

MODEL H30-0016-0020 USER MANUAL

Model H30-00016-0020 Version 1.0.0

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1. Specifications

Environmental Protection:	IP65
Operating Voltage:	8-32VDC
Operating Temperature:	-20° to +70°C (-4 to +158°F)
Storage Temperature:	-30° to +80°C (-22 to +176°F)
Display:	FSTN, LED Backlit, 240 X 320 Pixels, 3.9" Diagonal, Full Monochrome Graphics
Housing Connectors:	(1) Deutsch DT04-12PA, (1) Deutsch DT04-12PB, (1) Deutsch DT04-12PC
Mating Connectors:	(1) Deutsch DT06-12SA, (1) Deutsch DT06-12SB, (1) Deutsch DT06-12SC
Digital Outputs:	(3) Dedicated SPST, 10 Amp Relays(4) Programmable SPST, 3 Amp Relays
Digital Inputs:	(8) Common Ground, Digital Inputs
Analog Inputs:	(4) Programmable 4-20 mA, 0-5 VDC or Resistive Inputs (1) Magnetic Pickup Input
Standard Communications:	J1939 CAN bus, RS485
Optional Communications:	Cellular, RF (FUTURE DEVELOPMENT)

WARNING

- DISCONNECT ALL ELECTRICAL POWER TO THE MACHINE PRIOR TO INSTALLATION
- FOLLOW ALL MACHINE MANUFACTURER'S SAFETY WARNINGS
- READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS
- INSTALLATION BY QUALIFIED TECHNICIAN ONLY

2. User Interface

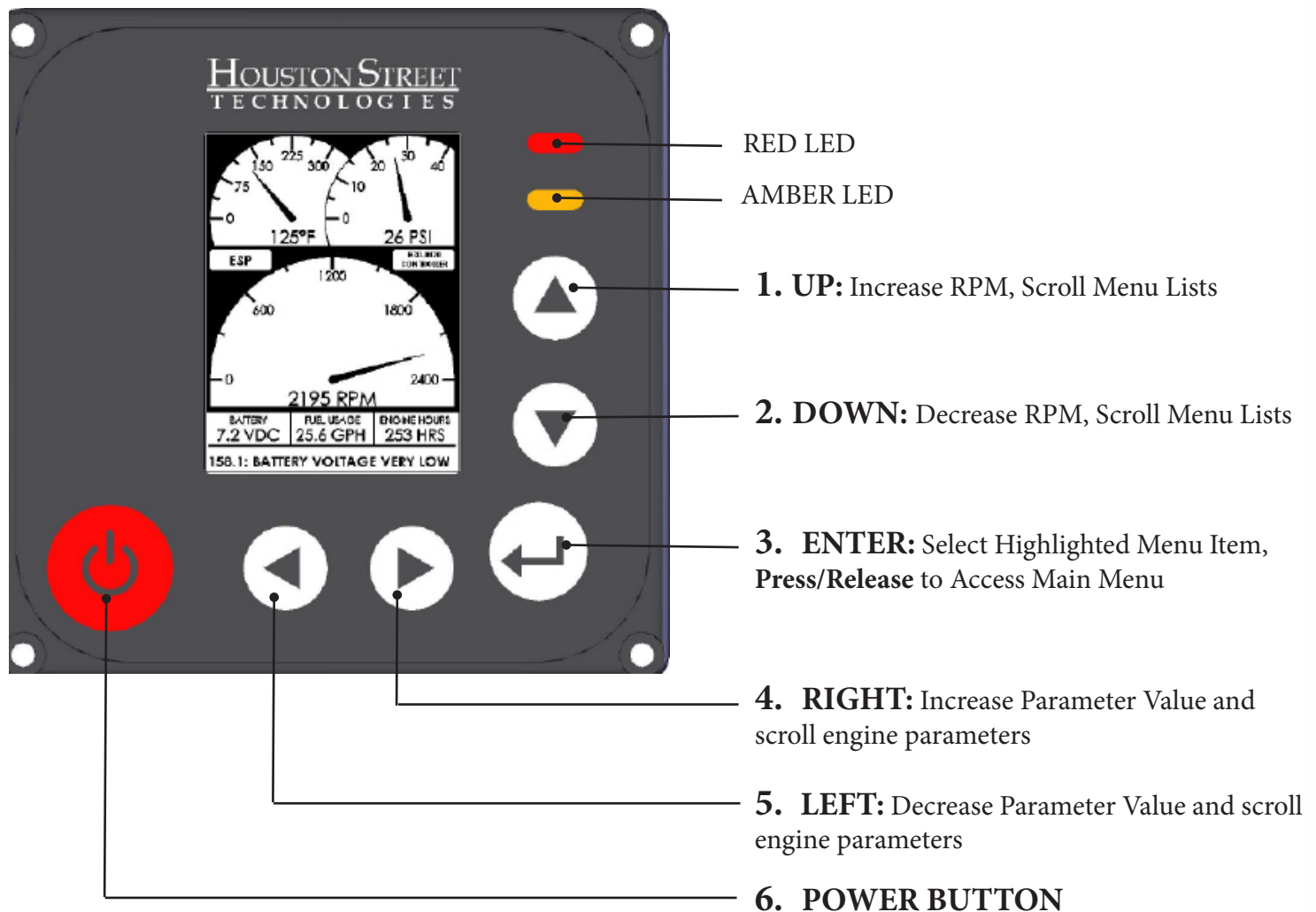
The H30's monochrome graphical LCD display is used as a visual interface for the operator. The H30's primary screen is the Operation Screen (shown below), which displays user-defined operating parameters on three analog gauge faces as well as scrolling text for a total of six parameters in addition to any active fault codes being broadcast by the engine ECU.

The power button is used to regulate power to the H30 and stop the engine from running. The engine can be started by turning the key to the Start position. This will supply power to the controller which in turn will immediately power the engine ECU. The engine can be shutdown by pressing the power button when the engine is running. The controller cuts the power to the engine ECU when it is turned off.

CAUTION: Engine manufacturer recommendations should always be followed when shutting down the engine.

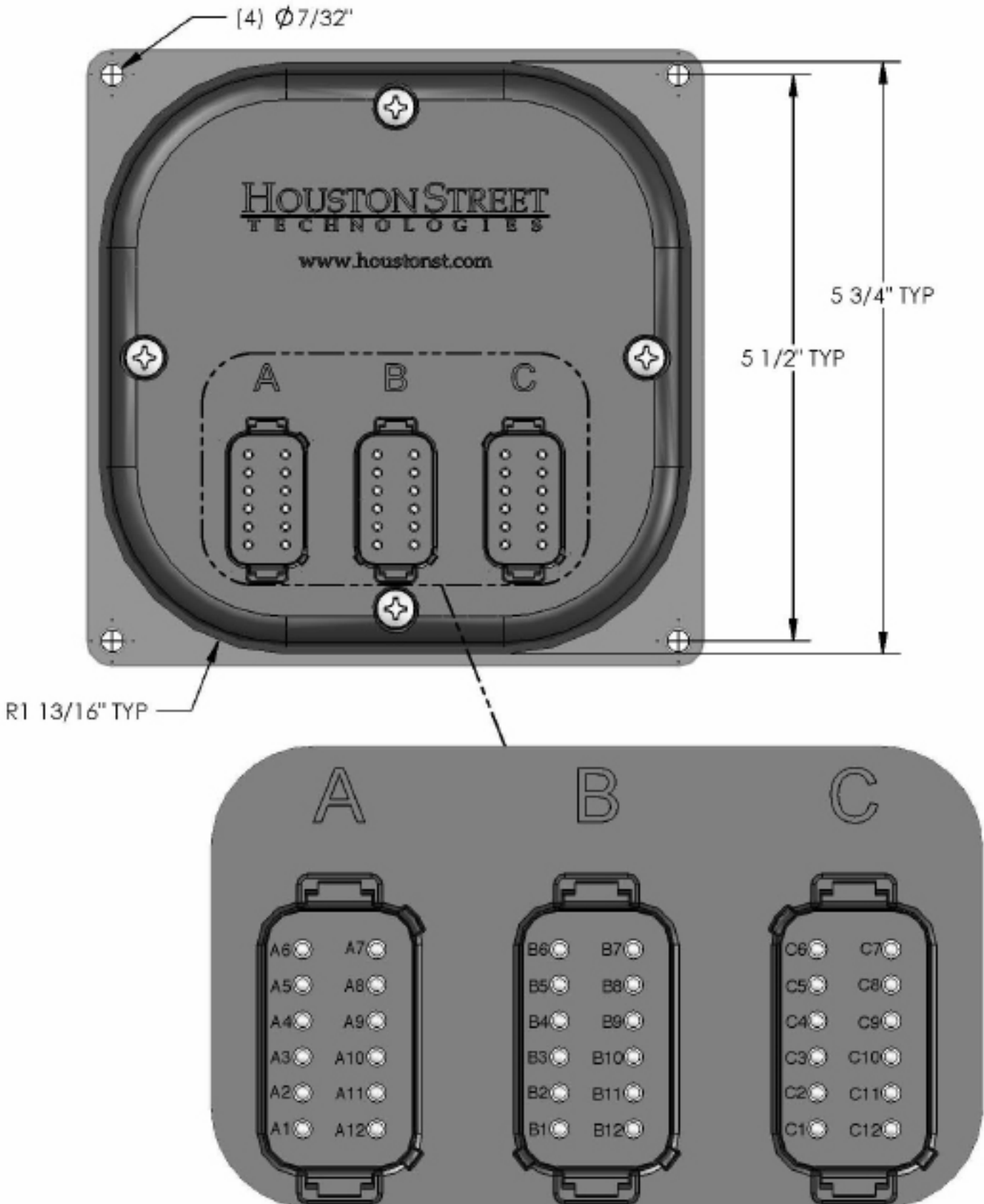
On the face of the controller an amber LED is used as an active warning fault indicator, while a red LED is used as a derate or shutdown indicator.

The six tactile push buttons on the face of the H30 have the following general functions:



3. Installation

The cutout pattern required for surface mounting the H30 is shown below:



CAUTION: Power supply at pin 2 of Connector A (ECU Power) should be protected with a 10 Amp fuse or circuit breaker.

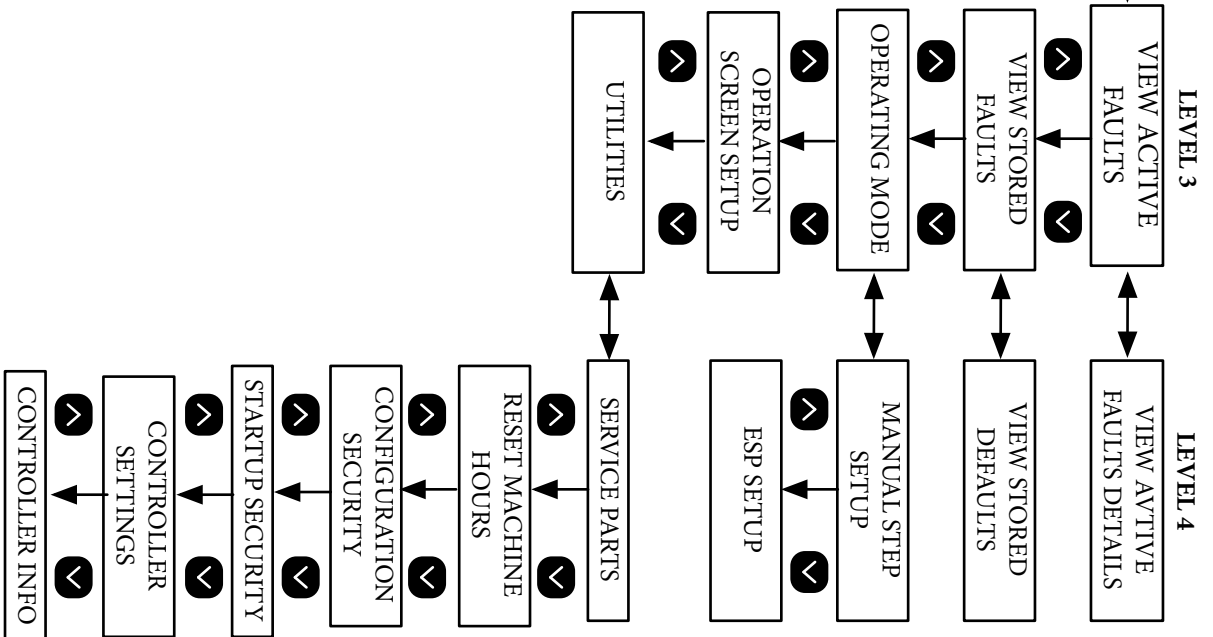
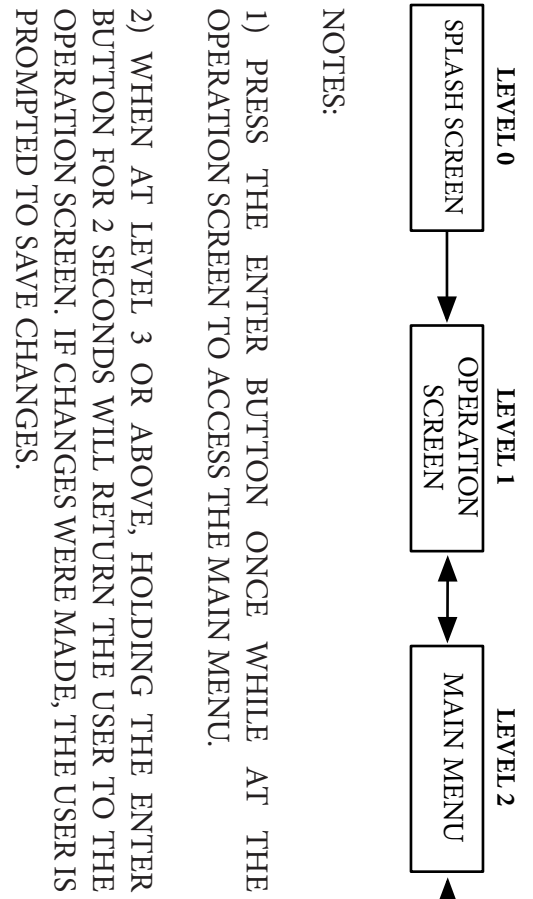
Connector A is required for electronic engines.

Connectors A and B are required for mechanical engines.

Connector C is required for extended features only.

CONNECTOR/ PIN NO.	DESCRIPTION
A1	GROUND
A2	FUSED ECU POWER SUPPLY, 10 AMP INPUT
A3	ALTERNATOR EXCITE OUTPUT
A4	START RELAY OUTPUT
A5	ECU POWER/FUEL SOLENOID HOLD OUTPUT
A6	CAN SHIELD
A7	CAN LO
A8	CAN HI
A9	RS485 (+)
A10	RS485 (-)
A11	DIGITAL OUTPUTS POWER SUPPLY INPUT
A12	H30 POWER SUPPLY INPUT
B1	DIGITAL INPUT #1
B2	DIGITAL INPUT #2
B3	DIGITAL INPUT #3
B4	DIGITAL INPUT #4
B5	ANALOG INPUT #1 (+)
B6	ANALOG INPUT #1 (-)
B7	ANALOG INPUT #2 (+)
B8	ANALOG INPUT #2 (-)
B9	MAGNETIC PICKUP INPUT (+)
B10	MAGNETIC PICKUP INPUT (-)
B11	DIGITAL OUTPUT #1
B12	DIGITAL OUTPUT #2
C1	DIGITAL INPUT #5
C2	DIGITAL INPUT #6
C3	DIGITAL INPUT #7
C4	DIGITAL INPUT #8
C5	DIGITAL OUTPUT #3
C6	DIGITAL OUTPUT #4
C7	ANALOG INPUT #3 (+)
C8	ANALOG INPUT #3 (-)
C9	ANALOG INPUT #4 (+)
C10	ANALOG INPUT #4 (-)
C11	RS232 Tx
C12	RS232 Rx

4. Menu Flow Chart



5. Screen Detail

MAIN MENU

- 1) VIEW ACTIVE FAULTS
- 2) VIEW STORED FAULTS
- 3) OPERATING MODE
- 4) OPERATION SCREEN SETUP
- 5) UTILITIES

RETURN TO OPERATION SCREEN

MAIN MENU

UP/DOWN BUTTON: SCROLL THE MAIN MENU

LEFT/RIGHT BUTTON: NOT USED

ENTER BUTTON: MAKE SELECTION OF HIGHLIGHTED ITEM

ACCESS: PRESS AND RELEASE ENTER BUTTON WHILE AT THE OPERATION SCREEN

ACTIVE FAULTS

SPN.FMI: FAULT DESCRIPTION 1
SPN.FMI: FAULT DESCRIPTION 2
SPN.FMI: FAULT DESCRIPTION 3
SPN.FMI: FAULT DESCRIPTION 4

RETURN TO MAIN MENU

ACTIVE FAULTS

UP/DOWN BUTTON: SCROLL THE FAULT LIST

LEFT/RIGHT BUTTON: NOT USED

ENTER BUTTON: MAKE SELECTION OF HIGHLIGHTED FAULT TO VIEW MORE DETAILED DESCRIPTION AND TROUBLE SHOOTING TIPS

ACCESS: MAIN MENU...VIEW ACTIVE FAULTS

STORED FAULTS

SPN.FMI: FAULT DESCRIPTION 1
SPN.FMI: FAULT DESCRIPTION 2
SPN.FMI: FAULT DESCRIPTION 3
SPN.FMI: FAULT DESCRIPTION 4

RETURN TO MAIN MENU

STORED FAULTS

UP/DOWN BUTTON: SCROLL THE FAULT LIST

LEFT/RIGHT BUTTON: NOT USED

ENTER BUTTON: MAKE SELECTION OF HIGHLIGHTED FAULT TO VIEW A MORE DETAILED DESCRIPTION AND TROUBLE SHOOTING TIPS

ACCESS: MAIN MENU...VIEW STORED FAULTS

OPERATING MODE

OPERATING MODE: MANUAL STEP

SETUP MANUAL STEP MODE

ESP MODE: ENABLED

SETUP ESP MODE

RETURN TO MAIN MENU

OPERATING MODE

OPERATING MODE: MANUAL STEP

SETUP MANUAL STEP MODE: SELECT TO CONFIGURE MANUAL STEP SETUP

UP/DOWN BUTTON: SCROLL THE SCREEN

LEFT/RIGHT BUTTON: CHANGE HIGHLIGHTED PARAMETER

ENTER BUTTON: MAKE SELECTION

ACCESS: MAIN MENU...OPERATING MODE

MANUAL STEP SETUP

SKIP TO IDLE: ON
OF STEPS: 2

IDLE:	800 RPM
STEP 1:	1200 RPM
STEP 2:	2595 RPM

RETURN TO OPERATING MODE

MANUAL STEP SETUP

SKIP TO IDLE: OPTION TO HAVE THE CONTROLLER SKIP INTERMEDIATE STEPS AND RETURN DIRECTLY TO IDLE DURING SHUTDOWN

OF STEPS: SET THE NUMBER OF STEPS (10 MAXIMUM)

IDLE: ENGINE SPEED AT STARTUP

STEP #: ENGINE SPEED AT DESIGNATED STEP NUMBER

UP/DOWN BUTTON: SCROLL THE SCREEN

LEFT/RIGHT BUTTON: DECREASE/INCREASE HIGHLIGHTED PARAMETER

ENTER BUTTON: RETURN TO OPERATING MODE SCREEN (WHEN HIGHLIGHTED)

ACCESS: MAIN MENU...OPERATING MODE...SETUP MANUAL STEP MODE

ESP SETUP – 3-WAY VALVE

FEED FWD TYPE: CLOSE TO RUN
ENGAGE SPEED: 2250 RPM
DISENGAGE SPEED: 2050 RPM
FEED FORWARD: D/O #1
FEED REVERSE: D/O #2
REVERSE TIME: 0.3 SECONDS

VALVE DELAY: .25 SECONDS

MANUAL FORWARD: UNUSED
MANUAL REVERSE: UNUSED

RETURN TO OPERATING MODE

ESP 3-WAY VALVE SETUP

FEED FWD TYPE: DETERMINED BY THE TYPE OF SOLENOID USED TO DRIVE FORWARD ROLLERS. CLOSE TO RUN IS USED ON ACTIVE TYPE SOLENOIDS WHILE OPEN TO RUN IS USED ON INACTIVE TYPE SOLENOIDS. SHOULD NOT BE CHANGED FROM FACTORY SETTING

ENGAGE SPEED: ENGINE SPEED THAT THE FEED ROLLERS WILL FEED FORWARD

DISENGAGE SPEED: ENGINE SPEED THAT THE FEED ROLLERS WILL STOP FEEDING FORWARD (AND REVERSE, IF ENABLED)

FEED FORWARD: THE DIGITAL OUTPUT USED TO POWER THE FEED FORWARD SOLENOID

FEED REVERSE: THE DIGITAL OUTPUT USED TO POWER THE FEED REVERSE SOLENOID

REVERSE TIME: THE LENGTH OF TIME THE FEED ROLLERS WILL REVERSE

VALVE DELAY: SOLENOID TIME DELAY BETWEEN SWITCHING FROM FORWARD TO REVERSE AND VICE VERSA (USED TO MINIMIZE STRESS ON THE HYDRAULIC SYSTEM)

MANUAL FORWARD: DIGITAL INPUT USED TO MANUALLY FEED THE ROLLERS FORWARD WHILE THE ENGINE IS RUNNING

MANUAL REVERSE: DIGITAL INPUT USED TO MANUALLY REVERSE THE FEED ROLLERS WHILE THE ENGINE IS RUNNING

Up/DOWN BUTTON: SCROLL THE SCREEN

LEFT/RIGHT BUTTON: CHANGE HIGHLIGHTED PARAMETER

ENTER BUTTON: RETURN TO OPERATING MODE SCREEN (WHEN HIGHLIGHTED)

OPERATION SCREEN SETUP

LARGE GAUGE: ENGINE SPEED
 UPPER LEFT: COOLANT TEMP
 UPPER RIGHT: OIL PRESSURE

SCROLLING DISPLAY ORDER:

ENGINE SPEED	
COOLANT TEMP	
OIL PRESSURE	
THROTTLE POS	
BATTERY	1
ENGINE LOAD	2
ACTUAL TORQUE	3
ENGINE HOURS	4
FUEL LEVEL	
FUEL USAGE	5

RETURN TO MAIN MENU

OPERATION SCREEN SETUP

LARGE GAUGE: USED TO SET THE LARGE GAUGE ON THE OPERATION SCREEN TO THE DESIRED ENGINE PARAMETER

UPPER LEFT: USED TO SET THE UPPER LEFT GAUGE OF THE OPERATION SCREEN TO THE DESIRED ENGINE PARAMETER

UPPER RIGHT: USED TO SET THE UPPER RIGHT GAUGE OF THE OPERATION SCREEN TO THE DESIRED ENGINE PARAMETER

SCROLLING DISPLAY ORDER: SET THE ORDER OF THE TEXT PARAMETER DISPLAYED BELOW THE LARGE GAUGE

Up/Down Button: SCROLL THE SCREEN

Left/Right Button: CHANGE HIGHLIGHTED PARAMETER

ENTER Button: RETURN TO MAIN MENU (WHEN HIGHLIGHTED)

ACCESS: MAIN MENU...OPERATION SCREEN SETUP

UTILITIES

- 1) SERVICE PARTS
- 2) RESET MACHINE HOURS
- 3) CONFIGURATION SECURITY
- 5) CONTROLLER SETTINGS
- 6) CONTROLLER INFO

RETURN TO MAIN MENU

UTILITIES MENU

UP/DOWN BUTTON: SCROLL THE UTILITIES SCREEN

LEFT/RIGHT BUTTON: NOT USED

ENTER BUTTON: MAKE SELECTION OF HIGHLIGHTED ITEM

ACCESS: MAIN MENU...UTILITIES

SERVICE PARTS

REMAINING
HOURS

- OIL FILTER:
- FUEL FILTER:
- FAN BELT:
- AIR FILTER 1:
- AIR FILTER 2:
- WATER PUMP:
- STARTER:

- ALTERNATOR:
- UPPER RAD. HOSE:
- LOWER RAD. HOSE:
- TEMP. SENDER:
- PRESS. SENDER:

VIEW CONTACT INFO
RETURN TO UTILITIES MENU

SERVICE PARTS

VIEW CONTACT INFO: DISPLAYS CONTACT INFORMATION FOR PROCUREMENT OF REPLACEMENT PARTS

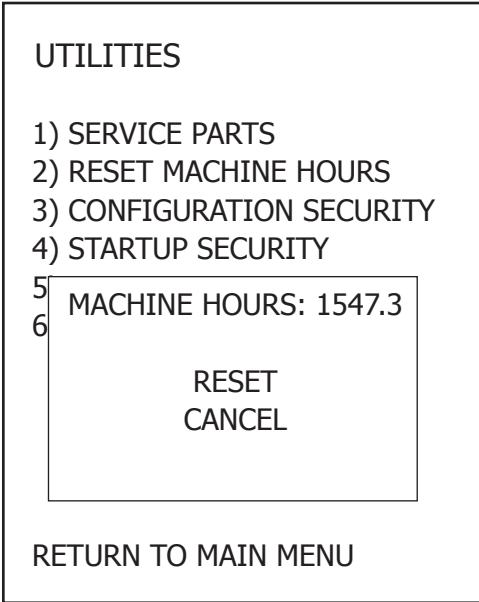
UP/DOWN BUTTON: SCROLL THE SERVICE PARTS HOURS

LEFT/RIGHT BUTTON: CHANGE THE HIGHLIGHTED HOUR

ENTER BUTTON: RETURN TO THE UTILITIES MENU (WHEN HIGHLIGHTED)

ACCESS: MAIN MENU...UTILITIES...SERVICE PARTS

NOTES: WHEN THE REMAINING HOURS OF ANY SERVICE PART REACH ZERO, A WRENCH WILL APPEAR ON THE OPERATION SCREEN AS A SERVICE REMINDER.



RESET MACHINE HOURS

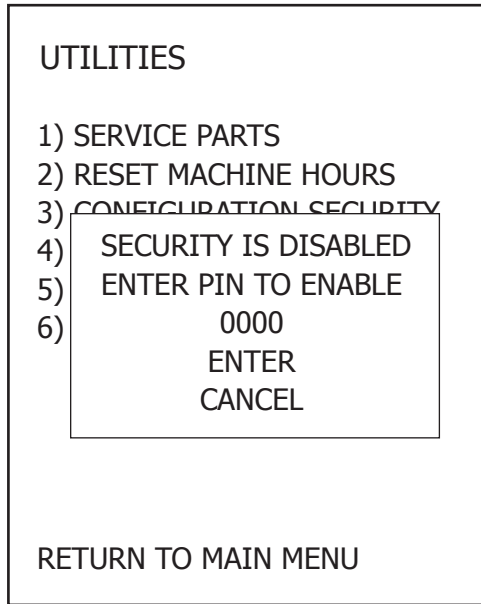
UP/DOWN BUTTON: SELECT RESET OR CANCEL

LEFT/RIGHT BUTTON: NOT USED

ENTER BUTTON: RESETS MACHINE HOURS OR CANCELS OUT TO UTILITIES SCREEN

ACCESS: MAIN MENU...UTILITIES...RESET MACHINE HOURS

NOTES: RESETTING MACHINE HOURS DOES NOT EFFECT ENGINE HOURS STORED BY THE ENGINE ECU.



CONFIGURATION SECURITY

UP/DOWN BUTTON: CHANGE PIN NUMBERS

LEFT/RIGHT BUTTON: SELECT PIN NUMBER OR ENTER/CANCEL

ENTER BUTTON: MAKES SELECTION OF HIGHLIGHTED PARAMETER

ACCESS: MAIN MENU...UTILITIES...CONFIGURATION SECURITY

NOTES: TO DISABLE CONFIGURATION SECURITY, ENTER THE SAME PIN NUMBERS USED TO ENABLE SECURITY

CONTROLLER SETTINGS**AUTO CONTRAST: OFF****CONTRAST: 88****POWER SAVE: OFF****LANGUAGE: ENGLISH****TEMPERATURE: FAHRENHEIT****PRESSURE: PSI****FUEL USAGE: GALLONS/HOUR****RESET SETTINGS TO DEFAULT****RETURN TO UTILITIES MENU****CONTROLLER SETTINGS****AUTO CONTRAST:** TURN AUTO CONTRAST FEATURE ON OR OFF**CONTRAST:** SET THE SCREEN CONTRAST HIGHER (DARKER) OR LOWER (LIGHTER)**POWER SAVE:** SET TIME INCREMENT THAT THE H30 WILL WAIT WHILE NO BUTTON IS PRESSED AND THE ENGINE IS NOT RUNNING UNTIL ENTERING SLEEP MODE. SETTING RANGE 1 - 20 MINUTES.**LANGUAGE:** SELECT DESIRED LANGUAGE**TEMPERATURE:** SELECT BETWEEN FAHRENHEIT OR CELSIUS**PRESSURE:** SELECT BETWEEN PSI OR KPA**FUEL USAGE:** SELECT BETWEEN GALLONS/HOUR OR LITERS/HOUR**RESET SETTINGS:** RESET CONTROLLER CONFIGURATION SETTINGS TO DEFAULT FACTORY SETTINGS. THIS FEATURE IS NOT AVAILABLE WHEN THE CONFIGURATION SECURITY IS ACTIVE**UP/DOWN BUTTON:** SCROLL ADJUST CONTRAST SCREEN**LEFT/RIGHT BUTTON:** CHANGE THE HIGHLIGHTED PARAMETER**ENTER BUTTON:** RETURN TO THE UTILITIES MENU (WHEN HIGHLIGHTED)**ACCESS:** MAIN MENU...UTILITIES...CONTROLLER SETTINGS

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MODEL H30
ENGINE CONTROLLER
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H30-0016-0020
S/W VERSION: 10000.3.213
H/W VERSION: 20008.0.203

CONTROLLER INFO

ENTER BUTTON: RETURN TO UTILITIES MENU

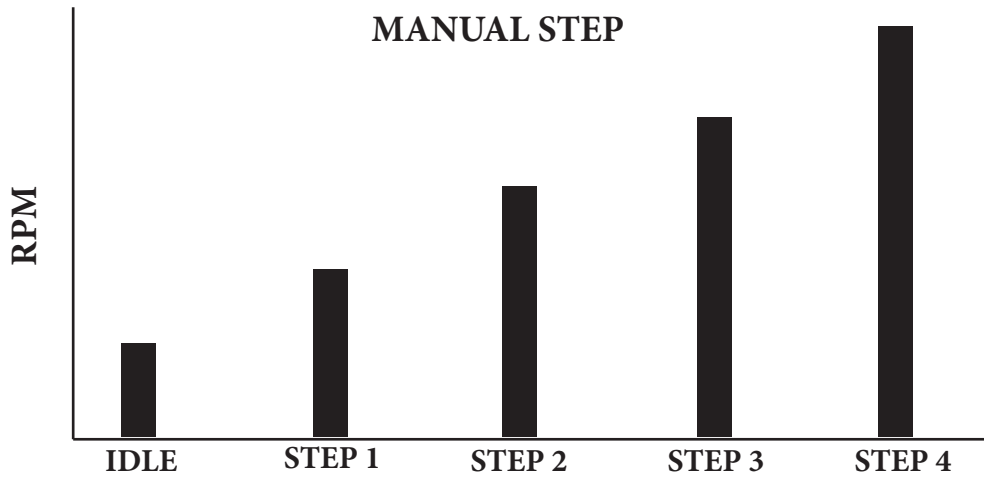
ACCESS: MAIN MENU...UTILITIES...CONTROLLER INFO

NOTE: BOTTOM OF THE SCREEN CONTAINS THE CONTROLLER MODEL NUMBER, HARDWARE AND SOFTWARE VERSION NUMBERS. THIS INFORMATION MAYBE USED FOR TROUBLE SHOOTING PURPOSES.

6. Manual Operation Mode

MANUAL STEP

When in **MANUAL STEP** mode the engine will operate within a range of low and high RPM values, increasing and decreasing speed in set increments. A maximum of (10) steps can be used to quickly (or slowly) increase or decrease engine speed with each press of the UP or DOWN button.



To access the **MANUAL STEP SETUP** screen:

- 1) Press ENTER while at the Operation Screen to access the Main Menu.
- 2) Use U/D buttons to highlight OPERATING MODE and press ENTER.
- 3) Use U/D buttons to highlight MANUAL STEP SETUP and press ENTER.

7. Engine Stall Protection (ESP)

When **ENGINE STALL PROTECTION (ESP)** is enabled, the H30 can be used to engage and disengage feed rollers that may be overloading the engine, causing it to stall. One of the H30's digital outputs can be configured to engage the feed forward solenoid at a set RPM limit, while a second digital output can be used to reverse the feed direction for a set amount of time (0.1 to 5.0 seconds) when a low RPM limit is reached. Reversing the feed direction is optional, the H30 can be configured to simply stop feeding until the engine RPM's increase to a minimum threshold speed and then re-engage the feed forward solenoid.

ESP - SINGLE VALVE

A single-valve feed system is comprised of a single 3-position valve that uses two solenoids to control hydraulic oil flow, and ultimately the feed direction.

FEED FWD TYPE	Determined by the type of solenoid used to drive the feed system. Should not be changed from factory setting
ENGAGE SPEED	Minimum engine RPM at which the feed rollers will begin feeding forward
DISENGAGE SPEED	Engine RPM that the feed rollers will stop (and reverse if enabled)
FEED FORWARD	The digital output used to control the feed forward solenoid
FEED REVERSE	The digital output used to control the feed reverse solenoid
REVERSE TIME	Length of time the feed rollers will be reversed
VALVE DELAY	Solenoid time delay between switching from forward to reverse and vice versa (used to minimize stress on the hydraulic system)
MANUAL FORWARD	Digital input used to manually forward the feed rollers when the engine is running
MANUAL REVERSE	Digital input used to manually reverse the feed rollers when the engine is running

ESP SETUP – 3-WAY VALVE

FEED FWD TYPE: CLOSE TO RUN
 ENGAGE SPEED: 2250 RPM
 DISENGAGE SPEED: 2050 RPM
 FEED FORWARD: D/O #1
 FEED REVERSE: D/O #2
 REVERSE TIME: 0.3 SECONDS

VALVE DELAY: .25 SECONDS

MANUAL FORWARD: UNUSED
 MANUAL REVERSE: UNUSED

RETURN TO OPERATING MODE

To enable/disable **ESP**:

- 1) Press ENTER while at the Operation Screen to access the Main Menu.
- 2) Use U/D buttons to highlight OPERATING MODE and press ENTER.
- 3) Use U/D buttons to highlight ESP MODE.
- 4) Use L/R buttons to ENABLE or DISABLE.

ESP settings can be configured by highlighting SETUP ESP MODE.

ESP DISABLE

When ESP is DISABLED in the Operating Mode screen the outputs assigned to FEED FORWARD and FEED REVERSE are set to an open state. The result will differ depending on the type of solenoids used to drive the feed system. If the FEED FWD TYPE is OPEN TO RUN then the rollers will continuously feed forward. If the FEED FWD TYPE is CLOSE TO RUN then the rollers will remain stationary.

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