


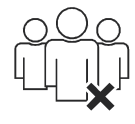
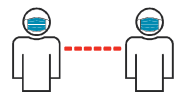
QSK78 CM2350 K137 Familiarization

Orlando Quispe

15/02/2021

1

- Mantener la distancia (1.5m)
- Evitar aglomeraciones y/o reuniones
- Si vas a salir usa mascarillas



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- Mantener cuarentena
- Lavarse cte. Las manos
- Cubrirte al toser o estornudar
- Limpieza en el área con implementos adecuados



OBJETIVOS

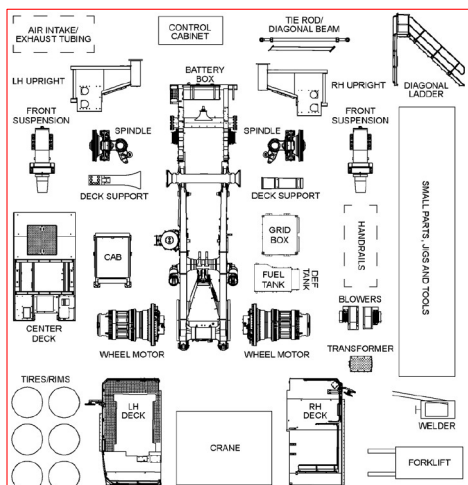
Al finalizar este curso, el técnico será capaz de:

- Comprender el desglose del QSK78 CM2350 Nombres de motor K126 y K137, que describen el motivo de la introducción del motor,
- describir la información de servicio disponible, reconocer e identificar visualmente el motor,
- describir las especificaciones del motor, identificar la placa de datos y las ubicaciones de estampación del número de serie, y
- describir las características y componentes del motor.

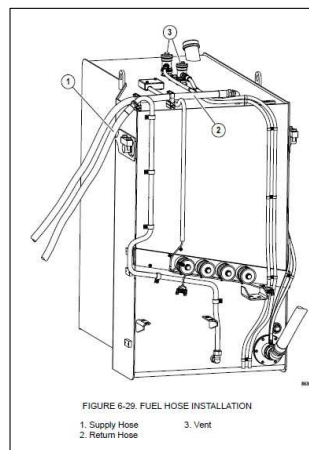
REGLAS DE CLASE

- ¡Diviértete!
- Hacer preguntas. Si no lo entiende, pregunte ...
- Si tiene conocimiento de algo diferente a lo que se indica en esta capacitación, no dude en compartirlo. No todos tenemos siempre la información más reciente. ¡Está todos en el mismo equipo!
- Toma nota.

Modulo del equipo 980E-5



Modulo equipo

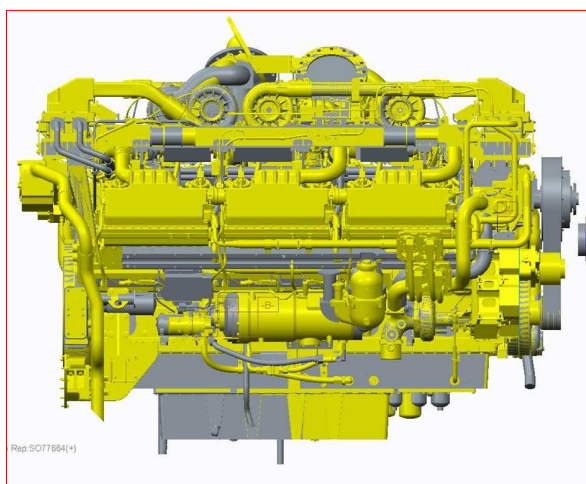


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Vistas

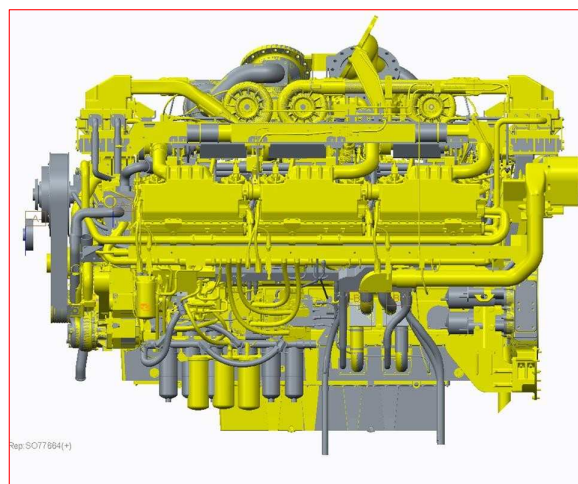
RB Side



Grey – QSK78 T2 SO77664

Yellow – QSK78 T4 SO10455

LB Side



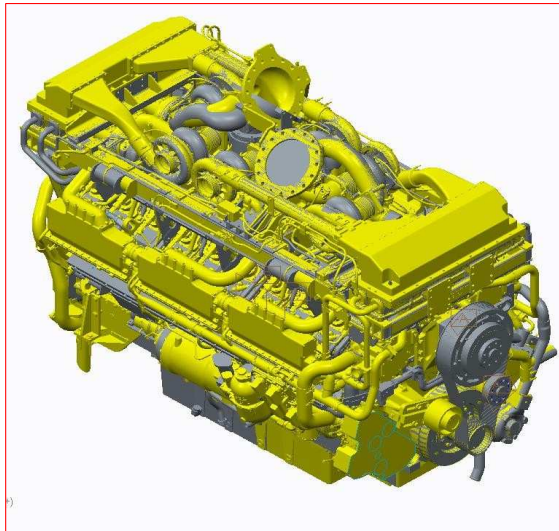
Insert Data Classification

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Vistas

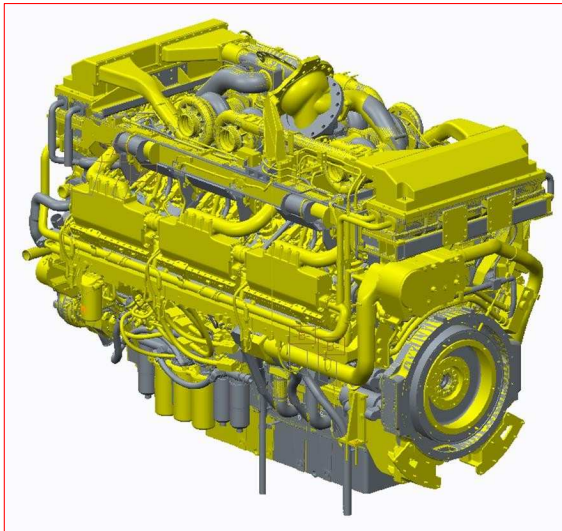
Front RB



Grey – QSK78 T2 SO77664

Yellow – QSK78 T4 SO10455

Back LB



Insert Data Classification

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QSK78 MCRS T4F.

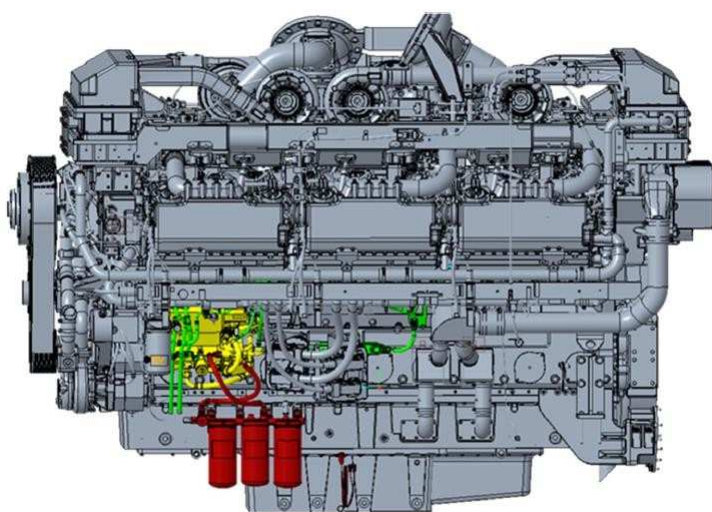


Figure 7: Fuel pump

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QSK78 CM2350 MCRS Service Models:



K126 – Tier 4 Final

- Mobile Off-Highway Two Stage with SCR (Mining)
- Used primarily in North America – US & Canada. At this time.



K137 - Unregulated

- Mobile Off-Highway Two Stage No SCR (Mining)
- Used primarily in South America but is an available NEW Engine option for un-regulated emission regions.
- Not Available in North America



K154C – Tier 2 and Unregulated

- Mobile Off-Highway Two Stage No SCR (Mining)
- Used Globally even North America
- HPI to MCRS Conversion at HHP Master Rebuild Center

Random 980E-5 Haul Truck Facts:

- Cummins Engine Nomenclature: QSK78 CM2350 K126/K137/K154C
 - Komatsu Engine Nomenclature: SSDA18V170
- 1,378,500 lbs (647,999 kg) = 980E-5 rated Gross vehicle weight (GVW)
 - 3500 @ 1800 rpm Gross HP
- 400 U.S. Ton (800,000 lbs) Payload Capacity
 - Total Tire weight: 71,838 lbs (32585 kg)
 - Financing Options are available!

QSK78 Model Summary by Region

North America

CM500
HPI

CM2350
K126

CM2350
K154C

South America

CM500
HPI

CM2350
K137

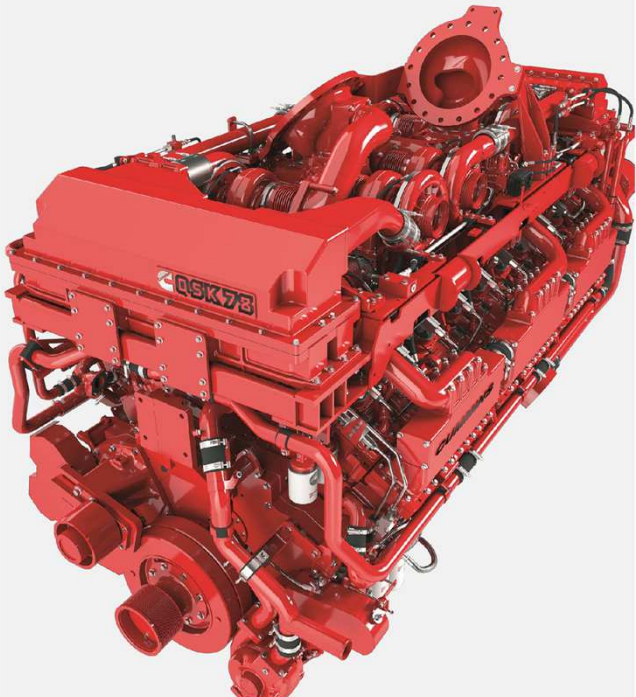
CM2350
K154C

All Other Regions Globally

CM500
HPI

CM2350
K137

CM2350
K154C





QSK78 CM2350 K126, K137 & K154C Technology

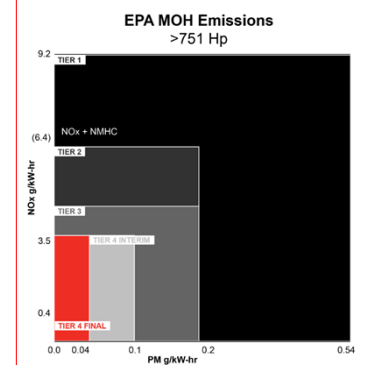
Public

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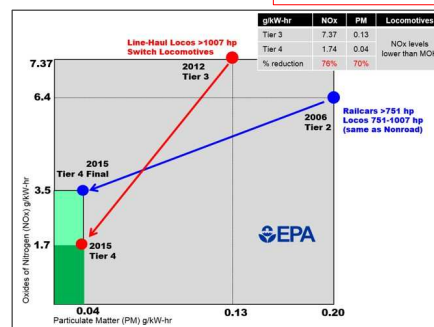
Tier 4 MOH Emissions Reduction

	NOx	PM
Tier 2	6.4 g/kW-hr	0.20
Tier 4 Final	3.5 g/kW-hr	0.04
Tier 4 Final Locomotive	1.74 g/kW-hr	0.04
% Reduction	45%	80%
% Reduction (Loco)	73%	80%



- Tier 4 presents the most significant change in non-road engine technology ever!
- Cummins' OEMs leveraged EPA's Transition Program for Equipment Manufacturers (TPEM) so we could directly move from Tier 2 to Tier 4 Final product

*MOH – Mobile Off Highway

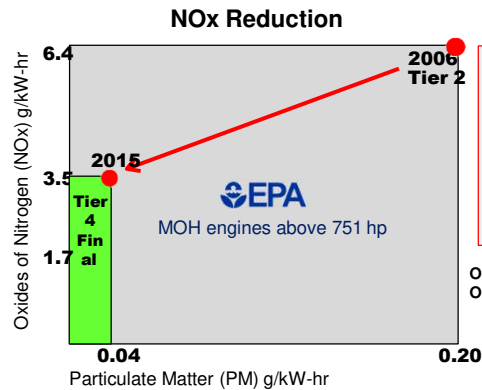


- Locomotive and Railcar Emissions Reduction

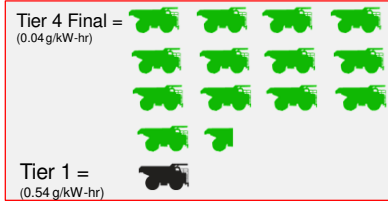
14

Tier 4 Nonroad Emissions Reduction

		NOx		NMHC / CO / PM		(g/kW-hr)							
		(NOx+NMHC) / CO / PM		(g/kW-hr)		[Conversion: (g/kW-hr) x 0.7457 = g/bhp-hr]							
kW	(HP)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
>560	(>751)	(6.4) / 3.5 / 0.20				3.5 / 0.40 / 3.5 / 0.10 0.67 / 0.40 / 3.5 / 0.10 ^a				3.5 / 0.19 / 3.5 / 0.04 0.67 / 0.19 / 3.5 / 0.03 ^b			
Rev February 2010		T2		Tier 3		Tier 4 Interim		Tier 4 Final					



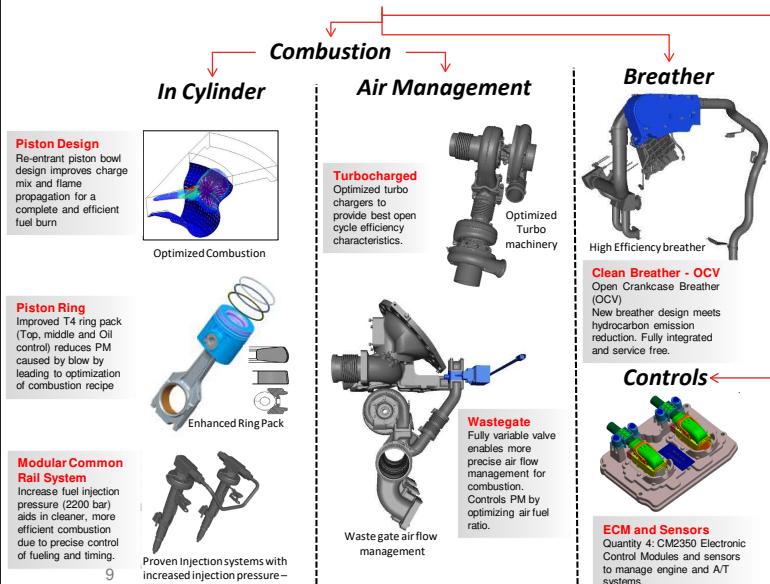
PM Reduction



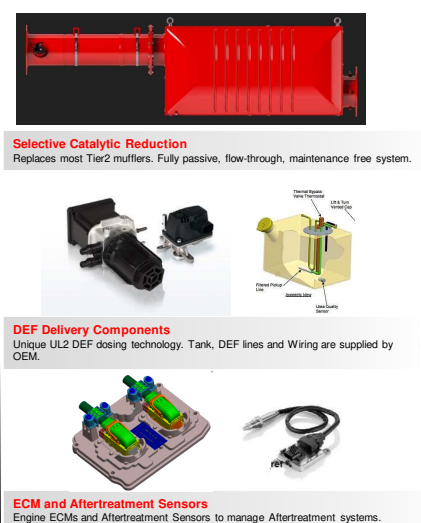
One Tier 1 machine PM = **Fourteen Tier 4 Final** machines
 One Tier 2 machine PM = **Five Tier 4 Final** machines

Cummins QSK78 K126 Tier 4F Solution

Particulate Matter Control (PM) K126

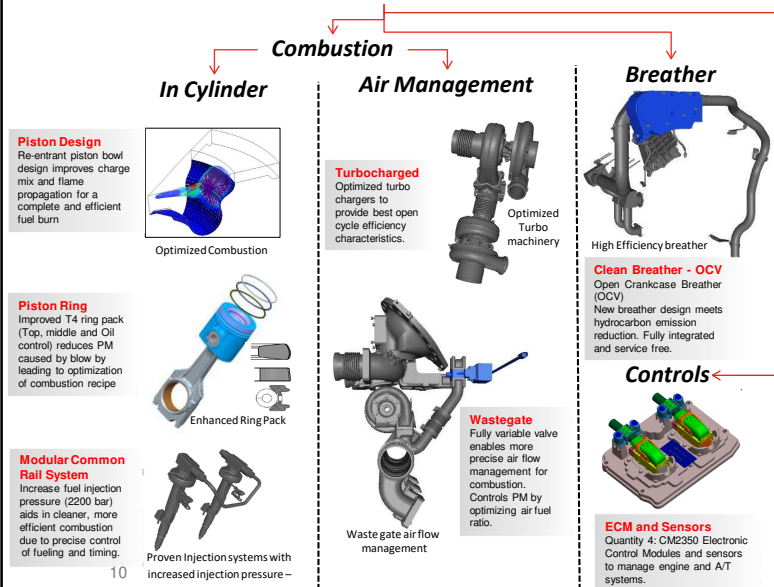


NOx Control – K126 Only



Cummins QSK78 K137 Unregulated Solution

Particulate Matter Control (PM) K137



K137 es una construcción de producción final Tier 4 que utiliza una nueva calibración ECM sin postratamiento.

En otras palabras:

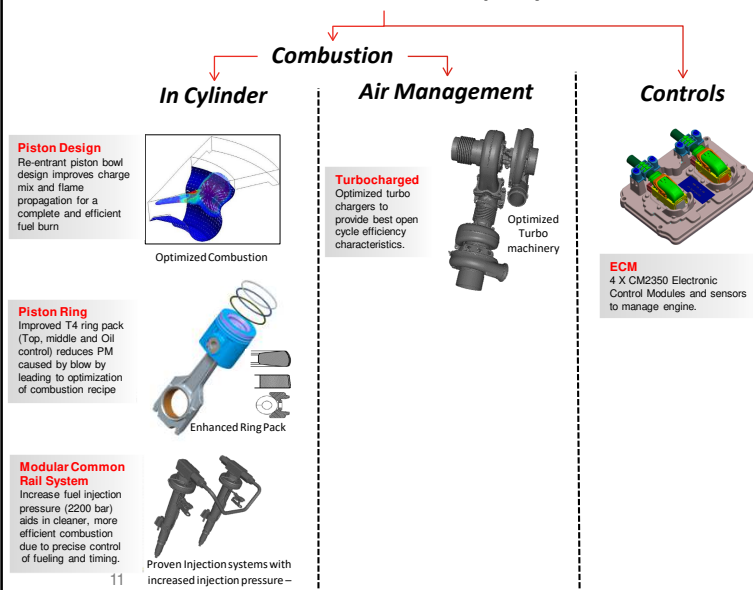
Igual que el motor T4 pero diferente calibración y sin postratamiento.

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Cummins QSK78 K154C HPI to MCRS Conversion at Rebuild

Particulate Matter Control (PM) K154C



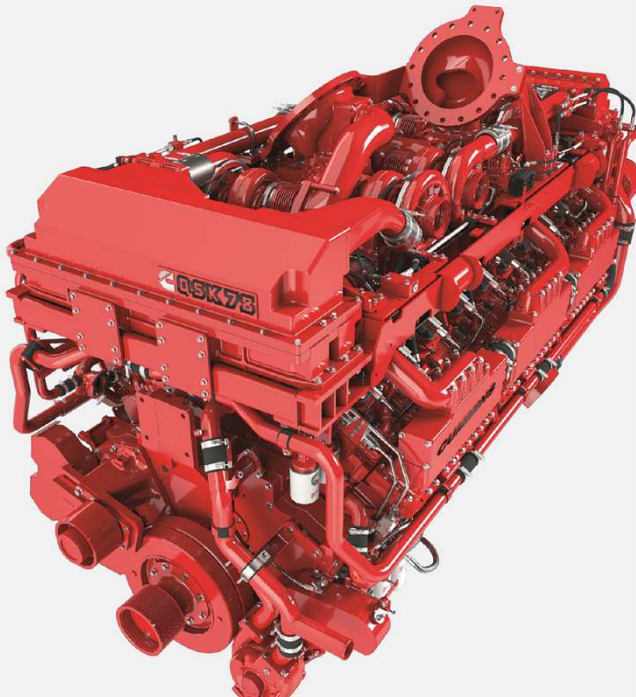
K154C es un programa en el que un motor HPI se convierte a MCRS en un HHP MCRS.


Es una mezcla de componentes de motor Tier 2 y Tier 4 sin compuertas ni postratamiento.

Esta conversión cumple con los requisitos para las regiones Tier 2 y de emisiones no reguladas y mejora la confiabilidad del motor y el consumo de combustible en comparación con HPI QSK78.

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QSK78 CM2350 K126 & K137

Cambios en Arquitectura

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BLOCK & ATTACHMENTS

- Block Casting
- Straight Cut Connecting Rods
- Big End Bearings
- Re-Entrant Forged Steel Piston
- T4 Ring Pack
- Open Crankcase Breather
- High Boron Liners with Sealing Ring
- Cylinder Head and Gasket
- MCRS Gear drive
- Lifting Brackets
- Rocker Covers
- Rocker Housings
- LB Cam Gear and Tone Wheel
- Hydraulic Compound Idler Gear
- Gear Housing
- Gear Cover
- Cam Follower Covers

COOLING SYSTEM

- HTC and LTA Thermostat Housing
- LTA Coolant Plumbing
- HTC Coolant Plumbing
- Wastegate Coolant Plumbing
- Turbo Coolant Plumbing
- Coolant Manifold Tubes

QSK78 CM2350 K126/K137 – Architecture Changes

INTAKE SYSTEM

- 2 Stage Frame and Mounting
- Two Stage Turbochargers (6 - HE800 LP, 6 - HE600 HP)
- Aftercooler Intake Manifolds

LUBRICATION

- Turbo Oil Supply/Drain Lines
- Eliminator
- 20 Micron Fuel Pump Lube Filter (DLF)

Exhaust System

- Exhaust Manifold
- Wastegates
- Wastegate Transfer Tubes
- Bellows
- 2S Interstage Connections

AFTERTREATMENT SYSTEM (NOTE: K126 ONLY)


- Two 8000 Series SCR Aftertreatment Assemblies
- Two DDDRP's – Dual Dosing Decomposition Reaction Pipes
- 4 Dosing Valves – 2 per bank of exhaust
- 4 Dosing Units – Electrically Heated
- Coolant Heated DEF Tank
- Exhaust System Cleaning Logic
- Inlet and Outlet NOx Sensors
- Inlet and Outlet Aftertreatment Temperature Sensors
- Aftertreatment Relay

ELECTRONIC CONTROLS

- Main Wire Harness
- EGT/Injector Wire Harness
- Integrated Fuse Blocks
- Four CM2350 ECMs
- Compressor Inlet Temperature
- Wastegate Relay
- Oil Quality Relay
- Fuel Pump Oil Pressure Sensor
- Fuel Pump Oil Pre-lube Switch
- Thermocouple EGT's
- EGT Modules/Converter Boxes
- Crankcase Pressure Sensor
- Chip Detectors
- Camshaft Position Sensor
- Dual alternators

FUEL SYSTEM

- 5 Cyl MCRS Fuel Pump (2200 bar)
- Injectors with NCS**
- HP & LP Fuel Lines
- Outerwall Bank to Bank Balance Line
- Rail Pressure Sensor (2700 bar)
- MDV (2750 bar)
- Fuel Inlet Manifold
- Injector Drain Fuel Plumbing
- Fuel Drain Manifolds
- Stage 1 Fuel Filter Head
- Stage 1 Fuel Filter Canister
- Stage 2 Fuel Filter Head
- Stage 2 CYWM Fuel filter
- Fuel Pump Drive Shaft Adapter
- Fuel Inlet 86 Micron Screen
- Stage 2 Outlet 86 Micron Screen
- Fuel Pump Drive w/ DLF Mounting
- 2 Stage Air Bleed Valve and Line



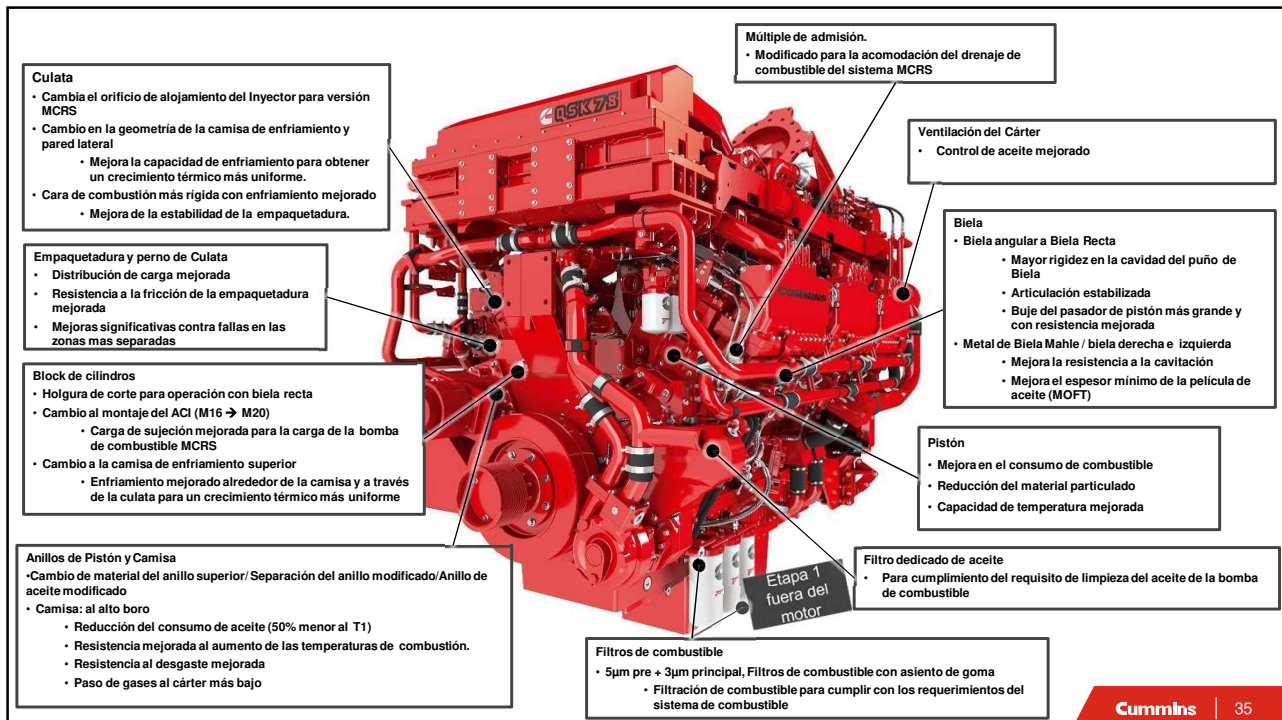
Configuration	
Displacement	78 liter (4759 in ³)
Bore	170 mm (6.69 in)
Stroke	190 mm (7.48 in)
Engine Wet Weight	12,309 kg (27,137 lbs.)
Aftertreatment Weight	719 kg (1588 lbs.) 2 x SCR 8000 w/ DDDRP
Cylinder Configuration	60 Degree V - 18

Key:

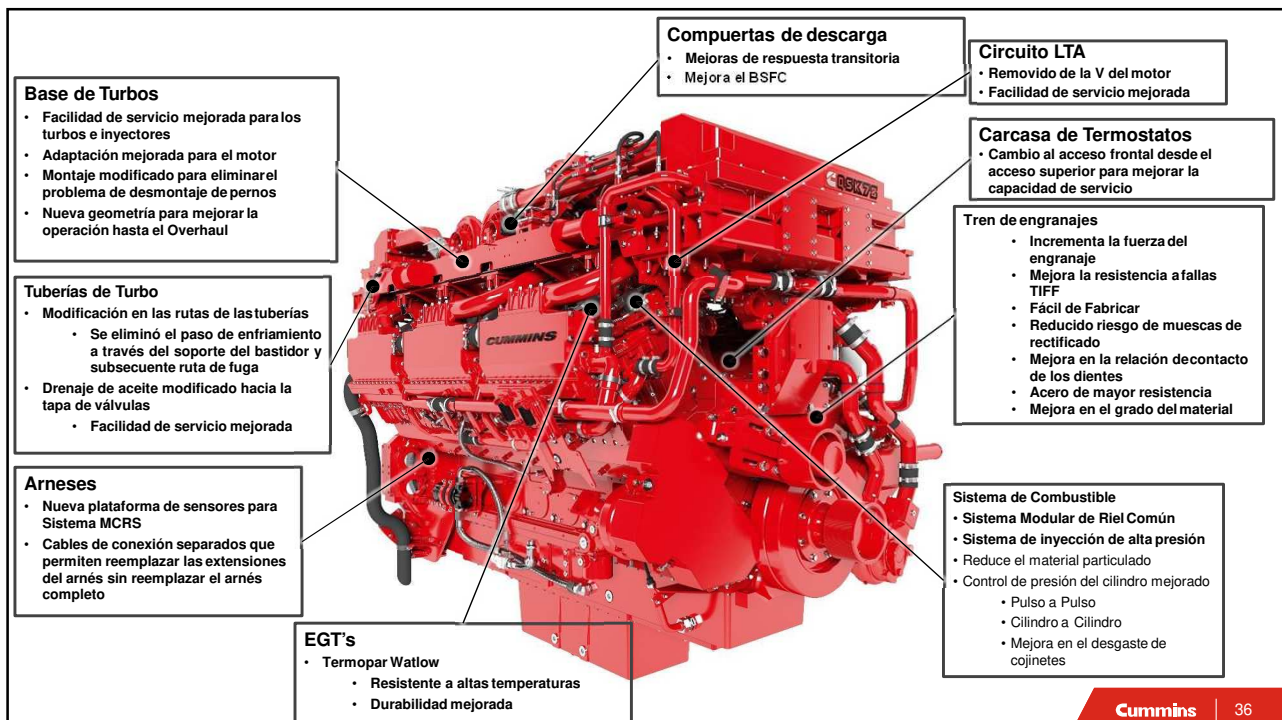
- LB – Left Bank
- 2S – Two Stage Turbocharging
- CYWM – Cyclops Wide Mouth
- HTC – High Temperature Circuit
- LTA – Low Temperature Aftercooled
- SCR – Selective Catalytic Reduction
- MDV – Mechanical Dump Valve
- T4 – Tier 4
- MCRS – Modular Common Rail System
- EGT – Exhaust Gas Temperature
- HP – High Pressure
- LP – Low Pressure
- NCS – Nozzle Combustion Shield
- DLF – Dedicated Lube Filter
- DDDRP – Dual Doser Decomposition Reaction Pipe

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Agenda y resumen de **Modulo 1.**

- **Diagnostic Test :**

- ✓ 10 preguntas en el test (do you've any question)

- **Revisemos lo aprendido. Highlight modulo 1 :**

- ✓ Engine Tier 2
- ✓ 10% aumentada la vida útil
- ✓ 2 a 5% disminucion en el FC fuel consumption
- ✓ 50% reducción de consumo de aceite (Breather OCV + Cilinder liner Boro +Inyección electronica)
- ✓ Cambio Performance parts (culata, inyector, cores, HTC, LTC)
- ✓ Mejora termodinámica de componentes expuestos a temperatura
- ✓ Distribución mejorada, TIFF
- ✓ New Breather, de impacto variable, aprovechamiento máximo

- **Dudas pendientes por resolver :**

- ✓ Q+A 1 :
- ✓ Q+A 2 :



Q+A

