



**Distribution**

# **OSBMA**

## **School Bus Technical Update**

**Jack Szalka** – Technical Support Manager (TSM)

**Dave Dickerson** – Account Executive (AE)

Bus – East Region

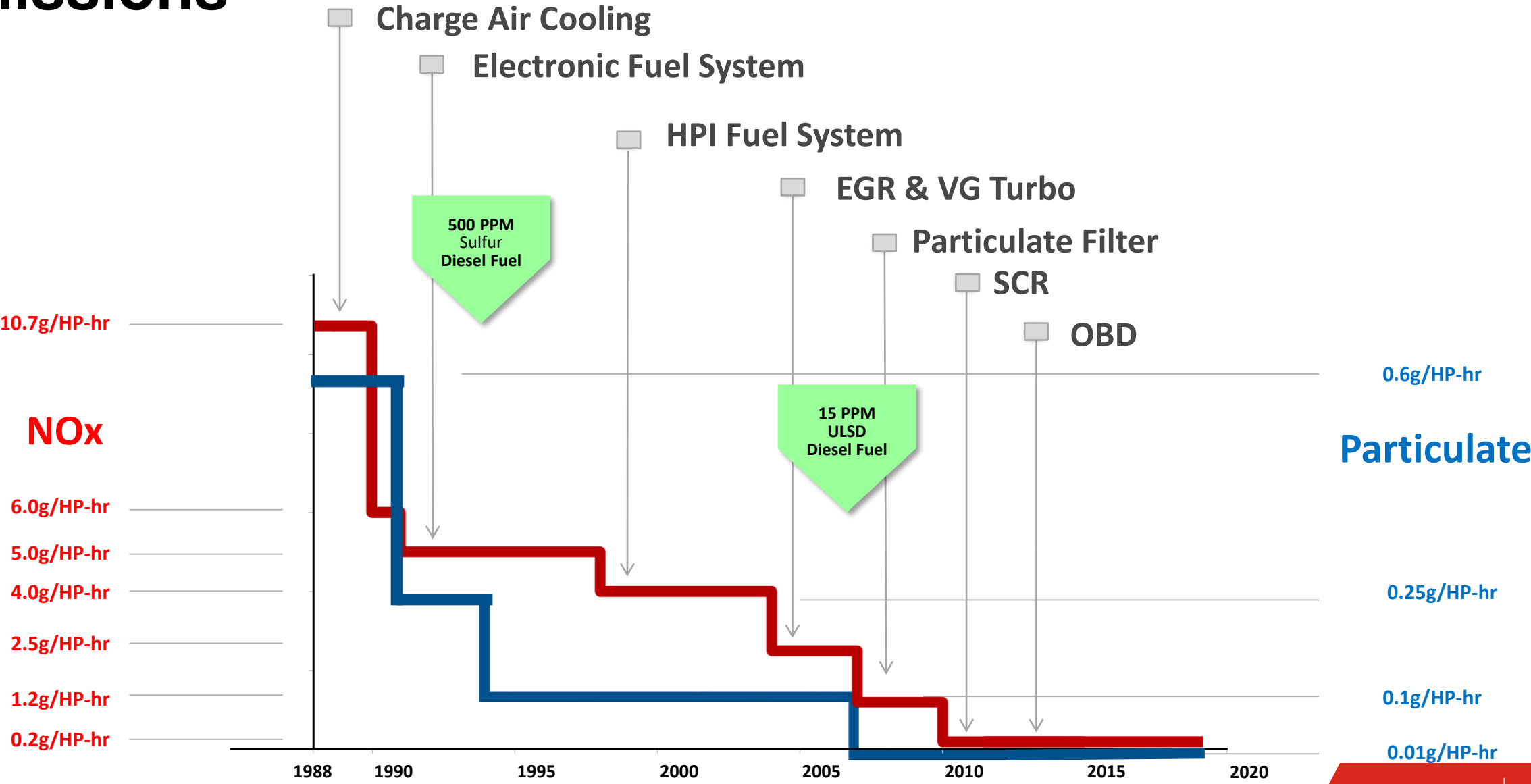
October 2019

# ***EPA Emissions Road Map***

***Where we came from and where we are now !***



# Where We've Come From – EPA Diesel Emissions





Today's Diesel engines are **90%** cleaner than a decade ago!  
**97%** cleaner than 20 years ago! ***With significantly better fuel economy...***



# History of The B Series Engine

July 1983:  
B-Series  
Introduced

1998 ISB:  
24V Cylinder  
Head

2002 ISB:  
EGR  
Introduced

2007 ISB:  
5.9L to 6.7L  
DPF introduced

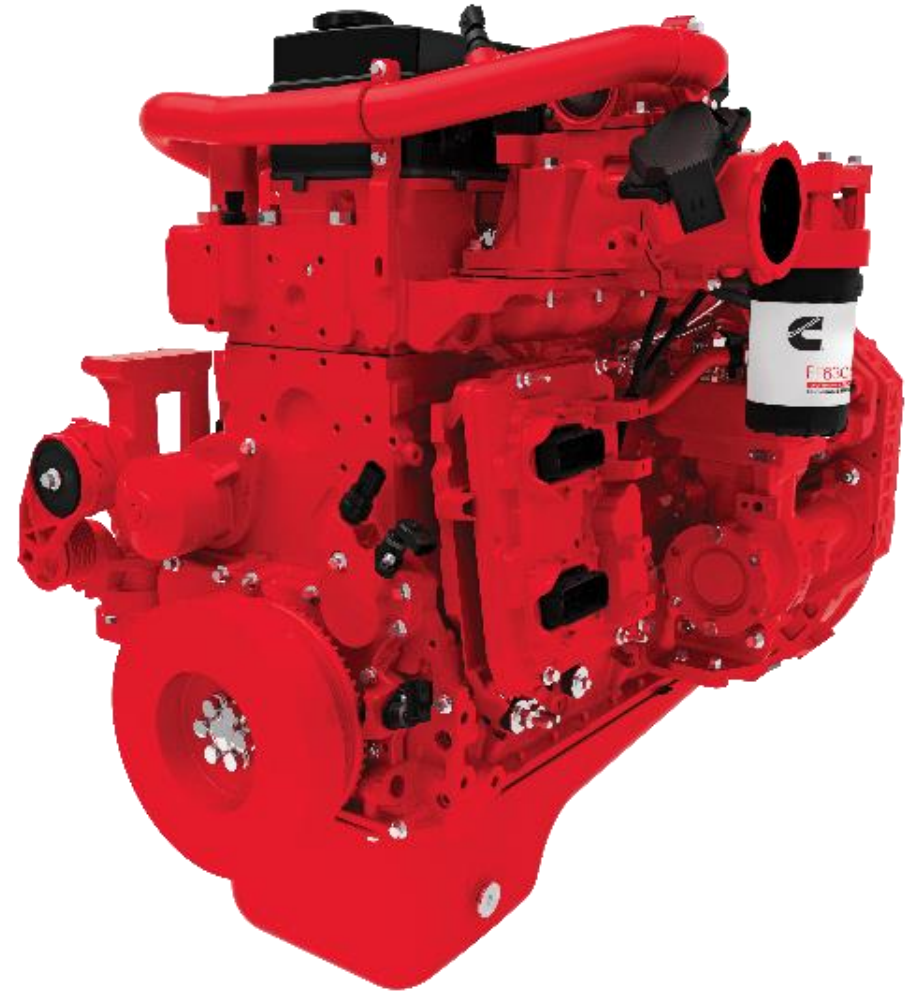
2010 ISB6.7:  
SCR  
Introduced

2017 B6.7:  
Single Module  
Introduced



# Stable Architectural Design

- 35+ Years of Parent Bore design
- 20+ Years of 4 valve head
- 17 Years:
  - Variable Geometry Turbocharge (VGT)
  - Exhaust Gas Recirculation (EGR)
  - High Pressure Common Rail (HPCR)
- 12 Years of 6.7 liters of displacement
- ***12 Years of Aftertreatment***



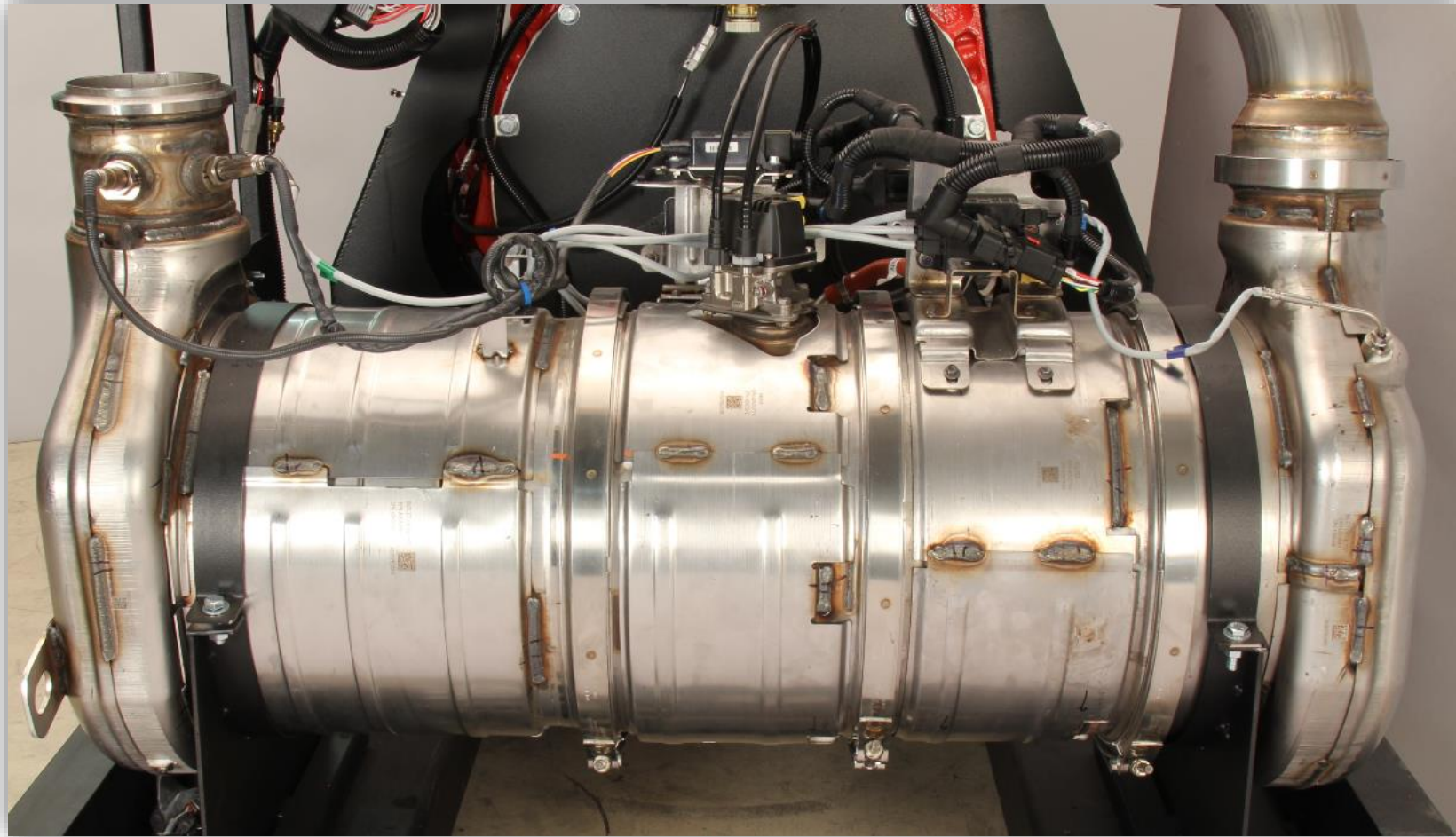


# 2017 MidRange Single Module Aftertreatment

- Customer voice-driven design
- MidRange System features:
  - Up to 70% reduction in size
  - Up to 30% reduction in weight
- Enhanced thermal efficiency  
reliability – durability



## Compact Design for easy maintenance and access





# Modular Components



# B6.7™ Base Warranty

- 5 Years / 100,000 Miles
- 100% Coverage for:
  - Parts and labor on warrantable failures
  - Aftertreatment
  - Consumables used in the repair
- All with no deductible





## Available Extended Coverages

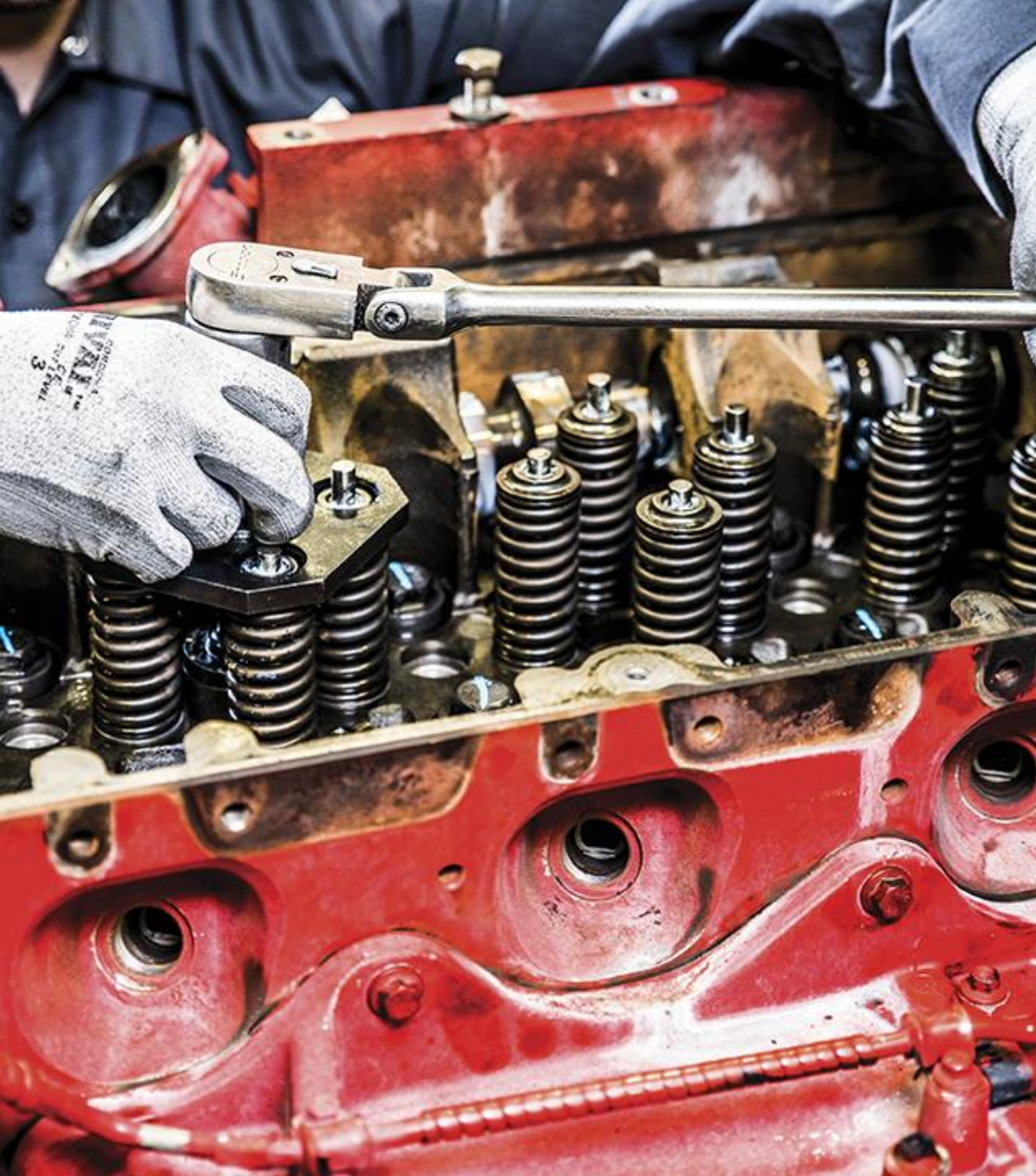
Years	Miles	Kilometers
5	200,000	321,869
5	Unlimited	
7	150,000	241,402
10	200,000	321,869
10	Unlimited	

### **Additional coverage options available**

Options shown available on select plans (i.e. EXC, SBP)

- Includes registered parts and labor
  - **EXC coverage** – *complete coverage including EGR components*
  - **SBP coverage** – *complete coverage minus injectors*
  - **NEC coverage** – *engine coverage including EGR minus maintenance components and accessories*
  - **SMC coverage** – *major components*
- Aftertreatment Extended coverage**
  - **AB3 coverage** – *MUST be packaged with the EXC coverage*





# **Service and Maintenance Best Practices**

# Pre-Trip Inspections

**DAILY** pre-trip inspection per OEM & Cummins maintenance manuals

- • Air Cleaner Restriction
- Air Intake Piping
- Air Tanks and Reservoirs
- Coolant Level
- Charge Air Piping
- Crank Case Breather Tube
- Drive Belts
- Cooling Fan(s)
- • Fuel-Water Separator
- • Lube Oil Level
- Exhaust Piping
- DEF Level





# Routine Maintenance Schedule

Maintenance Item	Miles	Kilometers	Hours
Oil and Filter	15,000	24,000	500
Fuel Filter	15,000	24,000	500
Coolant Filter	15,000	24,000	500
Standard Coolant	60,000	96,000	2,000
Overhead Adjustment	150,000	240,000	5,000
Coalescing Filter	Every 3 <sup>rd</sup> to 4 <sup>th</sup> Oil Change Interval		
DEF Filter	200,000	320,000	6,500
Particulate Filter Cleaning	200,000	320,000	6,500*

NOTE: Be aware of hours vs. mileage for maintenance intervals.



# Maintenance Scheduling

- **Fleet Maintenance Guidelines:**
  - Service Intervals should be based on **HOURS**
  - Mileage based intervals assume a **30 mph average vehicle speed which is NOT THE CASE FOR MOST BUSES**
- **Calculating Maintenance Mileage Intervals:**
  - Determine fleet average speed via INSITE/Other
  - Multiply fleet average speed by maintenance hours to recalibrate mileage maintenance table
- **EXAMPLE:**
  - Fleet avg. speed = **11 mph**
  - DPF filter clean recommendation = **6500 hours**
    - Original recommended mileage = 200,000 miles
  - Adjusted mileage =  $(11\text{mph} \times 6500\text{h}) =$  **71,500 miles**

Adjusted Intervals  
(Ex: 11 mph average)

<b>B6.7™</b>		Kilometers	12,000	24,000	24,000	48,000	96,000	120,000	242,000	322,000
		Miles	7500	15,000	15,000	30,000	60,000	75,000	150,000	200,000
		Hours	250	500	500	1000	2000	2500	5000	6500
		Months	3	6	12					
		Years				1		4		
<b>Maintenance Intervals</b>		Procedure	Step							
		Air Cleaner Restriction	Check	X						
		Charge Air Piping	Check	X						
		Charge Air Cooler	Check	X						
		Lubricating Oil and Filters	Change							
		Engine Coolant Antifreeze	Check		X					
		Batteries	Check		X					
		Battery Cables and Connections	Check		X					
		Refer to Procedure 359-003 in Section 3.								
<b>B6.7™</b>		Kilometers	4,500	9,000	9,000	18,000	35,500	44,000	89,000	115,000
		Miles	2,750	5,500	5,500	11,000	22,000	27,500	55,000	71,500
		Hours	250	500	500	1000	2000	2500	5000	6500
		Months	3	6	12					
		Years				1			4	
<b>Maintenance Intervals</b>		Procedure	Step							
		Air Cleaner Restriction	Check	X						
		Charge Air Piping	Check	X						
		Charge Air Cooler	Check	X						
		Lubricating Oil and Filters	Change							
		Engine Coolant Antifreeze	Check		X					
		Batteries	Check		X					
		Battery Cables and Connections	Check		X					
		Radiator Pressure Cap	Check		X					
		Fuel Filter (Spin-On Type)	Change			X				
		Drive Belt, Cooling Fan	Check				X			
		Cooling Fan Belt Tensioner	Check				X			
		Air Compressor Discharge Lines	Check				X			
		Cooling System	Check					X		
		Vibration Damper, Viscous	Check					X		
		Engine Steam Cleaning	Clean					X		
		Radiator Hoses	Check					X		
		Crankcase Ventilation Filter	Change						X	
		Overhead Set	Adjust							X
		Aftertreatment Diesel Particulate Filter	Clean / Exchange							X
		Aftertreatment Diesel Exhaust Fluid Dosing Unit Filter	Change							X
		Refer to Procedure 359-003 in Section 3.								

*\*See equipment manufacturer for service information*

*Recommend Maintenance be performed based on number of hours accumulated.*

- Schedule above reflects **11 mph** as 1 hour
- Be aware of hours vs. mileage for maintenance intervals

# ReCon<sup>®</sup> DPF Program

Rigorously cleaned, and tested to meet Cummins specifications for soot capacity, Cummins ReCon Diesel Particulate Filters (DPF) provide an efficient and cost-effective method to handle DPF maintenance and service requirements. Each Cummins ReCon DPF is subjected to a proprietary imaging test to verify soot capacity, thus ensuring engine backpressure will be minimized.



## Less Time in the Shop

When you purchase a ReCon DPF, the DPF is simply removed and replaced, instead of waiting for a cleaning process that can keep your bus down for an extended time



## Better to the Core

Cummins gives you full credit for acceptable cores exchanged when replacing the DPF with a ReCon DPF. This helps reduce cost and is the most cost-effective way of keeping your DPF working properly



## We Have you Covered

Cummins ReCon DPF's are backed by a 1-year/100,000 miles warranty, ensuring that your filter will operate like new, with all parts and labor covered.



## Additional Information

Visit [Cummins Diesel Particulate Filter Website](#) for more in-depth information surrounding using Cummins genuine DPF filters or consult the [ReCon DPF Brochure](#)

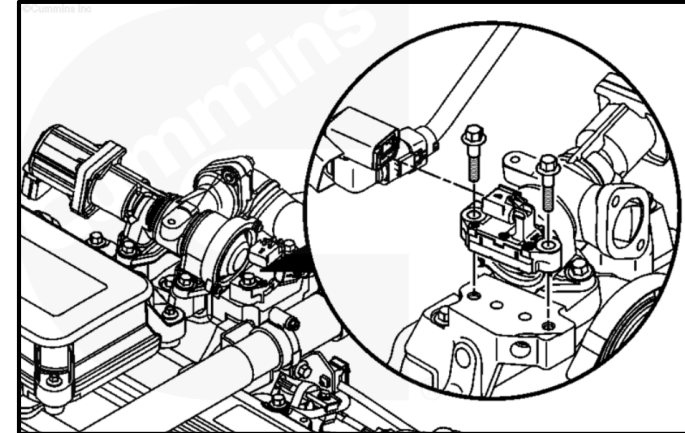
# DPF and EGR Diff Sensor & Port Cleaning

## Best Practice

Inspect all INTAKE and EXHAUST CONNECTIONS for LEAKS at EVERY CHANCE.

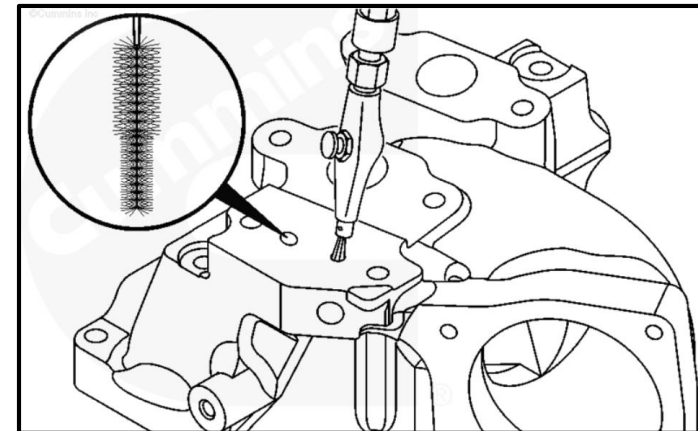
### Cleaning DPFs:

- Look at hours not miles to maximize uptime due to idle: **5,000 hours**
- Requires “Maintenance Reset” in ECM using Insite Software.
- **ALWAYS** use new exhaust gaskets in DPF and exhaust connections.
- Remove old gasket materials completely from connections.
- Inspect Aftertreatment Inlet for Oil, Coolant, Fuel Contamination.



### Cleaning EGR differential sensor and ports:

- Packed or dirty EGR diff sensor and ports can create downstream issues in aftertreatments
- Look at intake air connection for EGR diff port cleaning
- EGR Valve cleaning procedure can be found in procedure **011-022 EGR Valve**
- Differential Port (DP) cleaning procedure can be found in procedure **010-080 Air Intake Connection**
- Benefit of **5000 hour** cleaning will **reduce bus downtime** due to EGR DP port and sensor related **faults – 3382, 1921, 1896, 3375.**
















# **Mobile Regen Set Speed - Aftertreatment Diesel Particulate Filter - Temperature Stabilization**

## **INSITE Programmable Parameters**

# Mobile Regen Set Speed & DPF Temp Stabilization

- School Bus OEM's have the minimum regen vehicle set speed parameter set to **5 mph** (default)
- Some School bus OEM's have the minimum regen set speed parameter **locked** at 5 MPH and it can't be adjusted without the OEM password
- The default for the DPF regen stay warm is **“disabled”** – (this parameter is adjustable) *Some OEM's are now setting this parameter to “enable”*

# Mobile Regen Set Speed & DPF Temp Stabilization – Example – Insite General Default setting

 Aftertreatment		
 Diesel Particulate Filter		
 Active Regeneration in PTO and Remote Modes		Disable
 Aftertreatment Diesel Particulate Filter Stationary Regeneration with Parking Brake		Disable
 Aftertreatment Diesel Particulate Filter Temperature Stabilization		Disable
 Automotive Mobile Regeneration		Enable
 Minimum Vehicle Speed		5 mph
 Diesel Particulate Filter Lamp		Installed
 Diesel Particulate Filter Regeneration Permit Switch		Disable

- The CM2250 & CM2350 engines have a DPF stay warm feature – *aftertreatment temperature stabilization*



# Mobile Regen Set Speed 5 MPH Temp stabilization disabled

- When the “*minimum regen set speed*” is set to a speed other than zero ( i.e.....5 MPH ) and the temp **stabilization is DISABLED** the *In-Mission* regen **will not start** until **40 MPH** is reached and will discontinue when drops below **5 MPH**
- When speed drops below **5 mph** - the in-mission regen now is stopped and **will require the 40 MPH vehicle speed to re-start**
- Routes where a vehicle does not exceed 40 MPH could lead to regen issues

# Mobile Regen Set Speed “Zero”

- If the mobile regen set speed is set to **zero**, the regen start **does not require the 40 mph** speed to initiate
- The regen **will continue at zero road speed** ( i.e..... stopped in traffic or on the route) Dosing will decrease as temps drop
- The regen **will stop** if the aftertreatment temps can no longer be maintained (stopped or parked idling condition) The regen will restart once aftertreatment target temperatures are achieved

# Mobile Regen Set Speed “5 MPH” Temp Stabilization “Enabled”

- When the regen speed parameter is **set above zero**, (i.e..... 5 mph) **the DPF temp stabilization (stay warm) can be *enabled* to dose low amounts and “keep the DPF warm”** and the regen will not be required to completely start over again
- When the DPF temp stabilization is **enabled** the **40 mph vehicle speed target is removed** and the regen will start when the speed is 0.6 above the minimum set speed (i.e.....5.6 mph)

# Mobile Regen Set Speed & DPF Temp Stabilization

- The DPF regen stay warm parameter should be enabled when the mobile regeneration set speed is something other than zero ( i.e....5 MPH )
- This parameter is designed for low duty cycle, low speed applications where minimum regen set speed is requested to be **greater than zero**
- ***If “Mobile Regeneration Minimum Vehicle Speed” is set to 0 mph,*** active regeneration is **not** inhibited due to vehicle speed - use of the ***“Aftertreatment Diesel Particulate Filter Temperature Stabilization”*** feature is unnecessary.










# Mobile Regen Set Speed & DPF Temp Stabilization

- Technical Service Bulletin - **TSB170058** was released to review the DPF temperature stabilization feature in detail
- In the past, many of the OEM's have defaulted DPF Temp stabilization to "Disabled" – Pre-2017
- Many delivering OEM dealers are changing the setting the DPF temp stabilization to "Enable"

***The DPF temp stabilization feature is NOT available on 2007-2009 CM2150 vintage engines! -***

# School Bus DPF & Temp Stabilization Features

 Aftertreatment		
 Diesel Particulate Filter		
 Active Regeneration in PTO and Remote Modes	Disable	
 Aftertreatment Diesel Particulate Filter Stationary Regeneration with Parking Brake	Disable	
 Aftertreatment Diesel Particulate Filter Temperature Stabilization	Enable	
 Automotive Mobile Regeneration	Enable	
 Minimum Vehicle Speed	5 mph	



## **Campaigns & Temporary Repair Practices (TRP)**

## **B6.7 Navistar Fuel Heater Temporary Repair Practices (TRP) 2129 - Campaign C2127**

~~T2129 – B6.7 Navistar Fuel Heater~~ – This was released March, 2019 to disable the fuel heater in the fuel filter head by removal of the 50 AMP fuse. If the heater was damaged it also provided the removal of the heater and installation of a temporary plug – This TRP will soon be closed and replaced by an active campaign – ***TRP 2129 was closed 10-18-19 and all ESN's added to C2127***

***The Safety Campaign C 2127 – Released 8/1/19*** – Campaign is being done in phases – Phase 1 & 2 in process.

All new units built after February 2019 were shipped without a heater and only a plug in the filter head. **A different campaign is scheduled for late November early December 2018** to have the heater installed.

**New IC buses after Mid October 2019 are being built with heaters**

Heater was incorrectly wired – campaign will reverse the wires, replace fuse and install new heater – School bus campaign kit – Includes heater and 30 AMP fuse. Repairs should be completed in just under 1 hour.



# Open Campaigns

- **C2191-B6.7 CM2350 MY17-MY18 Product Improvement Calibration Campaign** – Released to recalibrate the Engine Control Module on certain **B6.7 CM2350** engines with a product improvement calibration for improved reliability. Primarily to correct oil in the compressor side of the turbocharger – refer to **TSB190012**. The calibration update also has software updates for **FC3383** EGR port soot deposits – refer **TSB190165** - This software also has improvements for **FC334** – coolant temp erratic – when using auxiliary heaters
- **C2115 - ISB CM2350 265HP and Higher Emissions Recall Campaign** – Released 6-13-19 This field action authorizes certified repair locations to upfit certain **ISB CM2350 higher HP** engines with an improved SCR Catalyst, if the engine meets the criteria listed below. **For MY2013 thru MY2014** engines that qualify for a new SCR Catalyst, a new wiring harness connector plug, and a calibration update will be required. **This field action provides for retroactive coverage of repairs, including customer billable repairs, completed by Cummins authorized repair locations prior to the release date of this field action.**

# ISB CM2350 TRP's – SCR- VGT- NOx

**T2084 – ISB and ISL CM2350 SCR Replacement - Engine Model year 2013 through 2014** – *This TRP authorizes replacement of the **SCR catalyst** when directed by troubleshooting to resolve a failure.* To qualify the ESN must be on the list attached to the TRP. Coverage will be regardless of warranty status and **does include retroactive reimbursement**. This is not yet a proactive repair and does require a failure.

**T2083 - ISB, ISC, and ISL CM2250 SCR Replacement – Engine Model year 2010 – 2012 – Same as TRP 2084 -**

The **proactive** SCR campaigns to replace T2084-T2083 for school bus application is expected early 2020.

**T2145 - ISB6.7 CM2350 MY2013 and MY2014 Variable Geometry Turbocharger Actuators for Out of Warranty Failures.** Variable Geometry Turbocharger Actuator failures on certain ISB6.7 CM2350 MY2013 engines. This TRP authorizes **certified repair** locations to replace the Variable Geometry Turbocharger Actuator if fault codes or troubleshooting lead to a confirmed failure of the VGT Actuator.

The failure must be under 10 years and/or 185,000 miles

This does allow retroactive reimbursement for prior repairs for VGT actuator replacement not covered by warranty

**T2146 – ISB6.7 MY 2013 NOx Outlet Sensor - System Outlet NOx Sensor** failures on certain ISB6.7 CM2350 engines if fault codes or troubleshooting lead to a confirmed failure of the System Outlet NOx Sensor.

The failure must be under 10 years and/or 185,000 miles

This does allow retroactive reimbursement for prior repairs for NOx outlet sensor replacement *not covered by warranty*

# ISB CM2350 TRP's – SCR- VGT- NOx – Reimbursement

- **T2147 – ISB6.7 CM2350 MY2013 - Turbocharger Replacement Retroactive - Reimbursement for out of warranty failures**
- **T2148- ISB6.7 CM2350 MY2013 Diesel Exhaust Fluid Dosing Valve Retroactive – Reimbursement for Out of Warranty Failures**
- **T2160 – ISB6.7 CM2350 MY2013 Engine Outlet NOx Sensor Retroactive – Reimbursement for Out of Warranty Failures**

The three TRP's for ISB6.7 CM2350 MY2013 listed above allow for reimbursement of listed items that previously failed and were *not covered by warranty. Parts only if not done by a Cummins authorized location.*

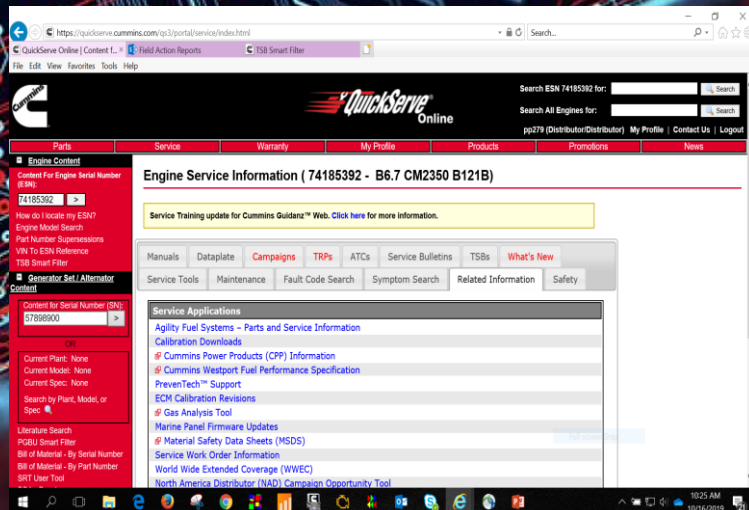


# ISB CM2350 MY2013-2015 – FC3375 Update

- The software update for **FC 3375** – Excessive regen on ISB CM2350 MY2013-2015 should be available for download January 2020.
- ECM calibration may be available Mid December, but could have access on one off basis prior to then
- The updated software is only compatible with the updated SCR catalyst. **MY2013 & MY2014** engines – will need SCR replaced. The SCR campaign is expected to be released in January 2020 and when replacing the SCR, the ECM will need to be calibrated to a different ECM code which will include the new software improvements for FC3375. **The MY2015 does not require SCR replacement.**
- The update to the software for **ISB CM2350 MY2016** may be slightly behind the MY2013-2015
- TSB will be published to review FC 3375 when the calibration is released. The TSB will include inspection of the EGR differential ports and EGR system for plugging



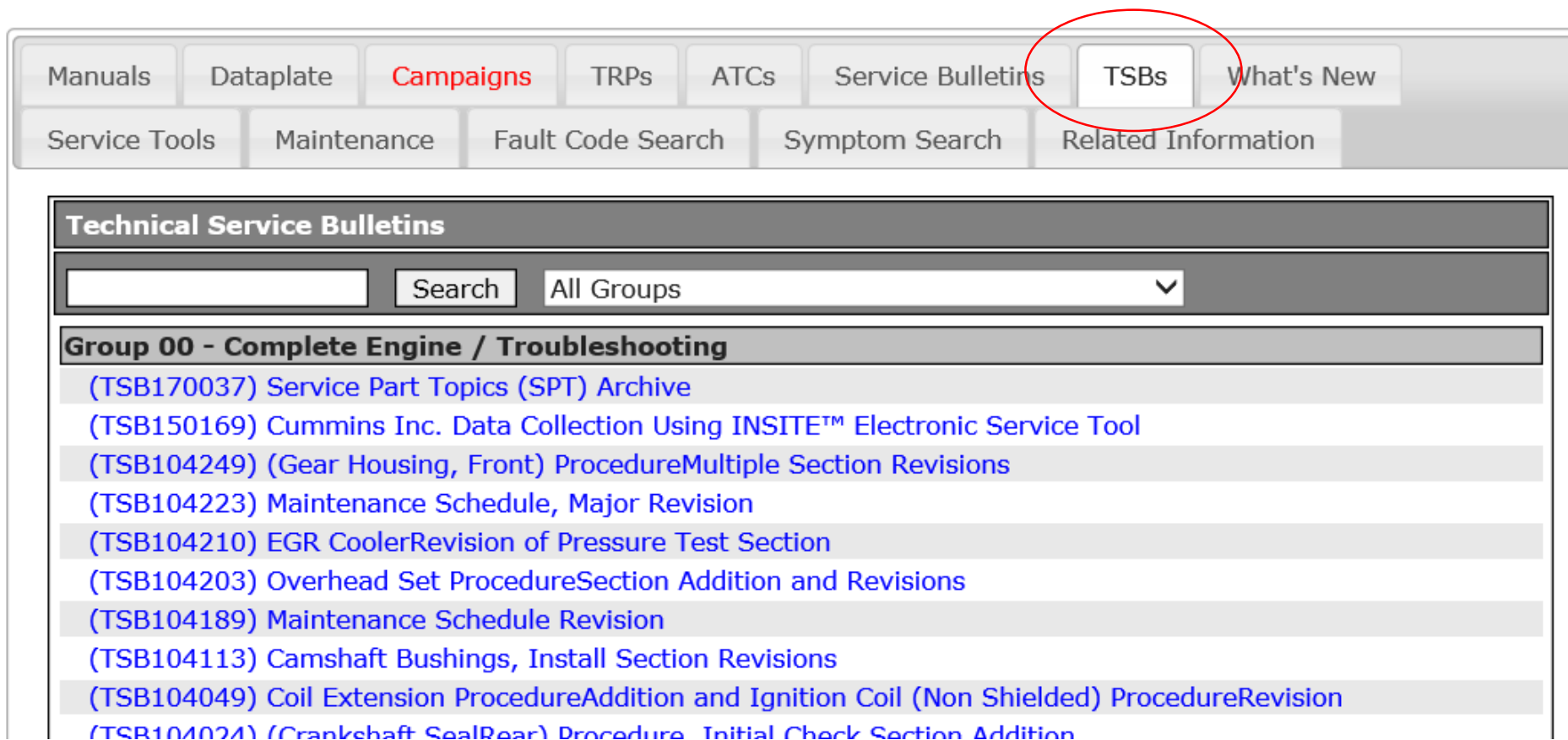
# Technical Service Bulletins (TSB's) QuickServe Online (QSOL)



# Cummins TSB's

- Technical Service Bulletins are available at [\*\*Quickserve On-line\*\*](#). The TSB provides information related to specific reported issues by engine model
- TSB's are listed by group category – Complete Engine, Fuel system, Head, Injectors, Cooling etc.
- TSB's generally review issues that could be OEM related, parts changes, specific technical instructions or additional repair directions

# TSB – QuickServe Online



Manuals   Dataplate   **Campaigns**   TRPs   ATCs   Service Bulletins   **TSBs**   What's New

Service Tools   Maintenance   Fault Code Search   Symptom Search   Related Information

**Technical Service Bulletins**



  Search   All Groups ▼

**Group 00 - Complete Engine / Troubleshooting**

- [\(TSB170037\) Service Part Topics \(SPT\) Archive](#)
- [\(TSB150169\) Cummins Inc. Data Collection Using INSITE™ Electronic Service Tool](#)
- [\(TSB104249\) \(Gear Housing, Front\) ProcedureMultiple Section Revisions](#)
- [\(TSB104223\) Maintenance Schedule, Major Revision](#)
- [\(TSB104210\) EGR CoolerRevision of Pressure Test Section](#)
- [\(TSB104203\) Overhead Set ProcedureSection Addition and Revisions](#)
- [\(TSB104189\) Maintenance Schedule Revision](#)
- [\(TSB104113\) Camshaft Bushings, Install Section Revisions](#)
- [\(TSB104049\) Coil Extension ProcedureAddition and Ignition Coil \(Non Shielded\) ProcedureRevision](#)
- [\(TSB104024\) \(Crankshaft SealRear\) Procedure Initial Check Section Addition](#)



# TSB - Smart Search



PartsServiceWarrantyMy ProfilePro

Engine Content

Content For Engine Serial Number (ESN):  
74185392 >  
How do I locate my ESN?  
Engine Model Search  
Part Number Supersessions  
VIN To ESN Reference  
TSB Smart Filter

Generator Set / Alternator Content

Content for Serial Number (SN):  
57898900 >  
OR  
Current Plant: None  
Current Model: None  
Current Spec: None  
Search by Plant, Model, or Spec

Engine Service Information ( 74185392 - B6.7 CM2350 B121

Service Training update for Cummins Guidanz™ Web. [Click here](#) for more information.

ManualsDataplateCampaignsTRPsATCService BulletinsTS  
Service ToolsMaintenanceFault Code SearchSymptom SearchRelat

Service Applications

[Agility Fuel Systems – Parts and Service Information](#)  
[Calibration Downloads](#)  
[Cummins Power Products \(CPP\) Information](#)  
[Cummins Westport Fuel Performance Specification](#)  
[PrevenTech™ Support](#)  
[ECM Calibration Revisions](#)  
[Gas Analysis Tool](#)

# TSB – Smart Search – This does default to your ESN or can be sorted

The screenshot displays the Cummins TSB Smart Filter web application. The browser address bar shows the URL: [https://quickservice.cummins.com/qs3/portal/service/tsb\\_smart\\_filter.html?header=false](https://quickservice.cummins.com/qs3/portal/service/tsb_smart_filter.html?header=false). The page title is "TSB Smart Filter".

At the top of the application, there are buttons for "Save Changes", "Clear Selections", and "Close Window". Below these is a dropdown menu for "Show Documents For Last: 365 days".

The main content area is divided into three sections:

- Document Types:** A list of checkboxes for selecting document types. The selected options are: ☒ Parts Information, ☒ Service Information, ☒ Diagnostic, and ☒ Warranty.
- Engine Group:** A list of checkboxes for selecting engine groups. The selected option is: ☒ Mid Range. Other options include Heavy Duty, High Horsepower, and Natural Gas.
- Engine Region:** A list of checkboxes for selecting engine regions. The selected option is: ☒ U.S. and Canada. Other options include Mexico and Central America, South America, Africa, Middle East, Europe, CIS, India, and Japan.

On the right side, there is a section for "Engine Models" with a list of checkboxes. The selected option is: ☒ 6B5.9. Other options include 4B3.9, 6A3.4, 6C8.3, A1400, A1700, A2000, A2300, B GAS INTERNATIONAL CM556, B3.3, B4.0 CM2620 B154B, B4.5, B4.5 CM2350 B129B, B4.5 CM2350 B146C, B4.5 CM2350 B147B, B4.5 CM2620 B158B, B4.5 RGT, B4.5S, B5.9 G, and B5.9 GAS PLUS CM556.

On the left side, there is a section titled "TSB Smart Filter" with a table of documents. The table has two columns: "Document" and "Description". The documents listed are:

Document	Description
TSB110141	New Low Output Piston Type Transfer Pump Av
TSB190153	Incorrect Variable Geometry Turbocharger (VGT
TSB140086	New SCR Catalyst Part Numbers
TSB180047	Aftertreatment Diesel Exhaust Fluid Dosing Unit
TSB150105	Three-Bung Aftertreatment Selective Catalytic R
TSB150057	Aftertreatment Outlet NOx Sensor Water Intrusio
TSB190011	Exhaust Outlet Connection Exhaust Leak
TSB190040	Coolant Level Sensors Discontinued on New Pro
TSB190003	CM2350 Engine Control Module (ECM) Malfunc
TSB150153	Fault Code 3314, 3317, 3319, 3146 or 4518 Cau
TSB180139	UL2 DEF Dosing Unit External DEF Leaks

The bottom of the screen shows the Windows taskbar with various application icons and the system clock indicating 10:21 AM on 10/16/2019.

# School Bus TSB's

## All School Bus Applications – Refer to TSB's for details

**TSB170058** – Aftertreatment Temp Stabilization Setting – ISB CM2250- ISB CM2350- B6.7 CM2350 – The temp stabilization feature should be **enabled** on any school bus that has the minimum regen road speed set **above zero**.

**TSB190012** – ECM Calibration update to correct turbo compressor side oil leak – B6.7 CM2350 – **C2191**  
ECM calibration campaign was released 8/24/19

**TSB190165** – B6.7 CM2350 - FC 3383 - Soot deposits in the intake air connection exhaust gas entrance ports are present and have affected EGR flow measurements. After troubleshooting and inspection If ECM calibration code revision on unit was released prior to December 2018, calibrate the unit with the latest ECM calibration code revision. **C2191**

# TSB - Navistar – IC School Bus

## Navistar – IC School Bus

**TSB190038** – Fuel Heater Failure – Can cause FC 559-4691 – hard start -stall – external fuel leak – Also refer to ~~TRP 2129~~ for this issue – B6.7 CM2350 – **Campaign C2127** released 8/1/19

**TSB180009** – Navistar-IC - Charge air clamps loose or broken – Can cause aftertreatment codes to include but not limited to 1922, 1981 and failed DPF – B6.7 CM2350 - Refer to IC for repair

**TSB170120** - Navistar-IC Hood seal issue – Can cause regen issues and FC3375 - B6.7-ISB CM2350 - Refer to IC for repair

**TSB180032** – Navistar-IC - Ruptured Air Compressor supply hose – Can cause FC 3389 – FC3375 aftertreatment and regen issues – B6.7 – ISB CM2350 - Refer to IC for repair

**TSB170046** – Navistar-IC – Belt chirp – Excessive length on IC belt – Can cause tensioner wear due to excessive length of belt leading to belt shredding – ISB – B6.7 CM2350

**TSB150165** – Navistar-IC Starter Motor Malfunction – ISB CM2350 – Refer to IC for repair

**TSB160031** – Navistar-IC – DEF Quality FC's – 1715,6766,6765,6767 – IC DEF quality sensor issue – Refer to IC for repair



# TSB – Thomas/FCCC School Bus

## Thomas School Bus

**TSB110060** – Belt tensioner issues due to belt too long – ISB CM2250

**TSB150040** – Belt shredding Thomas pusher bus – ISB CM2350

**TSB120236** – FC 1679 – DEF Tank temp issues – Thomas/FCCC – ISB CM2250

# TSB - Bluebird School Bus

## Bluebird School Bus

**TSB170089** – Allison trans FC P2637 – Corrected with engine ECM update – B6.7 CM2350

**TSB170081** – FC 3555 after updating ECM calibration – Bluebird School Bus – TSB directs to different ECM code to correct – B6.7 CM2350

**TSB150073** – ABS light on after engine ECM calibration – Issue was reported in 2016 and corrected but is happening on B6.7 CM2350 with latest version of Insite – Bendix Acom diagnostic software is required to reset ABS controller to clear lamp – or unplug the ABS fuse prior to calibrating the engine ECM – **Recent** **TSB190174** reviews the process for ECM calibration on **B6.7 – MY2017 and newer** – Directs removal of OEM - ABS and transmission fuse **prior** to engine ECM calibration. *The final correction is in process and should be corrected in engine ECM software.*

# Cummins Bulletins

Refer to the following bulletins for Cummins engines

[3379001](#) – **Fuels for Cummins Engines** –

Specs/Properties/Analysis/Additives/Biofuels/Filtration/Natural Gas/NG-LPG Spec

[3810340](#) – Link to [5411406](#) - **Oil & Oil Analysis Recommendations** –

Classification/Grades/Specs/Sampling/Analysis Interpretation

[3666286](#) – Link to [5411406](#) - **Cummins Requirements for Cooling System Extended Service Intervals** – & [3666132](#) – Link to [5411406](#) – **Coolant Requirements and Maintenance**  
Specs/Testing/Maintenance/Cleaning/Filtration

[4021566](#) - **Diesel Exhaust Fluid (DEF) Specifications** for Cummins® Selective Catalytic Reduction (SCR) – Specs/Handling/Storage/Testing

[3379000](#) – **Air for your engine**

# Oil & Coolant Registration List

Cummins has an oil and coolant registration list available for review on [QuickServe](#)

The oil/coolant manufactures who have supplied the requested information and have met the appropriate Cummins Engineering Standard (CES) standard will appear on the registration list

If they are not on the list, they may not have applied or did not meet the CES standard – It's also possible the fluid is under a different brand name or description



# Oil & Coolant Registration List

The published list of oils and coolants are on Quickserv online in the service area under the service tools tab

The screenshot shows the Quickserv online interface. At the top, there is a navigation bar with tabs: Manuals, Dataplate, Campaigns, TRPs, ATCs, Service Bulletins, TSBs, and What's New. Below this, there is a secondary navigation bar with tabs: Service Tools, Maintenance, Fault Code Search, Symptom Search, and Related Information. The 'Service Tools' tab is circled in red. Below the navigation bar, there is a list of links under the heading 'Service Tools'. The links are: 3rd Parts/Non Cummins Data Link Adapters, Clean Care Kit Content Sheets, Coolant Registration Lists, Electrical Connector Database, Expert Diagnostics System (EDS), Fault Information System File Download, ICON, INCAL, INLINE Adapters, INSITE, Oil Consumption Evaluator, Oil Registration Lists, Service Products Catalog, and Wiring Repair Kit Content Sheets. The 'Coolant Registration Lists' and 'Oil Registration Lists' links are circled in red. Below the list of links, there is a section titled 'Service Tool Instructions' with a list of links: (3377791) ECM Bench Calibration Base Harness, (3377996) Valve Insert Remover, (3400361) Charge Air Cooler Leak Test Kit, (3400413) NOx Sensor Module Diagnostic Kit, and (3400451) Exhaust Gas Recirculation (EGR) Cooler Leak Test Kit.

Service Tools
<a href="#">3rd Parts/Non Cummins Data Link Adapters</a>
<a href="#">Clean Care Kit Content Sheets</a>
<a href="#">Coolant Registration Lists</a>
<a href="#">Electrical Connector Database</a>
<a href="#">Expert Diagnostics System (EDS)</a>
<a href="#">Fault Information System File Download</a>
<a href="#">ICON</a>
<a href="#">INCAL</a>
<a href="#">INLINE Adapters</a>
<a href="#">INSITE</a>
<a href="#">Oil Consumption Evaluator</a>
<a href="#">Oil Registration Lists</a>
<a href="#">Service Products Catalog</a>
<a href="#">Wiring Repair Kit Content Sheets</a>
Service Tool Instructions
<a href="#">(3377791) ECM Bench Calibration Base Harness</a>
<a href="#">(3377996) Valve Insert Remover</a>
<a href="#">(3400361) Charge Air Cooler Leak Test Kit</a>
<a href="#">(3400413) NOx Sensor Module Diagnostic Kit</a>
<a href="#">(3400451) Exhaust Gas Recirculation (EGR) Cooler Leak Test Kit</a>

# Oil Registration List

Oil Registration by Cummins Engineering Standards (CES) - QuickServe



## Oil Registration List

Click a Cummins Engineering Standards (CES) Number below to view the list of registered oils.

- [CES 20074](#)
- [CES 20075](#)
- [CES 20076](#)
- [CES 20077](#)
- [CES 20078](#)
- [CES 20081](#)
- [CES 20085](#)
- [CES 20086](#)
- [CES 20087](#)
- [CES 20088](#)
- [CES 20092](#)



**How to select the right engine oil for your Cummins engine:**

1. Enter your ESN (if available) into the left hand navigation box.
2. In your owner's/operation and maintenance manual, Section V Maintenance Specifications, find 018-003 Lubricating Oil Recommendations and Specifications.
3. Find the recommended viscosity grade and Cummins Engineering Standard (CES) number for your engine.
4. Use the CES number to pick the correct oil registration list.
5. Once on the correct oil registration CES number list, find an oil you prefer that has the recommended viscosity grade.

# Coolant Registration List

Coolant Registration by Cummins Engineering Standard (CES) QuickServe



## Coolant Registration Lists

---

Click a Cummins Engineering Standards (CES) Number below to view the list of registered coolants and chemicals.

- [CES 14603](#)
- [CES 14439](#)
- [CES 14636](#)



**INSITE™**



**QuickServe Online**

Search ESN 73796906 for:  [Go](#)  
Search All Engines for:  [Go](#)  
99779 (Distributor/Distributor) My Profile Contact Us Logout

Parts Service Warranty My Profile Products Promotions News

Engine Control  
Content For Engine Serial Number (ESN)  
73796906  
How to Use the ESN  
Engine Model Search  
Part Number Supersessions  
Use To ESN Reference  
TSB Smart Filter

Generator Set / Alternator  
Content  
Content For Serial Number (SN)  
57898900  
Content Plant: None  
Content Model: None  
Content Spec: None  
Search By Plant, Model, or Spec

Literature Search  
PG&I Smart Filter  
Bill of Material - By Serial Number  
Bill of Material - By Part Number  
BOM Visual Tree

**Engine Service Information ( 73796906 - ISB6.7 CM2350 B101)**

Free - Cummins Guidara™ Web Training via MySite for North American Dealers. [Click here](#) for more information.

Manuals Datasheet Campaigns TRPs ATCs Service Bulletins TSBs What's New  
Service Tools Maintenance Fault Code Search Symptom Search Related Information Safety

**Manuals**

Wiring Diagrams  
(4310801) ISB6.7 CM2350 B101 Wiring Diagram  
[Fault Code Troubleshooting Manual](#)  
(4310801) ISB6.7 CM2350 B101 Fault Code Troubleshooting Manual [\[Change History\]](#)  
**Service Manuals**  
(2883587) ISB6.7 CM2350 B101 Service Manual [\[Change History\]](#)  
(5411406) Fluids for Cummins® Products Service Manual [\[Change History\]](#)  
**Owners Manuals**  
(2883546) ISB6.7 CM2350 B101 Owners Manual [\[Change History\]](#)  
Operation and Maintenance Manuals

# Insite – Quickserve Online



# Insite – Subscriptions - Renewal & Technical Support

- Software - Insite renewals, license transfer, Guidanz, Fleet Cals, Zap Its, Incal, Quickserve, and PowerSpec we have one contact number for the **East Region**

**1-888-861-5123 – 6:30 AM to 5:30 PM – Monday through Friday**

You can also email [subscription.support@cummins.com](mailto:subscription.support@cummins.com)

- Insite Program Technical Support

**1-800-Cummins (800-286-6467) 24 hours – 7 days**

[Insite.cummins.com](https://insite.cummins.com) also has a live chat support and e-mail request options.

***If you are requesting technical support with an Insite tool issue, please have your Insite open and available to review - Connected to WIFI if available***

# Cummins.com – Insite Training Material

The screenshot shows the Cummins.com website interface. The browser address bar displays <https://www.cummins.com/support/digital-products-and-services-support>. The navigation bar includes the Cummins logo and links for Products, Parts & Service (highlighted with a red circle and a red arrow), About, News, Careers, and Support. On the right of the navigation bar are links for Language, Region, and Search.

The main content area is divided into four columns:

- SALES & SERVICE**
  - Find a Local Dealer or Distributor
  - Request a Sales Quote
  - Schedule Service
  - Service Specials & Offers
  - Find a Coach Care RV Service Center
  - Contact Customer Assistance
  - Credit Application
- PARTS**
  - Find a Local Dealer or Distributor
  - Find Parts Online
  - Request a Parts Price Quote
  - Parts Specials & Offers
  - Benefits of Genuine Cummins Parts
  - Coolants & Chemicals
  - Diesel Particulate Filters (DPF)
- MANUALS & TECHNICAL DOCUMENTS**
  - Filters
  - Lubricants
  - ReCon Engines & Parts
  - Start-Up Batteries
  - Webasto Heating Systems
  - Credit Application
- DIGITAL PRODUCTS & SERVICES**
  - Connected Diagnostics View All
  - EDS
  - Guidanz
  - Incal
  - Inline
  - Insite** (highlighted with a red arrow)
  - Powerspec

Below the main content area, there is a section titled "Digital Products and Services Support" with a dropdown menu. The menu items are:


- ADEPT
- Connected Diagnostics
- Cummins Update Manager
- Dynamic Engine System Analysis (DESA)


The main text area below the menu states: "Cummins offers a wide variety of software, mobile applications, and digital hardware to help you get the most out of your Cummins-powered equipment. If you currently use one of these digital products and/or services, this page provides access to valuable resources and support."


Below the text is a section titled "Search Digital Products and Services Support Topics".


The Windows taskbar at the bottom shows the date and time as 6/12/2019, 1:37 PM.


# Insite Training Presentations - [cummins.com](https://cummins.com)

[Products](#)[Parts & Service](#)[About](#)[News](#)[Careers](#)[Support](#)

 Language

 Region

 Search



## INSITE™

Digital Products and Services

- Connected Diagnostics
- Connected Advisor
- Connected Software Updates
- Cummins Update Manager
- Dynamic Engine System Analysis (DESA)
- Expert Diagnostic System
- Guidanz™
- HOLSET E-Tool
- INCAL
- INLINE™
- INSITE™**
- INSITE CENSE™

INSITE performs engine diagnostics and displays electronic engine information on your PC. With step-by-step diagnostics, built-in engine drawings and schematic diagrams, working with INSITE is easy. Using this software application will reduce troubleshooting time, errors and incorrect procedures and quickly get your vehicle back on the road again.

Features:

- Quick access to trip information
- Adjust parameters and review/clear fault information quickly and easily
- Easy-to-follow troubleshooting assistance
- Wiring and sensor location diagrams
- Store engine and trip information for future use, or as programming templates

Looking for Support?  
[Click Here](#)



HOLSET E-Tool

INCAL

INLINE™

INSITE™

INSITE CENSE™

INSITE™ Fault Viewer

JoystickConfig Service

License Configuration Tool

Marine Component Software  
Download Tool

PowerSpec

PrevenTech

QuickCheck

QuickServe Online

RoadRelay

Woodward Toolkit Support  
Resource

- Quick access to trip information
- Adjust parameters and review/clear fault information quickly and easily
- Easy-to-follow troubleshooting assistance
- Wiring and sensor location diagrams
- Store engine and trip information for future use, or as programming templates



Software Downloads



Software Licensing



Training Videos



Training Materials



SOFTWARE DOWNLOADS



Your company's firewall may inhibit the installation of these files.  
Please contact your system administrator for assistance if you receive such a message.

Rectangular Snip

Looking for  
Support?  
Click Here

**ATTENTION INSITE USERS:** INSITE 8.5 has been released. With this release there is a special requirement customers need to prepare for:



## TRAINING MATERIALS



INSITE Overview, updated 3/19/2018 (Size: 6 MB)



Licensing & License Configuration Tool Overview, updated 4/14/14 (Size: 3.8 MB)



INSITE 8.0.3 New Feature Training: ECM Code Search, updated 5/11/15 (Size: 0.9 MB)



How to Backup INSITE Work Orders (Size: 0.5 MB)



## CONTACT CUMMINS

Rectangular Snip

For general inquiries or questions regarding your Cummins product, please use the form below, or call us anytime.



# Insite Training Contents

- [Getting Started](#)
- [Launching & Licensing](#)
- [Configuring Options](#)
- [ECM Multi-Level Security](#)
- [ECM Connections](#)
- [Fault Codes & Fault Information System](#)
- [Data Monitor Logger](#)
- [ECM Diagnostic Tests & Advanced ECM Data](#)
- [Features & Parameters](#)
- [Calibration Selection & ECM/PDD Code Search](#)
- [Work Orders, ECM Images & Templates](#)
- [Trip Information](#)
- [Audit Trail](#)
- [Inquire Data Extraction](#)
- [OBD Monitors](#)
- [Expert Diagnostic System \(EDS\)](#)
- [J1939 Datalink Messages](#)
- [Guidanz Web \(formerly CSS\)](#)
- [Support](#)



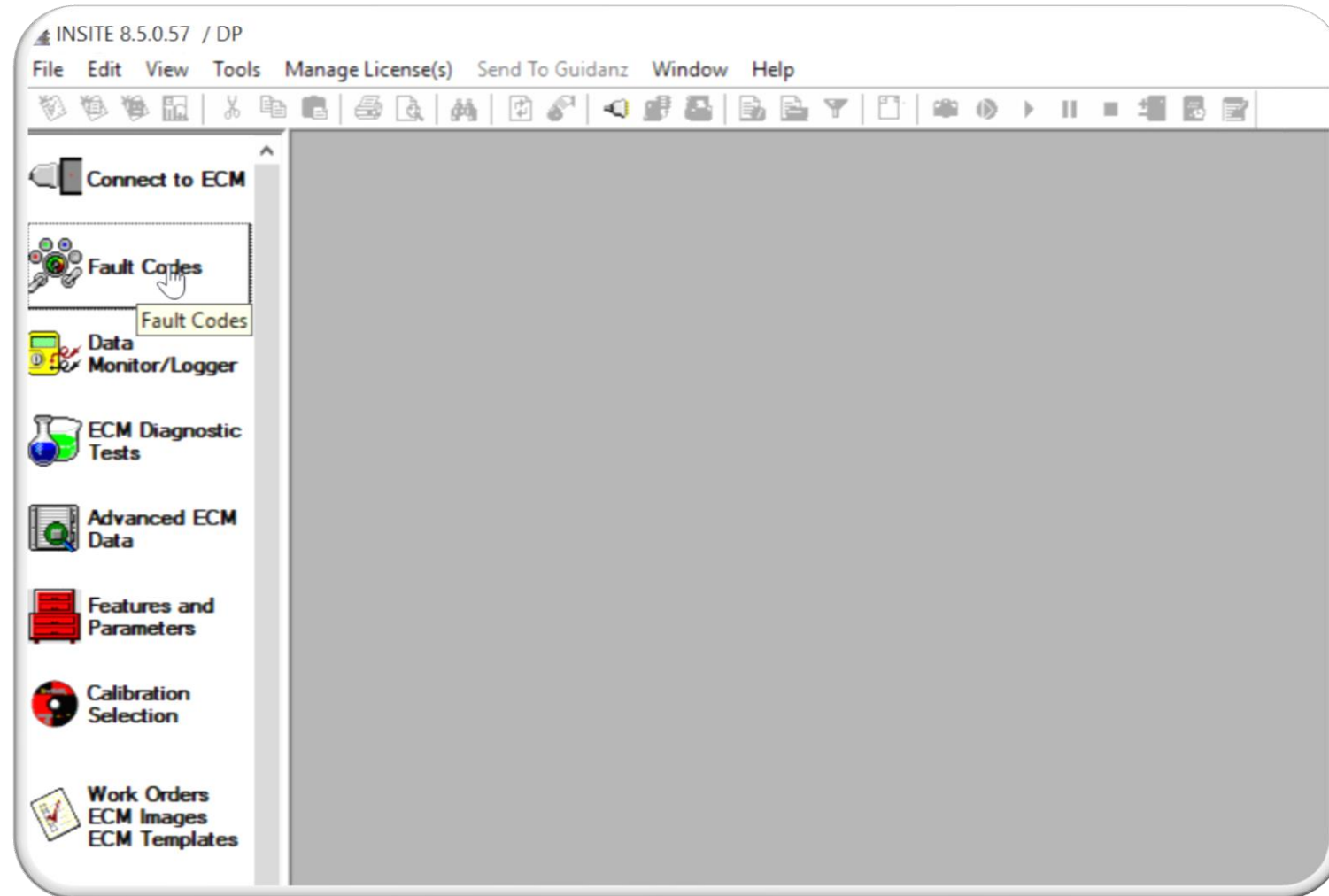
# Troubleshooting

To perform even ***the basic*** troubleshooting on the engine you ***must have these tools !!!***

- Insite – Pro is available if ECM calibration is desired
- QuickServe On Line (QSOL) Full Access Version – Provides access to T/Shooting, Shop Manuals, Technical Service Bulletins (TSB's), Warranty Manuals, Campaign information and more!
- QuickServe also offers access to the individual Cummins Online training database – It does require personal login

*The days of flashing out codes has past. Fault codes can be related and caused by other codes. You need to look at **all codes** and have an understanding of them to determine where to go!*

# Identifying Fault Codes Using INSITE



# Using QSQL to Troubleshoot Fault Codes

The screenshot displays the Cummins QuickServe Online interface. At the top, there's a navigation bar with the Cummins logo, the QuickServe Online branding, and search fields for ESN (58244713) and All Engines. Below this is a menu bar with links to Parts, Service, Warranty, My Profile, Products, and Promotions. The main content area is titled "Engine Service Information ( 58244713 - ISB6.7 CM2350 B101)". A yellow banner promotes Cummins Guidanz™ Web Training via Skype. Below the banner is a tabbed interface with categories like Manuals, Dataplate, Campaigns, TRPs, ATCs, Service Bulletins, TSBs, What's New, Service Tools, Maintenance, Fault Code Search, Symptom Search, Related Information, and Safety. The "Manuals" tab is active, showing a list of documents: Wiring Diagrams, Fault Code Troubleshooting Manual, Service Manuals, and Owners Manuals. Each document entry includes a part number, title, and a link to "Change History". On the left side, there's a sidebar with "Engine Content" and "Generator Set / Alternator Content" sections, each containing search fields and filters.

File Edit View Favorites Tools Help

Cummins QuickServe Online

Search ESN 58244713 for:

Search All Engines for:

id310 (Employee/Employee)

Parts Service Warranty My Profile Products Promotions

Engine Content

Content For Engine Serial Number (ESN):

58244713 >

How do I locate my ESN?  
Engine Model Search  
Part Number Supersessions  
VIN To ESN Reference  
TSB Smart Filter

Generator Set / Alternator Content

Content for Serial Number (SN):

>

OR

Current Plant: None  
Current Model: None  
Current Spec: None

Search by Plant, Model, or Spec

Literature Search  
PCBU Smart Filter  
Bill of Material - By Serial Number

Engine Service Information ( 58244713 - ISB6.7 CM2350 B101)

Free - Cummins Guidanz™ Web Training via Skype for North American Dealers. [Click here](#) for more information.

Manuals Dataplate Campaigns TRPs ATCs Service Bulletins TSBs What's New

Service Tools Maintenance Fault Code Search Symptom Search Related Information Safety

Manuals

Wiring Diagrams

(4310801) ISB6.7 CM2350 B101 Wiring Diagram

Fault Code Troubleshooting Manual

(4310800) ISB6.7 CM2350 B101 Fault Code Troubleshooting Manual [\[Change History\]](#)

Service Manuals

(2883567) ISB6.7 CM2350 B101 Service Manual [\[Change History\]](#)

(5411406) Fluids for Cummins® Products Service Manual [\[Change History\]](#)

Owners Manuals

(2883566) ISB6.7 CM2350 B101 Owners Manual [\[Change History\]](#)

# Diagnostic Process Unit # / ESN

## Get all the facts

- Lube Analysis - Fluid contaminants
- Add Oil History
- ECM Download

## Relate the symptoms

- To the basic engine systems and components
- Check QuickServe
- TSB/ TRP's Campaign's

## Who completed last repair?

- Repair History Maintenance History
- DPF / Aftertreatment Cleaning

## Do the easiest things first

- Follow the published repair Processes
- Engine Fault Code Analyzer
- All fault codes with more than one count logged in the last 25 engine hours.

## Determine the cause of the problem and make a thorough repair

- Double-check before beginning any disassembly



# Data Collection In Action

## ECM Image

- Fault Codes
- Regeneration Frequency
- Idle Time

## Repair Records

- Maintenance
- Warranty
- Campaigns / TSB / TRP

## Fluid

- Analysis
- Consumption

# Fault Lamps

# 2013 to Current – OBD

## On-Board Diagnostics

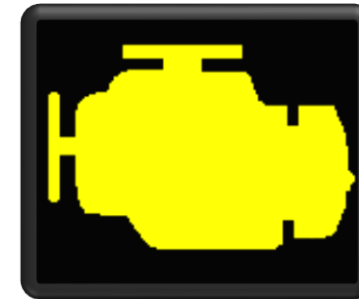
- Continuously monitors performance of the emissions system
- The MIL illuminates when the OBD system detects a malfunction that can increase exhaust emission levels.
- Used in thousands of on-road vehicles since 2007

## Requirements – MIL Lamp

- ISO 2575 Symbol F01 (Engine Outline)
- Must be amber in color
- Can be used in conjunction with other lamps
- Is **required** on all 2013 certified on-highway diesel engines (ISB, ISL, ISX-12 and ISX-15 CM2350 on-highway engines have full OBD

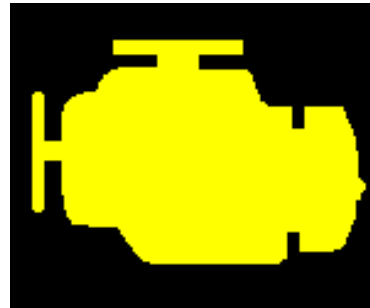


Malfunction Indicator Lamp



# Malfunction Indicator Lamp (MIL)

- Requirements – MIL Lamp
  - ISO 2575 Symbol F01 (Engine Outline)
  - Must be amber in color
  - Can be used in conjunction with other lamps



# Dash Lamp – Check Engine

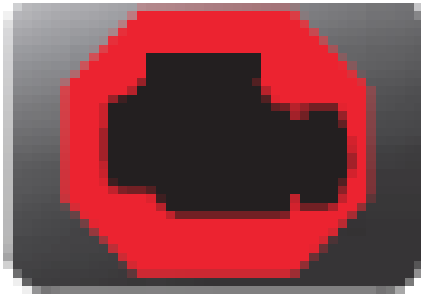
- The “**Check Engine Lamp**” amber in color and can either be the image of an engine featuring a wrench *Or can be text “**Check**” or “**Check Engine**”* – It is illuminated for non-OBD faults but can be illuminated in conjunction with the MIL



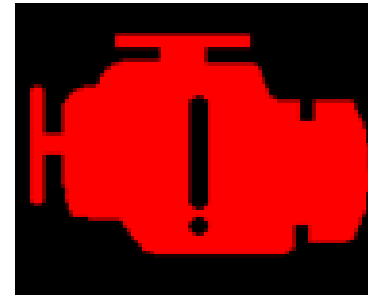


# Dash Lamp – Red Warning Lamp

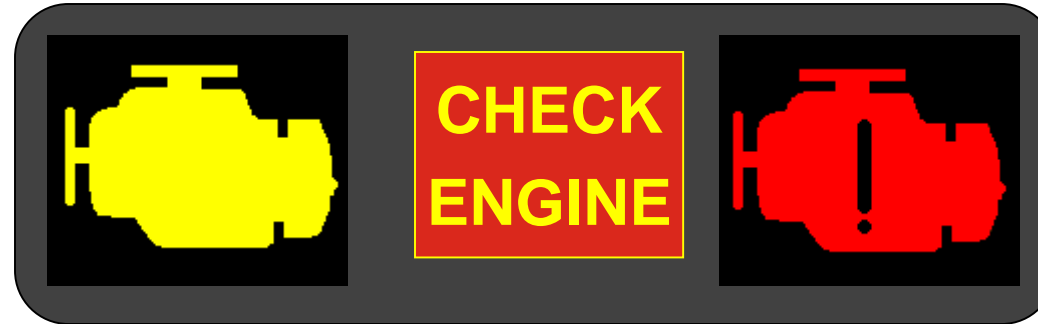
- The “Red Stop Lamp” Can be the image of an engine with an exclamation point ( ! ) the outline of a stop sign featuring and engine, ***Or the text “Stop’ or “Stop Engine “***



STOP



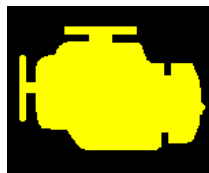
# 2013 - OBD Driver Interface 3 Lamp Strategy



**Check Engine Lamp - (Amber Warning Lamp)**  
This is the standard lamp that we have used in all previous Cummins applications. Used for Non-OBD faults.



**Stop Engine Lamp**  
Used to indicate **Engine Protection Fault Codes**.



**Malfunction Indicator Lamp (MIL)**  
This lamp is used to indicate an **Emissions Related Failure** has occurred (OBD Faults).

# MIL Lamp



---

**ANY** issue that would cause “out of emission” will generate a fault/MIL lamp and likely engine ECM fault code!

( Notice - I did not state **ENGINE** problem )

---

The MIL lamp may be on, but depending on the code, it may take more than one event (trip) to log a code. **Most codes log on first event (trip) but a few are multiple trip to log.**

---

*Fault codes related to emissions must be cleared by using the “**conditions for clearing**” process in the fault code description*

---

If the engine is run for a period of time with a emission related FC it will generate a de-rate resulting in fault codes 3712 and/or 3714

---

Derate is required to prevent extended “out of emission” operation

---

When a fault code is logged and has a associated derate, to clear the derate code, **YOU MUST OPERATE** the engine in the condition described for clearing the codes and/or run the diagnostics. If you don't you could get FC 3712 and/or 3714 **return with no other codes**

---

If you don't have the work saved with the codes, you may not know what generated the code and no way to know what the original code was and proper steps to clear the code. The derate code **MAY NOT** clear until conditions are met (or recalibrate the ECM)

# So, Now you have codes – What do you do now?

- You have dozens of fault codes – What now? Where do you go?
- How do you do troubleshooting engine faults on Cummins products?
- What level of repair do you do? Bolt on components only?
- How do you determine if the fault code is a OEM issue, engine problem, maintenance issue?
- What code do you troubleshoot first ?
- **First** recorded fault code could lend a clue – But may not be the correct direction!

Active - Highest Count – First – Last – Best Guess ?????

- Should any be disregarded?

More Later .....

# Fault Code Rules

- **RULE #1** - If you are sending the unit out to a vendor for repairs, ***DO NOT CLEAR CODES !!!!!***
- **RULE #2** – Don't just clear ***active*** codes with the hope it will fix the issue
- **RULE #3** – ALWAYS make a Insite work order/ECM image

It's ***VERY difficult*** to troubleshoot fault codes or issues without a code to reference – or knowing frequency – or when it logged – or other related codes

The work order/ECM image provides a great deal of information – so if you learn one thing in this session – It's always create a work order/ECM image



# Fault Codes

- All fault codes record ***snap shot history*** the first and last time it logs along with ECM time and engine run time
- Fault code history and fault code “snap shots” tell you more about the issue than just the code itself – Read the story the code is telling
- **Knowing which code logged first *along with*** what the engine was doing when the code logged can be helpful when troubleshooting
- The fault code snap shot data records the operating state and condition of the engine when the code logged – That is very helpful when diagnosing or trying to ***re-create*** the code(s)

# Insite Work Order/ECM Image

- **ALWAYS create an Insite Work order (ECM Image)** – Takes just a few seconds to create
- The work order (Image) will have all features and parameters retained in the event of ECM failures
- Abuse and engine protection history is available to help in failure analysis – These can not be cleared or reset
- The initial work order will have the fault codes saved, so codes could be cleared and original work order referenced or sent for review (.eif file)
- The work order has endless information about the engine and engine history

# Understanding Fault Codes

Component  
Description

Component Location

Conditions for  
**Running** the  
Diagnostics

Conditions for **Setting**  
the Fault Codes

Action Taken When the  
Fault Code Is **Active**

## Things to remember with Fault Codes **Always**;

- Create INSITE work order prior diagnostics
- Follow Troubleshooting steps per QuickServe Online

File: 193-fc3574

Page 1 of 3

### Fault Code 3574

Aftertreatment 1 Diesel Exhaust Fluid Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level

CODES	REASON	EFFECT
Fault Code: 3574 PID(P), SID(S): SPN: 4334 FMI: 1/18 Lamp: Amber SRT:	Aftertreatment Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range - Moderately Severe Level. Low diesel exhaust fluid pressure has been detected in the dosing unit.	Possible reduced engine performance.

#### Conditions for Setting the Fault Codes:

The Engine Control Module (ECM) detected the aftertreatment diesel exhaust fluid pressure was less than a threshold.

#### Action Taken When the Fault Code is Active:

The ECM illuminates the amber CHECK ENGINE lamp and/or the malfunction indicator lamp (MIL) immediately when the diagnostic runs and fails.

Engine torque will be reduced if the engine is operated for an extended period of time with this fault active.

Engine torque will be severely reduced.

Vehicle speed will be limited to 8 km [5 mi] per hour after extended engine operation with the fault code active.

# FC 3754 – Overview

File: 193-fc3574

Page 1 of 3

## Fault Code 3574

**Aftertreatment 1 Diesel Exhaust Fluid Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level**

CODES	REASON	EFFECT
Fault Code: 3574 PID(P), SID(S): SPN: 4334 FMI: 1/18 Lamp: Amber SRT:	Aftertreatment Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range - Moderately Severe Level. Low diesel exhaust fluid pressure has been detected in the dosing unit.	Possible reduced engine performance.

# FC 3574 – Description – Location – Conditions for Running Diagnostics

## Component Description

The Engine Control Module (ECM) provides a 5 volt supply and a ground to the aftertreatment diesel exhaust fluid pressure sensor. The pressure sensor provides a signal to the ECM on the sensor signal circuit. This sensor signal voltage changes, based on the aftertreatment diesel exhaust fluid pressure supplied by the dosing unit. The ECM will detect a low signal voltage at low diesel exhaust fluid pressures, and a high signal voltage at high diesel exhaust fluid pressures.

## Component Location

The aftertreatment diesel exhaust fluid pressure sensor is internal to the aftertreatment diesel exhaust fluid dosing unit and can not be serviced separately.

## Conditions For Running The Diagnostics

This diagnostic runs when the diesel exhaust fluid dosing unit is in the priming or dosing state.

# FC 3574 – Conditions for Setting the Code and Actions Taken

## Conditions for Setting the Fault Codes:

The Engine Control Module (ECM) detected the aftertreatment diesel exhaust fluid pressure was less than a threshold.

## Action Taken When the Fault Code is Active:

The ECM illuminates the amber CHECK ENGINE lamp and/or the malfunction indicator lamp (MIL) immediately when the diagnostic runs and fails.

Engine torque will be reduced if the engine is operated for an extended period of time with this fault active.

Engine torque will be severely reduced.

Vehicle speed will be limited to 8 km [5 mi] per hour after extended engine operation with the fault code active.



# Clearing Fault Codes – MIL Lamp

## Conditions For Clearing The Fault Code

- To validate the repair, perform the "Aftertreatment Diesel Exhaust Fluid Doser Pump Override Test" found under "ECM Diagnostic Tests" in the recommended Cummins electronic service tool or equivalent.
- The fault code status displayed by the recommended Cummins electronic service tool or equivalent will change to INACTIVE immediately after the diagnostic runs and passes.
- The ECM will turn off the amber CHECK ENGINE lamp immediately after the diagnostic runs and passes.
- For On-Board Diagnostics (OBD) engines, the ECM will extinguish the Malfunction Indicator Lamp (MIL) after three consecutive trips where the diagnostic runs and passes.
- The "Reset All Faults" command in the recommended Cummins electronic service tool or equivalent can be used to clear active and inactive faults, as well as extinguish the MIL for OBD applications.

# Troubleshooting

## Use QSOL for troubleshooting steps

- Campaign notifications
- Fault Code Analyzer
- Updated regularly

## DO NOT use INSITE for troubleshooting steps

- Troubleshooting steps within INSITE are not updated as regularly as other sources
- Do use INSITE for additional fault code diagnostics and service procedures



# Fault Codes

If the engine is run for a period of time with a emission related FC it will generate a de-rate resulting in fault codes 3712 and/or 3714

Derate is required to prevent extended “out of emission” operation

When a fault code is logged and has a associated derate, to clear the derate code, **YOU MUST OPERATE the engine in the condition described for clearing the codes and/or run the diagnostics.** If you don't you could get FC 3712 and/or 3714 **return with no other codes**

If you don't have the work saved with the codes, you may not know what generated the code and no way to know what the original code was and proper steps to clear the code. The derate code **MAY NOT** clear until conditions are met (or recalibrate the ECM)

# Fault Code 3714 Active with No Other Active Fault Codes TSB120309

- SCR related Fault Code(s) 1682, 1683, 1713, 2976, 3151, 3238, 3241, 3258, 3261, 3423, 3425, 3558, 3559, 3563, 3567, 3568, 3572, 3574, 3575, 3596, 3748, 4156, 4169, or 4769 **can lead to Fault Code 3714 (inducement) within 1 hour and will eventually lead to Fault Code 3712 (severe inducement) if not addressed.**
- Even when those active fault(s) are addressed before Fault Code 3714 becomes active and are cleared, Fault Codes 3714 and 3712 will still become active due to a diagnostic **not** verifying that the fault codes are cleared.
- To correct the issue, troubleshoot all active fault codes. Verify all fault codes, except a possible Fault Code 3714 or 3712, are inactive. Use INSITE™ 7.6 electronic service tool or higher to calibrate the engine control module (ECM) with the latest calibration from QuickServe™ Online or the April 2013 INCAL Calibration DVD. Once the ECM has the new software, all fault codes will be cleared.

# Fault Codes

## Things to remember with Fault Codes

- Always create a work order/image with Insite prior to clearing codes
- Always follow steps in fault code overview for the conditions for clearing fault codes – Some codes will require the diagnostics to run before turning off the MIL lamp and/or associated derate. The fault code diagnostics are what determines how many “Trips” (FC diagnostics) are required to run to clear MIL and/or code
- The MIL may not always go out when you reset the engine check engine fault - It has to be satisfied the issue has been corrected to turn off the MIL or eliminate the derate code

# OEM Wiring Effect: Aftertreatment Related Codes

## Complaint

- Check engine light, fault codes, and possible engine derates.
- Cummins Inc. (CMI) **part replacements do not resolve the issue.**

## Additional Troubleshooting

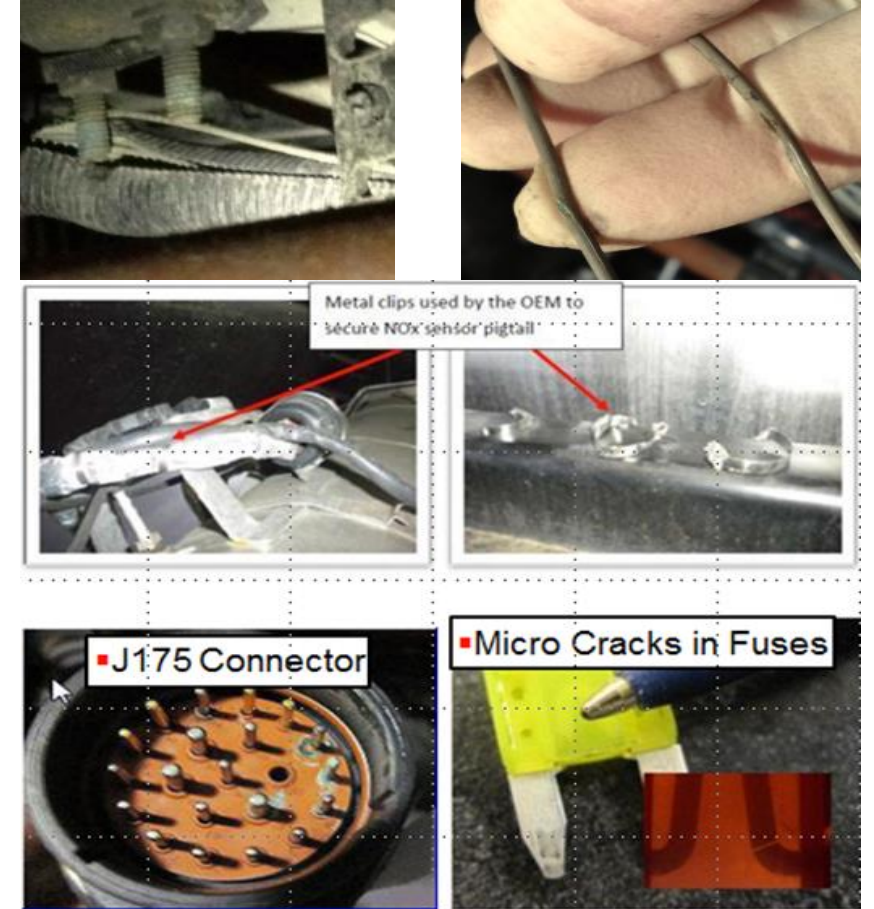
- Currently root cause is suspected to be an OEM harness issues.

## Correction

- Repair OEM aftertreatment wiring harness
- Reference TSB's and OEM service bulletins

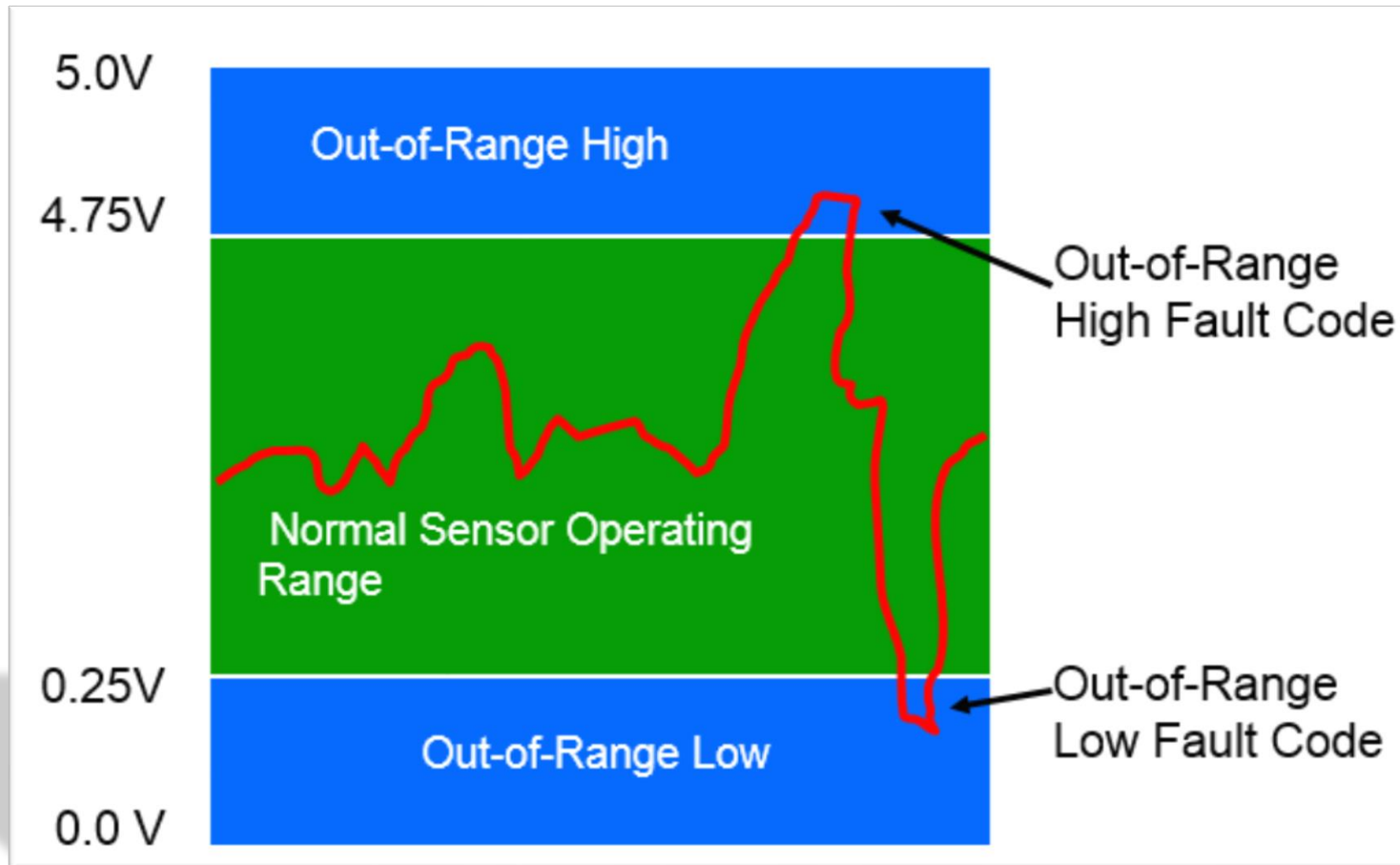
## Fault Code Facts

- More than 200 of the 415 fault codes can be OEM induced





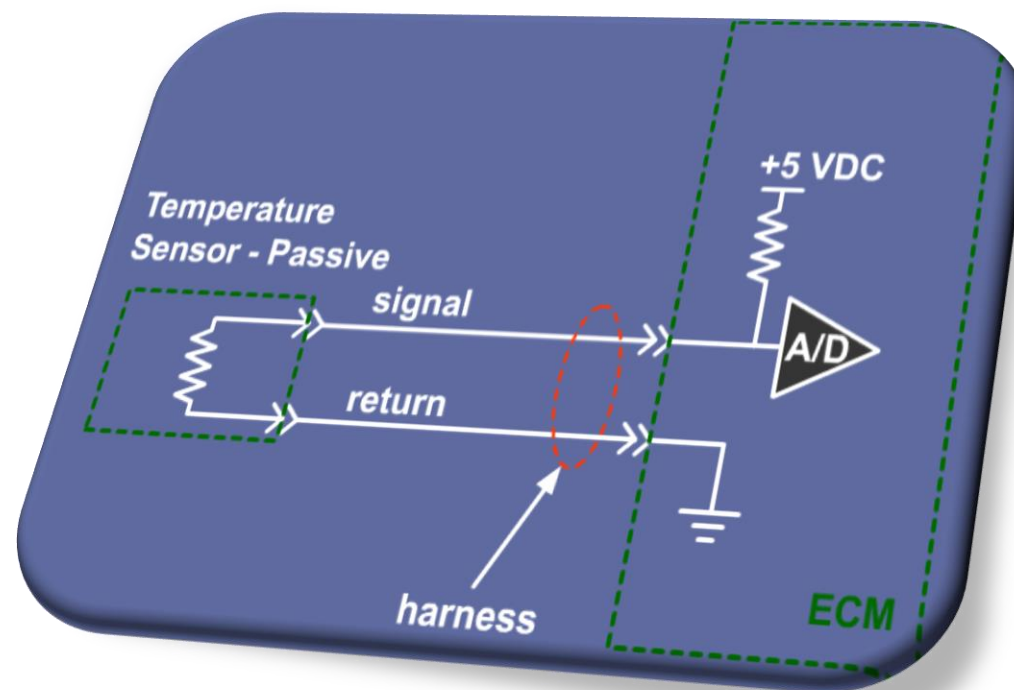
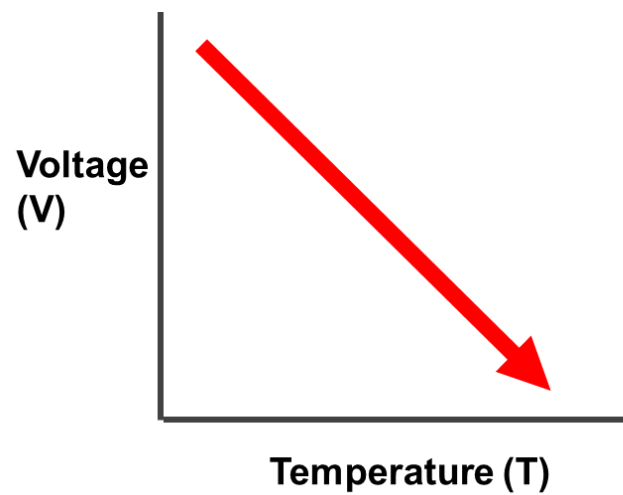
# Sensor Wiring and Operation



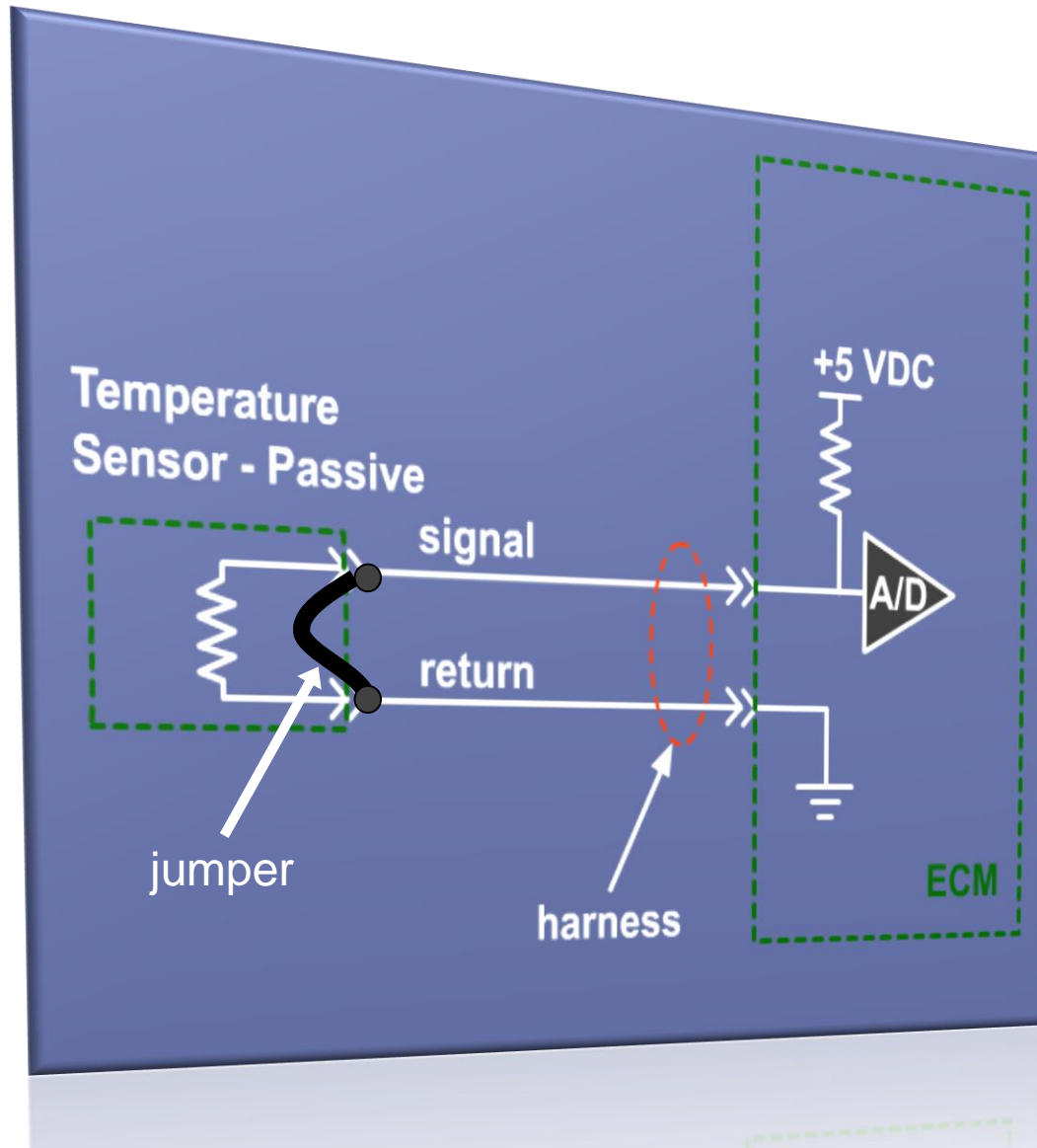
# Temperature Sensor Operation

Temperature and voltage are inversely proportional:

- As temperature **increases**, signal voltage **decreases**.
- As temperature **decreases**, the signal voltage **increases**.



# Temperature Sensor Diagnostics

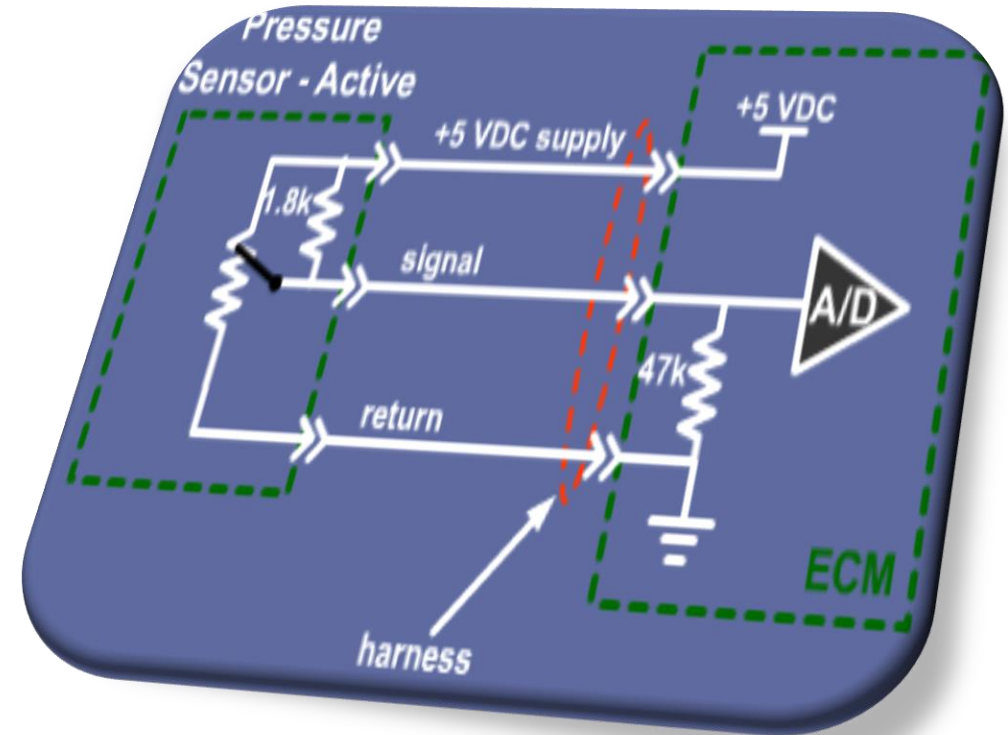
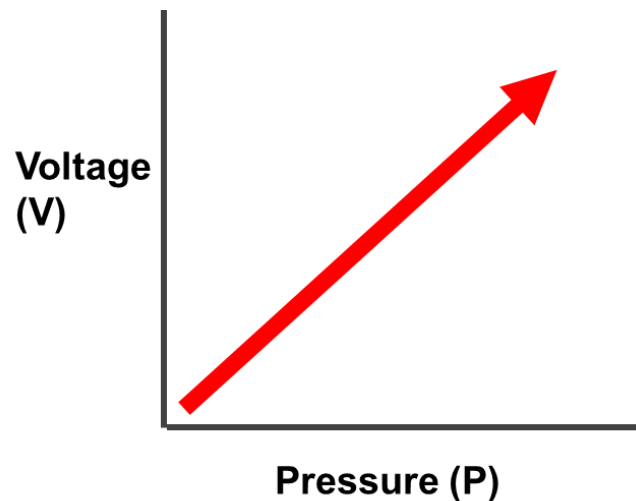


**Continuity Test:** *Jump the signal wire to the return wire to create an out-of-range low fault code on temperature sensors (verify in INSITE).*

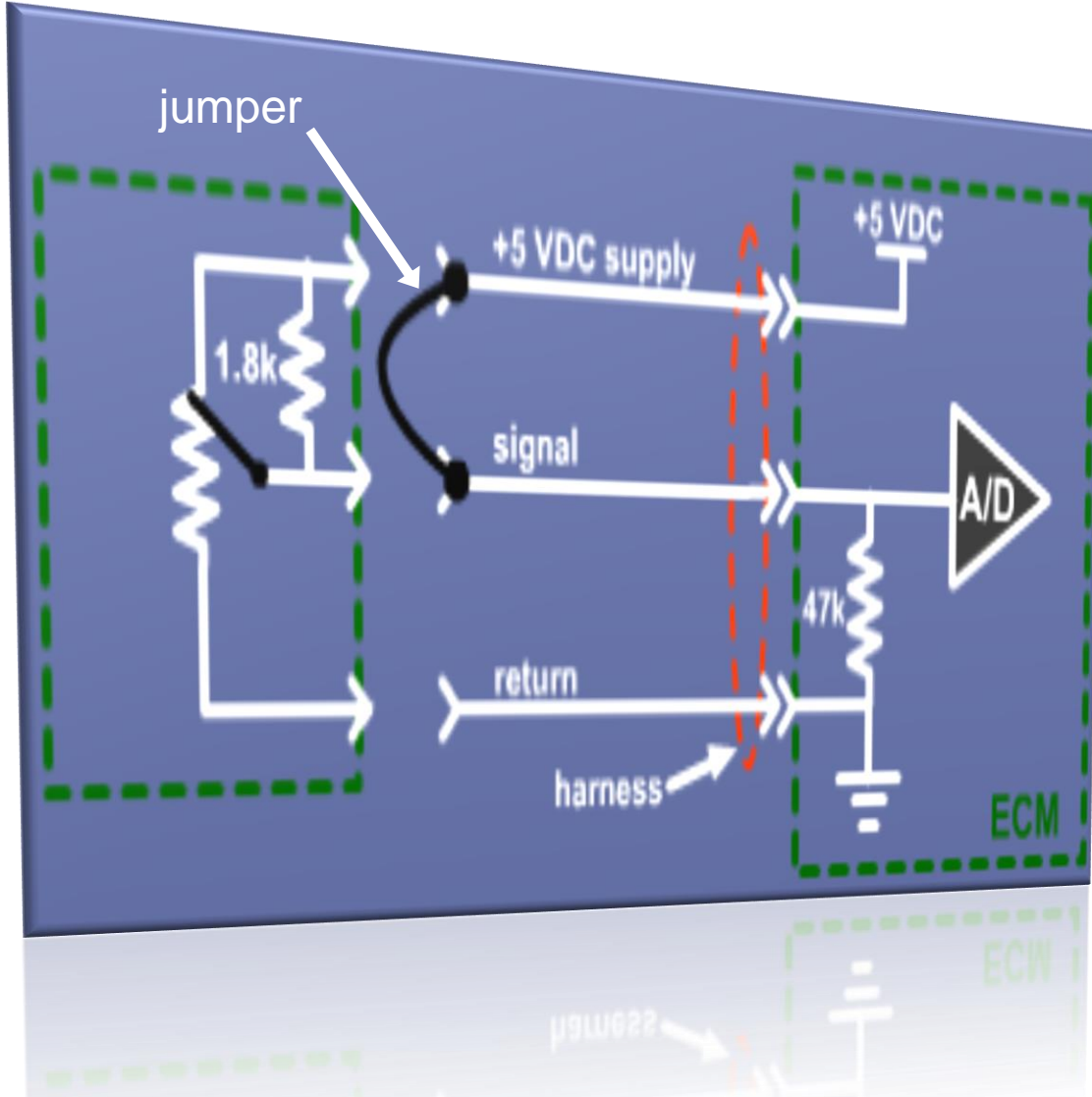
# Pressure Sensor Operation

Pressure and Voltage are proportionally related.

- As pressure **increases**, the signal voltage **increases**.
- As pressure **decreases**, the signal voltage **decreases**.



# Pressure Sensor Diagnostics



**Continuity Test:** *Jump the 5 volt supply to the signal wire to create an out-of-range high fault code on pressure sensors (verify in INSITE).*

# Using Test Leads to Change the Fault Code State



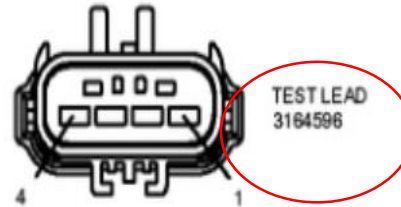


# Wiring diagrams show the correct test lead required for testing

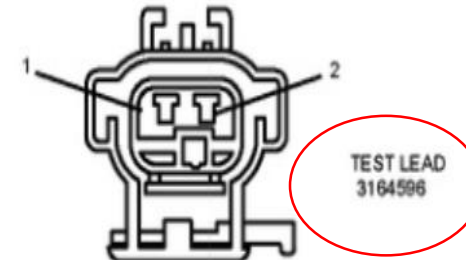
INJECTOR PASS THROUGH CONNECTOR



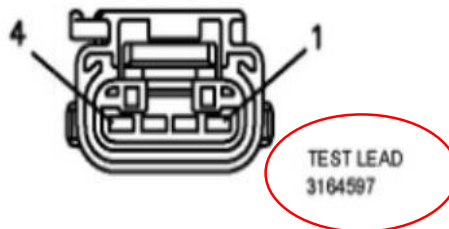
VARIABLE GEOMETRY TURBOCHARGER ACTUATOR  
JUMPER HARNESS CONNECTOR



EXHAUST GAS RECIRCULATION TEMPERATURE SENSOR  
OIL PRESSURE SWITCH  
CONNECTOR MATING FACE



TURBOCHARGER COMPRESSOR INTAKE  
PRESSURE/TEMPERATURE SENSOR  
CONNECTOR MATING FACE



# Test Lead Kit P/N 5299367



# Tension Testing

Visual inspection can't confirm pin/socket tension

## Proper Tension Testing Best Practices

- Always straighten the test lead so the pins/sockets are not side loaded
- Test lead must be inserted vertically into a connector
- Let gravity alone pull on the lead so each pin/socket is tested with equal force
- Compare known good and suspect pins/sockets



# Using Test Leads

**Normal Pin to Socket relationship occurs when correct test lead is used**



Integrity of connection is maintained

**Pin to Socket relationship following use of incorrect test lead**



Integrity of connection is lost

**Pin to Socket relationship following use of multimeter lead**



Integrity of connection is lost



# Using Test Leads to Change the Fault Code State



# Fault Codes – Using Image Analyzer

Customer Name :

Customer Name\*\*

System Type :

ISB6.7 CM2350 B101

ECM Code :

DT90002.36

Engine Serial Number :

73671741

Unit Number :

\*\*\*\*\*

Image Date :

5/26/2016 7:25:38 AM

Software Phase :

1F020806

Export Current Feature

Export All Features

Please select display option from the drop down list:

Total Engine Hours

001512:31:52

Active Fault

Most Recent Fault Codes

Sr. No	Fault Codes	Status	Counts	Lamp	Description	First	Last	Time Since First Fault	Time Since Last Fault
1	1922	Active	1	Red	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Most Severe Level	001512:19:36	001512:19:36	0:12:16	0:12:16
2	1921	Inactive	1	Amber	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	001512:18:20	001512:18:20	0:13:32	0:13:32
3	2639	Inactive	1	None	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level	001512:18:16	001512:18:16	0:13:36	0:13:36



# Fault Code – Snap Shot Image Analyzer

<b>Customer Name :</b>	Customer Name**	<b>System Type :</b>	ISB6.7 CM2350 B101	<b>ECM Code :</b>	DT90002.36	<b>Engine Serial Number :</b>	736
<b>Unit Number :</b>	*****	<b>Image Date :</b>	5/26/2016 7:25:38 AM	<b>Software Phase :</b>	1F020806	<a href="#">Export Current Feature</a>	
<b>Please select Fault Code:</b>		2639 ▼					
<b>Fault Code description:</b>		Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level					

Parameter	First Occurrence	Last Occurrence	Unit	Time since First Fault
Aftertreatment Diesel Exhaust Fluid Dosing Unit State	Dosing	Dosing		
Aftertreatment Diesel Exhaust Fluid Dosing Valve Commanded Position	Closed	Closed		
Aftertreatment Diesel Exhaust Fluid Pressure	130.7	130.7	psi	
Aftertreatment Diesel Exhaust Fluid Tank Heating Valve Position Commanded	Closed	Closed		
Aftertreatment Diesel Exhaust Fluid Tank Level	73	73	percent	
Aftertreatment Diesel Exhaust Fluid Tank Temperature	90	90	°F	
Aftertreatment Diesel Oxidation Catalyst Intake Temperature	759.0	759.0	°F	
Aftertreatment Diesel Particulate Filter Differential Pressure	4.70	4.70	inHg	
Aftertreatment Diesel Particulate Filter Intake Temperature	781.3	781.3	°F	
Aftertreatment Diesel Particulate Filter Operating State	Active DPF Regeneration	Active DPF Regeneration		

# **Fault Code Analyzer – Insite - QuickServe**

# Insite – Fault Code Analyzer

- Version 8.1.3 was released April 20<sup>th</sup> 2015 – To download Insite updates you must run the update tool ( **Current Version is now at 8.5.1** )
- **8.1.3 has a built in fault code analyzer (FCA) that will work if the PC has an active internet connection**
- Insite will send the fault codes via the internet connection to the FCA component – the FCA will return the codes in a prioritized order and display related codes –
- You **MUST** be connected live to the engine, with internet access for the FCA to work – ***It does not show if it's primary or related***

- Fault Code Analyzer (FCA) is tuned for 2010 – 2013 ISX ISC/L ISB automotive products. It may not be specifically tuned for use with some industrial and older legacy automotive products

# Fault Code Analyzer - FCA

INSITE 8.1.3.174 - ISX12 CM2350 X102/X103/X108/ISX15 CM2350 X101/X104/X109 - Engine Serial Number - 75037986 - ECM Code - EF10139.03

File Edit View Tools Manage License(s) Send To CSS Window Help

Connect to ECM Ctrl+E  
Disconnect ECM  
Login a New User  
ECM Passwords...  
ECM Password Removal...  
Reset Datalink Adapter  
Calibration Selection  
Prioritized Fault Codes  
Data Monitor/Logger  
Trip Information  
Options

Customers/ECM Images System Type Customer Name Vehicle U

160503-164734	ISX12 CM2350 X102/X103/X108/ISX15 CM2350 X101/X104/X109	Customer Name**	00000000
160502-212318	ISX12 CM2350 X102/X103/X108/ISX15 CM2350 X101/X104/X109	Customer Name**	00000000
M2350A [0]			
0509	Initial		

de	Status	Count	Lamp	Description	PID	SID
Fault Parameters		First	Last	Units		
3545	Inactive	2	Amber	Aftertreatment 1 Outlet NOx Sensor - Abnormal Rate of Change		
3311	Inactive	1	Red	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Most Severe Level		
3312	Inactive	1	Red	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Most Severe Level		
3697	Inactive	24	Red	Engine Control Module Calibration Memory - Bad Intelligent Device or Component		253

Data  
Features and Parameters  
Calibration Selection  
Work Orders  
ECM Images  
ECM Templates  
Trip Information  
Audit Trail  
Inquire Data Extraction

Fault Codes

DD1210A / I1030\ Firmware: R RR

# Fault Code Analyzer – FCA – This one may not be as accurate as QSOL

INSITE 8.1.3.174 - ISX12 CM2350 X102/X103/X108/ISX15 CM2350 X101/X104/X109 - Engine Serial Number - 75037986 - ECM Code - EF10139.03

File Edit View Tools Manage License(s) Send To CSS Window Help

Disconnect from ECM

Fault Codes

Data Monitor/Logger

ECM Diagnostic Tests

Advanced ECM Data

Features and Parameters

Calibration Selection

Work Orders ECM Images ECM Templates

Trip Information

Audit Trail

Inquire Data Extraction

WO-20

WO-20

Image-C

L-2010

Fault Co

354

331

331

369

System Type

Prioritized Fault Codes

This list shows which fault codes to troubleshoot first.  
The Fault Code Analyzer supplied this list based on the fault codes read when first connected.

	Order	Primary Fault Codes	Related Fault Codes
ISX12 CM2350 X102/X103/X108/ISX15 CM2350 X101/X104/X109			
CM2350A			
	1	3697	
	2	1932	
	Unprioritized	428	
	Unprioritized	2387	
	Unprioritized	2961	
	Unprioritized	3311	
	Unprioritized	3312	
	Unprioritized	3342	

Print

Close

Customer Name

Vehicle U

\*\* 00000000

\*\* 00000000

PID SID

253

Component

# What code do you troubleshoot first ???

ECM Image Analyzer I-20190516-141649821



Data Collection		Aftertreatment System		Calculators		Image Summary		Sensor Monitor Parameters	
Duty Cycle Monitor		Fault Codes		Fault Snapshot		Engine Abuse History		Engine Protection	
Customer Name :		Customer Name**		System Type :		ISB6.7 CM2350 B101		ECM Code :	
						DT90113.05		Engine Serial Number :	
								73796906	
Unit Number :		*****		Image Date :		5/16/2019 2:16:49 PM		Software Phase :	
						143C4701		Export Current Feature	
								Export All Features	
Select display option from the drop down list:		Total Engine Hours		005675:06:40		Active Fault		Most Recent Fault Code	
Fault Codes	Status	Counts	Lamp	Description		First	Last	Time Since First Fault	Time Since Last Fault
1921	Active	1	Amber	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level		005673:34:13	005673:34:13	1:32:27	1:32:27
2639	Inactive	3	None	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level		005672:13:48	005673:34:10	2:52:52	1:32:30
3376	Active	1	Amber	Aftertreatment Diesel Particulate Filter Incomplete Regeneration - Condition Exists		005672:51:50	005672:51:50	2:14:50	2:14:50
2272	Inactive	89	Amber	EGR Valve Position Circuit - Voltage Below Normal or Shorted to Low Source		005548:35:36	005648:02:21	126:31:04	27:04:19
1228	Inactive	20	Amber	EGR Valve Position - Data Erratic, Intermittent, or Incorrect		005544:31:52	005648:02:17	130:34:48	27:04:23
3714	Inactive	49	Amber	Engine Protection Torque Derate - Condition Exists		005544:04:58	005648:00:48	131:01:42	27:05:52
2349	Inactive	13	Amber	EGR Valve Control Circuit - Current Below Normal or Open Circuit		005557:44:32	005648:00:48	117:22:08	27:05:52
1896	Inactive	17	Amber	EGR Valve Controller - Out of Calibration		005544:29:19	005642:00:41	130:37:21	33:05:59
285	Inactive	1	Amber	SAE J1939 Multiplexing PGN Timeout Error - Abnormal Update Rate		Not Available	Not Available	Not Available	Not Available



# QSOL Fault Code Analyzer Demo



If an engine has multiple active Fault Codes, the Engine Fault Code Analyzer can help you determine which one to troubleshoot first. Click on the Fault Code Search mini tab located under the main Service tab.

Engine Fault Code Analyzer

Engine Fault Code Search

SPN/FMI To Fault Codes

Enter all active fault codes. Also enter all inactive fault codes with more than one count logged in the last 25 engine hours.

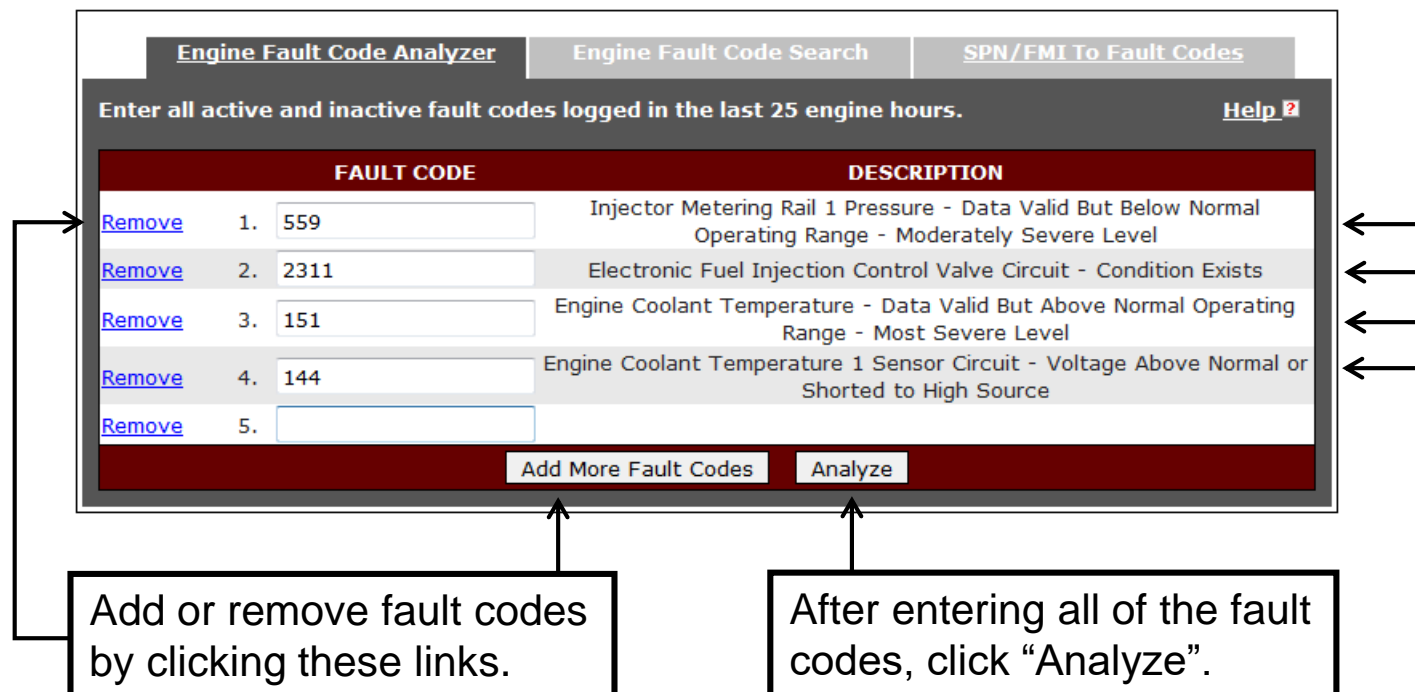
[Help](#) ?

	FAULT CODE	DESCRIPTION
<a href="#">Remove</a>	1. <input type="text"/>	
<a href="#">Remove</a>	2. <input type="text"/>	
<a href="#">Remove</a>	3. <input type="text"/>	
<a href="#">Remove</a>	4. <input type="text"/>	
<a href="#">Remove</a>	5. <input type="text"/>	

## Fault Code Search Tab

An ESN or Service Model Name has to be entered into QuickServe Online for the Fault Code Analyzer Tool to be used. Enter all active fault codes and any inactive fault codes that have been logged in the last 25 engine hours.

Once a fault code is entered, the Fault Code Analyzer Tool will display the fault code description.



The screenshot shows the 'Engine Fault Code Analyzer' tool interface. At the top, there are three tabs: 'Engine Fault Code Analyzer' (selected), 'Engine Fault Code Search', and 'SPN/FMI To Fault Codes'. Below the tabs, a message states: 'Enter all active and inactive fault codes logged in the last 25 engine hours.' with a 'Help' link. The main area contains a table with two columns: 'FAULT CODE' and 'DESCRIPTION'. The table lists five fault codes with their descriptions and a 'Remove' link for each. At the bottom of the table, there are two buttons: 'Add More Fault Codes' and 'Analyze'.

FAULT CODE	DESCRIPTION
<a href="#">Remove</a> 1. 559	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
<a href="#">Remove</a> 2. 2311	Electronic Fuel Injection Control Valve Circuit - Condition Exists
<a href="#">Remove</a> 3. 151	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Most Severe Level
<a href="#">Remove</a> 4. 144	Engine Coolant Temperature 1 Sensor Circuit - Voltage Above Normal or Shorted to High Source
<a href="#">Remove</a> 5.	

Annotations:

- An arrow points from the 'Remove' links to a box: 'Add or remove fault codes by clicking these links.'
- An arrow points from the 'Analyze' button to a box: 'After entering all of the fault codes, click "Analyze".'
- Four arrows point from the 'DESCRIPTION' column to a box: 'Once a fault code is entered, the Fault Code Analyzer Tool will display the fault code description.'



Fault Code Search Tab

Fault Code Analyzer Tool will display the Root Fault Code and the Dependent Fault Codes. You should then troubleshoot each Root Fault Code one at a time in the order displayed.

Engine Fault Code Analyzer		
Engine Fault Code Search		
SPN/FMI To Fault Codes		
Enter all active and inactive fault codes logged in the last 25 engine hours. <a href="#">Help ?</a>		
ORDER	ROOT FAULT CODE	POSSIBLE DEPENDENT FAULT CODES
1	<a href="#">2311</a>	559
2	<a href="#">144</a>	151
<a href="#">Go Back</a> <a href="#">Start Over</a>		

Click on the fault code to see the troubleshooting steps for that fault code.

To reset the search, click here.

The Dependant Fault Codes are codes that can be eliminated from the troubleshooting process by troubleshooting the Root Fault Codes.



**Fault Code Search Tab**

As you click on the fault codes, the links turn green to let you know which ones you've checked.

**Engine Fault Code Analyzer** | Engine Fault Code Search | [SPN/FMI To Fault Codes](#)

Enter all active and inactive fault codes logged in the last 25 engine hours. [Help ?](#)

ORDER	ROOT FAULT CODE	POSSIBLE DEPENDENT FAULT CODES
1	<a href="#">2311</a>	559
2	<a href="#">144</a>	151

[Go Back](#) [Start Over](#)

Click "Go Back" to jump back and add or remove fault codes.

Click here to clear the fault codes and analyze more.

**Engine Fault Code Analyzer** | Engine Fault Code Search | [SPN/FMI To Fault Codes](#)

Enter all active and inactive fault codes logged in the last 25 engine hours. [Help ?](#)

	FAULT CODE	DESCRIPTION
<a href="#">Remove</a>	1. 559	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
<a href="#">Remove</a>	2. 2311	Electronic Fuel Injection Control Valve Circuit - Condition Exists
<a href="#">Remove</a>	3. 151	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Most Severe Level
<a href="#">Remove</a>	4. 144	Engine Coolant Temperature 1 Sensor Circuit - Voltage Above Normal or Shorted to High Source
<a href="#">Remove</a>	5.	

[Add More Fault Codes](#) [Analyze](#)



You can use the Engine Fault Code Search tool to quickly find troubleshooting steps for a particular Fault Code.

### Engine Service Information ( 79637306 - ISX15 CM2350 X101)

The screenshot displays the Cummins QuickServe Online interface. At the top, there is a navigation bar with tabs: Manuals, Dataplate, Campaigns, TRPs, Service Bulletins, TSBs, What's New, and Service Tools. Below this, a secondary navigation bar includes Maintenance, Fault Code Search, Symptom Search, and Related Information. The main content area features three sub-tabs: Engine Fault Code Analyzer, Engine Fault Code Search (which is highlighted), and SPN/FMI To Fault Codes. Within the 'Engine Fault Code Search' sub-tab, there is a section titled 'Engine Fault Code Search' containing a text input field and a 'Search' button. Two arrows point from the text box below to the input field and the 'Search' button respectively.

When you enter the Fault Code and click “Search” you are automatically taken to the Fault Code overview page.

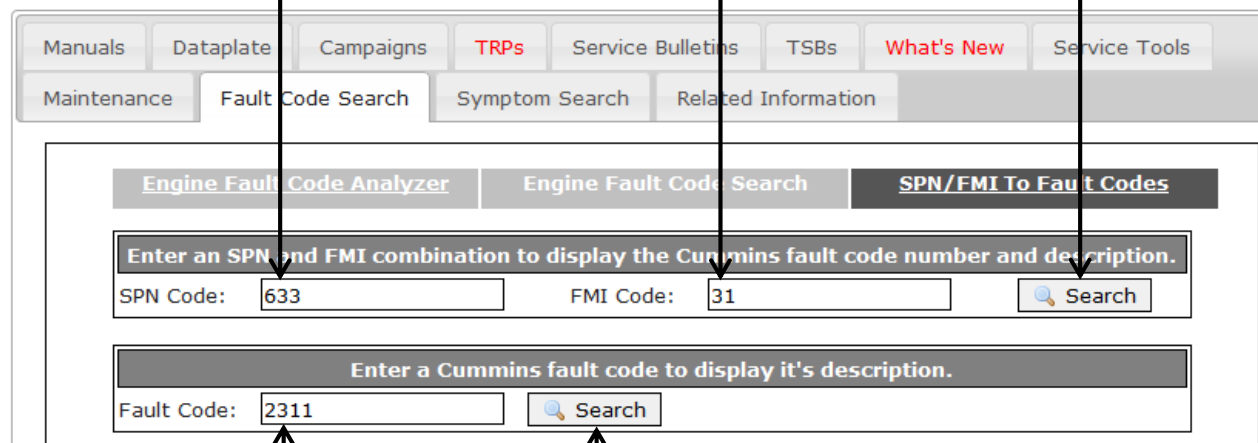


## Fault Code Search Tab

You can use the SPN/FMI to Fault Code Tool to cross-reference SPN/FMI Codes with Cummins Fault Codes.

Enter a SPN and a FMI code and click “Search”.

### Engine Service Information ( 79637306 - ISX15 CM2350 X101)



The screenshot shows the 'Engine Service Information' page for engine 79637306 - ISX15 CM2350 X101. The 'Fault Code Search' tab is selected. Within this tab, the 'SPN/FMI To Fault Codes' sub-tab is active. The interface includes two search sections:

- Top Section:** A header bar reads 'Enter an SPN and FMI combination to display the Cummins fault code number and description.' Below this, there are input fields for 'SPN Code:' (containing '633') and 'FMI Code:' (containing '31'), followed by a 'Search' button.
- Bottom Section:** A header bar reads 'Enter a Cummins fault code to display it's description.' Below this, there is an input field for 'Fault Code:' (containing '2311') and a 'Search' button.

Arrows from the text boxes point to the input fields and the 'Search' buttons.

The equivalent fault code will appear here. Click “Search” to see a detailed summary of the fault code.



**Fault Code Search Tab**

After clicking “Search” you can see detailed information about the fault code including Description, reason that the fault code appears, possible effect it will have on the engine, and more.

[Engine Fault Code Analyzer](#) | [Engine Fault Code Search](#) | [SPN/FMI To Fault Codes](#)

**Enter an SPN and FMI combination to display the Cummins fault code number and description.**  
SPN Code:  FMI Code:  [Search](#)

**Enter a Cummins fault code to display its description.**  
Fault Code:  [Search](#)

**Details for Cummins fault code: 2311**

SPN	FMI	Lamp Color	Description
633	31	Amber	Electronic Fuel Injection Control Valve Circuit - Condition Exists

**Reason**

Electronic Fuel Injection Control Valve Circuit - Condition Exists. The fuel pump actuator circuit resistance is too high or too low, or an intermittent connection has been detected.

**Effect**

Possible reduced engine performance.

**Component Location**

The high-pressure fuel pump is mounted to the gear housing. The fuel pump actuator is mounted on the fuel pump. The fuel pressure sensor is mounted in the high pressure fuel rail. The fuel pressure relief valve is mounted on the high pressure fuel rail.

**Circuit Description**

The circuit is a pulse-width modulation (PWM) driver in the engine control module (ECM) that controls the fuel pump actuator. The actuator is grounded in the ECM. The actuator is normally open. The PWM duty cycle to the fuel pump actuator depends on the difference between desired rail pressure and sensed rail pressure.

**Troubleshooting Information**

[Click Here To View The Complete Fault Code Information](#)

Click here to see the troubleshooting steps for this fault code.



You can use the Engine Symptom Search tool to find troubleshooting steps based on symptoms rather than Fault Codes.

### Engine Service Information ( 73472878 - ISB6.7 CM2350 B101)

Manuals Dataplate Campaigns TRPs Service Bulletins TSBs What's New Service Tools

Maintenance Fault Code Search Symptom Search Related Information

**Engine Symptom Search**

Aftertreatment Diesel Particulate Filter - Excessive Soot Loading

Please select a symptom...

<Sort by Usage>

Aftertreatment Diesel Particulate Filter - Excessive Ash Cleaning

Aftertreatment Diesel Particulate Filter - Excessive Automatic and/or Stationary Regeneration

Aftertreatment Diesel Particulate Filter - Excessive Soot Loading

**Air Compressor Air Pressure Rises Slowly**

Air Compressor Cycles Frequently

Air Compressor Noise is Excessive

Air Compressor Pumping Excess Lubricating Oil into the Air System

Select the symptom that you are looking for from the drop-down list and you will be automatically taken to the troubleshooting steps for that symptom. Alphabetical order is the default for the drop-down menu but you can sort by most used symptom trees by clicking here.

# QuickServe Version Fault Code Analyzer

Manuals

Dataplate

Campaigns

TRPs

ATCs

Service Bulletins

TSBs

What's New

Service Tools

Maintenance

Fault Code Search

Symptom Search

Related Information

Engine Fault Code Analyzer

Engine Fault Code Search

SPN/FMI To Fault Codes

Enter all active fault codes. Also enter all inactive fault codes with more than one count logged in the last 25 engine hours. [Help ?](#)

	FAULT CODE	DESCRIPTION
<a href="#">Remove</a>	1. <input type="text" value="559"/>	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
<a href="#">Remove</a>	2. <input type="text" value="2639"/>	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
<a href="#">Remove</a>	3. <input type="text" value="1922"/>	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Most Severe Level
<a href="#">Remove</a>	4. <input type="text" value="1866"/>	Exhaust Gas Recirculation Differential Pressure - Data Erratic, Intermittent, or Incorrect
<a href="#">Remove</a>	5. <input type="text"/>	

Add More Fault Codes

Analyze

m/qs3/portal/service/index.html?message=esnupdated#tab-1



# QuickServe FCA

ManualsDataplateCampaignsTRPsATCsService BulletinsTSBsWhat's New

Service ToolsMaintenanceFault Code SearchSymptom SearchRelated Information

Engine Fault Code AnalyzerEngine Fault Code SearchSPN/FMI To Fault Codes

Enter all active fault codes. Also enter all inactive fault codes with more than one count logged in the last 25 engine hours.

Help?

ORDER	PRIMARY FAULT CODES	RELATED FAULT CODES
1	<u>1866</u>	
2	<u>559</u>	
3	<u>1922</u>	2639

Go BackStart Over

If any additional fault codes are still active after validating the first three primary fault codes, then re-enter the remaining fault codes.

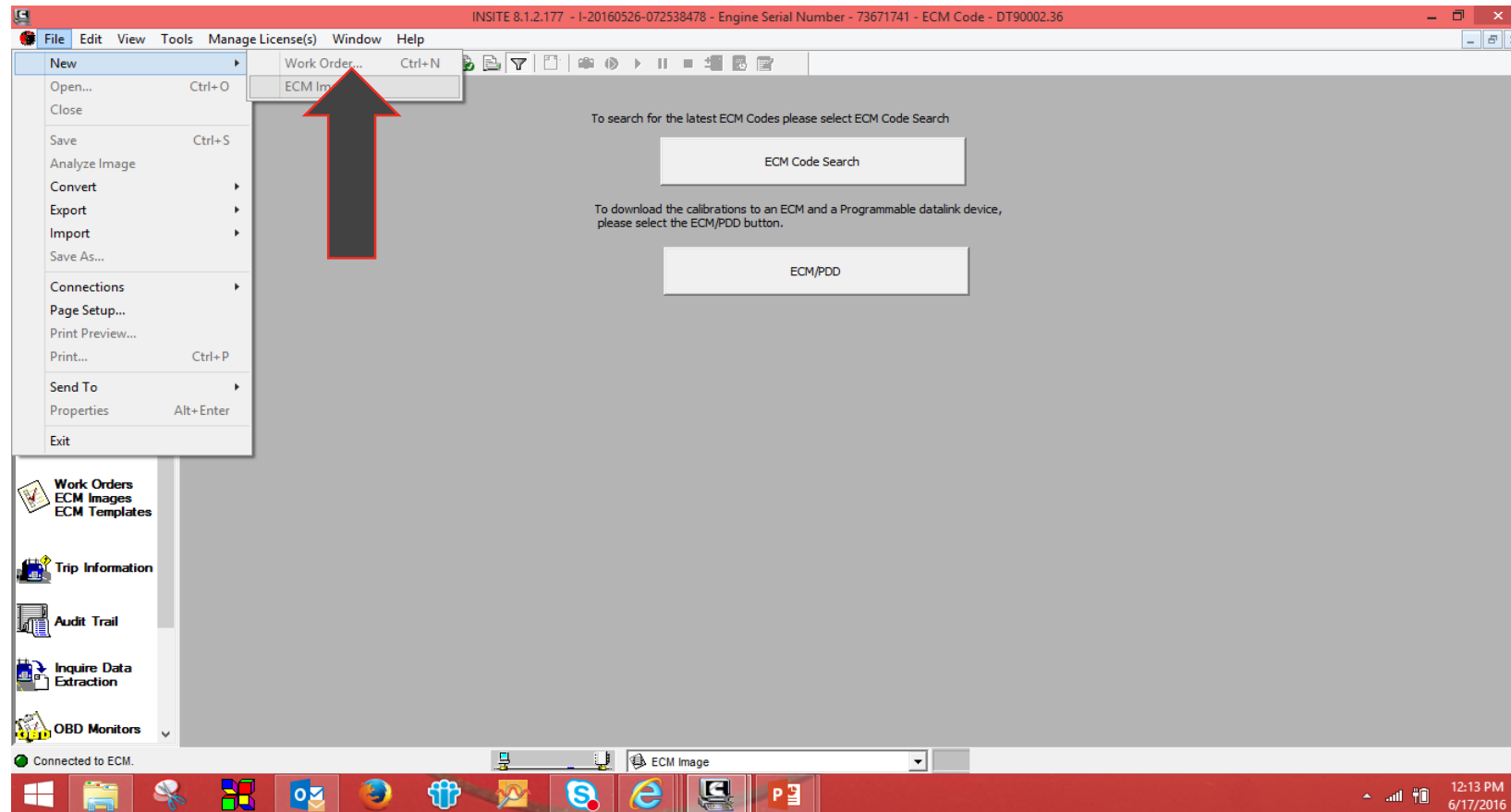
# **Insite – Work Order – Image**



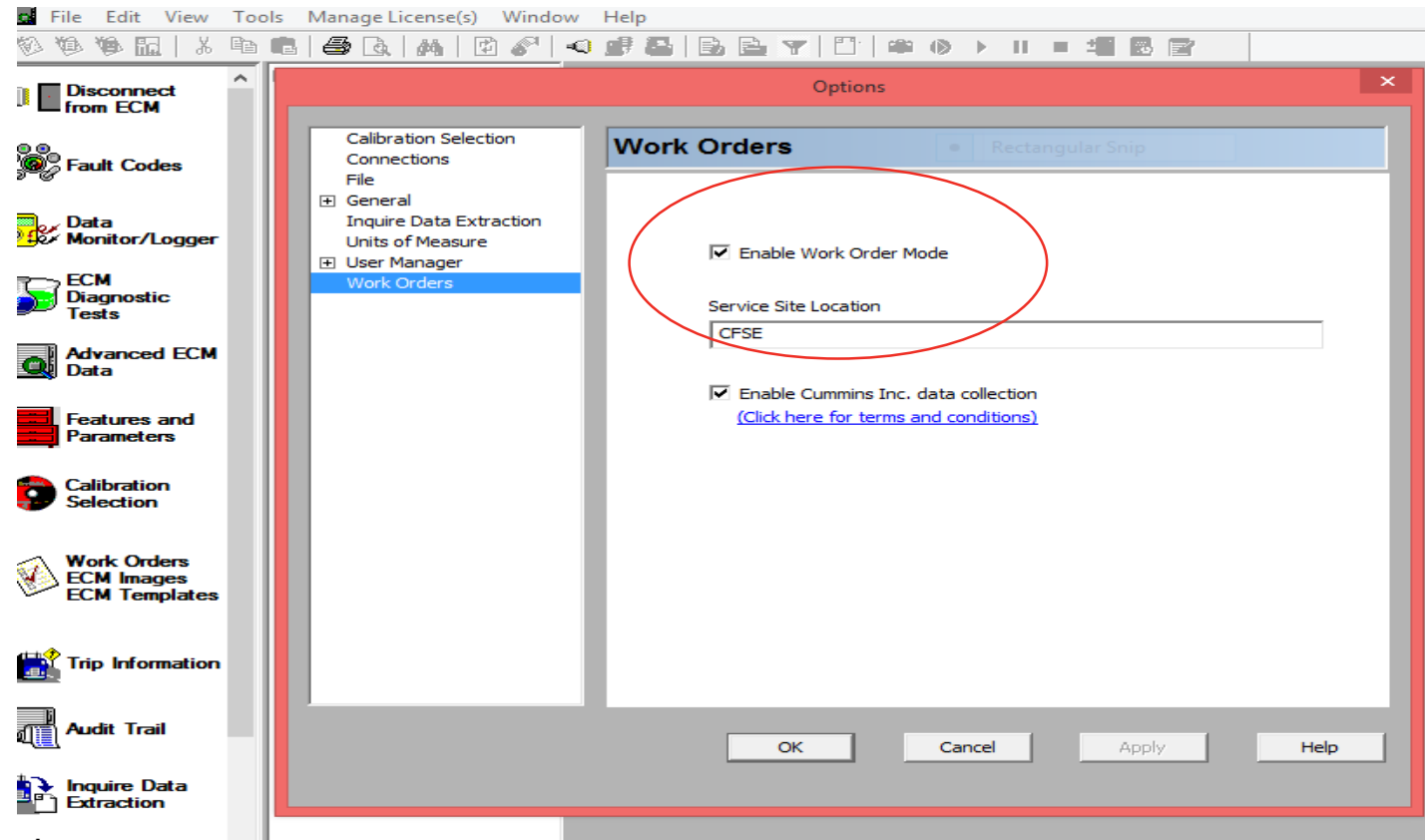
# Work Orders/Images

- It's recommended to set up your Insite so it will auto create work orders (images) whenever first connecting and will create another when disconnecting from the ECM
- No technical support group can offer assistance without seeing ECM images ( work orders )
- The image provides powerful information to help start the troubleshooting process
- ***Don't clear Fault Codes!*** Unless YOU are doing the repair – or saving work orders (images)

# Work Orders



# Insite Work Order - Auto



# ECM Image Analyzer

# Insite Image Analyzer

- The ECM image analyzer was added to Insite several versions ago
- It's a very good, quick easy way to look at the ECM work order/image in a quick concise way
- ***You must generate an Insite work order (Image) to use the Insite Image Analyzer***

INSITE 8.1.4.129 - I-20161206-161332741 - Engine Serial Number - 73550170 - ECM Code - DT90002.18

File Edit View Tools Manage License(s) Send To CSS Window Help

Work Orders/ECM Images System Type Customer Name Vehicle Unit Number Engine Serial Number Start Repair Date Last Modified

261431	ISB6.7 CM2350 B101	Caledonia Schools	15-1	73550170	06-Dec-2016 04:13:39 PM	06-Dec-2016
Image-CM2350A [0]						
I-20161206-161332741	Initial					06-Dec-2016
WO-20161109-093552	ISB6.7 CM2350 B101	Customer Name**	*****	73550170	09-Nov-2016 09:35:52 AM	09-Nov-2016
WO-20161102-142838	ISB6.7 CM2350 B101	Caledonia	15-1	73550170	02-Nov-2016 02:28:38 PM	02-Nov-2016
WO-20161025-145540	ISB6.7 CM2350 B101	Customer Name**	*****	73550170	25-Oct-2016 02:55:40 PM	25-Oct-2016
261431 10/20/16	ISB6.7 CM2350 B101	Caledonia	15-1	73550170	20-Oct-2016 02:12:42 PM	20-Oct-2016
WO-20161010-103921	ISB6.7 CM2350 B101	Customer Name**	*****	73550170	10-Oct-2016 10:39:21 AM	10-Oct-2016

ECM Template System Type Module Type System Comment Date And Time Origin

T-20160519-133741	ISB6.7 CM2350 B101	CM2350A [0]		19-May-2016 01:37:41 PM	I-20160519-130253050
T-20161003-174842	ISB6.7 CM2350 B101	CM2350A [0]		03-Oct-2016 05:48:42 PM	I-20160929-103525973

Connected to ECM.

ECM Image



# Insite Image Analyzer

## Demo



**Service**

**QuickServe®**  
Online

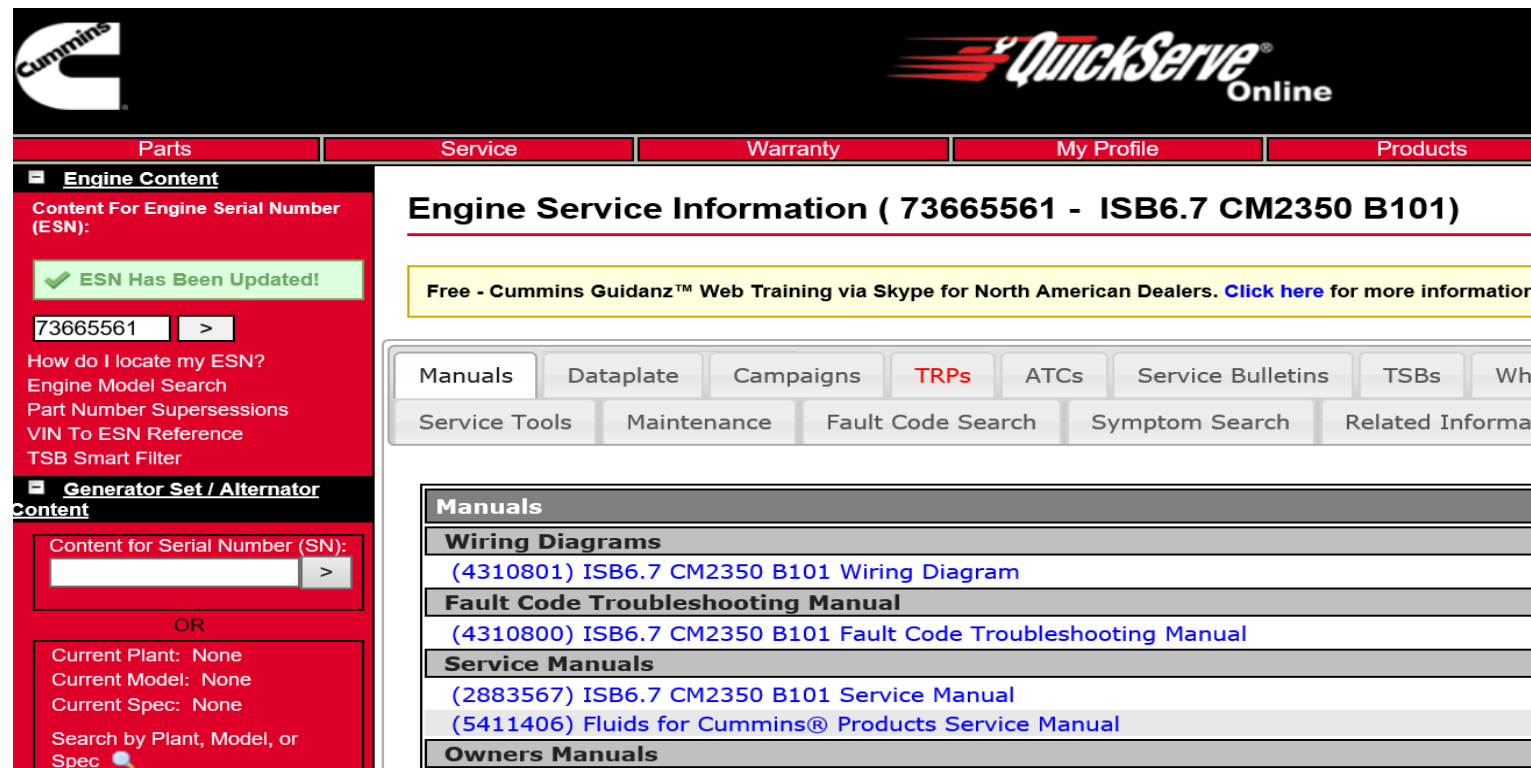


**Basic Navigation**

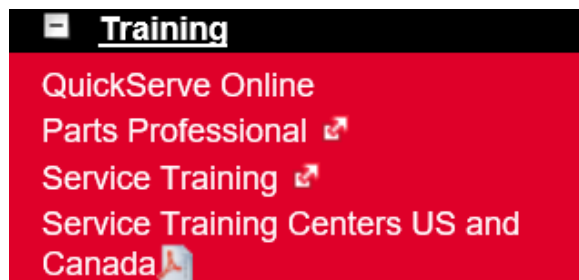
# **QuickServe Online Service Training**

## **Live Demo**

# QuickServe Online Service Training



The screenshot shows the QuickServe Online Service Training interface. At the top, there is a navigation bar with tabs for Parts, Service, Warranty, My Profile, and Products. The main content area is divided into two columns. The left column contains a sidebar with links for Engine Content, Generator Set / Alternator Content, and Training. The right column displays the Engine Service Information for a specific engine (73665561 - ISB6.7 CM2350 B101). Below the header, there is a yellow banner for Cummins Guidanz Web Training via Skype. A navigation bar below the banner includes tabs for Manuals, Dataplate, Campaigns, TRPs, ATCs, Service Bulletins, TSBs, and Wh. Below this, there is a row of buttons for Service Tools, Maintenance, Fault Code Search, Symptom Search, and Related Information. The main content area on the right lists various manuals and documents, including Wiring Diagrams, Fault Code Troubleshooting Manual, Service Manuals, and Owners Manuals.



The screenshot shows the Training sidebar. It includes a 'Training' section with links to QuickServe Online, Parts Professional, Service Training, Service Training Centers US and Canada, and a PDF icon.



# QuickServe Online Service Training

Welcome to Cummins Service Training, JACK SZARKA (A520100/pp219) EAST - NEW HODSON (02051)

Training Programs

Training Courses

Classes ▾

Upload Scores

User Profile

[Technician FAQ](#)

Copy

Excel

CSV

PDF

Show  entries

☐ Only My Location Programs ☒ All Programs

Search:

Program ID

Color

Program Name

Completed  
Date  
(m/d/y)

%  
Completed

Product  
Filter

2013-07Q

Green

ISB6.7 CM2350 B103 Maintenance

08/31/2016

100

2016-41F

Green

ISB6.7 CM2350 B101, ISB6.7 CM2350 B103 Parts Familiarization

08/31/2016

100

2012-24L

Green

ISB6.7 CM2350 B101 Lite Repair

09/13/2013

100

2012-26Q

Green

ISB6.7 CM2350 B101 Maintenance

09/13/2013

100

2016-06Q

Green

ISB6.7 CM2250 and ISB6.7 CM2350 B101 - CIHR Level 1

09/13/2013

100

2016-07Q

Green

ISB6.7 CM2250 and ISB6.7 CM2350 B101 - CIHR Level 2

09/13/2013

100

Q+A



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