "B10710 Controller"
- b. Click on « OK » to validate
- c. The «Connect to» window will open and a communication port must be chosen. (Usually Com 1)
- d. Click on « OK » to validate
- e. The "port setting" window will open for the selection of communication parameters
- f. Select : bits per second: 9600 - data bits: 8 - parity: none - stop bits: 1 - flow control: hardware
- g. Click « OK » to validate

4. Capturing the Information

In this step, the data contained in the Fire Pump Controller will be copied to a file in your laptop computer

- a. Select Transfer – Capture Text –
- b. A window will open so that you can select a file. With the help of the Browse function, enter the name of the file that you will designate to receive the data.
- c. It is good practice to save the data with a name incorporating the date.
Ex : my documents\021024.txt (for October 24,2002)
(In case you are experiencing problems, go to step 7)
- d. If the « Select Capture File » window is open, click on « Open » (available on certain HyperTerminal version only)
- e. Click on « Start » to begin capturing, or downloading, the controller's data

Note : The data will not start downloading to your laptop computer until the « Print » button is pressed on the Fire Pump Controller display.

The data required for the creation of the pressure graph are both the 7-day résumé and the pressure readings. To obtain the 7-day résumé, the "Print" button must be pressed once. To obtain the pressure readings, the "Print" button must be pressed once again within 60 seconds of the first time it was pressure for the 7-day résumé. This data will be saved in the file chosen in step 4C

- f. If the data that appears on your screen is not legible, please go to step 7d for the troubleshooting information on data transmission problems.

5. Closing Hyper Terminal Session

Once the data has downloaded, the HyperTerminal session can be disconnected.

- a. Click on File, select Exit
- b. Click on « YES » to disconnect

Note : Upon closing the session, the Hyper Terminal software will ask if you want to save the session (see step 3a).

If you want to save the session, the data will be saved and an icon will appear the next time the Hyper Terminal will be open.

If you decide not to save the session, step 3 will have to be repeated the next time the Hyper Terminal software is opened

saved document does not appear in the file list.

The saved file is a .TXT file. Make sure the correct file type (.TXT or *.*) is chosen

6. Reading and Printing of the Data

The downloaded data is saved in the file created in step 3a. This file is a .TXT file that can be read by "Notepad", "Word", "Lotus" and "Excel" and other software's.

Upon opening this file, for it to show in the file list, the ".TXT" file type needs to be selected.

The data can be saved and printed using Word, Excell, Notepad.....

- d. In the destination file, the data is not formatted and the text is illegible.

In the save file, the data is not formatted because the communication parameters are not adequate.

In Hyper Terminal, click on File – Properties – Settings – ASCII Setup and verify ASCII receiving. Append line feeds to incoming line ends : ON; Force incoming data to 7-bit ASCII : OFF; Wrap lines that exceed terminal width : ON

7. Troubleshooting

- a. Communication icon does not appear (step 2C)

In certain versions of Hyper Terminal, the icon is hidden because the program has never be used. You must go to the end of the menu to have the icon appear.

- b. In step 4c, an error message appears indicating that the file cannot be found.

In certain versions of Hyper Terminal, an empty .TXT file must be created so that it can be designated as the destination file

While keeping the HyperTerminal session open, open Word. Select File -Save As and create the destination file for the downloaded data to be saved into (Ex : 021024). Important : this file must be a .TXT file only.

- e. No data appears on the laptop computer screen when the "Print" button is pressed

Press the "Print" button firmly for approximately 1 second.

Communication has not been established. Select Call-Call and verify if the "connected" status appears at the bottom left of the screen.

Communication is not in capture mode. Select Transfer-Capture Text - select the appropriate file. Verify if the "Capture" status appears at the bottom right of the screen.

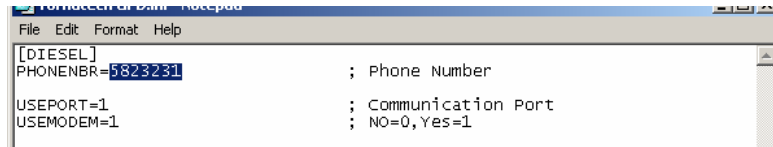
- c. When the file is opened in Word, Excel, or any other software, the

- f. The data is downloaded on the screen but the destination file remains empty.

Communication is not in capture mode. Select Transfer-Capture Text - select the appropriate file. Verify if the "Capture" status appears at the bottom right of the screen.

Installation

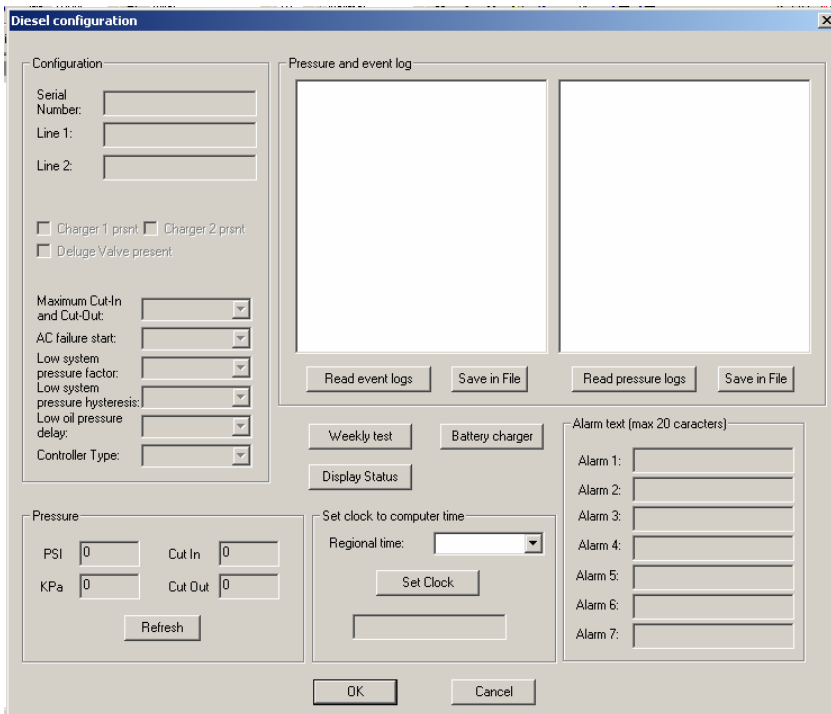
1. Install B10710 viewer EXE file and launch it.
 - a. Click 'Configuration' button and enter the phone number of the B10710 controller after the equal sign.



- b. Verify USEPORT is the one your computer is connected to.
- c. Verify USEMODEM=1
- d. Save the file, close it

Remote visualization

1. Click 'Diesel control' button. The following window appears.



The modem reads the actual status of the controller. The system is not live, that means that it reads the pressure when the window is open, and each time the 'Refresh' is activated.

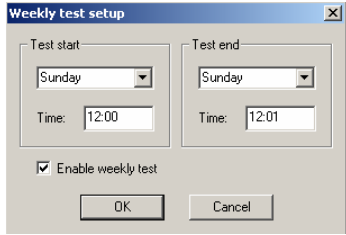
Actual pressure is shown on the bottom left.

2. Click 'Read event logs'

button to download last seven days events. Depending of the number of events, the speed of the communication, downloading can take several minutes. Those events can be saved in txt format by a click in the 'Save in File'. All events can be visualized using the vertical bar that appears after download.

3. Click 'Read pressure logs' button to download last seven days pressure data's. Depending of the number of pressure data's, the speed of the communication, downloading can take several minutes. Those pressure data's can be saved in txt format by a click in the 'Save in File'. All pressure data's can be visualized using the vertical bar that appears after download.

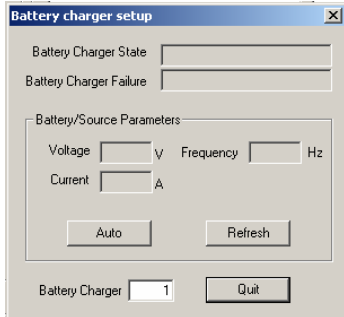
Click the 'Weekly test' button to have access to the weekly test settings.



Note : If the time is correctly set, it is possible to perform a test while communicating with the controller.

Battery chargers

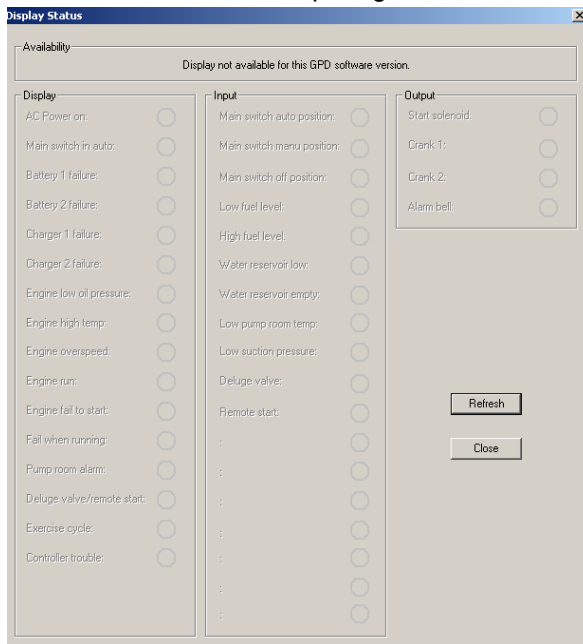
Click Battery charger button to have access to the battery charger monitoring.



By default the charger #1 status appears in the screen. To have access to the battery #2, the number 2 must be entered in the bottom window, and the refresh button must be activated. If Auto button is activated, the battery charger is monitored continuously.

Controller status.

When the button 'display status' is activated, a new window opens and the status of the display, status of input contacts and status of output signals are visualized.



Note : This windows is the monitoring of the electronic board. As the manual control is independent from the electronic board, this window does not monitor a possible manual crank.

Note : the monitoring is not permanent, so to have the actual status of the controller, 'Refresh' button must be activated.

Notes: