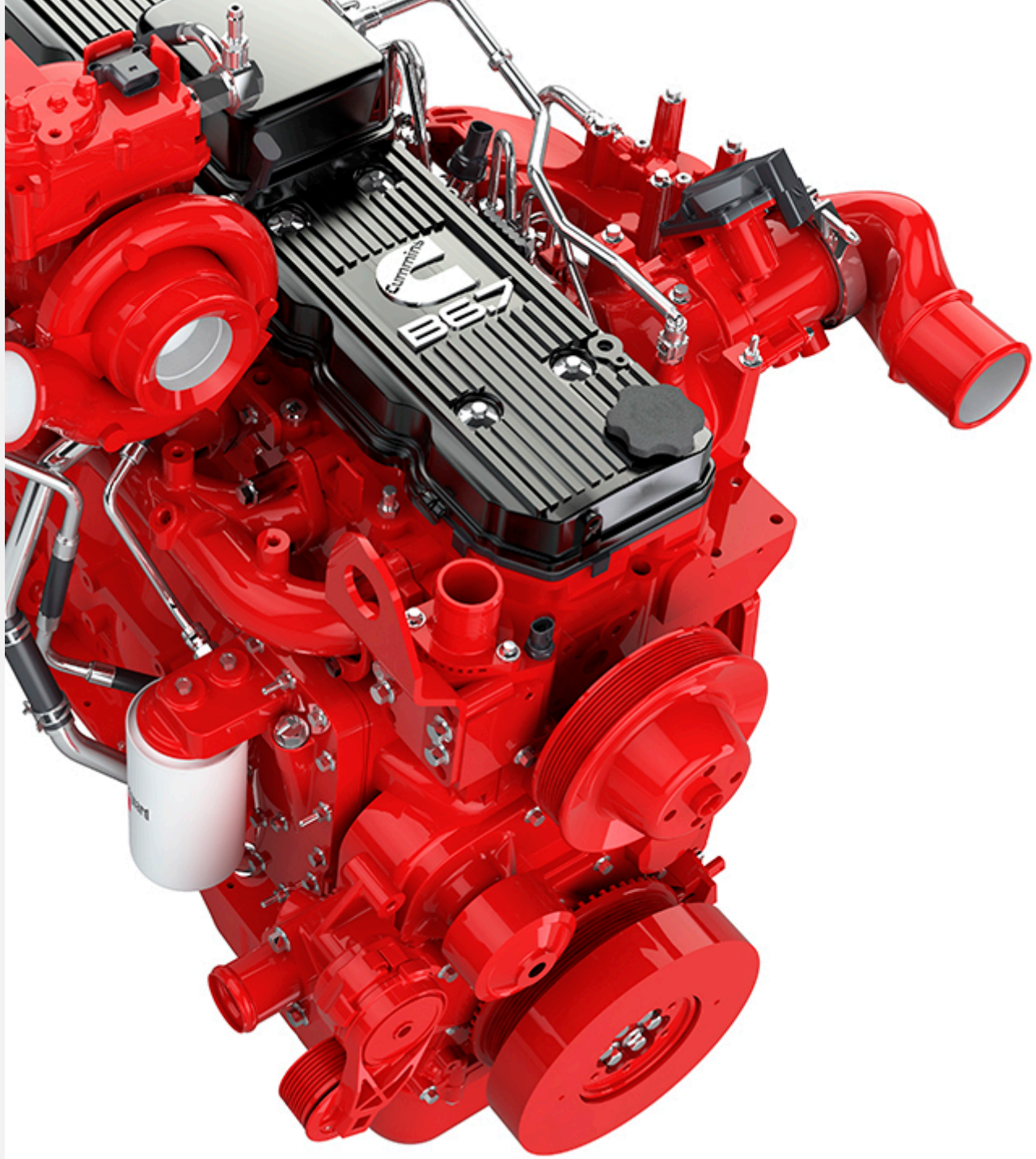
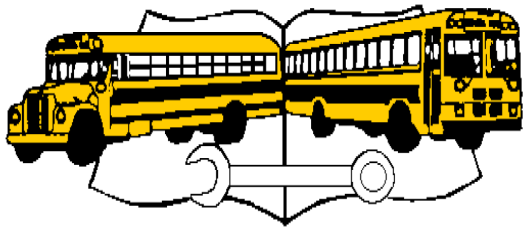


OSBMA School Bus Technical Update

Jack Szalka – Technical Support Manager - Bus

Dave Dickerson – Account Executive – Bus

October 21 2020



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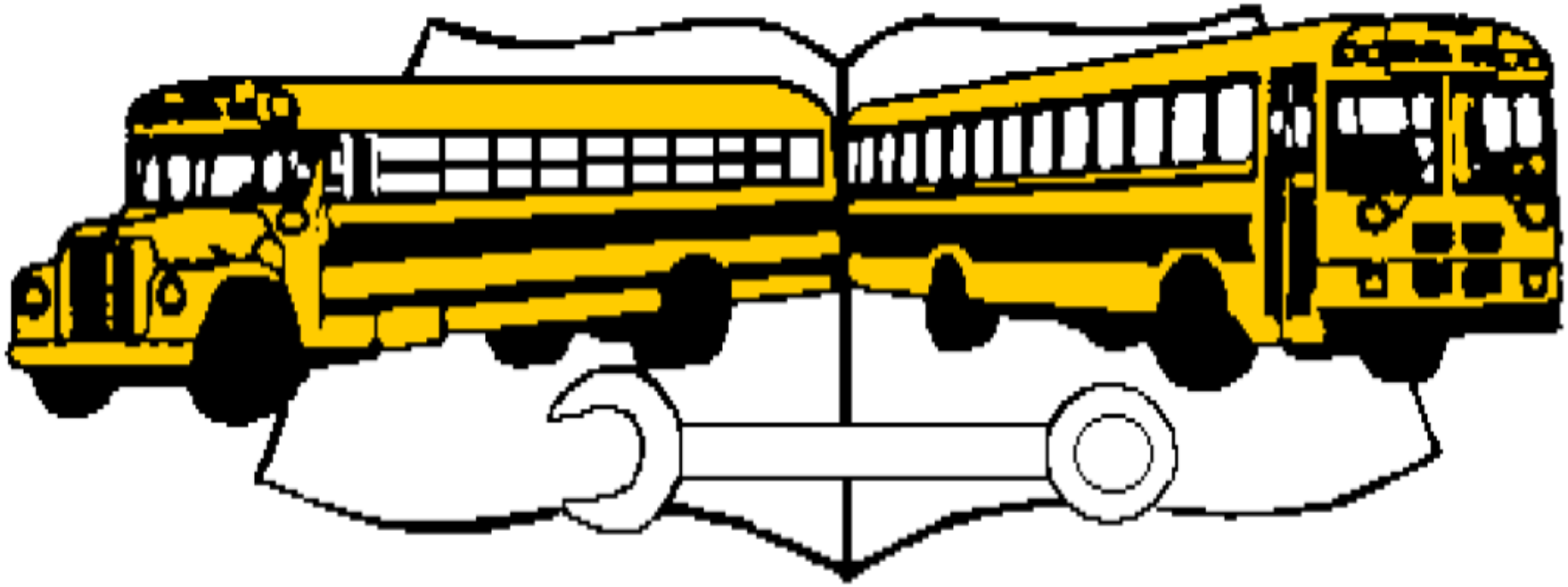

Thank you to the Ohio School Bus Mechanics Association for coordinating this session !

Questions

This is your opportunity to get answers ！

PLEASE ask questions ！

Type questions in the chat, or unmute - feel free to ask at anytime!

Contact Information

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Agenda

B6.7 Model Year 2021

Campaign – Temporary Repair Practices (TRP) Update

Quick Overview/Review Regeneration

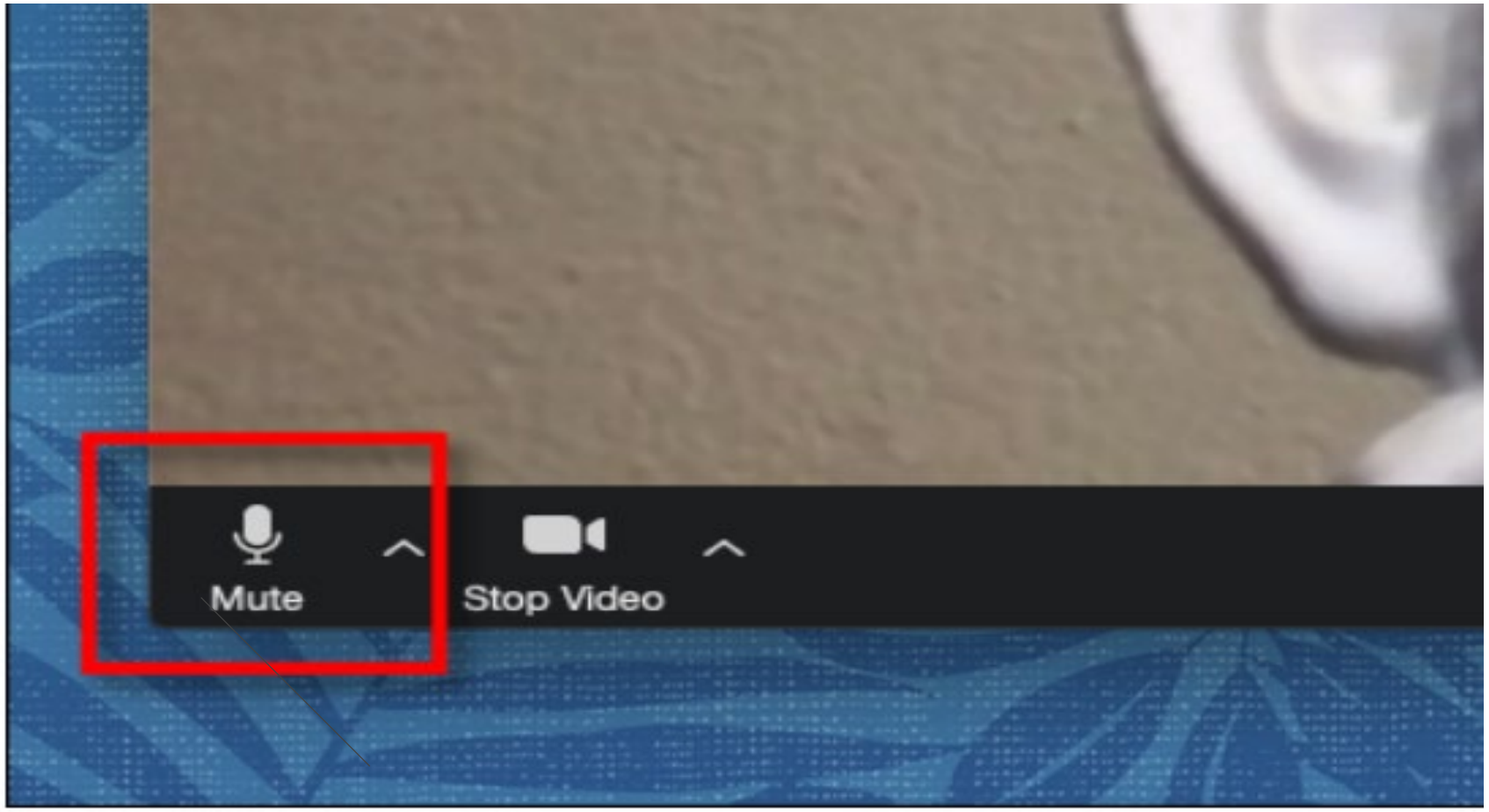
- Regen Set Speeds
- Troubleshooting
- Time Based Regen
- Insite Image Analyzer - Insite
- QuickServe Fault Code Analyzer
- Insite Tests
- Frequent Regen Update

QuickServe Online

- Insite Support Manual
- QSOL Technician Training
- Basic Parts Look-up – parts.cummins.com

Questions & Answers

Please Mute yourself and/or your phone



Buses Parked – Extended Period

Buses Parked – Extended Period

- Drain fuel water separators ***prior to starting*** – Recheck after running the engine
- Test DEF concentration using refractometer - **specification is 32.5 +/- 1.5 percent.** Refer to Service Bulletin 4021566 DEF specifications

DEF has an expected shelf life of 18 months minimum when stored under the following conditions.

Storage temperature between -5°C to 25°C [23°F to 77°F]

Sealed containers

Avoiding direct sunlight

Shelf life is reduced by 6 months for each 5°C [9°F] increment above recommended temperatures

- ***Use fast idle*** to allow aftertreatment temps to reach 300F – this should activate NOx sensors and DEF dosing
- Refer to shop manual procedure 000-005 for long term storage when a vehicle will be parked and not run for 12 months or more
- Consult your Diesel fuel supplier for checking bulk fuel supply tank

2021 B6.7 Update

Summary of Changes to 2021 B6.7

MAINTENANCE REGULATORY RELIABILITY

BASE ENGINE

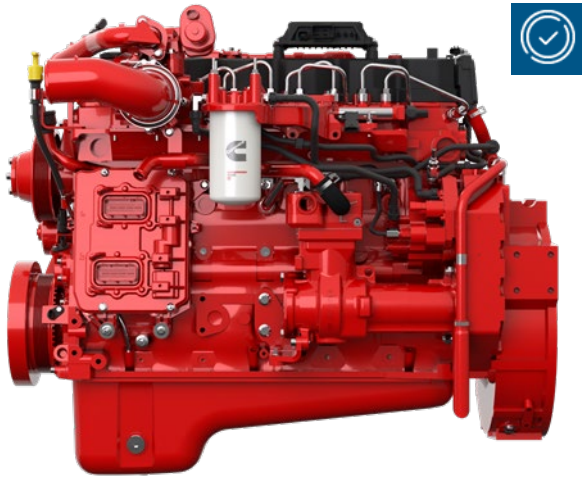
- Modified valve cover design to incorporate new breather and connectivity device
- Incorporated OEM truck requested engine-mounted air cleaner bracket (***school only***)

ELECTRONICS

- Next generation CM2450 control module and controls software
- Improved connectivity to find, resolve, and prevent issues
- Wiring harness changes to improve reliability and integrate with CM2450.

LUBE AND COOLING

- Implemented copper-free oil cooler.



AIR HANDLING

- Added exhaust manifold pressure sensor
- Improved turbocharger speed sensor robustness

POWER CYLINDER

- Modified piston design for improved maintenance intervals and to maintain dependability.
- Top and oil piston rings with improved coatings and designs

MAINTENANCE

- Maintenance-free breather system.
- Increased capabilities on oil filter and Stage 1 & 2 fuel filters

Changes to 2021 B6.7 Aftertreatment

REGULATORY RELIABILITY

DOSING SYSTEM

Updated UL2.0 dosing unit with the Next Gen Nozzle for improved uptime and performance.

PHASE 35 SOFTWARE

Compatible with next generation CM2450 control module and controls software for improved computing capabilities required to meet emissions and OBD requirements.

SENSING TECHNOLOGY

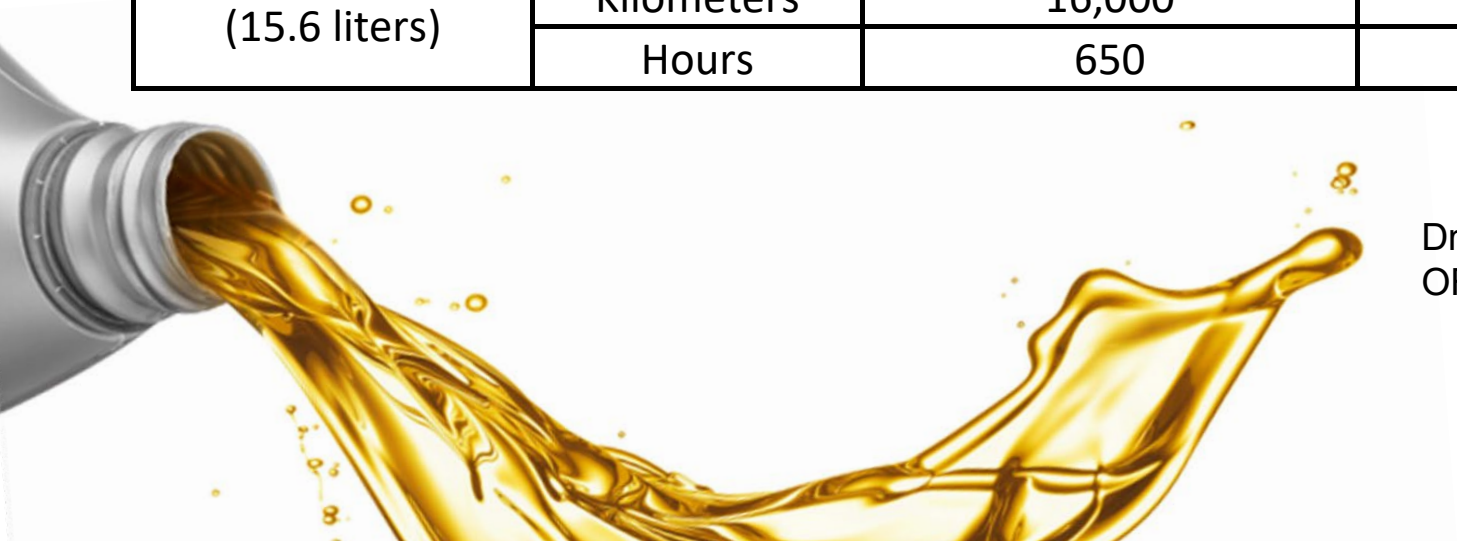
Improved RADP Sensor for improved uptime.

B6.7 | 2021 Maintenance Changes

Maintenance Event	EPA 2017 B6.7	EPA 2021 B6.7
Oil and Filter Change	Up to 20K miles / 550 hours (duty cycle dependent)	Up to 30K miles / 1000 hours / 18 months (duty cycle dependent)
Fuel Filter Change	15K miles / 500 hours	60K miles / 2000 hours / 18 months
Crankcase Ventilation Filter ("Breather") Change	75K miles / 2500 hours	MAINTENANCE FREE
Valve Lash Adjust	150K miles / 5000 hours	150K miles / 5000 hours
DPF Clean	200K miles / 6500 hours	200K miles / 6500 hours
DEF Filter Change	200K miles / 6500 hours	200K miles / 6500 hours

B6.7 | 2021 Oil Drain Interval Schedule

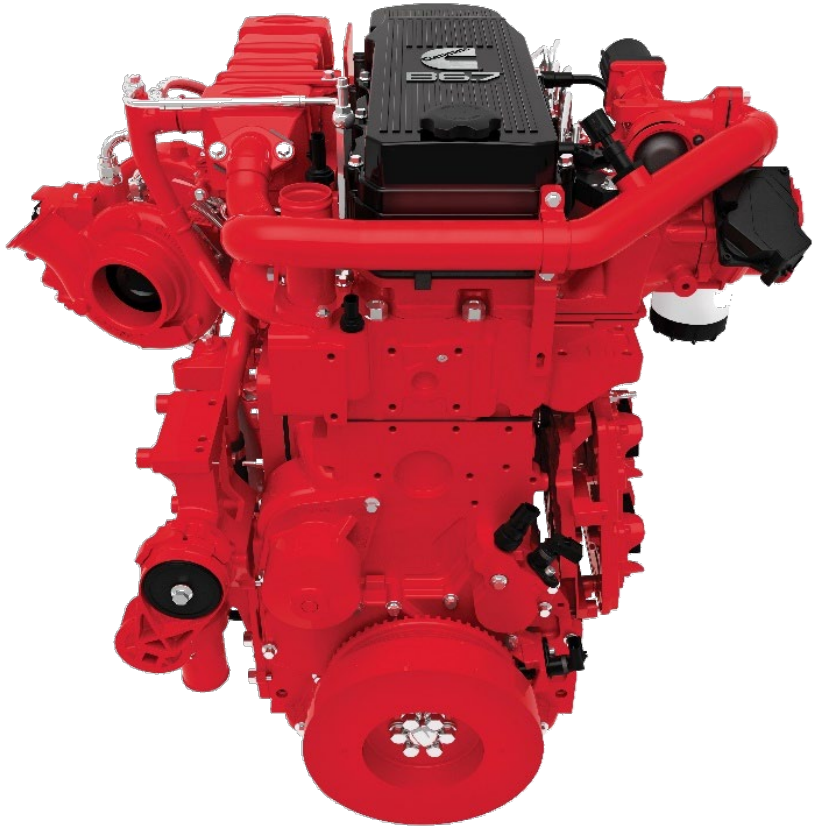
Total Oil Capacity (Oil Pan + Lube Filter)	Engine Distance or Run Time	Fuel Economy		
		Severe < 6 mpg (<2.6 km/liter)	Normal 6 -10 mpg (2.5-4.3 km/liter)	Light > 10 mpg (>4.3 km/liter)
19.5 quarts (18.5 liters)	Miles	12,000	25,000	30,000
	Kilometers	19,000	40,000	48,000
	Hours	900	1000	1,000
16 quarts (15.6 liters)	Miles	10,000	20,000	25,000
	Kilometers	16,000	32,000	40,000
	Hours	650	750	850



Drain the oil and change the lube filter according to engine distance OR run time from the table OR 18 months, **whichever comes first.**

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



B6.7™ 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*

Campaigns & Temporary Repair Practices (TRP)

What is Campaign – TRP – TSB ?

Campaign (C) - Proactive repair to address specific issue to specific engine serial number group – Generally does not require a specific failure – Several do cover travel but no towing

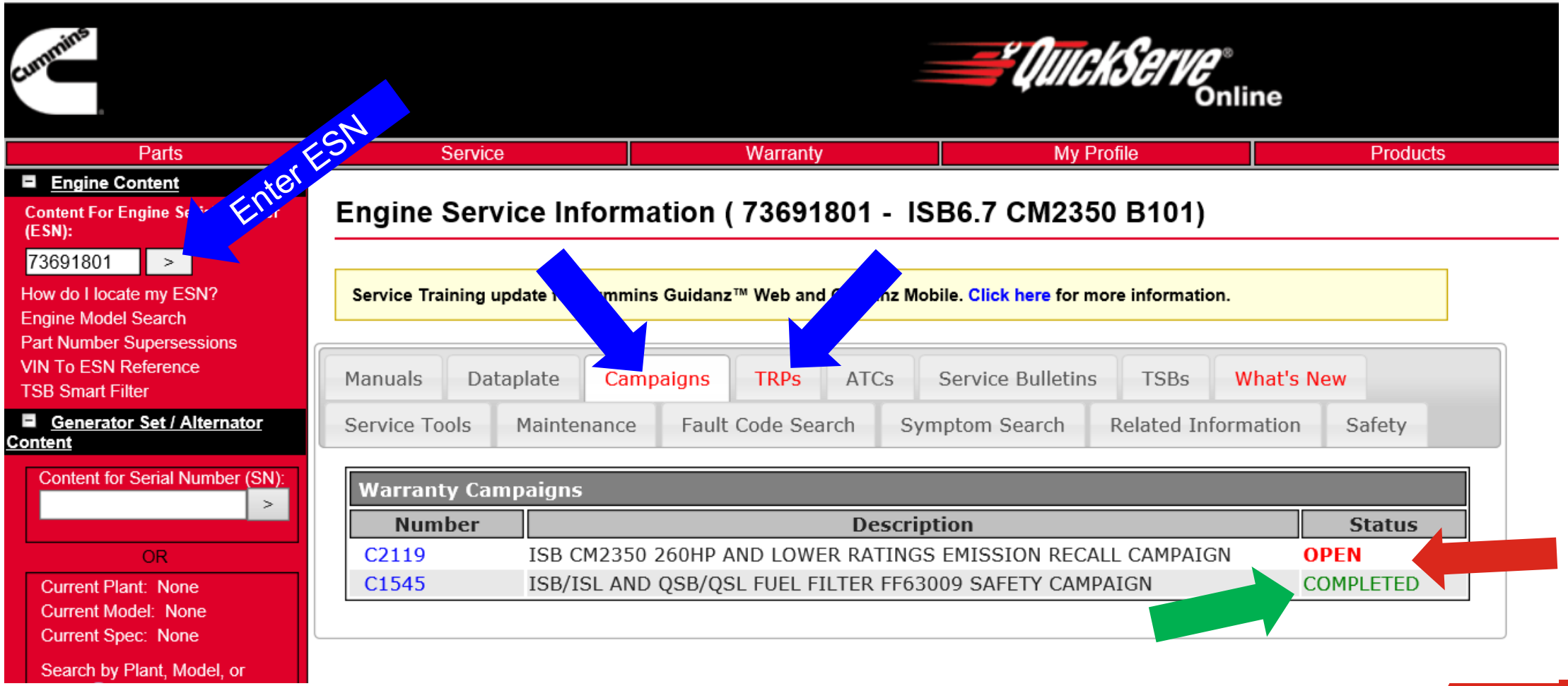
Temporary Repair Practice (TRP) – Provides direction or coverage for a failure to a specific engine serial number group – Generally requires a failure to apply – Several cover travel but no towing

Technical Service Bulletin (TSB) – TSB's are sorted into categories by related engine component, engine family and/or engine serial number. They can provide additional direction or information beyond what is reviewed in normal troubleshooting or repair. TSB can also provide additional OEM related information as it relates to product issues, changes or OEM related service bulletins. TSB's can also review parts information changes and details along with specific maintenance information.

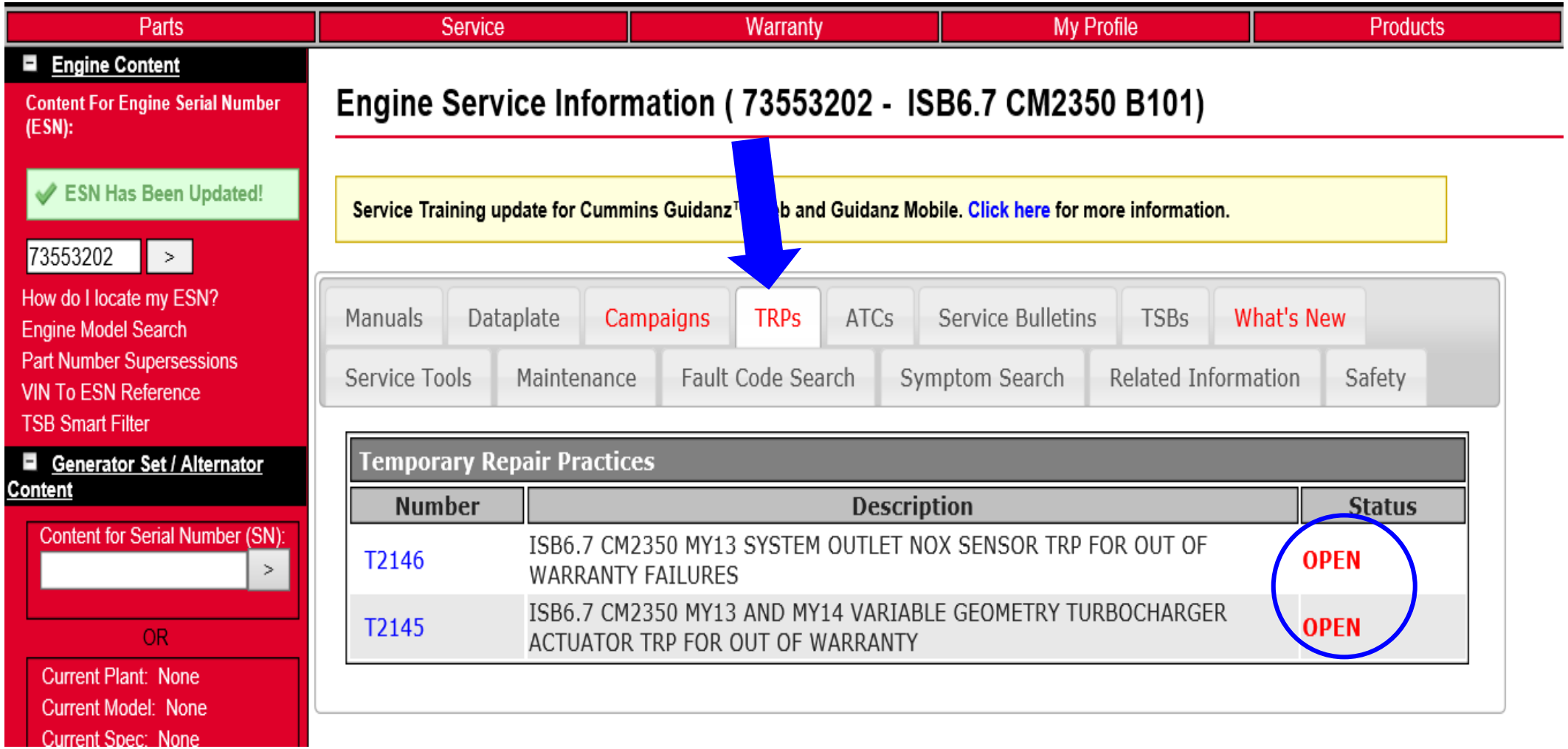
Account Team Coverage (ATC) – Provides direction for a specific OEM, customer or group of engines. These are very specific repair events

Use *QuickServe* to check for Campaigns or TRP's

The free version of QSOL DOES NOT show Campaigns, TRP's



Two TRP's Available – T2145 & T2146 show still open



School Bus Campaigns

Warranty Memo 2010

- Due to COVID19 Cummins paused the ***pro-active*** *replacement* of SCR catalyst on several campaigns early April – To complete the campaign the engine need to have a failure requiring replacement
- This was done to ensure parts availability for in use failures
- M2010 was originally expected to end July 1st but most were extended to October 1st.
- M2010 has expired October 1st - All campaigns have reverted back to Pro-Active status

Campaign – School Bus

Campaigns – Engine

- C2191C - B6.7 CM2350 MY17-MY18 Product Improvement Calibration Campaign
- C1296 - ISB 6.7 CM2250 Fan Hub Drive Pulley **Product Safety Campaign** School Bus
- C2302A – B6.7 IC Engine Mounted Fuel Heater Safety Campaign

Campaigns - SCR

- C2118B - ISB CM2250 260 HP and lower MY2010-2012 Emission Recall Campaign
- C2114C - ISB CM2250 265 HP & Higher – MY 2010-2012 Emission Recall Campaign
- C2115A - ISB CM2350 MY2013-2014 *265HP and Higher* Emissions Recall Campaign
- C2119A - ISB CM2350 MY2013-2014 Lower HP - SCR Replacement

All above campaigns are subject to change – Please refer to QSOL for current information

SCR Campaigns

C2115 & C2119 – ISB CM2350 – MY2013-14 Replacement of the SCR catalyst on engines **MY2013-14** – These require the ECM calibration to be changed to a different base calibration to match the new SCR due to elimination of the NH3 sensor – *Help for too frequent regen included in software update* (more about too frequent regen later)

C2114 & C2118 – ISB CM2250 MY2010-12 Replacement of the SCR catalyst **MY2010-2012** – No calibration change required

Travel covered on the campaigns listed

Campaigns C2115 & C2119 – Software

ISB CM2350 MY2013-2015

- ECM software update released December 2019.
- The software change is a complete re-write with significant testing prior to release – Extensive field testing was done prior to release
- **ISB CM2350 MY2015 *does not require SCR replacement and only an* ECM calibration software update**

ISB CM2350 MY2013 & MY2014 With SCR Replacement

- C2115-2119 - December 16th 2019 ECM rev includes FC3375 improvements
- If the SCR was replaced prior to December 15, the ECM needs to be updated to latest revision!
- *When C2119/C2115 is performed a different ECM calibration is used and it includes fixes for FC3375 – too frequent regen*
- *If C2119/C2115 was done early verify ECM calibration released after 12-15-19 was installed*

T2084 or C2119-C2115

- If the SCR was replaced under T2084 and completed prior to 12-15-19 - ECM calibration may need to be updated to get the TFR corrections
- ***C2119/C2115 will show open even if T2084 was completed and SCR was replaced***
- Several **MY2013-2014** ISB's were updated with field test calibrations requiring the new SCR. Those units will show "open" on C2119-2115 and must be completed – The exemption sticker must be removed and advise CFSE

ISB CM2350 MY2016

- The software for MY2016 is expected for release early Q1 2021.
- Software update only – no parts required

IC Fuel Heater Campaign C2302

- ~~**C2127** - Rewire, reinstall the fuse and install a new fuel heater. **C2128** - installed a new heater for units shipped with plugs only w/o a heater –~~ ***These were canceled March 24, 2020***
- **C2302** -Safety campaign to disable the fuel heater on B6.7 engines in the IC chassis NHTSA ID: 20E-018
- Campaign **C2302** instructs removal of the fuse, cut off the connector at the heater to disable operation and install a wire cap plug. If heater has failed, heater is removed and plug installed.

Long term solution is under investigation and not expected release until 2021

- **ATC2333** was released July 1 with option to opt out of heater. This is ***not recommended*** for units operating in cold weather regions

Slide info is basic information only - Information subject to change at anytime - Please refer to each Campaign or TRP for specific details, changes adjustments, deletion or expiration

IC Fuel Heater - ATC-2333

- **ATC-2333** was issued to offer eligible customers an opportunity to receive a $50 refund ***instead of a fuel heating*** solution being developed by Cummins for ***future*** installation.
- Upon receiving a signed agreement from the appropriate party in authority with respect to the eligible engine(s), service providers may offer the customer a $50 refund per eligible engine in a manner agreed to by both the customer and the service provider.
- If opting for the $50 refund, ***all future actions related to the fuel heater are eliminated***

Above is basic information only - Subject to change at anytime - Please refer to each Campaign or TRP for specific details, changes adjustments, deletion or expiration

Campaign – C2191 - B6.7 MY17-18

- **C2191-C B6.7 CM2350 MY17-MY18 Product Improvement Calibration Campaign –** Calibration of the Engine Control Module on certain **B6.7 CM2350** engines with a product improvement calibration for improved reliability.
- This calibration improvement is primarily to correct oil in the compressor side of the turbocharger – Refer to **TSB190012**.
- Customers using **Zonar** have the ability to upload the calibration using Zonar over the air calibration update or the customer can request a ***free In-line Mini for DYI***

- ***Travel is not covered under this campaign***

Above is basic information only - This is subject to change at anytime - Please refer to each Campaign or TRP for specific details, changes adjustments, deletion or expiration

B6.7 Turbo Compressor Seal Oil Leak – Review

TSB190012

Symptom:

External lubricating oil leak

Lubricating oil in charge air cooler (CAC)

Lubricating oil leak at turbocharger

Resolution

A new engine control module (ECM) calibration code is available to prevent a pressure difference across the turbocharger during certain running conditions that can lead to compressor seal oil leaks. **C2191 released to update ECM calibration**

Service Instructions

Complete the compressor seal oil leak troubleshooting tree. See corresponding Service Manual, Bulletin 5411226. Reference Symptom Tree t185.

Repair any issues found during troubleshooting and clean lubricating oil from the turbocharger piping, charge air cooler (CAC), and intake as necessary.

If turbocharger is found to meet reuse guidelines as stated in troubleshooting tree. Do **not** replace turbocharger.

B6.7 Turbo Compressor Seal Leak – Review

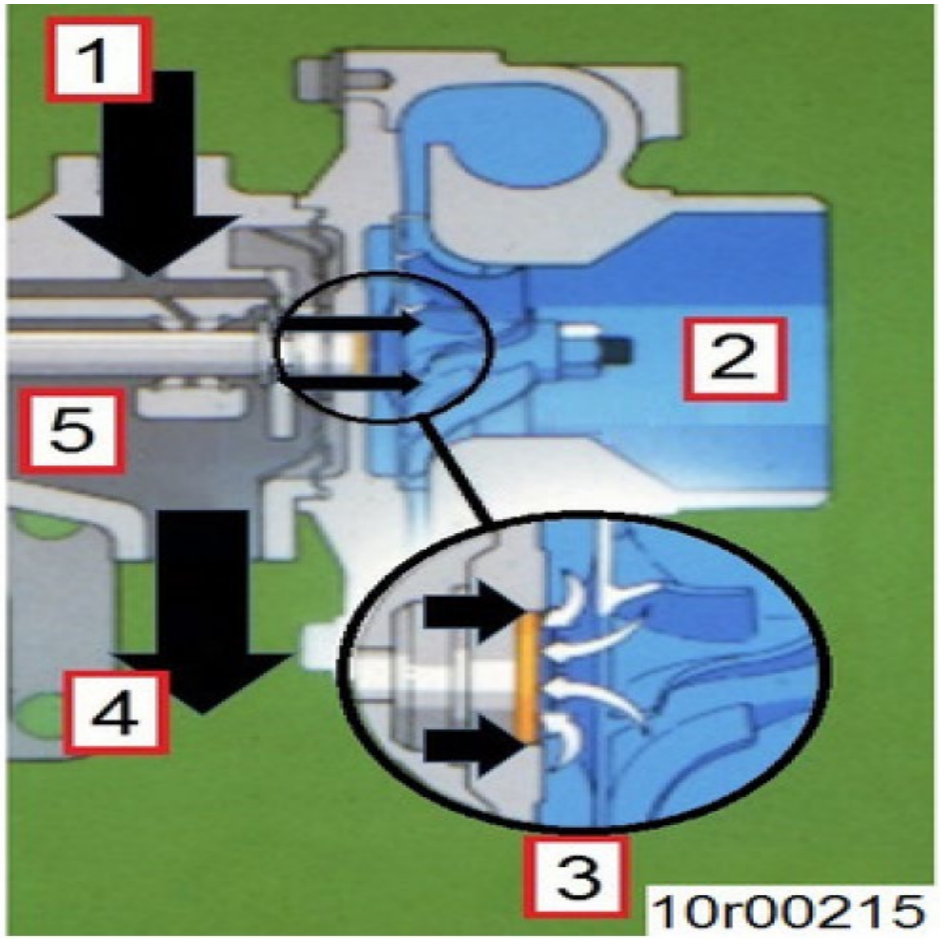
The ECM calibration has tuning to create boost differential

System Boost leaks must be corrected or leaks may continue

After repair is complete and the engine is operated, residual lubricating oil could be pushed from the turbocharger compressor housing and produce lubricating oil streaks in or on the turbocharger piping. This observation alone does **not** constitute a malfunction that requires further repair.

Calibrate the unit with latest engine control module (ECM) calibration code if ECM calibration code has **not** been updated prior to December 2018.

- **Refer to TSB190012**



Bluebird – B6.7 - FC 3556 after C2191 *or ECM calibration* revision update

- **FC 3555 or 3556** – "*Wait to start – Datalink error*" after completing a calibration update for **C2191** on Bluebird buses. **TSB170081** was released 2017 to address this issue and directs to ***change*** the base calibration to the cross reference listed.
- This calibration change process was covered by a ATC1929 released in 2017 and has since expired. Units that the ATC was not completed could generate FC 3555 or 3556 when updating a current calibration.
- **ATC2343** was released specific to the impacted Blue Bird population and will allow for changing the base calibration per TSB170081

Above is basic information only - This is subject to change at anytime - Please refer to each Campaign or TRP for specific details, changes adjustments, deletion or expiration

ABS Lamp On – After ECM calibration

The ABS lamp on after ECM calibration update for units with Bendix EC60 – EC80 controller

Step 3: B6.7 CM2350 – MY 2017 – ABS light on after engine ECM calibration update

Before doing a ECM Update on Bluebird school bus remove the ABS and Transmission battery fuses to prevent bleed over to those controller's.

On the conventional buses they are located behind the cover inside the bus under the dash (large plastic cover in center under the dash) on the back side of the cover has fuse ID and location.

On the flat nose rear engine buses they are in the large gray box in top left of engine compartment with four clips that hold the cover on and fuse ID is on back of cover.

On the flat nose front engine the same gray box is outside under the driver's window (second compartment down from window). Hopefully this will eliminate problems.

The ABS codes should go inactive after fuses are installed and key switch cycled.

For the ABS lamp, P-phase was completed and the cal changes are waiting for the next calibration release - below are the estimated dates:

MY17-19: ~Aug/Sep 2020 ????

MY15-16: ~Oct 2020

MY 20: ~July 2020

This issue is primarily on Bluebird but will happen on IC if they are equipped with Bendix EC60-80 controller

ABS Lamp – After Calibrating ECM

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 –

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.*

Refer to TSB150073 for the process to reset the ABS controller using the Bendix Acom software

Please note – IC school bus with the Bendix EC60 or EC80 controller could have the same issue.

ISB MY2013-2016

Too Frequent Regen Update

ISB CM2350 MY2013-2016 – FC3375 "Too Frequent Regeneration" or *"Regeneration Issues"*

ISB CM2350 MY2013-2015	ISB CM2350 MY2013 & MY2014 With SCR Replacement	*T2084 or C2119-C2115*	ISB CM2350 MY2016
• ECM software update released December 2019. • The software change is a complete re-write with significant testing prior to release – Extensive field testing was done prior to release • **ISB CM2350 MY2015 *does not require SCR replacement and only an* ECM calibration software update**	• C2119 - December 16th 2019 ECM rev includes FC3375 improvements • If the SCR was replaced prior to December 15, the ECM needs to be updated to latest revision! • *When C2119/C2115 is performed a different ECM calibration is used and it includes fixes for FC3375 – too frequent regen* • *If C2119/C2115 was done early verify ECM calibration released after 12-15-19 was installed*	• If the SCR was replaced under T2084 and completed prior to 12-15-19 - ECM calibration may need to be updated to get the TFR corrections • *C2119/C2115 will show open even if T2084 was completed and SCR was replaced* • Several **MY2013-2014** ISB's were updated with field test calibrations requiring the new SCR. Those units will show "open" on C2119-2115 and must be completed – The exemption sticker must be removed and advise CFSE	• The software for MY2016 is expected for release Q1 2021 • Software update only – no parts required

Note – During calibration update it's recommended to ***clean EGR ports, check exhaust gas psi tube and check for boost leaks***

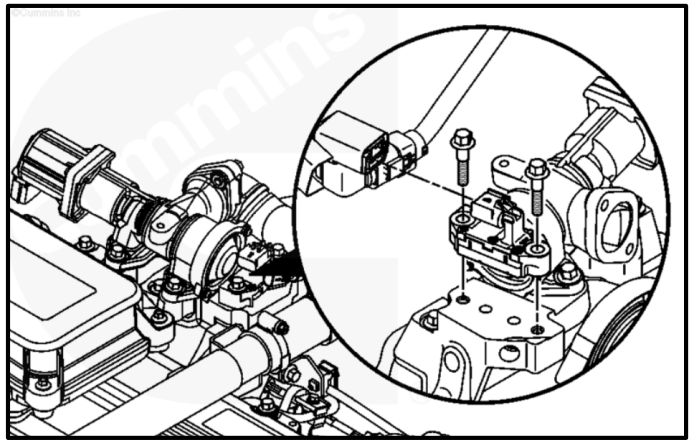
DPF and EGR Diff Sensor & Port Cleaning

Best Practice

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

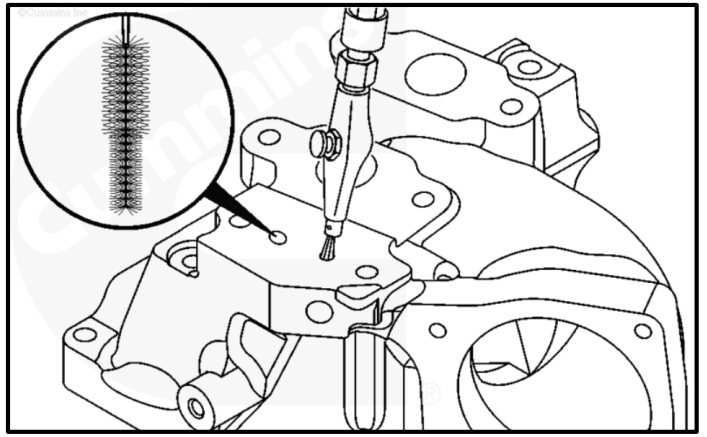
Cleaning DPFs:

- Look at hours not miles to maximize uptime due to idle: **5,000-6500hours**
- 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 – Also 5579934 bulletin**
- Benefit of **5000 hour** cleaning will **reduce bus downtime** due to EGR DP port and sensor related **faults – 3382, 1921, 1896, 3375**.



Bulletin 5579934

Service Bulletin

Contact Us

Service Bulletin Number: 5579934	Released Date: 22-jul-2019
Exhaust Gas Recirculation (EGR) System Intake Air Connection Inspection and Cleaning Guidelines	

Exhaust Gas Recirculation (EGR) System Intake Air Connection Inspection and Cleaning Guidelines

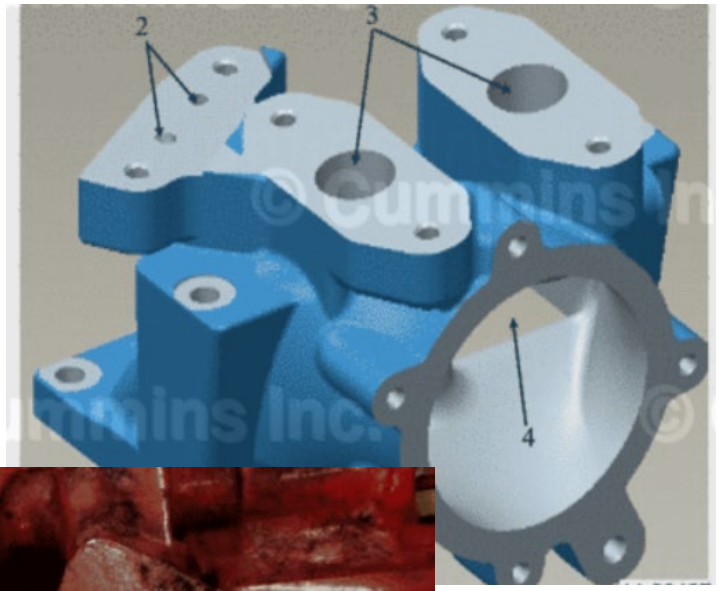
Table of Contents

I. Products Affected

All midrange engines with exhaust gas recirculation (EGR)

II. Introduction

- This document provides guidelines to inspect and clean the intake air connection in the exhaust gas recirculation (EGR) system.
- The intake air connection combines EGR flow and fresh air flow into charge flow. Charge flow then goes through the air intake grid heater prior to reaching the air intake manifold.
- EGR flows through the intake air connection exhaust gas entrance ports prior to entering the fresh air flow stream. A differential pressure is measured across one of the exhaust gas entranc
  engine control module (ECM) uses this measurement to estimate EGR flow.
- EGR flow measurement by the ECM is accurate when the intake air connection exhaust gas entrance ports are clean or lightly sooted.
- EGR differential pressure sensor ports/cross drillings need to be maintained in a clean condition to ensure that EGR flow measurement by ECM is accurate.
- Air Intake Connection exhaust gas entrance ports and EGR differential pressure sensor ports/cross drillings may accumulate moderate soot deposits that can change the ECM's EGR flow m
  accuracy.



School Bus – TRP's

Temporary Repair Practices - TRP's

- TRP is a ***Temporary Repair Practice*** to address a specific item.
- Only parts and labor listed in the TRP are covered unless otherwise noted – Troubleshooting may or may not be included – Refer to specific TRP
- **TRP's *only apply*** to engines that are no longer covered by a Cummins Base, Extended, Parts or Emissions warranty program – If other warranties apply, claims should be filed against those coverages
- Travel may be covered – please check the TRP for details. Towing is not covered
- Duration of coverage and expiration will be listed in the TRP
- Repair must be done by authorized Cummins repair locations - Eligibility for a temporary repair practice (TRP) must show **OPEN** on QSOL and the engine serial number listed

TRP's T2145 & T2146

T2145-D - 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

T2146-C – ISB6.7 MY2013 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

- Above is basic information only - These are subject to change at anytime - Please refer to each Campaign or TRP for specific details, changes adjustments, deletion or expiration

Aftertreatment System

Mobile Regen Set Speed

Aftertreatment Diesel Particulate Filter Temperature Stabilization

INSITE Programmable Parameters

Aftertreatment – Feature & Parameter Settings

- Check the regeneration ECM settings to be sure they are properly adjusted to allow for optimal operation
- **ISB/B6.7 MY2010-12 CM2250 – MY 2013-20 CM2350** – Verify the DPF stay warm feature – *aftertreatment temperature stabilization - **enabled*** – ***Refer to TSB170058***
- Verify the regen minimum set speed is adjusted to **5 MPH** *or zero if the application allows*
- When the set speed is ***above*** zero and temp stabilization is ***enabled*** it will allow a mobile regeneration event to occur when speeds above the set speed are achieved. When temp stabilization is ***not enabled*** it requires a vehicle speed of 40 before regen is allowed.
- Set speed of zero does ***NOT*** require temp stabilization to be enabled
- When set to zero, regen will be allowed when temp, exhaust flow can be achieved and maintained

Operating a bus on a low duty cycle urban route with a set speed above zero and temp stabilization ***DISABLED*** can cause regen issues

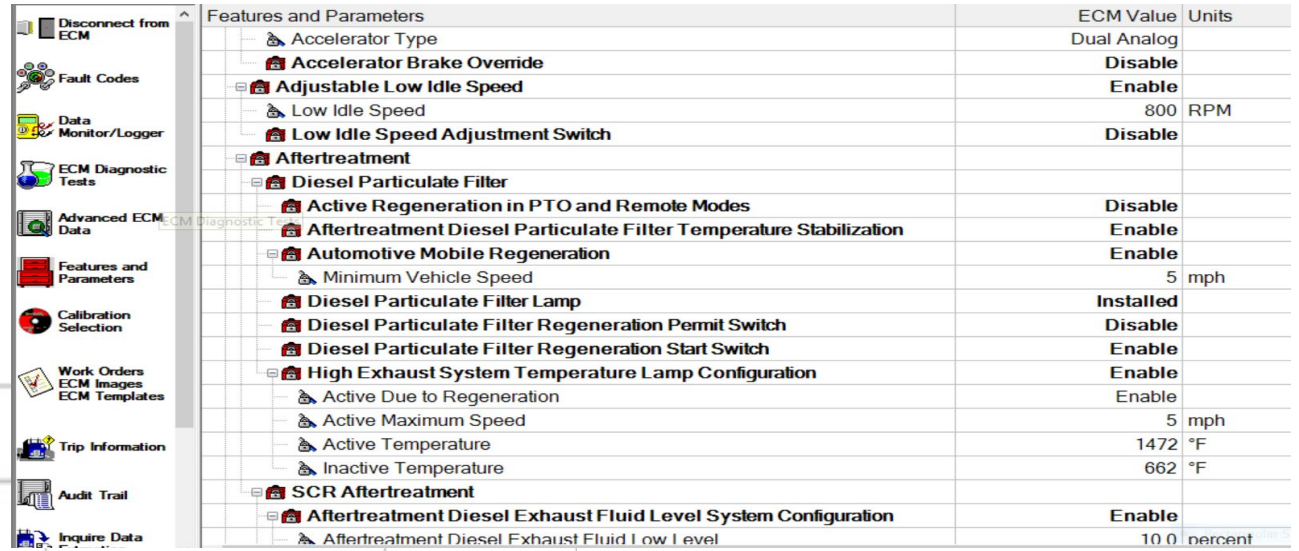
ISB CM2150- MY2007-2009 ***DO NOT*** have the temp stabilization feature – **Option - adjust regen speed to zero**

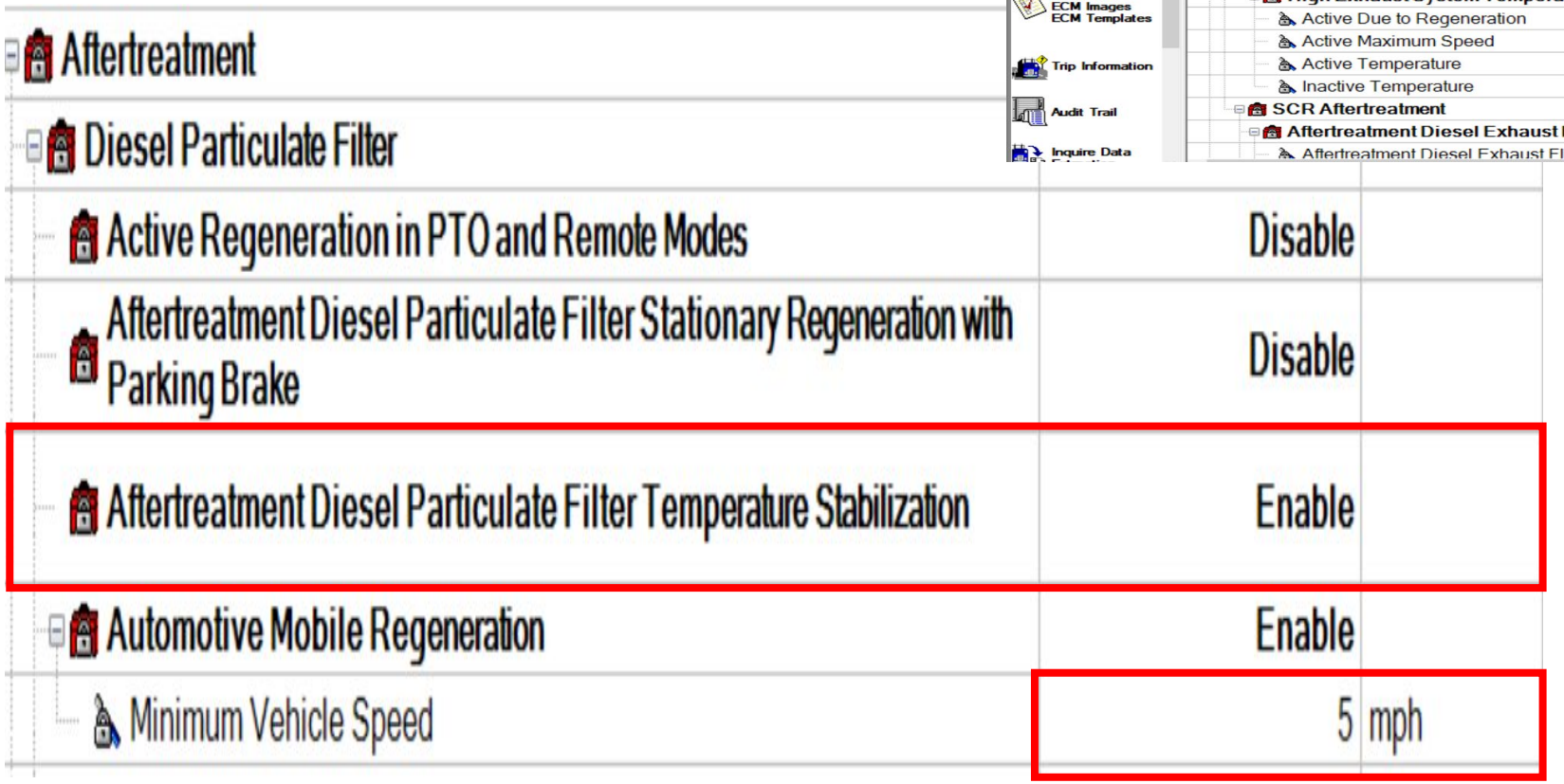
Mobile Regen Set Speed & DPF Temp Stabilization – Example – Insite General *Default* settings

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* – *Refer to TSB170058***

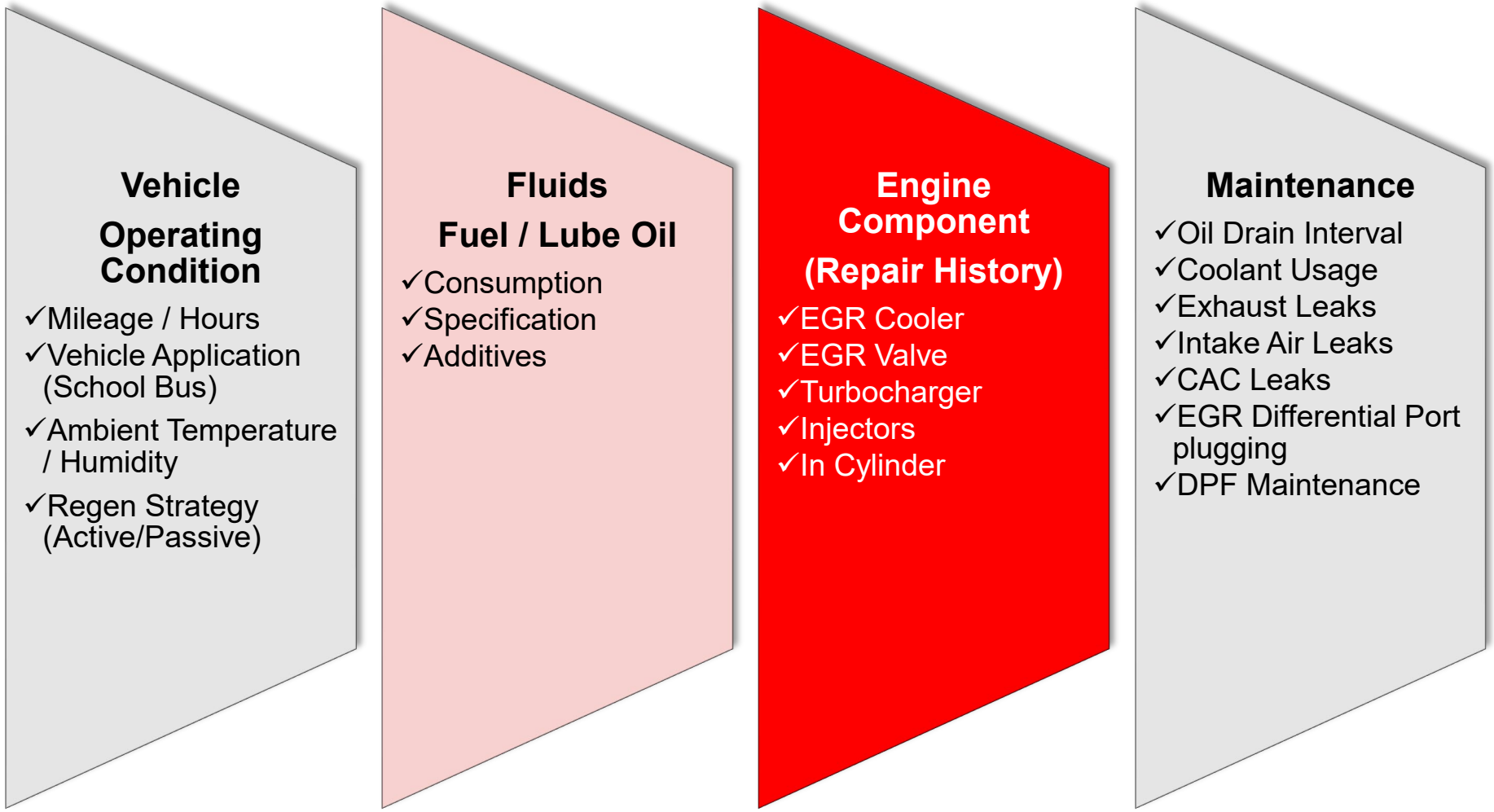
School Bus DPF & Temp Stabilization Feature Settings





REGENERATION BASICS

The Key to Aftertreatment Diagnostics



Types of Regeneration (Active/Passive)

Converting Soot to gases

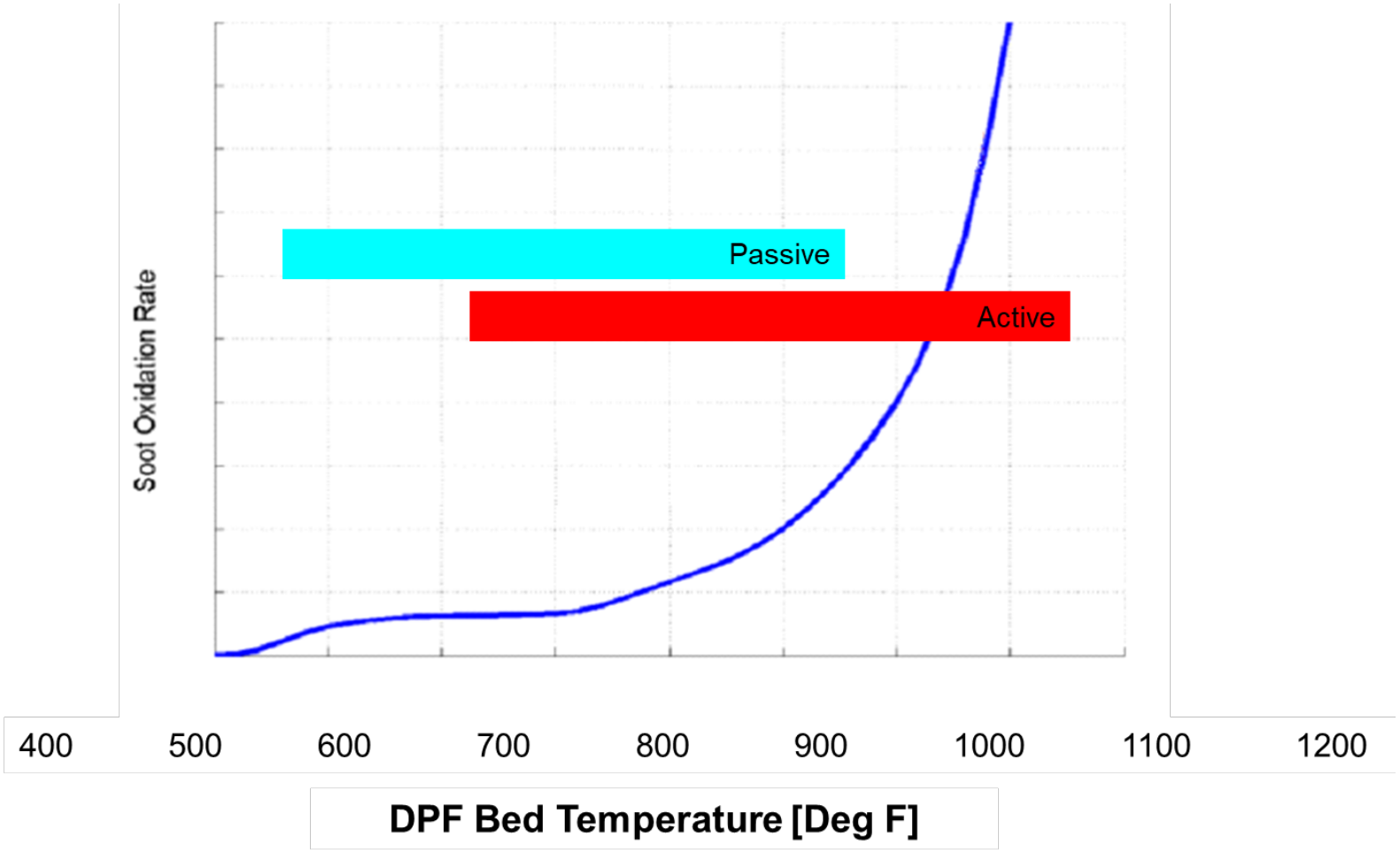
- CO_2, H_2O, N_2

Passive regeneration

- Temperature >550F in exhaust
- Soot oxidation rate slow compared to active regen

Active regeneration

- Thermal Management
- Requires temperature >932°F
- Use of the turbocharger
- Use of aftertreatment injection (2 main methods)



Types of Regeneration: ACTIVE REGEN's

Mobile Regen

ECM initiated

- ***Vehicle in motion***
- Soot load limit reached
- Regen time limit reached (24 hrs)
- Diesel fuel injected in cylinder
- Duration is dependent on duty cycle

Stationary

Operator initiated

- ***Vehicle in Park***
- Transmission in Neutral
- Dash switch – regen will only initiate when soot load FC active
- Regen duration will be only to extinguish lamp

Service tool

Technician initiated

- ***Vehicle in Park***
- Cummins INSITE required
- Regen runs for a specific duration of time 1-1/2 to 2 hours depending on ambient temp

Desorb

Typically at cold engine startup

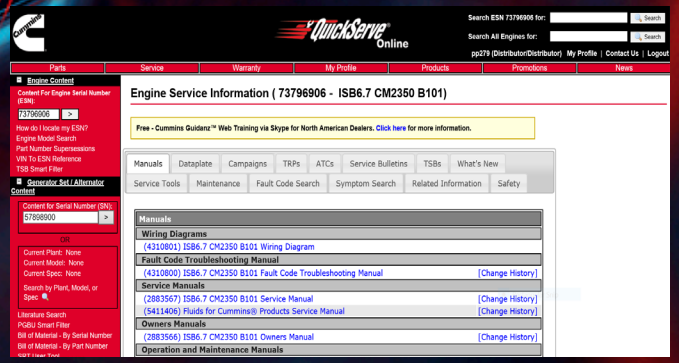
- ***Vehicle in Park***
- Elevated Idle w/ increased turbo noise
- Reduces humidity in aftertreatment
- **NO** dosing takes place

This is not a regen

Tips for Preventing Regen/Aftertreatment Issues

Tips and Checks

- Regen vehicle set speed set correct - **0-5 MPH**
- Aftertreatment Temp Stabilization Enabled – **2010 to Current** – **Enable** if regen set speed above zero
- DPF clean/replace performed at recommended miles/hours – ***6500*** hours or 200,000 miles
- EGR differential ports cleaned or inspected – **5000-6500 hours – Bulletin 5579934**
- Idle shutdown enabled - **10-15 minutes** – Reduction of unnecessary idle time
- Use of PTO/fast idle for warm-up – **1000-1200 RPM's** – Fast idle is always preferred in cold weather or extended idle
- Winter front use when ***not equipped*** with ***on/off*** clutch fan ?
- Boost leaks due to leaking hoses clamps - **Periodic inspection** – Boost leaks create additional engine out smoke
- Air filters replaced prior to being restricted - **Use air cleaner restriction gauge**
- Correct fuel filter priming and maintenance - **Correct prefill process** – Prevents fuel system damage
- Diesel fuel meeting cetane requirement - **42 or higher** – low cetane fuel will create additional engine out smoke
- Drain water from fuel water separator – **Periodic filer inspect/drain**



Troubleshooting Insite – Quickserve Online

Troubleshooting

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

- Insite – Pro is required to perform ECM calibration updates
- 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!
- Full Access QuickServe provides access to the individual Cummins Online training database – Requires personal login to be set up

QSOL is updated daily so it is the most current and reliable tool for service and parts look up. Print manuals or link to troubleshooting trees in Insite can be significantly outdated

Troubleshooting

When starting to troubleshoot an issue - ***Before starting the repair*** or getting too far along –

- ✓Check warranty status – Base warranty - Extended coverage
- ✓Check for open Campaigns – TRP's – ATC's – ***Can't be viewed in free version of QSOL***
- ✓Check for TSB's that may apply – You definitely should check TSB's once you do find root cause prior to fix. The TSB could include a part change, OEM direction or other important information! – *Free version of QSOL ONLY looks at sample ESN you selected!*

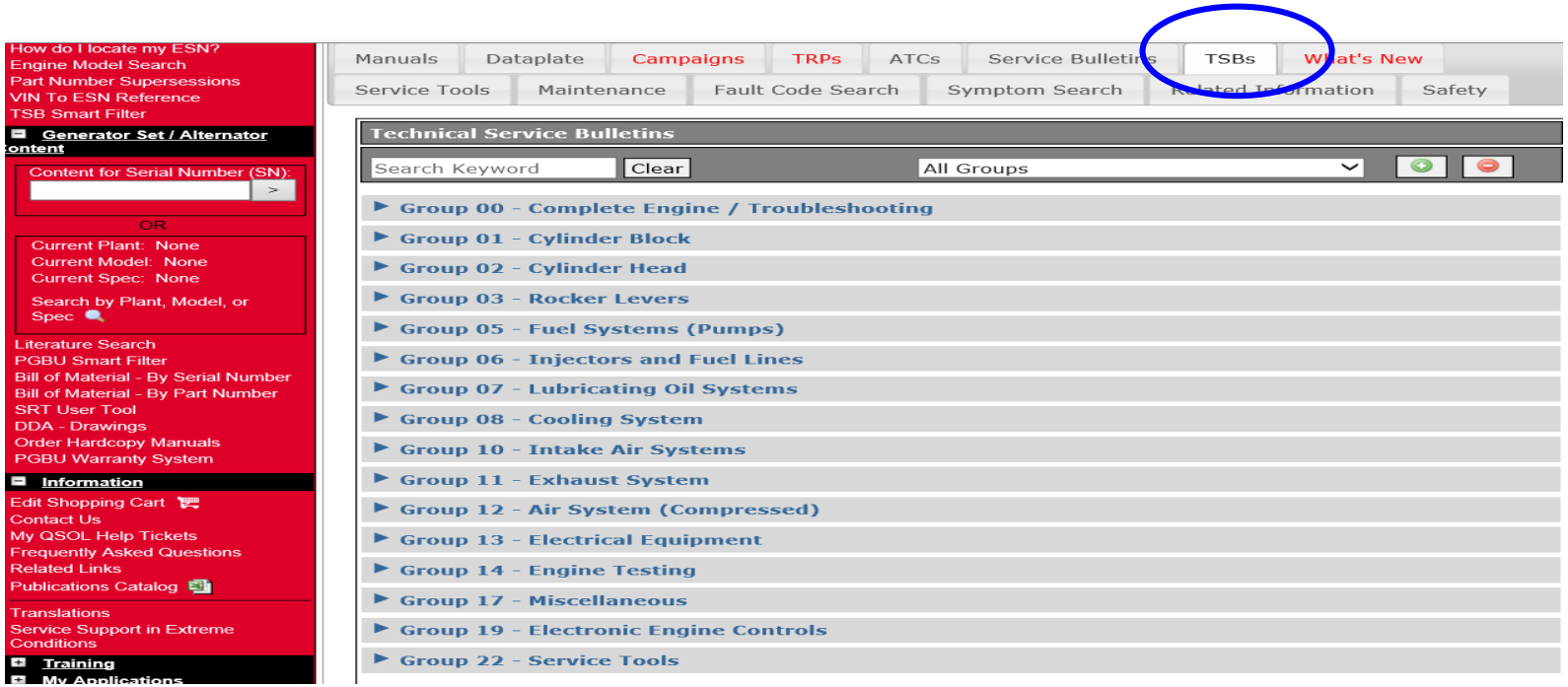
Technical Service Bulletins (TSB's)

Check QuickServe for open Campaigns – TRP's – ATC's and warranty status

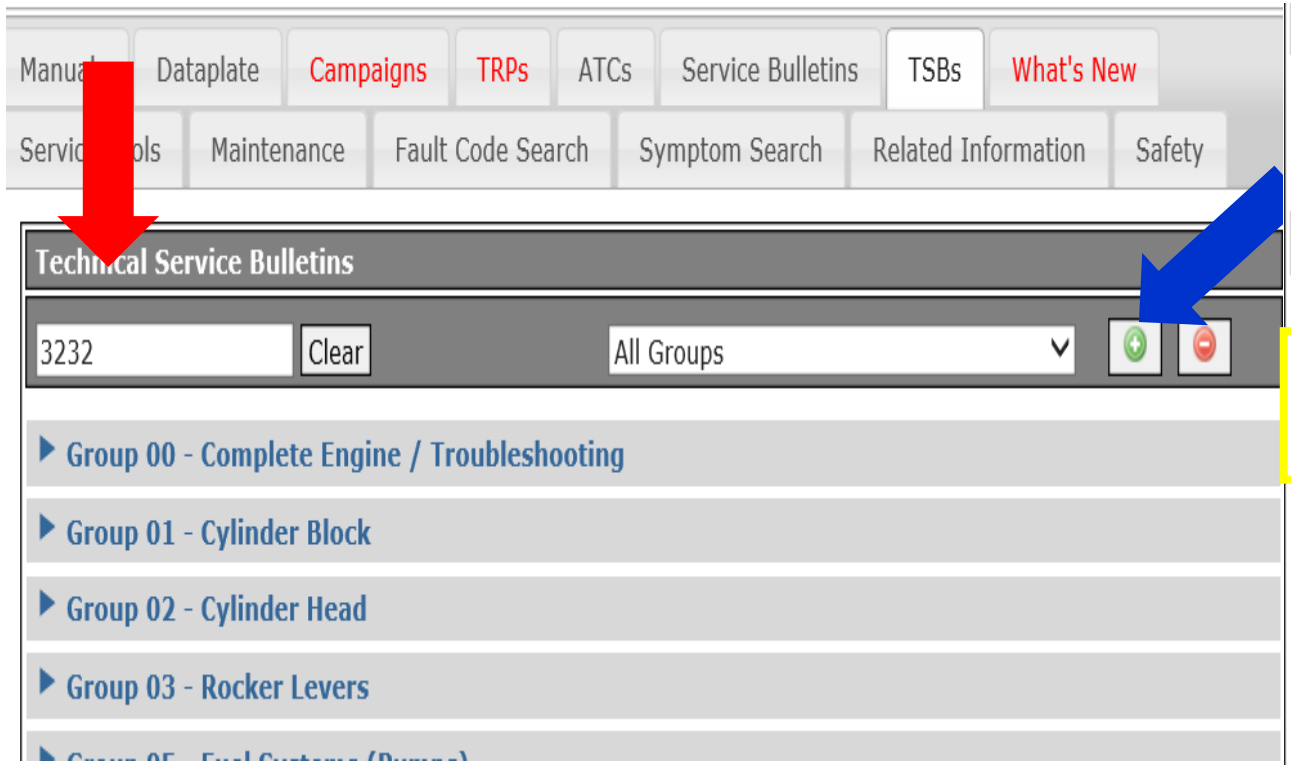
Review technical service bulletins TSB's - for any other detail or direction

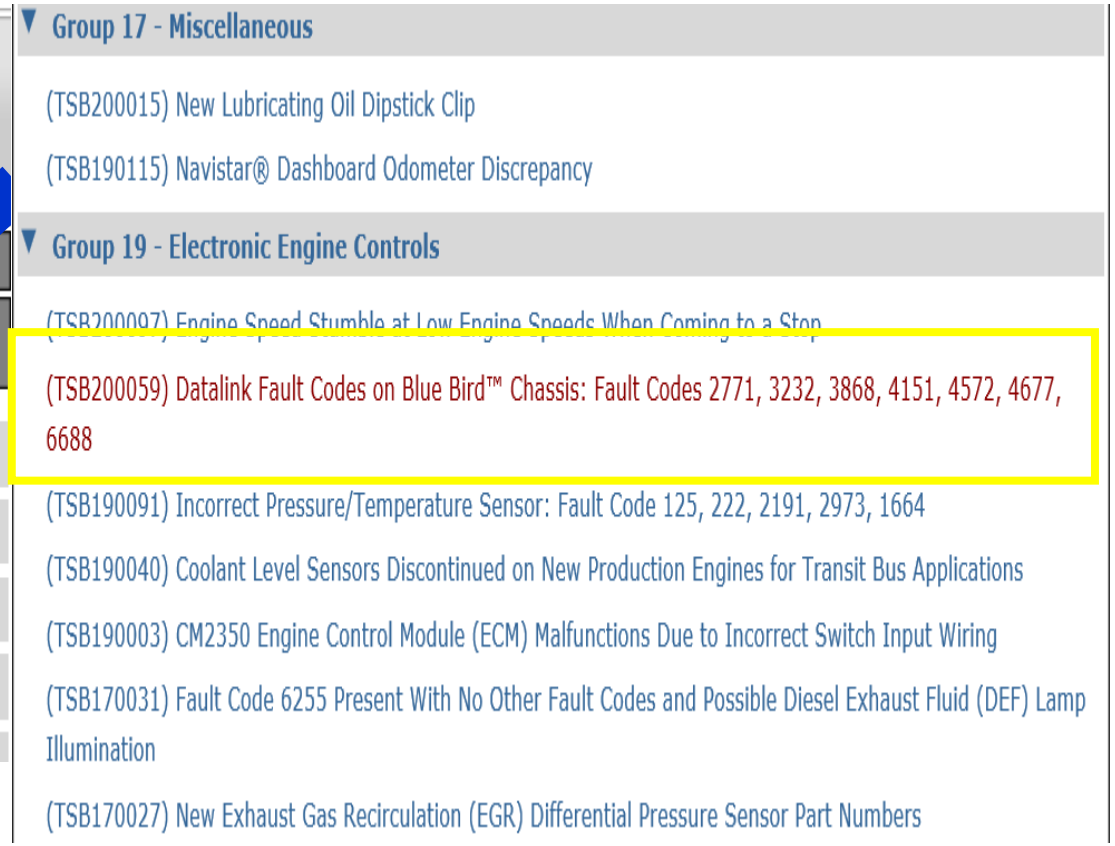
TSB are sorted by group

TSB's may include OEM information or direction to OEM repair documents



TSB – Search – Add key word or FC number in search box and hit enter
Expand (green +)
Search results highlighted in red that match you key word





School Bus TSB's – All OEM

TSB170058 ISB CM2250/CM2350 B6.7 CM2350	Aftertreatment Temp Stabilization Setting The temp stabilization feature should be ***enabled*** on any school bus that has the minimum regen road speed set ***above zero***.
TSB190012 B6.7 CM2350	ECM Calibration update to correct turbo compressor side oil leak – **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. Also refer to campaign **C2191**
TSB190181 ISB CM2350	Exhaust Gas Recirculation (EGR) System Differential Pressure Sensor Incorrect Installation: Fault Codes 3361, 3389, 3382 and 3383 – Shows correct orientation of EGR differential sensor
TSB190091 ALL- ISB/B6.7	Incorrect Pressure/Temperature Sensor: Fault Code 125, 222, 2191, 2973, 1664 – The barometric air pressure and/or turbocharger compressor intake pressure looks the same as the Intake manifold pressure on ISB/B6.7engines. They can easily be installed in wrong location. Future sensors may be color coded
TSB190202 B6.7 MY2017	**Current** - Aftertreatment Diesel Exhaust Fluid (DEF) Dosing Unit with Fault Codes 3558 and 3559 - **Neither a good or malfunctioning aftertreatment DEF dosing unit can cause Fault Codes 3558 or 3559** to come active as these fault codes are isolated within the OEM wiring harness. An electrical short or open circuit has been detected in the DEF dosing unit OEM wiring harness.
TSB190200 B6.7 MY2017	**Current** - Fault Code (FC) 3749 with no other diesel exhaust fluid (DEF) system related fault codes. Frozen aftertreatment DEF tank at colder ambient conditions lead to inability to dose DEF after a cold soak. Inability to dose DEF. motoring event and can lead to FC3749. Review fault snapshot data for FC3749 in INSITE™ electronic service tool to verify if DEF tank was frozen at the time of fault
TSB070007 ALL Engines	Troubleshooting and Repair Direction for High Blowby and/or Oil Consumption – Links to Bulletin 5631318 This document will provide the required repair instructions for engines that have experienced foreign object debris ingestion (dust out).

TSB OEM Specific

[TSB170089](#) – Allison trans FC P2637 – Corrected with engine ECM update

[TSB170081](#) – FC 3555 after updating ECM calibration – TSB directs to different ECM code

[TSB150073](#) – ABS light on after engine ECM calibration

Bendix Acom diagnostic software is required to reset ABS controller to clear lamp or unplug the ABS fuse prior to calibrating the engine ECM –

[TSB190174](#) *Directs removal of OEM - ABS and transmission fuse prior to engine ECM calibration.*

[TSB200059](#) – Datalink FC's 2771-3232-3868-4154-4572-4677-6688 – OEM Relay issue

[TSB180009](#) – Charge air clamps loose or broken – Can cause aftertreatment codes to include but not limited to 1922, 1981 and failed DPF - Refer to IC for repair

[TSB170120](#) **–** Navistar-IC Hood seal issue – Can cause regen issues and FC3375 - Refer to IC for repair

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

[TSB170046](#) – **ISB-B6.7 CM2350 -** Navistar-IC – Belt chirp – Excessive length on IC belt – Can cause tensioner wear

[TSB160031](#) – **ISB-B6.7 CM2350 -** Navistar-IC – DEF Quality Sensor FC's – 1715,6766,6765,6767 – Refer to IC for repair

[TSB190174](#) – **B6.7 CM2350** ABS Lamp on after ECM calibration download MY2017 – newer – Equipped with Bendix EC-80 ABS system

[TSB110060](#) – Belt tensioner issues due to belt too long – ISB CM2250

[TSB150040](#) – Belt shredding Thomas pusher bus

[TSB120236](#) – FC 1679 – DEF Tank temp issues

Troubleshooting

- What is the frequency of regen ?
- What fault codes are you logging?
- Regen 2639-1921-1922-3375 could be a result of other issues (upstream) understanding what is going on and if other codes started first can help get to root cause much quicker
- Restricted air filters, significant boost leaks, plugged EGR ports will all log other codes and give you a clue on where to go Not knowing what the prior codes may have been makes it difficult to find root cause
- If you just clear codes and don't **create a Insite image/work order** you are just guessing on next step – Not knowing what the prior codes were makes it difficult to find root cause - No data to help with diagnostics
- Have you checked for campaigns, TRP's or TSB's ?

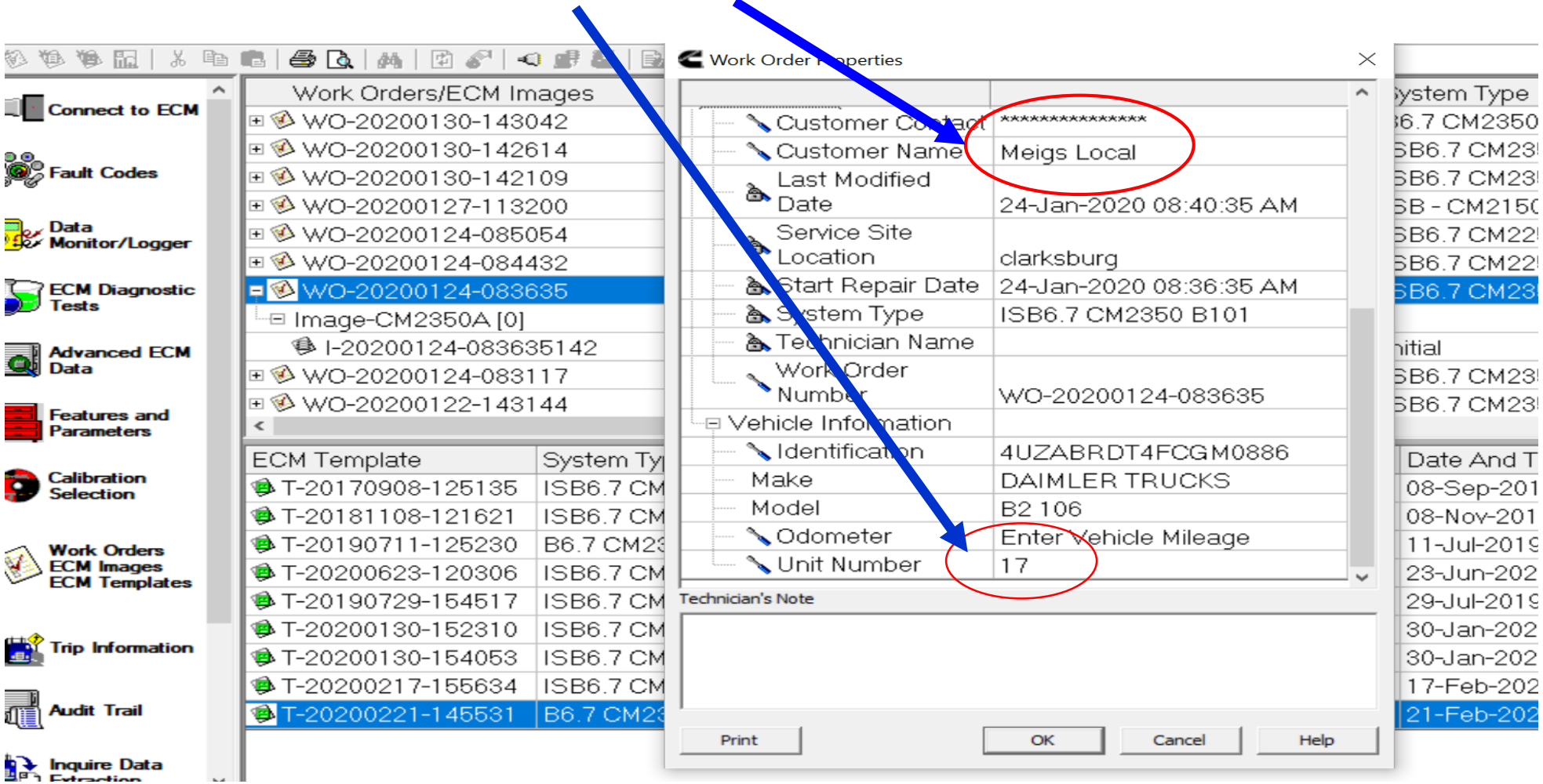
Data *ALWAYS* Tells a Story

Look at all of the data – CREATE A WORK ORDER/Image

- What is it the data telling you ?
- What is the repair history ?
- What is the regen frequency ?
- Does it have a history of frequent fault codes being cleared(audit trail) ?
- What codes are logged – Are they related ?
- How many hours since DPF cleaning or has it been clean ?
- Have EGR port plugging been checked ?
- Using Oil or Coolant ?
- How long has the unit run to compare after regen frequency ?
- Start with the easy checks !

ALWAYS Create Insite Work Orders

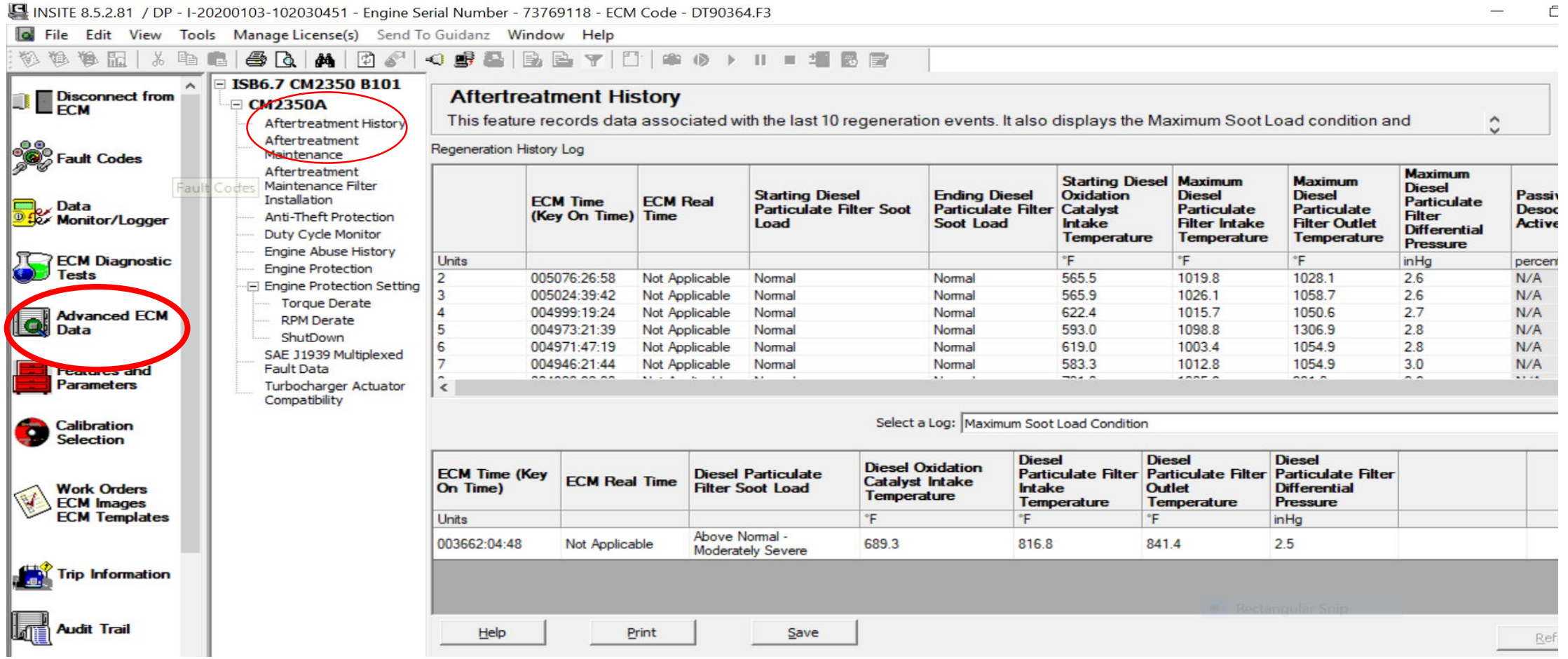
PLEASE add the *UNIT Number and Name* to your work orders



Regen History – Insite

The last 10 regens completed are stored in the Insite ECM image

- Advanced ECM Data – Aftertreatment History **(Using image analyzer is much easier)**

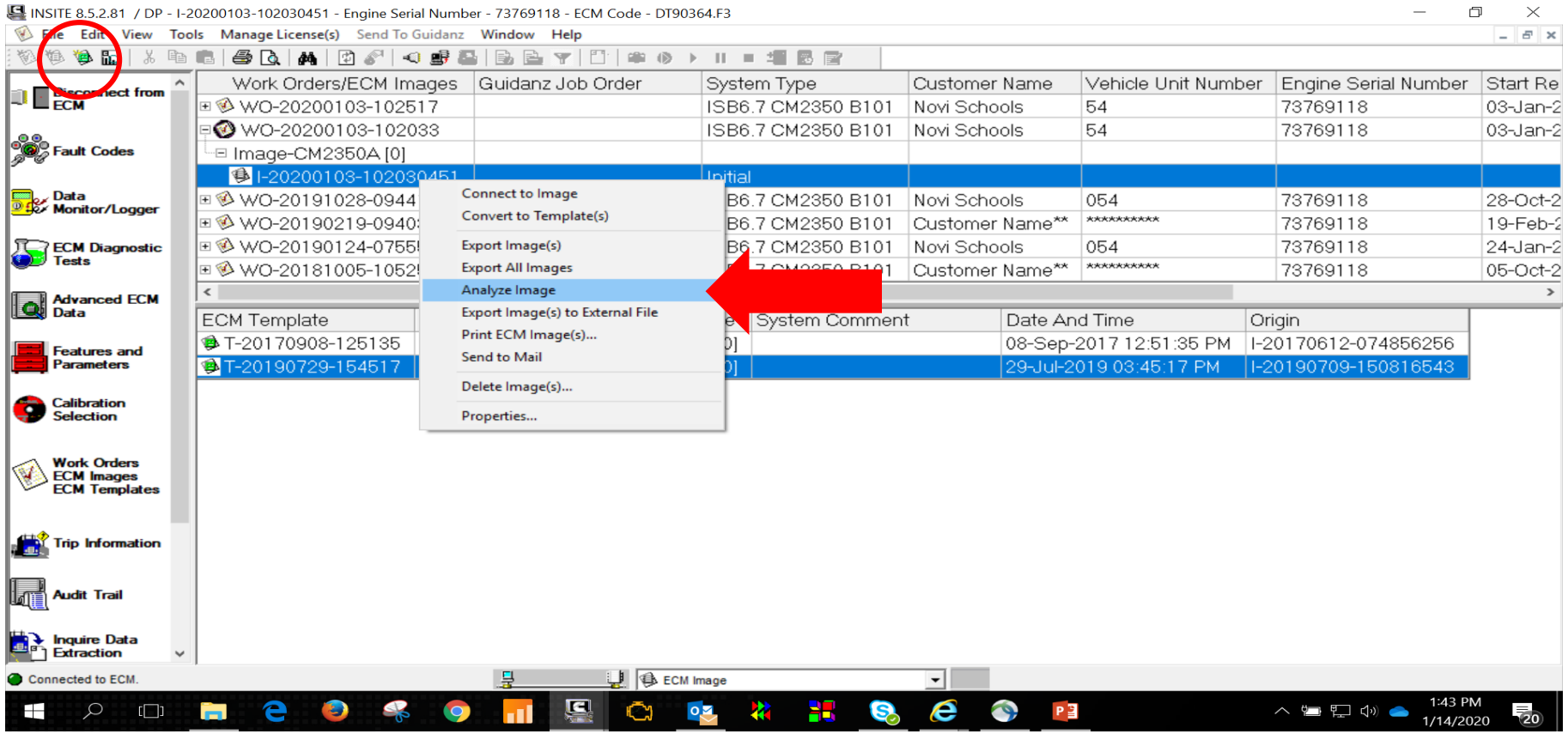


	ECM Time (Key On Time)	ECM Real Time	Starting Diesel Particulate Filter Soot Load	Ending Diesel Particulate Filter Soot Load	Starting Diesel Oxidation Catalyst Intake Temperature	Maximum Diesel Particulate Filter Intake Temperature	Maximum Diesel Particulate Filter Outlet Temperature	Maximum Diesel Particulate Filter Differential Pressure	Passi Desoc Active
Units					°F	°F	°F	inHg	percen
2	005076:26:58	Not Applicable	Normal	Normal	565.5	1019.8	1028.1	2.6	N/A
3	005024:39:42	Not Applicable	Normal	Normal	565.9	1026.1	1058.7	2.6	N/A
4	004999:19:24	Not Applicable	Normal	Normal	622.4	1015.7	1050.6	2.7	N/A
5	004973:21:39	Not Applicable	Normal	Normal	593.0	1098.8	1306.9	2.8	N/A
6	004971:47:19	Not Applicable	Normal	Normal	619.0	1003.4	1054.9	2.8	N/A
7	004946:21:44	Not Applicable	Normal	Normal	583.3	1012.8	1054.9	3.0	N/A

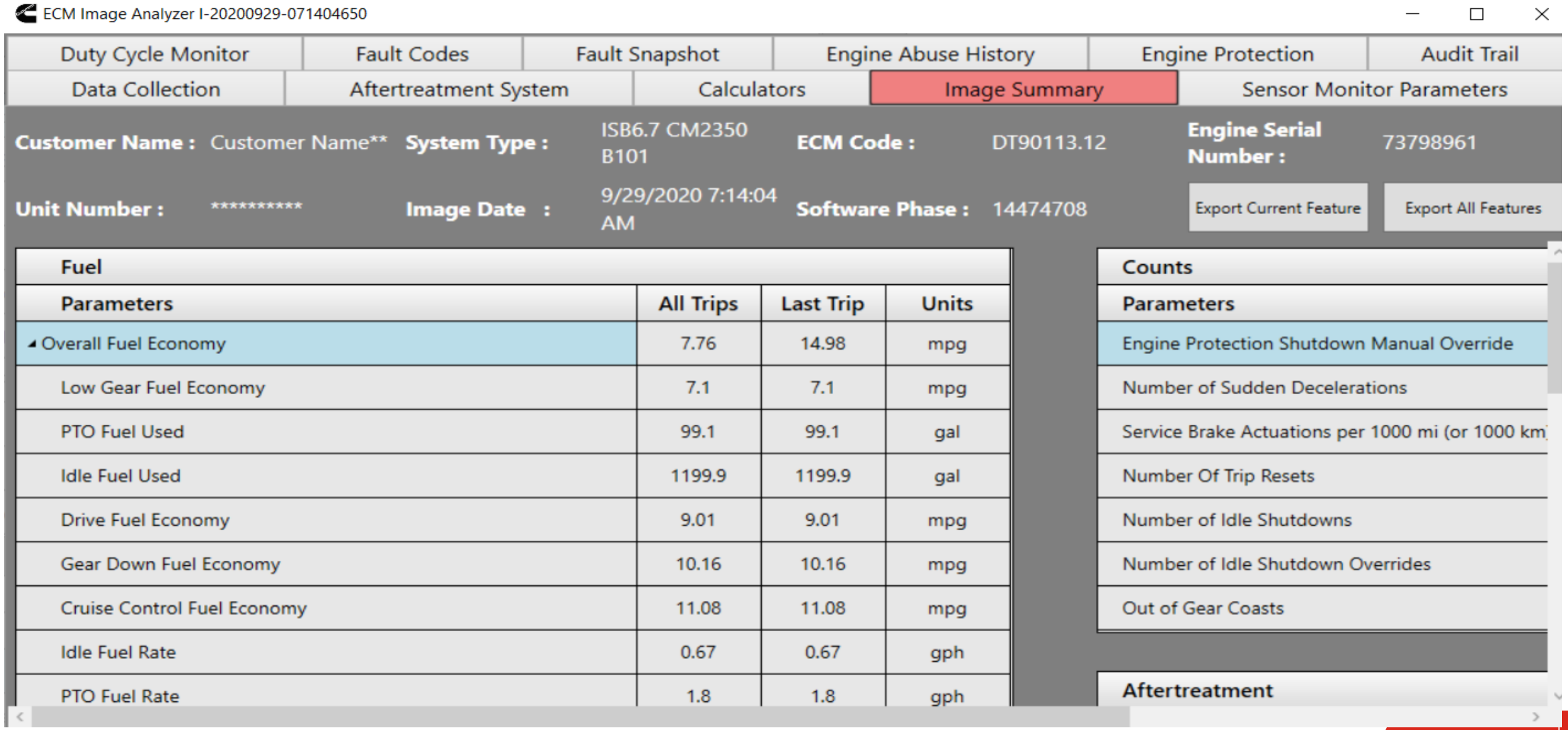
ECM Time (Key On Time)	ECM Real Time	Diesel Particulate Filter Soot Load	Diesel Oxidation Catalyst Intake Temperature	Diesel Particulate Filter Intake Temperature	Diesel Particulate Filter Outlet Temperature	Diesel Particulate Filter Differential Pressure
Units			°F	°F	°F	inHg
003662:04:48	Not Applicable	Above Normal - Moderately Severe	689.3	816.8	841.4	2.5

Regen History – ECM Image Analyzer

- ECM image analyzer is much easier to read and use – It converts into an easy to read format
- You must have a ECM work order/image to convert
- Right Click the third line down on the ECM image – or once third line is highlighted you can use the 4th Icon – double click either and the ECM image analyzer will run
- It will open the image analyzer in multiple tabs



ECM/Work Order Image Analyzer



Mobile Regen Timer Schedule

- ISB – CM2150 – EPA 2007 (2007-2009) – 96 hrs.

2007-09 EPA engines in School buses generally will not run on the timer

- ISB – CM2250 – EPA 2010 (2010-2012) – 24 hrs
- ISB – CM2350 – EPA 2013 (2013-2016) – 24 hrs
- B6.7 – CM2350 – EPA 2017(2017- Current) - 24 hrs.

Occasional off timer event can be normal due to operation of that vehicle

ISB CM2350 – School Bus – Normal - Regens on the timer

ECM Time (Key On Time)	ECM Time (Real Time)	Time Since Previous Regeneration	Starting Diesel Particulate Filter Soot Load	Ending Diesel Particulate Filter Soot Load	Starting Diesel Oxidation Catalyst Intake Temperature	Diesel Particulate Filter Intake Temperature	Diesel Particulate Filter Outlet Temperature	Diesel Particulate Filter Differential Pressure
004517:42:47	Not Available	24:38:12	Normal	Normal	614.5	966.9	1020.9	1.3
004493:04:35	Not Available	24:24:36	Normal	Normal	566.0	1045.0	1012.3	0.5
004468:40:00	Not Available	24:21:00	Normal	Normal	621.5	980.8	1038.0	1.5
004444:18:59	Not Available	24:27:26	Normal	Normal	633.7	1008.7	1004.9	1.2
004419:51:34	Not Available	24:24:16	Normal	Normal	498.9	1007.8	1011.9	1.3
004395:27:18	Not Available	24:28:18	Normal	Normal	588.9	994.1	983.6	1.0
004370:59:00	Not Available	24:59:04	Normal	Normal	602.2	1007.4	1006.9	1.3
004345:59:56	Not Available	24:44:54	Normal	Normal	563.3	1056.5	965.5	0.9
004321:15:02	Not Available	24:24:59	Normal	Normal	570.7	1006.9	1059.6	1.6
004296:50:02	Not Available	-	Normal	Normal	567.8	1014.2	1021.1	1.2
Average :	-	24:32:31	-	-	-	1008.83	1012.47	1.18
Standard Deviation :	-	0:11:48	-	-	-	25.25	24.79	0.3

ISB CM2350 School Bus – Bad - Off timer – Plugged EGR ports & EGR cooler

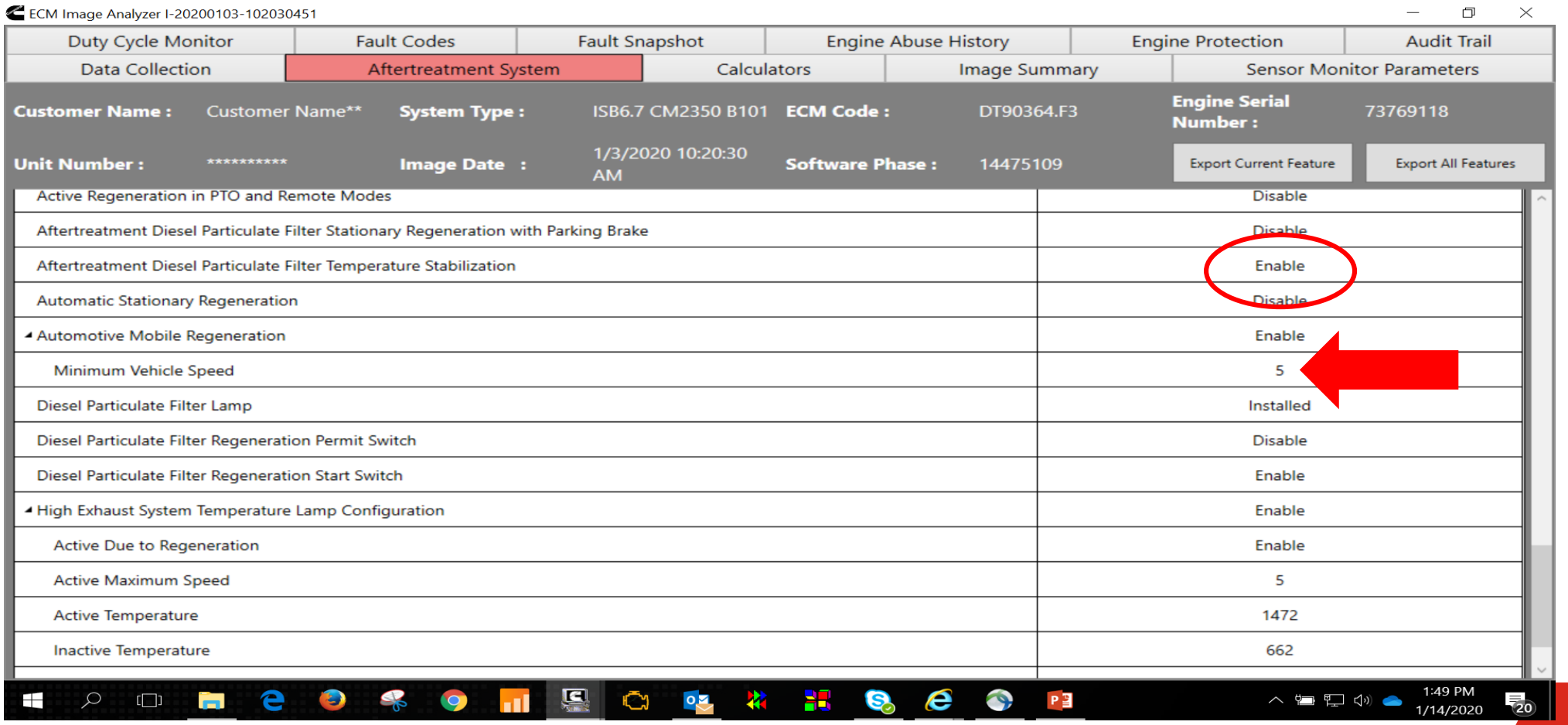
ECM Time (Key On Time)	ECM Time (Real Time)	Time Since Previous Regeneration	Starting Diesel Particulate Filter Soot Load	Ending Diesel Particulate Filter Soot Load	Starting Diesel Oxidation Catalyst Intake Temperature	Maximum Diesel Particulate Filter Intake Temperature	Maximum Diesel Particulate Filter Outlet Temperature	Maximum Diesel Particulate Filter Differential Pressure
005606:20:58	Not Applicable	6:09:38	Normal	Normal	562.6	952.5	1123.0	3.6
005600:11:19	Not Applicable	1:40:11	Normal	Normal	614.8	946.4	1072.0	1.9
005598:31:09	Not Applicable	2:01:09	Above Normal - Least Severe	Normal	441.3	1012.1	1095.8	0.7
005596:30:00	Not Applicable	2:08:32	Above Normal - Least Severe	Normal	342.5	1008.1	1104.1	1.2
005594:21:28	Not Applicable	11:04:06	Above Normal - Least Severe	Above Normal - Least Severe	584.6	912.2	1006.0	4.2
005588:13:22	Not Applicable	1:01:11	Normal	Normal	442.6	954.4	1061.9	2.2
005582:11:11	Not Applicable	10:01:34	Above Normal - Least Severe	Normal	612.8	1026.5	1100.8	4.6
005572:14:36	Not Applicable	7:59:19	Normal	Normal	593.0	897.6	995.3	2.9
005564:15:18	Not Applicable	25:08:40	Normal	Normal	566.2	962.4	1043.9	4.3
005539:06:38	Not Applicable	-	Normal	Normal	595.6	976.4	1025.8	3.7
Average :	-	**7:28:15**	-	-	-	**964.96**	**1062.86**	**2.93**

Insite Regen

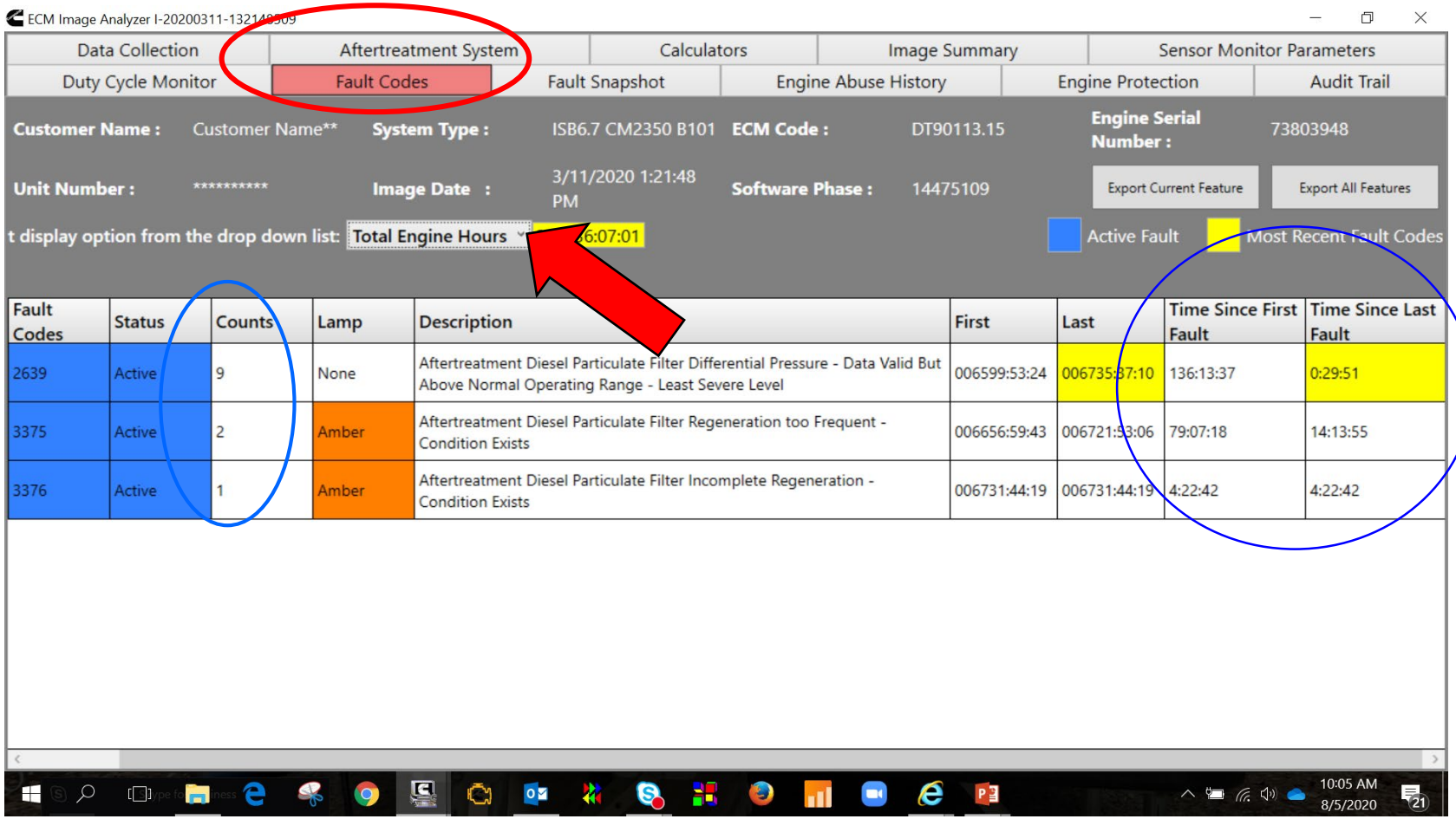
Not on the timer

Regen Speed Settings – Image Analyzer – Quick look to verify settings are correct

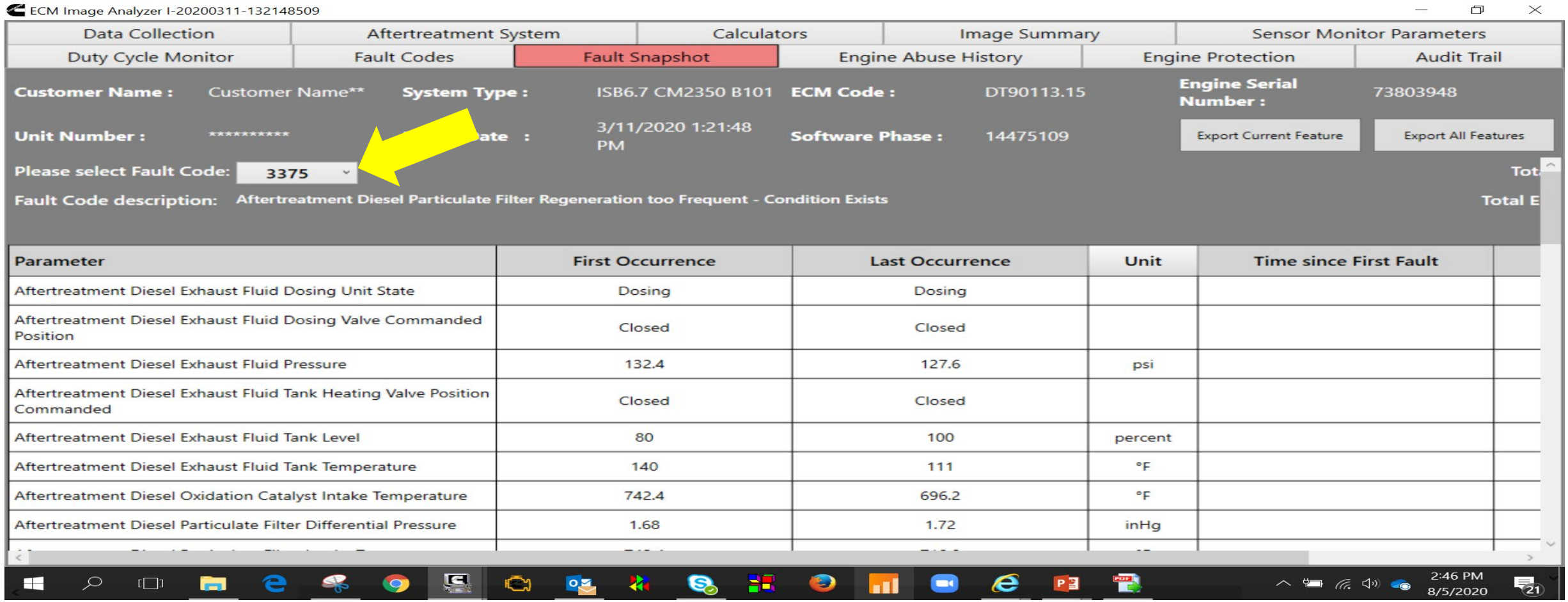
Scroll down below the regen frequency to review how the vehicle is set up in features and parameters



Click the Fault Code Tab – You can toggle to engine hours (from ECM time) Displays the time since first and time since last
Fault code counts & Active Inactive



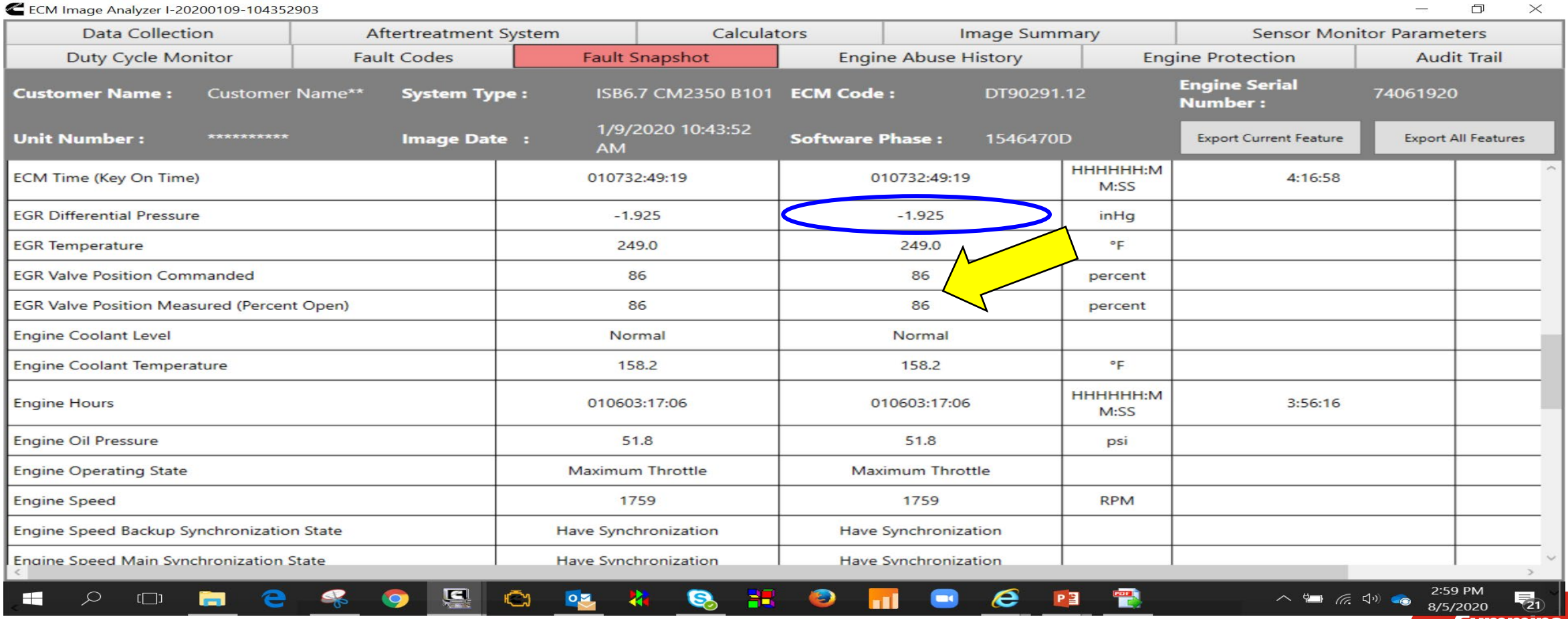
Fault Snapshot tab – Toggle between FC's to look at first and last engine parameter details when code(s) logged



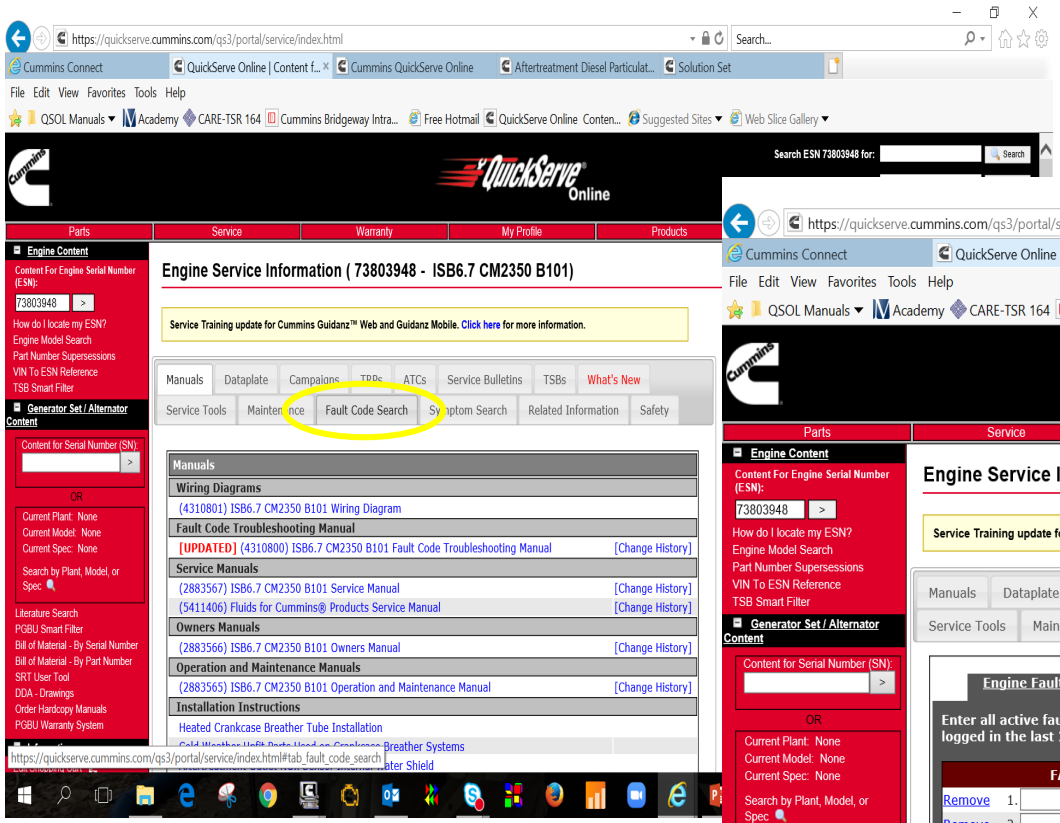
This example FC3382 snap shot data – EGR flow error

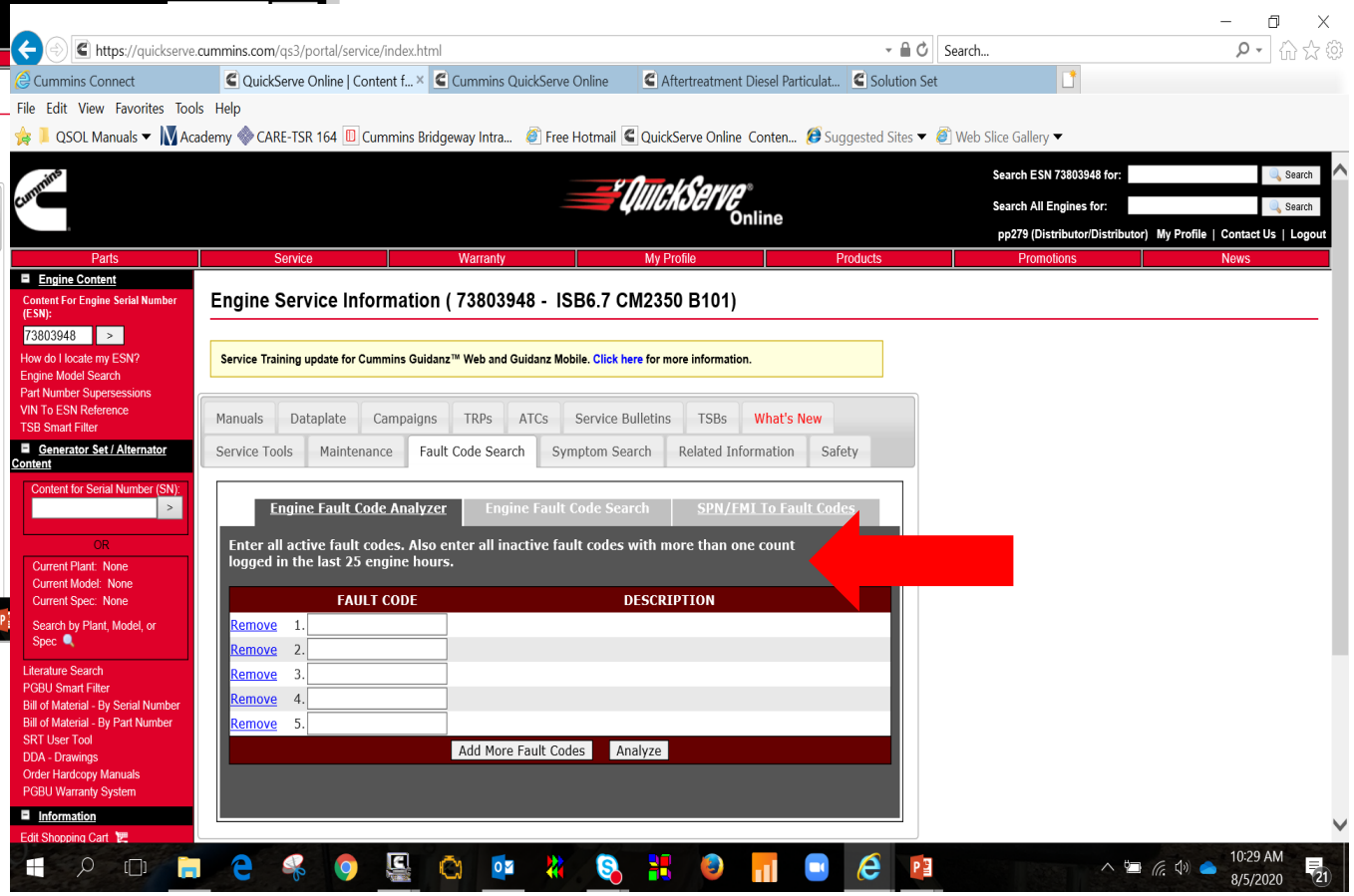
Note EGR is commanding 86% and flow is -1.9 – EGR port plugging ?

Reviewing and understanding snap shot data can help your investigation

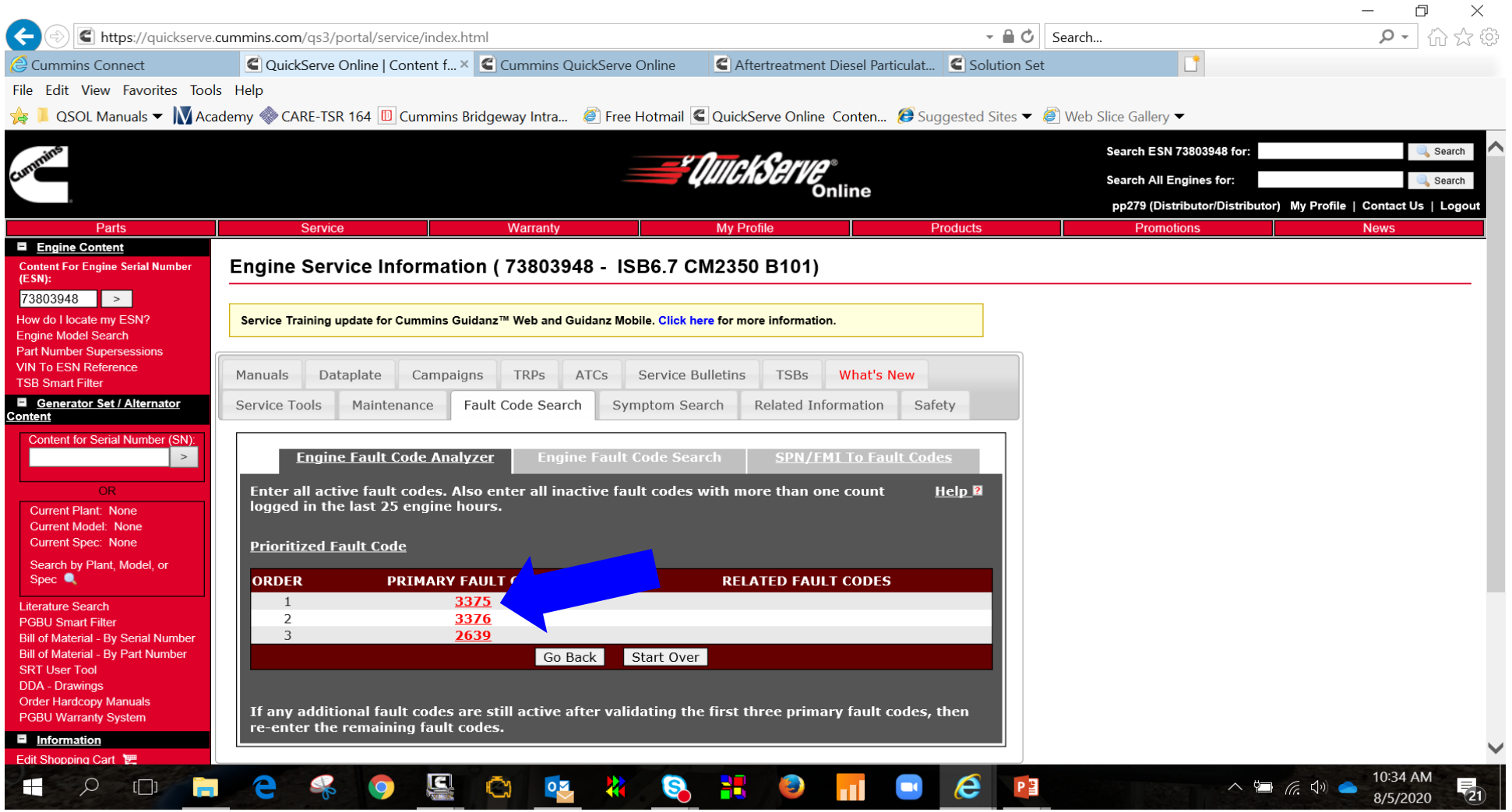


Fault Code Analyzer - QSOL – Enter ESN – FC Search – Enter FC's All Active & IA with more than one count in past 25 hrs





Enter Codes – Hit Analyze Button – In this case, all should FC's should be investigated and completed in the *order listed* 1-2-3 – click the link to the tree - When going through each FC T/shooting, some steps may be covered in prior FC's – Don't assume by fixing FC#1 it fixes 2 & 3



Clearing Fault Codes

- **DO *NOT* CLEAR** fault codes with the hope that will fix the issue –
- You must look at everything!

“conditions for running the diagnostics”

“conditions for setting the fault code”

“actions taking when fault code is active”

“conditions for clearing the fault code”

Doing a “Reset All” may not clear the MIL lamp and eliminate the de-rate. It is possible the conditions for running the diagnostics (trips) have not been met so it will not meet the conditions for clearing the FC and associated de-rate

The fault code may clear, but MIL lamp could remain on, with de-rate still active

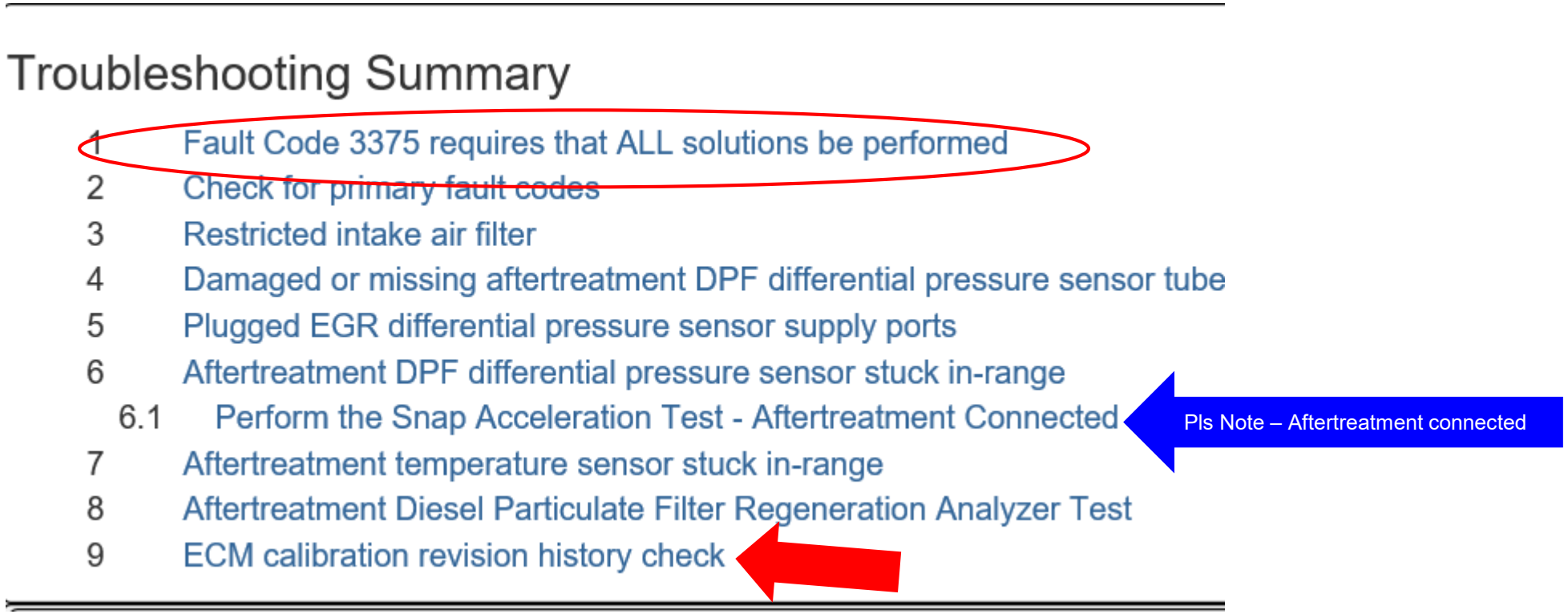
Clearing Fault Codes

- ***DO NOT Clear fault codes if you are going to sending it to a dealer or Cummins Distributor for repair***
- ***No repair can be made without codes in the ECM***
- Writing down the codes only provides a very small portion of what is needed in proper troubleshooting
- If you do clear codes – ALWAYS create a Insite work order (Image)

The ECM image can be sent to the repair location in .eif format and loaded into that locations Insite program for review

If a FC diagnostic step states "requires that ALL solutions be performed" – *Every step must be completed*

Even if you find EGR ports plugged on step (5) all of the following steps must be verified (9) – ECM calibration rev history check is almost always last, generally "this helps prevent" future occurrences but may not always fix the current issue by just calibrating



Diagnostic Tests

Insite – Tests

Example - FC 3375 – Step 8 directs to run DPF regen analyzer test

Aftertreatment DPF Regen Analyzer Test 014-027 Shop Manual

The Aftertreatment Diesel Particulate Filter (DPF) Regeneration Analyzer Test is a diagnostic test used to identify malfunctioning engine performance components. The test is located in INSITE™ electronic service tool under the Diagnostic Tests tab.

- This test will take approximately 30 to 60 minutes to complete.
- The test status will be shown in the status window.
- Test description window
- Instructions window
- Status window
- Status bar - shows progress of the test (will disappear when the test is complete).

014-027 Aftertreatment DPF Regen Analyzer Test

The Aftertreatment Diesel Particulate Filter Regeneration Analyzer Test requires:

- INSITE™ electronic service tool version 8.4.1
- Minimum of 250 MB of available computer hard drive space before starting the test.

The Aftertreatment Diesel Particulate Filter Regeneration Analyzer Test is only to be used when directed by published troubleshooting.

During the test is will have a status box – This section is used to assist troubleshooting abort messages from the Status Window and displays failure messages in numerical order

- **Abort messages** - displayed in the Status Window. The most recent message will appear at the bottom.
- **Analyzing the data** - Troubleshooting for individual messages is contained in the table. Multiple messages are to be addressed in ***numerical order***. (Section 014-027)

014-027 Aftertreatment DPF Regen Analyzer Test – Shop Manual

- **(455-014-008) Engine Testing (In Chassis)**
- (100-014-010) Crankcase Blowby, Measure
- (493-014-016) Aftertreatment Diesel Particulate Filter (DPF) Regeneration Test
- (493-014-017) Snap Acceleration Test
- (99-014-024) Fluorescent Tracer Dye Test
- (493-014-025) Aftertreatment Selective Catalytic Reduction (SCR) System Test
- **(455-014-027) Aftertreatment Diesel Particulate Filter Regeneration Analyzer**

Section 16 - Mounting Adaptations - Group 16

Section 17 - Miscellaneous - Group 17

Section 19 - Electronic Controls - Group 19

Section L - Service Literature

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014-027 Aftertreatment Diesel Particulate Filter Regeneration Analyzer

General Information

The Aftertreatment Diesel Particulate Filter (DPF) Regeneration Analyzer Test is a diagnostic used to identify malfunctioning engine performance components. The test is located in INSITE™ electronic service tool under the Diagnostic Tests tab.

LARGE

This test will take approximately 30 to 60 minutes to complete.

The test status will be shown in the status window.

1. Test description window
2. Instructions window
3. Status window
4. Status bar - shows progress of the test (will disappear when the test is complete).

If the test fails, refer to shop manual for explanation of individual messages.

Multiple messages are to be addressed in numerical order.

The test has 23 possible messages

014-027 Aftertreatment Diesel Particulate Filter Regeneration Analyzer

4	EGR differential pressure is above specification.	Perform all the following checks: • Clean and inspect the EGR valve. Refer to Procedure 011-022 in Section 11. • Clean and inspect the EGR differential pressure sensor. Refer to Procedure 019-370 in Section 19. • Check the EGR differential pressure sensor reading in INSITE™ electronic service tool with the keyswitch on and engine off. If the EGR differential pressure sensor is **not** 0 ±2 kpa [0 ±0.3 psi], replace the sensor. Refer to Procedure 019-370 in Section 19.

SCR System Test

Insite Tests - SCR – Test is checking SCR system

Aftertreatment Selective Catalytic Reduction (SCR) System Test 014-025

ISB/B6.7 – (2013MY – Current)

Diagnostic test is used to identify malfunctioning aftertreatment SCR system components. The test is located in INSITE™ electronic service tool under the diagnostic tests tab.

The test consists of the following subtests.

- Aftertreatment Warm-Up and Diesel Exhaust Fluid (DEF) Dosing System Test
- Aftertreatment SCR Deposit Burn Test
- Aftertreatment Nitrogen Oxides (NOx) Sensor Rationality Test
- Aftertreatment SCR Catalyst Test.
- The SCR system test will display the status of each of the subtests in the subtest status window.
- The SCR system test will take approximately 60 to 80 minutes to complete.

014-025 Aftertreatment Selective Catalytic Reduction (SCR) System Test

Requirements

Check the engine control module (ECM) calibration revision history for calibration updates for this test. If the ECM does not contain that revision or higher, update the calibration. Refer to Procedure 019-032 in Section 19.

The SCR system test should only be used when directed by a service procedure, fault code troubleshooting tree, symptom troubleshooting tree, or expert diagnostic system (EDS).

The SCR system test has status message box – refer 014-025 for error messages if will not complete

Section 014-025 gives details on pass/fail results for each section test

*Refer to **TSB170033** if engine runs rough during test – Requires ECM update to correct*

Since we have open campaigns for SCR replacement on most ISB CM2250 MY2010-2012 and ISB CM2350 – MY2013-2014 - If directed to run the SCR test on one of the engines, check status on QSOL for possible coverage

014-025 Aftertreatment Selective Catalytic Reduction (SCR) System Test

Insite will display pass or fail – Depending on what portion of the test fails will determine the next step – Repair manual section 014-025 has details and direction

SMALL | MEDIUM | LARGE

Aftertreatment SCR System Test Screen

1. Subtest Status - All Passed
2. Main Status Window Shows Test Complete
3. Pop-up message appears when test is complete.

Regen Updates

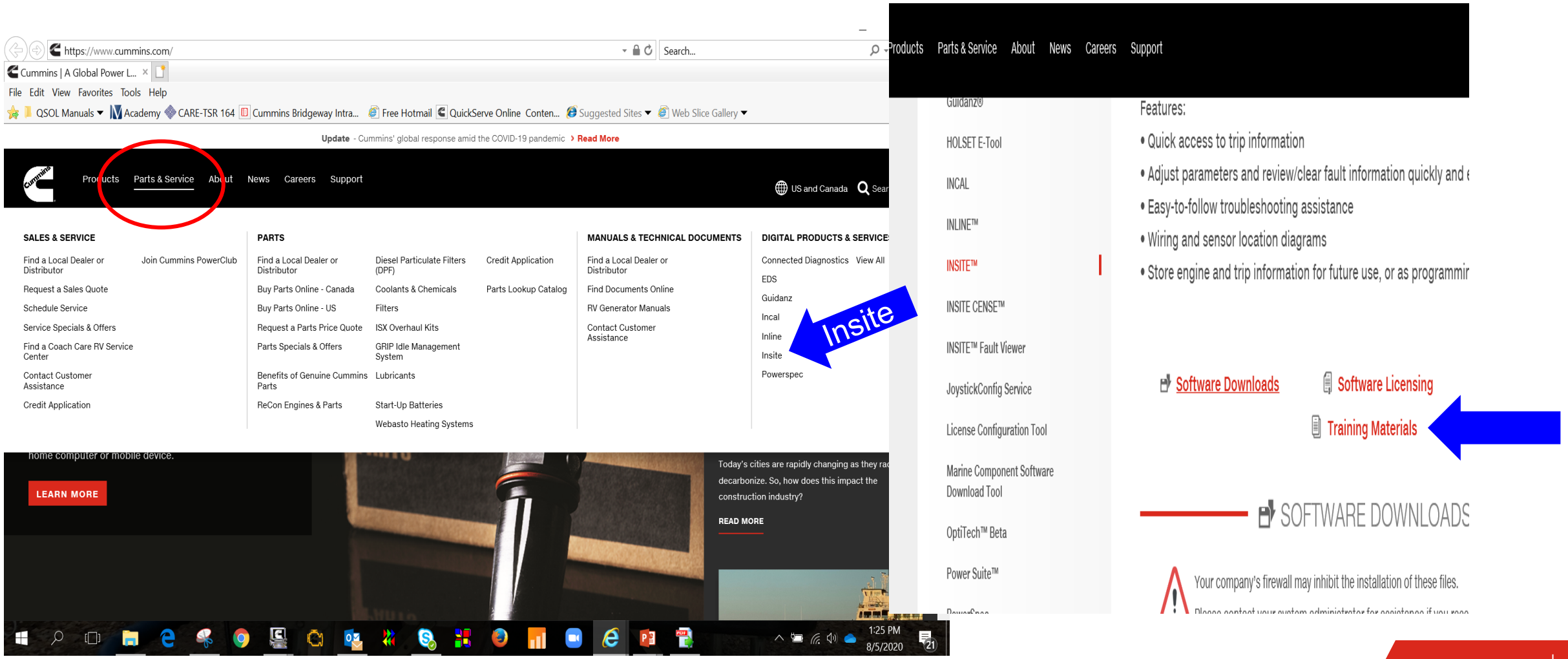
Insite Support QuickServe – Online Training

Insite Support 1-800-Cummins

Issues or problems with Insite or questions – Call **1-800-Cummins** (1-800-286-6467) or go to www.cummins.com

Insite or QSOL renewal or subscription 1-888-861-5123 or ***subscription.support@cummins.com***

Insite use reference training document – Go to www.cummins.com – Parts & Service – Insite – Training materials



Insite Overview – You can print to PDF or read online

TRAINING MATERIALS

- INSITE Overview, updated 3/19/2018 (Size: 6 MB)
- Visão Geral do INSITE, in Brazilian Portuguese (Size: 7 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 Export/Backup/Email Work Order Image(s) (Size:0.5 MB)

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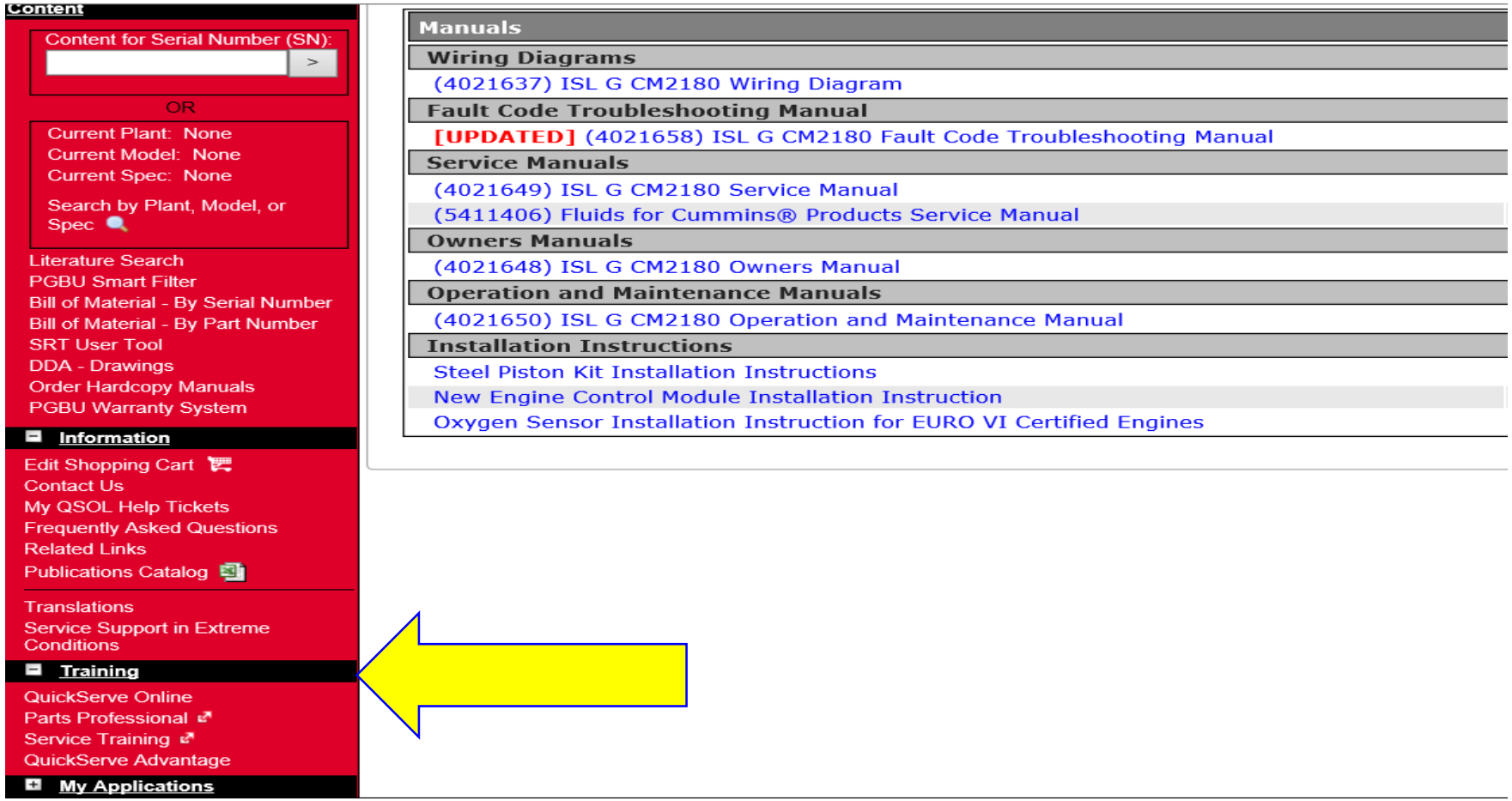
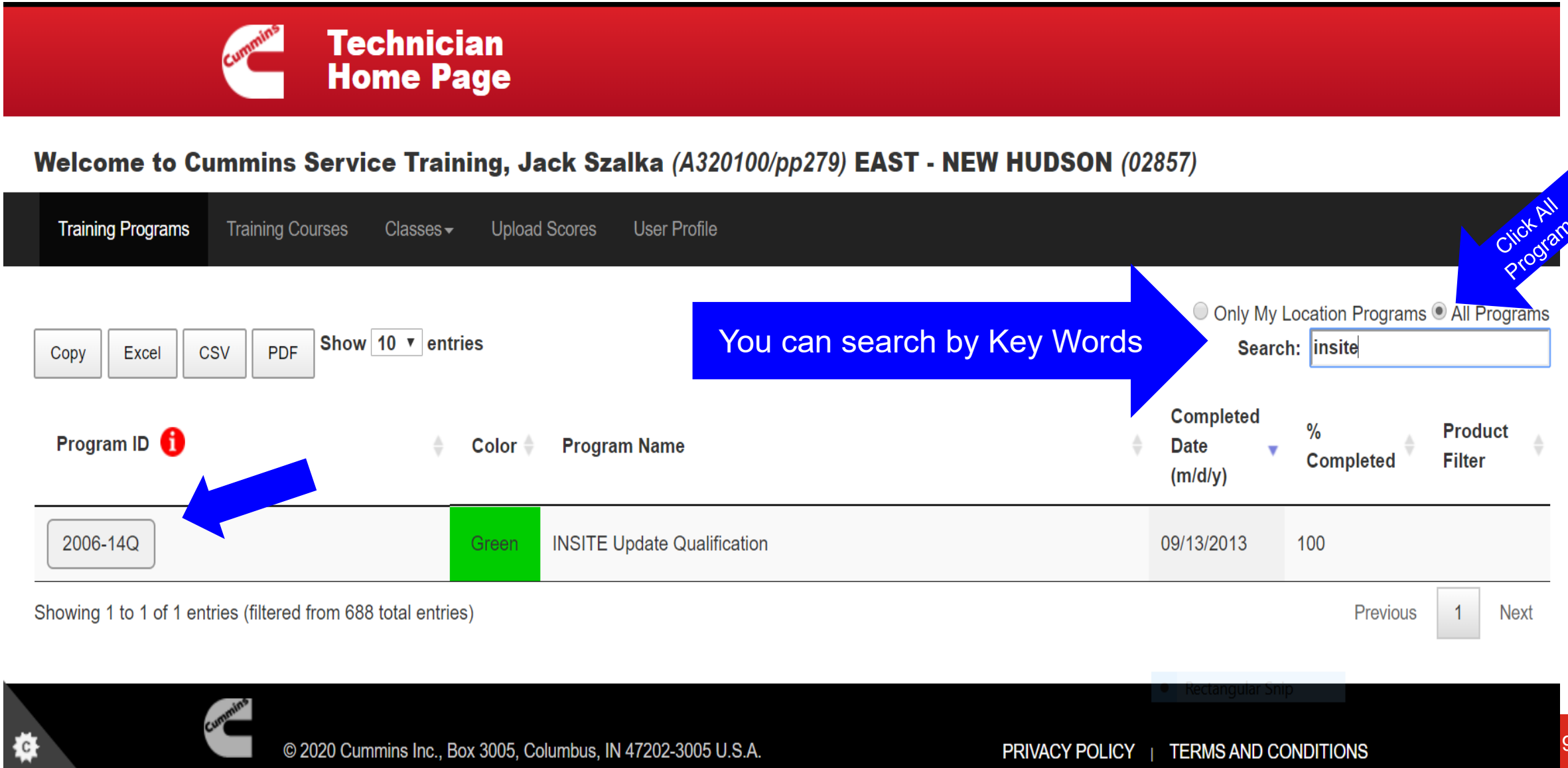
QuickServe Online Service Training

You must be registered with individual login ID's and passwords – No extra charge for access

Log in using you QSOL account login and click the link to the training database



QSOL – Online Training



QSOL – Click Hyperlink to start – Estimated course time is listed for each module and for entire course

Program Guide Details

Qualification Program ID: **2006-14Q** Program Name: **INSITE Update Qualification**

Download Program Guide For CD

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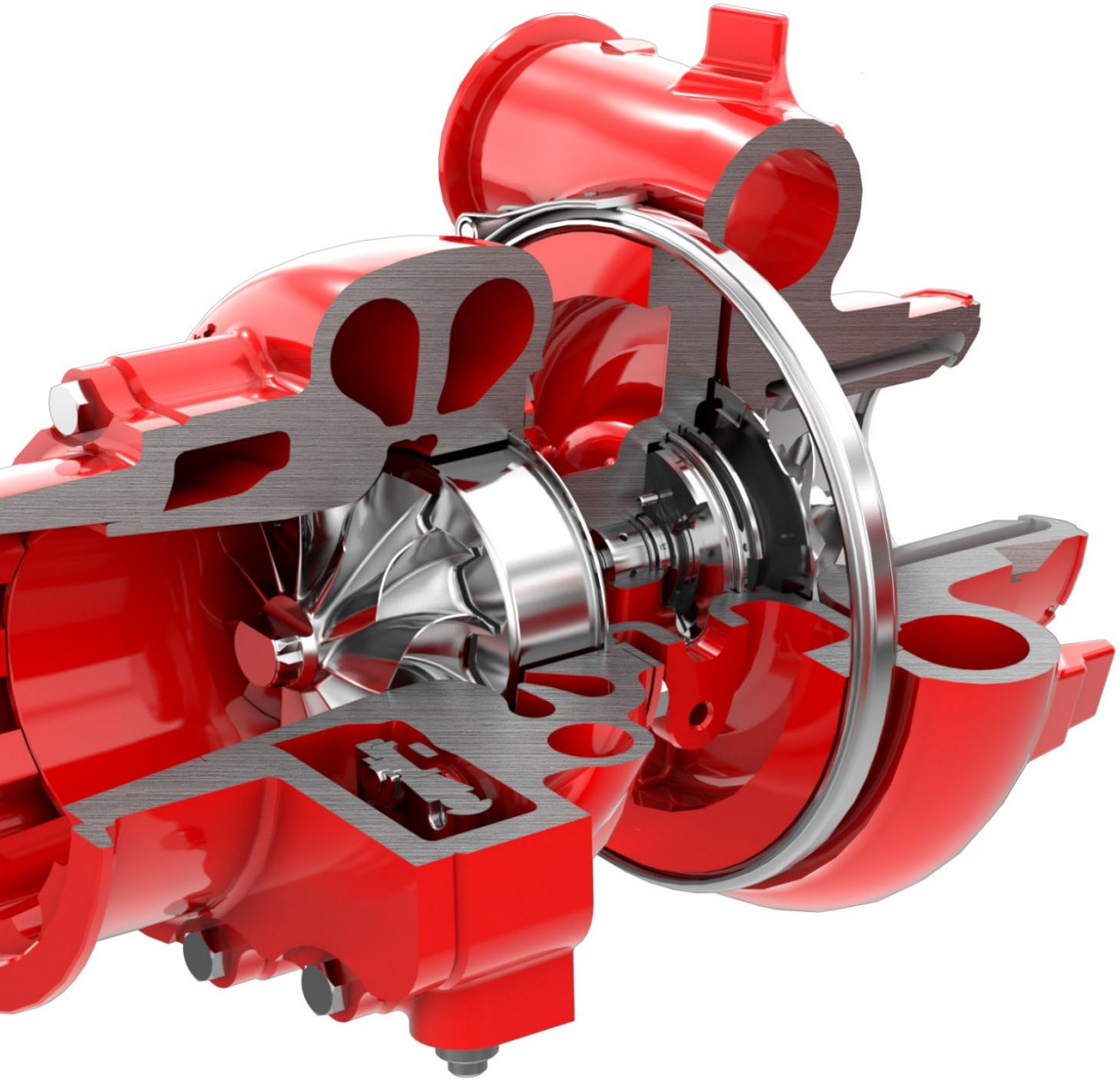
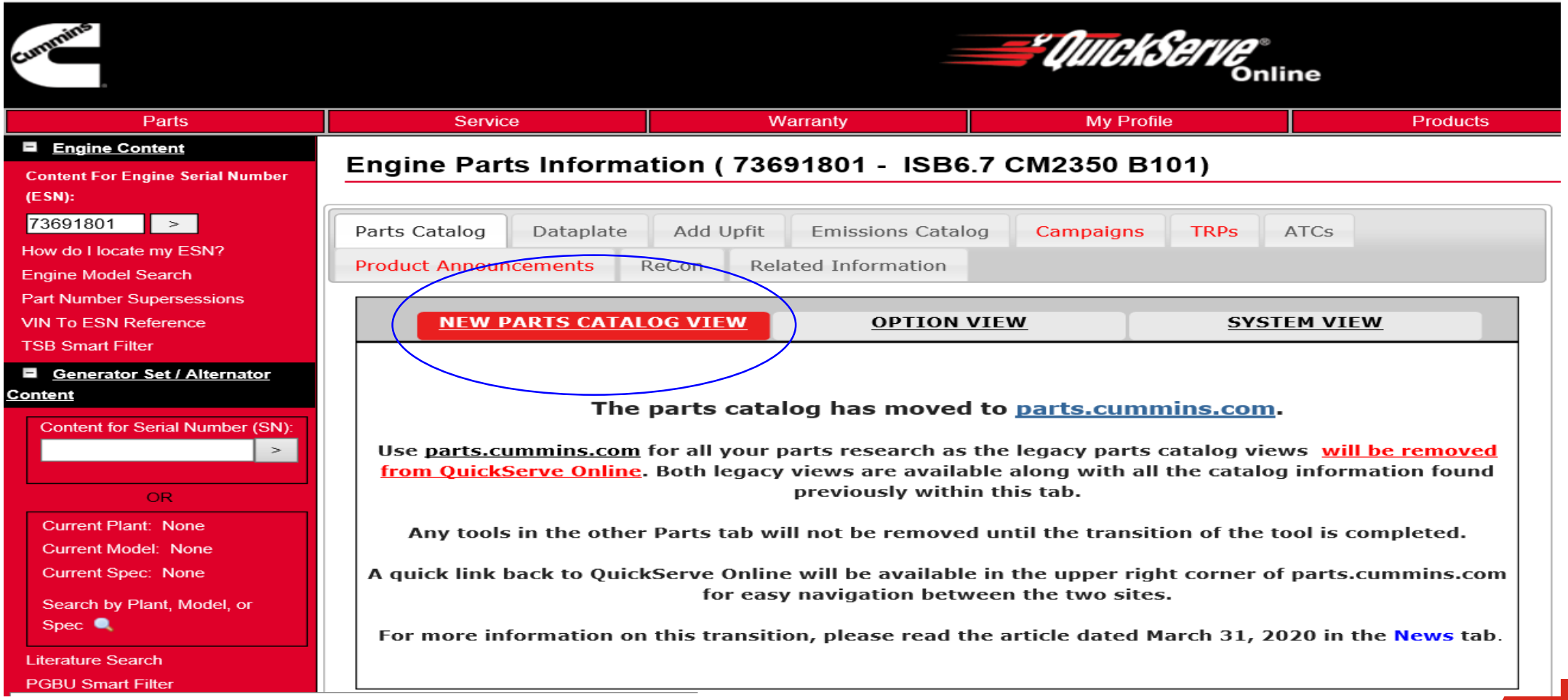
Search:

Course ID	Course Name	Course	Course Time	Course Type	CD ROM ID	Completed Date
1027	Insite - Windows Familiarization	1	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1028	Insite Registering And Fuctionality	2	0.2 hours	Online	Gen-6 (4091911)	06/29/2007
1029	Insite - Operation	3	0.6 hours	Online	Gen-6 (4091911)	06/29/2007
1030	Insite - Read And Reset Fault Codes	4	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1031	Insite - Diagnostic Operation	5	0.2 hours	Online	Gen-6 (4091911)	06/29/2007
1027	Insite - Windows Familiarization	1	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1028	Insite Registering And Fuctionality	2	0.2 hours	Online	Gen-6 (4091911)	06/29/2007
1029	Insite - Operation	3	0.6 hours	Online	Gen-6 (4091911)	06/29/2007
1030	Insite - Read And Reset Fault Codes	4	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1031	Insite - Diagnostic Operation	5	0.2 hours	Online	Gen-6 (4091911)	06/29/2007
1032	Insite - Reading And Adjusting Features And Parameters	6	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1033	Insite - Ecm Calibration	7	0.3 hours	Online	Gen-6 (4091911)	06/29/2007
1034	Insite - Multimodule Calibration	8	0.2 hours	Online	Gen-6 (4091911)	06/29/2007
1035	Insite - Ecm Data	9	0.3 hours	Online	Gen-7 (4091912)	06/29/2007
1036	Insite - Work Orders	10	0.2 hours	Online	Gen-7 (4091912)	06/29/2007
1037	Insite - Printing And File Manipulation	11	0.2 hours	Online	Gen-7 (4091912)	06/29/2007
1057	INSITE 7.2 Update	12	0.2 hours	Online	Gen-17 (4091958)	02/01/2010
1140	INSITE 7.5 Update	13	0.4 hours	Online	Gen-25 (4092012)	09/13/2013
All	Total Hours		3.7 hours		Hours Remaining	0 hours

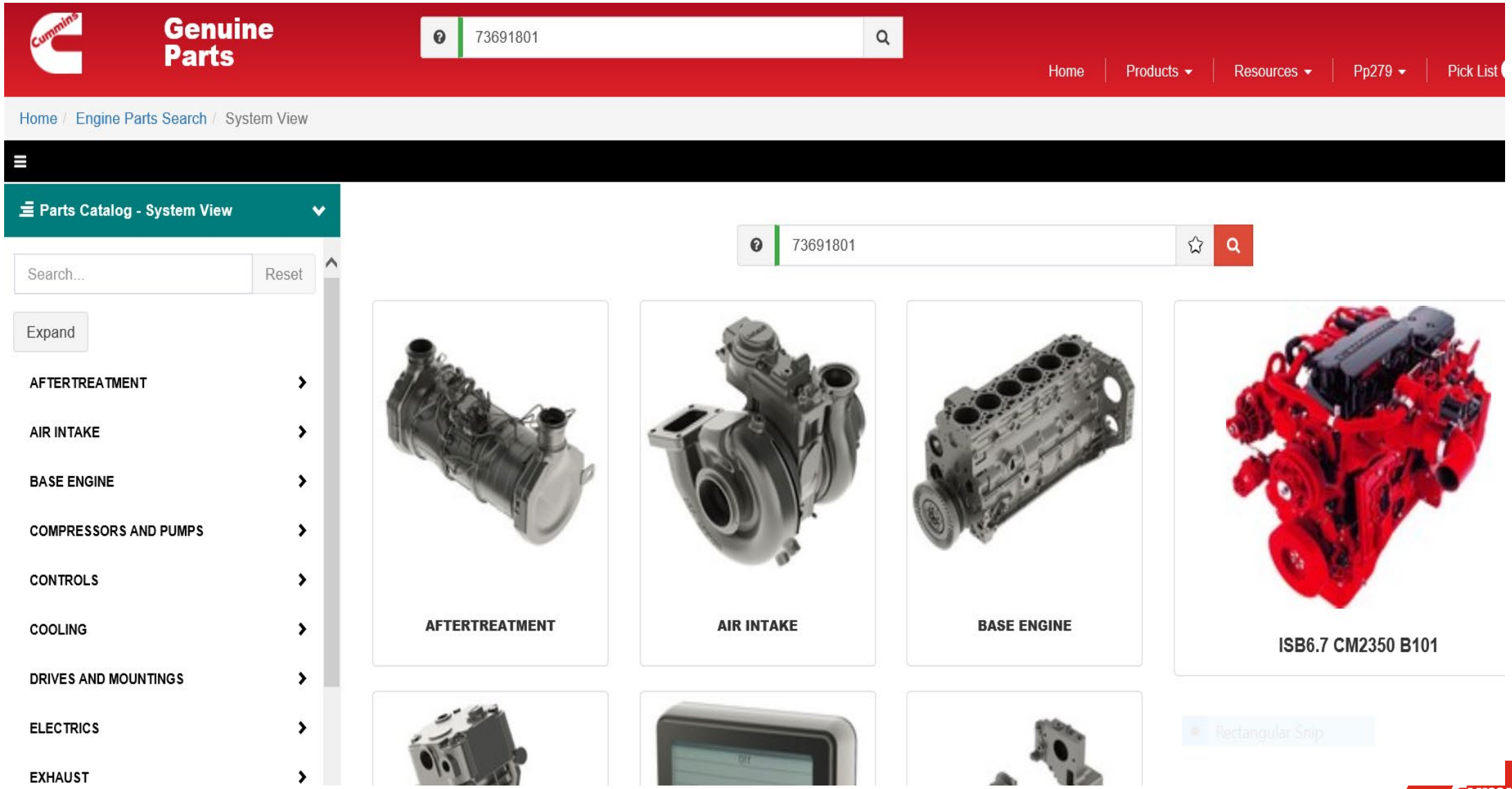


QuickServe – Parts

New Parts Catalog View – parts.cummins.com - We are converting over and the original QSOL parts look-up still works but migrate over



Layout of parts.cummins.com



Genuine Parts

73691801

Home | Products | Res

Home / Engine Parts Search / System View / System Details / Option Details

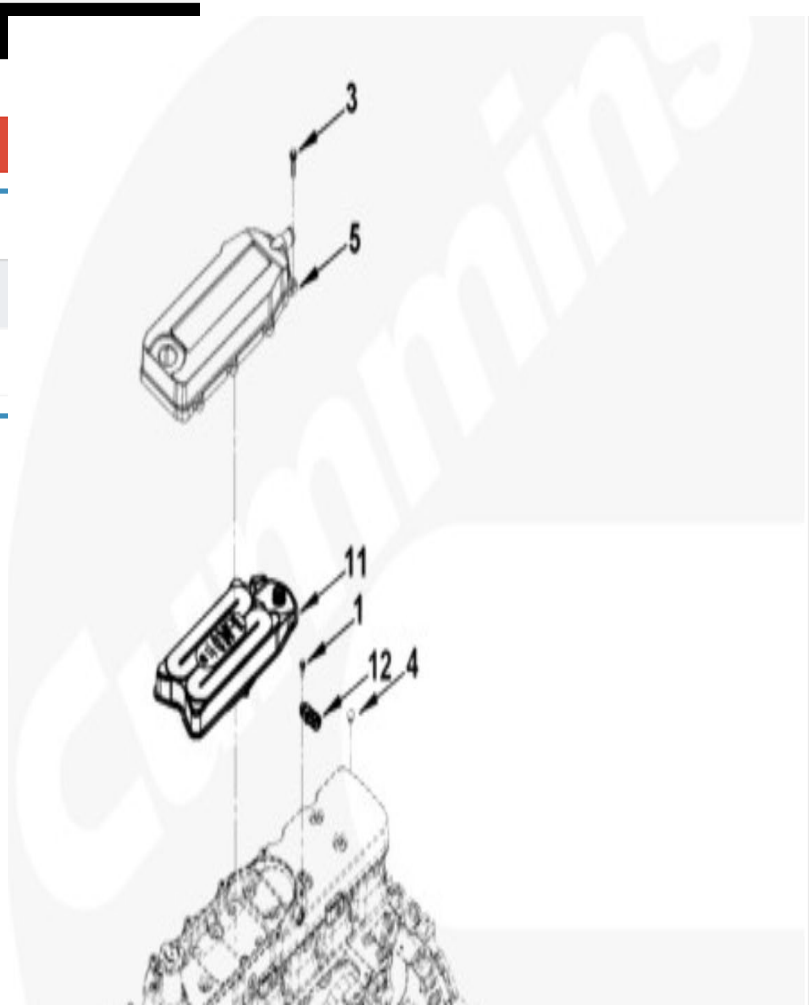
73691801

Graphics for Crankcase Breather

Option	Description	Group	Plant Code
BR9311-03	Crankcase Breather	03.02	87

Remarks

Crankcase Breather
Engine Family: B Series
Breather Type: Open
Filter Supply Method: Mounted
Fuel Type: Diesel
Plumbing Mtg Responsibility: Cummins
Breather Loc: Valve Cover
Engine Cylinders: 6
Engine Aspiration: CAC, Turbocharged
Breather Drain Loc: External Oil Drain Tube in Crankcase



Ref	Part Number	Description
1	3968475	Screw, Hex Flange Head Cap
2	3900630	Screw, Hex Flange Head Cap
3	3902023	Screw, Hex Flange Head Cap
4	3905368	Expansion Plug
5	4989994	Breather Cover
6	3939258	Cover Plate Gasket
7	4931725	Accessory Hole Cover
8	4932701	Plain Hose Coupling
9	4934496	Plain Hose Coupling
10	5255740	Lubricating Oil Drain Tube
11	4936636	Breather Element
12	4984575	Pressure Sensor

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**

Q+A


Cummins