

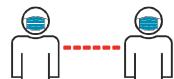
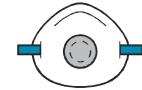
Cummins® Power Systems

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

2

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



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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.

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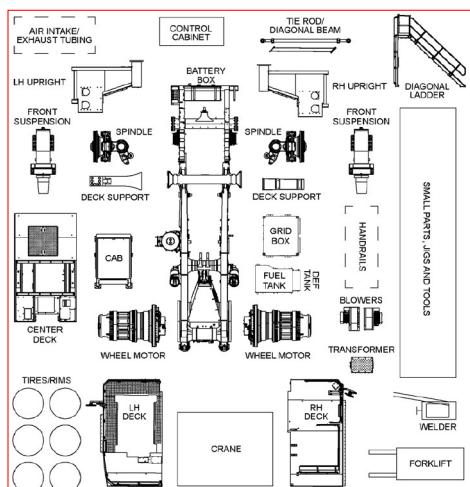
REGLAS DE CLASE

- ¡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. ¡Estamos todos en el mismo equipo!
- Toma nota.

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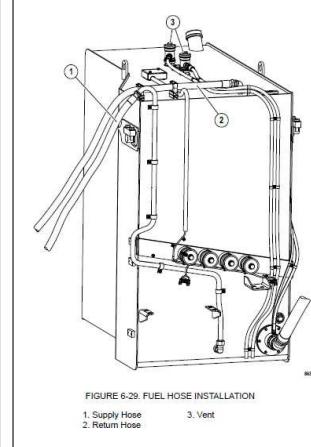
Modulo del equipo 980E-5



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Modulo equipo

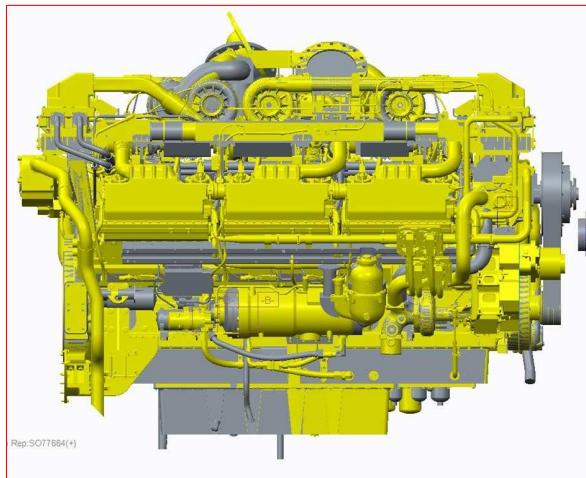


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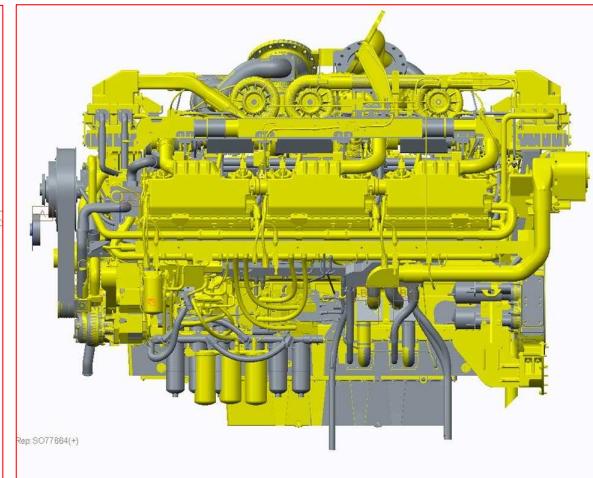
7

Vistas

RB Side



LB Side



Grey – QSK78 T2 SO77664

Yellow – QSK78 T4 SO10455

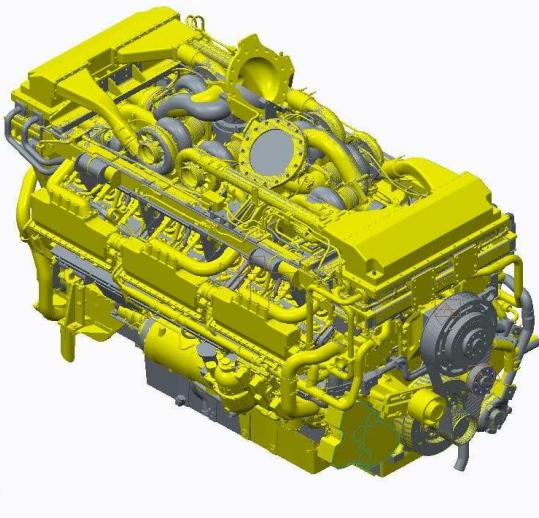
Insert Data Classification

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Vistas

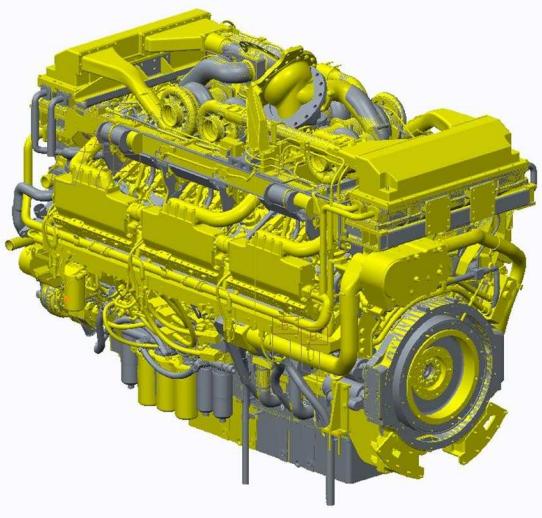
Front RB



Grey – QSK78 T2 SO77664

Yellow – QSK78 T4 SO10455

Back LB



Insert Data Classification

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QSK78 MCRS T4F.

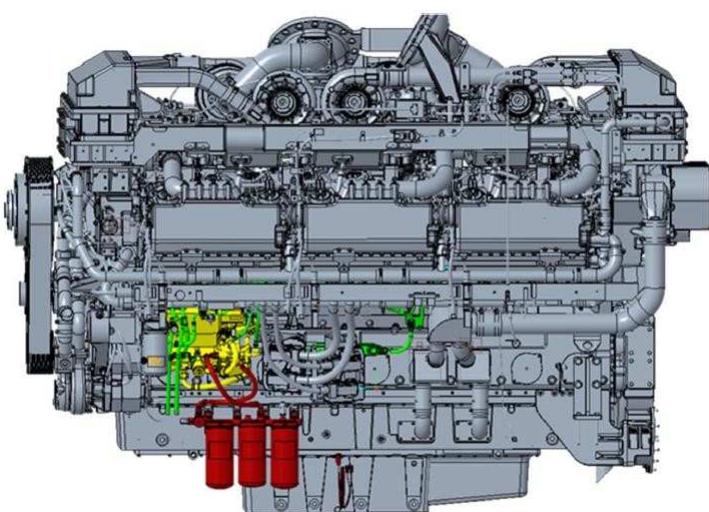


Figure 7: Fuel pump

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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!

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QSK78 Model Summary by Region

North America

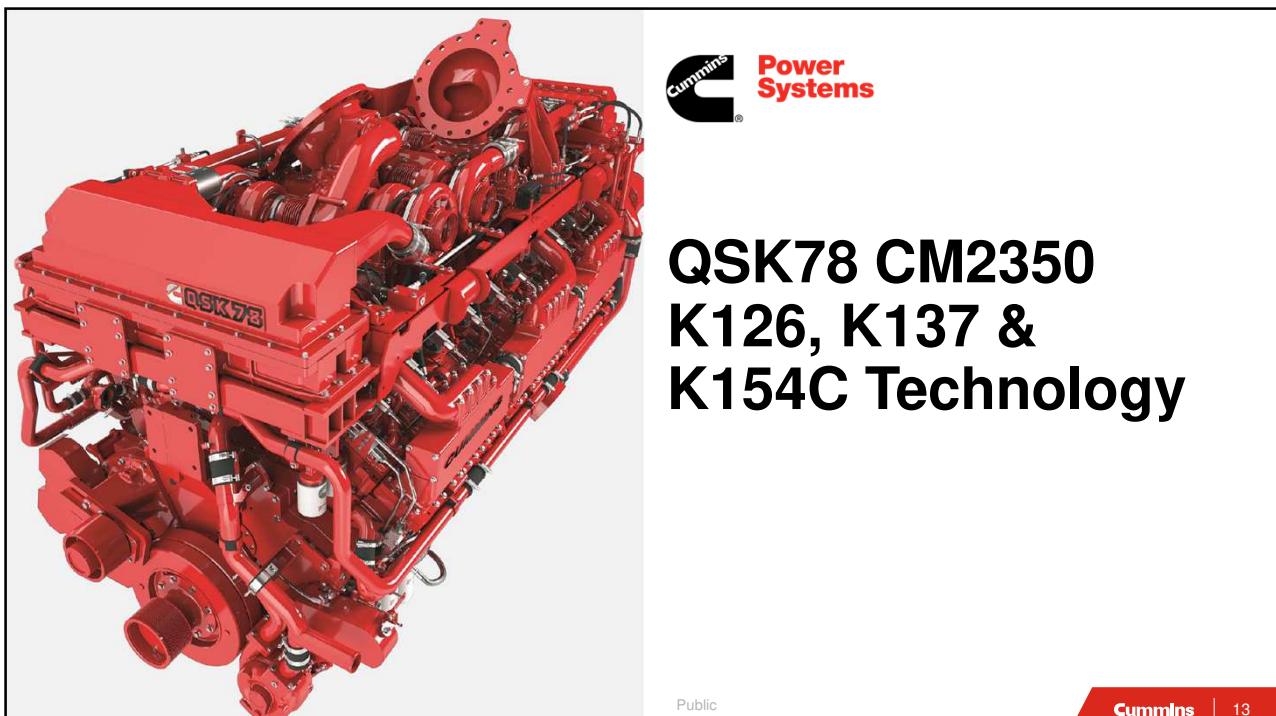
CM500
HPICM2350
K126CM2350
K154C

South America

CM500
HPICM2350
K137CM2350
K154CAll Other
Regions
GloballyCM500
HPICM2350
K137CM2350
K154C

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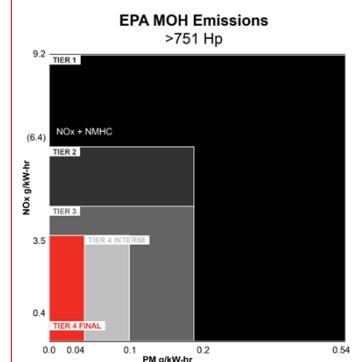


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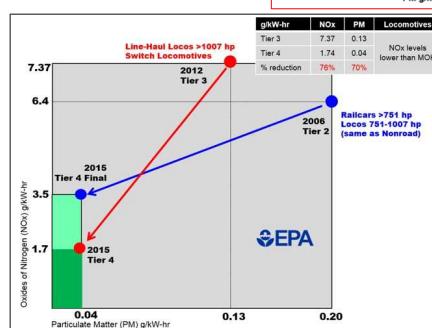
Tier 4 MOH Emissions Reduction

	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



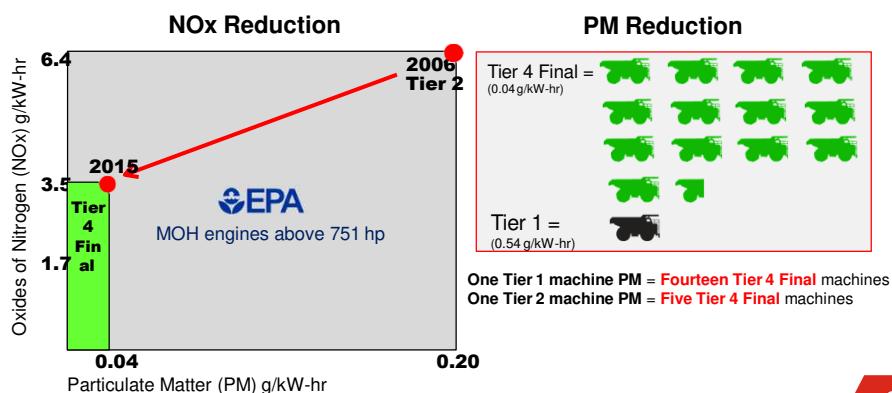
- Locomotive and Railcar Emissions Reduction

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Tier 4 Nonroad Emissions Reduction

kW (HP)		NOx / NMHC / CO / PM (g/kW-hr)		(NOx+NMHC) / CO / PM (g/kW-hr)		[Conversion: (g/kW-hr) x 0.7457 = g/bhp-hr]						
		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						

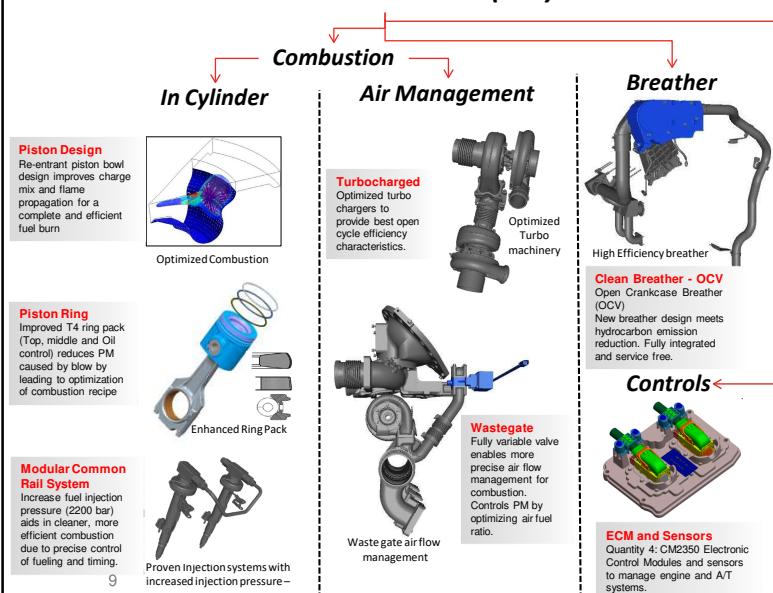


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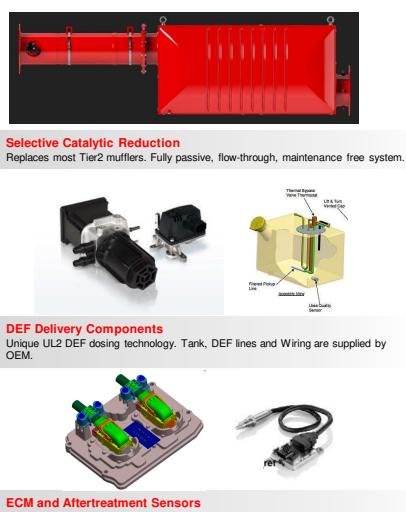
15

Cummins QSK78 K126 Tier 4F Solution

Particulate Matter Control (PM) K126



NOx Control – K126 Only

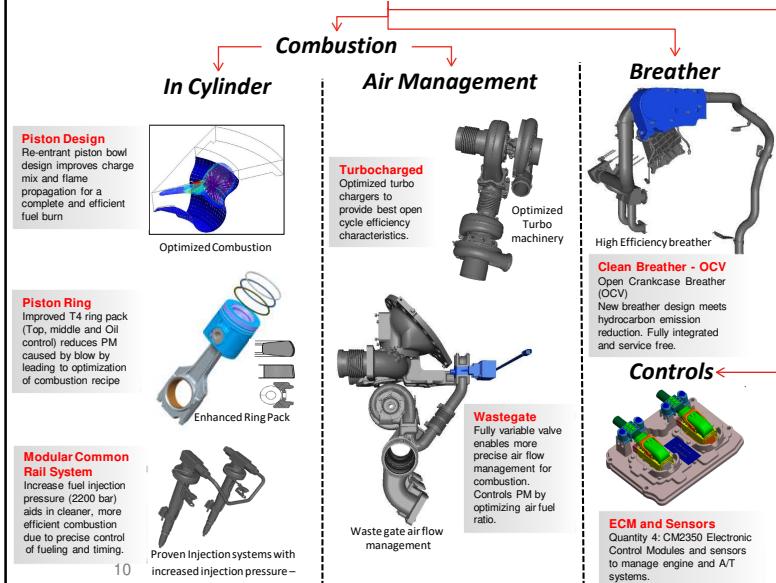


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Cummins QSK78 K137 Unregulated Solution

Particulate Matter Control (PM) K137



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

En otras palabras:

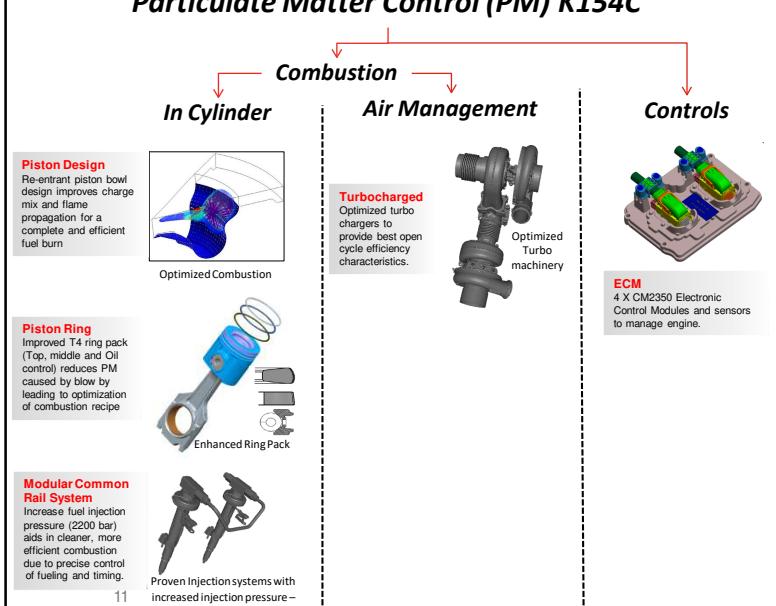
Igual que el motor T4 pero diferente calibración y sin postratamiento.

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Cummins QSK78 K154C HPI to MCRS Conversion at Rebuild

Particulate Matter Control (PM) K154C



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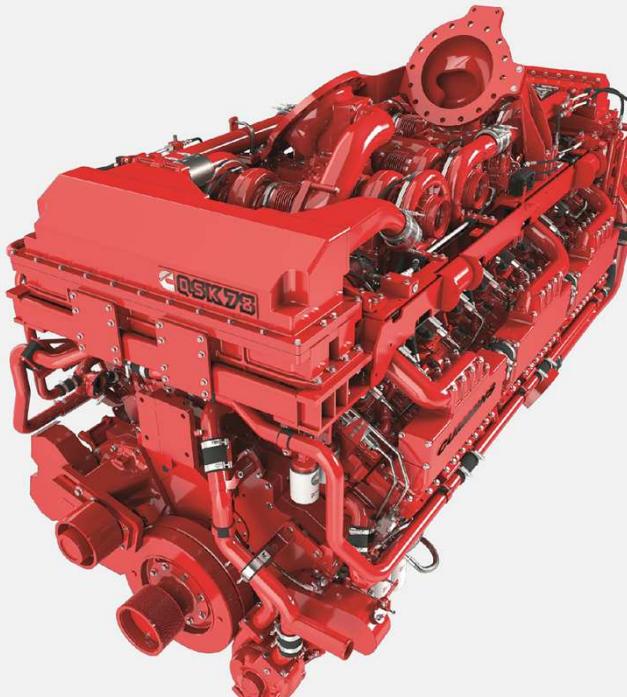
K154C es un programa en el que un motor HPI se convierte a MCRS en un HHP MCRS.

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

Public

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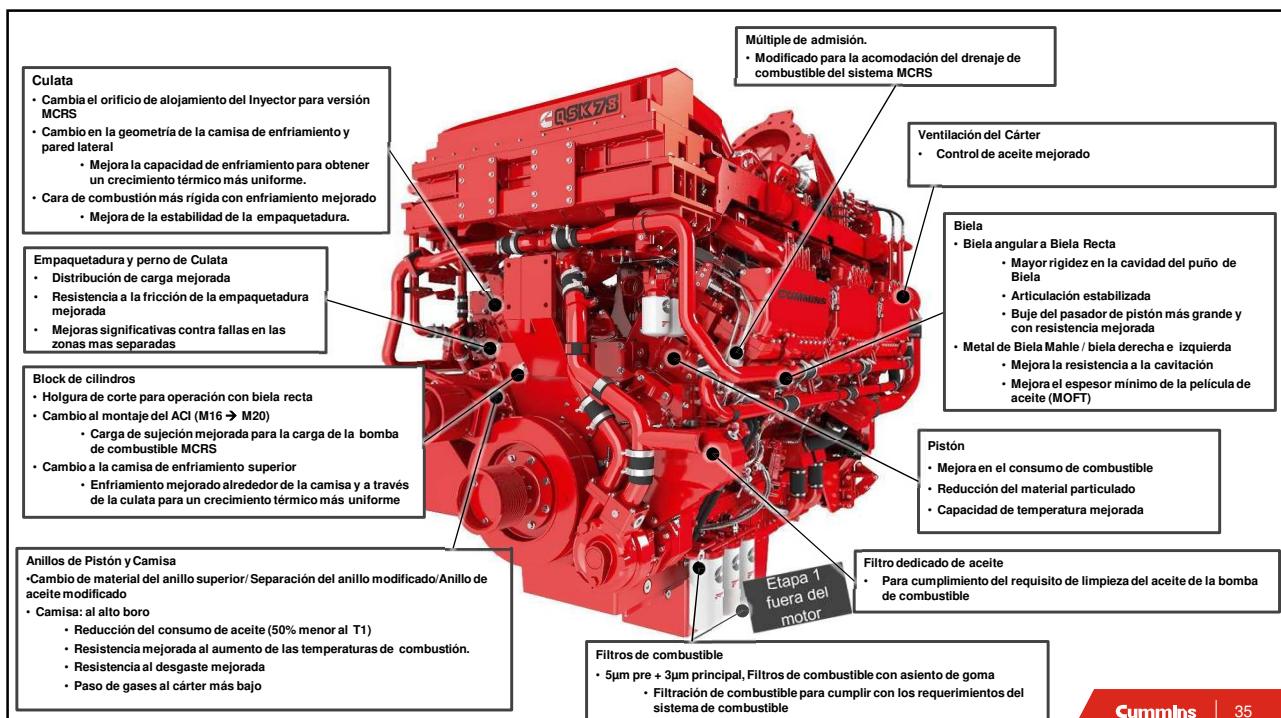
BLOCK & ATTACHMENTS		QSK78 CM2350 K126/K137 – Architecture Changes	
Block Casting	INTAKE SYSTEM	AFTERTREATMENT SYSTEM (NOTE: K126 ONLY)	
Straight Cut Connecting Rods	2 Stage Frame and Mounting	Two 8000 Series SCR Aftertreatment Assemblies	
Big End Bearings	Two Stage Turbochargers (6 - HE800 LP , 6 - HE600 HP)	Two DDDRP's – Dual Dosing Decomposition Reaction Pipes	
Re-Entrant Forged Steel Piston	Aftercooler Intake Manifolds	4 Dosing Valves – 2 per bank of exhaust	
T4 Ring Pack		4 Dosing Units – Electrically Heated	
Open Crankcase Breather		Coolant Heated DEF Tank	
High Boron Liners with Sealing Ring		Exhaust System Cleaning Logic	
Cylinder Head and Gasket		Inlet and Outlet NOx Sensors	
MCRS Gear drive		Inlet and Outlet Aftertreatment Temperature Sensors	
Lifting Brackets		Aftertreatment Relay	
Rocker Covers	LUBRICATION		
Rocker Housings	Turbo Oil Supply/Drain Lines		
LB Cam Gear and Tone Wheel	Eliminator		
Hydraulic Compound Idler Gear	20 Micron Fuel Pump Lube Filter (DLF)		
Gear Housing		ELECTRONIC CONTROLS	
Gear Cover	Exhaust System	Main Wire Harness	
Cam Follower Covers	Exhaust Manifold	EGT/Injector Wire Harness	
COOLING SYSTEM	Wastegates	Integrated Fuse Blocks	
HTC and LTA Thermostat Housing	Wastegate Transfer Tubes	Four CM2350 ECUs	
LTA Coolant Plumbing	Bellows	Compressor Inlet Temperature	
HTC Coolant Plumbing	2S Interstage Connections	Wastegate Relay	
Wastegate Coolant Plumbing		Fuel Pump Oil Pressure Sensor	
Turbo Coolant Plumbing		Fuel Pump Oil Prelube Switch	
Coolant Manifold Tubes		Thermocouple EGT's	
		EGT Modules/Converter Boxes	
		Crankcase Pressure Sensor	
		Chip Detectors	
		Camshaft Position Sensor	
		Dual alternators	
Configuration		FUEL SYSTEM	
Displacement	78 liter (4759 in ³)	5 Cyl MCRS Fuel Pump (2200 bar)	
Bore	170 mm (6.69 in)	Injectors with NCS	
Stroke	190 mm (7.48 in)	HP & LP Fuel Lines	
Engine Wet Weight	12,309 kg (27,137 lbs.)	Outerwall Bank to Bank Balance Line	
Aftertreatment Weight	719 kg (1588 lbs.) 2 x SCR 8000 w/ DDDRP	Rail Pressure Sensor (2700 bar)	
Cylinder Configuration	60 Degree V - 18	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	

Key:

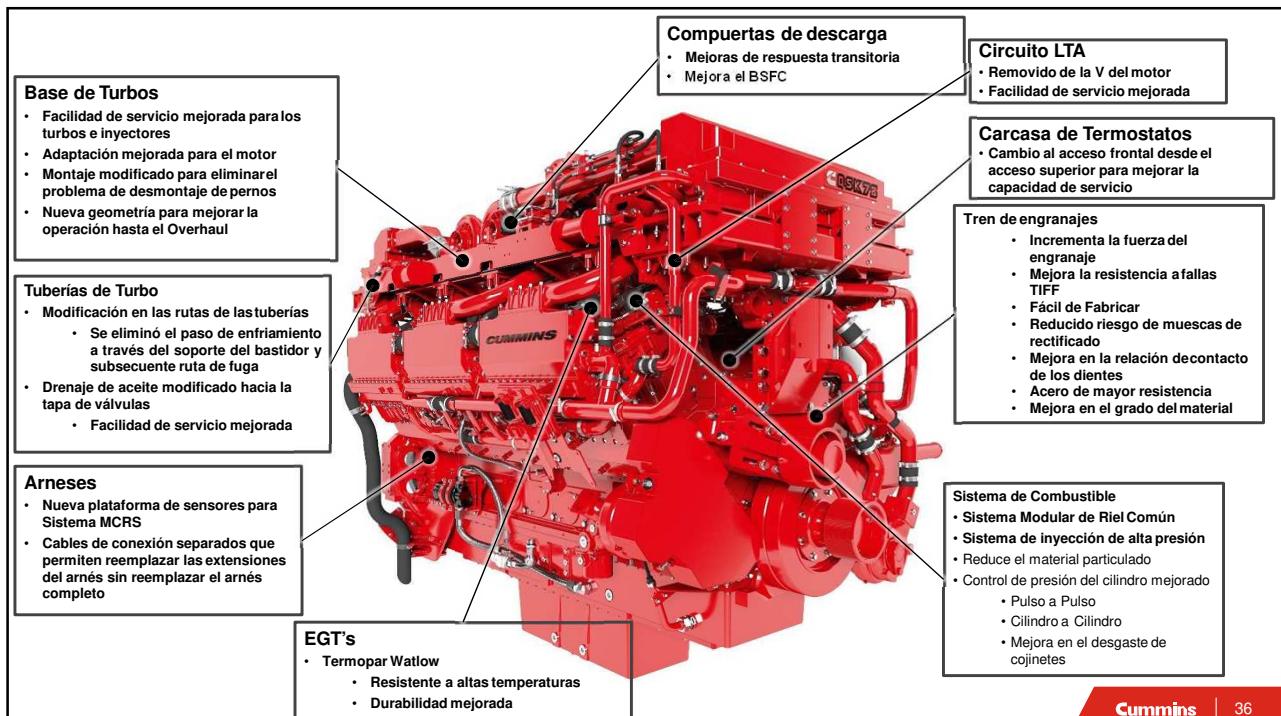
- LB – Left Bank
- 2S – Two Stage Turbocharging
- CYWM – Cyclops Wide Mouth
- HTC – High Temperature Circuit
- LTA – Low Temperature Aftercooled
- SCR – Selective Catalytic Reduction
- T4 – Mechanical Dump Valve
- T4 – T4
- MCRS – Modular Common Rail System
- EGT – Exhaust Gas Temperature
- HP – High 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% disminución en el FC fuel consumption
 - ✓ 50% reducción de consumo de aceite (Breather OCV + Cylinder 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 :

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Q+A

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