



PowerSpec User Guide

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PowerSpec Overview:

Cummins PowerSpec is a free downloadable PC application designed to allow customers the ability to tailor the operation of their Cummins engine for their specific needs. The following features highlight the capability of PowerSpec:

Gearing Coach - provides recommendations and a calculator to help optimize vehicle gearing for a specified application and load.

Reading Engine Data - reads engine feature settings, trip information, and fault codes from a Cummins engine (requires supported adapter).

Configuring Electronic Features - provides recommended electronic engine feature settings based upon vehicle application and business profile, and allows customers to change these settings on a Cummins engine to meet their specific needs (requires supported adapter).

All of these benefits (except Configuring Electronic Features) will be available to all users immediately upon installation of PowerSpec. The ability to spec electronic engine feature settings requires help from an authorized Cummins distributor or dealer, and can be enabled in one of the following ways:

- Obtain a PowerSpec license from your local Cummins Distributor
- Use a “HotSpec” (created by licensed PowerSpec user)

This manual will focus on how to accomplish these options.

Website Address: www.cumminsengines.com/powerspec

PowerSpec System Requirements:

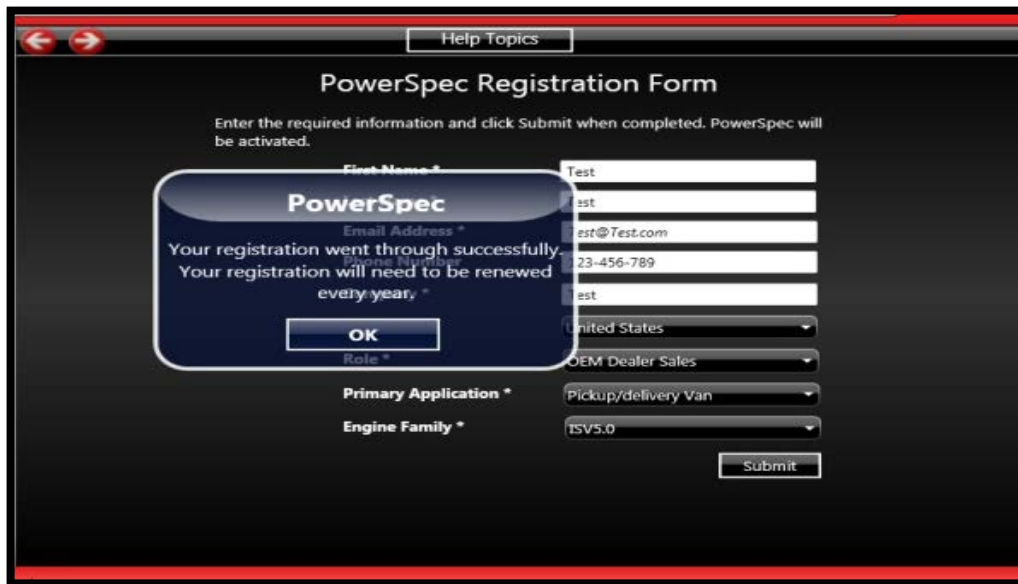
Your system configuration must meet or exceed the following minimum standards in order to run the PowerSpec application:

Computer

- Operating System: 32 or 62 bit versions of Windows Vista , Windows 7 , Windows 8
- RAM: 500 MB of RAM space
- Hard Drive: 480 MB of free hard-disk space
- Port: COM port or USB port
- Browser: Internet Explorer 8 above

User Registration and Market Selection

- Upon opening the PowerSpec application for the first time, users will be required to register. By providing basic demographic information, such as name, email address, primary role and application, and engine family most often used, Cummins will be able to cater future PowerSpec revisions to meet our customer's needs.



Help Topics

PowerSpec Registration Form

Enter the required information and click Submit when completed. PowerSpec will be activated.

PowerSpec
Your registration went through successfully.
Your registration will need to be renewed every year.

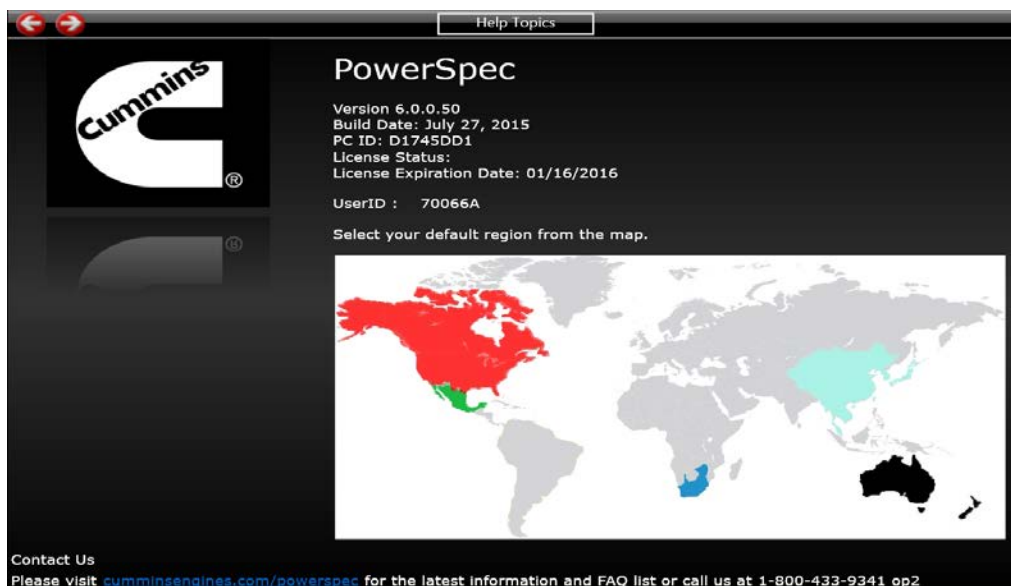
OK

First Name * Test
Email Address * est@Test.com
Phone Number * 23-456-789
Role * OEM Dealer Sales
Primary Application * Pickup/delivery Van
Engine Family * ISV5.0

United States
Submit

NOTE: registering to use PowerSpec is not the same as receiving a PowerSpec license. In order to receive a PowerSpec license, please contact your local Cummins Distributor.

- After registering to use PowerSpec, the specific region that you are interested in gearing, or operating in should be selected. To do this, select the specific Market and/or Area on the World Map:



Help Topics

PowerSpec

Version 6.0.0.50
Build Date: July 27, 2015
PC ID: D1745DD1
License Status:
License Expiration Date: 01/16/2016
UserID : 70066A

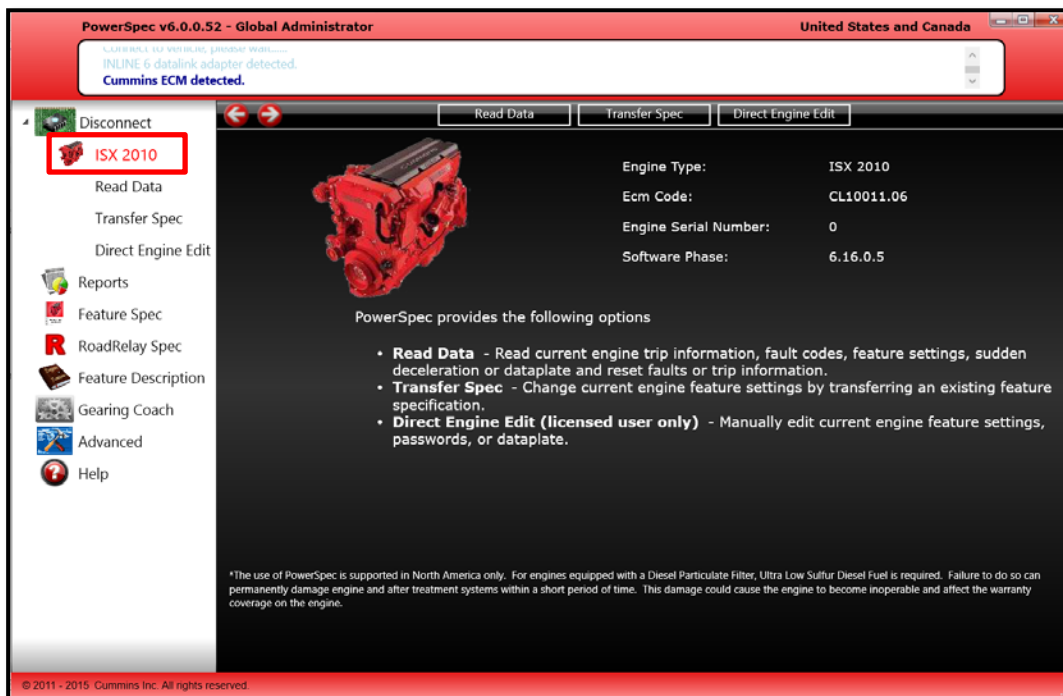
Select your default region from the map.

Contact Us
Please visit cumminsengines.com/powerspec for the latest information and FAQ list or call us at 1-800-433-9341 op2

- By selecting the default region on the map, specific engines and corresponding emissions regulations will be filtered in the Gearing Coach portion of PowerSpec.
- To change your market, select the “Help” menu node and click on the new market.
NOTE: Selecting the East Asia Market (China) will require PowerSpec to restart.

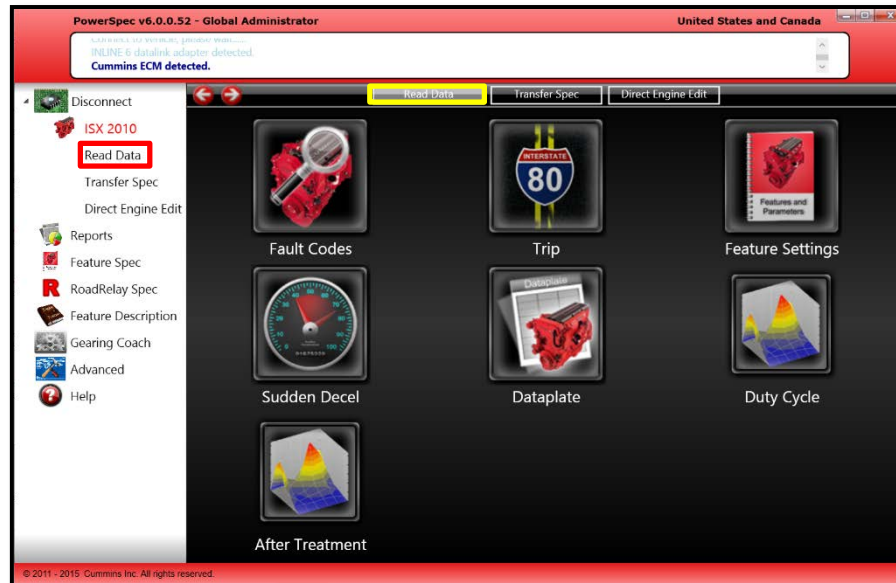
Devices

- PowerSpec is compatible with the following devices:
 - Inline 5
 - Inline 6
 - Noregon DLA+
 - Noregon DLA_PLC
 - Noregon Wireless
 - Nexiq USB-Link 9.2.1+
 - Dearborn DPA 4
 - Dearborn DPA 5
- When connected with a compatible adapter (e.g. INLINE 6), the engine name will appear in the left menu. In the status box (just below the title bar) an update will be displayed that shows a connection to the adapter.
- Clicking the engine icon will display information including the engine type, ECM code, serial number and software phase. Action items will also be visible above the engine.



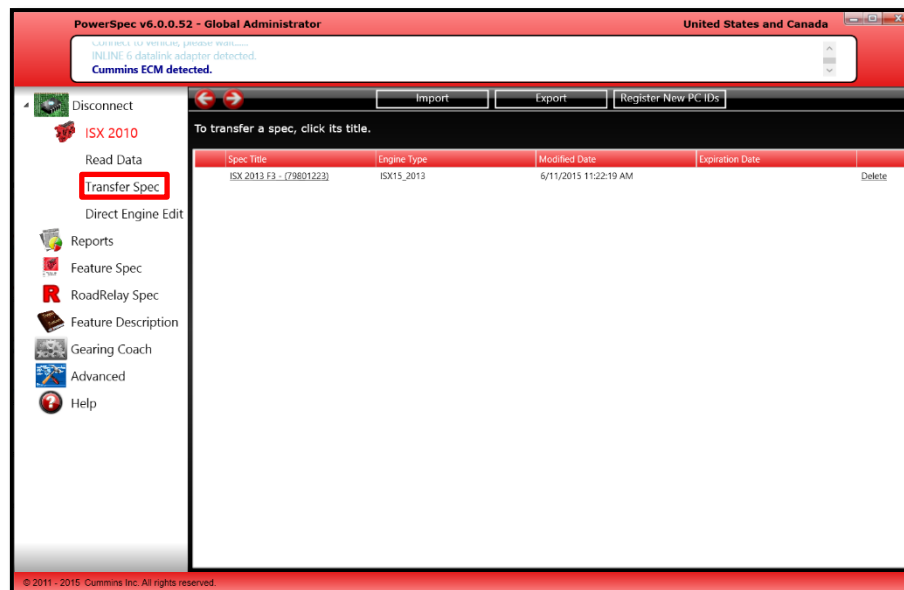
Read Data

- By clicking the “Read Data” link, you can access fault codes, trip information, feature settings, sudden deceleration data dataplate information, duty cycle and aftertreatment reports. For more information, see “Read Data”, pg. 27.



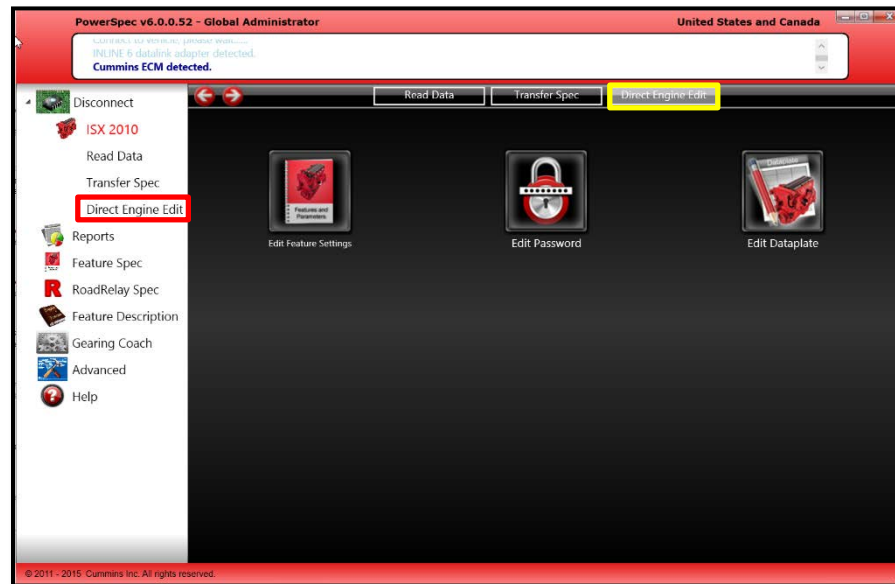
Transfer Spec

- You can change current engine feature settings by transferring an existing feature specification. For more information, see “Transferring a Spec”, pg. 25.



Direct Engine Edit

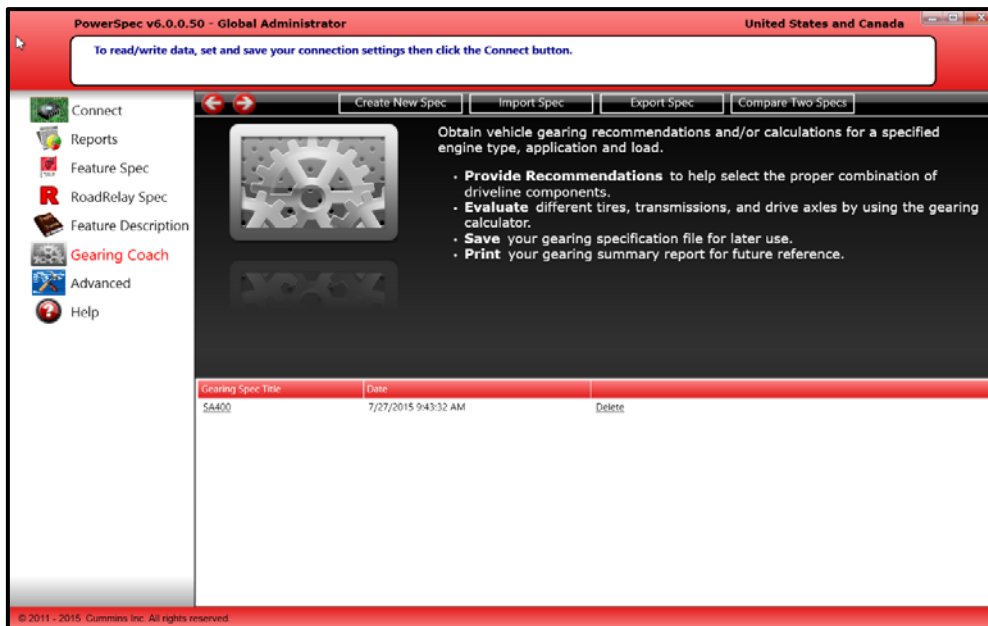
- Licensed users can manually edit the feature settings, passwords and data plates of the current engine connected.



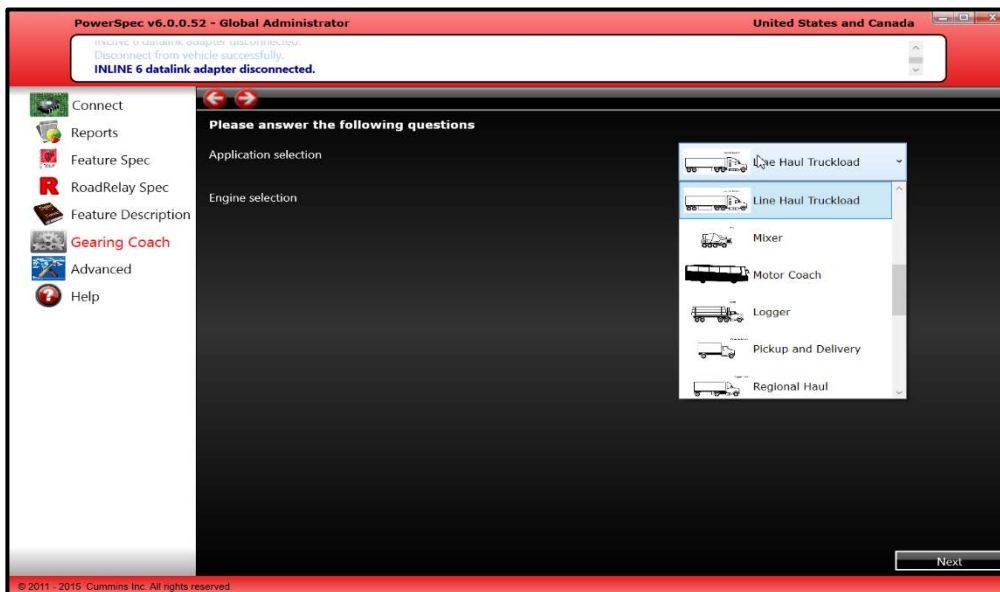
Gearing Coach

Getting Gearing Recommendations

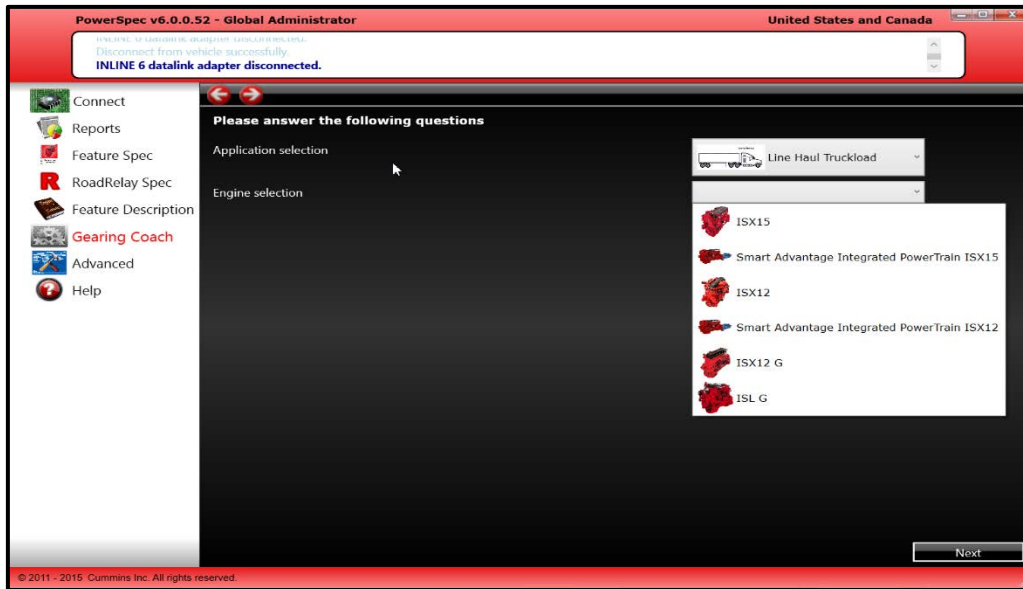
- PowerSpec offers you the ability to create gearing profiles and save them for use/editing at a later date. To create a new spec, select Gearing Coach from the left menu, then “Create New Spec” on the top of the page.



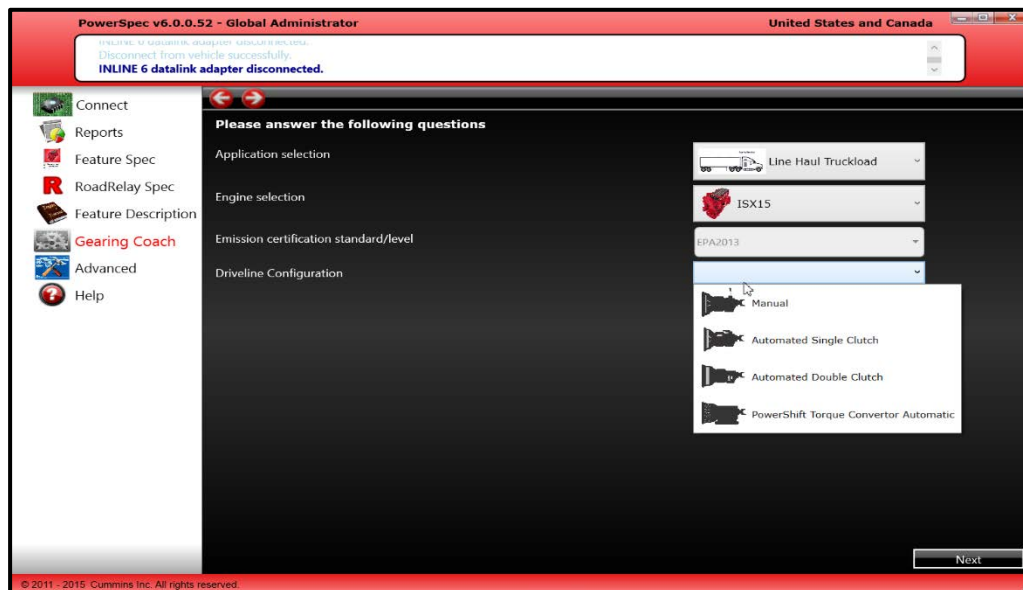
- The first selection that will need to be made is what the application and vehicle type the customer be operating.



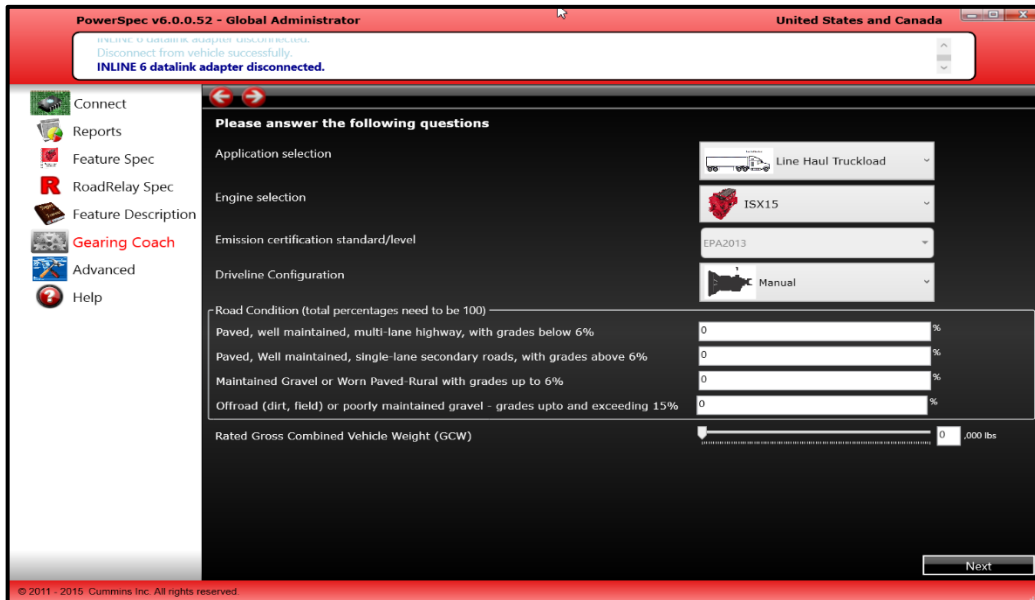
- Once the application has been selected, the specific engine options that fit within the vehicle size and application will be generated. Please select the specific engine you are interested in spec'ing:



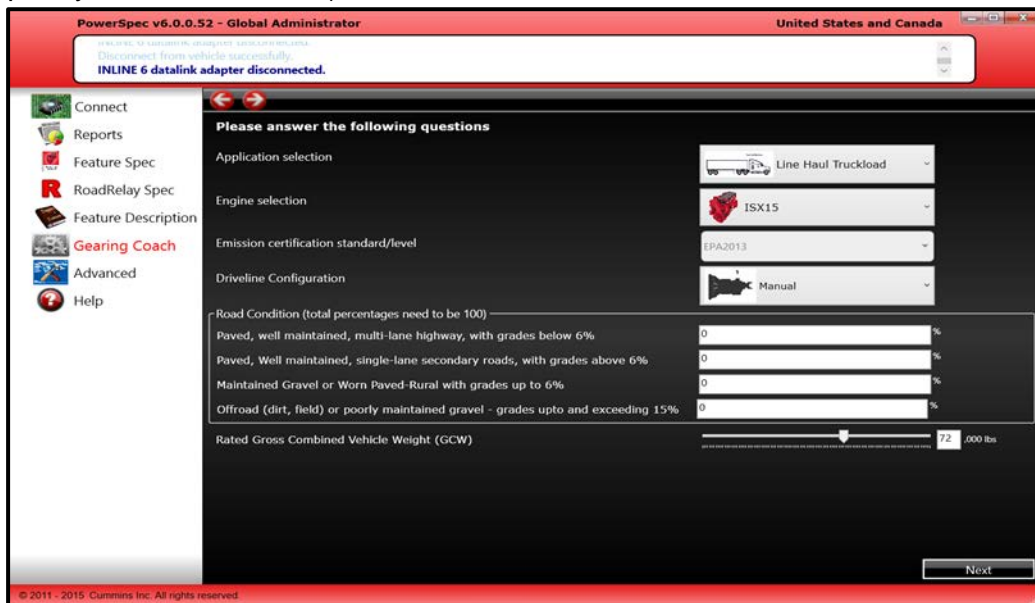
- After selecting the specific engine option that will be used, please select the driveline configuration that you are interested in utilizing. Depending on the model chosen, gearing rpm ranges, performance characteristics, and/or PowerSpec support messages may differ:



- The next information that needs to be provided is the specific road conditions that the vehicle will spend time operating on (percentages must add up to 100):

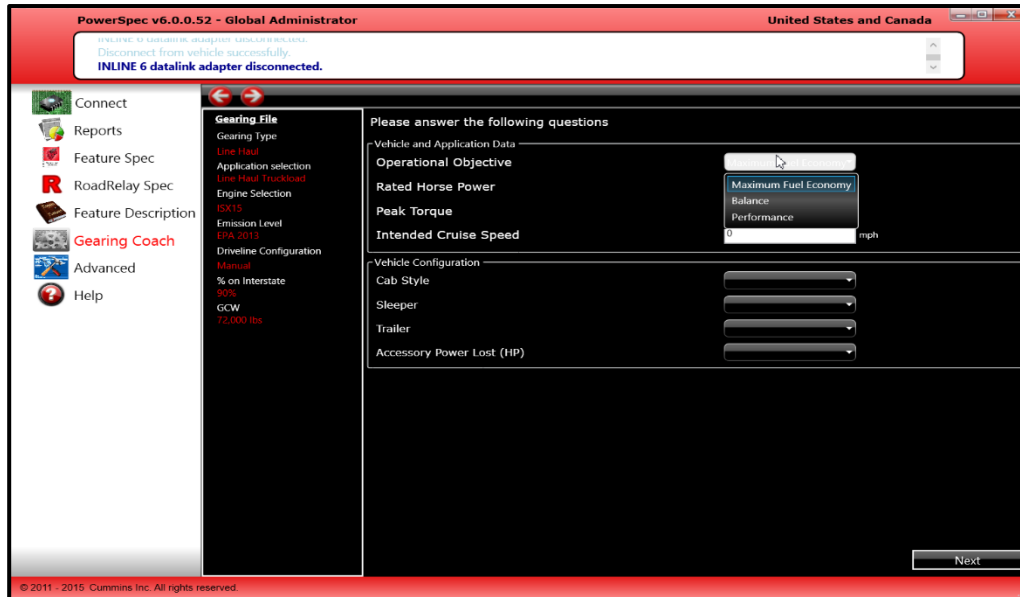


- The specific road conditions will influence the gearing recommendations and performance requirements of the spec. Therefore it is vital that the road condition percentages accurately represent the surface profiles the vehicle will be subject to.
- The last input needed on the application profile page is what GVW the vehicle will typically or spend most of the time operating at (e.g. vehicle rated to 80,000 lbs, but typically carries 68,000 lbs):

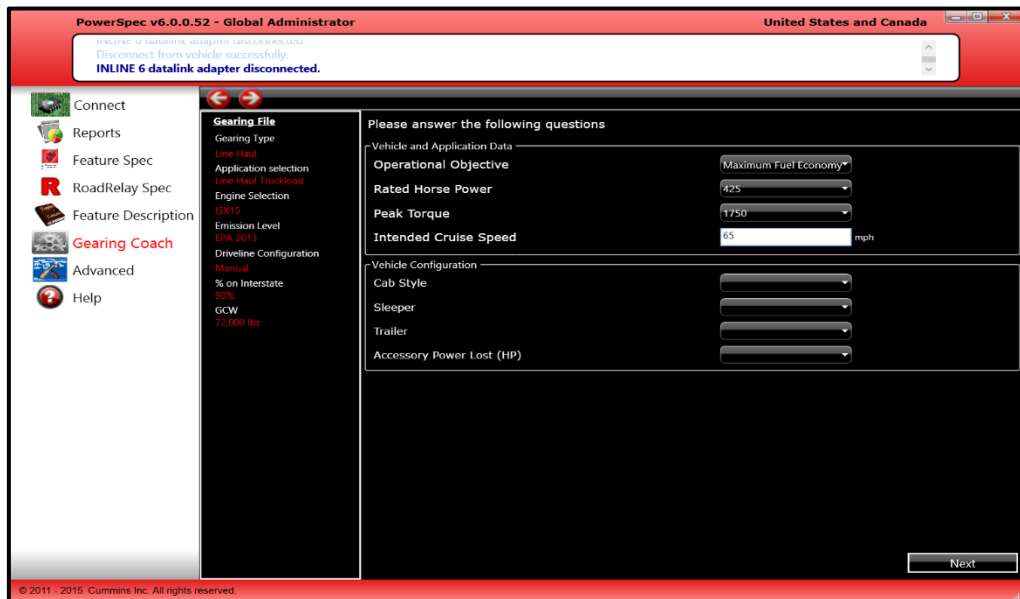


NOTE: The specific vehicle weights may exceed specific application and/or engine characteristics, as well as influence the recommended RPM @ Cruise output range and vehicle performance characteristics

- After completing the Application Profile page, click next and answer the questions on the vehicle and engine profile page. The first question will ask for the operational objective. Please choose between Fuel Economy, Balance or Performance:

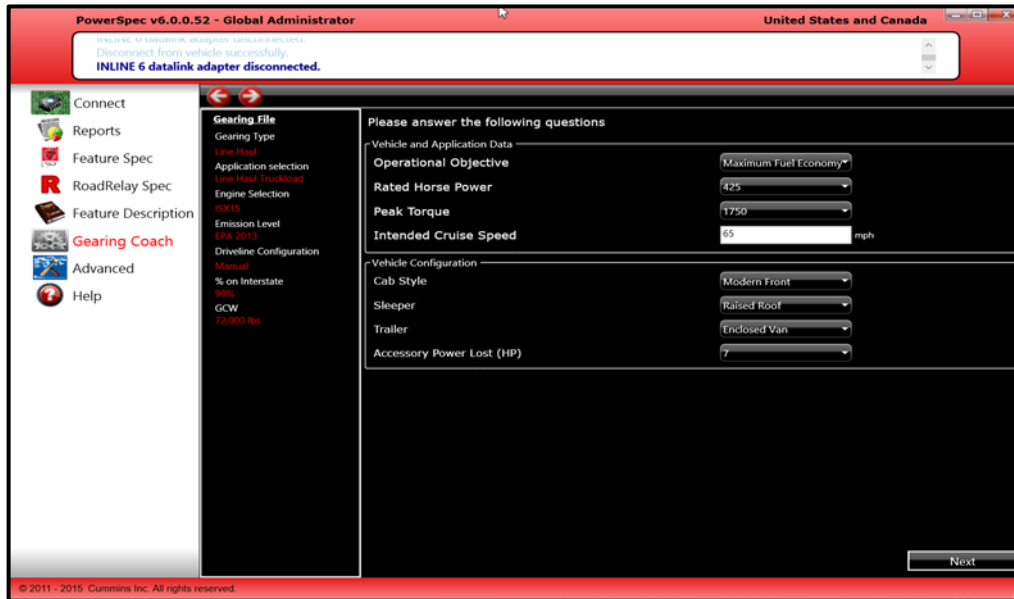


- After selecting the Operational Objective, please select the Rated Horsepower and Peak Torque and intended vehicle cruise speed:

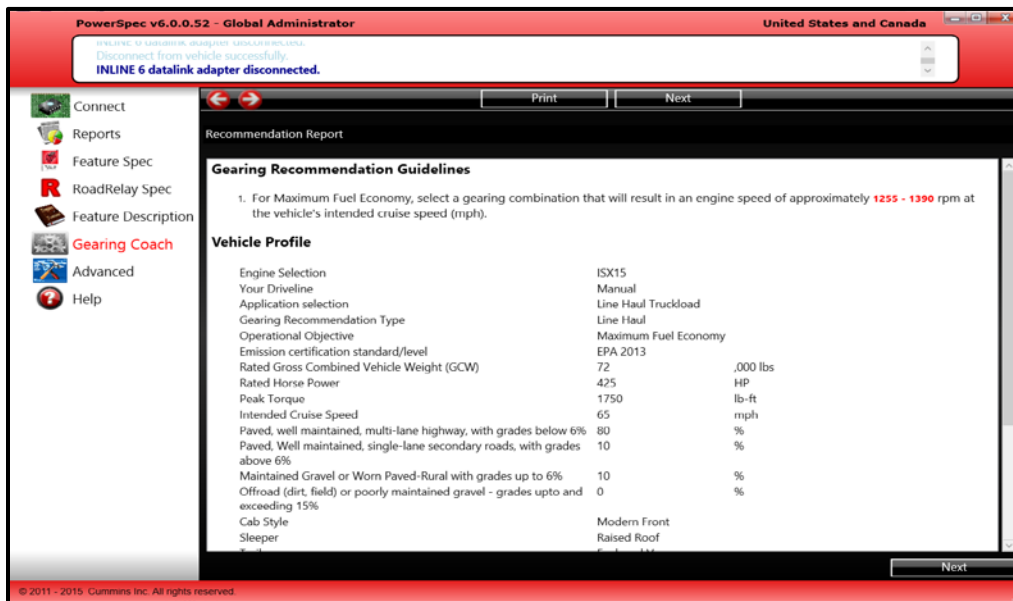


- The area for the Vehicle Profile page is the vehicle configuration which will differ depending on the application selected. The following question may appear:
 - Cab Style – Frontal Area of the Truck
 - Sleeper – Roof Style of the Truck
 - Trailer – Type of Trailer used in the application
 - Accessory Power Lost – Amount of HP used by accessory demand
 - 7 HP – Typical range of hp loss for most applications
 - 15 HP – Moderate, recommended for school buses, shuttle buses and vehicles with large air conditioning systems.

- 20 HP – High, recommended for concrete mixers, refuse trucks, transit buses and other vehicles with very large air conditioning systems or hydraulic accessories



- After completing the Vehicle Profile page, clicking “next” will take you to the Recommendation Report:



- The Recommendation Guideline provides the RPM range to gear for in order to meet the operational objectives. This can be done by selecting a combination of rear axle ratio, transmission top gear, and tire revolutions per mile.
- Additionally, the Recommendation Report provides a summary of all the choices that have been made up to this point. Clicking next will take you to the Gearing Calculator page.

Gearing Calculator

- After reviewing Cummins' vehicle gearing recommendation guidelines and clicking "Next", you will begin the **Gearing Calculator**. The calculator will provide final detailed gearing specifications based on the selected driveline components.

PowerSpec v6.0.0.52 - Global Administrator United States and Canada

INLINE 6 datalink adapter disconnected.

Next

To use the calculator to evaluate gearing combinations, enter the data into all input fields (above the white box). The 'select' link will provide component information if needed.

Intended Cruise Speed	65	mph
Transmission Top Gear Ratio	0.74	Must Select Eaton, FRO-17210C
Low Gear Ratio	12.94	
Tire Size	503	select rmi/mi, Michelin, XZAJ Energy
Rear Axle Ratio	2.23	select Dana, D40-156

Engine RPM at Intended Speed	1302
Engine RPM at 65 mph Checkpoint	1302
Startability	27
Gradeability at Cruise Speed	1.79
Gradeability in Top Gear	2

This vehicle spec exceeds the minimum Cummins performance requirements and provides opportunity to trade performance for fuel economy by selecting a transmission and/or axle ratio that lowers engine speed, or by selecting an engine with less power.

This engine and gearing selection enables the customer to achieve their operational objectives of Maximum Fuel Economy.

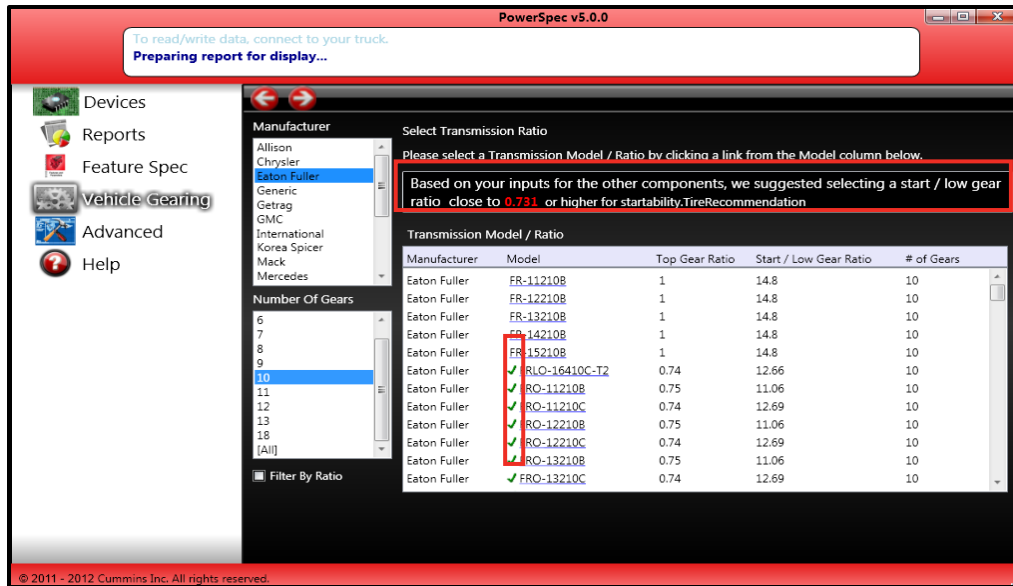
Performance Balance Maximum Fuel Economy

1200 1300 1400 1500 1600 1700 RPM

Next

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- Fill in the requested information. The transmission top gear ratio must be selected from the transmission database. To do this, click on the "Must Select" link to the left of the Transmission Top Gear Ratio field. The rest of the fields can manually be entered, or a specific model of axle, or tire can be chosen by clicking on the "select" link to the left of the associated field. To select a specific tire or axle, first choose a manufacturer from the list and indicate either the number of transmission gears, the tire size, or ratings for Rear Axle Ratio. Now select your model and the values will be updated in the gearing calculator.



Based on your inputs for the other components, we suggested selecting a start / low gear ratio close to **0.731** or higher for startability.TireRecommendation

- Based on all other inputs, the gearing calculator displays a recommendation at the top of the “select” page, guiding your choice of models. A green check will appear next to the models that fit the guidelines and an asterisk will appear next to the suggested axle ratio in the drop down box.
- *Note: For “Transmission Top Gear Ratio” and “Transmission Start/Low Gear Ratio” (for certain applications), choosing an item from the selection list will generate values for both boxes.*
- Once the customer has selected the appropriate transmission ratio, tire size, and rear axle ratio, the gearing calculator will provide the following Cummins Gearing Outputs at the bottom:
 1. The Engine RPM at Intended Cruise Speed
 2. The Engine RPM at 65mph Checkpoint
 3. The Startability percentage
 4. Gradeability at Cruise
 5. Gradeability in Top Gear

Engine RPM at Intended Speed	1302
Engine RPM at 65 mph Checkpoint	1302
Startability	27
Gradeability at Cruise Speed	1.79
Gradeability in Top Gear	2

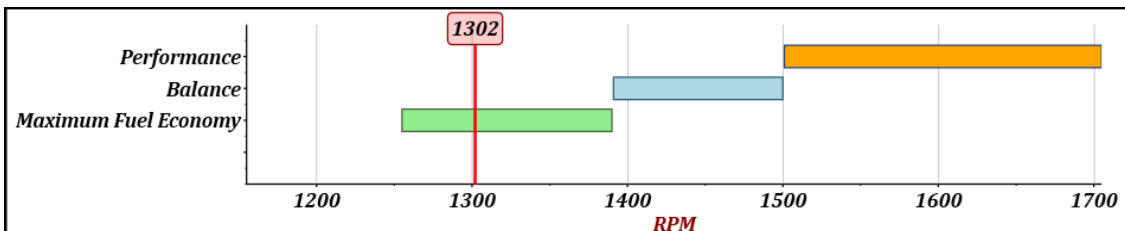
- Once you have finished submitting your data, PowerSpec will calculate whether or not your results are consistent with Cummins recommendations. Depending on the results of this calculation, two or three unique messages will appear:

This vehicle spec exceeds the minimum Cummins performance requirements and provides opportunity to trade performance for fuel economy by selecting a transmission and/or axle ratio that lowers engine speed, or by selecting an engine with less power

This engine and gearing selection yields a higher engine speed at vehicle cruise and is more performance oriented than the specified Maximum Fuel Economy objective/preference.

To decrease engine speed (rpms) at cruise, consider selecting a lower transmission top gear ratio, lower rear axle ratio, or bigger tires.

- The first message will calculate the performance characteristics of the spec. If you meet the startability and gradeability requirements, a green message (shown above) will appear. If you exceed the requirements, you may be informed of additional ways to improve your fuel economy.
- The second message compares the RPM @ Cruise values to the stated operational objective. If the spec falls within the Cummins recommended RPM @ Cruise range for the given operational objective, a green message will appear; however, if the spec does not fall within the recommended RPM @ Cruise range, a yellow message will appear (shown above).
- The third message (if it is needed) provides guidance on ways to increase or decrease your RPM @ Cruise value to be in line with the customer's operational objective.
- Your spec'd rpm @ cruise speed will also be shown in a graph. Most engines and applications will have a specific rpm range for fuel economy, balance, or performance. After running your calculation, the following chart will appear below the output information:

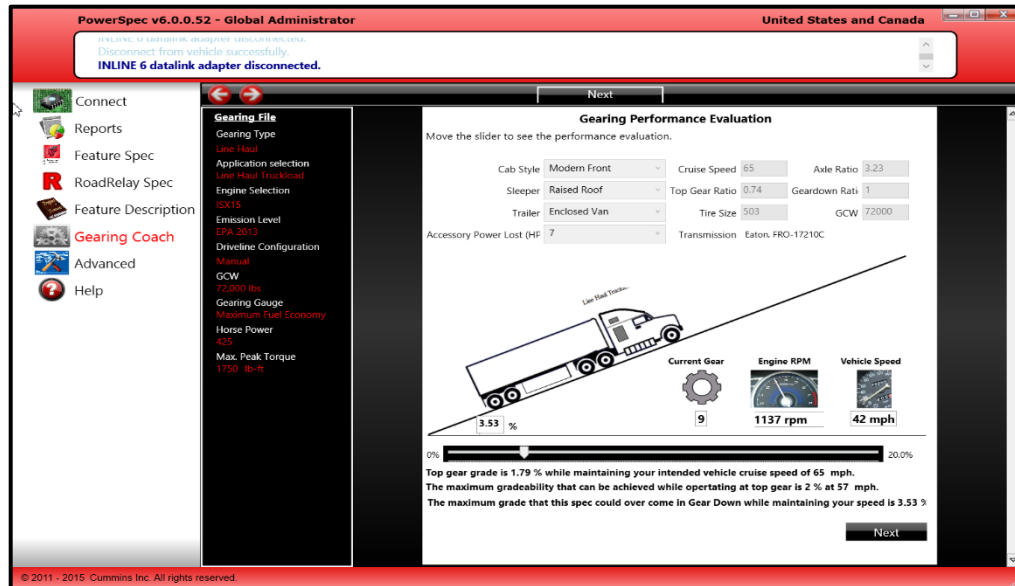


NOTE: RPM ranges and duty cycle objective buckets will differ depending upon engine / applications selected

- Once you have received 2 green messages, you will be able to continue on to either the Performance Evaluator Page or to the Summary Report.

Performance Evaluator

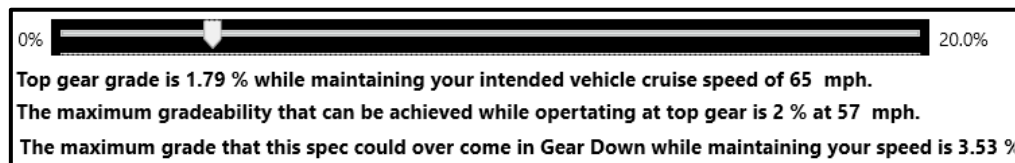
- Running the performance evaluation feature allows you to evaluate the gradeability of the powertrain (Engine, Transmission, Axle, Tire) in the top two gears. The performance evaluation feature is designed to make sure that the vehicle meets the minimum performance guidelines, and ensures that you are comfortable with your spec.



- All of the inputs to the gradeability calculator have previously been chosen. The Summary of these choices can be found above the gradeability graphics :

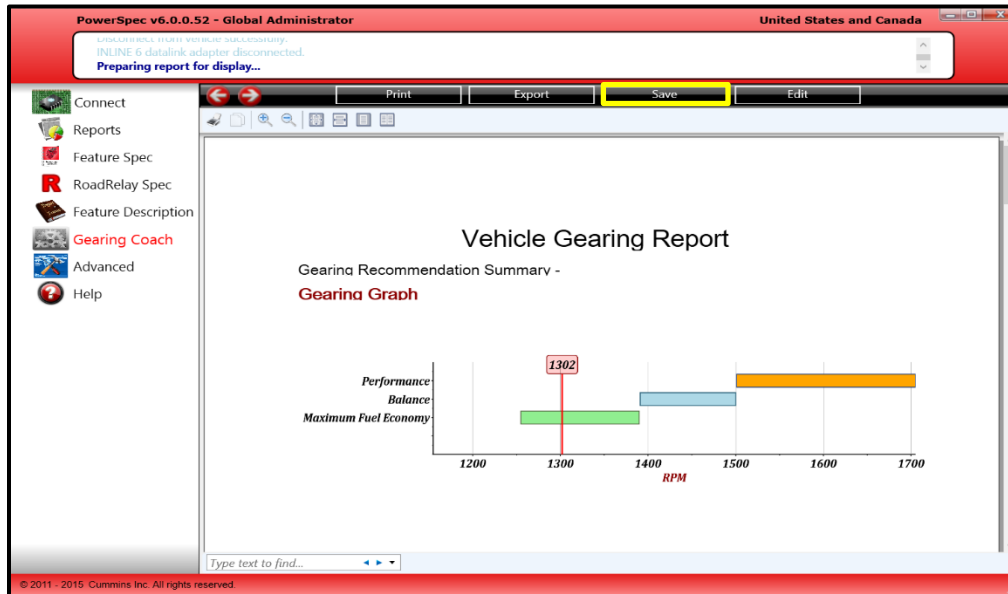
Cab Style	Modern Front	Cruise Speed	65	Axle Ratio	3.23
Sleeper	Raised Roof	Top Gear Ratio	0.74	Geardown Ratio	1
Trailer	Enclosed Van	Tire Size	503	GCW	72000
Accessory Power Lost (HP)	7	Transmission	Eaton, FRO-17210C		

- By dragging the “Percent Grade” bar at the bottom of the page to increase the grade the truck will be seeing, 3 different gradeability values will be calculated:
 - Cruise Speed
 - Top Gear
 - Hold Speed while operating in Gear Down

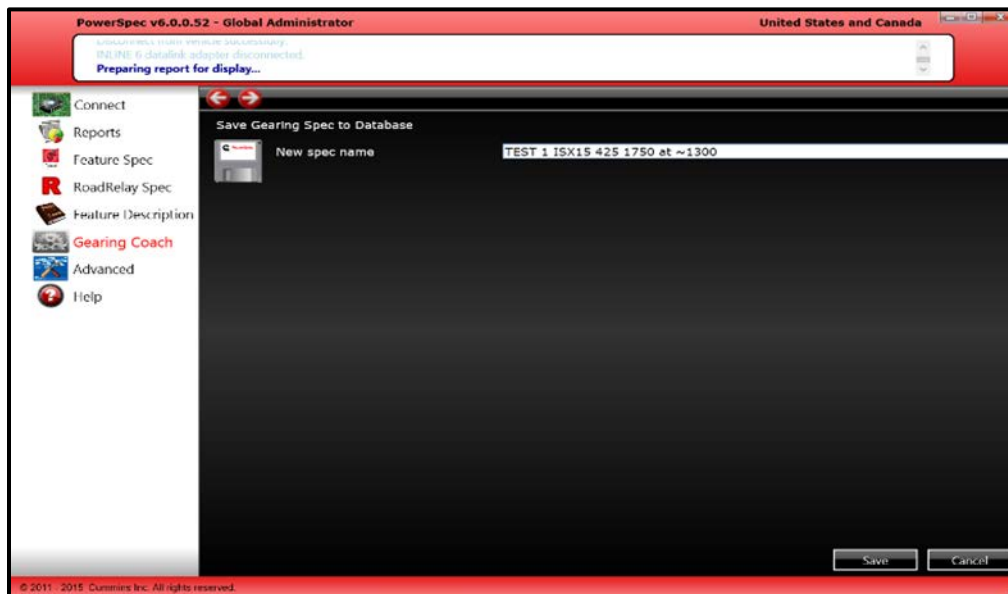


Vehicle Gearing Report

- If you either choose to skip the Gearing Performance Evaluation portion, or complete the Gearing Performance Evaluation portion of PowerSpec, you will be taken to the **Vehicle Gearing Report**



To save the gearing spec you have just created, click “Save” then name the spec and click “OK”.



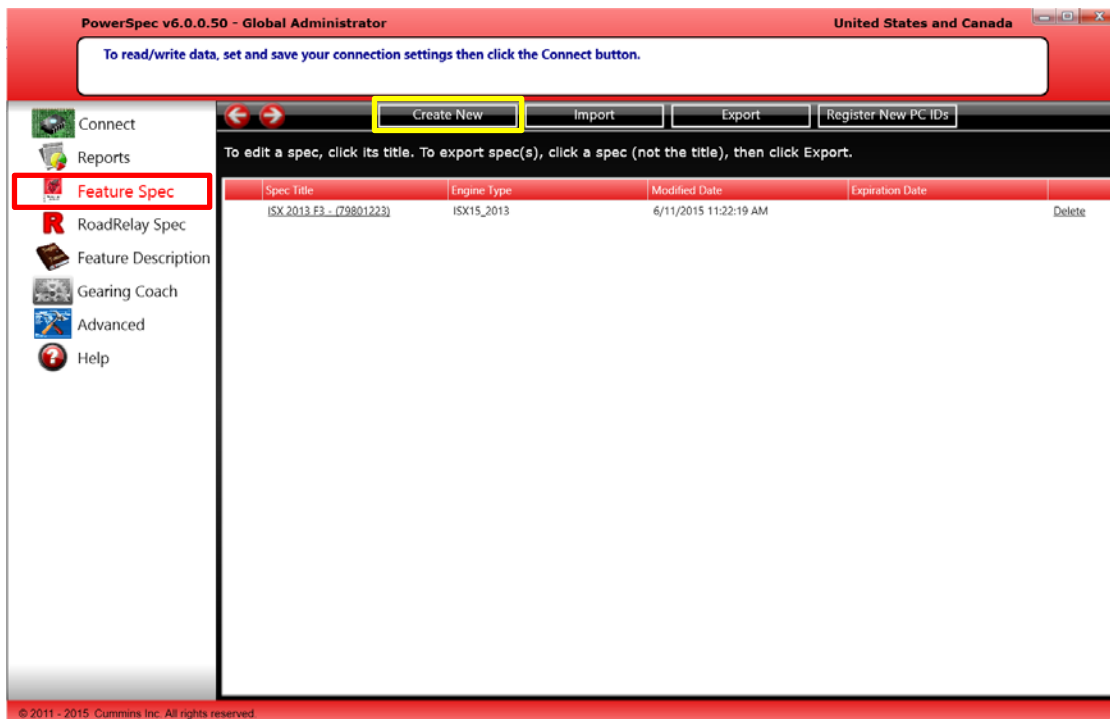
- After saving the spec, you can now reference the full report by clicking the name on the vehicle gearing main page. Here you can also export and save the spec to a selected folder on your computer.

Feature Spec Settings

- PowerSpec enables users to tailor programmable engine features to their specific needs.
- For users who wish to control feature settings from a central location, PowerSpec offers the ability to create a HotSpec that runs only on the target PC(s). HotSpecs can only be created from licensed PowerSpec PCs, and can only be edited by the HotSpec creator
- When used on a specified target PC, the HotSpec will transfer to a Cummins engine with the same authority as the licensed PC that created it. This is the preferred method for many large fleets that only wish to license the fleet manager's PC and keep the shop PCs unlicensed.

Creating a New Spec

- Select "Feature Spec" from the Main Menu
- On the next page, you have option of selecting an existing spec from the list, creating a new one, or opening one from a file that was given to you by someone else. To create a new Spec, select "Create New" from the menu.



- Similar to the Gearing Calculator, select your:
 - Engine
 - Application
 - Emissions level
 - Road Conditions
 - GVW
 - Horsepower and Torque Ratings
 - Operational Objective

NOTE: If an ISX15 or ISX15 SmartAdvantage Powertrain is selected, an additional field called “ADEPT Feature Usage” will be able to be selected. For more information on ADEPT, please consult the ADEPT Feature Description.

Please answer the following questions

Engine selection: ISX15

Application selection: Less Than Truckload

Emission certification standard/level: EPA 2013

Road Condition (total percentages need to be 100)

Paved, well maintained, multi-lane highway, with grades below 6%	80	%
Paved, Well maintained, single-lane secondary roads, with grades above 6%	10	%
Maintained Gravel or Worn Paved-Rural with grades up to 6%	10	%
Offroad (dirt, field) or poorly maintained gravel - grades upto and exceeding 15%	0	%

Rated Gross Combined Vehicle Weight (GCW): 70 ,000 lbs

Engine's Horsepower: 450 HP

Maximum (peak) Torque of the engine: 1750 lb ft

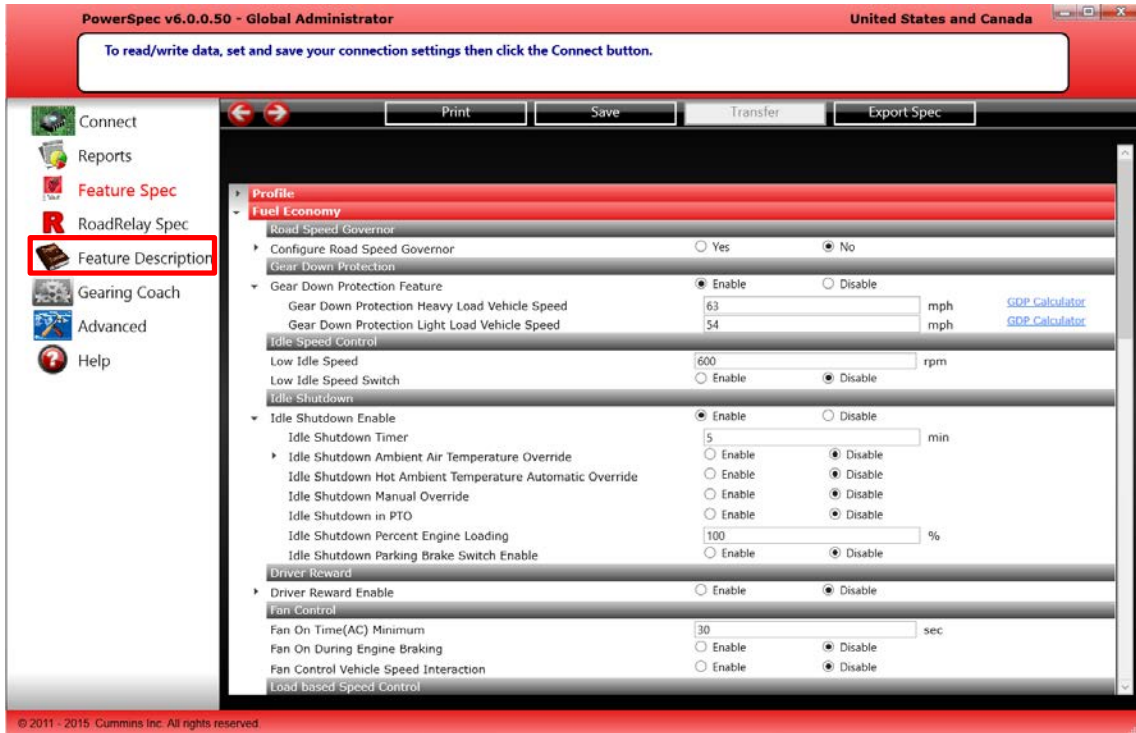
ADEPT feature usage: Yes No

Operational Objective Selection: Maximum Fuel Economy

Next

- On the following page, PowerSpec will use the application information previously supplied to recommend a feature and parameter set.

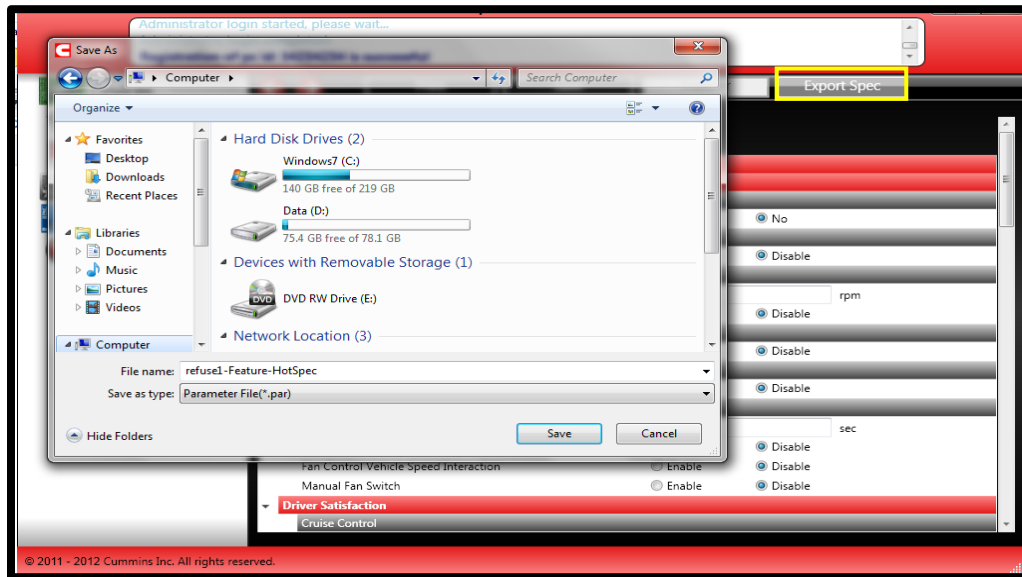
- The engine feature setting page will list your vehicle profile along with feature and parameter setting for your review. Review the page to confirm that the settings fall in line with your desired Spec. You can make changes to the information by clicking in the appropriate boxes. If you have questions or need further explanation on certain features and parameters, click the “Feature Description” option from the left menu bar. *Note – the input will not save automatically.



- After adjusting any electronic engine feature parameters, you can save your template by clicking the save button.

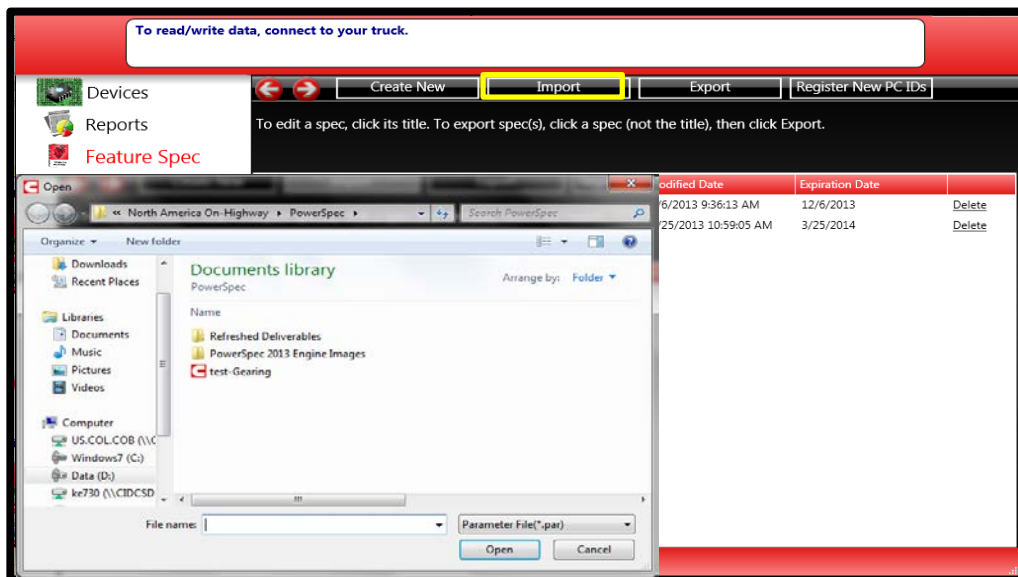
Exporting a Spec

- If you need to save a spec in a format other than a PowerSpec file, click “Export Spec.” PowerSpec gives you three options for saving including a .csv option for use in Microsoft Office Applications. Select your option, click “OK” then “Save.” Your file can now be opened in your respective format.



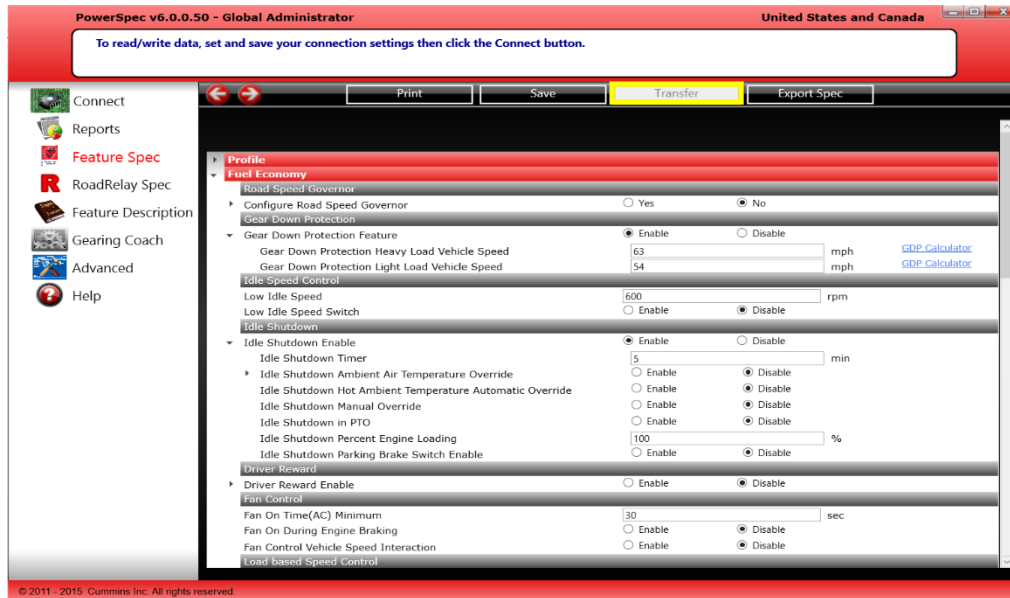
Importing a Spec

- To import a spec, click “Import” at the top of the Feature Spec page. You will be prompted by a system window. Choose the desired spec and click “open”. You can also import a spec by opening the same file from the Windows folder, without opening PowerSpec first.

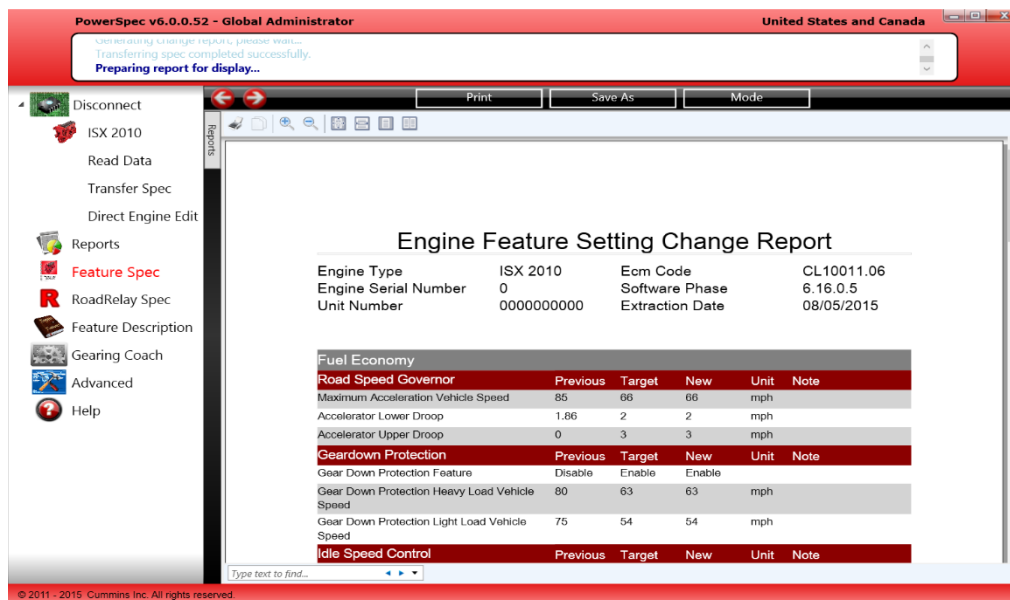


Transferring a Spec

- To transfer an existing Spec to an engine, select “Transfer” at the top of the Feature Spec parameters page.



- To transfer a Spec make sure a supported adapter and cable is connected to your engine. Select a spec from the list and the transfer process should begin. (Note: the “Transfer” button is disabled if you are not connected to a vehicle.)



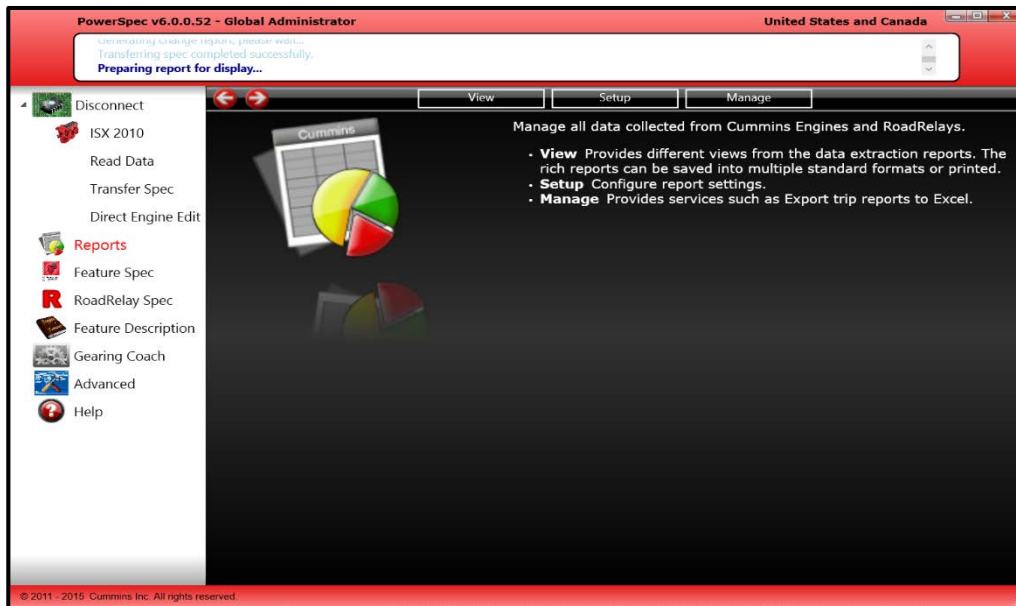
- Once the transfer is finished, PowerSpec will bring up a change report. If you receive an error message, the transfer has failed.



- Once the transfer process is finished, PowerSpec will generate a report for your records. By clicking "Mode," you can transition between a full report and a shortened one. By clicking "Print Report," you can print a hard copy of the transfer report for your records. Click "Save As" to save the report for your records. Once you are finished, simply click "Done" to return to the Transfer Feature Spec main page.
- You may also transfer a Spec once you have finished creating/editing it. Simply click "Transfer" on the Spec's feature settings page and follow the same process as above.

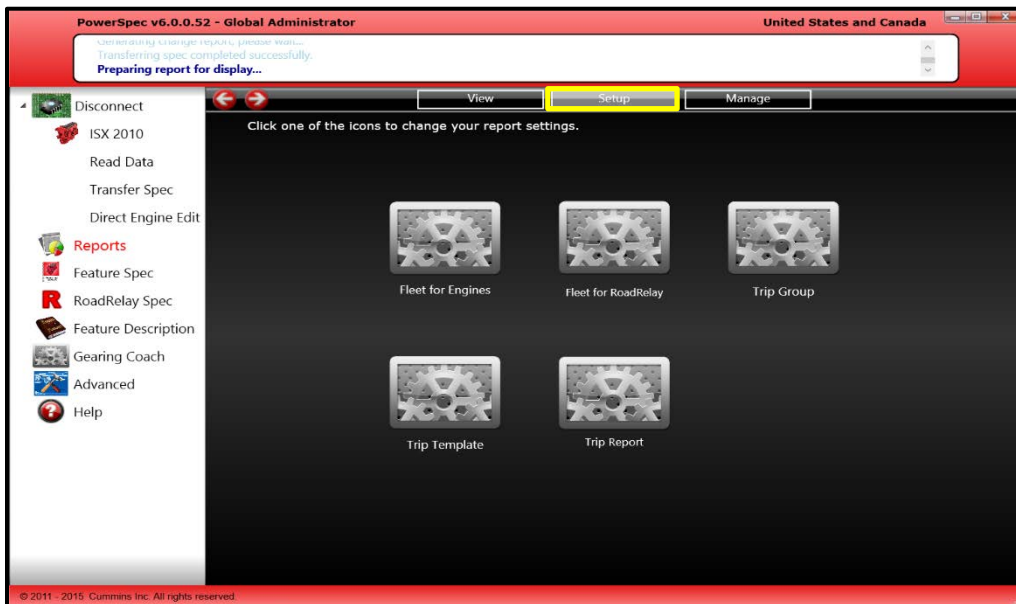
Reports

- PowerSpec also allows you the ability to read different types of engine data from trip information to fault codes (including the capability to reset inactive fault codes).
- You can add fleets, sub-fleets or add a vehicle. When you read data from a truck, the trip information is stored under the default fleet/ sub-fleet, automatically. Any truck can be added to a fleet you created by simply dragging and dropping.

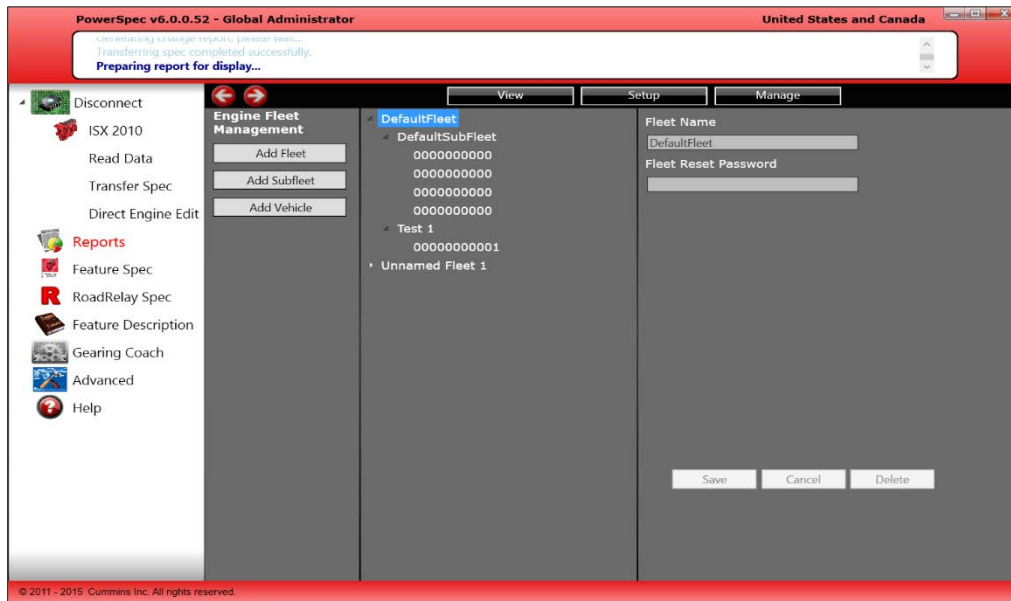


Fleet Management

- If you are interested in managing multiple vehicles and engines in a consolidated place, click on the Setup option to see the following page:



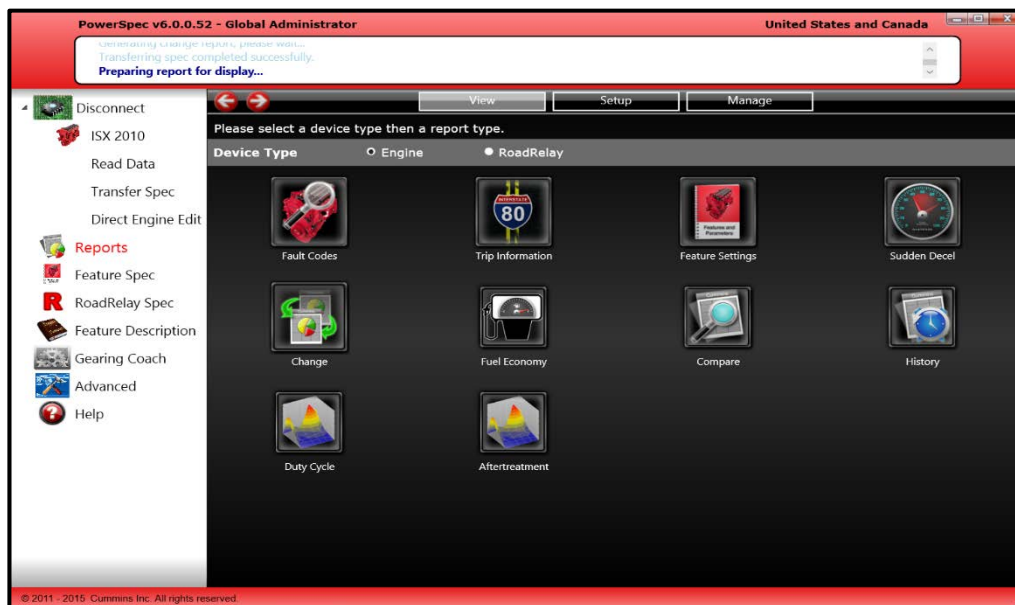
- Clicking Fleet for Engines (on the previous screen) will bring you to the following engine and fleet management page. The grey window on the left will list your company name and count of fleets, sub-fleets, vehicles, and data records.



- You can also configure the engines in each subfleet and track key engine information and track specific engines performance characteristics.

View Data

- If nothing is selected, the bottom icons show all reports stored in the database. As you pick a vehicle or vehicles, fleet or sub-fleet and a start/end date, it will show the number of reports for those selections.



Fault Codes

- By clicking 'Faults', you can view a populated list of the fault codes the engine has experienced within the date range selected. The list also includes a description of each.

The screenshot shows the PowerSpec v6.0.0.52 - Global Administrator interface. The main window displays an "Engine Fault Report" for engine 0000000000, dated 8/5/2015 2:41:33 PM. The report includes engine details and a table of active fault codes.

Active Fault Codes	Description	Fault Code	Count
Power Supply Lost With Ignition On - Data erratic, intermittent or incorrect		1117	1
EGR Valve Position Circuit - Voltage below normal, or shorted to low source		2272	1
Engine Injector Bank 1 Barcodes - Out of Calibration		2765	1
Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source		132	1
Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage below normal, or shorted to low source		1241	1
Aftertreatment Purge Air Actuator Circuit - Voltage below normal, or shorted to low source		3223	1
Aftertreatment Fuel Shutoff Valve Circuit - Voltage below normal, or shorted to low source		1924	1

Feature Settings

- You can easily check a list of the feature settings of each engine selected in the 'View Data' page. This includes data on disabled features and multiplexing data, if selected at the top of the report.

The screenshot shows the PowerSpec v6.0.0.52 - Global Administrator interface. The main window displays an "Engine Feature Settings Report" for engine 0000000000, dated 8/5/2015 2:48:34 PM. The report includes engine details and sections for Fuel Economy and Geardown Protection settings.

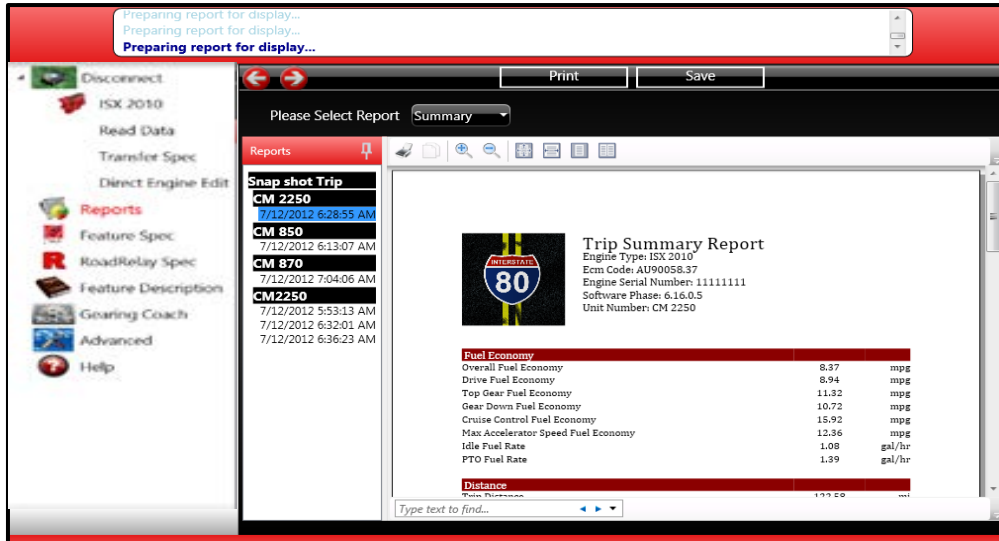
Engine Type	ISX 2010	Ecm Code	CL10011.06
Engine Serial Number	0	Software Phase	6.16.0.5
Unit Number	0000000000	Extraction Date	08/05/2015

Fuel Economy	
Road Speed Governor	
Road Speed Governor Enable	Enable
Maximum Acceleration Vehicle Speed	66 mph
Accelerator Lower Droop	2.00 mph
Accelerator Upper Droop	3.00 mph
Global Maximum Road Speed	120 mph

Geardown Protection	
Gear Down Protection Feature	
Gear Down Protection Heavy Load Vehicle Speed	63 mph
Gear Down Protection Light Load Vehicle Speed	54 mph

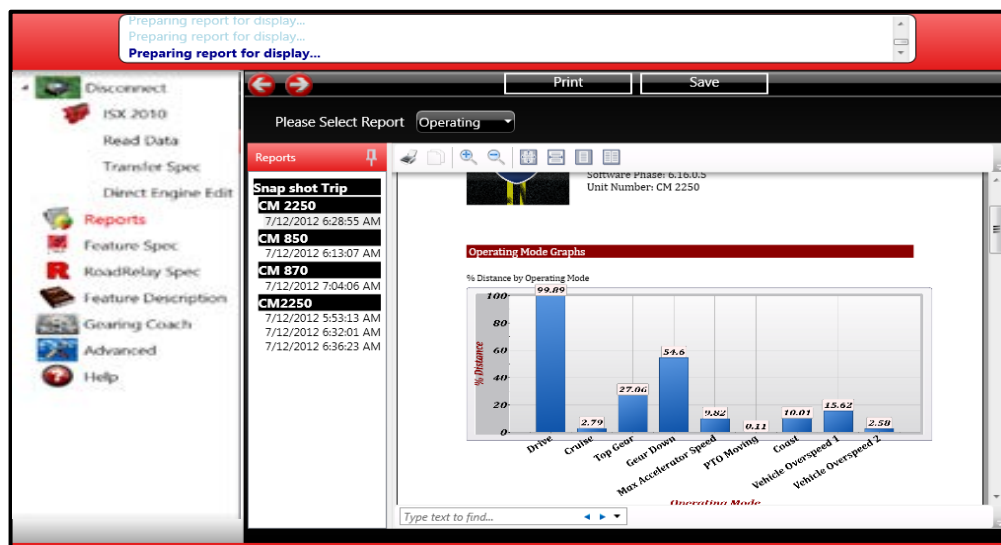
Trip Information

- Trip information can be viewed in summary, detail, or operating reports. Summary will give a high level overview of fuel economy, distance traveled, time travelled and other averages.



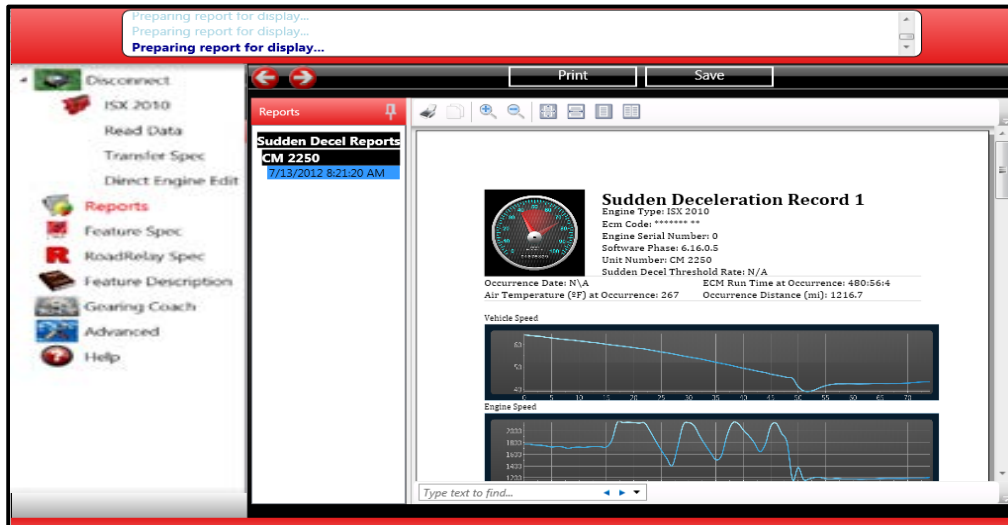
Trip Report

- Viewed in operating report, trip information is displayed in graph format to show a visualization of certain characteristics of the engine during a given trip based on the engine's operating modes.
- The trip report has 4 different formats available for you to choose from:
 - Summary (default)
 - Detail
 - Operating
 - One Page



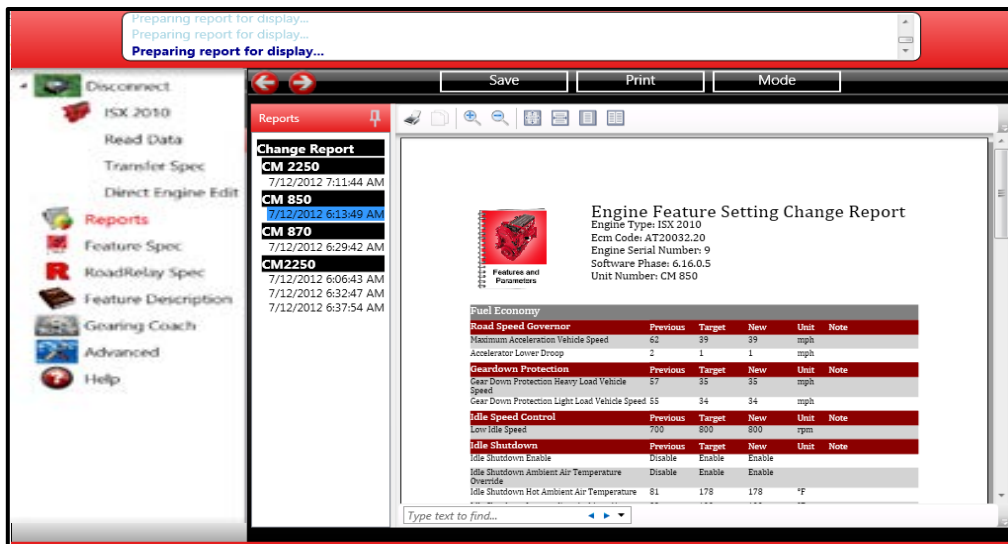
Sudden Deceleration

- PowerSpec also displays, graphically, sudden decel events. The report includes the time, vehicle speed, engine speed, engine load, and throttle during an event.



Change Report

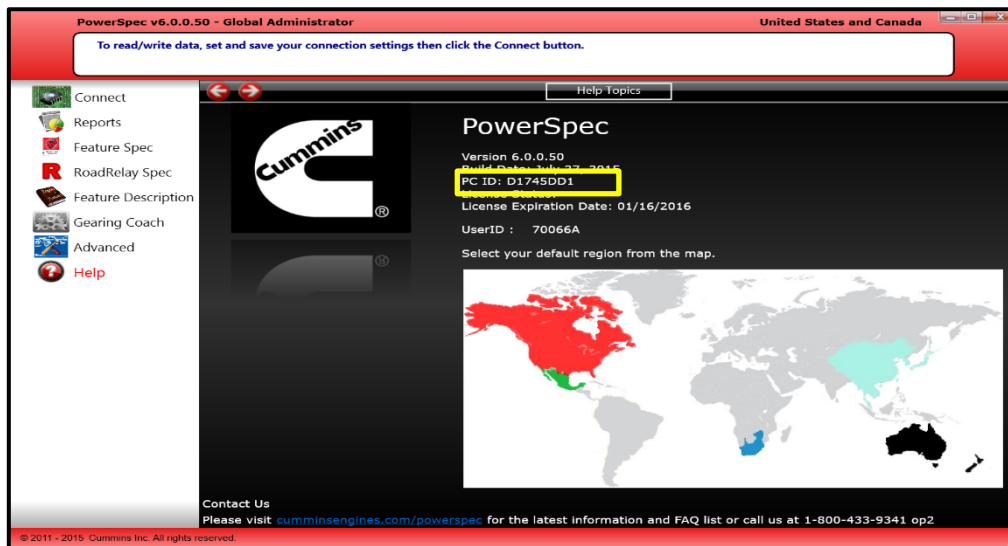
- To view the history of changes made to an engine's feature settings, click 'Change Report'. Here you can compare the new and old feature settings in table format.



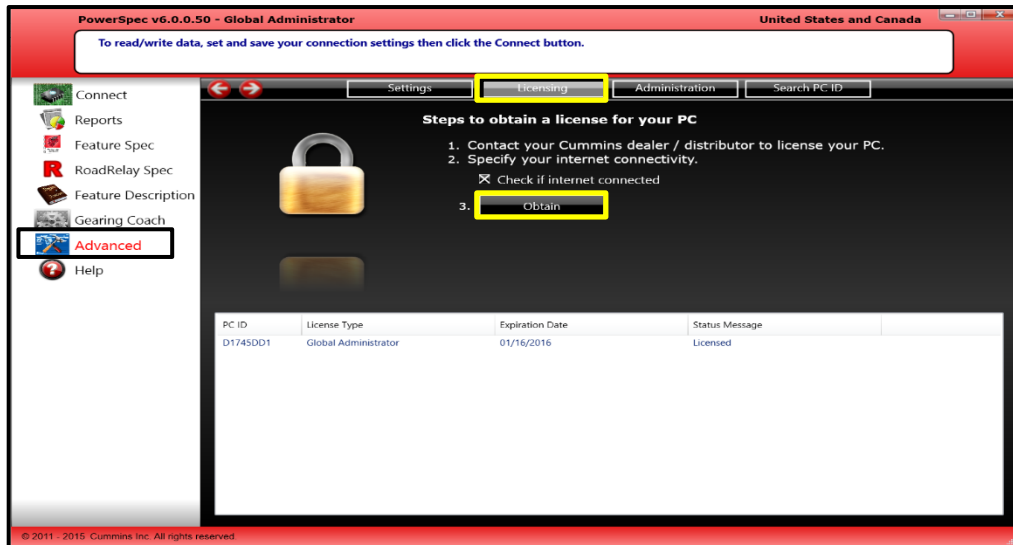
Licensing: Customer Instructions

Licensing a PC for PowerSpec Feature Settings

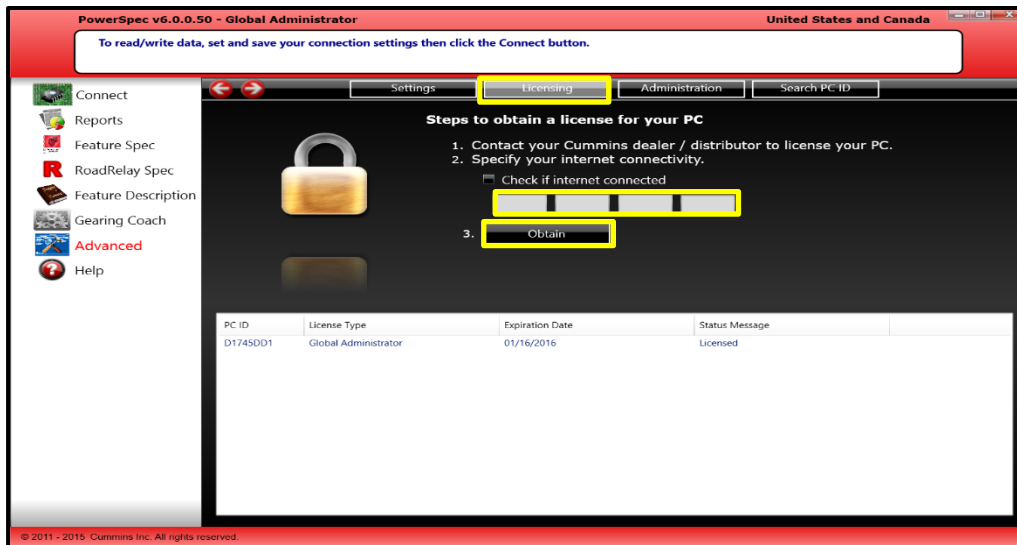
- To start the process, install PowerSpec on the target PC and obtain the PC ID from the PowerSpec Main Menu (next to copyright).



- Next provide the Cummins Distributor with the PC ID and the following personal information:
 - First/Last Name
 - Email Address
 - Company Name
 - Zip Code
 - Phone NumberPCID - (Located on PowerSpec “Help” page)Format: 8 characters long – alphanumeric: A-F, 0-9
- After your Cummins Distributor has created the PowerSpec license, there are two methods for installing the license on the target PC:
 - For computers connected to the internet:
 - First, select “Advanced” in the left pane and “Licensing” from the top of the page.
 - On the licensing page, select “Internet Connected,” then click “Obtain.” The license will install automatically in a few seconds.



- For computers not connected to the internet:
 - o De-select "Check if Internet connected" box and enter the license key
 - o Type the 24 digit numeric license key provided by the distributor, then click "Obtain" to install the license. *Note: Each license key only works on the targeted PC.*

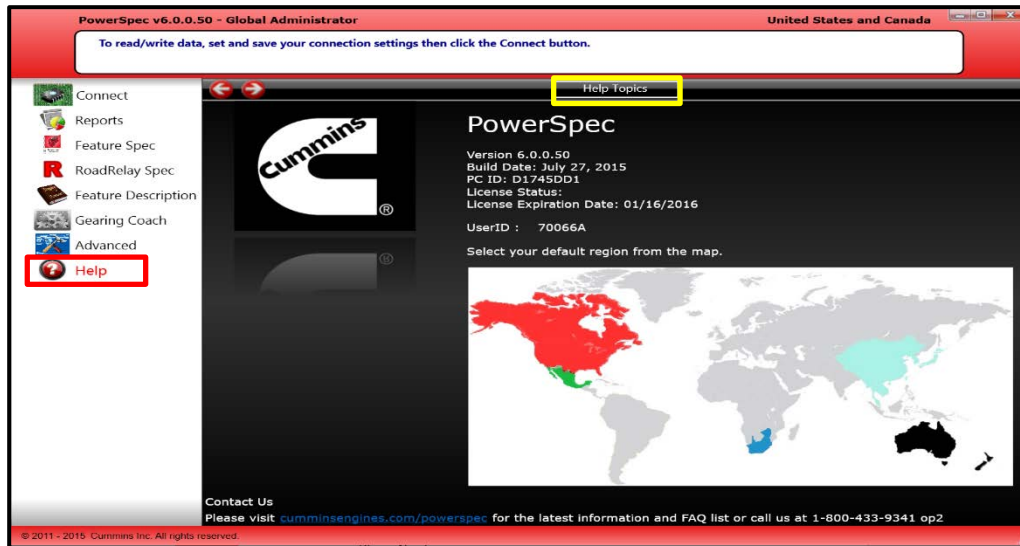


You have now successfully obtained a PowerSpec license!

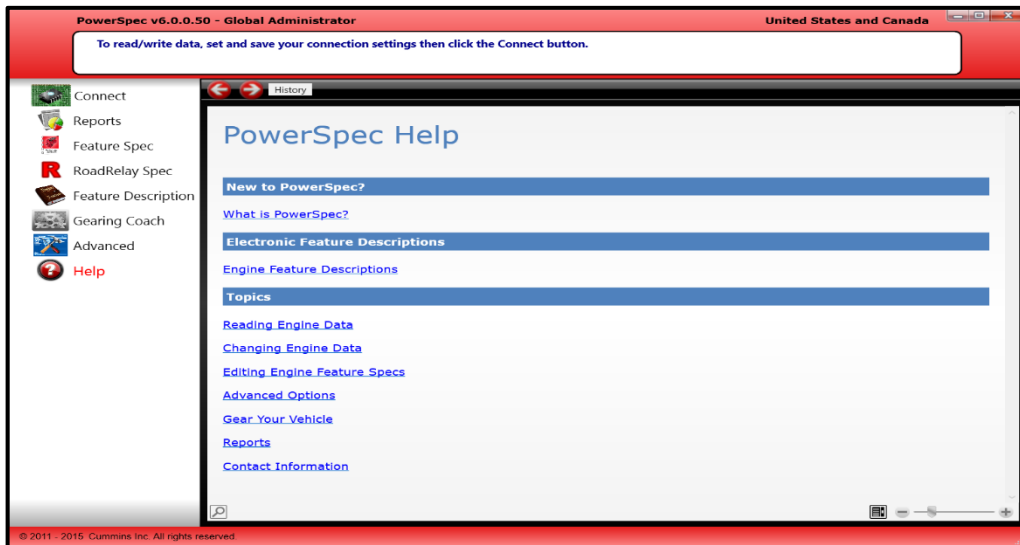
PowerSpec Help

PowerSpec overview

- PowerSpec contains a library of information including: a program overview, engine feature descriptions, and more in-depth descriptions of how to use the program. These topics are located under the 'Help' menu. Click 'Help' in the left menu and the 'Help Topics' at the top of the page.

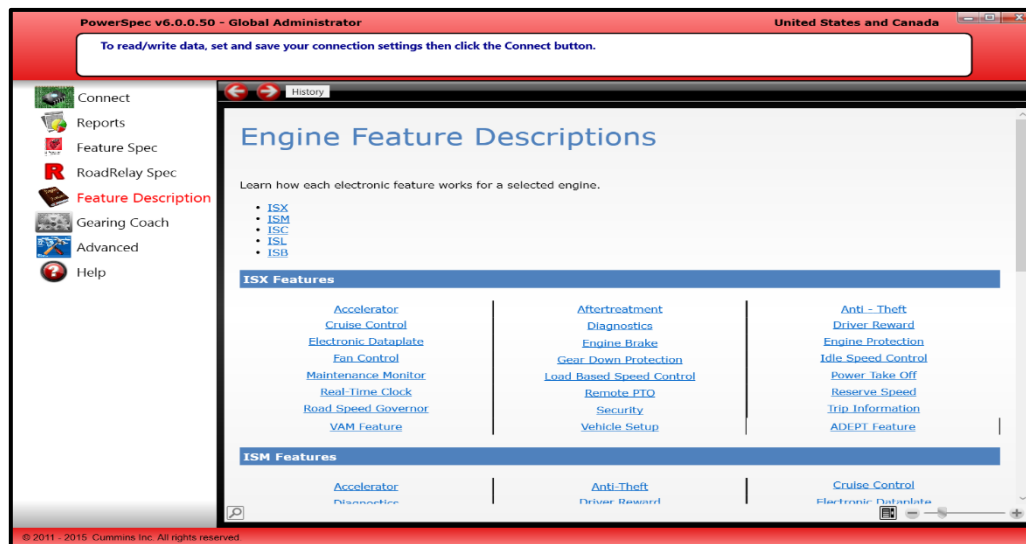


- PowerSpec Help contains a comprehensive overview of all the information you need to complete any task.



Feature Descriptions

- Each engine feature in the Featured Description section includes:
 - Overview
 - Features and Parameters Setup
 - Theory of Operation
 - Driver Technique



- PowerSpec 6.0 also contains a direct link to the engine feature descriptions within the navigation bar on the left.

For More Information:

Contact: Your local Cummins Distributor
Visit: www.cumminsengines.com/powerspec
Call: 1-800-DIESELS