

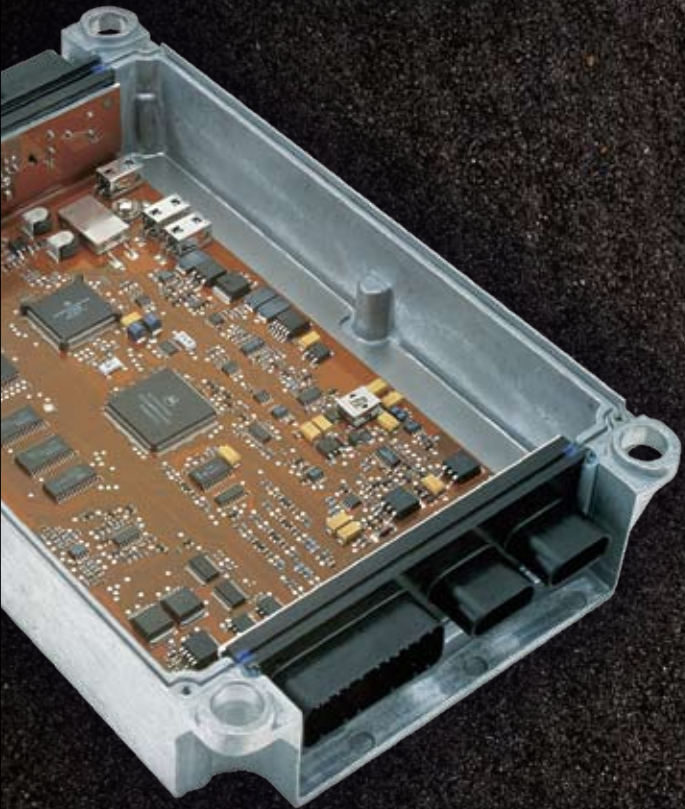
ENGINE

DDEC

DETROIT DIESEL
DEMAND PERFORMANCE™



**WHY ARE DDEC EQUIPPED TRUCKS
THE FIRST OUT AND THE LAST BACK
IN THE YARD EVERYDAY?**



**BECAUSE DRIVERS LOVE THEM,
FLEET MANAGERS RELY ON THEM,
AND OWNERS BANK ON THEM.**

**Fuel economy needs
improvement?**

Too much idle time?

**Need to improve your
driver's habits?**

**When is maintenance
required on your trucks?**

**What kinds of tools are needed
to do your own maintenance?**

**Having trouble getting the engine
data and reports you need?**

Are cold starts a problem?

DETROIT DIESEL ELECTRONIC CONTROLS HAS THE ANSWERS.

Because national logistics firms and suppliers have not boosted shipping rates but are adding escalating fuel surcharges to account for increases in diesel fuel – we have to increase our fuel economy to offset the fuel costs.

1 3 9 11

My drivers are keeping their trucks running while parked in order to run the heater or air conditioner. This is killing our fuel economy and causing unnecessary wear on the engine.

1 9

Unknowledgeable drivers can ruin a fleet's fuel economy. Driver training must include fuel economy data. Today's engines allow fleet managers to obtain detailed information on drivers' habits, providing the data needed for training and bonuses.

1 3 9 11 12

With over 40 trucks in my fleet, I'm having problems supplying our maintenance mechanics with accurate PM scheduling, history reports, cost-per-mile incentives and overall performance evaluations of our equipment.

2 5 6 7

Everything on our truck is electronic – what's the most efficient way for our fleet to get the data out of our vehicles and utilize it for service and maintenance schedules?

3 4 6 7 8

Electronic engines save and record a lot of data. How do I turn raw vehicle data into useful information that can be used by both the service department and management?

2 3 4 8

I know that starting, warming up, and running diesel engines in cold weather requires specific tools. What tools do I use to achieve better engine performance and extend engine lifecycle?

9 10

DDEC FAMILY OF PRODUCTS

INFORMATION MANAGEMENT

1

ProDriver® DC

Also reference 6SA551 for more product details

2

IRIS®

Also reference 6SA538 for more product details

3

DDEC Reporting System

Also reference 6SA507 for more product details

4

Data Summaries

Also reference 6SA552 for more product details

TROUBLESHOOTING & MAINTENANCE

5

Maintenance Alert System™

Also reference 6SA537 for more product details

6

ProLink Handheld Reader

Also contact your local service representative for more product details

7

Pocket Diagnostic Link®

Also reference 6SA553 for more product details

8

Diagnostic Link® Software

Also reference 6SA470 for more product details

MAXIMIZE PROFITS

9

Optimized Idle®

Also reference 6SA440 for more product details

10

Ether Start® System

Also reference 6SA396-14 for more product details

11

Fuel Economy Incentive

Also reference 6SA557 for more product details

12

PasSmart

Also contact your local service representative for more product details

DETROIT DIESEL ELECTRONIC CONTROLS HAS THE ANSWERS.

Detroit Diesel Electronic Control (DDEC®)

Since 1985 Detroit Diesel has produced over 750,000 electronically controlled engines. DDEC V, the successor to DDEC 1,2,3 and 4, arrived as the most powerful electronic control system available on any heavy-duty vehicle engine. The increased capability of DDEC V allows Detroit Diesel to offer vehicle owners a logical, simple and complete system of products and programs to assist with every phase of vehicle ownership. The combination of DDEC V and the new system of products and programs is known as the DDEC System.

DDEC V

When specifying an engine, it is important to build a system that is safe, efficient, cost effective and easy to maintain. Once a vehicle is spec'ed, you want to manage it in order to maximize profit by reducing the costs of operation and increasing productivity of the vehicle and driver through the use of engine management tools.

Optimize Vehicle Specifications

Vehicle ownership always begins with spec'ing a vehicle to:

- Provide the necessary performance
- Attract and keep high quality drivers
- Keep cost per mile low
- Maximize resale value

The DDEC System addresses each of these. Spec Manager® allows a vehicle owner or dealer to create and evaluate any number of specifications right in their office.

The DDEC V ECM has a number of important features. Those identified in blue have a significant impact on residual value.

- Multiple engine ratings
- Cruise Control
- Idle Shutdown
- Engine Protection
- Auto shutdown to protect engine from damage
- Power ramp down
- Viewable driver engine data



ProDriver® DC

- ProDriver DC is a dashboard-mounted display that provides instantaneous data and summary information on vehicle and engine operation to the driver.
- Assists you in managing your trucks' operations, providing comprehensive data and activity reports that can be used to improve fuel economy, driver performance, driver satisfaction and operating costs.

Take the guesswork out of monitoring fleet and driver performance. ProDriver DC data provides:

- Current, instantaneous and average MPG
- Trip time, miles, fuel, MPG, average speed
- Driving time, percentage, miles, fuel, MPG
- Idle time, fuel and percentage
- Cruise time, percentage, miles, fuel, MPG
- Top gear miles, fuel, MPG, time and percentage
- PTO time, fuel and percentage
- Over speed time and percentage compared to two speed thresholds
- Over rev time and percentage
- Maximum speed and RPM
- Coasting time and percentage
- Automated oil change interval tracking
- Average engine load
- New screens and menu items, including a fuel economy incentive graph
- Data card capabilities
- Provides date and time of selected activities
- Task button to view favorite screens quickly and easily



IRIS[®]

(InfraRed Information System)

- IRIS is a wireless communication system between your computer and your fleet consisting of a base transceiver and a truck-mounted mobile transceiver.
- Two-way communication is virtually effortless with IRIS, since it replaces the need for a traditional cable connection.

With IRIS you can:

- Automatically extract stored data from all your Detroit Diesel products
- Use on-hand desktop computers and keyboards
- Have one wireless solution for short range communication needs. With correct translator box selection, IRIS can be used with all your PC tools
- Provides you with access to the data to manage your fleet efficiently, in less time than it takes at the pump or signing your truck into your lot
- IRIS continually searches for vehicles and once it locks on a vehicle it downloads data until the vehicle leaves and then searches for another vehicle
- Precise alignment is not necessary
- Operating data may be downloaded while fueling
- DDEC Reports can be generated automatically
- IRIS can extract HVAC ABS and automatic transmission data with appropriate software from the system manufacturer
- Outdoor application range is 25 feet – indoor application range is 50 feet
- Links to diagnostic troubleshooting programs
- Sends and receives data
- One IRIS transceiver can automatically download data from multiple vehicles in succession, downloads occur in less than 2 minutes
- Can be mounted and operated externally freeing up valuable bay space

IRIS eliminates wasted time looking for cables, the laptop computer casualties due to theft, and PC replacement due to dropped laptops. IRIS eliminates the need for drivers to remember to plug in. And, IRIS is not software specific.



Reports - Life-To-Date
Date: 04/27/2008 09:52 AM

DDEC® Reports - Period Activity
Date: 04/27/2008 09:52 AM

DDEC® Reports - Daily Engine Usage
Date: 04/27/2008 09:52 AM

DDEC® Reports - Periodic Maintenance
Date: 04/27/2008 09:52 AM

DDEC® Reports - Engine Load
Date: 04/27/2008 09:52 AM

Engine Load Histogram
Number of Hours vs. % of Period Time

Engine Speed Histogram
Number of Hours vs. % of Period Time

Speed Range (RPM)	Hours	% of Period Time
0-1000	10	10%
1000-1200	20	20%
1200-1400	30	30%
1400-1600	40	40%
1600-1800	50	50%
1800-2000	60	60%
2000-2200	70	70%
2200-2400	80	80%
2400-2600	90	90%
2600-2800	100	100%

Within Speed Histogram

Speed Range (RPM)	Hours
0-1000	10
1000-1200	20
1200-1400	30
1400-1600	40
1600-1800	50
1800-2000	60
2000-2200	70
2200-2400	80
2400-2600	90
2600-2800	100

Engine Speed Histogram

Speed Range (RPM)	Hours
0-1000	10
1000-1200	20
1200-1400	30
1400-1600	40
1600-1800	50
1800-2000	60
2000-2200	70
2200-2400	80
2400-2600	90
2600-2800	100

Summary Statistics:

Parameter	Value
Max RPM	2800
Min RPM	0
Avg RPM	1500
Max Torque	1000
Min Torque	0
Avg Torque	500



DDEC® Reporting Software

- DDEC Reports Software produces a wide variety of diagnostic and management reports useful for analyzing driver performance using the information collected from DDEC.
- Reports offer the opportunity for fleet managers to review driving habits and assess how those habits impact driving performance and wear on the engine and vehicle.

DDEC Data is a recording device within the ECM that is automatically turned on at the factory and is recording engine operating information. Extraction of this data can be made by direct connection to the vehicle or via IRIS® wireless connection. Once the information is downloaded to your computer, DDEC Reports assists you in producing detailed analysis.

Some of the types of reports accessible in DDEC Reports include:

- Trip Activity
- Speed vs. RPM
- Engine Load vs. RPM
- Periodic Maintenance
- Daily Engine Usage
- Life-to-Date Summary
- Hard Brake
- Last Stop Record

All the reports are displayed in an easy-to-read format, several which have dual display capabilities: graphical and tabular. The graphical representation offers the opportunity to easily view information at a quick glance for diagnosis, while the tabular format displays more detail for a comprehensive analysis.

Trip Fuel
Fuel Economy
Avg Drive Load
Avg Vehicle Speed

Driving Time
Driving Percent
Driving Fuel
Driving Economy

Vehicle Speed Limit
Time
Percent
Distance
Fuel

Top Gear
Time
Percent
Distance
Fuel

Top Gear -
Time



Data Summaries (DDDS)

- DDDS is software designed for the owner or fleet manager, allowing them to make informed decisions and improvements to the bottom line.
- Unique to DDDS are custom reports and standard default trip and monthly reports from the information downloaded from DDEC data.

DDDS was designed to make fleet analysis easier to report and understand. It provides comprehensive reports for the owner.

DDDS extracts DDEC Data and puts the information into a database. Reports are then created from information contained within the database. DDDS allows the user to select and sort the type of information he would like to view within specified parameters, eliminating the need to manually create spreadsheets or sifting through stacks of paper documents. When using DDDS, fleet managers can easily focus on fuel economy, driving time, idle time, or hard braking incidents, highlighting troubled vehicles and / or drivers. Problems are identified and corrective action plans can be implemented.

Extraction of this data can be made by direct connection to the vehicle or via IRIS wireless connection.



DETROIT DIESEL

- ION KEY ON
- OIL LEVEL
- AIR FILTER
- COOLANT LEVEL
- FUEL RESTRICT
- ODEC CODES
- ODEC REPORT-PM

FILTER RESET **CHECK**

ELECTRONIC CONTROLS

DETROIT DIESEL

- ION KEY ON
- OIL LEVEL
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FILTER RESET **CHECK**

ELECTRONIC CONTROLS

Maintenance Alert System™

- MAS is an engine monitoring system that routinely checks key engine operating parameters.
- At a glance, MAS takes the guesswork out of filter and fluid checks and changes.
- MAS saves time and money by providing engine information to mechanics and operators reducing both unexpected downtime and normal routine service.

The sensors include:

- Oil Level Sensor (OLS) – Used to measure the oil level in the engine oil sump after the engine has been shut down.
- Add Coolant Level Sensor (ACLS) – Mounted at a higher position in the top tank cooling system than the standard DDEC coolant level sensor. Provides a warning when the coolant levels are low and supplies a prompt prior to the engine shutdown routine.
- Fuel Restriction Sensor (FRS) – Measures the inlet restriction at the fuel pump. This is the optimal position for the sensor, as it takes into account the entire vehicle fuel supply system, rather than simply a primary or secondary filter restriction.
- Air Filter Restriction Sensor (AFRS) – Measures two thresholds of restriction 18" water and 25" water.

An interior cab-mounted display module provides an easy means of checking and viewing MAS information.



ACTIVE CODES	110
ENGINE RPM	851
ENG. LOAD PCT	48%
OIL TEMP	25 C

DETROIT DIESEL
CORPORATION



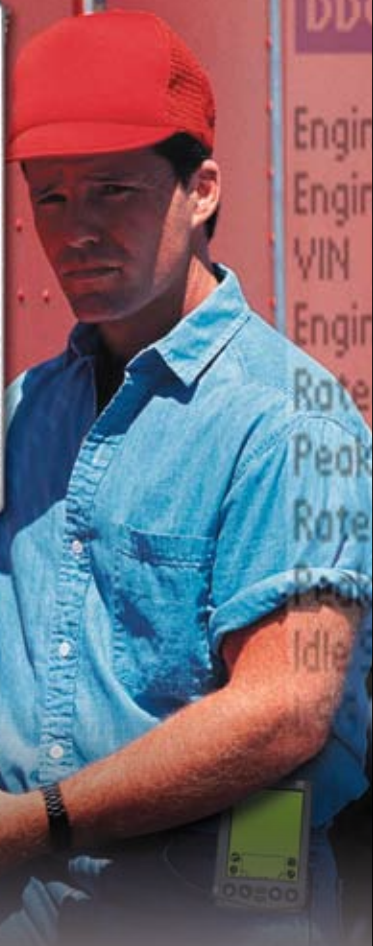
7 8 9
4 5 6
1 2 3
ENTER FUNI

ProLink Handheld Reader

- The ProLink Handheld Reader is a portable diagnostic tool used for maintenance and troubleshooting.
- ProLink provides trouble codes, diagnostic tests and a snapshot recording of engine data, reducing unneeded service write-ups and increases shop productivity.

The ProLink handheld reader is a durable diagnostic tool for maintenance and troubleshooting. This versatile tool is able to diagnose DDEC 2, 3, 4, 5 engines as well as the MBE 900 and MBE 4000 on-highway engines. The LCD display, with contrast adjustment, displays 4 lines of 20 characters per line.





Pocket Diagnostic Link (PDL)

- PDL Software loads on to your own personal digital assistant (PDA) allowing on-the-spot mobile audits of engine operating functions.
- Keep all your important information at-hand. Important engine data can be audited anytime, anywhere.
- Increased shop productivity – spend more time troubleshooting the vehicle and less time looking for cables or connectors, or waiting for other diagnostic tools. PDL can make viewing and clearing fault codes a simple task.

PDL Software increases workforce agility – the entire shop can diagnose, check or download information from DDEC with minimal hardware and expense. It is installed on your PDA within seconds and the connection hardware makes communication with DDEC a snap.

Diagnose - Detroit Diesel Diagnostic Link

File Calibration Snapshot Diagnostic Tools Window Help

WARNING **Connected**

Welcome to Detroit Diesel Diagnostic Link

What would you like to do?

-  Open an existing calibration file
-  Retrieve the calibrations from the ECM
-  Look at the instrumentation values
-  Look at active and inactive faults
-  Stop recording a snapshot
-  Stop DDEC Repairs

Close Out

Caution:


- To avoid personal injury, the operator of a vehicle must not use or read this diagnostic tool while the vehicle is in operation.
- Doing so may result in loss of vehicle control, which may cause vehicle damage and may result in personal injury.
- This diagnostic tool must be used by personnel other than the vehicle operator.
- The vehicle operator must maintain control of the vehicle while an assistant performs the diagnostic evaluation.

Observe all safety precautions in operator and service manuals.

Diagnose - Instrumentation


Switches3 *1	List *2	Graph *3	User *4	EGR *5
Power *1	Brake *2	Fan *3	OptDis *4	
MiscIO *5	Stake *7	Voltage/Fus *8	CC/PTO *9	Switches2 *8

Engine Speed rpm



0.0

Boost Pressure psi




0.0

Percent Engine Load 8%




Delivery Angle deg




-45.0

Vehicle Speed



0 km/h

Battery Potential

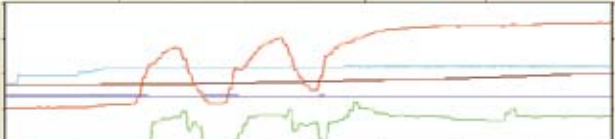


12.2 V

CONNECTED RUN

Instrumentation - HIGH SPEED TEST.DXL Vehicle Unit Number: 69 Engine Serial Number: D14027

Mech *1	Pres *2	Temp *3	In4-1 *4	In4-2 *5
ESS *6	Turbo *7	Graph *8	User *9	



Description	Value	Units	Min	Max
Air Inlet Pressure	51.5	psi	0.0	80.0
Battery Potential	13.5	V	0.0	40.8
EGR Data Pressure	21.6	100	0.0	100.0

98:02:45

Air Inlet tmp sensor - input voltage h

Diagnostic Link[®] PC Software

- Diagnostic Link PC Software is a powerful trip-reporting program that assists fleet managers in effectively and efficiently running their operations.
- Time saving diagnostic and troubleshooting tool; allows mechanics and technicians to pinpoint opportunities to improve operations and identify problems quickly.

Includes a built in service manual and the ability to change engine settings and print reports. When used with a laptop PC Diagnostic Link Software provides a portable troubleshooting kit.



DETROIT DIESEL



68°F 



ELECTRONIC CONTROLS

Optimized Idle[®]

- **Optimized Idle automatically starts and stops your engine to maintain engine temperature, battery voltage and cab temperature. Data is displayed on an internal cab-mounted display.**

Prolonged Engine Idling

- Wastes fuel and money
- Causes excessive engine wear
- Is a cause of pollution
- May pose health risks to drivers

Optimized Idle Features and Benefits

- Provides significant cost savings through idle reduction
- Can eliminate cold starts and warm-up time
- Eliminates damaging deep discharge battery cycles
- Reduces electrical system road calls
- Extends engine and battery life
- Electrical appliances such as refrigerator, TV, VCR, can be used without worrying about dead batteries
- Keeps satellite systems and other parasitic electrical loads from running down the battery
- No additional weight — alternate power sources can weigh 400 lbs., or more!
- Requires no additional maintenance, unlike add-on heaters or power sources

The Thermostat

- Accurately controls interior temperature, provides both heating and cooling
- Driver rests better in driver-selected temperature range on truck applications
- Adjustable “comfort zone” allows selection of how often the engine idles
- Provides a “continuous run” mode when outside temperatures are extreme
- Easy to use, lighted temperature display and control panel

DETROIT DIESEL



Ether Start System



BATTERY +

STARTER -

200A FUSE LEAD

FUSE BLOCK

REDUCED FUEL CLEANER

DETROIT DIESEL
ETHER START SYSTEM
2351/257
MAGNET

STARTER

DETROIT DIESEL
2351/257
REDUCED FUEL CLEANER

Ether Start[®] System

- Ether Start is an automatic cold weather starting system that uses electronic controls and sensors to assist a diesel engine in cold weather conditions.
- Ether Start ensures that there will be no chance of engine abuse. An indicator light let's you know if there is a low ether supply.

DDEC monitors the engine speed, air, oil and coolant temperatures. When needed, a small amount of ether is injected into the air intake manifold at the precise time required to enhance engine start.

The amount of ether is electronically controlled to optimize the starting process and prevent engine damage.



Fuel Economy Incentive (FEI) Program

- Fuel Economy Incentive Program is software that allows fleet managers to establish fuel economy improvement goals and reward drivers who exceed the goal by providing incremental increases in max road speed.
- Fleets save money while allowing the driver to control his goal “earnings” of extra speed.

Speed has the largest effect on your operational cost. Every 5 MPH costs about 0.5 MPG. If you are running 75 MPH and slow to 65 MPH, that is 1 MPG savings, over \$5,000 per year, based on 150,000 miles driven and fuel prices of \$1.75 a gallon.

Speeding, rapid acceleration and braking can lower your fuel economy by as much as 33% at highway speeds and 5% around town.

The FEI software can easily be programmed for the driver incentive to be automatic using DDDL PC software. FEI is a great tool for drivers and managers to work together to improve the overall fleet fuel economy.

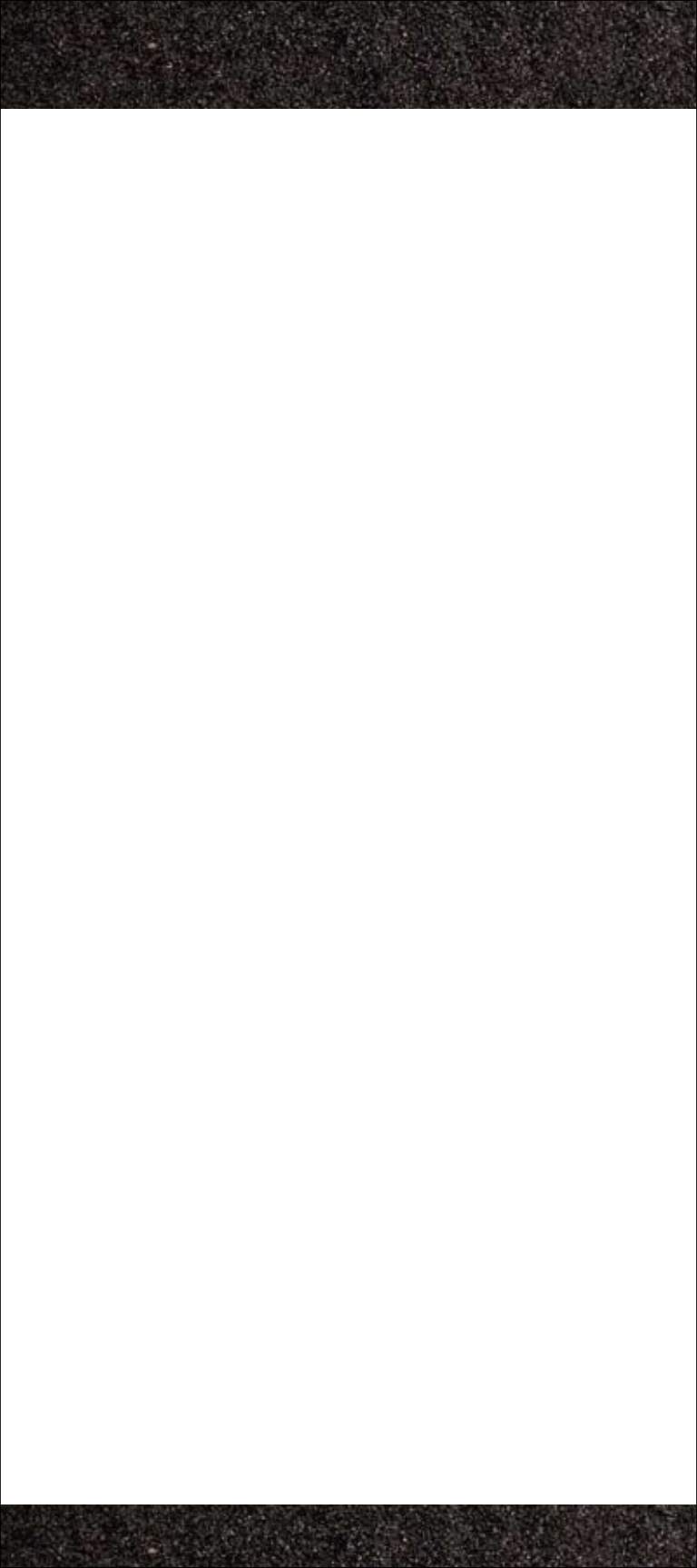


PasSmart

- PasSmart is software that allows a driver to have a second Vehicle Speed Limit (VSL) above the normal VSL to assist while passing other vehicles on the highway.
- Provides the fleet manager the ability to provide drivers the speed they need in certain situations while still maintaining a fuel efficient, overall road speed limit.

After double-pumping the foot pedal, the vehicle is given 20 seconds to accelerate to a speed above the normal VSL limit. Once the normal VSL has been exceeded, a new higher VSL becomes the maximum vehicle speed limit. This limit is the normal VSL plus the Passing Speed Increment.

A passing speed duration timer starts when vehicle speed exceeds the normal VSL limit and continues to count until the vehicle speed drops back below the normal VSL speed. At the end of the passing event, PasSmart is automatically deactivated and the driver cannot exceed the normal VSL unless the foot pedal is double-pumped again.



Notes

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DETROIT DIESEL

DEMAND PERFORMANCE™

