M154B *series* J1939 Universal Control
for Electronically Governed Engines

Installation / User Manual

For

Cummins QSF 4.5 Engines

P/N: MN10071-00

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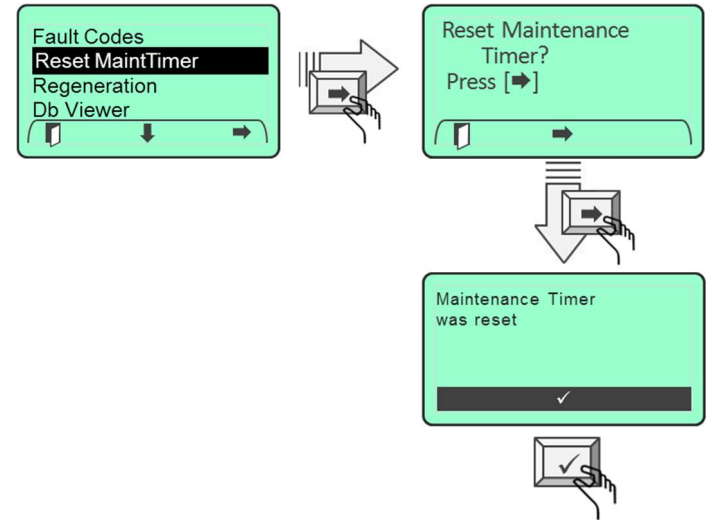
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When a T4F Engine requires Selective Catalytic Reduction (SCR), the DEF Tank Level bar graph is displayed on all displays for both single and dual display formats. The bar graph cannot be removed.

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 "↻" softkey to access the next data display available.
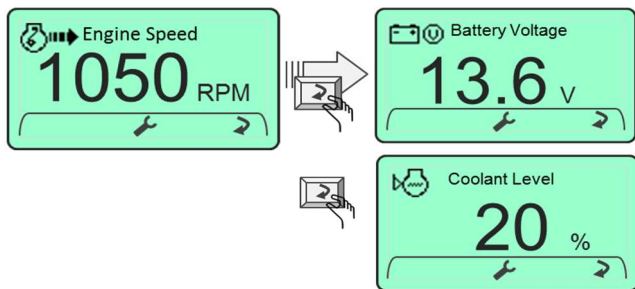
See Appendix B Display List for complete selection of data displays available.

Engine Settings
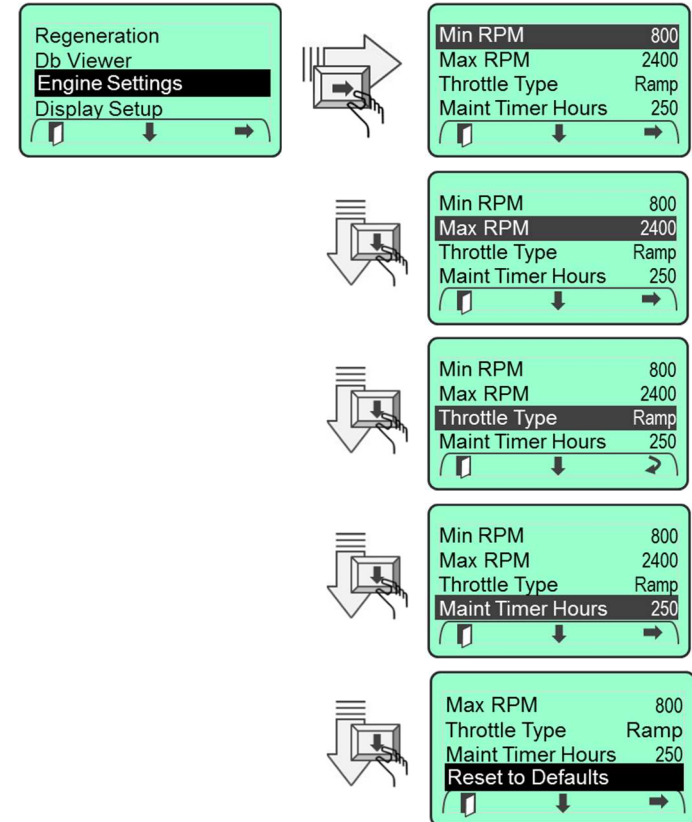
Regeneration
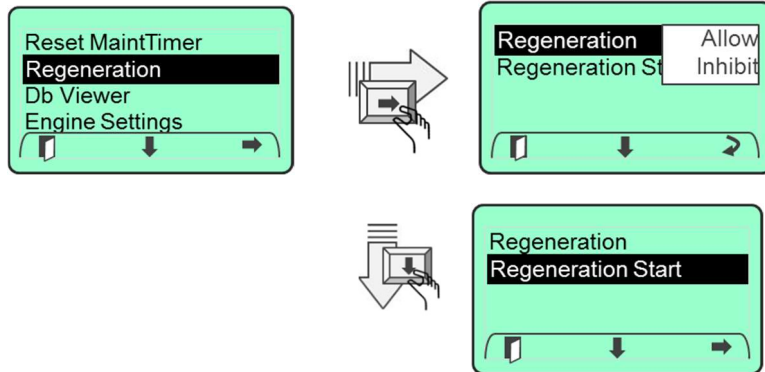
DB Viewer
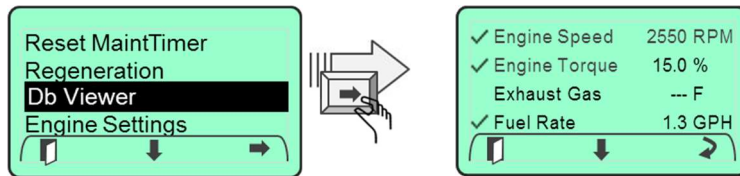
Dual Data Format

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 "↻" softkey to access the next data display available.

Single Data/System Status Format

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 up to 6 icons to identify which area needs attention: Engine Faults, Regeneration or the SCR System.
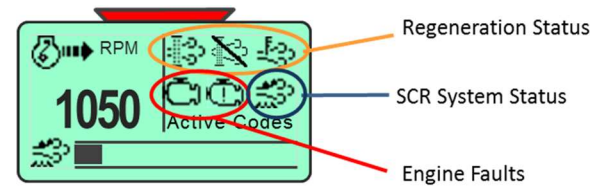
The SCR System Status icon will be displayed when there is a problem with the SCR System. If not addressed the icon will start to flash. If the issue is not addressed, the Engine performance will be derated and the Engine icon will also appear. If unattended, the Engine will be shut down.

Refer to the SCR System Status section of this manual for a detailed explanation of the SCR System icons and meaning.

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.
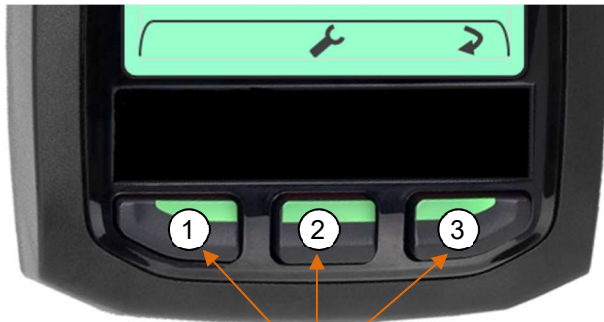
Navigation Buttons

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

Dual Data Format

V	BAR	%	C	%	F
13.6	1.01	38	70.0	20	167.0

C	C	F	KgH	HRS	%
127.0	459.0	167.0	3.5	38	47

RPM	%	F	PSI	GPH	C
1050	48	258.0	14938.0	3.5	47.0

KgH	C	PSI	F	HRS	%
3.5	29.4	22.0	158.0	150	80

PSI	F	RPM	F	F	HRS
43.5	217.0	1200	158.0	260.0	38

%	PSI	V	C
36	22.0	13.6	127.0
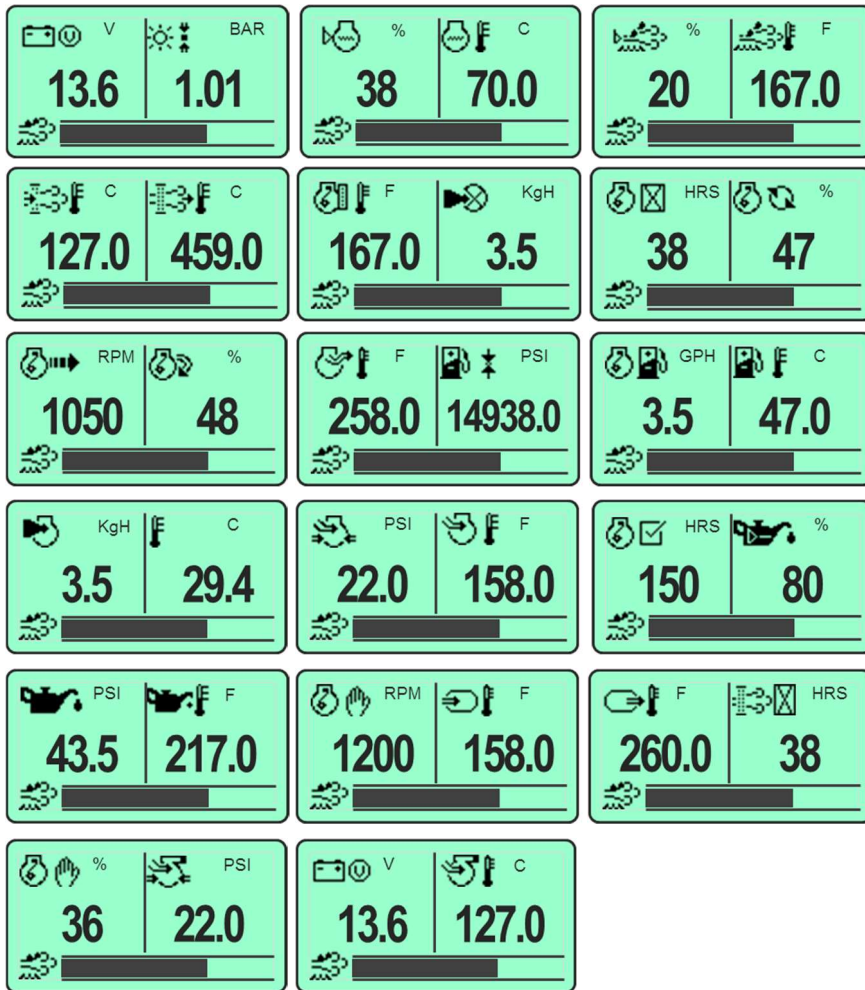
Accessing the Main Menu

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.

Engine Speed
1050 RPM

Fault Codes
Reset MaintTimer
Regeneration
Db Viewer
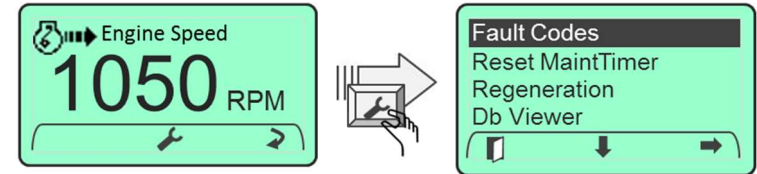
Navigating the Main Menu

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.

Fault Codes
Reset MaintTimer
Regeneration
Db Viewer
Engine Settings
Display Setup
About

Exit Softkey
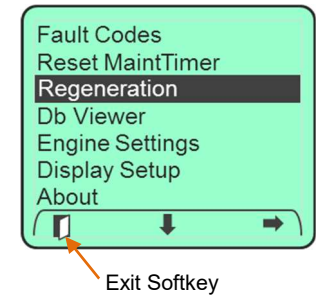
Changing Parameter Settings

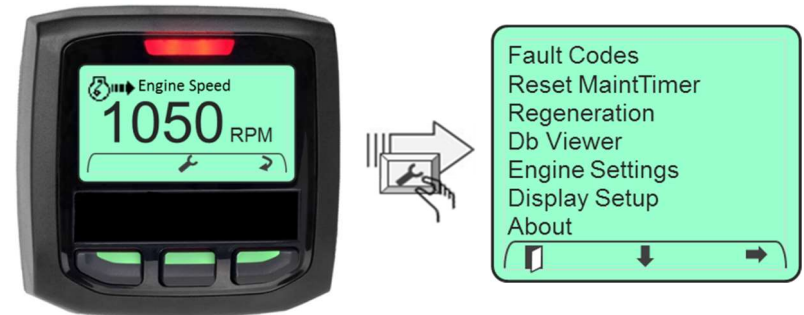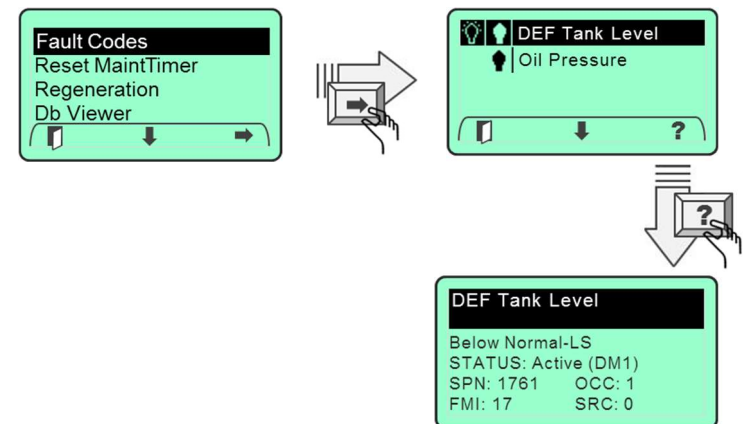Parameter settings can be changed in one of two ways; using the "**+**" / "**-**" softkeys to increment and decrement a numeric value or using the "**Change**" softkey to toggle through a predetermined list of settings or the. The M154B guides the user through this process by dynamically providing the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

Min RPM	800
Max RPM	2400
Throttle Type	Ramp
Maint Timer Hours	250

Min RPM	600....
Max RPM	3150..
Throttle Type	Ramp
Maint Timer Hours	250
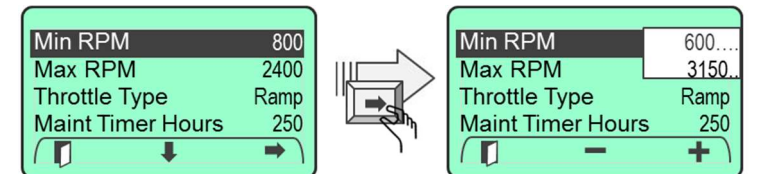
Changing a Selection

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 "↻" 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.

Min RPM	800
Max RPM	2400
Throttle Type	Ramp
Maint Timer Hours	250

Min RPM	800	2-State
Max RPM	2400	Ramp
Throttle Type		Disable
Maint Timer Hours	250	
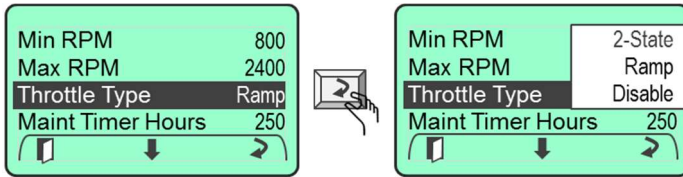
Use the EXIT "🚪" softkey to save the selection and return to the previous display.

Single Data Format – con't

Inlet Air MFR	Intake Fresh Air	Intake Manifold Temp
3.5 KgH	29.4 C	158.0 F

Intake Manifold Press	Maintenance	Oil Level
22.0 PSI	150 HRS	80 %

Oil Pressure	Oil Temp	Requested Speed
60.3 PSI	217.0 F	1200 RPM

Throttle Position	Turbo Inlet Press	Turbo Inlet Temp
36 %	22.0 PSI	127.0 C

SCR Inlet Temp	SCR Outlet Gas Temp	Since Last Regen
158.0 F	260.0 F	38 HRS

Appendix B – Display List

Single Data Format

Note: Available data is dependent on model.

Battery Voltage	Barometric Pressure	Coolant Level
13.6 V	14.6 PSI	20 %
Coolant Temp	DEF Tank Level	DEF Tank Temp
167.0 F	20 %	167.0 F
DOC Inlet Temp	DOC Outlet Temp	ECU Temp
127.0 C	459.0 C	167.0 F
EGR MFR	Engine Hours	Engine Load
3.5 KgH	38 HRS	47 %
Engine Speed	Engine Torque	Exhaust Gas Temp
1050 RPM	48 %	258.0 F
Fuel Rail 1	Fuel Rate	Fuel Temp
14938.0 PSI	3.5 GPH	47.0 C

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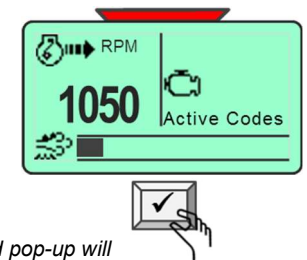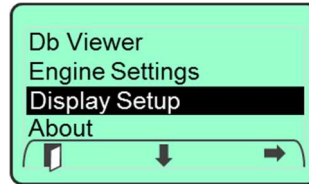
Note: If the fault condition is cleared the associated pop-up will automatically be removed.
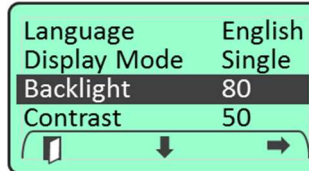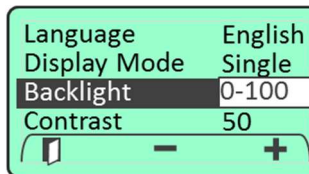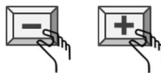
Contrast and Lighting

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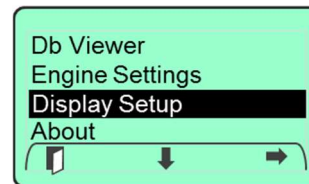
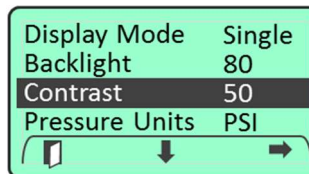Use the ✚ / - softkeys to set the backlight value.

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.
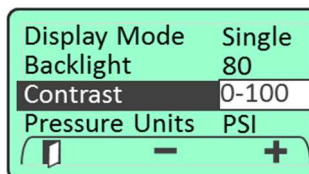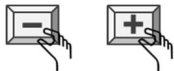
Appendix A – Displayed Data

| Parameter	Identifier	PGN	SPN
Active Faults	DM1	65226	
Stored Faults	DM2	65227	
Barometric Pressure	AMB	65269	108
Battery Voltage	VEP	65271	168
Coolant Level	EFL/P1	65263	111
Coolant Temperature	ET1	65262	110
DEF Tank Level	AT1T1I1	65110	3517
DEF Fluid Temperature	AT1T1I1	65110	3031
Direct Lamp Control	DLCC	64775	623/624
DOC Inlet Temperature	A1DOC	64800	4765
DOC Outlet Temperature	A1DOC	64800	4766
ECU Temperature	ET2	65188	1136
EGR Mass Flow Rate	EGF1	61450	132
Engine Hours	HOURS	65253	247
Engine Load	EEC2	61443	92
Engine Speed	EEC1	61444	190
Engine Torque	EEC1	61444	513
Exhaust Gas Temperature	IC1	65270	173
Exhaust Manifold Pressure	Proprietary	65280	
Fuel Rate	LFE1	65266	183
Fuel Pressure – Rail 1	EFL/P2	65243	157
Fuel Temperature	ET1	65262	174
Intake Fresh Air	AMB	65269	171
Intake Manifold Pressure	IC1	65270	102
Intake Manifold Temperature	IC1	65270	105
Oil Level	EFL/P1	65263	98
Oil Pressure	EFL/P1	65263	100
Oil Temperature	ET1	65262	175
Requested Speed	TSC1	00000	696
SCR Intake Temperature	A1SCREGT1	64830	4360
SCR Outlet Temperature	A1SCREGT1	64830	4363
Hours Since Last Regeneration	AT1S2	64697	6941
Throttle Position	LFE1	65266	51
Turbo Intake Pressure	TCI3	65177	1176
Turbo Intake Temperature	TCI3	65178	1172
Wait To Start	SHUTDN	65252	1081

Troubleshooting Guide

Symptom	Action
Key "ON"; No display or alarm sounded	• 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.	• 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.	• Check display contrast/lighting level • Replace tachometer gauge
Key "ON"; Display "ON"; Engine data is missing or intermittent.	• 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	• 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	• 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.	• 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.	• Check User Setting menu. Throttle Type set for 2-State or is disabled.

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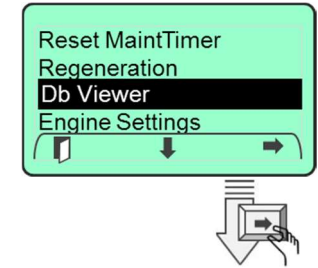
The display will present a listing of the data in alphabetical order and provide a realtime update of the data values. Any data parameter that cannot read data from the CANbus will show dashes "---" in the data value field.
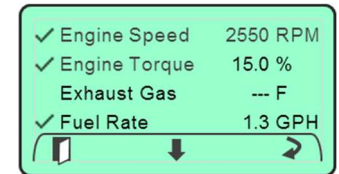
Display Mapping

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.
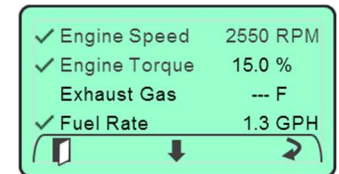
A checkmark will be shown to indicate the data parameter has been selected for the rotation list.
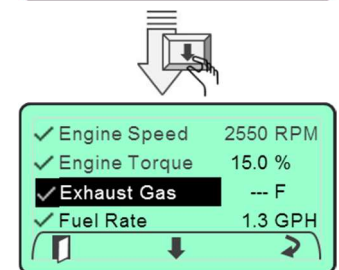
To remove a data parameter from the rotation list, select the desired data parameter and remove the selection using the "Change" softkey.

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.
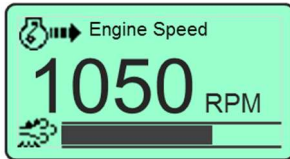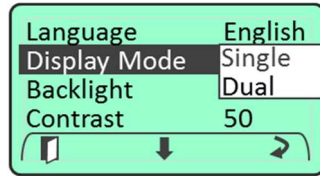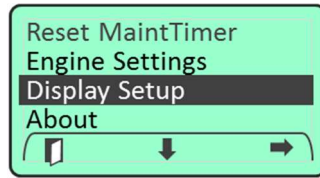

Single Display
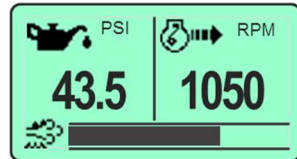
Dual Display

System Components

PART NUMBER	DESCRIPTION
M154B00-M3017	Kit; Eng Ctrl, J1939, Cummins T4F SCR Series, 2.3" Dpy
M154B01-M3017	CP; Eng Ctrl, J1939, Cummins T4F SCR Series, 2.3" Dpy, 8x6 PNL MNT
M154B10-M3017	CP; Eng Ctrl, J1939, Cummins T4F SCR Series, 2.3" Dpy, 8x7 ENCL
M154B20-M3017	CP; Eng Ctrl, J1939, Cummins T4F SCR Series, 2.3" Dpy, NEMA 4X ENCL
DS1104-M3017	DP; 2.3", J1939 Ctrl, Cummins T4F SCR Series, 2.3" Dpy, std ver
MN10071	Manual; User/Install, M154B Series Cummins QSF28 T4F
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)
1000146-50	Harness; Control, M154B Series

Connection Details

Control Harness

PN:1000146-50 The main control harness provides connections from the engine to the controller, throttle switch, and key switch.
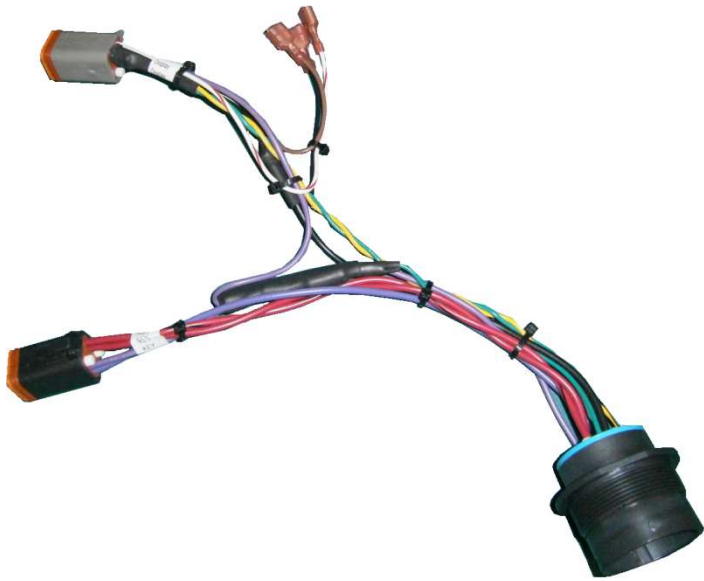
Control Harness Connector Details

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

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.
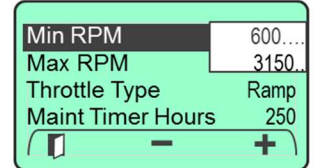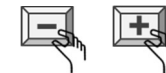
Setting Min Engine Speed

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.
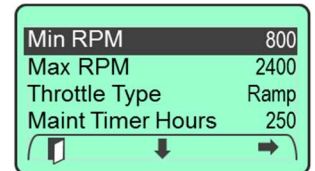
Navigate through the "Engine Settings" menu using "⬇" softkey until the "Min RPM" entry is highlighted. Press the "➡" softkey to select the min RPM entry setting.

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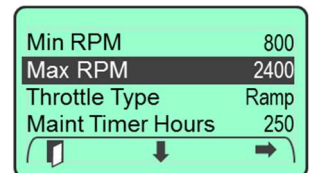
Use the ✚ / - softkeys to set the maximum engine rpm value.

Use the EXIT " 🚪 " softkey to save the selection and return to the previous display.
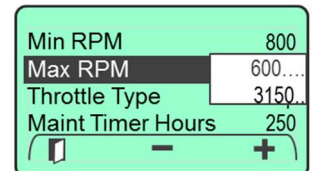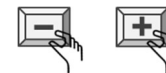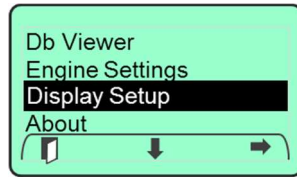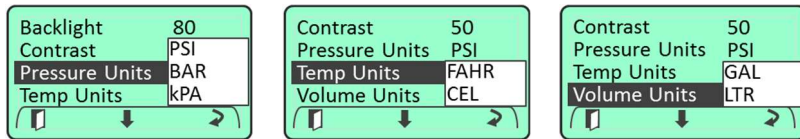
Engineering Units

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.

```
Db Viewer
Engine Settings
Display Setup
About
 📖        ⬇        ➡
```

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

```
Backlight      80
Contrast       PSI
Pressure Units BAR
Temp Units     kPA
 📖      ⬇      ⤴
```
```
Contrast        50
Pressure Units  PSI
Temp Units      FAHR
Volume Units    CEL
 📖      ⬇      ⤴
```
```
Contrast        50
Pressure Units  PSI
Temp Units      GAL
Volume Units    LTR
 📖      ⬇      ⤴
```

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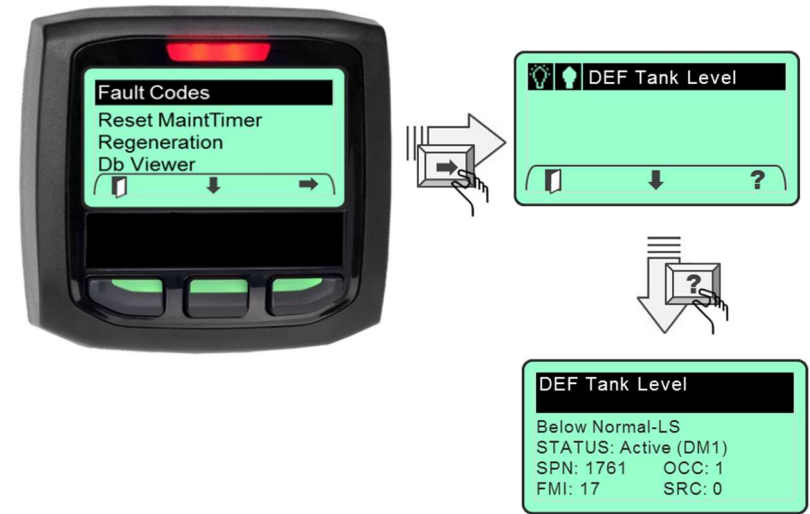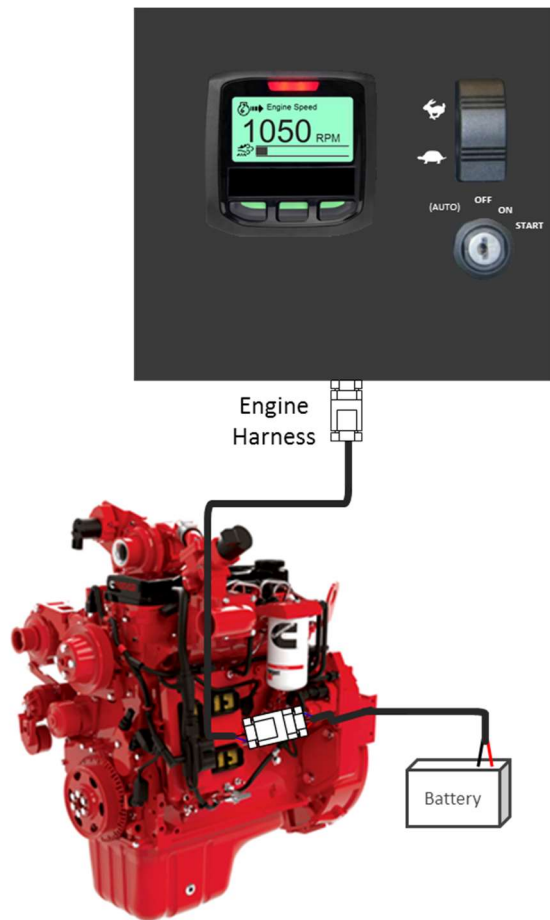
Fault Codes

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.

Wiring Diagram

System Block Diagram

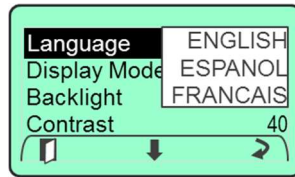|	Active Fault
	Stored Fault
	Active & Stored Fault
	Active Fault
	Stored Fault
	Active & Stored Fault
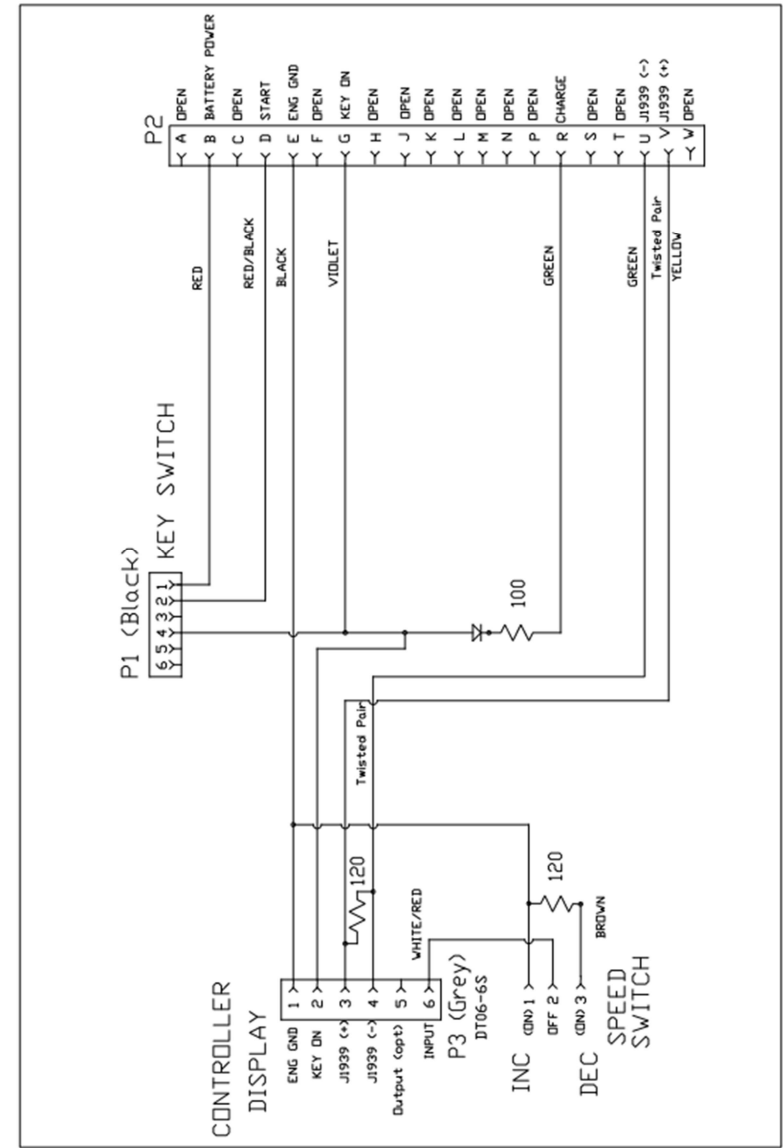
Unknown Fault Codes

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.
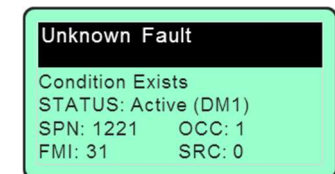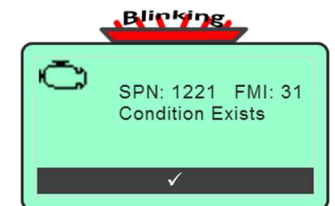
Language Selection

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.

```
Language        ENGLISH
Display Mode    ESPANOL
Backlight       FRANCAIS
Contrast            40
┌─┐
│ │      ↓           ↱
```

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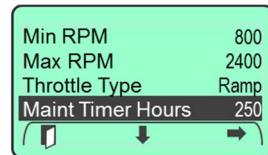
Maintenance Timer

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.
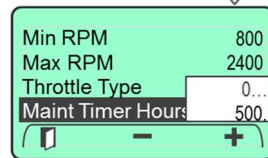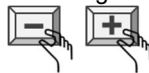
Setting Maintenance Timer

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.

```
Fault Codes
Reset MaintTimer
Engine Settings
Display Setup
┌─┐
│ │      ↓           ➡
```
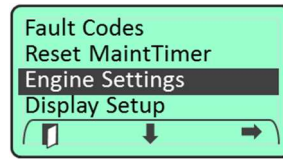
Navigate to the "Maint Timer Hours" entry using the "↓" softkey. Use "➡" softkey to select maintenance timer hours.

```
Min RPM            800
Max RPM           2400
Throttle Type     Ramp
Maint Timer Hours  250
┌─┐
│ │      ↓           ➡
```

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

```
Min RPM            800
Max RPM           2400
Throttle Type      0…
Maint Timer Hours  500…
┌─┐
│ │      —           +
```

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.

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	
Minimum Engine RPM	800 RPM
Maximum Engine RPM	3150 RPM
Throttle Type	RAMP Mode
Maintenance Timer	250 Hours
Passcode	OEM Specfied 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.

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.
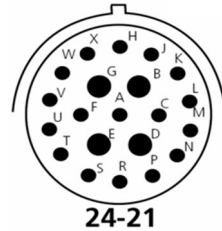
24-21

| 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
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,J, 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

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.
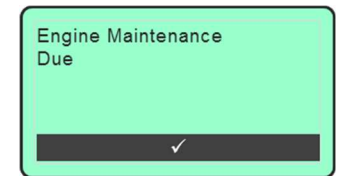
Engine Maintenance Due
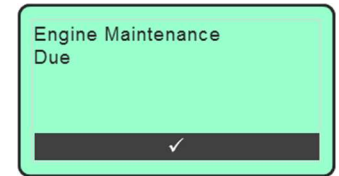
Acknowledging Maintenance Timer

Acknowledge the maintenance alert by selecting the acknowledge "✓" softkey.
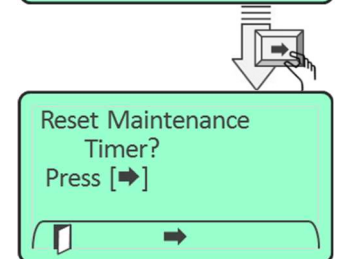
Resetting Maintenance Timer

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.

Engine Maintenance Due

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.

Fault Codes
Reset MaintTimer
Engine Settings
Display Setup
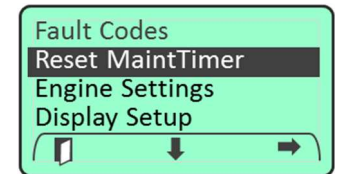
Press the "➡" softkey to reset the timer.

Reset Maintenance Timer?
Press [➡]

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

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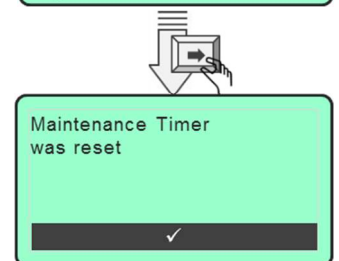
Note: The maintenance hours data display will indicate 0 hrs when the timer has expired and the operator has not yet reset the timer.

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.
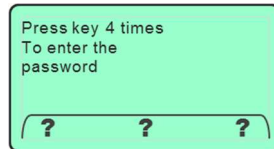
Entering Passcode

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
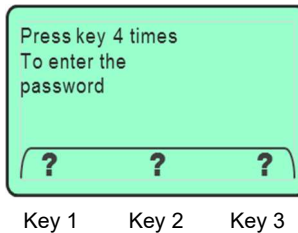
Installing the System

⚠ 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.

SCR After Treatment Operation

Diesel Exhaust Fluid (DEF) Monitoring

The M154B Control System monitors the engines response to DEF Level and Quality and provides continuous feedback to the operator. All M154B displays provide a bar graph showing the level of the DEF Tank. This level is measured by the engine and communicated to the control system. Using a standard ICON along with varied presentation techniques the control display provides the operator with up-to-date status of the DEF System. The DEF ICON and typical data display is shown below.

DEF ICON
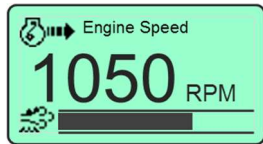
SCR System Status

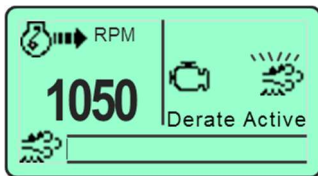The engine provides the following levels of SCR System feedback indications.

1. Warning 1 – DEF Tank Level <10%
2. Warning 2 – DEF Tank Level <5%
3. Initial Engine Derate – DEF Tank Level <2.5%
4. Secondary Engine Derate – DEF Tank Level Empty
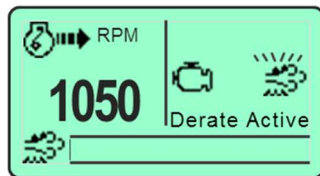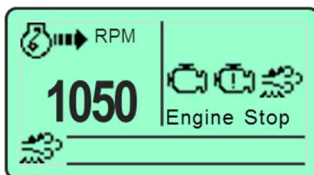5. Final Engine Derate – Engine Stop (configuration dependent)

Warning 1

Warning 2

Initial Engine Derate

Secondary Engine Derate

Final Engine Derate

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 selection using the "Change" softkey.

When regeneration is inhibited the M154B Control System will alert the operator by presenting the regeneration inhibit ICON.
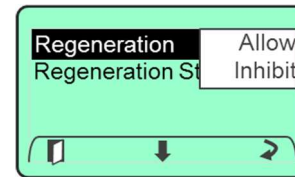
Note: Inhibiting regeneration for extended periods can cause the engine to enter various levels of derate inducements.

Reset to Defaults

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.
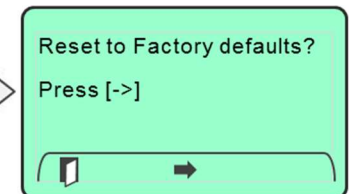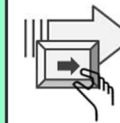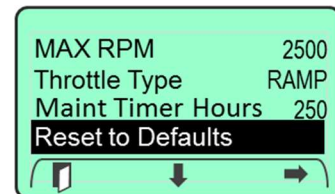
Press the "➡" softkey to return the unit to factory defaults.
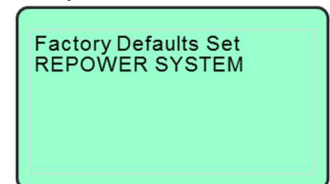
Throttle Switch Operation

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.
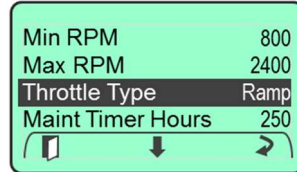
Min RPM	800
Max RPM	2400
Throttle Type	Ramp
Maint Timer Hours	250

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

Min RPM		2-State
Max RPM		Ramp
Throttle Type		Disable
Maint Timer Hours		250
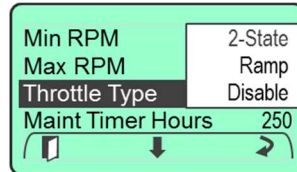
Ramp Throttle Operation

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 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

---

Conditions Not Met: If any condition is not met the regeneration start process will fail. When this occurs the control system prompts the operator of this failure by providing a list of possible reasons for the failure. After acknowledging the prompt the operator will be guided back to the regeneration "Acknowledging" screen.

| Check Interlocks |
| Exhaust Temp Too Low |
| Active Faults |
| Idle speed too high |
| ✓ |
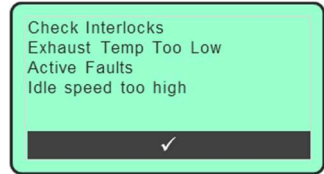
Note: An active regeneration process can be interrupted at any time by pressing the throttle switch or inhibiting regeneration via the regeneration menu.

Delaying Regeneration

When normal operation does not allow the engine to perform the cleaning process the control system will be alerted by the engine that regeneration is needed. When the control system is alerted an operator prompt is displayed. This display allows the operator to enter regeneration or delay

| Regeneration |
| Requested |
| Allow | Delay |

the regeneration process for a later time. Should the operator choose to delay regeneration the prompting display will occur every 30 minutes. This allows the operator to start the regeneration process at that time or continue to delay.

This condition can occur due to insufficient engine loading or operator intervention by inhibiting regeneration. When this condition exists it is recommended that the operator initiate the regeneration process without significant delay.

When regeneration is delayed, the system will alert the operator by activating the Regeneration ICON.

1050 | Regen Req'd

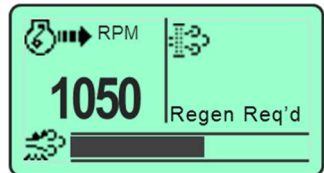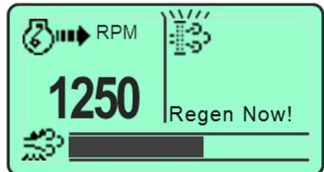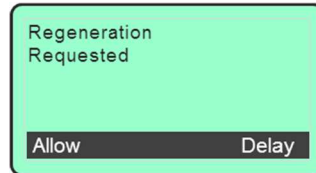Should the operator continue to delay regeneration the need for regeneration will become more severe. When this condition exits the control system will present the "Regen Now" display.
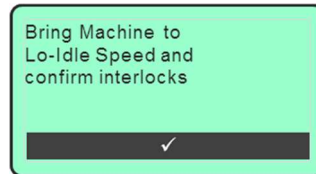
1250 | Regen Now!

Non-Mission Regeneration

Non-mission regeneration is performed when the cleaning process is unable to be completed through normal engine operation. When this condition exists the operator will be prompted to allow regeneration or delay regeneration.

Acknowledging: Should the operator allow regeneration the control system will guide the operator through the regeneration sequence to start the regeneration process.
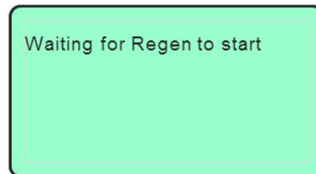
Proceeding: This display prompts the operator to lower the engine speed to the Min RPM setting that has been configured in the Engine Settings menu. It also prompts the operator to ensure all interlocks are set. The engine speed must be lowered or the control system will not initiate the regeneration process.
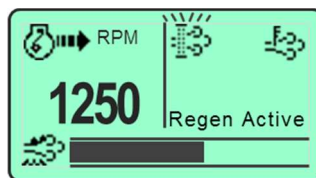
Note: Engine speed must be within +/- 100 rpm of Min RPM setting.

Any interlock that is not set will also prevent the regeneration process from starting. Please consult engine specification and configuration settings to determine which interlocks must be set. The control system receives information from the engine indicating status of the interlock system. The control system does not determine which interlocks must be set.

Waiting for Regen to Start: When all conditions have been met for regeneration to start the control system will command the engine to enter regeneration. The operator is prompted while the control system is waiting for regeneration to start.

Regen Active: When regeneration becomes active the control system will exit to the data display state and provide indications of the regeneration process.

When regen is active the regeneration ICON will be active and blinking. When the Exhaust Temperature becomes high enough the High Exhaust System Temperature ICON will activate.

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.
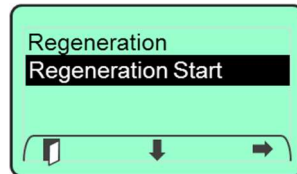
Regeneration

In-Mission Regeneration

In-Mission regeneration occurs when normal engine operation provides favorable conditions for emissions cleaning. During the regeneration process active dosing and/or high exhaust temperatures will cause the High Exhaust Temperature (HEST) Icon to become active. The M154B Control System will alert the operator to this condition via the display show below.
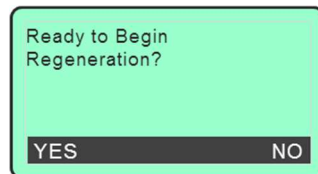

HEST ICON

Manual Regeneration

Manual regeneration is not passcode protected and is accessible by the operator. The manual operation to start regeneration allows the operator to decide when and where to perform the regeneration process.
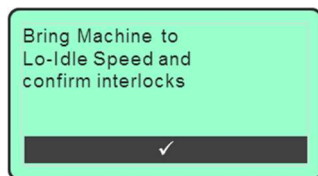
Initiating: To force the regeneration process access the main menu and navigate to the "Regeneration" menu selection. Select "Regeneration" using the "➡" softkey and then select the Regeneration Start entry. The system will guide the operator through the sequence of events to start regeneration.

Acknowledging: The operator will be prompted to acknowledge their intent to start the regeneration process. Answering "No" exits the regeneration start process. Answering "Yes" continues to the next sequence in starting regeneration.
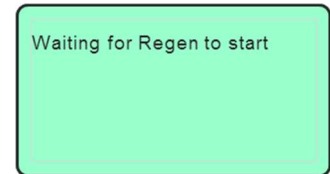

Proceeding: This display prompts the operator to lower the engine speed to the Min RPM setting that has been configured in the Engine Settings menu. It also prompts the operator to ensure all interlocks are set. The engine speed must be lowered or the control system will not initiate the regeneration process.
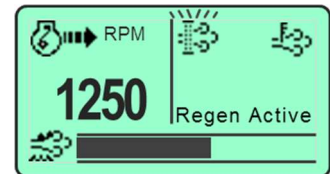

Note: Engine speed must be within +/- 100 rpm of Min RPM setting.

Any interlock that is not set will also prevent the regeneration process from starting. Please consult engine specification and configuration settings to determine which interlocks must be set. The control system receives information from the engine indicating status of the interlock system. The control system does not determine which interlocks must be set.

Waiting for Regen to Start: When all conditions have been met for regeneration to start the control system will command the engine to enter regeneration. The operator is prompted while the control system is waiting for regeneration to start.

Regen Active: When regeneration becomes active the control system will exit to the data display state and provide indications of the regeneration process.

When regen is active the regeneration ICON will be active and blinking. When the Exhaust Temperature becomes high enough the High Exhaust System Temperature ICON will activate.

Conditions Not Met: If any condition is not met the regeneration start process will fail. When this occurs the control system prompts the operator of this failure by providing a list of possible reasons for the failure. After acknowledging the prompt the operator will be guided back to the regeneration "Acknowledging" screen.

Note: An active regeneration process can be interrupted at any time by pressing the throttle switch or inhibiting regeneration via the regeneration menu.