

M154B series *J1939 Universal Control* for Electronically Governed Engines



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Installation / User Manual

Yanmar T4F Engines with DPF

P/N: MN10072-00

MBW-Technologies, LLC (2 – Year) Limited Warranty

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Statements made by any person, including representatives of MBW, which are inconsistent or in conflict with the terms of this Limited Warranty, shall not be binding upon MBW unless reduced to writing and approved by an officer of MBW.

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Warranty Return Procedure:

To obtain warranty service, contact MBW Technologies, LLC Technical Support Department at (267) 932-8573 x341 or email support@mbwtech.com to describe problem and determine appropriate action.

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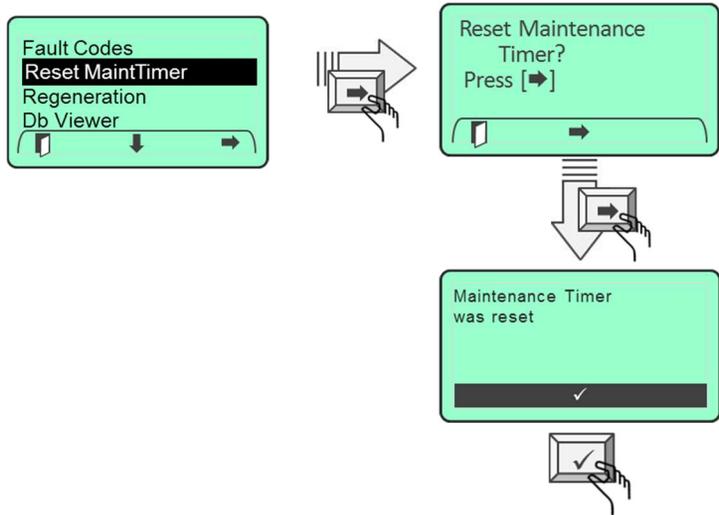
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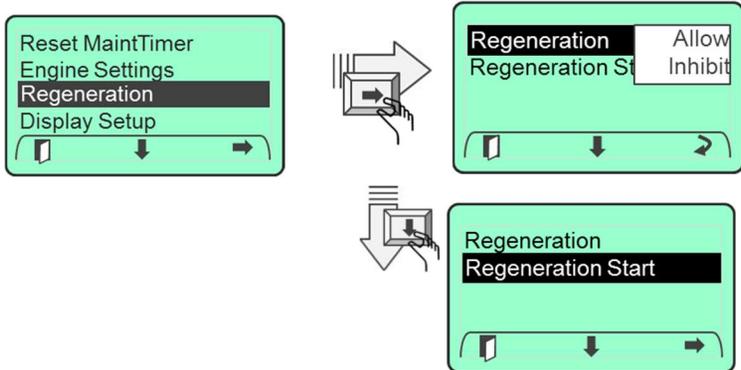
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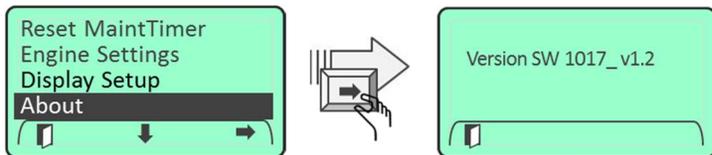
Reset Maintenance Timer



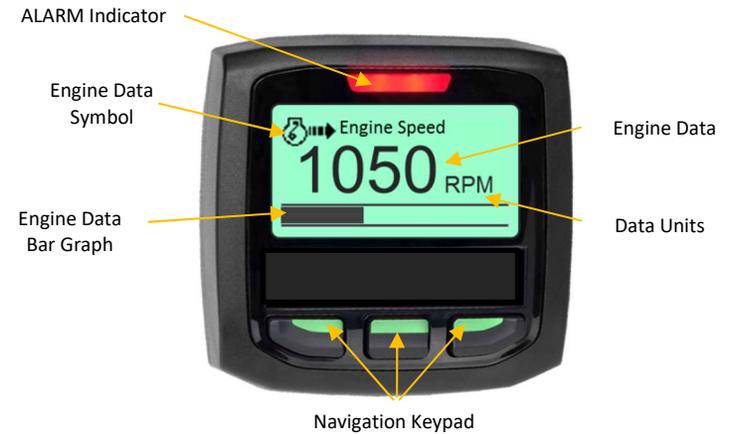
Regeneration



About



System Startup



Powering the System

The M154B Control Panel is powered from the engine battery connection via the engine harness connector. Make sure the engine harness is connected to the M154B before proceeding. To power the system turn the key switch to the “ON” position. This will activate the control panel and apply power to the engine ECU. Should the control panel indicate a fault condition do not start the engine. Review the fault condition and proceed to correct the condition before starting the engine. See Fault Codes section of this manual for details on system faults.

Starting the Engine

To start the engine, turn the key switch clockwise to the “Start” position. Should a fault condition exist the engine ECU may prevent the engine from starting. All fault conditions will be indicated by the digital display. The display will indicate the active fault(s) by presenting a pop-up graphic describing the fault condition.

Controlling Engine Speed

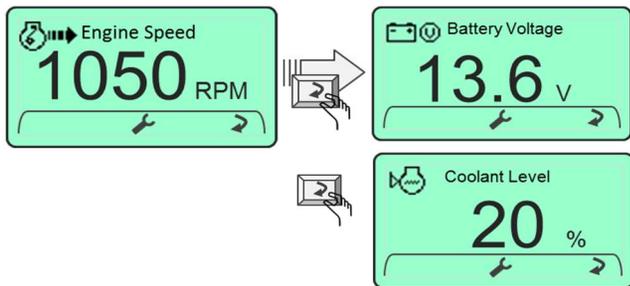
When the engine is started, the control panel will set the engine speed to the minimum rpm speed setting. To change the engine speed toggle the throttle control (“Fast-Rabbit / Slow-Turtle”) switch to reach the desired speed setting. The engine speed cannot be commanded below the minimum rpm speed setting or above the maximum rpm speed setting. See section Configuring Min/Max Engine Speeds for more details.

Engine Data

The Engine data may be displayed in three different formats: Single Data Format, Dual Data Format and Single Data/Status Format.

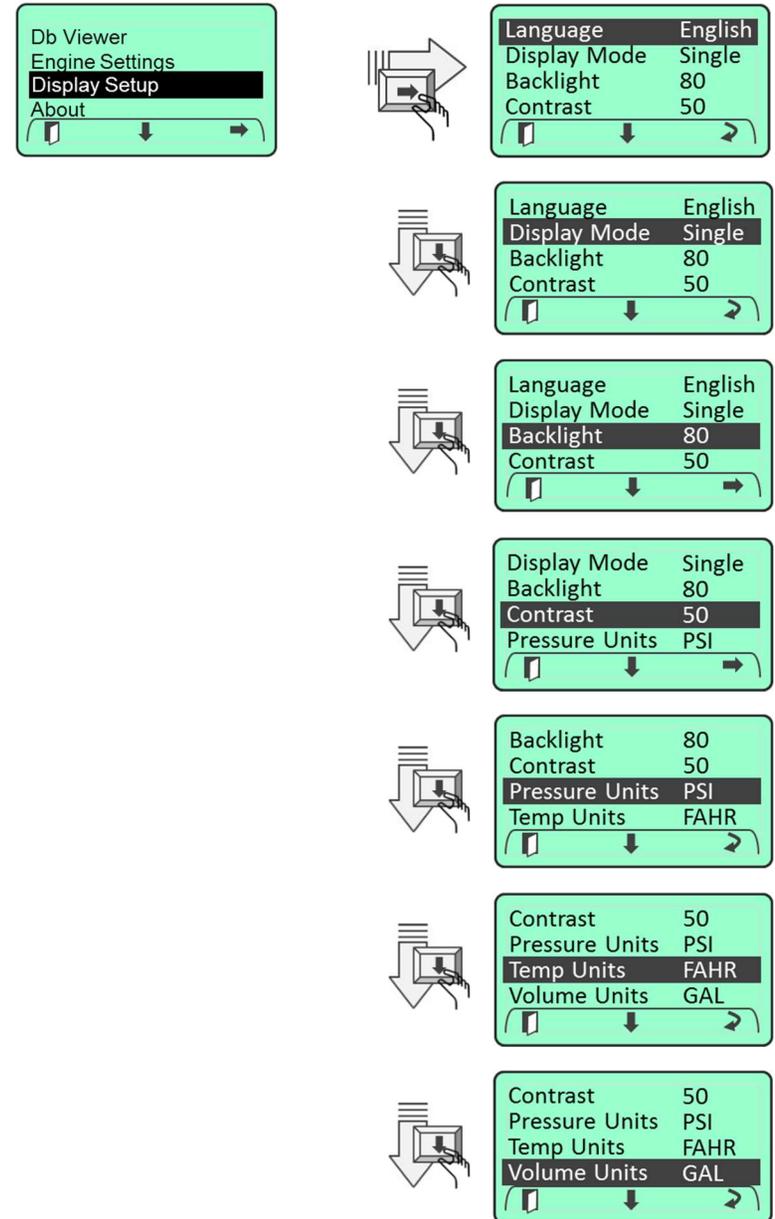
Single Data Format

To change the data being displayed press any key to activate the softkey menu. Press the change “U” softkey to access the next data display available.



See Appendix B Display List for complete selection of data displays available.

Display Setup



Engine Settings

Dual Data Format

Refer to the Display Setup section to configure the screen for two parameters at a time as shown below.

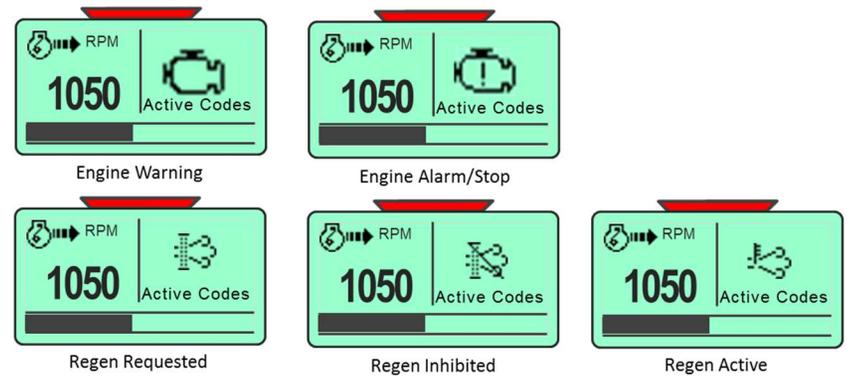


To change the data being displayed press any key to activate the softkey menu. Press the change “U” softkey to access the next data display available.

Single Data/System Status Format

Engine and System Status

When there is status information that needs the attention of the operator, the Single Data/System Status format will be displayed as shown below. The right side of the screen will display icons to identify which area needs attention: Engine Faults or Regeneration System.



Wait to Start

The “Wait to Start” is generated by the engine ECU when the ECU determines the operator is trying to start the engine before the heaters have finished heating.



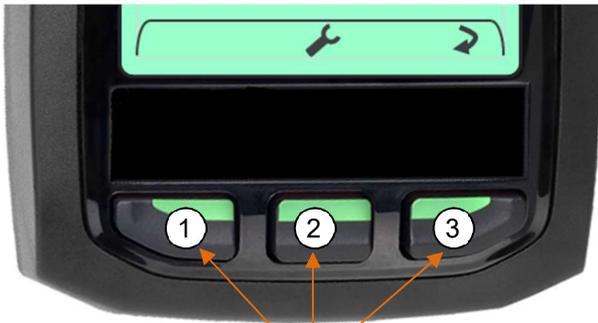
Wait to Start

Default Display

To configure a specific display as the default startup display, access the desired display and leave active for 5 minutes. The system will automatically set this display as the default startup display.

Menu Navigation

The control unit has three navigation buttons which are dynamically configured as softkeys. The system softkeys are used to navigate between displays, select menu items and change data. Pressing any of the three buttons will display the softkey menu associated with each button.



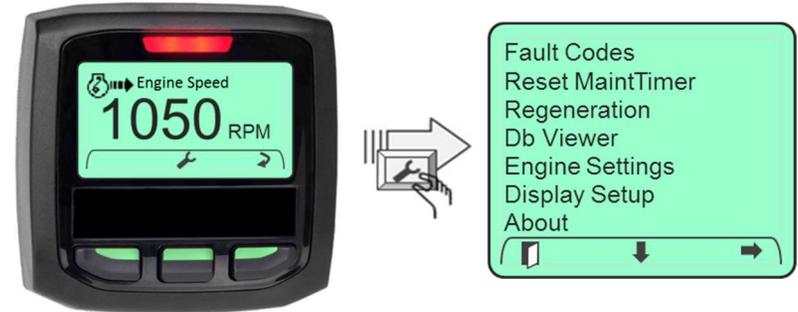
Navigation Buttons

Softkey Buttons

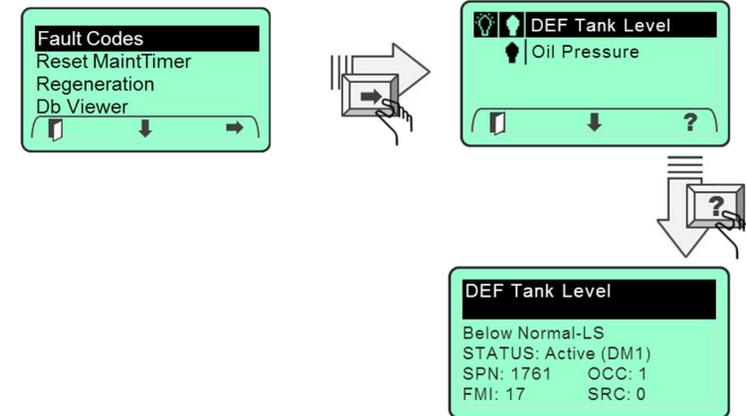
- : Tools (Main Menu)
- : Exit
- : Change
- : Scroll Down
- : Select
- : Increment Value
- : Decrement Value
- : Acknowledge
- : More Information

Appendix C - Menu Overview

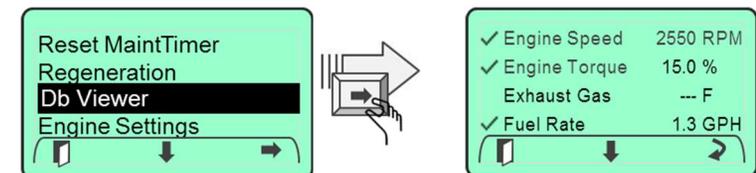
Main Menu



Fault Codes



DB Viewer



Dual Data Format

Accessing the Main Menu

To access the Main Menu press any of the three navigation buttons. The M154B will display a softkey popup window defining the available navigation possibilities. Select the Main Menu using the **“Tools”** softkey.

Navigating the Main Menu

Access the main menu using the **“Tools”** softkey. The main menu will be displayed along with the main menu softkey popup window. Navigate through the main menu selections by using the **“↓”** key. When the desired menu item is highlighted, press the **“→”** key to select the menu item. To exit the main menu and return to the data displays press the **“Exit”** softkey.

Exit Softkey

Changing Parameter Settings

Parameter settings can be changed in one of two ways; using the **“+”** / **“-”** softkeys to increment and decrement a numeric value or using the **“Change”** softkey to toggle through a predetermined list of settings or the. The M154B guides the user through this process by dynamically providing the proper softkey choices.

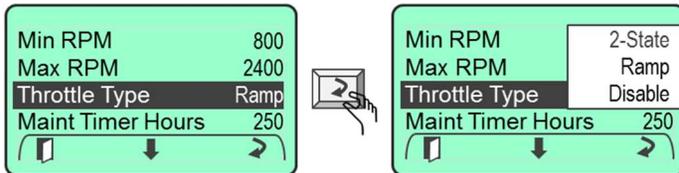
Changing a Numeric Value

The Min RPM engine setting is an example of a numeric value that can be configured. Changing the minimum rpm setting is accomplished by entering the engine settings menu, navigating to the Min RPM menu and then selecting the Min RPM setting via the **“→”** softkey. The M154B will display the **“+”** / **“-”** softkey popup. The **“+”** / **“-”** softkeys are then used to increment and decrement the rpm value.

Changing a Selection

Setting the throttle type is an example of toggling through a selection of predetermined choices. To change the throttle type, access the throttle type menu from the engine settings menu. Navigate to the throttle type menu using the “↓” softkey. Note: The M154B changes the softkey popup window to provide the user with the correct navigation choices.

Toggle through the available throttle type settings by using the change “U” softkey. When the desired parameter is displayed navigating to the next menu item or exiting from the engine settings menu by selecting the “Exit” softkey.



Use the EXIT “□” softkey to save the selection and return to the previous display.

Appendix B – Display List

Single Data Format

Note: Available data is dependent on model.



Appendix A –Displayed Data

Description	Identifier	PGN	SPN
Active DTCs	DM1	65226	
Previously Active DTCs	DM2	65227	
Ash Load Percent	AT1S	64891	3720
Barometric Pressure	AMB	65269	108
Battery Voltage	VEP	65271	168
Coolant Temperature	ET1	65262	110
DOC Inlet Temperature		64948	
DOC Outlet Temperature		64946	
DPF Mode Status	Yanmar Prop		3701
DPF Active ReGen Inhibit Switch Status	Yanmar Prop		3703
DPF Auto Active ReGen Init Status	Yanmar Prop		3718
DPF Active ReGen Forced Switch Status	Yanmar Prop		4175
Exhaust Manifold Pressure	IC1	65280	
Engine Hours	HOURS	65253	247
Engine Load	EEC1	61443	92
Engine Speed	EEC1	61444	190
Engine Stop	Yanmar Prop	65297	
Fuel Rail #1 Pressure	EFL/P2	65243	157
Fuel Rate	LFE	65266	183
Fuel Temperature	ET1	65262	174
Intake Fresh Air	AMB	65269	171
Intake Manifold Pressure	IC1	65280	
Intake Manifold Temperature	IC1	65270	105
Key Switch Status	Yanmar Prop	65297	
Maintenance			
Requested Speed	TSC1	00000	696
Soot Load Percent	AT1S	64891	3719

System Operation

Alarms

Alarm Functionality

Engine fault codes (active and stored) are generated by the engine ECU and communicated to the control panel via the CANBus communications network.

Active Fault Codes

The M154B Control System reads standard J1939 DM1 messages to indicate active fault codes. When a fault is active the control system activates a popup Fault Display containing a check engine ICON, Fault severity text based on fault lamp activation (Engine symbol = “Warning”; Engine symbol with “!” = “Stop”) a description of the active fault and the FMI text associated with the active fault. The display to the right represents an unacknowledged fault for an oil pressure fault condition.



The acknowledge alarm stripe at the bottom of the display prompts the operator to acknowledge the fault. The controller also blinks the red LED fault indicator located above the digital display.

Acknowledging Active Faults

To acknowledge an active fault, press the “**Acknowledge**” softkey (middle) button. This will remove the pop-up graphic. The controller will indicate that an active fault is present by displaying a fault lamp icon on the main data display. The system will also display “Active Codes” in the alarm description area of the display.



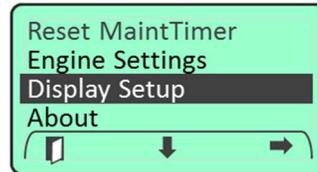
Note: If the fault condition is cleared the associated pop-up will automatically be removed.

Contrast and Lighting

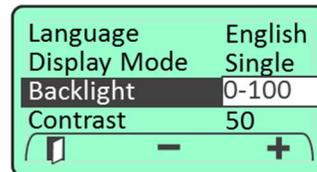
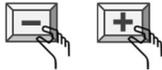
Backlight Setting

The LCD backlight is adjustable from 0% to 100%. To adjust the LCD backlight enter the Main Menu and navigate to the “Display Setup” menu. When highlighted enter the Display Setup menu by selecting the “➔” softkey.

Navigate through the “Display Setup” menu using “↓” softkey until the “Backlight” entry is highlighted. Press the “➔” softkey to select the backlight parameter setting.



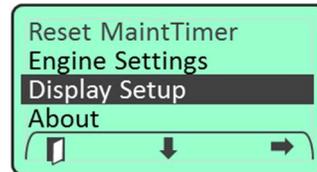
Use the + / - softkeys to set the backlight value.



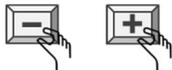
Contrast Setting

The LCD contrast is adjustable from 0% to 100%. To adjust the LCD contrast enter the Main Menu and navigate to the “Display Setup” menu. When highlighted enter the Display Setup menu by selecting the “➔” softkey.

Navigate through the “Display Setup” menu using “↓” softkey until the “Contrast” entry is highlighted. Press the “➔” softkey to select the contrast parameter setting.



Use the + / - softkeys to set the contrast value. Note: Setting the contrast value below 30 may render the display to be unreadable.



Troubleshooting Guide

Symptom	Action
Key “ON”; No display or alarm sounded	<ul style="list-style-type: none"> Verify Battery is connected and battery switch, if installed, is in “ON” position. Check engine fuse. If fuse blown check engine wiring. Check engine harness connection at control panel. Reset circuit breaker
Key “ON”; No display or alarm sounded; Tachometer backlight flashing; No throttle control.	<ul style="list-style-type: none"> Check engine harness connection at control panel. Engine connector pin W is improperly wired. Pin W MUST be open.
Key “ON”; Alarm sounded but no display.	<ul style="list-style-type: none"> Check display contrast/lighting level Replace tachometer gauge
Key “ON”; Display “ON”; Engine data is missing or intermittent.	<ul style="list-style-type: none"> Check Engine harness connections. Check main fuse on engine. Check for active alarms. Check Diagnostic Trouble Codes.
Key “ON”; Display active and showing data but Engine will not start	<ul style="list-style-type: none"> Check for system alarms. Check Diagnostic Trouble Code screen for engine faults. Check external engine shutdown input.
Key “ON”; Display active, no engine data, Engine will not start	<ul style="list-style-type: none"> Check for system alarms. Check Diagnostic Trouble Code screen for engine faults. Check remote engine shutdown input. Replace Control Panel.
Throttle switch does not change engine speed.	<ul style="list-style-type: none"> Engine Fault. Check DTC screen for specific engine failure. Ensure Engine Speed settings do not exceed engine manufacturer recommendations. Check Throttle Type setting to ensure throttle is not disabled
Engine Speed will not ramp.	<ul style="list-style-type: none"> Check User Setting menu. Throttle Type set for 2-State or is disabled.

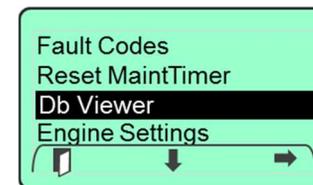
System Components

PART NUMBER	DESCRIPTION
M154B00-Y2017	Kit; Eng Ctrl, J1939, Yanmar T4F, 2.3" Dpy
M154B01-Y2017	CP; Eng Ctrl, J1939, Yanmar T4F, 2.3" Dpy, 8x6 PNL MNT
M154B10-Y2017	CP; Eng Ctrl, J1939, Yanmar T4F, 2.3" Dpy, 8x7 ENCL
M154B20-Y2017	CP; Eng Ctrl, J1939, Yanmar T4F, 2.3" Dpy, NEMA 4X ENCL
DS1104-Y2017	DP; 2.3", J1939 Ctrl, Yanmar T4F, 2.3" Dpy, std ver
MN10072	Manual; User/Install, M154B Series Yanmar T4F with DPF
MN10045	Manual; Mounting Template, 2.3" Dpy, B Series
1000017-23	Keyswitch; 4 pos, ACC-OFF-ON-START, common key
1000107-00	Switch; Rocker, (ON)-OFF-(ON)
1000146-00	Harness; Control, M154B Series Yanmar

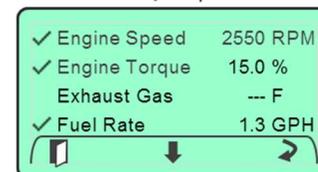
Contact MBW Sales to confirm all part numbers.

Database Viewer / Display Mapping

The Db Viewer menu selection provides a listing of all data supported by the M154B System. To access the Db Viewer enter to the Main Menu. Navigate to the "Db Viewer" menu entry using the "↓" softkey. Select Db Viewer using the "→" softkey.

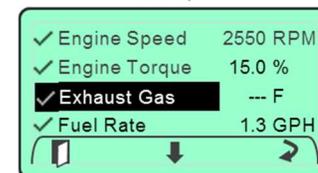
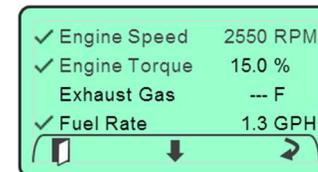


The display will present a listing of the data in alphabetical order and provide a realtime update of the data values. Any data parameter that cannot read data from the CANbus will show dashes "---" in the data value field.



Display Mapping

The M154B allows the operator to decide which data displays will be shown in the main rotation list of displays. Any data parameter listed in the Db Viewer list can be selected to be viewed in the main rotation list of displays. To selected a data parameter for the viewing list scroll down the data list using the "↓" softkey. When the desired data parameter is highlighted select the parameter for the rotation list by using the "Change" softkey.



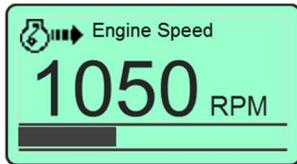
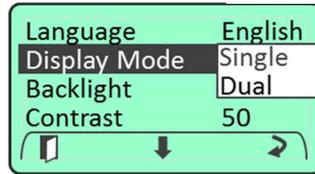
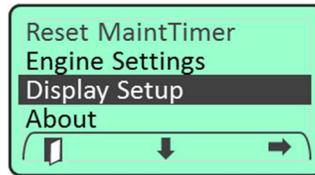
A checkmark will be shown to indicate the data parameter has been selected for the rotation list.

To remove a data parameter from the rotation list, select the desired data parameter and remove the selection using the "Change" softkey.

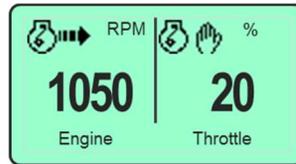
Display Format

Two display formats are available in the M154B Control System; “Single” display and “Dual” display formats. To access the display format setting, enter the Main Menu. Navigate to the “Display Setup” menu entry using “↓” softkey. When highlighted, enter the Display Setup menu by selecting the “→” softkey. Navigate to the “Display Setup” menu using “↓” softkey until the “Display Mode” entry is highlighted.

Choose the desired display mode setting by cycling through the list of choices using the “Change” soft key.



Single Display



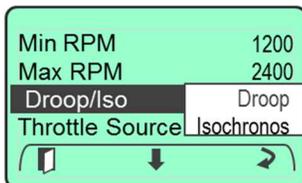
Dual Display

Droop Operation

The M154B allows the user to select Droop or Isochronous operational mode.

To access the “Droop” setting, enter the Main Menu. Navigate to the “Engine Settings” menu entry using “↓” softkey and select “Engine Settings” using the “→” softkey.

Navigate through the “Engine Settings” menu using “↓” softkey until the “Droop/Iso” entry is highlighted. Press the “Change” “↺” softkey to select the Droop or Isochronous setting.

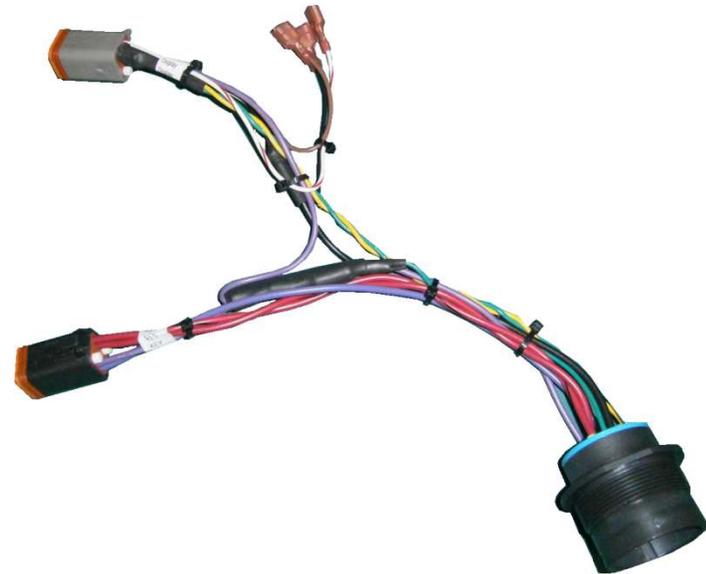


Use the EXIT “↵” softkey to save the selection and return to the previous display.

Connection Details

Control Harness

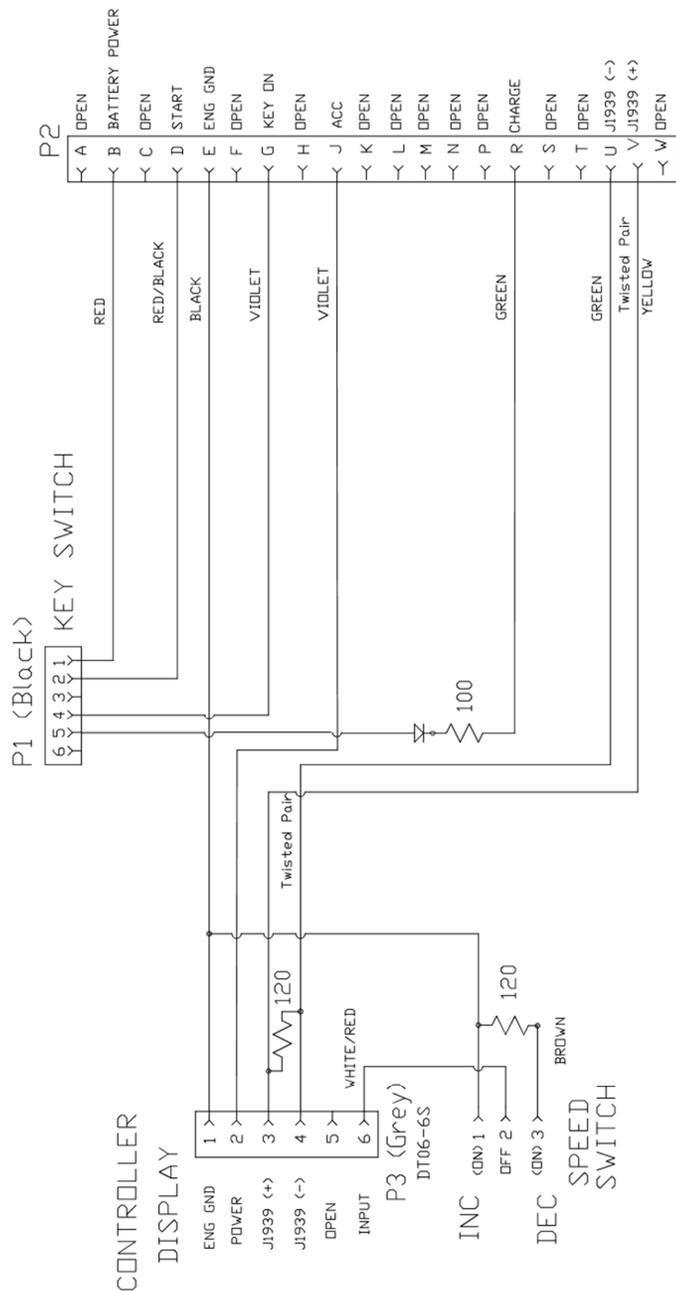
PN:1000146-00 The main control harness provides connections from the engine to the controller, throttle switch, and key switch.



Control Harness Connector Details

Connector	Description
P1	6 Pin; connects to keyswitch, black housing
P2	Engine connector
P3	6 Pin; connects to controller, grey housing
White/Red Quick Connect	Center position of throttle switch
Brown Quick Connect	Lower position of throttle switch
Black Quick Connect	Top position of throttle switch

Wiring Diagram

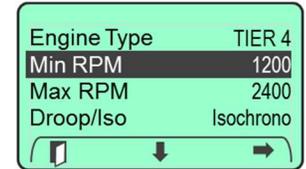


Engine Speed Limits

The M154B allows the user to configure minimum and maximum engine rpm limits. The minimum engine rpm value is determined by the “Min RPM” speed setting in the Engine menu. The maximum engine rpm value is determined by the “Max RPM” speed setting in the Engine menu. Once configured the M154B prevents the user from throttling the engine above or below these values.

Setting Min Engine Speed

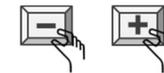
To access the “Min RPM” setting, enter the Main Menu. Navigate to the “Engine Settings” menu entry using “↓” softkey and select “Engine Settings” using the “→” softkey.



Navigate through the “Engine Settings” menu using “↓” softkey until the “Min RPM” entry is highlighted. Press the “→” softkey to select the min RPM entry setting.



Use the + / - softkeys to set the minimum engine rpm value.



Use the EXIT “⏏” softkey to save the selection and return to the previous display.

Setting Max Engine Speed

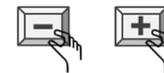
To access the “Max RPM” setting, enter the Main Menu. Navigate to the “Engine Settings” menu entry using “↓” softkey. When highlighted enter the Engine Settings menu by selecting the “→” softkey.



Navigate through the “Engine Settings” menu using “↓” softkey until the “Max RPM” entry is highlighted. Press the “→” softkey to select the Max RPM entry setting.



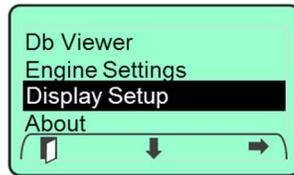
Use the + / - softkeys to set the maximum engine rpm value.



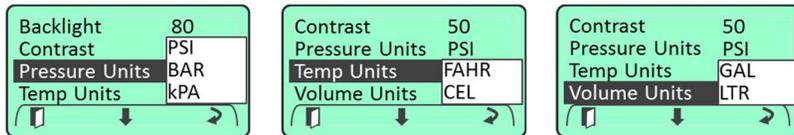
Use the EXIT “⏏” softkey to save the selection and return to the previous display.

Engineering Units

Displayed engineering units can be configured for Pressure, Temperature and Volume. To access the engineering unit's settings, enter the Main Menu. Navigate to the "Display Setup" menu entry using "↓" softkey. When highlighted enter the Display Setup menu by selecting the "→" softkey.



Navigate through the "Display Setup" menu using "↓" softkey until the desired engineering unit's parameter is highlighted.



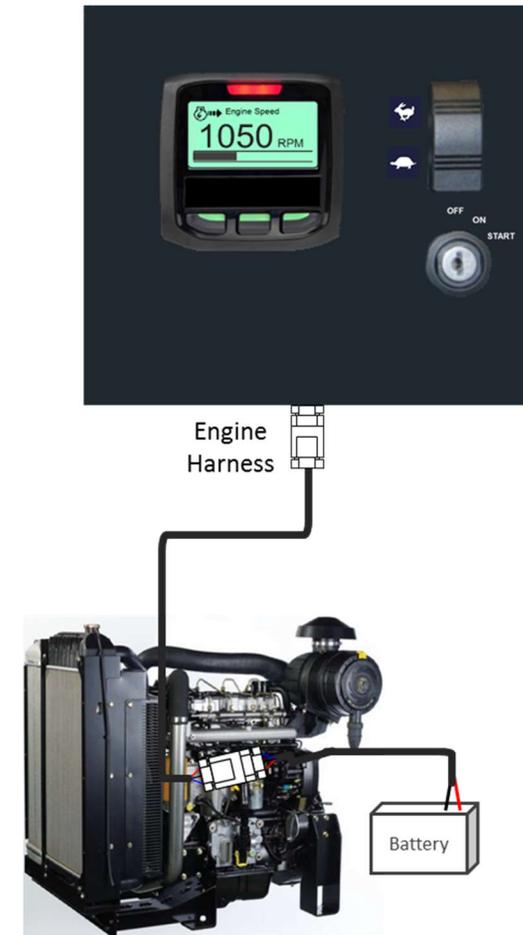
Choose the desired parameter setting by cycling through the list of choices using the "Change" softkey.



Fault Codes

The M154B allows the operator to request any stored fault codes that may be contained in the engine ECU. To view stored faults select the "Fault Codes" menu selection from the main menu. When selected the control system will send a request to the engine ECU for any stored faults the ECU may have stored. The control system uses the standard J1939 DM2 messaging request for this data. Should any faults exist the M154B will provide a summary list of the active and stored faults. The summary list will show if the fault is Active / Stored, or both Active and Stored. The summary list will contain the engine manufacturer specific Fault Code (if available) for the fault condition. To view more detailed information about any of the fault conditions listed, navigate to the desired fault condition and select the "?" softkey. A more detailed description of the fault will be presented along with the current Status. The additional information includes description, J1939 SPN, FMI, Source Address and Occurrence data.

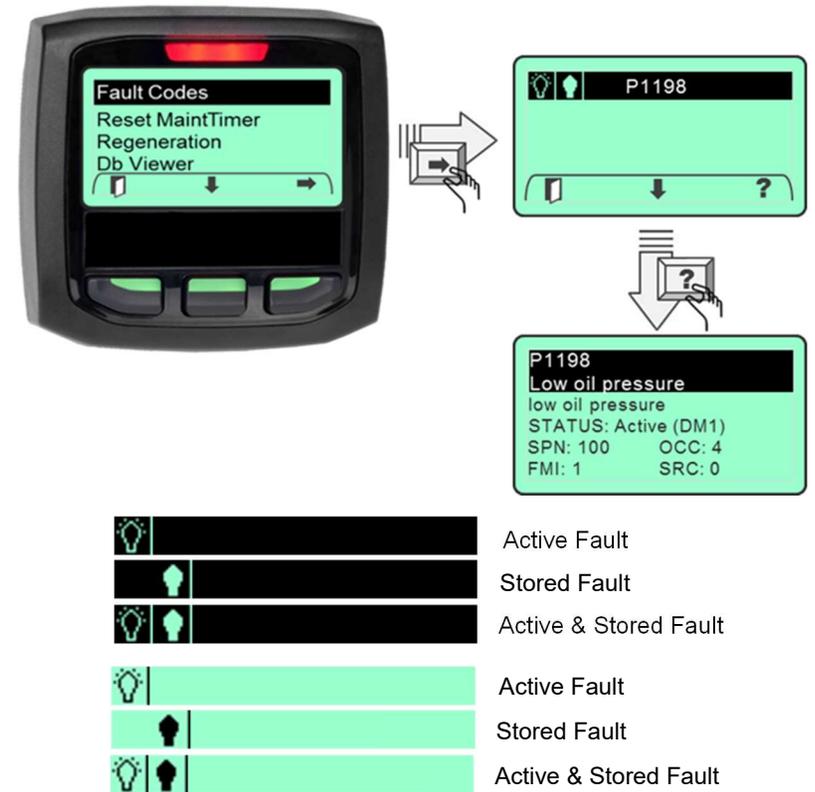
System Block Diagram



Factory Defaults

PARAMETER	DEFAULT VALUE
Display Settings	
Language	English
Display Mode	Single
Backlight	80%
Contrast	45%
Pressure Units	PSI
Temperature Units	Fahrenheit
Volume Units	Gallons
Engine Settings	
Engine Type	T4F
Minimum Engine RPM	1000 RPM
Maximum Engine RPM	3150 RPM
Throttle Type	RAMP Mode
Throttle Source	CAN
DROOP/ISO	DROOP
Maintenance Timer	250 Hours
Passcode	OEM Specified and enabled
TSC1 Source Address	7

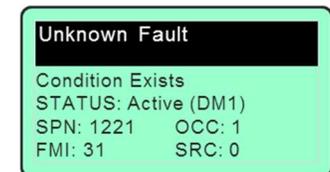
The system settings may be returned to factory defaults at any time by selecting “Reset to Defaults” in the Engine Settings screen.



Unknown Fault Codes

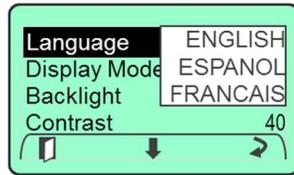
Should the control system encounter a fault code that is not identified by the manufacturers fault code list, the control system will indicate the active lamp, SPN Number, FMI code and FMI text.

When detail information about the fault is requested the control system will provide the broadcast SPN, FMI, Occurrence and SA values.



Language Selection

The M154B provides a language selection via the Display Setup menu. To set the language enter the Main Menu and navigate to the “Display Setup” menu. Navigate to the Language selection and use the “Change” “↻” softkey to set the language.



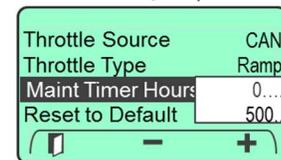
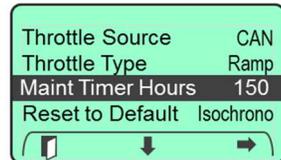
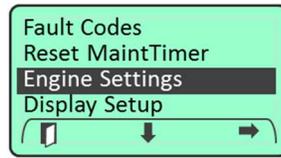
Note: Not all versions of the M154B will provide language selection capability.

Maintenance Timer

The M154B System provides an engine maintenance timer feature. The maintenance timer is a countdown timer and indicates the amount of engine runtime remaining until maintenance is due. The maintenance timer is configurable and resettable by the operator. If the system is powered but the engine is not running maintenance hours will not be accumulated.

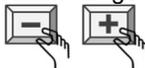
Setting Maintenance Timer

The timer will activate when set to a value > 0. To configure the maintenance timer enter the Main Menu and then navigate to the Engine Settings menu using the “↓” softkey. Select the “Engine Settings” menu using the “→” softkey.



Navigate to the “Maint Timer Hours” entry using the “↓” softkey. Use “→” softkey to select maintenance timer hours.

Use the + / - softkeys to set the “Maint Timer Hours” value. The timer has a settable range of 0-500 hours.

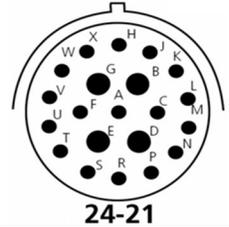


Use the “EXIT” softkey to save the selection and return to the previous display.

Note: Setting the timer to 0 will disable the maintenance timer operation.

Engine Connector

The engine connector is labeled “Engine” and requires no additional wiring. This connector mates directly to the on-engine harness connector. The table below describes the engine harness connections, associated connector pin number and wire color.



Desc	PIN Number	Engine Harness Connector – P2	Contact Size	Wire Color
B+	B	Battery + (10A)	12	Red
Start	D	Starter (30)	12	Red/Black
Ground	E	Ground	12	Black
Ignition Out	G	ECU Power (Ignition)	12	Violet
Key On	J	Accessory (15)	16	Violet
Charge In	R	Charge Lamp	16	Dark Green
CAN Lo	U	CAN Low (twisted pair)	16	Light Green
CAN Hi	V	CAN High (twisted pair)	16	Yellow
No Connection	A,C,F,H,K,L,M,N,P,S,T,W			

Technical Specifications

System Specs

DS1104	
Display	Dot Matrix LCD
Resolution	128 x 64 pixels
Dimensions	76mm x 76mm (3.0" x 3.0")
Operating Voltage	9 to 32 VDC
Power Consumption – Backlight OFF	100 mA max at 12 VDC
Power Consumption – Backlight ON	500 mA max at 12 VDC
Communication	J1939 CAN 2.0B
Operating Temperature	-30C to +70C (-22F to 158F)
Storage Temperature	-40C to +80C (-40F to 176F)
Reverse Polarity Protection	Yes
Salt Spray	IEC60068-2-52: 1996
EMC	IEC61000 and EN55022
Degree of Protection	IP67
System Protection	Provided externally

Installing the System

⚠ CAUTION

The safety messages that follow have CAUTION level hazards.

ALWAYS ensure the power supply is OFF and battery cables are disconnected before you make any electrical connections.

Making the Connections

The control panel has one round connector with 21 contacts. This connector is an HDP24 Deutsch connector and provides the connection to the engine connector. (Note: Some engine may require an interface harness for this connection. Contact MBW Technical Support Team for details.) The supply power MUST be OFF when interconnecting the system.

Recommended order:

1. Verify the battery / battery switch connections to engine per the engine installation diagram. (Refer to engine manufacturer installation manual.) Verify engine is bonded to battery return (-). Verify engine block is connected to battery ground.
2. Disconnect battery.
3. Install control panel into housing. Attach engine connector to housing using supplied locknut and ring.
4. Fasten control panel to housing using #8 8-32 screws (not supplied).
5. Connect engine harness connector to mating control panel connector (HDP24-21 connector).
6. Connect battery.
7. Turn ignition key to "ON" position.
8. Ensure digital display is active. If display is not active;
 - a. Check battery and power connections.
 - b. Check ignition switch is on position.
9. Ensure system is displaying data for engine speed.

Maintenance Timer Alert

When the maintenance timer expires the system will activate an "Engine Maintenance Due" alert popup window. If the maintenance due alert is acknowledged but the timer is not reset the alert popup will reinitiate for each key "ON" cycle.



Acknowledging Maintenance Timer

Acknowledge the maintenance alert by selecting the acknowledge "✓" softkey.

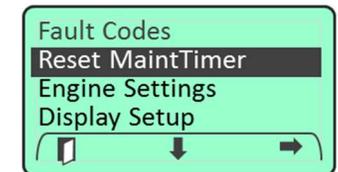


Resetting Maintenance Timer

The maintenance timer is operator configurable and can be accessed via the engine settings menu. See "MaintTimer Hours" selection in engine settings menu. When the maintenance timer has expired a popup alert window will be displayed indicating that "Engine Maintenance is Due". The operator must acknowledge this popup to return the controller to normal display operation.



To reset the maintenance timer enter the Main Menu and then scroll to the "Reset MaintTimer" entry using the "↓" softkey. Press the "➡" softkey to select the reset maintenance timer menu item.



Press the "➡" softkey to reset the timer.



Acknowledge the timer was reset by pressing the Acknowledge "✓" softkey.



Note: The maintenance hours data display will indicate 0 hrs when the timer has expired and the operator has not yet reset the timer.

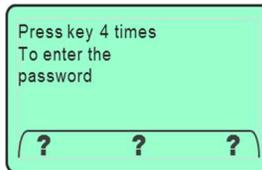
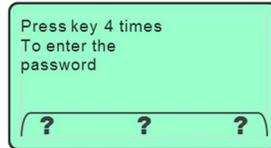


Passcode

The controller passcode has been preset by the OEM and protects various parameters in the system database. When the operator tries to access the Engine Settings menu, the user will be prompted for the passcode entry. Entering the correct passcode will unlock the Engine Settings menu and changes may be made to various engine parameters. The Engine Settings menu will relock when the operator leaves the Engine Settings menu and the passcode will need to be reentered.

Entering Passcode

The passcode consists of four entries via the three key keypad and can be any combination of numbers 1 thru 3. These numbers correspond to the softkey numbering. Assume the passcode is 1111. To enter the passcode press key #1 four times.



Key 1 Key 2 Key 3

Regeneration Inhibit

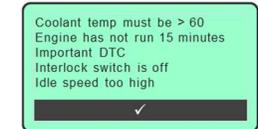
Regeneration Inhibit is not passcode protected and is accessible by the operator; however, the inhibit will be lost when power is cycled to the controller.

To inhibit regeneration access the main menu and navigate to the “Regeneration” menu selection. Select “Regeneration” using the “➔” softkey and then select the Regeneration Allow / Inhibit entry. Change the

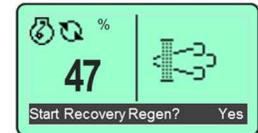
Complete: When recovery regeneration is complete the control system will provide a prompt indicating completion. The engine will return to the minimum engine rpm value and be ready to return to normal operation. The operator must acknowledge the prompt by momentarily pressing the “✓” softkey.



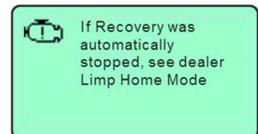
Conditions Not Met: If either condition engine rpm not lowered to the “slow” rpm setting or the interlock mechanism not set the engine will not enter the regeneration process. The control system will prompt the operator if this condition exists. The operator must acknowledge this display. When acknowledged the control system will cycle back to the start of this sequence.



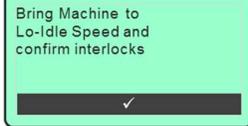
Delaying: Delaying the recovery regeneration process should only occur when the equipment must be prepared before for the process can begin. This delay is utilized in situations where a machine needs to be moved to a more suitable location to complete the regeneration process. The engine will remain in limp home mode until the regeneration process can be completed.



Aborting or Recovery unable to complete: Should the operator need to abort the recovery regeneration process while it is active the control system allows the operator to enter the regeneration menu and select regeneration inhibit. The operator may also Toggle the throttle switch to abort the process. When the engine has recognized the abort command, the control system will display the warning prompt shown. The operator must acknowledge this screen to return to online system operation.



Proceeding Or Initiating from delay: The first display prompts the operator to reduce the engine throttle speed to the minimum rpm value. To return the engine to the minimum rpm value use the throttle switch “Turtle” position and adjust the engine speed to the programmed min rpm setting. (See engine menu for details on configuring min engine speed.)

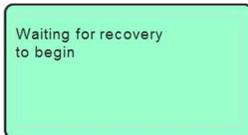


The prompt also reminds the operator confirm that all interlocks have been set. (Note: Interlocks are application specific, are hardwired into the engine harness and are not controlled by the control panel.) The operator must acknowledge this prompt by momentarily pressing the “✓” softkey.

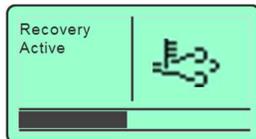
Confirming: The operator will be prompted by the control system to begin the regeneration process. This is a final confirmation by the operator that regeneration is requested. The operator has the choice to begin regeneration by selecting the “Yes” softkey or exiting the regeneration request by selecting the “No” softkey. If all conditions are met the control system will command the engine to the “initiate regeneration rpm value”. This value is configured within the ECU and cannot be changed. This value may vary by engine model. For most models this value is 800 rpm. Should conditions not be met the control system will display a checklist of items for the operator to review. See “Conditions not Met”.



Continuing with the regeneration request by selecting “Yes” will command the engine to enter regeneration mode. The control system will display a waiting prompt until the engine acknowledges the recovery regeneration state is active. Should all conditions not be met the control system will display a checklist of items for the operator to review.

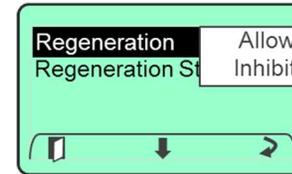


Active: When the recovery regeneration state is active the control system will display a timer showing the progress of the manual regeneration process. The time to complete stationary regeneration will vary based on the level of cleaning process that is needed. The maximum time is 3 hours. Stationary regeneration can be stopped at any time by entering the regeneration menu and selecting regeneration inhibit.



Caution: The regeneration process increases engine rpm. The throttle switch will not control rpm during this time. Care should be taken to ensure all safety measures are met before proceeding to the regeneration process.

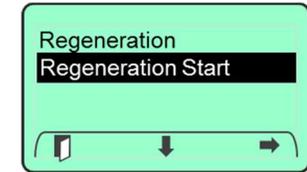
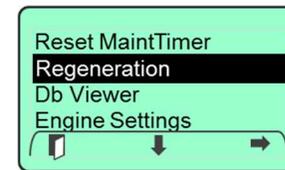
selection using the “Change” softkey. When regeneration is inhibited the M154B Control System will alert the operator by presenting the regeneration inhibit ICON.



Note: Inhibiting regeneration for extended periods can cause the engine to enter various levels of de-rate inducements.

Regeneration Start

Regeneration Start is not passcode protected and will start a Manual Regeneration when selected. See the section on Manual Regeneration

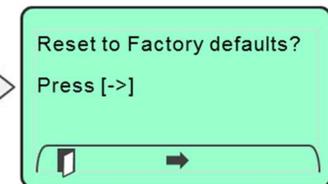
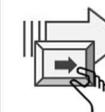
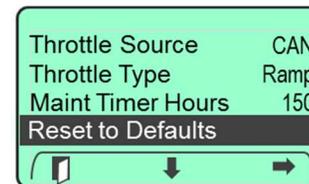


Reset to Defaults (Engine Specific)

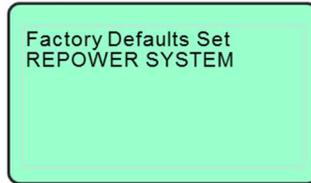
To access the “Reset to Defaults” setting, enter the Main Menu. Navigate to the “Engine Settings” menu entry using “↓” softkey. When highlighted enter the Engine Settings menu by selecting the “→” softkey.

Navigate through the “Engine Settings” menu using “↓” softkey until the “Reset to Defaults” entry is highlighted.

Press the “→” softkey to navigate to the confirmation screen.



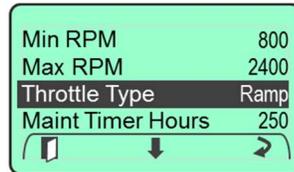
Press the “➔” softkey to return the unit to factory defaults.



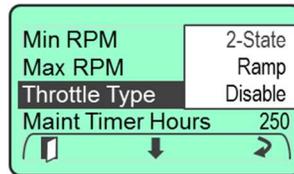
The M154B allows the user to configure three modes of throttle operation; Ramp, 2-State and Disabled. These modes are configured in the Engine Settings Menu.

Configuring Throttle Switch Operation

To change the throttle operation access the “Throttle Type” setting menu by entering the Main Menu. Navigate to the “Engine Settings” menu entry using “⬇” softkey. When highlighted enter the Engine Settings menu by selecting the “➔” softkey. Navigate through the “Engine Settings” menu using “⬇” softkey until the “Throttle Type” entry is highlighted.



Choose the desired parameter setting by cycling through the list of choices using the “Change” softkey.



Ramp Throttle Operation

Ramp throttle operation allows the user to increment or decrement the desired engine RPM value by 10 RPM. To increment engine rpm simply press the throttle switch in the “Rabbit” position. Pressing the throttle switch in the “Turtle” direction will decrement the engine speed by 10 rpm. Holding the throttle switch in the “Rabbit” or “Turtle” position for > 2 seconds will cause the engine speed to increment or decrement at a rate of 50* RPM / second.

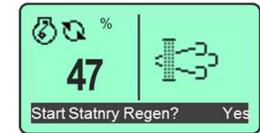
Note: The user cannot adjust the engine speed above or below the configured “Min” and “Max” engine speed settings. See section, *Engine Speed Limits for more details.*

2-State Throttle Operation

Two-state throttle operation allows the operator to choose between two predetermined engine speeds at the single touch of the throttle control. The two predetermined engine speeds are defined by the rpm value

the operator that engine power reduction will occur within 2 hours if stationary regeneration is not completed.

When the operator acknowledges the Power Reduce prompt the control panel returns to normal operation. The system will continue to remind the operator that stationary regeneration needs to be started.



Aborting: Aborting the stationary regeneration process while it is active is accomplished by entering the regeneration menu and selecting inhibit or toggling the throttle switch. Each of these actions will abort the process. When the engine has recognized the abort command the control system will display “Stationary Interrupted”. The operator must acknowledge this screen to return to normal operation.

Recovery Regeneration

Recovery Regeneration is required when stationary regeneration is unable to be completed or has been inhibited for an extended period of time. The recovery regeneration state causes the engine to enter limp home mode preventing normal engine operation. This is the most serious regeneration condition and requires immediate operator intervention to initiate the regeneration process. Failure to initiate recovery regeneration could result in required DPF system service by an authorized engine technician.

Initiating: The control system will alert the operator that recovery regeneration is required by displaying an alert display indicating ‘Limp Home Mode Recovery Required’. This alert will activate even if regeneration has been inhibited.

The operator must acknowledge this alert to continue. Acknowledgement of this alert is completed by momentarily pressing the “✓” softkey.

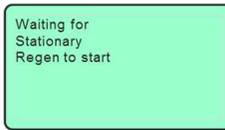


The operator will then be prompted to begin the recovery process or continue to delay the regeneration process. Selecting the “Yes” softkey will proceed with the recovery regeneration process. Selecting the “No” softkey will delay the recovery regeneration process.

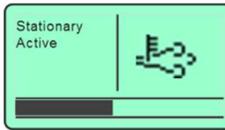


regeneration rpm value”. This value is configured within the ECU and cannot be changed. This value may vary by engine model. For most models this value is 800 rpm.

Continuing with the “Ready to Begin Regeneration” request by selecting “Yes” will command the engine to enter regeneration mode. The control system will display a waiting prompt until the engine acknowledges the stationary regeneration request and enters the regeneration state. Should all conditions not be met the control system will display a checklist of items for the operator to review. See conditions not met.



Active: When the stationary regeneration state has been activated the control system will display a timer showing the progress of the stationary regeneration state. The time to complete stationary regeneration will vary based on the level of cleaning process that is needed. The maximum time is 30 minutes. (Note: Stationary regeneration can be stopped at any time by entering the regeneration menu and selecting regeneration inhibit or by toggling the throttle switch.)

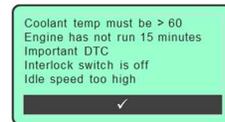


Caution: The regeneration process increases engine rpm. The throttle switch will not control rpm during this time. Care should be taken to ensure all safety measures are met before proceeding to the regeneration process.

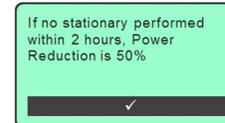
Complete: When stationary regeneration is complete the control system will provide a prompt indicating completion. The engine will return to the minimum engine rpm value and be ready to return to normal operation. The operator must acknowledge the prompt by momentarily pressing the “✓” softkey.



Conditions Not Met: If either condition, engine rpm not lowered to the “slow” rpm setting or the interlock mechanism not set the engine will not enter the regeneration process. The control system will prompt the operator if this condition exists. The operator must acknowledge this display. When acknowledged the control system will cycle back to the start of this sequence.



Delaying: Delaying stationary regeneration is accomplished by selecting “No” to any of the prompts that ask the operator to continue with the regeneration process. Short delays of stationary regeneration are acceptable. This delay is utilized in situations where a machine needs to be moved to a more suitable location for the regeneration process. A system alert will occur informing



configured in the Engine Settings menu for “Min RPM” speed and “Max RPM” speed. Pressing the throttle control in the “Rabbit” position sets the engine rpm to the configured “Max RPM” speed setting. Pressing the throttle control in the “Turtle” position sets the engine rpm to the configured “Min RPM” speed setting.

CAUTION: Changes to settings in the “Engine” menu will take affect while the engine is running. Any change to throttle type setting or engine min/max settings will become active after the change is saved AND a throttle command is issued.

Disabled Throttle Operation

The M154B control allows the user to disable throttle commands. This is accomplished by selecting the “Disable” setting. When selected the transmission of the J1939 TSC1 message is suppressed.

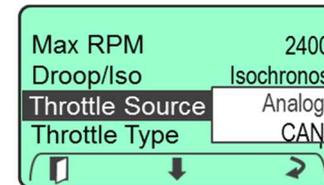
Throttle Source Operation

Yanmar T4F with DPF

The M154B allows the user to select the throttle source as Analog or CAN bus.

To access the “Throttle Source” setting, enter the Main Menu. Navigate to the “Engine Settings” menu entry using “↓” softkey and select “Engine Settings” using the “➡” softkey.

Navigate through the “Engine Settings” menu using “↓” softkey until the “Throttle Source” entry is highlighted. Press the “Change” “⤵” softkey to select the Analog or CAN.



Use the EXIT “⏪” softkey to save the selection and return to the previous display

DPF Regeneration

DPF (Diesel Particulate Filter) is used to filter particulates from the exhaust of diesel engines. Overtime this filter begins to clog as a result of unburned soot in the exhaust. When this occurs the engine determines the state of the filter and engine performance and broadcasts a message to indicate the status of the system regeneration. Regeneration removes the excess particulate matter and returns the engine to its maximum performance.

DPF ICONS and Actions

 = DPF Regeneration Requested. This icon is activated when the engine sends a CANBus message to the control panel indicating the DPF has become restricted.

 = DPF Regeneration Inhibited. This icon is activated when the engine sends a CANBus message to the control panel indicating DPF regeneration is inhibited.

 = DPF Regeneration Active. This icon is activated when the engine detects High Exhaust Temperature due to regeneration.

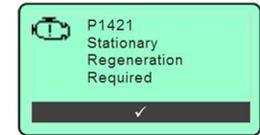
The regeneration process requires the operator to provide the proper inputs to the control system in order for the regeneration process to activate. The control system reduces the complexity of this process by guiding the operator through a series of display prompts. Each display prompt presents to the operator the input choices available by using softkeys. The softkey entry will be located directly above the button associated with this entry. In the example shown below, the “Left” button represents “Allow”. The “Right” button represents “Delay”. Many of the prompts require the operator to acknowledge the condition before the regeneration process will continue. The “Middle” button represents the “✓” softkey which is used for operator acknowledge.



Stationary Regen

Stationary Regeneration is required when normal operation of the engine has prevented automatic regeneration to occur. This condition can occur due insufficient engine loading or operator intervention by inhibiting the regeneration process. This is a more serious condition and requires operator intervention to initiate the regeneration process.

Initiating: The control system will alert the operator that stationary regeneration is needed by displaying an alert display indicating ‘Stationary Regeneration Required’. This alert will activate even if regeneration has been inhibited. The operator must acknowledge this alert to continue. Acknowledgement of this alert is completed by pressing the “✓” softkey.



The operator will then be prompted to “Prepare for Stationary Regeneration” or continue to delay the regeneration process. Selecting the “Yes” softkey will proceed with the stationary regeneration process with the control system guiding the operator through a series of interactive prompts.

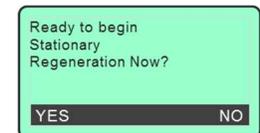


Proceeding or Initiating from Delay: The first display prompts the operator to reduce the engine throttle speed to the minimum rpm value. To return the engine to the minimum rpm value use the throttle switch “Turtle” position and adjust the engine speed to the programmed min rpm setting. (See engine menu for details on configuring min engine speed.)



The prompt also reminds the operator confirm that all interlocks have been set. (Note: Interlocks are application specific, are hardwired into the engine harness and are not controlled by the control panel.) The operator must acknowledge this prompt by momentarily pressing the “✓” softkey.

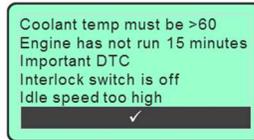
Confirming: The operator will be prompted by the control system to begin the regeneration process. This is a final confirmation by the operator that regeneration is requested. The operator has the choice to begin regeneration by selecting the “Yes” softkey or exiting the regeneration request by selecting the “No” softkey. If all conditions are met the control system will command the engine to the “initiate



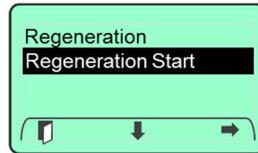
Not 50hrs Since Last Regen: Manual regen will not be allowed if less than 50hrs of engine operation has occurred since the last regeneration cycle. Should this condition exist the control system will prompt the operator of this condition.



Conditions Not Met: If either condition engine rpm not lowered to the “slow” rpm setting or the interlock mechanism not set the engine will not enter the regeneration process. The control system will prompt the operator if this condition exists. The operator must acknowledge this display. When acknowledged the control system will cycle back to the start of this sequence.



Exiting the manual regeneration request by selecting “No” will take the operator back to the regeneration menu. At time the operator can re-enter the regeneration start sequence or exit the menu and proceed to normal operation.



Aborting: Aborting the manual regeneration process while it is active is accomplished by entering the regeneration menu and selecting inhibit or toggling the throttle switch.

Regeneration Modes

The Yanmar Tier 4F engine has 4 regeneration states.

- **Automatic or Reset** – This is the most common regeneration state and occurs without operator intervention.
- **Manual** – This regeneration state is initiated by the operator through the control panel menu. Manual regeneration can be initiated by the operator at any time as long as the engine has run at least 50 hours since the last regeneration cycle.
- **Stationary** – This regeneration state is more serious. Continued engine operation with this request active will ultimately cause the engine to enter a recovery state and enter limp mode. This state will be entered should the operator continue to operate the engine with regeneration inhibited while ignoring the control system requests for regeneration.
- **Recovery** – Recovery regeneration is entered when the engine cannot perform regeneration. When in this mode the engine will enter a limp home mode limiting engine operation. It recommended that the operator perform regeneration immediately.

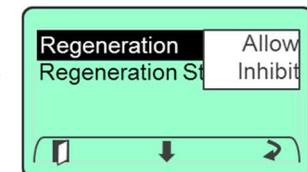
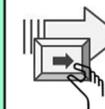
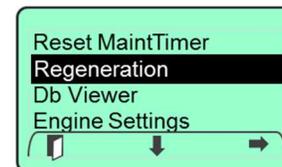
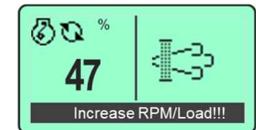
Reset Regen Normal

Active: Automatic or Reset Regeneration is performed when normal engine operation provides sufficient exhaust temperatures AND regeneration is not inhibited by the operator. During this process a “High Exhaust Temperature” icon will be displayed warning the operator that high exhaust temperatures are present.



Regeneration Inhibited due to Low Exhaust Temp:

Should regeneration be required but the DOC Temperature is too low the control system will generate a display showing regeneration is requested. This condition is typically a result of insufficient engine loading. The control system indicates to the operator that engine load should be increased.



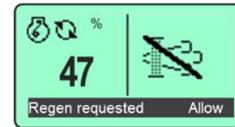
Should regeneration be required but regeneration has been delayed or inhibited by the operator the control system will generate a display indicating that “Auto Regeneration is Requested”. When alerted the operator will be given a choice to allow the regeneration process to proceed or continue to delay the regeneration process.



When the operator selects “Allow” the control panel will guide the operator through an interactive sequence of displays to start regeneration.



Selecting “Delay” will continue to inhibit the regeneration process. The main display will indicate inhibited regeneration by displaying the regeneration inhibited indicator. While in the delay state, the M154L Control System will pop-up the Auto Regeneration Requested display every 30 minutes.

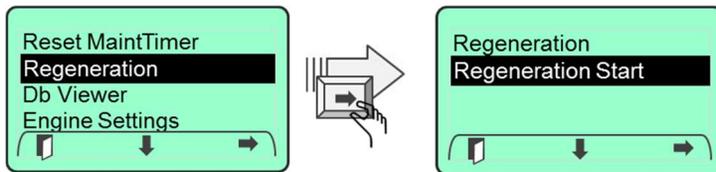


Note: Continuing to delay regeneration will cause the engine controller to eventually proceed to a more immediate regeneration state (“Stationary Regeneration”). When in this mode the engine must be parked and normal operation will not be allowed.

Manual Regeneration

Manual Regeneration allows the operator to decide when and where to perform the regeneration process.

Initiating: The control system provides a menu selection to initiate this process.



Requesting: When manual regeneration has been initiated by selecting “Regen Start”, the control system will provide a prompt indicating that it is requesting the engine to enter manual regeneration mode.

Proceeding: The operator will be guided through a series of display prompts before engine regeneration has been activated. The first prompt will ask the operator to reduce the engine throttle speed to the minimum rpm

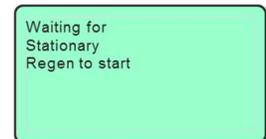


value. To set the minimum rpm value set the throttle switch to the slow setting. The operator will also be asked to confirm all interlocks have been set. Interlock settings are prewired from the factory and no additional input is needed from the operator for this setting. The operator must acknowledge this prompt by momentarily pressing the “✓” softkey. If all conditions are met the control system will command the engine to the “initiate regeneration rpm value”. This value is configured within the ECU, cannot be changed and may vary from model to model. For most models this value is 800 rpm.

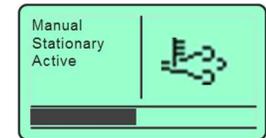
Confirming or Initiating from Delay: The control system proceeds to prompt the operator with a regeneration confirmation screen. This is a final confirmation by the operator that regeneration is requested. The operator has the choice to begin regeneration by selecting the “Yes” softkey or exiting the regeneration request by selecting the “No” softkey.



Continuing with the regeneration request by selecting “Yes” will command the engine to enter regeneration mode. The control system will display a waiting prompt until the engine acknowledges the manual regeneration state.



Active : When the manual regeneration state is active the control system will display a timer showing the progress of the manual regeneration state. The time to complete manual regeneration will vary based on the level of cleaning process that is needed. The maximum time is 30 minutes.



(Note: Manual regeneration can be stopped at any time by entering the regeneration menu and selecting regeneration inhibit or toggling the throttle switch.)

Caution: The regeneration process increases engine rpm. The throttle switch will not control rpm during this time. Care should be taken to ensure all safety measures are met before proceeding to the regeneration process.

Complete: When manual regeneration is complete the control system will provide a prompt indicating completion. The engine will return to the minimum engine rpm value and be ready to return to normal operation. The operator must acknowledge the prompt by momentarily pressing the “✓” softkey.

