ROADRELAY™ 5

User's Guide

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1 Introduction

The RoadRelay 5™ (hereafter referred to as "RoadRelay™") is a vehicle monitoring system that helps drivers perform better and helps owners collect important information about the operation and performance of the vehicle.

Driver benefits include fuel economy feedback information (see "Leg Information" section), estimated time of arrival (see "Estimated Time of Arrival (ETA)" section), a built-in clock with alarm (see "Using the Clock" and "Using the Alarm" sections), driver coaching and driver information pop-ups (see "Pop-ups" section), and many other features.

For protection of the vehicle and the property it is carrying, the anti-theft feature (see "Anti-theft" section) can be used.

To help service the vehicle, information from the Engine Control Module can be viewed (see "Vehicle Monitor" section). To help troubleshoot vehicle problems, fault information is displayed when a fault occurs and then stored for later access by service personnel (see "Fault Information" section). Maintenance is assisted by the use of periodic maintenance pop-ups and stored service information (see "Scheduled Maintenance" and "Service History" sections).

Additionally, if you use the PowerSpec™ office software, many other types of stored information such as trip data, fault information, sudden deceleration events, and much more can be extracted and presented in easy-to-read reports. RoadRelay™ configurations (Feature Settings) and firmware can be changed with PowerSpec™.

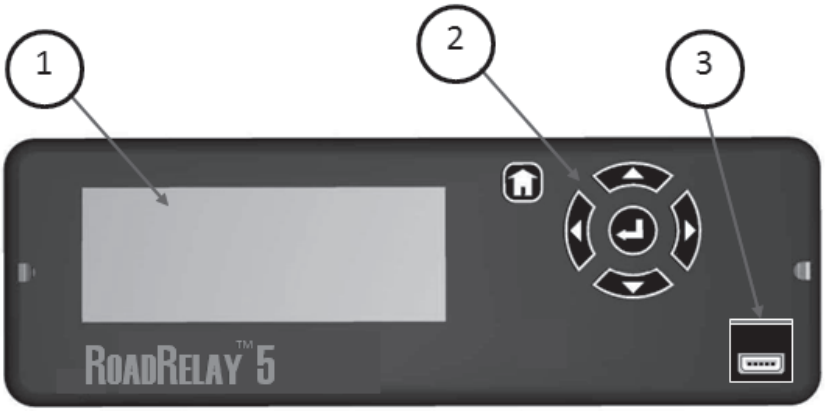
2 Assumptions

This User's Guide assumes that the RoadRelay™ has been properly installed (refer to the RoadRelay Installation Guide for installation and troubleshooting information).
The RoadRelay™ will work with all electronic engines. The examples assume that the engine is a late-model Cummins engine (Celect Plus, ISB, ISC, ISL, ISM, ISX). Some (very few) screens and features will not be present when the RoadRelay™ is used with engines other than those listed. Contact your distributor for details.

3 Getting Started

When first using the RoadRelay™, reading a few sections of this manual will allow you to quickly start using the product. The recommended sections are “Front Panel Features”, Rear Panel Features”, "Using the Keypad", "Configuring for a RV or Heavy Duty Application", "Selecting a Language", "Using the Clock", and "Units of Measure". Scan the Table of Contents to find other sections that explain features you wish to use.

4 Front Panel Features



1. Display
2. Navigational keypad
3. Mini USB Port

4.1 Display

192 x 64 pixel monochrome LCD display with LED backlighting.

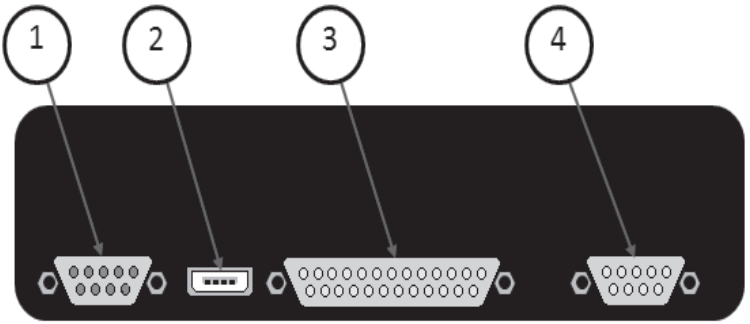
4.2 Navigational Keypad

The keypad consists of five navigation keys and one HOME key. The keys are backlit for easy reading in low light situations.

4.3 Mini USB Port

The front panel USB port interfaces the RoadRelay™ to a personal computer. This port functions as a built-in RP1210 compliant data link adapter. The data link adapter communicates with all J1939 electronic devices connected on the vehicle network. RP1210 applications such as Cummins PowerSpec™ can utilize this port to communicate to the Cummins engine and the RoadRelay™. Likewise, non-Cummins RP1210 applications can use this port to communicate with their network devices as well. To find out more about PowerSpec™, visit www.powerspec.cummins.com or talk to your local Cummins distributor.

5 Rear Panel Features



1. DB-9 serial port (female)
2. USB port
3. DB-25 Connector
4. DB-9 serial port (male)

5.1 DB-9 Serial Port (Female)

This communications port is used to connect the RoadRelay™ to a personal computer. It has the same functionality as the front panel USB port.

5.2 Standard USB Port

The rear panel USB host port is reserved for future use.

5.3 DB-25 Connector

This connector interfaces all the RoadRelay™ electrical connections including vehicle network connections. Refer to the RoadRelay 5™ Installation Manual for further details.

5.4 DB-9 Serial Port (Male)

This communications port can be customized to support National Marine Electronic Association (NMEA) devices (GPS devices) and the Cummins proprietary Open Interface (OI) protocol.

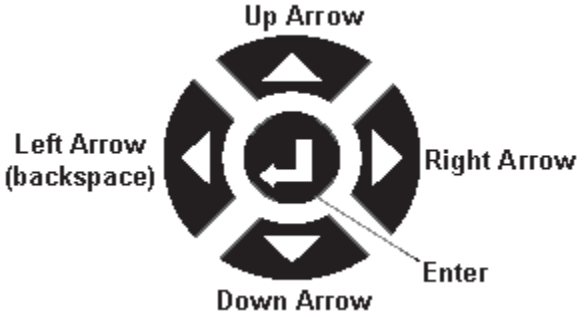
6 Using the Keypad

Related sections: Leg Information- Automatic Leg Screens

NOTE: All examples will start from an AUTO LEG screen. See the "Leg Information" section to view these screens. To reach an AUTO LEG screen press the HOME key . The HOME key toggles between the top menu screen and the AUTO LEG screen.

The RoadRelay™ has a six key back-lit keypad. Five keys are used to navigate through the different screens and to enter data. The Home key toggles between the top level icon screen and the AUTO LEG screen. The HOME key serves as a quick way to return to the AUTO LEG screen or the top menu screen regardless of where you are located in the RoadRelay™ menu system. A picture of each key and its name is shown below.

Home



Note: The RoadRelay™ will automatically power down 15 seconds after the key switch is turned off. The RoadRelay™ may be powered by pressing the ENTER key. As a long as any key is pressed within 15 seconds, the RoadRelay™ will remain powered.

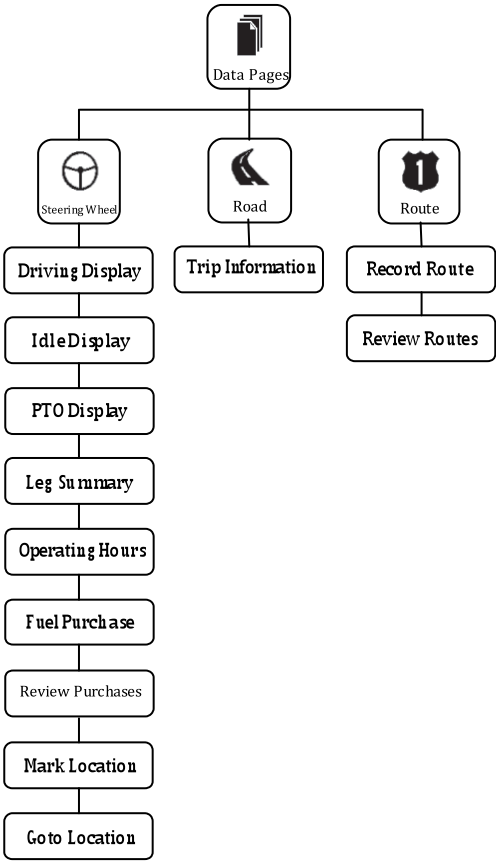
7 Icon Overview

The RoadRelay™ menu system consists of three top level icons: A Data Pages, Vehicle, and Configuration/Settings icon.

Each top level icon is assigned three secondary icons. Under each secondary icon is a list of RoadRelay™ features.
The RoadRelay™ menu topography is described in the following sections.

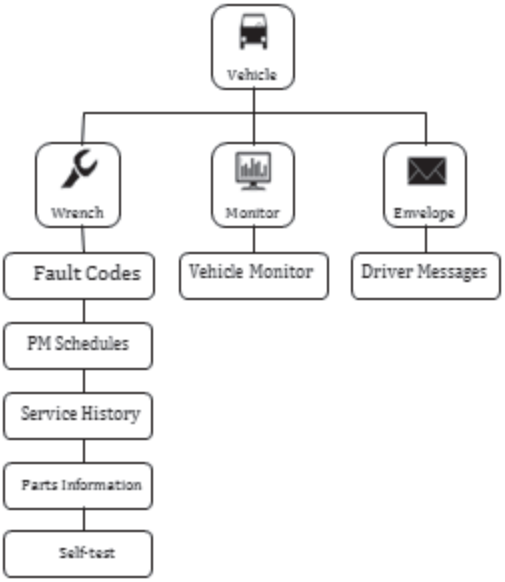
7.1 Data Pages Icon Menu

The Data Pages icon menu consists of three secondary icons: Steering Wheel, Road, and Route icons. The features under each secondary icon are illustrated in the drawing below. Depending on your vehicle type, configuration, and RoadRelay ™ options, not all features listed may be available. Refer to the feature description sections for further details.



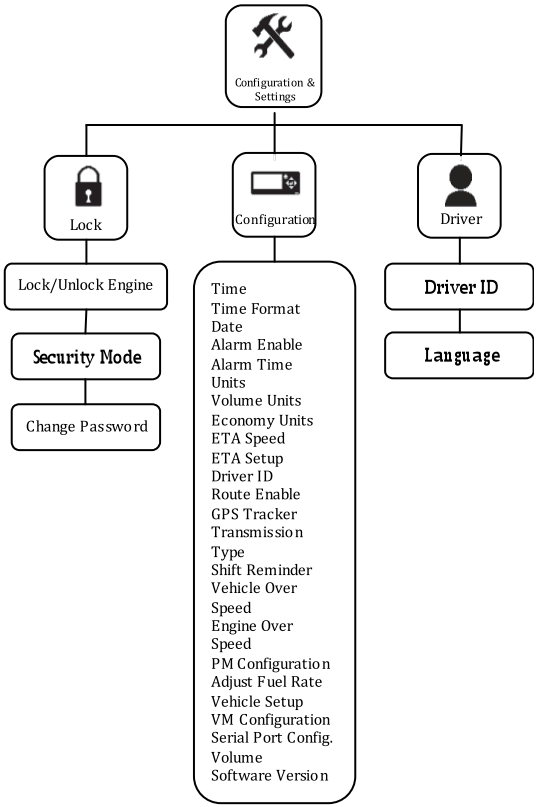
7.2 Vehicle Icon Menu

The Vehicle icon menu consists of three secondary icons: Wrench, Monitor, and Envelope icons. The features under each secondary icon are illustrated in the drawing below. Depending on your vehicle type, configuration, and RoadRelay™ options, not all features listed may be available. Refer to the feature description sections for further details.



7.3 Configuration & Settings Icon Menu

The Configuration & Settings icon menu consists of three secondary icons: Lock, Configuration, and Driver icons. The features under each secondary icon are illustrated in the drawing below. Depending on your vehicle type, configuration, and RoadRelay™ options, not all features listed may be available. Refer to the feature description sections for further details.



8 Menu Navigation

The navigation keys on the keypad behave slightly different depending on the screen that is being viewed.

8.1 Top Level Icon Screen Navigation

From the top level icon screen, use or to move the SELECTOR left or right. The "highlighted" icon will be displayed in reverse video with a dark background. The Vehicle icon is selected in the example below.

When is pressed, the Configuration & Settings icon is highlighted as show in the example below.

The key selects the highlighted icon and displays the second level menu icons.

The Home key toggles between the top level icon screen and the AUTO LEG screen.

Also from the top level menu, the functions the same as .

The functions the same as the key.

8.2 Second Level Icon Screen Navigation

From the second level icon screen, use  or  to move the SELECTOR left or right. The "highlighted" icon will be displayed in reverse video with a dark background.

The  key selects the highlighted icon and displays the list of features for the selection icon.

The Home key  toggles between the top level icon screen and the AUTO LEG screen.

The  returns to the top level icon screen.

The  functions the same as the  key.

8.3 Text Screen Navigation

There are four types of text screens:

a. Menu Screens
b. Entry Screens
c. Up/Down Entry Screens
d. Data Screens

8.3.1 Menu Screens

Menu screens can be identified by the presence of a SELECTOR (reverse video text) on a text screen consisting of one to four lines of text. When in a menu, use  or  to move the SELECTOR up or down in the list. The and  will automatically repeat if held down. If you reach the top or bottom of a menu, it will "wrap around" to the other end of the menu. To select an item, move the SELECTOR to the desired item and press  .

From a Menu screen the  key will "back-out" of the menu to the second level icon screen.

The  functions the same as the  key.

The Home key toggles between the top level icon screen and the AUTO LEG screen.

8.3.2 Entry Screens

Entry screens can be identified by the presence of a CURSOR (blinking rectangle) on the screen. When in an Entry screen, use or to scroll up or down a list of selectable data. Most Entry screens only allow the entry of numeric characters; other Entry screens allow the entry of alphanumeric characters. It may or may not be necessary to use or keys to move the CURSOR to the next desired character to edit. Once a character is changed, the RoadRelay™ will "auto advance" to the next character to be edited. When you are finished entering all characters, press .

If you want to undo the last key-press, use until the CURSOR is over the desired character to be changed.

If you wish to leave an Entry screen and NOT modify the entry, keep pressing the until you return to the menu screen.

The Home key toggles between the top level icon screen and the AUTO LEG screen. *Data entries are only saved after the is pressed. Exiting an Entry screen by pressing the does NOT save the entry.*

Example: Press . Press until the icon is highlighted. Press . Press until the icon is highlighted. Press . Move the SELECTOR until "Time" is highlighted. Press . You will see the current RoadRelay™ time and a blinking CURSOR. Press or to change the hour. Press to move to the next character (if you wait for longer than two

seconds, the RoadRelay™ will auto-advance to the next character for you). Finish the data entry by entering the minutes. The screen will now show the number you have currently selected. Press to save your changes or press several times to discard the change and return to the Configuration menu screen.

8.3.3 Up/Down Entry Screens

Some screens use or to scroll up or down a set of possible choices. The screen changes to show the new choice as or is pressed.

Example: Press. Press until the icon is highlighted. Press Press until the icon is highlighted. Press . Move the SELECTOR until "Time Format" is highlighted. Press . You will see the current time format. Press or to change the format switch between 12 and 24 hours. Press to save your changes or press several times to discard the change and return to the Configuration menu screen.

8.3.4 Data Screens

Screens showing data, such as leg or vehicle monitor, will update every second. If data is unavailable or invalid, the screen will have question marks in place of numerical data.

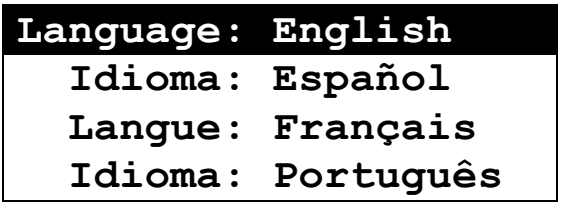
9 Controlling Display Brightness

The RoadRelay™ has six levels of brightness (including off). When in an AUTO LEG screen, pressing will increase the display brightness; pressing will decrease the brightness. When at the lowest level (off) any key press will turn the display on at the lowest brightness level.
The RoadRelay™ saves two separate brightness settings. One setting is saved if the headlights are OFF and another setting is

saved if the headlights are ON. If the headlights are OFF, you may adjust the setting for headlights being off. If the headlights are ON, you may adjust the setting for headlights being on.

10 Selecting a Language

Related sections: Using the Keypad

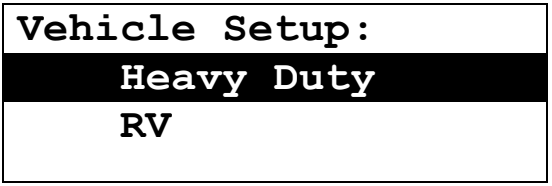


The RoadRelay™ supports four languages: English, Spanish, French, and Portuguese. To change the language, press  , select  , select  , and select "Language". Use or to move between the language choices. Press  to select the language. Press  to exit this screen without changing the language.

11 Configuring for a RV or Heavy Duty Application

Related sections: Estimated Time of Arrival (ETA), Mark and Go To, Driver Messages, Leg Information

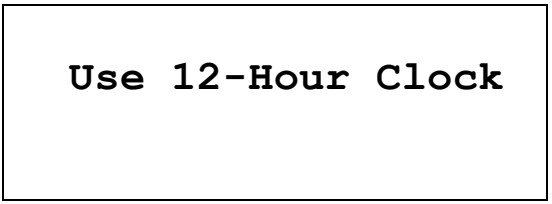
Press  , select  , select  , and select "Vehicle Setup". Use  or  to move between the choices. Press  to select your choice. Press  to exit this screen without changing the vehicle setup.



12 Setting the Clock

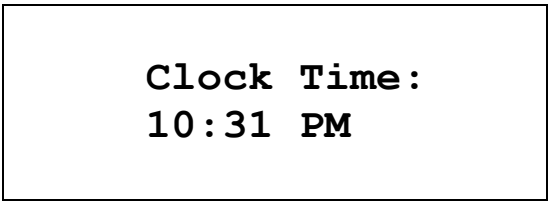
Related sections: Using the Keypad

12.1 Choosing a 12 or 24-hour Clock



To change between a 12 and 24-hour clock, press , select , select , and select "Time Format". Use or to toggle between 12 and 24-hours. Press to finish.

12.2 Setting Clock Time



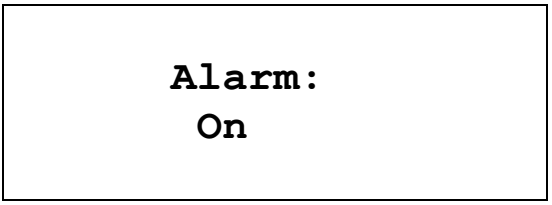
To set the clock time press , select , select , and select "Time". Use or to enter your time. Press to advance to the next character position. If using a 24-hour clock, press to finish. If using a 12-hour clock, Press to advance to the

AM/PM field, then use or to toggle between AM and PM. Press to finish.

13 Using the Alarm

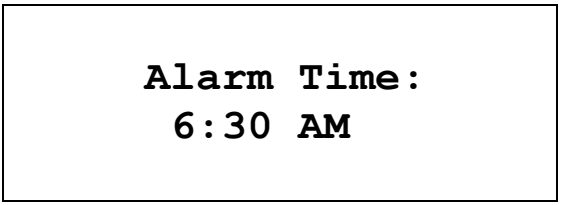
Related sections: Using the Keypad, Using the Clock

13.1 Turning the Alarm On or Off



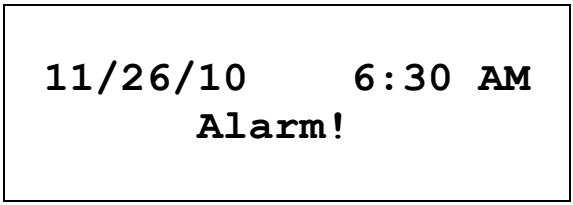
To turn the alarm ON or OFF, press , select , select , and select "Alarm Enable". Use or to toggle between On and Off. Press to finish.

13.2 Setting the Alarm Time



To set alarm time press , select , select , and select "Alarm Time". Use or to enter the alarm time. Press to advance to the next character position. If using a 24-hour clock, press to finish ETA setup. If using a 12-hour clock, Press to advance to the AM/PM field, then use or to toggle between AM and PM. Press to finish.

When the alarm goes off, the buzzer will sound and the alarm screen will appear:

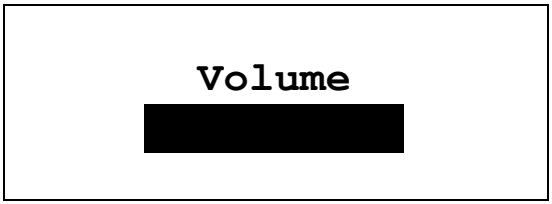


Press any key to shut off the buzzer. If a key is not pressed, the alarm will shut off after 1 minute.

14 Adjusting the Volume

Related sections: Using the Keypad, Setting the Alarm, Pop-ups

This configuration setting adjusts the volume of all audible sounds made by the RoadRelay™. These sounds include the Alarm and all pop-ups.



To adjust the volume, press  , select  , select  , and select "Volume". Use or  to increase the volume. Use or  to decrease the volume. Press  to finish.

15 Units of Measure

Related sections: Using the Keypad

The RoadRelay™ has three screens dedicated to configuration of the measurement system:

Units of Measure – Choice of US, UK, Europe or Metric, which allows the user to select the primary units of measure based on country or region.
Volume Units – Choice of gallons, imperial gallons, or liters.
Economy Units – Choice of mpg, mpG, kpl, or lpk.

15.1 Units of Measure - US, UK, Europe, or Metric System

Press  , select, select  , select  , and select "Units". Use  or  to move between the four units of measure. Press  to select the units of measure. Press  to exit this screen without changing the units of measure.

Units:	US
	UK
	Europe
	Metric

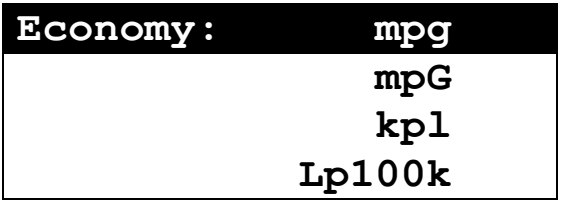
The table below summarizes the parameters that are affected by changes to the Unit of Measure configuration.

Parameter	US	UK	Europe	Metric
Distance	Miles	Miles	Kilometers	Kilometers
Economy	mpg	mpIG	kpl	kpl
Temperature	Fahrenheit	Celsius	Celsius	Celsius
Air Pressure	"Hg	millibars	kPa	kPa
Other Pressures	psi	kPa	kPa	kPa
Volume	gallons	Imp. Gallons	liter	liter
Time Format	12 hour	24 hour	24 hour	24 hour
Date Format	mm/dd/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

If the RoadRelay™ *is in "Fleet Mode", you will not be able to change the units of measure (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*

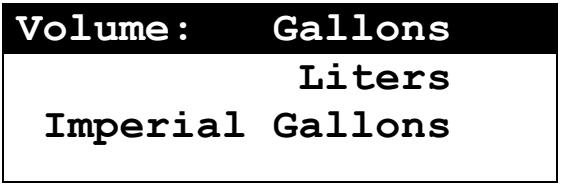
15.2 Economy Units

Press , select, select , select , and select "Economy Units". Choices are miles per gallon (mpg), miles per Imperial gallon (mpG), kilometers per liter (kpl), and liters per 100 kilometers (lpk).
Use or to move between the four economy units. Press to select the economy units. Press to exit this screen without changing the economy units.



15.3 Volume Units

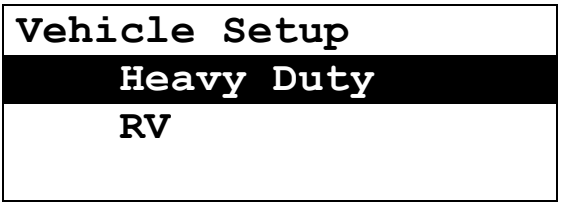
Press , select, select , select , and select "Volume Units". Choices are Gallons, Liters, and Imperial Gallons. Use or to move between the three volume units. Press to select the volume units. Press to exit this screen without changing the volume units.



16 Vehicle Setup

Vehicle Setup shall define the RoadRelay™ feature functionality based upon the vehicle's primary use: Heavy-Duty or Recreational Vehicle (RV).

To change your vehicle setup, press  , select  , select  , and select "Vehicle Setup". Use  or  to select “Heavy Duty" or "RV".



When RV mode is selected, the following features will be unavailable:

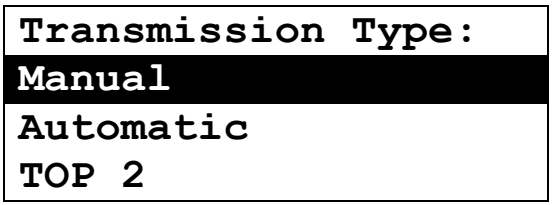
1. ETA
2. Driver Messages
3. Average vs. Instantaneous Fuel economy feedback on leg driving screen
4. Idle Display Fleet Goal percent feedback on leg idle screen
5. PTO Mode screen under leg
6. Trip – PTO, Coast, and Idle Shutdown screens are not shown

17 Setting Transmission Type

Related sections: Coaching Pop-ups

This setting does not affect the transmission in any way; it tells the RoadRelay™ *what type of transmission is present. It also prevents coaching pop-ups for automatic transmissions. For TOP-2 transmissions, it prevents pop-ups while in the top 2 gears.*

To select a transmission type, press , select , select , and select "Transmission Type". Use or to select “Manual", "Top-2", or "Automatic".



Press to finish. Press to exit this screen without saving changes.

18 Leg Information

Related sections: Driver ID, Using the Clock, Estimated Time of Arrival (ETA), Units of Measure, Trip Information, Configuring for a RV or Heavy Duty Application

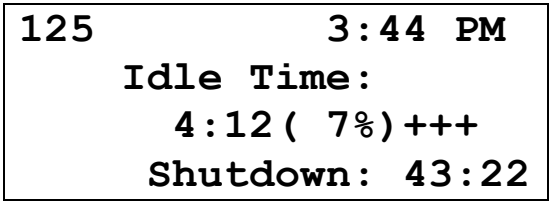
A "leg" is data collected since the last time the leg information was reset. A leg has less information than a trip. Leg information cannot be retrieved using office software - it is only used for driver feedback.

18.1 Automatic Leg Screens

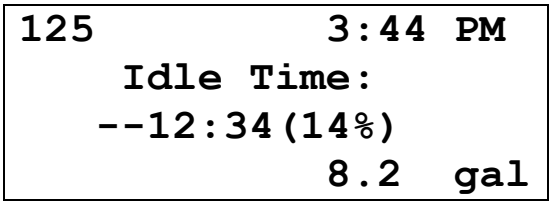
The leg screens are the "top-level" screens. By pressing you will eventually reach an AUTO LEG screen. When the vehicle’s mode of operation (drive, idle, or PTO) changes, the screen will automatically change between the AUTO LEG screens. "Heavy Duty" mode has Idle, Driving, and PTO screens; RV mode has Idle and Driving screens. The change will occur immediately, or after 5 minutes depending upon whether "Short Stop Mode" is ON or OFF *(short stop mode can only be turned ON or OFF using*

PowerSpec™ office software). All examples in this User's Guide start from an AUTO LEG screen.

18.1.1 Automatic Idle Display



OR



The top line of the screen shows the current Driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

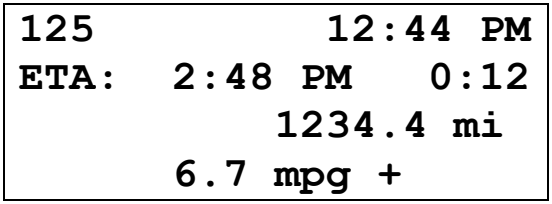
The second line identifies this as the idle screen.

The third line shows the amount of time the engine has been idling, the percentage of total leg time the engine has been idling, and performance vs. a 20% goal. Plus (+) and minus (-) symbols indicate performance against this idle-time goal. Therefore, each + or - indicates a 2% difference in actual idle time vs. the goal. A "-" indicates too much time is being spent idling; a "+" indicates better performance than the goal. *If the* RoadRelay™ *is in "RV Mode", you will not see the feedback for performance vs. idle-time goal. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

The last line will show the remaining time until the engine automatically shuts down or how much fuel has been used while

idling. This is determined by the type of engine and how the engine is set up.

18.1.2 Heavy Duty Automatic Driving Display



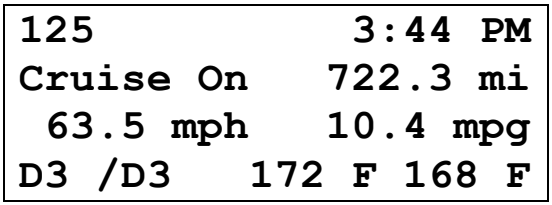
The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

The second line shows Estimated Time of Arrival (ETA) information. This can be read as: “At your current speed you will arrive at 2:48 PM, which is 12 minutes ahead of when you are scheduled to arrive."

The third line shows the number of miles traveled on this leg.

The last line shows the average leg fuel economy, and performance vs. the overall average fuel economy. Each + or - indicates a 10% change in the displayed fuel consumption rate. For example, ++ indicates a leg fuel economy rate that is currently 20% better (less than) than the overall average rate. *If the RoadRelay™ is in "RV Mode," you will not see the feedback for leg performance vs. the average fuel economy. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

18.1.3 RV Automatic Driving Display



The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

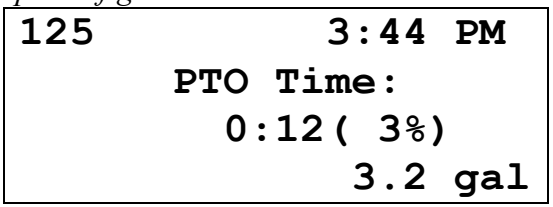
The second line shows that cruise control is activated and the leg distance. If cruise control is off, the cruise status will not be shown.

The third line shows the cruise control set speed and the current fuel economy. If cruise control is off, the cruise set speed will not be shown.

The last line shows the transmission gear selected/attained, transmission fluid temperature, and coolant temperature. If the transmission information is not available, it will not be shown.

18.1.4 Automatic PTO Display

This screen will only be displayed if the Power Take-Off (PTO) is engaged, the vehicle is not moving, and the displaying of PTO mode is ON (PTO mode is set by PowerSpec™ office software). *If the RoadRelay™ is in "RV Mode", you will not be able to access this screen. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*



The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

The second line identifies this as the PTO screen.

The third line shows how long the PTO has been engaged while the vehicle was not moving, and percentage of total leg time the PTO has been engaged with the vehicle not moving.

The last line shows the amount of fuel used while the PTO was engaged and the vehicle was not moving.

18.2 Manual Leg Screens

In addition to Automatic leg screens, you may manually select one of the three engine mode displays (Drive, Idle, and PTO). These screens do NOT automatically switch as the vehicle operation changes; you can use this to always show a particular leg screen.

Manual leg screens are selected by pressing  . Press  until the  icon is highlighted. Press  Press  until the  icon is highlighted. Press  . The first five items in this menu, Driving Display, Idle Display, PTO Display, Leg Summary, and Operating Hours, represent the Manual Leg screens. Move the SELECTOR until "Driving Display" is highlighted. Press  . Use  or  to move between the screens. *If the RoadRelay™ is powered-down or another menu is selected, you will need to return to this menu to restore the manual leg screen.*

18.2.1 Manual Driving Display

This display is identical to the Automatic Driving Display, except that this screen is always shown regardless of vehicle operation (see Automatic Driving Display description).

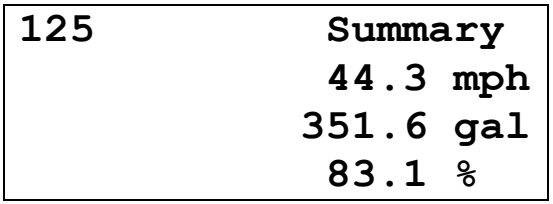
18.2.2 Manual Idle Display

This display is identical to the Automatic Idle Display, except that this screen is always shown regardless of vehicle operation (see Automatic Idle Display description).

18.2.3 Manual PTO Display

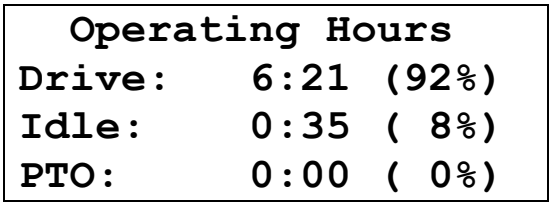
This display is identical to the Automatic PTO Display, except that this screen is always shown regardless of vehicle operation (see Automatic PTO Display description).

18.2.4 Leg Summary



The top line of the screen shows the current driver ID and the screen title. If the Driver ID feature is OFF, the driver name will be blank. The second line shows the average speed of the vehicle on this leg. The third line shows the amount of fuel used on this leg. The last line shows the average engine load on this leg.

18.2.5 Operating Hours



The top line of the screen shows the screen title. The second line shows the amount of time and percentage of total time spent driving on this leg. The third line shows the amount of time and percentage of total time spent idling on this leg. The last line shows the amount of time and percentage of total time spent idling with PTO engaged on this leg.

18.3 Resetting Leg Data

To erase the leg data and start over, hold  for 3 seconds while viewing the leg data. Press  again to reset or press  to leave this screen without resetting leg.

```
Reset Leg?
   Yes
```

19 Vehicle Monitor

Related sections: Units of Measure, Vehicle Monitor configuration

The vehicle monitor shows data currently being received by the RoadRelay™ from the data link.

To view the vehicle monitor screens, press  , select  , and select  . Use  or  to move between the screens. Note that your screens may not show all the data – if the information is not available, question marks may be shown or the entire line may be blank.

```
1850 rpm     19.0 psi
38.3 %       13.2 V
55.7 mph     35.0 psi
             181.3 F
```

This screen is the Configurable Vehicle Monitor screen. Refer to the Vehicle Monitor Configuration section for instructions on customizing this screen. The default screen setting is shown above. Holding the Enter key down for 5 seconds will reset this screen to factory defaults. Engine RPM and boost pressure are on the first line. Percent engine load and battery voltage are on the second line. Road speed and oil pressure are displayed on the third line. Engine coolant temperature is displayed on the last line.

```
RPM          1850.0 rpm
Boost Pres     32.3 psi
Load           38.3 %
Inst Econ       8.2 mpg
```

This screen shows engine RPM, boost pressure, current engine load, and instantaneous fuel economy.

```
Cool Temp    130.0 F
Oil Pres      82.5 psi
Oil Temp     110.0 F
Battery       ??.? V
```

This screen shows coolant temperature, oil pressure, oil temperature, and battery voltage. *In this example, the battery voltage is not available from the vehicle and therefore is shown as question marks.*

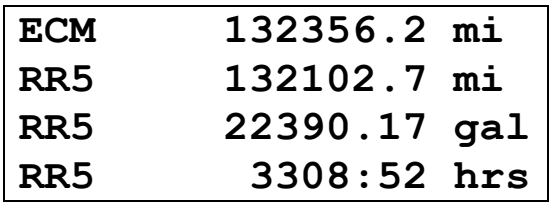
```
Road Speed    70.0 mph
Fuel Rate    17.08 gph
Air Pres      30.1 "Hg
Air Temp     110.0 F
```

This screen shows road speed, fuel rate, outside air pressure, and outside air temperature.

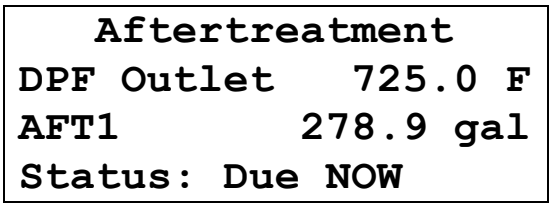
```
   Transmission
Gear Actual          9
Gear Requested      10
Trans Fluid   105.7 F
```

This screen shows the gears selected and requested. The bottom line shows the temperature of the transmission fluid. *This screen can only be seen on trucks with automatic transmissions which send this information to the* RoadRelay™. *The gear values are*

sent by the transmission and the displayed gears will vary by transmission manufacturer.



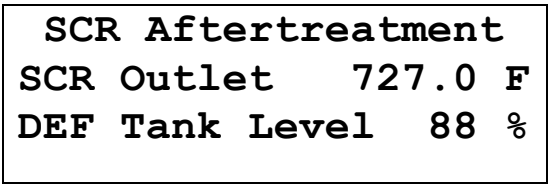
This screen shows the accumulated totals for distance traveled, fuel used, and hours of operation. "ECM" in the first column indicates the total is from the engine control module. "RR5" indicates the total is from the RoadRelay™. If the ECM data is not available, this data will not be shown.



This screen displays information and status of the Cummins Aftertreatment System. The second line shows the Diesel Particulate Filter (DPF) temperature. The third line shows the lifetime fuel used by the aftertreatment system. The fourth line shows the current status of the aftertreatment system. The valid aftertreatment status conditions are defined in the table below:

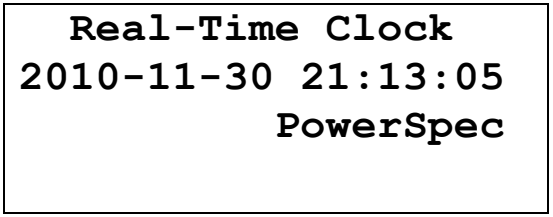
Status	Status Condition
<blank>	No regeneration activity
Status: Soon	Stationary (Parked) regeneration is due soon
Status: Due NOW	Stationary (Parked) regeneration is due now
Status: Active	The aftertreatment system is performing an Active regeneration.
Status: Passive	The aftertreatment system is performing a Passive regeneration.
Halted by Clutch	An Active regeneration has been halted by the clutch.
Halted Service Brake	An Active regeneration has been halted by the service brake.
Halted by PTO	An Active regeneration has been halted by PTO.
Halted by Throttle	An Active regeneration has been halted by the throttle.
Halted Not Neutral	An Active regeneration has been halted by the vehicle not being in neutral.

This screen can only be seen on vehicles equipped with the Cummins EPA 2007 or later Aftertreatment System. Reference your Cummins Owner's Manual for complete details on your vehicle's aftertreatment system.



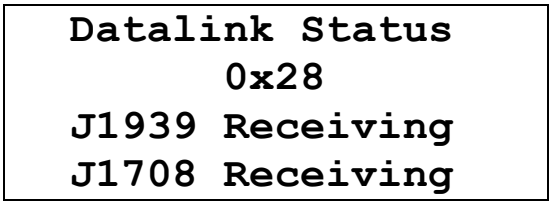
This screen displays information and status of the Cummins Selective Catalytic Reduction (SCR) Aftertreatment System. The second line shows SCR Outlet temperature. The third line shows the percentage of Diesel Exhaust Fluid (DEF) remaining.

This screen can only be seen on vehicles equipped with the Cummins EPA 2010 or later Aftertreatment System. Reference your Cummins Owner's Manual for complete details on your vehicle's aftertreatment system.

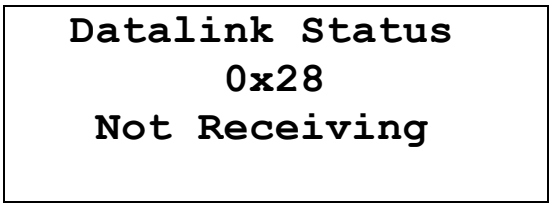


This screen shows the current time of the RoadRelay™'s internal Real-Time Clock (RTC). The second line displays the current date and time (in 24-hour format). The third line displays the device (tool) that was used to set the RTC. Any RoadRelay™ data that is time stamped (Fault Codes, Vehicle Over speed, etc.) is stamped with this RTC time.

The RTC time is set automatically to Universal Time when the unit is connected to PowerSpec™ office software or to an optional GPS antenna. The default time for the RTC is Driver Clock Time.



This screen shows the current status of the RoadRelay™'s communication links to the engine ECM. The second line displays the RoadRelay™ address (0x28 or 0x8C) on the communication link. The third and four lines display the status of the communication links. The fourth line may be blank depending on your RoadRelay™ -to-vehicle wiring.
If the following screen is displayed, no engine ECM communication is detected. The RoadRelay™ is not usable in this condition.



Contact your Cummins distributor for further information and/or service.

19.1 Vehicle Monitor Configuration

The Vehicle Monitor Summary screen can be customized to display up to eight vehicle monitor parameters. The default settings are defined in the Vehicle Monitor section of this manual.

VM 1 RPM
VM 2 Engine Load
VM 3 Road Speed
VM 4 Leave Blank
VM 5 Boost Pres
VM 6 Battery Volts
VM 7 Oil Pressure
VM 8 Coolant temp

To customize the Vehicle Monitor Summary screen for your vehicle, press  , select  , select  , and select "VMonitor Config". This screen displays the current (default) settings of the Vehicle Monitor Summary screen. The Vehicle Monitor Summary screen is divided into eight fields. Fields 1 through 4 will be displayed on the left of the Vehicle Monitor Summary screen and fields 5 through 8 will be displayed on the right side of the Vehicle Monitor Summary screen. The default parameter for each field is shown above.

For example, the steps necessary to change the parameter currently defined in field 5 "Boost Pres" to "Fuel Rate" are outlined below. Note that field 5 is displayed in the upper right-hand corner of the Vehicle Monitor Summary screen.

Use  to move to VM 5 Boost Press. Press  to select this field. ". Use  or  to move between the list of available parameters for your vehicle. Move the cursor to the "Fuel Rate"

parameter. Press  to select this parameter. Now to verify the results of the change, press  , select  , and select  . Use  or  to move to the Vehicle Monitor Summary Screen. Notice that field 5 (upper right-hand corner of screen) now displays the Fuel Rate.

1850 rpm	1.35 gph
38.3 %	13.2 V
55.7 mph	35.0 psi
	181.3 F

Additional notes:
1. Vehicle Monitor configuration can only be changed while the ignition switch is in the ON or RUNNING position.
2. Your list of parameters may be different from those of other vehicles. The RoadRelay™ will only display those parameters available for *your* particular vehicle.
3. The list of parameters also contains a “Leave Blank” and a “Reset To Default” option. The Leave Blank option will not display any information in the field. The Reset To Default option will reset the field to the default parameter assigned by the factory.
4. Refer to the Vehicle Monitor Section for instructions on resetting the entire Vehicle Monitor Summary screen to factory defaults.

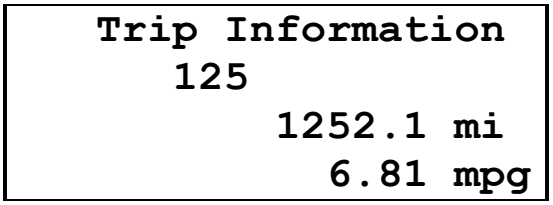
20 Trip Information

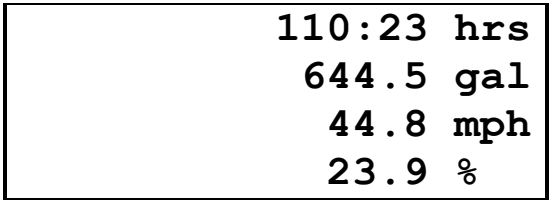
Related sections: Driver ID, Leg Information, Configuring for a RV or Heavy Duty Application

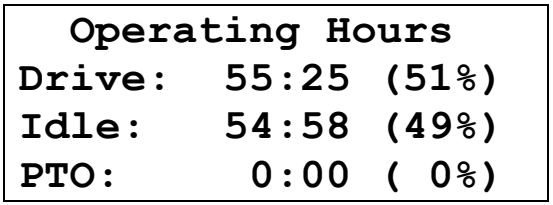
A "trip" is data collected since the last time the trip information was reset. A trip has more information than a leg. Trip information can be retrieved using PowerSpec™ office software.

To see trip information, press , select , select , and select "Trip Information". Trip information shall be displayed for the driver currently selected (Driver 125 in the following example).

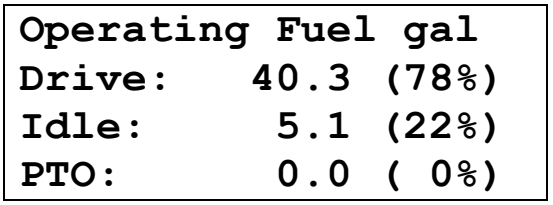
Use or to move between the screens. Press to exit Trip Information screens.



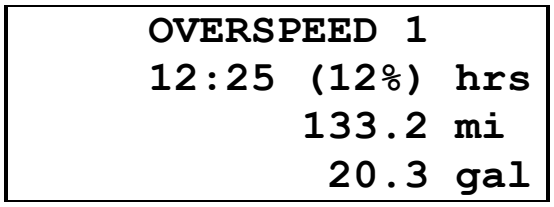


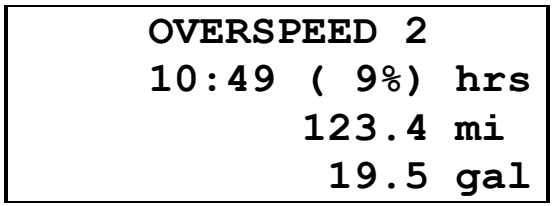


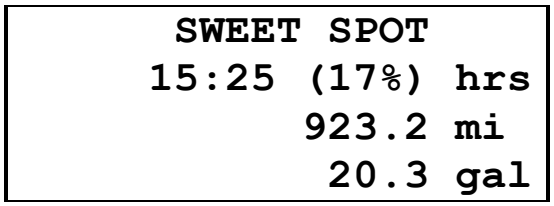
PTO information will not be shown if the RoadRelay™ is in "RV Mode".



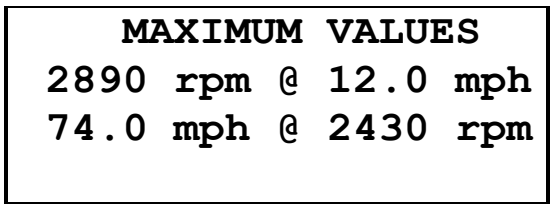
PTO information will not be shown if the RoadRelay™ is in "RV Mode".

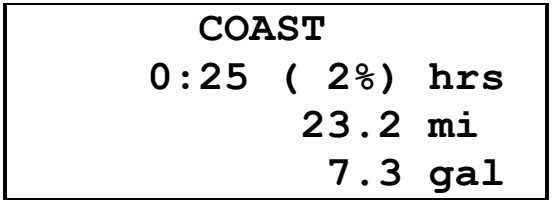




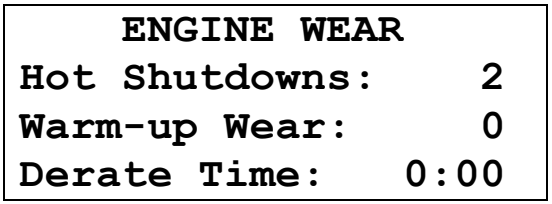


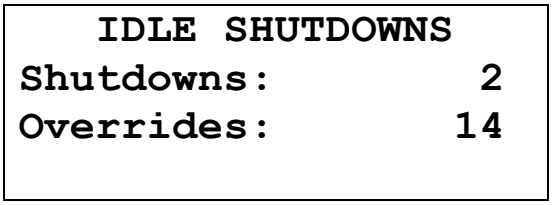
This screen will not be shown if the RoadRelay™ is in "RV Mode".



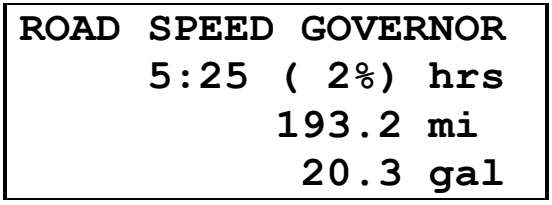


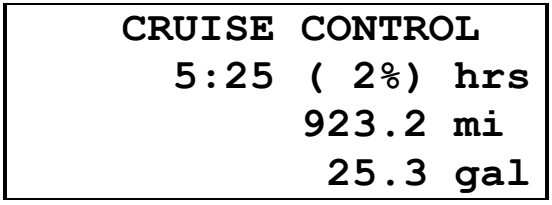
This screen will not be shown if the RoadRelay™ is in "RV Mode".





This screen will not be shown if the RoadRelay™ is in "RV Mode".





```
        TOP GEAR
      15:25 (22%) hrs
            923.2 mi
             29.3 gal
```

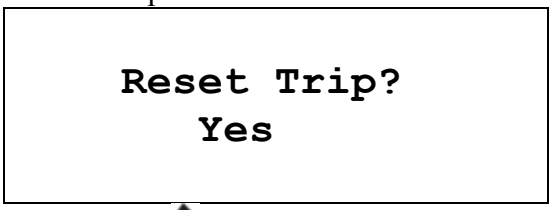
```
    NEXT GEAR DOWN
      9:25 (12%) hrs
           923.2 mi
            13.7 gal
```

```
    ENGINE BRAKES
      1:05 ( 2%) hrs
             12.2 mi
Number:      1123
```

```
   SERVICE BRAKES
       0:45 ( 2%) hrs
             3.2  mi
Number:      523
```

20.1 Resetting Trip Data

While viewing any Trip Information screen, press and hold  until you hear a "beep" from the RoadRelay™ (approximately 3 seconds). The Reset Trip confirmation screen is now displayed.



Press  to reset. Press  to exit this screen without resetting trip. *If the RoadRelay™ is in "Fleet Mode", you will not be able to reset the data (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*

21 Anti-theft

Related sections: Keypad-Entry Screens, Units of Measure

The Anti-theft feature deters vehicle theft by requiring the driver to enter a password using the RoadRelay™ keypad before allowing the engine to start. Anti-theft will work with Cummins Celect Plus (revision 4 software and later), ISB, ISC, ISL, ISM, ISX, and Signature 600 engines.

Important Note:
The engine control module determines whether this feature is ON or OFF. ALL Cummins engines leave the factory with Anti-theft turned OFF. Also, the key must be in the ON position in order for the engine to be locked or unlocked.

A customer desiring to use this feature must visit a distributorship or certified dealership and request to have INSITE™ (Cummins authorized service tool) turn the feature to ON (there may be a fee). In addition, while connected, it is VITAL that customers choose their password or passwords (all numeric) and write them to the ECM at this time. The factory default passwords are all 000000's and cannot be changed via

the RoadRelay™ keypad initially. Once changed to some meaningful sequence, users can stay with their selection of password or change it via the RoadRelay™ keypad.

21.1 Selecting the Anti-theft Mode

Anti-theft modes affect how the engine is locked.

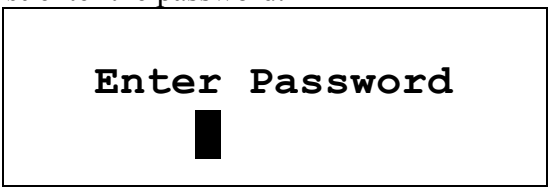
The four choices for the anti-theft mode are:

Mode	Description
Off	The anti-theft feature is off. Vehicle is NOT secured.
Manual	The driver locks the engine by entering a password.
Semi-Automatic	The driver locks the engine by selecting "Yes" when asked to "Arm Vehicle Security" at key-off.
Automatic	The engine is automatically locked after the ignition key is turned off.

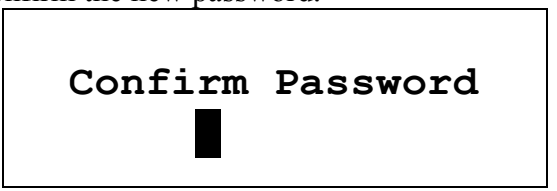
Read "How to Lock the Engine" for more details.

To select the Anti-theft mode, press  , select  , select  , and select "Security Mode". Use  or  to select the mode you wish to use. Press  to select the mode. Press  to quit. *If the* RoadRelay™ *is in "Fleet Mode" you will not be able to change this setting (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*

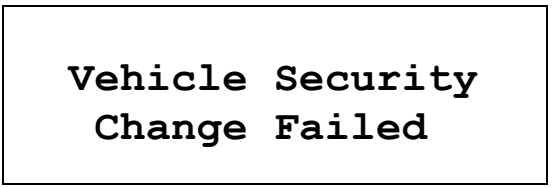
The user **must** enter the password.



If the engine is a Celect Plus and the previous mode was “Off”, the user must confirm the new password.



If confirmation fails, then the mode is not changed and the following screen is shown:

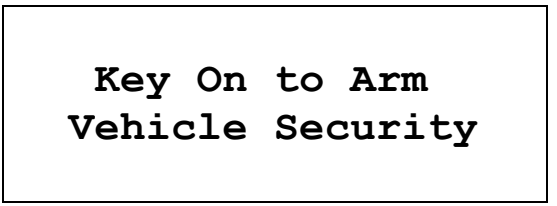


21.2 How to Lock the Engine

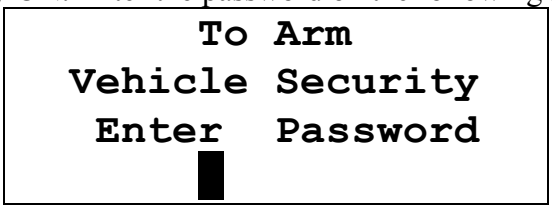
How the engine gets locked depends upon the "Anti-theft Mode"(Off, Manual, Semi-automatic, and Automatic). See "Selecting the Anti-theft Mode" for more information.

21.2.1 Manual Mode

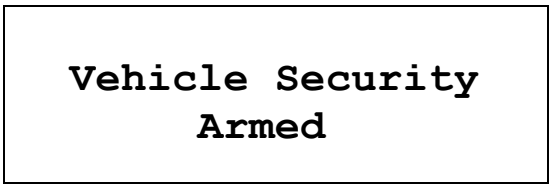
At key-off you will see the screen below.



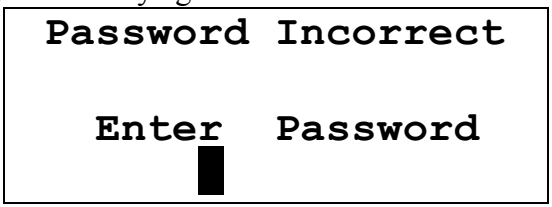
Turn the key ON. Enter the password on the following screen:



If the password is correct, you will see this screen and the engine is locked:



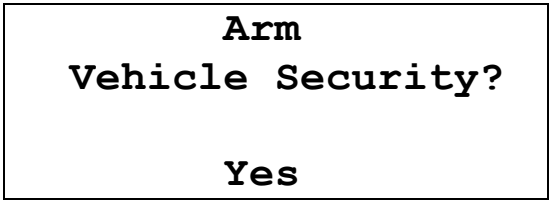
Otherwise, you must try again.



21.2.2 Semi-automatic Mode

At key-off you will see the screen below.

Turn the key ON. Press  to lock the vehicle. Press  to leave this screen and NOT lock the engine.

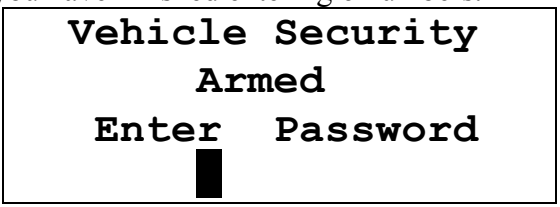


21.2.3 Automatic Mode

In Automatic Mode the engine automatically locks 30 seconds after the ignition key is turned OFF. If the engine is a CELECT Plus, it will automatically lock 20 seconds after a key-off or stall. This delay prevents the user from having to enter the password for inadvertent key-offs or engine stalls.

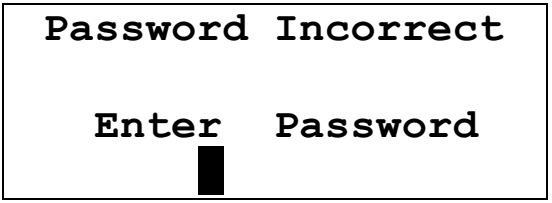
21.3 How to Unlock the Engine

If the engine is locked you must enter a six-number password. As the password is entered, each "?" will be replaced with a "*". Press  when you have finished entering 6 numbers.

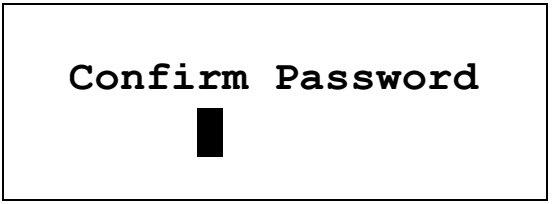


If the password is correct, the following screen will be displayed and the engine is now unlocked.

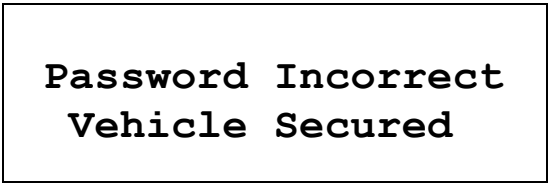
If the password is incorrect, the following screen will be displayed:



If you enter a correct password after an incorrect password, you must confirm the password by entering it again.



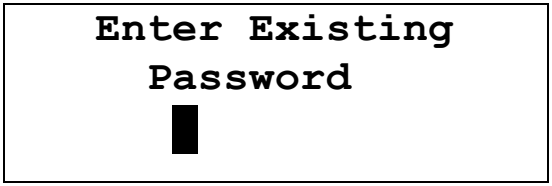
If the units of measure are "US" or "Metric" and you fail to enter the password correctly after five attempts, you will be locked out for 10 minutes. If the units of measure are "UK" or "Europe" and you fail to enter the password correctly after three attempts, you will be locked out for 30 minutes. When this occurs, the following screen will be shown:



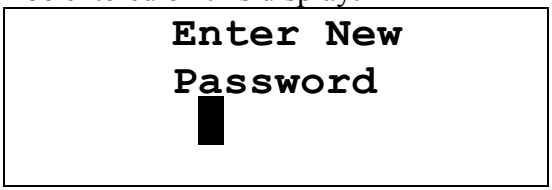
Note: The ignition key must be ON to allow the lockout timers to operate for the required 10 or 30 minutes.

21.4 Changing the Password

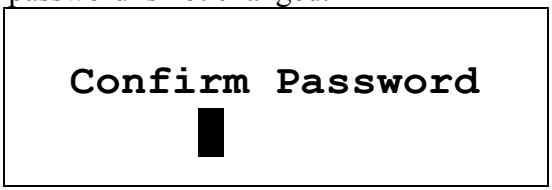
Press  , select  , select  , and select "Change Password". *If the RoadRelay™ is in "Fleet Mode", you will not be able to change this setting (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*



Once the existing password has been correctly entered, the new password can be entered on this display:



You must confirm the new password on the following display. If this fails the password is not changed.



Do not forget your password! When protected by the Anti-theft feature, the engine will not start without entering the password. Do not write your password where a thief can find it. Keep it someplace safe where you can find it easily. See the "Warranty" section for important Anti-theft warranty information.

21.5 Idle Lock

If the engine is a Cummins ISB, ISC, ISL, ISM, ISX, or Signature 600 it may be locked while idling. If locked while idling it will ignore accelerator pedal changes until unlocked. *Note: This feature is not available if the units of measure are "UK" or "Europe".*

To lock or unlock the engine, press  , select  , select  , and select "Lock/Unlock Engine". Refer to the "How to Lock the Engine" section. The unlocking procedure can be seen in the "How to Unlock the Engine" section

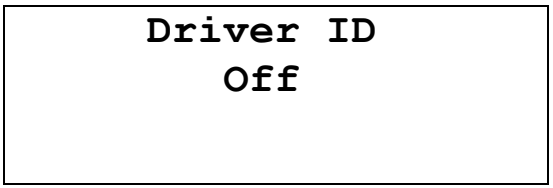
22 Driver ID

Related sections: Using the Keypad

RoadRelay™ can record separate information for up to sixteen drivers, using the Driver ID function. You can select up to fifteen drivers. In addition, you can select the "Other" driver.

22.1 Turning Driver ID On or Off

To turn Driver ID On or Off, press  , select  , select  , and select "Driver ID".



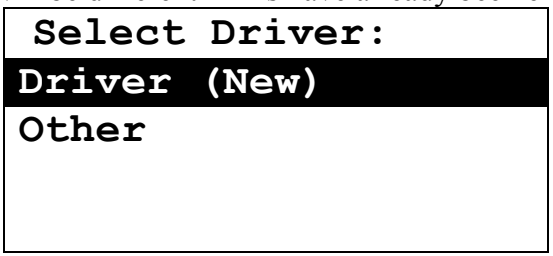
Use  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. Driver ID can also be turned On by pressing  , select  , select  , and select "Driver ID". Use or  to turn Driver ID On. Press  to save the selection. Press  to leave this screen and NOT update the choice. *If the RoadRelay™ is in "Fleet Mode", you will not be able to change this setting (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*

22.2 Choosing a Driver

If the Driver ID feature is ON, the following screen will appear at power On or by pressing  , selecting  , selecting  , selecting "Driver ID", and pressing  . When this screen is

selected and when it appears at power-up, 3 beeps will be heard to alert the driver.

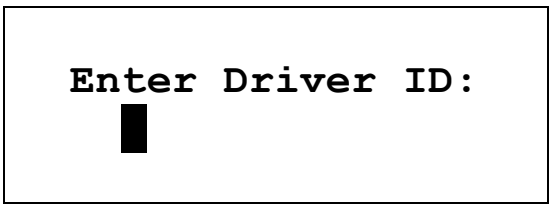
The screen will be different if IDs have already been entered.



If your ID appears on this screen, you may use or to select it. Pressing will accept the selection.

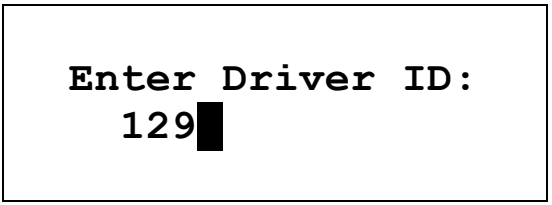
If you need to enter a new driver ID, select "Driver (New)". Press . Use or to scroll through the numeric list. Press to move the cursor to the next character or wait two seconds and the cursor will auto-advance to the next character position. Press to go back one character position. Continue to press to leave this screen and NOT update the choice.

Enter up to ten numbers to create an ID and press when finished.

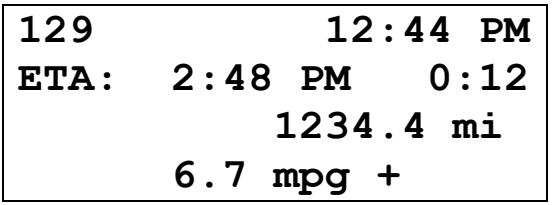


For example, to enter a Driver ID of 129, press , select , select , select "Driver ID", select “Driver (New)”, and press . Now enter the ID by pressing two times to select

numeral “1”, press to advance to the next character position, press three times to select numeral “2”, press to advance to the next character position, press one time to select numeral “9”. The screen will look like the following:

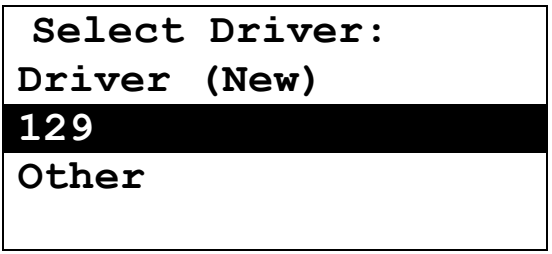


Press and the automatic leg screen will update with a new Driver ID.

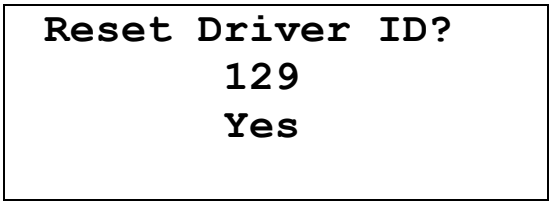


22.3 Resetting a Driver ID

A Driver ID can be removed from the RoadRelay™ in the following manner: Press , select , select , and select "Driver ID". From the Driver ID Menu, use or to scroll to the Driver ID to be reset. Next, hold down for 3 seconds.

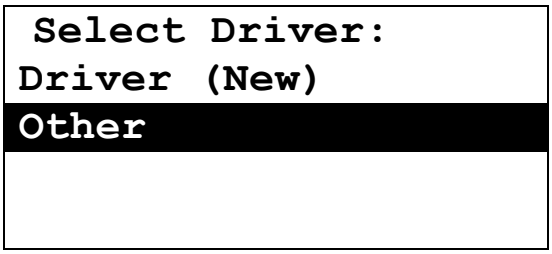


A confirmation screen will be displayed.



Press  to reset the Driver ID or press  to leave without making any changes.

After a Driver ID has been reset, the RoadRelay™ will default to Driver "Other" as shown in the updated Driver ID Menu screen below.



Note: *When a Driver ID is reset, the trip information associated with the Driver ID is also reset; therefore, one should be certain before resetting a Driver ID or use the RoadRelay™ Fleet Mode feature to prevent accidental Driver ID resets.*

23 Estimated Time of Arrival (ETA)

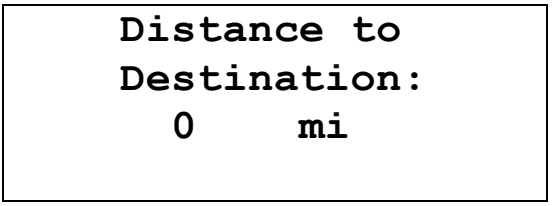
Related sections: Leg Information-Automatic Leg Screens-Driving Display, Using the Clock, Units of Measure, Configuring for a RV or Heavy Duty Application

If the RoadRelay™ is in "RV Mode" you will not be able to access this feature. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.

The ETA feature can be used by the driver to quickly show how he or she is doing vs. a scheduled arrival time. ETA information is displayed on the leg "Driving Screen".

23.1 Changing ETA Arrival Time and Distance

Press  , select  , select  , and select "ETA Setup".



Use  to navigate the cursor to the first character position. Use  or  to enter your travel distance. Press  to advance to the next character position. Press  to accept the new distance and go to the next screen. Press  repeatedly to exit without saving changes.

Use or  to enter your time. Press  to advance to the next character position. If using a 24-hour clock, press  to

finish ETA setup. If using a 12-hour clock, Press to advance to the AM/PM field then use or to toggle between AM and PM. Press to finish ETA setup. Press repeatedly to exit without saving changes.

23.2 Changing ETA Average Speed

Related sections: Units of Measure

Press , select , select , and select "ETA Speed".

```
Average ETA
Speed:
 42  mph
```

Use to navigate the cursor to the first character position. Use or to enter your speed. Press to advance to the next character position. Press to accept the new distance and go to the next screen. Press repeatedly to exit without saving changes.

24 Fuel Rate Adjustment

Related sections: Using the Keypad; Vehicle Monitor configuration

The Fuel Rate Adjustment feature is used to offset any discrepancies between the reported fuel used by the RoadRelay ™ and what is actually put in the vehicle tank. In most cases, this adjustment should never be changed from its default setting of 1.0; however, in some cases where a vehicle's actual fuel used (measured at the pump) does not match the fuel used reported by

the RoadRelay ™, it could be changed to make the RoadRelay ™ fuel reporting more accurate for your application.

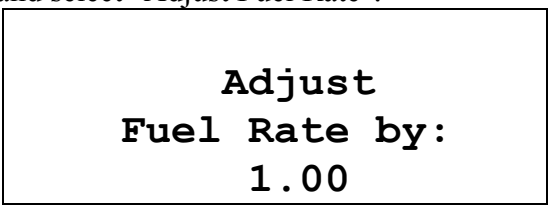
Note: There are many variables that impact the accuracy of fuel consumption reported by the engine to the RoadRelay ™. A major variable that can be eliminated is to make sure that the engine's Electronic Control Module (ECM) is properly configured for the vehicle. It is recommended that this configuration is checked prior to making a fuel rate adjustment in the RoadRelay ™. Contact your Cummins distributor for further information.

It should also be noted that changing the fuel rate multiplier in the RoadRelay ™ does NOT change the reported fuel used by the engine ECM. That is, once this setting is changed from its default value of 1.0, the RoadRelay ™ reported fuel usage will no longer match the engine ECM reported fuel usage. The feature will allow you to adjust the RoadRelay ™ reported fuel used by +/- 20 percent.

For example: If the RoadRelay ™ is reporting 10% optimistically (reporting less fuel than what is actually put in the tank), then you can increase the fuel adjustment factor from the default 1.0 to 1.10; likewise, if the RR is reporting 10% pessimistically (reporting more fuel than what is actually put in the tank), then you can decrease the fuel adjustment factor from the default 1.0 to 0.90.

24.1 Adjusting the Fuel Rate Multiplier

To change the fuel rate multiplier setting, press  , select  , select  , and select "Adjust Fuel Rate".



Use or to adjust the fuel rate multiplier. Press to finish. Press to exit without saving changes.

If the RoadRelay™ *is in "Fleet Mode", you will not be able to adjust the fuel rate (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*

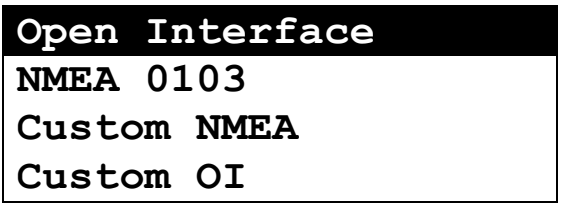
25 Serial Port Configuration

The Serial Port Configuration screen allows for the customization of the RoadRelay™'s Open Interface serial port. This serial port is the DB-9 male connector located on the rear panel of the RoadRelay™. There are four choices described below.

Serial Port Option	Description
Open Interface	RoadRelay will accept Cummins proprietary interface messages for reading/writing RoadRelay data. The serial port settings are not configurable.
NMEA 0183	RoadRelay will accept the receiving National Marine Electronic Association (NMEA) 0183 messages. The serial port settings are not configurable.
Custom NMEA	RoadRelay will accept NMEA messages based on custom serial port settings. The serial port settings are configurable.
Custom OI	RoadRelay will accept Cummins proprietary interface message for reading/writing RoadRelay data. The serial port settings are configurable.

25.1 Changing the Serial Port Configuration

To change the Serial Port Configuration, press , select , select , and select "Serial Port Config". Use or to move between the choices.



Press to select your choice. The next screen displayed is the serial port configuration settings. For the Open Interface and NMEA 0103 configurations, the serial port configuration settings are fixed. For Custom NMEA and the Custom OI settings, you will have the option to configure the port's baud rate, number of data bits, flow control, and the number of stop bits.

Baud Rate	**9600**
Data Bits	**8**
Flow Control	**None**
Stop Bits	**1**

To change Baud Rate, use or to move between the choices. Press to select your choice and move the cursor to the Data Bits configuration field.

To change the number of Data Bits, use or to move between the choices. Press to select your choice and move the cursor to the Flow Control configuration field.

To change Flow Control, use or to move between the choices. Press to select your choice and move the cursor to the Stop Bits configuration field.

To change the number of Stop Bits, use or to move between the choices. Press to select your choice and save the port settings.

Note: Pressing while on the Data Bits, Flow Control, and Stop Bits field configuration fields will backspace to the previous field.

Pressing  while on the Baud Rate field will exit the port configuration screen without saving changes.

If the RoadRelay™ is in "Fleet Mode", you will not be able to change the serial port configuration (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

26 Fault Information

The RoadRelay™ can display active fault information for a number of electronic devices (engine, transmission, ABS system, etc.) on the communication data link(s).

26.1 Fault Pop-ups

When a fault occurs for the first time, a pop-up will warn the driver that a fault condition exists. A pop-up reminder for an active fault will occur every 24 hours.

Example fault pop-ups:
If the engine is a late-model Cummins engine it will contain fault information and advice on the seriousness of the fault.

```
Water in Fuel
Circuit Failure:
Service Soon.
```

If the engine is not a late-model Cummins, the following would be shown:

```
Engine Controller
Water in Fuel indic.
Voltage > Normal
```

26.2 Loss of Power Fault Pop-up

The following fault occurs when the RoadRelay™ has experienced a power interruption (initial RoadRelay™ installation, battery removed from vehicle, cab power disconnected, etc.). This fault serves two purposes. First, it serves as a reminder to set the RoadRelay™ clock. Second, if it continues to pop-up after vehicle power interruptions, it signifies that the RoadRelay™ internal back-up battery is dead. Refer to the Back-up Battery Test Procedure section in this manual to determine if the back-up battery is functioning properly.

```
PID 168      Active 1
     RoadRelay
   Loss of Power
Set RoadRelay Clock
```

26.3 Fault Log

To view fault information press  , select  , select  and select "Fault Codes". If no faults have been received, you will see:

```
No Faults
 Recorded
```

Otherwise, faults will be listed by Cummins Fault Code, SPN, SID, and PID in order. Use  or  to move between the screens.

Once you reach a fault you would like to review further, press  .

Again, use or  to move between the screens. Press  to return to the Fault list. Fault code information is provided to help service personnel trouble-shoot problems. The fault log will contain a short description of each fault.

Example fault log screens:

If the engine is a Cummins engine, fault code information will be displayed in one of the two formats below. One format contains the Cummins Fault Code and advice on the seriousness of the fault. The second fault format contains a SPN, PID, or SID number that is used to reference the faulty device or system. If the fault is not from a Cummins engine, then only the SPN, PID, or SID format will be shown.

```
Code 428 Active 1
  Water in Fuel
 Circuit Failure:
  Service Soon.
```

```
PID 97    Active 1
Engine Controller
Water in Fuel indic.
Voltage > Normal
```

26.4 Resetting the Fault Log

To clear all inactive faults, you need to be on a fault log screen. Press  , select  , select  , and select "Fault Codes". Select a fault, then press  .

While viewing the fault log screen, press and hold  for 3 seconds. The RoadRelay™ will "beep" and the logs will be updated to show only the active fault codes.
Note that no codes are reset on the engine ECM. If the RoadRelay™ is in "Fleet Mode", you will not be able to reset the information (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

27 Preventative Maintenance

Related sections: Service History

Preventative Maintenance is used to indicate when it is time to perform scheduled maintenance.

27.1 Viewing Preventative Maintenance Schedules

To view the Preventative Maintenance schedules press, select, select and select "PM Schedules". There are four schedules. Use or to move between the schedules.

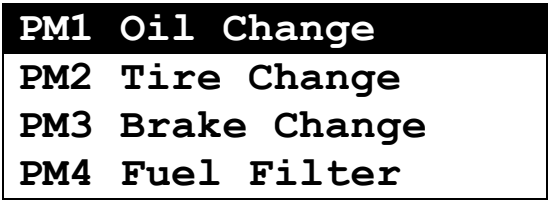
```
PM Schedule 1        *
     Oil Change
         5000   of
         6000   mi
```

This screen summarizes the schedule information. The first line indicates this is schedule 1. An asterisk (*) at the end of the line indicates that the pop-up is on; no asterisk would indicate the popup is off. The second line shows the schedule title (oil change). The next two lines show that oil is changed every 6000 miles, and 5000 miles have been driven since the last oil change. If the display shows “5000 to go”, instead of “5000 of”, there are 5000 miles until the next oil change is due.

27.2 Preventative Maintenance Schedule Setup

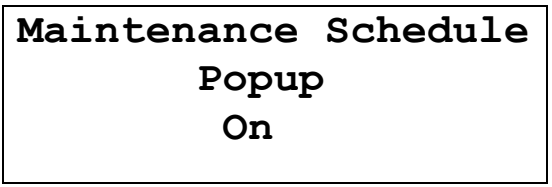
Preventative maintenance schedules are used to alert the driver that it is time to have the vehicle serviced. The RoadRelay™ has four maintenance schedules. A maintenance schedule has settings for pop-up on/off, title, duration, base count, and count direction.

To setup a maintenance schedule for your vehicle, press , select , select , and select “Prev Maint Config”.

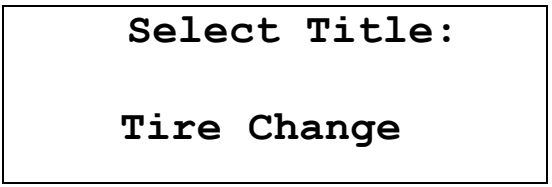


Use or to select the schedule you would like to change.

Press to continue. Press to leave the screen.

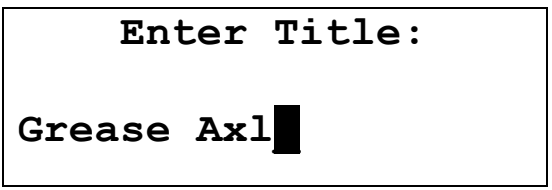


Use or to turn the pop-up ON or OFF. Press to continue.



Use or to see all of the pre-loaded maintenance titles.

Press to select the item. If none of the pre-loaded titles are appropriate, you may create your own by selecting "Custom". This will put the RoadRelay™ into a special entry mode for entering a title.



Use or to move through the different letters and numbers. If the arrow keys are held down, they will repeat. Press

to advance to the next character position. Press to move backwards. Press to finish.

Next, the interval information screen is selected.

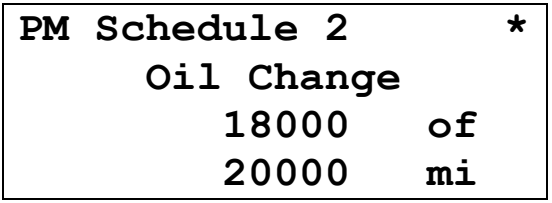
```
      Interval
Type:  Distance
Range: 30000 mi
Count: Up
```

The cursor starts on the "Type" line. Use or to move through the different types of intervals. Press to make a selection. Next, use or to enter the range. Press to advance to the next character position. Depending on the previous setting, it may be necessary to use to erase the previous range before the new range can be entered. Press when finished. Finally, use or to select between counting up or down on the "PM Schedules" screen (refer to Viewing Preventative Maintenance Schedules section in this manual). Press to complete the Preventative Maintenance Schedule setup.

If a maintenance schedule is already running, the title and count direction may be changed without resetting the elapsed count. Changing the maintenance interval type and range will reset the schedule.

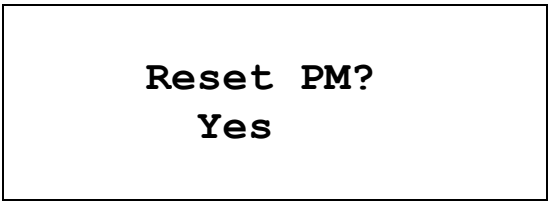
27.3 Preventative Maintenance Pop-ups

When a schedule reaches 90% (and every 5% of schedule thereafter) a Preventative Maintenance Pop-up will occur to alert the operator that it is time to schedule maintenance.



27.4 Resetting a Preventative Maintenance Schedule

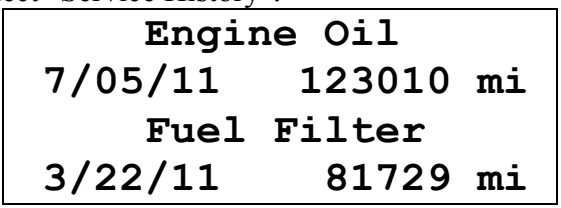
To reset a Preventative Maintenance schedule press, select, select, and select "PM Schedules". There are four schedules. Use or to move to the schedule to be reset. Press and hold until you hear a "beep" from the RoadRelay™ (approximately 3 seconds). The Reset PM confirmation screen is now displayed. Press to reset. Press to exit this screen without resetting the PM schedule.



Resetting the schedule will cause it to restart and create an entry in the Service History Log.

28 Service History Log

To view the Service History records, press, select, select, and select "Service History".

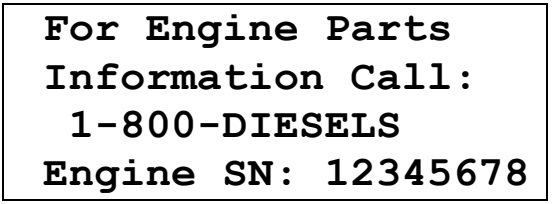


There can be up to 6 entries (2 per screen). Use  or  to move between the screens. Each record indicates the item serviced, date of service, and odometer reading when serviced. The odometer reading will be from the engine, if available; otherwise, it will be the RoadRelay™ odometer reading.

If no service history records are in the log, this screen will be shown.

29 Parts Information

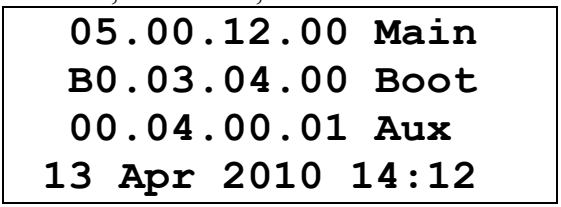
If your vehicle has a Cummins engine, the following screen can be seen by pressing  , selecting  , selecting  , and selecting "Parts Information".



The last line shows the engine serial number.

30 Software Version

Press  , select  , select  , and select "Software Version".



The information on this screen may be useful if making a call to Cummins for support.

31 Driver Messages

Related sections: Configuring for a RV or Heavy Duty Application

If the RoadRelay™ *is in "RV Mode" you will not be able to access this feature. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

If an unread driver message is in the RoadRelay™ the word "Message" will blink in the upper left-hand corner of the auto-leg screens, alternating with the Driver ID (if Driver ID is enabled).

To view Driver Messages, press  , select  , and select  .

Use  or  to move between messages. Press  to exit Driver Messages.

If there are no messages you will see this screen.

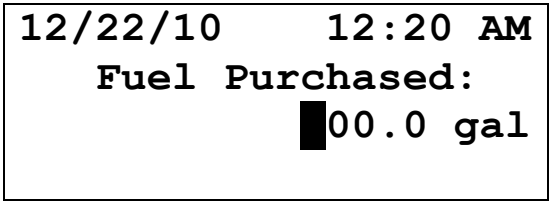
32 Fuel Purchase

Related sections: Using the Keypad, Units of Measure, Configuring for a RV or Heavy Duty Application

The fuel purchase feature can be used to store fuel purchase information and help with fuel tax records.

32.1 Entering Fuel Purchase Information

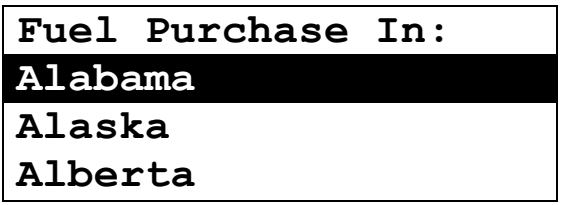
To create a Fuel Purchase record, press  , select  , select  , and select "Fuel Purchase".



The first line displays the current date and time. Use the key to move the cursor to the left. Use or to enter the amount of fuel purchased. Press to advance to the next character position. Press when finished. Press repeatedly to exit without saving a fuel purchase record.

32.2 Recording the Fuel-Purchase State

After the fuel purchase amount is successfully entered, you will be prompted to enter the state in which you purchased the fuel.



Use or to move through the list of states, provinces, territories or Mexico. Press when you have selected the state you want. If you leave this screen without entering anything, it will be marked as "Unknown" in the records!

Note: This menu will not appear if the units of measure are "UK" or "Europe".

32.3 Reviewing Fuel Purchase Information

To review Fuel Purchase records, press , select , select , and select "Review Fuel Purchases".

Use or to review Fuel Purchases. Press repeatedly to exit.

```
Fuel Purchase      1
Alabama
                58.4 gal
 12/22/10  12:20 AM
```

The top line indicates this is a review of fuel purchases and the record number. The oldest records have the lowest numbers. The second line shows the jurisdiction for which the data was collected. The third line shows the amount of fuel purchased in the jurisdiction. The last line shows the time of the purchase.

32.4 Resetting Fuel Purchase Records

To reset all Fuel Purchase records, press , select , select , and select "Review Fuel Purchases". Press and hold until you hear a "beep" from the RoadRelay™ (approximately 3 seconds). The Reset Fuel Purchases confirmation screen is now displayed.

```
        Reset
  Fuel Purchases?
        Yes
```

Press to reset. Press to exit this screen without resetting the Fuel Purchase records. This reset will erase all fuel purchase information.

If the RoadRelay™ is in "Fleet Mode", you will not be able to reset Fuel Purchases (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

33 Road Speed Recorder

Related sections: Menu Navigation

This feature is for the recording of data after a vehicle incident. An incident can be defined as any situation where a 75 second recording of road speed, engine speed, brake activity, and clutch activity may be of value to the driver or end user. To record the road speed, engine speed, brake activity, and clutch activity press and hold the Enter key for three seconds while viewing any icon screen. Icon screens include the Top Level icon screen and all Second level icon screens.

The following screen will appear asking if you really want to record the information. Use or to select Yes or No. Press to make the recording. Press to exit this screen without creating a recording.

```
Save
Road Speed Report?

Yes
```

If you select "Yes", the previous 60 seconds and the next 15 seconds of information are stored while moving. If you are stopped, the 60 seconds before stopping and 15 seconds after stopping are stored. You will see the following screen and hear a siren-like sound while the information is stored.

```
Recording Last
60 Seconds of
Road Speed
11/26/11   6:22 PM
```

The RoadRelay™ only saves one Roadspeed Recorder report. If another report is created, the previous report is deleted from memory. The Road Speed Recorder data can only be viewed using PowerSpec™ office software.

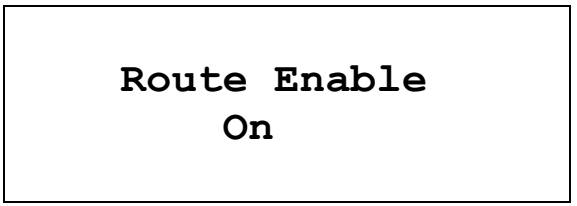
34 Route Recording

Related sections: Keypad-Entry Screens, Units of Measure, Setting the Clock Time, 12 or 24 Hour Clock Time, Setting the Date,

A route is the distance and time traveled since the last time a new route was started. This feature is used to create a record for each route. A route does not need to include any travel. It can be used to record time waiting to unload, stuck in traffic, etc.

34.1 Turning Route Recording On or Off

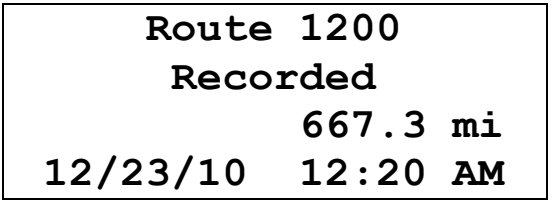
To turn ON or OFF the Route Recording feature, press  , select  , select  , and select "Route Enable". Use  or  to toggle between On and Off. Press  to finish.



If the RoadRelay™ is in "Fleet Mode" you will not be able to change this setting (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

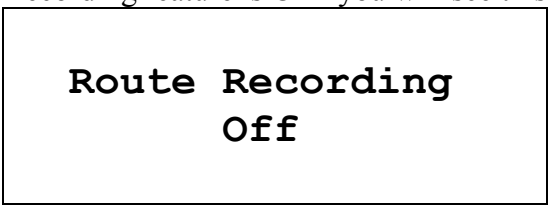
34.2 Starting a New Route

To start a new route press  , select  , select  and select "Record Route".

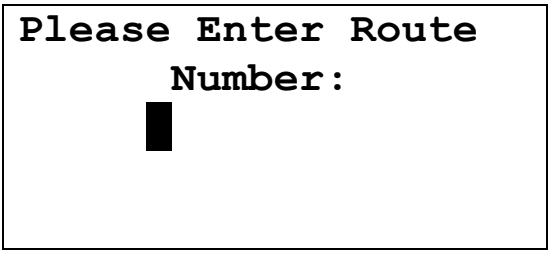


This screen will be shown for 5 seconds. It indicates the previous route number, distance traveled on the previous route, and the time this previous route began.

If the Route Recording feature is OFF you will see this screen:



34.3 Entering the New Route Number



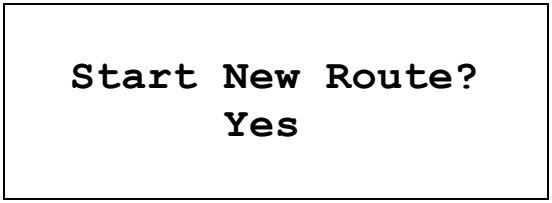
When the truck is stopped the screen above will appear asking for the route number. Use or to enter the route number. A route number can be 1 to 10 digits in length. Press to advance to the next character position. Press to finish.

If the vehicle is moving when a new route is started, this screen will immediately appear if Vehicle-in-Motion Lockout is OFF *(Vehicle-in-Motion Lockout can only be turned ON or OFF using PowerSpec™ office software).* A passenger may enter the new route number - for safety reasons *the driver should never enter data while driving*. If Vehicle-in-Motion Lockout is ON, this

screen will wait to appear until 5 minutes have passed while idling or a key on the RoadRelay™ is pressed while idling.

If you leave without entering a route number, route numbers will be asked for when another route is started, at key-off, and at key-on.

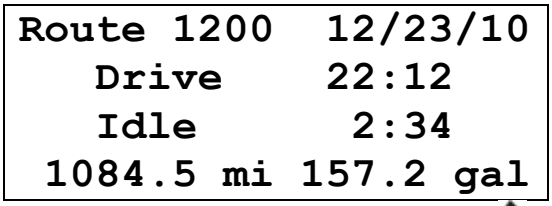
If the entered route number matches a previously entered route number, the user will be asked if this is a new route (as opposed to continuing the present route).



Use or to toggle between Yes and No. Press to finish.

34.4 Reviewing Route Records

To review the route information saved in the RoadRelay™, press , select , select , and select "Review Routes".



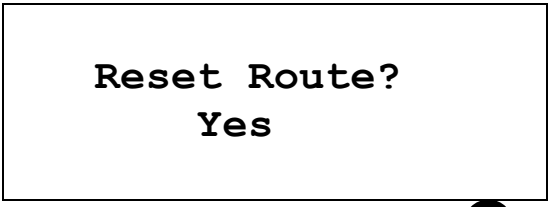
Use or to review the routes. To exit, press . The route information shown is the sum of all records in a route. The top line shows the route number and date when the route started.

The second and third lines show the amount of time spent driving and idling. The last line shows the total distance and fuel used on the indicated route.

34.5 Resetting Route Records

A route record can be reset while on the route review screen. Press  , select  , select  , and select "Review Routes".

While viewing the record you wish to reset, press and hold  for 3 seconds. The RoadRelay™ will "beep" and display the following confirmation screen.



This reset will erase all route information. Press  to reset or press  to exit without resetting the route record.
If the RoadRelay™ is in "Fleet Mode", you will not be able to reset the information (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

35 Pop-ups

Pop-ups are special screens that appear when the driver may need to be warned of certain events.

35.1 Coaching Pop-ups

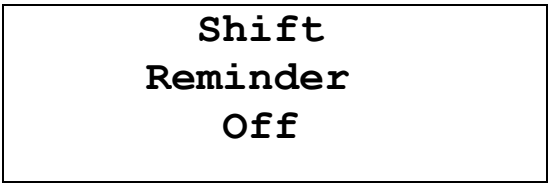
Related sections: Setting Transmission Type
Coaching pop-ups are used to help the driver operate the vehicle in a more economical and safer manner.

35.1.1 Shift Reminder

All engines have an RPM zone in which it gets the best fuel economy. Shift reminder can be used to remind the driver that it is time to shift up or down to remain in this range. The Shift Down RPM default setting is 1200 RPM. The Shift Up RPM default setting is 1700 RPM. The following sections explain how to turn on the pop-up indicator and how to change the Shift Reminder RPM settings.

35.1.1.1 Setting up Shift Reminder

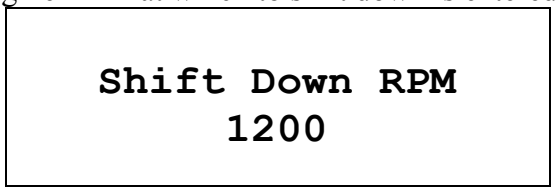
Press  , select  , select  , and select "Shift Reminder".



Use the  or  to change between On and Off. Press  to save the selection. Press  to exit this screen without changes.

If the RoadRelay™ is in "Fleet Mode", you will not be able to change this coaching pop-up setup (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).

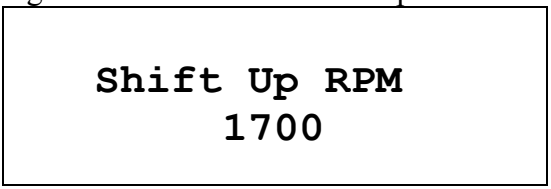
Next, the engine RPM at which to shift down is entered.



Use the  key to move the cursor to the left. Use  or  to enter the desired shift-down RPM. Press  to advance to the next

character position. Press when finished. Press repeatedly to exit without changing the shift reminder RPM.

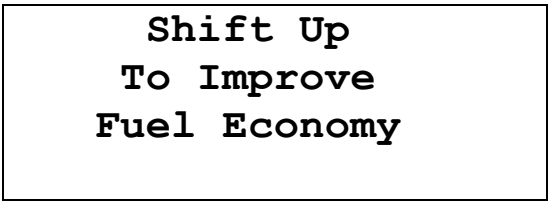
Finally, the engine RPM at which to shift up is entered.



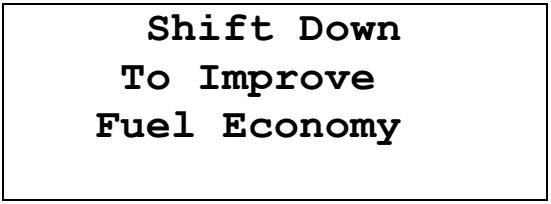
Use the key to move the cursor to the left. Use or to enter the desired shift-up RPM. Press to advance to the next character position. Press when finished. Press repeatedly to exit without changing the shift reminder RPM.

35.1.1.2 Shift Reminder Pop-ups

After the shift reminder has been enabled and engine RPM has been entered, the following pop-ups may occur.



This pop-up appears when the engine is operating above the shift-up RPM. Staying below this RPM improves fuel economy.



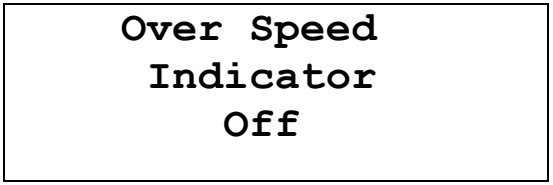
This pop-up appears when the engine is operating below the shift-down RPM. Staying above this RPM improves fuel economy.

35.1.2 Vehicle Over Speed

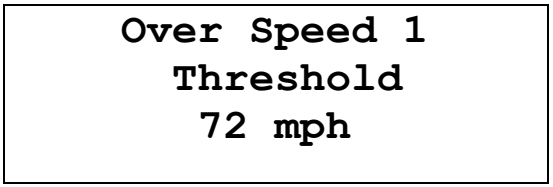
Vehicle over-speed is used to warn the driver when the vehicle is moving too fast. Driving too fast may be an unsafe condition. There are two over-speed thresholds used by the RoadRelay ™. The Over Speed 1 Threshold is what triggers the Vehicle Over Speed Pop-up. Its default setting is 72 mph (116 kph). The second threshold, Over Speed 2 Threshold has a default setting of 80 mph (129 kph). The following sections explain how to turn on the pop-up indicator and make adjustments to the over-speed threshold settings.

35.1.2.1 Setting Up Vehicle Over Speed

Press  , select  , select  , and select "Over Speed".



Use the  or  to change between On and Off. Press  to save the selection. Press  to exit without changing the selection. *Turning the pop-up off does NOT prevent an over speed occurrence from being recorded in trip data. If the* RoadRelay ™ *is in "Fleet Mode", you will not be able to change this coaching pop-up setup (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*



Over Speed 1 is the speed at which the warning pop-up occurs.

Use the key to move the cursor to the left. Use or to enter the desired threshold speed. Press to advance to the next character position. Press when finished. Press repeatedly to exit without changing the threshold speed.

Next, the Over Speed 2 threshold is entered.

```
Over Speed 2
  Threshold
  80 mph
```

No pop-up occurs when this speed is reached; however, the time spent above this speed is part of the recorded trip information.

Use the key to move the cursor to the left. Use or to enter the desired threshold speed. Press to advance to the next character position. Press when finished. Press repeatedly to exit without changing the threshold speed.

35.1.2.2 Vehicle Over Speed Pop-up

When the RoadRelay™ detects that the vehicle speed is greater than the Over Speed 1 Threshold setting, the RoadRelay™ will "beep" and the following pop-up is displayed on the screen. This pop-up will remain on the screen until the vehicle speed is less than the Over Speed 1 Threshold setting or until any key is pressed on the keypad.

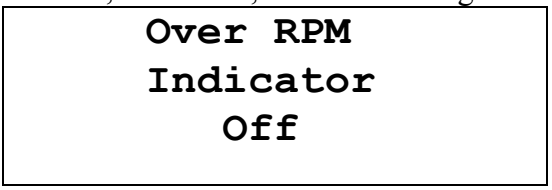
```
Vehicle Speed
Over 72 MPH
```

35.1.3 Engine Over RPM

Engine over RPM is used to warn the driver when the engine is being run too fast. Over-revving the engine may damage it. The default setting is 2400 RPM. The following sections explain how to turn on the Engine Over RPM indicator and make adjustments to the Engine Over RPM setting.

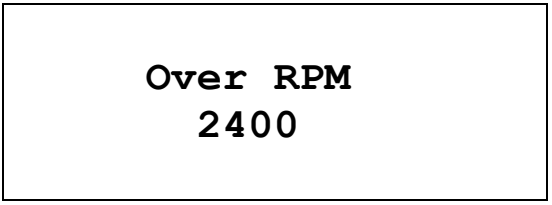
35.1.3.1 Setting Up Engine Over RPM

Press , select , select , and select " Engine Over RPM ".



Use the or to change between On and Off. Press to save the selection. Press to exit without changing the selection.

Turning the pop-up off does NOT prevent an over RPM occurrence from being recorded in trip data. If the RoadRelay™ *is in "Fleet Mode", you will not be able to change this coaching pop-up setup (Fleet mode can only be turned ON or OFF using PowerSpec™ office software).*



The entered number is the RPM at which the warning pop-up occurs. Use the key to move the cursor to the left. Use or to enter the desired threshold speed. Press to advance to

the next character position. Press  when finished. Press  repeatedly to exit without changing the Over RPM speed.

35.1.3.2 Engine Over RPM Pop-up

When the RoadRelay™ detects that the Engine RPM is greater than the Engine Over RPM Speed threshold setting, the RoadRelay™ will "beep" and the following pop-up is displayed on the screen. This pop-up will remain on the screen until the vehicle speed is less than the Over RPM Threshold setting or until any key is pressed on the keypad.

```
Engine Speed
Over 2300 RPM
```

35.1.4 Other Driver Coaching Pop-ups

```
Engine Warming Up
  Please Wait
```

This screen will be shown while the engine is too cold to be driven. When the engine temperature has sufficiently increased, then this screen will go away. Revving or loading the engine while it is cold may reduce its useful life.

```
    Turn On
  Engine Brake
  to Increase
Service Brake Life
```

This pop-up appears when service brakes are applied on an engine-brake-equipped vehicle, and the engine-brakes are currently not being used. The use of engine brakes reduces the amount of wear on the service brakes.

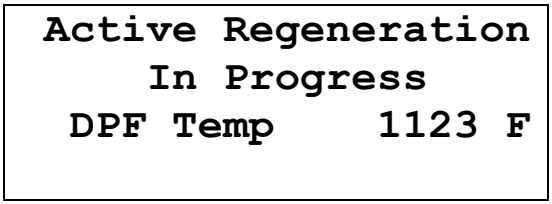
35.2 Aftertreatment Pop-ups

Aftertreatment pop-ups provide information to the driver in the event that the High Exhaust System Temperature (HEST) lamp or the Diesel Particulate Filter (DPF) lamp becomes active (illuminated). In addition, other informational aftertreatment pop-ups will be displayed if regeneration is halted due to certain vehicle conditions not being met. These Pop-ups shall only be displayed on engines equipped with the Cummins EPA 2007 Aftertreatment System. In addition, the RoadRelay™ must be connected to the J1939 vehicle communications datalink. Refer to the RoadRelay 5™ Installation Manual for further details on datalink wiring configurations. Refer to your Cummins Owner's Manual for further information on the Cummins Aftertreatment system.

35.2.1 Active Regeneration

An active regeneration is signified by the illumination of the HEST lamp and the RoadRelay™ Active Regeneration in Progress pop-up. In this condition, a high exhaust temperature may exist due to aftertreatment regeneration. Make sure that the exhaust pipe outlet is not directed at any surface or material that will melt, burn, or explode. Reference your Cummins Owner's Manual for complete instructions.

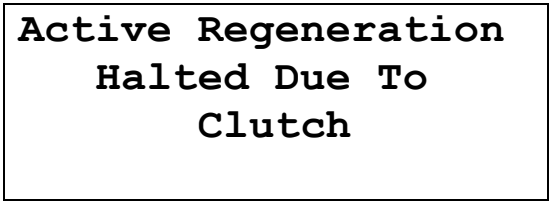
35.2.1.1 Active Regeneration in Progress Pop-up



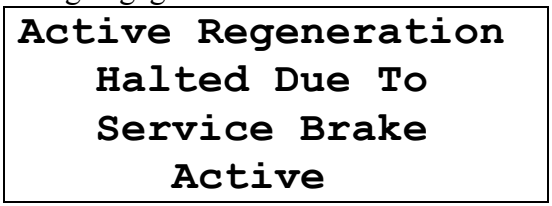
The third line displays the current DPF Outlet temperature.

35.2.1.2 Active Regeneration Complete Pop-up

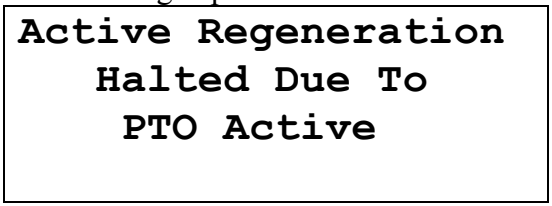
35.2.1.3 Active Regeneration Halted Pop-ups



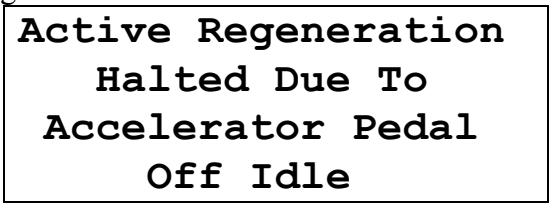
This pop-up indicates that the Active Regeneration was halted due to the clutch being engaged.



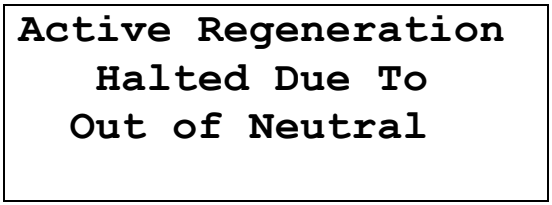
This pop-up indicates that the Active Regeneration was halted due to the service brake being depressed.



This pop-up indicates that the Active Regeneration was halted due to PTO being activated.



This pop-up indicates that the Active Regeneration was halted due to the accelerator pedal being depressed.

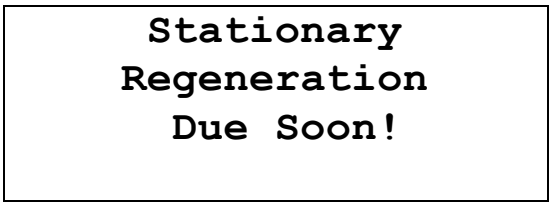


This pop-up indicates that the Active Regeneration was halted due to the vehicle not being in neutral.

35.2.2 Stationary Regeneration Due Notification

These pop-ups signify that your vehicle's aftertreatment system needs to perform a stationary (parked) regeneration. Refer to your vehicle's owner's manual for further information on performing a stationary regeneration.

35.2.2.1 Stationary Regeneration Due Soon Pop-up



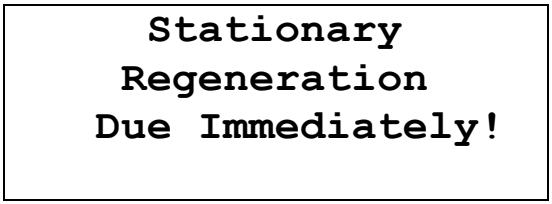
This pop-up signifies that the Aftertreatment Diesel Particulate Filter needs to be regenerated within the next 2-6 hours of operation. This can be accomplished by:

1. Changing to a more challenging duty cycle, such as highway driving, for at least 20 minutes

Or

2. Performing a Stationary (Parked) regeneration.

35.2.2.2 Stationary Regeneration Due Immediately Pop-up



This pop-up signifies that the Aftertreatment Diesel Particulate Filter needs to be regenerated within the next 1-2 hours. In addition, engine power may be reduced automatically. Regeneration can be accomplished by:

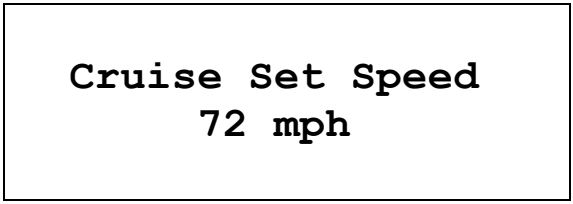
1. Changing to a more challenging duty cycle, such as highway driving, for at least 20 minutes

Or

2. Performing a Stationary (Parked) regeneration.

35.3 Cruise Set-Speed Pop-ups

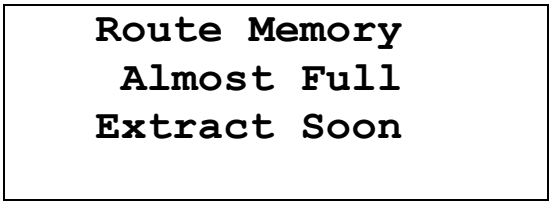
When the cruise control set-speed is changed the following screen will be shown:



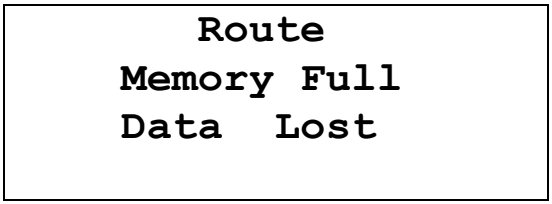
35.4 RoadRelay Informational Pop-ups

These pop-ups report information in regard to the functional operation of the RoadRelay™ itself.

35.4.1 Route Memory Pop-ups

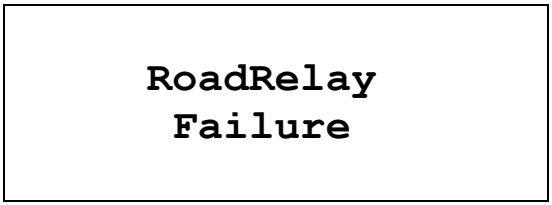


This screen indicates that RoadRelay™ information storage for the Route feature is 90 % or more full. This is a warning that data needs to be removed soon or it may be lost. The data should be reset (refer to Resetting Route Records section in this manual) or extracted with the PowerSpec™ office software.



This screen indicates that RoadRelay™ information storage for the Route Recording feature is full and some data has been lost. The data should be reset (refer to Resetting Route Records section in this manual) or extracted with the PowerSpec™ office software.

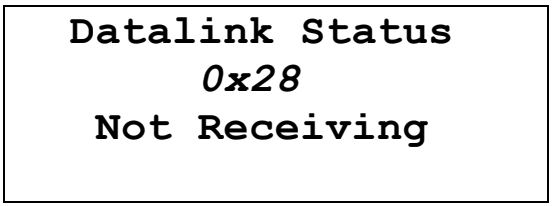
35.4.2 RoadRelay Failure Pop-up



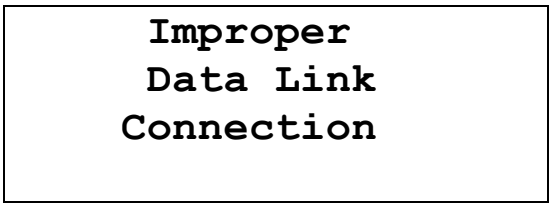
This screen indicates there is a defect in the RoadRelay™. Return the unit for repair.

35.4.3 Data Link Pop-ups

This screen indicates that no data has been received by the RoadRelay™ during the last 30 seconds from the engine. This failure indicates something is wrong with the engine electronics, wiring to the RoadRelay™, or possibly the RoadRelay™ itself. Check that all wires are attached correctly and that the engine electronics have power.

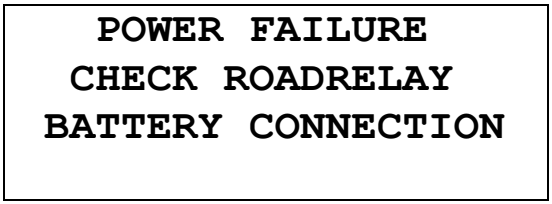


This screen indicates that no data is being received by the RoadRelay™. Typical it will be shown immediately after the "RoadRelay Data Link Failure" pop-up. This failure indicates something is wrong with the engine electronics, wiring to the RoadRelay™, or possibly the RoadRelay™ itself. Check that all wires are attached correctly and that the engine electronics have power. *The RoadRelay™ will no longer display the Automatic Leg screens until the data link problem is corrected.*
Depending on your vehicle's configuration, the "0x28" displayed in this pop-up may show "0x8C".



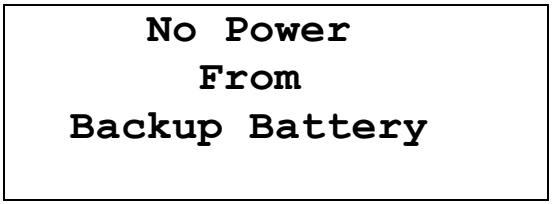
This screen indicates a problem with the connection between the RoadRelay™ and the engine. This failure indicates something is wrong with the engine electronics, wiring to the RoadRelay™, or possibly the RoadRelay™ itself. Check that all wires are attached correctly.

35.4.4 Power Failure Pop-up



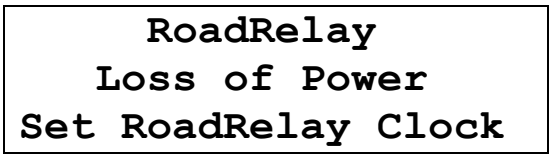
This pop-up occurs if the vehicle battery is disconnected from the RoadRelay™ prior to the vehicle keyswitch being turned OFF.
For proper data storage and data integrity, the RoadRelay™ requires that the vehicle keyswitch is turned OFF prior to removing vehicle unswitched (battery) power.
The RoadRelay™ will no longer display the Automatic Leg screens until the battery issue is corrected.
The pop-up can be dismissed by simply cycling (turning off, then back on) the vehicle keyswitch. If the problem persists, check the vehicle battery wiring to the RoadRelay™.

35.4.5 Back-up Battery Pop-up



If this pop-up occurs, the back-up battery inside the RoadRelay™ is not charged or is not holding charge. Check that all wires are properly connected to the RoadRelay™. Refer to the RoadRelay™ Back-up Battery Test Procedure section in this manual for further information.

35.4.6 RoadRelay Loss of Power



The RoadRelay™ will display this fault pop-up if the RoadRelay™ clock has not been set after the initial installation. Time/date stamping of data is very important for RoadRelay™ data integrity. Refer to the Setting the Clock section of this manual to set the clock time on the RoadRelay™.

Note: This pop-up is intended as a reminder for the user to set the clock and is NOT an indication that the RoadRelay™ has malfunctioned or has been improperly installed. If this pop-up continues to be displayed even after the clock time has been set, refer to the Back-up Battery Test Procedure section in this manual.

36 Environmental Information

The RoadRelay™ is designed to operate within a temperature range of -22⑤ to 185⑤ F (-30⑤ - 85⑤ C).
It will operate from a voltage supply of 9.5 to 40 volts.

37 Disconnecting Power for Extended Periods

RoadRelay™ data should be extracted prior to extended periods of time (more than 90 days) without being connected to primary power (vehicle battery). Failure to do so will result in a loss of data once the RoadRelay™'s internal back-up battery has discharged. After an extended period of time without primary power connected, it will take at least 7 days for the RoadRelay's™ back-up battery to reach full charge with vehicle power connected. During the power-down time, data may be lost.

38 Cleaning the RoadRelay

Do NOT use petroleum-based solvents or cleaners. Do NOT use abrasive cleansers or materials on the faceplate - they may cause scratches. Most standard household cleaners are suitable for use on the RoadRelay™.

39 Troubleshooting and Technical Support

Related sections: Software Version; Fault Information

Always check all wiring to the RoadRelay™ if you are having problems. Running the RoadRelay™ Self-test feature (refer to details in this section) will help determine if the RoadRelay is wired correctly. The RoadRelay™ Installation Guide contains useful troubleshooting information as well.
Do not open the RoadRelay™; doing so will void any warranty you may have. The RoadRelay™ has no user-serviceable parts.

Call Technical Support if you believe the unit is properly wired and still not working.

- 1-800-433-9341 in The USA
- 0800-286646 in the United Kingdom
- +1-812-3778136 for international calls

To make your call go as smoothly as possible, please have the following information handy when you call:

- Make and model of the vehicle in which the RoadRelay™ is installed
- Engine Type (for example, 2010 Cummins ISX)
- Software Version of your RoadRelay™ (refer to Software Version section of this manual)
- Transmission Type
- Any electronic systems on the vehicle (for example ABS)

39.1 Self-test

The RoadRelay™ Self-test feature verifies that critical internal hardware is functional and all necessary data are being received from the vehicle's data link. It is recommended to run the RoadRelay™ Self-test immediately after installing the RoadRelay™ and anytime you suspect there are problems.
The hardware/features verified during the self-test are listed in the table below:

Item	Description/Action
Keyswitch	Verifies the RoadRelay™ Keyswitch input is functional. / If the test fails, verify the RoadRelay Keyswitch input wiring. Refer to the RoadRelay™ Installation Guide for wiring details.
Datalinks	Verifies that the RoadRelay™ is receiving vehicle information over the vehicle data link. / If the test fails, verify the RoadRelay™ data link connections. Refer to the RoadRelay™ Installation Guide for wiring details.
RTC	Verifies the internal Real-time Clock is functional. / If the test fails, contact your Cummins distributor.
Battery Input	Verifies the RoadRelay™ Battery input is functional. / If the test fails, verify the RoadRelay™ Battery input wiring. Refer to the RoadRelay™ Installation Guide for wiring details.
Internal Voltages	Verifies RoadRelay™ internal power is functional. / If the test fails, contact your Cummins distributor.
Illumination	Verifies the Illumination input is functional. / If the test fails, verify the RoadRelay™ Illumination input wiring. Refer to the RoadRelay™ Installation Guide for wiring details.
Test Log	Displays the result (pass/fail) and the time/date stamp of the last time all tests were performed.

To run the RoadRelay Self-test, press  , select  , select  , and select "Self-test".
Note: The Self-test can only be executed when the vehicle is NOT moving.

```
Keyswitch
Datalinks
RTC
Battery Input
```

Use  or  to select a specific item to test or press  to run the test that is currently highlighted.
Individual tests can be executed but the Test Log time/date stamp will not be updated.
The following sections detail the functionality of each test.

39.1.1 Keyswitch Test

```
Turn Keyswitch OFF


Current State:    ON
```

The first line displays the required user action. The last line displays the current state of the keyswitch (ON or OFF). You will have 10 seconds to initiate the user action (turning the vehicle keyswitch ON or OFF). Failure to take action will cause the test to fail. To re-run the test, press  , then press  to re-enter the Keyswitch test.

The following screen indicates that the Keyswitch test passed.

```
Keyswitch Test
TEST PASSED

Current State:    ON
```

Press  to proceed to the next test or press  to exit the self-test. *You will not be able to proceed to the next test until the vehicle keyswitch is turned to the ON position. You will have 15 seconds to turn the keyswitch ON or the RoadRelay will power down.*

39.1.2 Data link Test

This screen indicates that the Datalink test passed.

```
Datalink Status
TEST PASSED
J1939: Receiving
```

The Datalink test does NOT require any user action. The second line automatically displays the test result.

Press  to proceed to the next test or press  to exit the self-test.

39.1.3 RTC Test

The following screen indicates that the Real-Time Clock test passed.

```
Real-Time Clock
2011-12-31 23:45:27
TEST PASSED
```

The RTC test does NOT require any user action. The second line displays the current real-time clock time.
For PowerSpec™ users, the time will be displayed in Universal Time.
The third line automatically displays the test result.

Press  to proceed to the next test or press  to exit the self-test.

39.1.4 Battery Input Test

This screen indicates that the Battery Input test passed.

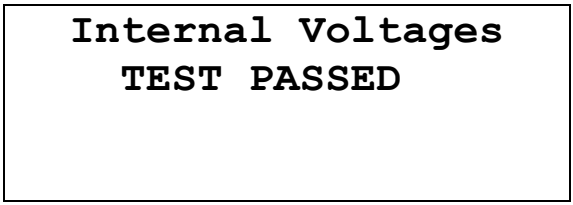
```
Battery Input
TEST PASSED
```

The Battery test does NOT require any user action. The second line automatically displays the test result.

Press  to proceed to the next test or press  to exit the self-test.

39.1.5 Internal Voltages Test

This screen indicates that the Internal Voltages test passed.

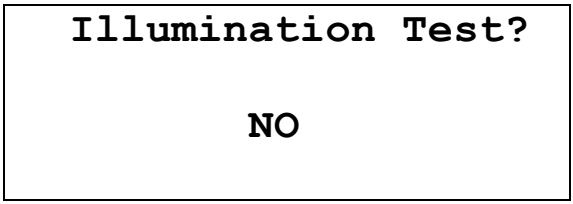


The Internal Voltage test does NOT require any user action. The second line automatically displays the test result.

Press ◄► to proceed to the next test or press ◄ to exit the self-test.

39.1.6 Illumination Test

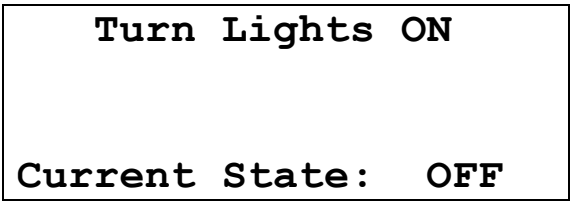
Entering the Illumination test displays the following confirmation screen.



Select "No" to by-pass the Illumination test.

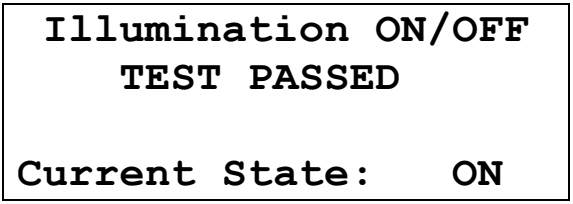
The Illumination test is optional since some installers choose not to connect the RoadRelay's™ Illumination input at the time of installation. If the Illumination input is not connected on your vehicle, the display brightness can be controlled manually from the RoadRelay™ keypad (see Controlling Display Brightness section of this manual).

To run the test, use or to toggle the selection to “Yes”. Press to confirm your selection



The first line displays the required user action. The last line displays the current state of the illumination input (ON or OFF). You will have 10 seconds to initiate the user action (turning the vehicle lights ON or OFF). Failure to take action will cause the test to fail. To re-run the test, press , then press to selection the Illumination test. Finally, press to select “Yes” on the confirmation screen to start the test.

This following screen indicates that the Illumination test passed.



Press to proceed to the Test Log or press to exit the self-test.

39.1.7 Test Log

The Test Log screen summarizes the results of the Self-test.

```
        Test Log
2011-12-31  23:45:57
Keyswitch     : PASSED
Datalink      : PASSED
RTC Clock     : PASSED
Battery       : PASSED
Int. Volts    : PASSED
Illumination  : PASSED
```

The second line displays the time/date when all the tests were executed. This line will be blank until the complete self-test has been executed. The time/date stamp is NOT updated when an individual or only a portion of the tests have been executed.

Use  or  to scroll through the results.

Press  or  to exit the Test log screen.

39.2 Back-up Battery Test Procedure

The following procedure will determine if the RoadRelay™ internal back-up battery is functional:

Note: Data may be lost while performing this procedure. Verify that data is extracted and/or backed-up before continuing.

1. Install the RoadRelay™ as outlined in the RoadRelay™ Installation Manual.
2. Set the time of day using the RoadRelay™ clock (refer to "Setting the Clock Time" section in this manual).

3. Remove power from the vehicle (disconnect vehicle battery or disconnect RoadRelay™ power harness) for a least 10 seconds.
4. Re-connect vehicle power.
5. Verify that the RoadRelay™ retained the time of day as set in step #2.

If the time of day is retained, the back-up battery is functioning properly. If the "RoadRelay™ Loss of Power" fault was detected, refer to "Resetting the Fault Log" section of this manual to reset the Loss of Power fault.
If the time of day is reset to 12:00 AM (time will be flashing), then the internal back-up battery is dead. Since the RoadRelay™ internal back-up battery is rechargeable, leave the vehicle battery and RoadRelay™ connected for at least 7 days and repeat steps 1 through 5 again. If the time of day still resets to 12:00 AM, then the internal back-up battery is no longer holding charge. The RoadRelay™ will continue to collect and monitor vehicle information, but data will be lost in situations where vehicle (battery) power is removed from the RoadRelay™ (such as removing the battery from vehicle, disconnecting power to the cab/dashboard, servicing the vehicle, during accidents, etc). The RoadRelay™ back-up battery is not a customer replaceable part. Only Cummins authorized personnel are allowed to replace the back-up battery or service the RoadRelay™. Contact your Cummins distributor for service information.

40 Calibration Updates

The RoadRelay™ is software upgradeable to support the latest features and updates. Visit us on the web at www.RoadRelay.com for details on the availability of new calibrations and other technical information.

41 Warranty

COVERAGE

Products Warranted

This warranty applies to the new RoadRelay 5™, sold by Cummins Inc. (hereinafter 'Cummins') and delivered to the first user on or after June 1 2011, anywhere in the world where Cummins-approved service is available*.

Base Warranty

The Base Warranty covers any failure of the Product that results, under normal use and service, from defects in material or workmanship (Warrantable Failure). This Coverage begins with the sale of the Product by Cummins and ends 90 (ninety) days from the date of delivery of the Product to the first user.

Consumer Products

This warranty on Consumer Products in the United States is a **LIMITED** warranty. **CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Any implied warranties applicable to Consumer Products in the United States terminate concurrently with the expiration of the express warranties applicable to such products. In the United States, some states do **not** allow the exclusion of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the limitations or exclusions herein may **not** apply to you.

This warranty is made to the first Owner in the chain of distribution, and Coverage continues until the end of the period of coverage.

CUMMINS RESPONSIBILITIES

During the Base Warranty

Cummins will pay for all parts and 1(one) hour of labor needed to repair the damage to the Products resulting from a Warrantable Failure.

Cummins will pay for the Products including, but **not** limited to: Associated harnesses and installation materials and RoadRelay™ that are **not** reusable due to the Warrantable Failure.

In the event the engine does **not** start because of a malfunction of the Cummins Antitheft feature anytime during the warranty period, Cummins will repair or replace the feature when the truck is brought to an authorized Cummins Repair Facility or a mechanic, authorized by Cummins, visits the vehicle. This is Cummins sole obligation and your sole remedy.

OWNER RESPONSIBILITIES

During the Base Warranty

Owner **must** deliver the Products to the repair location.

Owner is responsible for the cost of the Products provided during warranty repairs unless such items are **not** reusable due to the Warrantable Failure.

At the time when the parts are installed, Owner is responsible for the preparation of a written record containing the following: (1) The date of installation of the Product(s); (2) the Engine serial number; (3) the Engine miles, kilometers, or hours of operation; (4) the Product(s) installed; and (5) the location of the Product(s) in the application. The purpose of this record is to protect Owner's interests and support any claim for a Warrantable Failure. Owner is responsible for the operation and maintenance of the Products as specified in the applicable User's Guide. Owner is also responsible for providing proof that all recommended maintenance has been performed. Before the expiration of the warranty, Owner **must** notify a Cummins Distributor, Authorized Dealer, or other repair location* approved by Cummins of any Warrantable Failure, and deliver the Products to such facility for repair.
Owner is responsible for communication expenses, meals, lodging, and similar costs incurred as a result of a Warrantable Failure.
Owner is responsible for non-Product repairs and for "downtime" expenses, passenger delays, cargo damage, fines, all applicable taxes, all business costs, and other losses resulting from a Warrantable Failure.
Owner is responsible for Antitheft Feature repairs due to incorrect passwords, including failure of RoadRelay™ display caused by use of the RoadRelay™ outside of specified operating temperatures.

LIMITATIONS
Cummins is **not** responsible for radio frequency interference. Cummins is **not** responsible for failures or damage resulting from what Cummins determines to be abuse, neglect, including, but **not** limited to:
incorrect operation and maintenance as stated in the appropriate user's guide and installation guide, use of cleaners other than a moist cloth to clean RoadRelay™ keypads, displays, and enclosures.
This warranty does **not** apply to Products that bear the name of another company.
The Product(s) and parts used to repair a Warrantable Failure may be new Cummins parts, Cummins-approved rebuilt parts, or repaired parts. Cummins is **not** responsible for failures resulting from the use of parts **not** approved by Cummins.
A new Cummins or Cummins-approved rebuilt part used to repair a Warrantable Failure assumes the identity of the part it replaced and is entitled to the remaining coverage hereunder.
For warranty purposes, parts used in a warrantable repair assume the identity of the parts they replace.
CUMMINS DOES NOT COVER WEAR OR WEAROUT OF COVERED PARTS.
CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CUMMINS INC MAKES NO OTHER REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES WILL CUMMINS ENGINE COMPANY BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, INCLUDING WITHOUT LIMITATION LOST PROFITS OR INCOME, DAMAGE TO FREIGHT, AND LIVING OR TRAVEL EXPENSES, IN THE EVENT OF THEFT, OR IF THE ANTITHEFT FEATURE PREVENTS THE ENGINE FROM STARTING FOR ANY REASON, INCLUDING CUMMINS OWN NEGLIGENCE.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

In case of consumer sales, in some countries the Owner has statutory rights that cannot be affected or limited by the terms of this warranty.

Nothing in this warranty excludes or restricts any contractual rights the Owner may have against third parties.

* Locations in the United States and Canada are listed in the Cummins United States and Canada Sales and Service Directory; other locations are listed in the Cummins International Sales and Service Directory.

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Technical Support

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