

MORE TRACTION.

**CUMMINS ENGINES
FOR RAIL APPLICATIONS
49-4425 HP / 37-3300 KW**



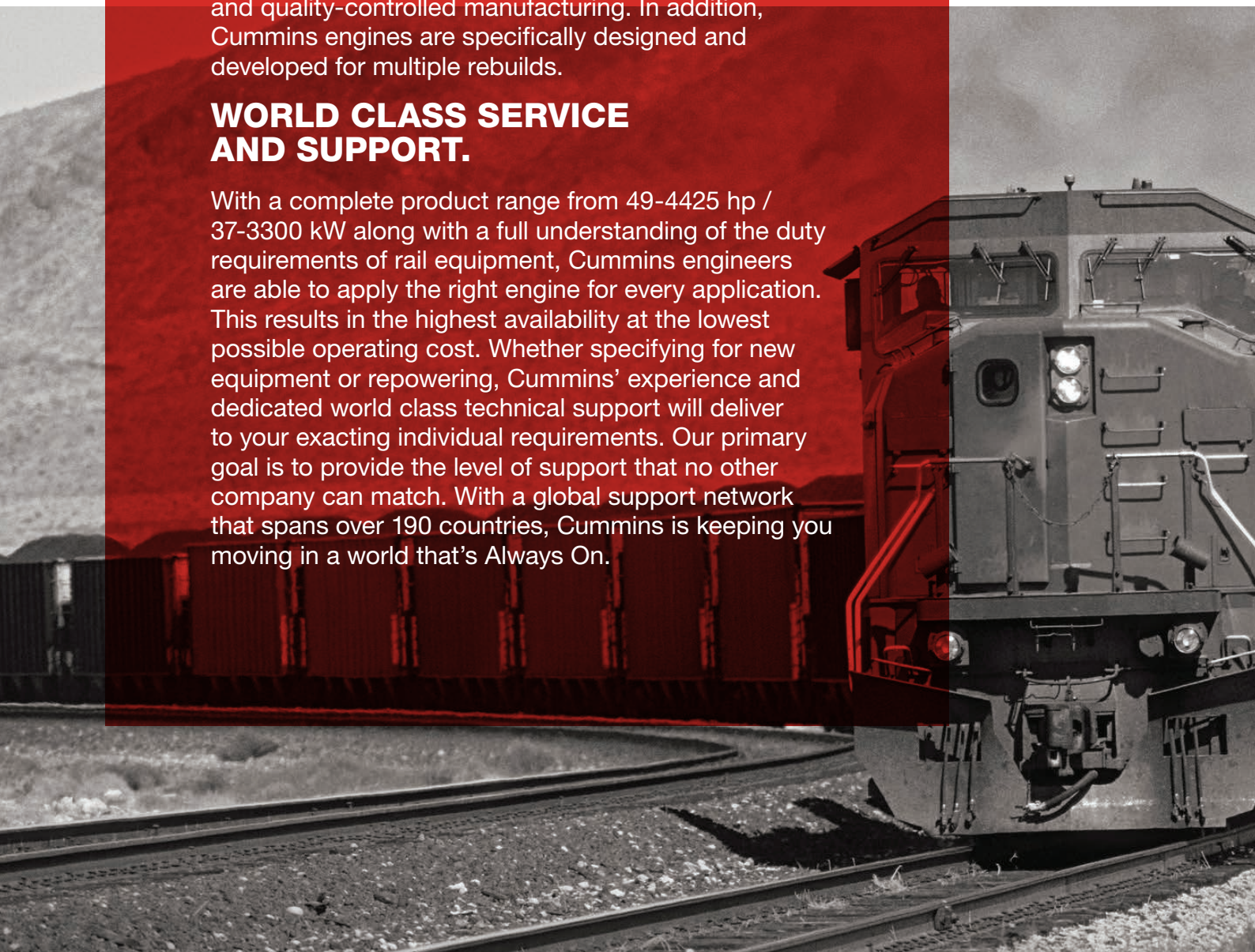
ALWAYS ON

DURABLE PERFORMANCE. THE POWER TO GO ANYWHERE.

Rail operations are extremely demanding, and at Cummins we know the importance of keeping your rail equipment on track at all times. With a Cummins engine in your machine, you get legendary reliability, durability, advanced emissions technology, and responsive service support. With over 30,000 engines running in the toughest rail applications, you can be assured that your rail engine is proven to perform. Exceptional durability is a fundamental requirement for all Cummins engines, mandating premium materials and quality-controlled manufacturing. In addition, Cummins engines are specifically designed and developed for multiple rebuilds.

WORLD CLASS SERVICE AND SUPPORT.

With a complete product range from 49-4425 hp / 37-3300 kW along with a full understanding of the duty requirements of rail equipment, Cummins engineers are able to apply the right engine for every application. This results in the highest availability at the lowest possible operating cost. Whether specifying for new equipment or repowering, Cummins' experience and dedicated world class technical support will deliver to your exacting individual requirements. Our primary goal is to provide the level of support that no other company can match. With a global support network that spans over 190 countries, Cummins is keeping you moving in a world that's Always On.





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NO COMPROMISE FOR MEETING EMISSIONS.

Emission standards for rail equipment differ around the world and this can be complex. Unique standards can apply to locomotives, railcars, track maintenance machinery and auxiliary power for the rail industry. For instance, E.U. emissions limits for locomotives are only partially aligned with U.S. emission standards and they vary depending on power output. Track maintenance equipment can also be classified as mobile machinery with different regulations around the world.

Current and future worldwide emission regulations have a major influence on future plans for new equipment and re-powers. EPA Tier 4 Final/Stage IIIB and Stage V products are available, and Cummins continues to meet further emissions challenges with the latest technology. Cummins

has the ability to provide the most suitable package for your rail equipment. With over \$600m invested each year on research and engineering, Cummins can provide customers with the most advanced and cost-effective diesel engines available.

THE RIGHT TECHNOLOGY MATTERS.

Cummins leadership in combustion research, fuel, air-handling, aftertreatment and controls systems allows us to achieve the goal of maximising customer value by providing the most appropriate emissions control technology integrated into each equipment type and market. Cummins component technology companies, subsidiaries, alliances and our relationships with universities and national laboratories uniquely position us to design, manufacture and implement the best solutions for the rail industry.

EPA AND EURO EMISSIONS LEADING ENGINES FOR LOCOMOTIVES.

**EPA TIER 3 AND TIER 4
EU STAGE IIIA, IIIB, AND V**

HIGH PERFORMANCE ENGINES FOR LOCOMOTIVES

With a comprehensive locomotive engine line-up available up to 4425 hp / 3300 kW, Cummins offers an unrivaled capability for locomotive traction power solutions. From yard switcher and industrial locomotives to mainline freight and passenger locomotives, Cummins has earned an unbeatable reputation for durability and strength in some of the toughest duty cycles and environmental conditions around the world's railways.

With the capability to meet global locomotive emissions requirements, Cummins can provide you with the right engine, wherever you are.

Cummins QSK MCRS engines use the modular common rail fuel system to meet EPA Tier 3 / Tier 4 / EU Stage IIIA Stage IIIA, IIIB and V.

- Maintains high injection pressures regardless of engine speed for exceptional performance across the rev range
- Provides improved response and load pickup with lower noise and vibration compared to unit injection systems
- Ultra clean and efficient, delivering a higher degree of combustion control
- Very quiet for operators at idle and light load operation, with excellent cold start capability



QSK19

755 hp Tier 3 SW/LH & Stage IIIA
755 hp Tier 4 Final (Non-Road)

QSK23

760 - 950 hp Tier 2 (Non-Road)
900 hp Stage IIIA Locomotive
760 - 1050 hp Tier 4 Final (Non-Road)

QST30

850 - 1200 hp Tier 2 (Non-Road)
1200 - 1500 hp Tier 3 SW
850 - 1500 hp
1000 - 1500 hp Tier 4 Final (Non-Road)

QSK38

1350 - 1500 hp Tier 3 SW/LH
1500 hp SIIIA Locomotive
1086 - 1600 hp Tier 4 Final (Non-Road)

QSK50

1800 - 2130 hp Tier 3 SW/LH
2000 hp SIIIA
1500 - 2500 Tier 4 Final (Non-Road)

QSK60

2301 - 2700 hp Tier 3 LH
2301 - 2500 hp SIIIA
2310 - 2700 hp Tier 4 LH / SIIIB
3000 hp Tier 2 (Non-Road)

GLOBAL EMISSIONS ENGINES FOR LOCOMOTIVES.

450-3300 HP / 335-2460 KW

Cummins QSK HPI engines use a High Pressure Injection (HPI) fuel system for non-emissionized regions.

The clean and efficient design works at up to 29,000 psi to optimize engine response with emissions. It delivers:

- Several HPI products achieve UICII Emissions
- Fuel optimized ratings available
- Excellent fuel economy
- Low running costs
- Long engine life to overhaul

Life cycle costs are significantly reduced, and with a highly advanced electronic management system, the engine sets unbeatable standards in productivity for diesel locomotives. They come packed with features to ensure high availability.

PRELUB SYSTEM: Prevents starts without oil pressure. This eliminates dry starts which improves engine life.

ELIMINATOR™: Self cleaning filter core which helps to eliminate oil filter change and disposal headaches. Saves up to 90% of lube system maintenance costs and increases productivity. Requires servicing only every 1,500 hours.

CENTINEL™: Constantly monitors engine duty cycle and load factors, removing small amounts of used oil as required and replenishing with new oil. The removed oil is blended into the fuel system to be burned during combustion.

QSK19

450 – 800 hp

QSK23

760 – 950 hp

QST30

760 – 1500 hp

QSK45

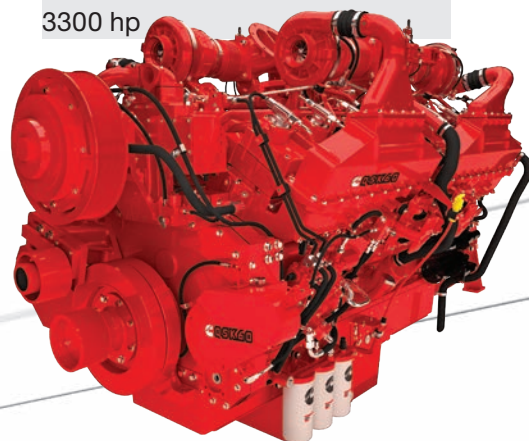
1500 – 1800 hp

QSK60

2200 – 3000 hp

QSK78

3300 hp



STT-TÅGTEKNIK AB TMZ 1111
WITH KTA50 REPOWER

NON-REGULATED ENGINES FOR LOCOMOTIVES.

485-1800 HP / 360-1340 KW

Cummins KV family of engines have over 40 years of experience in rail applications. They have developed a legendary status for reliability and durability in the toughest environments around the world.

Cummins continuous improvements have kept Cummins K Series engines ahead of the rest. Excellent fuel economy with low maintenance gives the lowest possible operating costs and maximum productivity.

Cummins combines decades of proven performance with advanced technology and the superior support network you need to achieve the highest levels of availability.

Cummins Pressure Time (PT) fuel system offers clean and efficient operation, with ease of maintenance. The high-performance mechanical PT injectors are built to handle high pressures for optimum combustion.

Custom-built turbochargers from Cummins Turbo Technologies are allied to either jacket-water or dual-loop aftercooling, ensuring that operators get the full power output regardless of altitude.

KTA19

485 hp (360 kW) @ 2100

510 hp (380 kW) @ 2100

600 hp (450 kW) @ 2100

KTA38

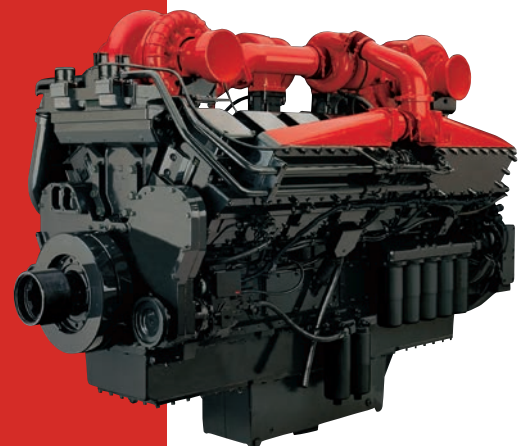
1050 hp (785 kW) @ 1800

1260 hp (940 kW) @ 1800

KTA50

1500 hp (1120 kW) @ 1800

1800 hp (1340 kW) @ 1900



MORE POWER – QSK95.

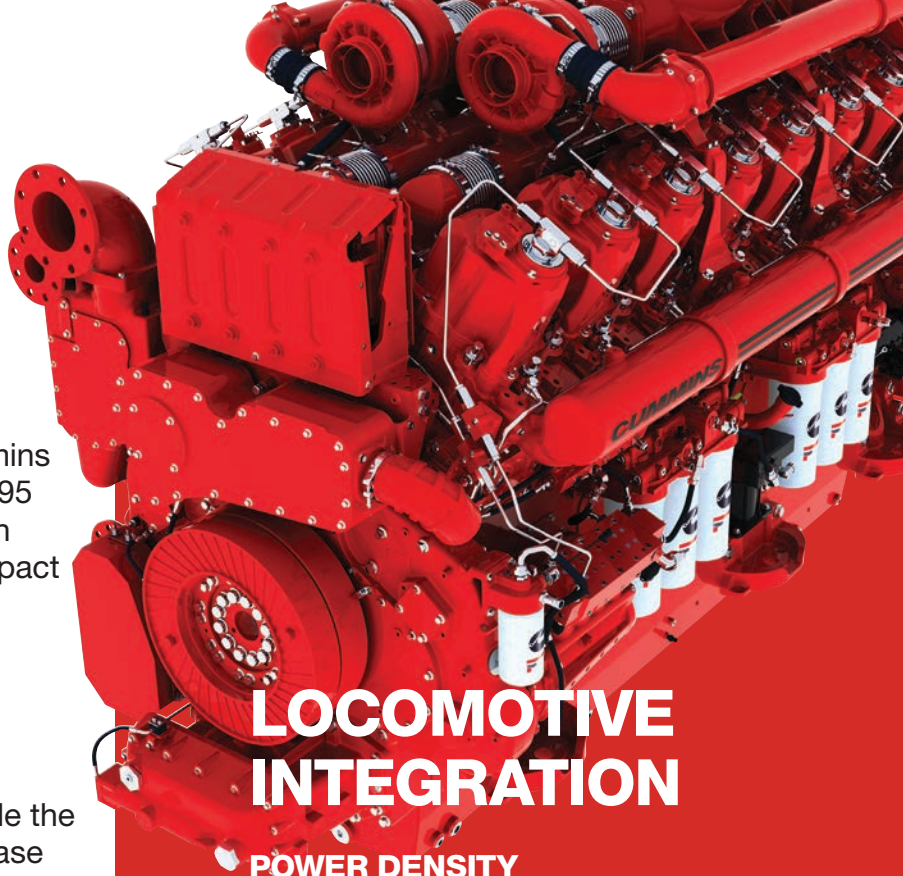
The most powerful offering from Cummins with up to 4425 hp / 3300 kW the QSK95 surpasses other high-speed engines. In terms of emissions capability and compact installation the QSK95 is way ahead of much larger medium-speed engines.

The most powerful high-speed 16V diesel engine meets EPA Tier 3 / Stage IIIA locomotive emissions with no aftertreatment, and it is robust to handle the demands of global applications. The base engine design allows for ease of move to EPA Tier 4, EU Stage IIIB and Stage V with only the addition of SCR aftertreatment.

The engine is built ultra-strong for harsh rail environments. Premium materials achieve very long life-to-overhaul, offering a major reduction in total life cycle costs.

PRODUCT FEATURES

- Best in class fuel economy drives lowest total operating costs
- 2200-bar clean burn Modular Common Rail Fuel System (MCRS)
- Forged Steel Pistons, Connecting Rods, and Crankshaft
- Two-Stage Aftercooling reduces radiator size and cost
- Single-Stage Quad-Turbochargers deliver immediate response
- 2 SAE-C hydraulic pump drives
- Rigid 6 Point Direct-Block Mounting
- High power to weight ratio greatly eases installations
- Extended Service Intervals and minimal down time per service event
- Every design decision based on durability and ease of service



LOCOMOTIVE INTEGRATION

POWER DENSITY

- High-speed engines derive power from engine rpm over displacement, and are smaller and lighter

CLEANER COMBUSTION

- NOx emissions result from time at high pressure and temperature. High speed engines produce less NOx
- Particulate control complexity increases with swept volume / cylinder. So, high-speed engines produce comparatively less PM

LESS NOx AND PM REQUIRES LESS AFTERTREATMENT

CUMMINS EPA TIER 4 SOLUTION

- Clean Burn Combustion + Urea-based Aftertreatment
- Maximum fuel economy
- Minimal changes to base engine
- Retain Tier 3 / Stage IIIA reliability and durability
- No increase in cylinder pressure
- No increase in heat rejection
- Aftertreatment system replaces existing silencer



REPOWERING FOR DECADES AHEAD.

The success of a railroad depends on maximising the useful life of capital-intensive equipment like locomotives. Cummins is a recognised expert in repowering older units with modern engine technology and providing the installation support necessary to ensure absolute minimum downtime.

A prime example is our QSK50 Tier 3 Power Module design. We pre-build the entire unit, including the engine, alternator, air intake, exhaust and air compressor drive, on a base skid. Then we work with the locomotive manufacturer or refurbisher on any modifications to the frame and/or hatch as well as electronic wiring and controls. An alternator coupling includes an internal hydraulic damping system and spring blades with torsional vibrations dampened by oil. Options include a cold weather heating system, cab air conditioner controls, forced ventilation engine compartment and an air starter. The package with the Cummins FIT system for monitoring of the oil, air, and fuel filtration, plus new cooling cores will be provided to install in the existing cooling package.

A replacement cooling package hatch can also be added as an option.

This packaged unit is Tier 3 EPA SW certified and delivers 2,130 HP (intermittent) at 1800 rpm. It is engineered, built and tested to deliver exceptional fuel economy, performance and reliability with reduced maintenance costs for what we project to be the next half-century of service.

The timeframe for repowering with a Cummins Power Module like this is measured in weeks rather than months. Cummins Power Modules are the ideal way to keep you moving down the tracks in a world that's Always On. Power modules for other Cummins Engines are also available.

EPA TIER 4 FINAL / STAGE IIIB ENGINES FOR RAILCARS.

With over 10,000 underfloor engines in service around the world, Cummins has unrivaled experience in powered diesel railcars.

Our horizontal engine configuration offers high acceleration and high-speed capability, with journey times reduced. It also reduces noise and vibration and increases passenger capacity. The engines allow for ease of access of maintenance technicians at the side of the rail vehicle. All of these operational benefits come with the renowned durability from Cummins.

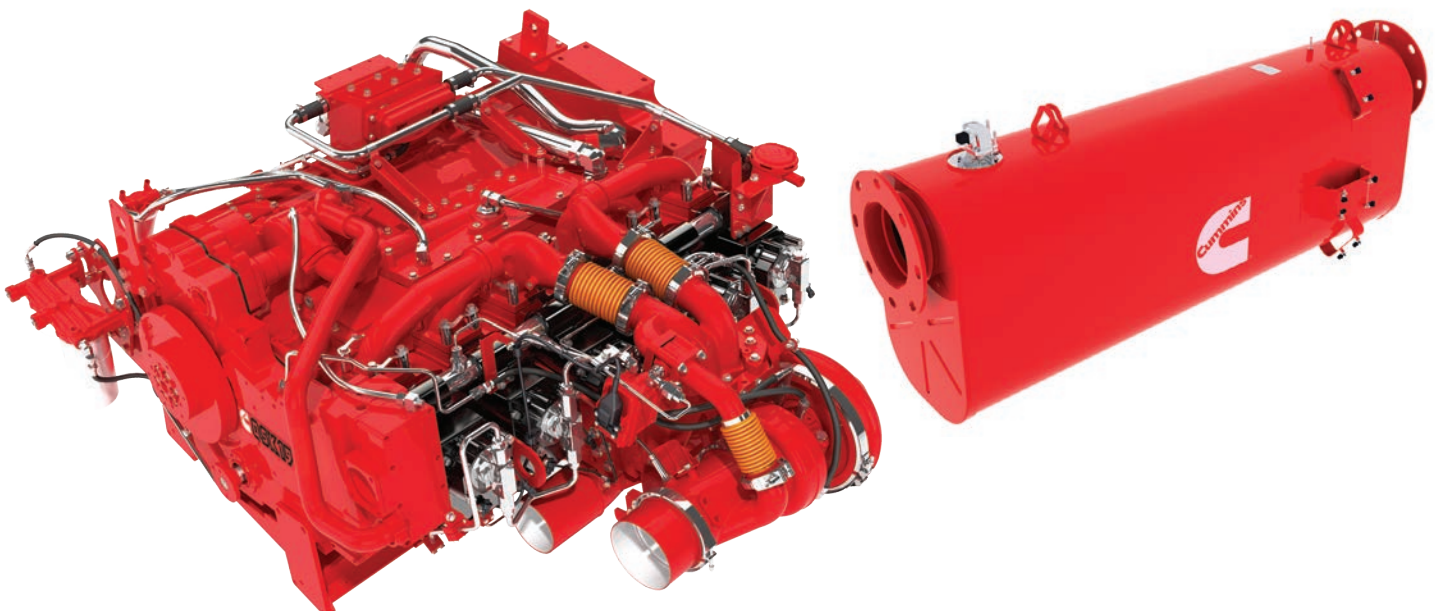
The N14-R engine has a pedigree of over 25 years in the rail industry around the globe. Powering inter-urban railcars, it has built a reputation for reliability and dependability.

The QSK19-R is a unique product in the underfloor railcar diesel market, offering unparalleled power, advanced electronics, low emissions and durability. Giving the operator benefits of lower than ever life cycle cost with reduced environmental impact.

With over 1,800 QSK19-R engines in use, this product has become the class leader in its field. The engine's compact package and high-power capability make it ideal for high-speed diesel railcars.

Cummins proven QSK19-R engine moves to EPA Tier 4 / Stage IIIB emissions with no compromise on performance. Long life to overhaul and low oil consumption is maintained whilst service intervals are extended.

- Base engine design – no changes required for long-term installation consistency
- Electronic Control Module – high processing capability to manage the engine and aftertreatment system
- Combustion technology – clean burn solution for low engine-out particulates
- Modular Common Rail Fuel System – delivering 2200 bar pressure for refined and rapid power delivery, reduced noise, and improved cold start
- Closed Crankcase Ventilation (CCV) system
- SCR aftertreatment – designed and built by Cummins to remove oxides of nitrogen from the exhaust stream. The flow-through catalyst replaces existing exhaust muffler and requires no scheduled maintenance. There is no requirement for a diesel oxidation catalyst or a diesel particulate filter



RAILPACK EXPERTISE.

CUSTOMISED RAILPACK CAPABILITY

Cummins has many years of experience in demanding railcar applications. We recognize that the complete railpack needs to be designed to meet high performance standards as well as the specific requirements of each installation. Working closely with customers, Cummins railpacks have won multiple in-service awards with some of the best engineered solutions in the world. We can deliver your customised solution including:

- Frame and mounts
- Alternator / transmission
- Cooling system
- Air filtration
- Aftertreatment and exhaust system

QSK19-R Tier 4F / Stage IIIB

760 hp / 567 kW @ 1800 rpm

760 hp / 567 kW @ 2000 rpm

QSK19-R UIC II

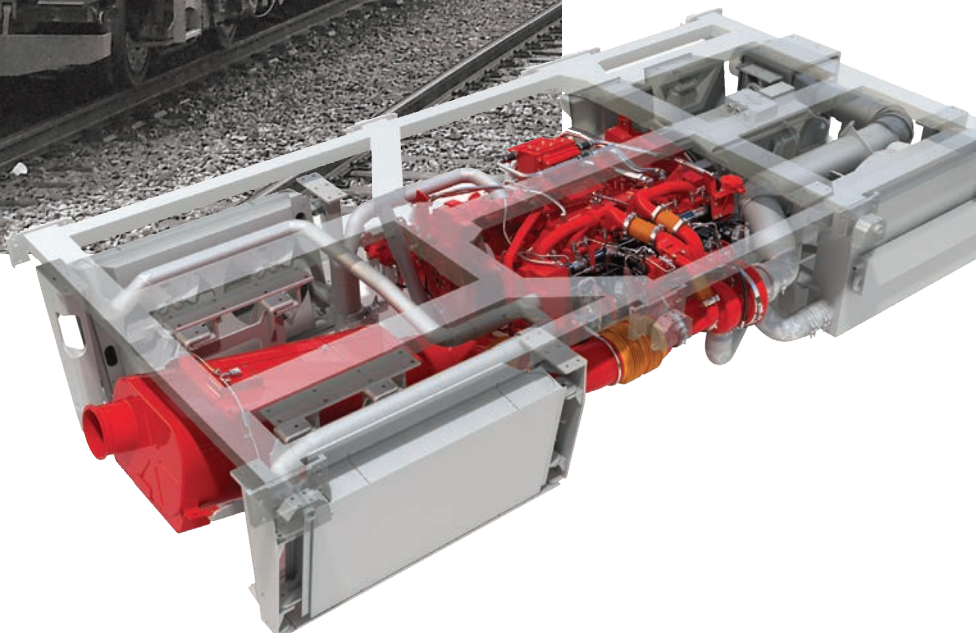
650 hp / 485 kW @ 2100 rpm

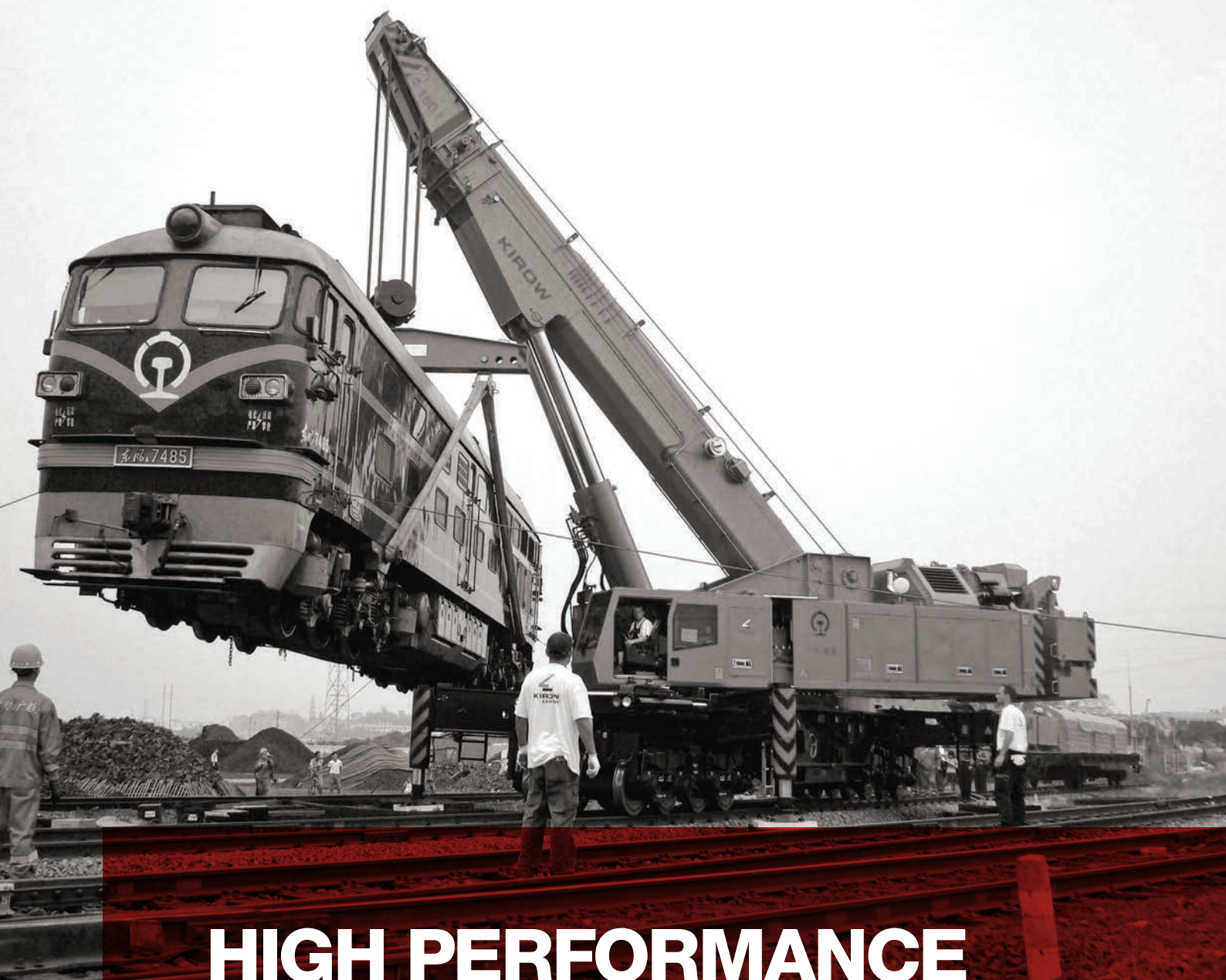
755 hp / 563 kW @ 2100 rpm

QSN14-R / N14-R

350 hp / 260 kW @ 2100 rpm

450 hp / 335 kW @ 2100 rpm





HIGH PERFORMANCE FOR TRACK MACHINERY.

When you couple our engine line-up spanning 49-2500 hp / 37-1864 kW with our unparalleled option availability and application engineering expertise, Cummins is the clear choice for your track maintenance equipment.

Cummins supplies the broadest range of engine displacement and power in the market, making it the industry leader in track machinery. These engines power a wide variety of equipment from rail cranes, ballast tamper and inspection machines, to rail grinders and track renewal machinery.

Choosing a Cummins engine for your track maintenance equipment brings certain advantages. Not only do you benefit from a reliable engine ensuring uptime requirements, you also choose from a range of products ready to meet the latest stringent emissions standards.

Up to Tier 4 Final or Stage V at Cummins, we use advanced technologies designed in house to provide customers with a clean and cost-effective solution. With a high power to weight ratio, heavy duty design and high peak torque, a Cummins engine is ready to work whenever and wherever you need it.

CUMMINS ENGINES FOR MAINTENANCE-OF-WAY APPLICATIONS

49-4425 HP / 37-3300 KW

Engine Model	Top Rating		Emissions Capability						
	HP	kW	Tier 2	Tier 3	Tier 4i	Tier 4 F	Stage IIIA	Stage IIIB	Stage V
QSF2.8	74	55				■	■	■	
QSB3.3	120	89		■	■			■	
QSF3.8	130	97				■	■	■	
F3.8	173	129				■			■
QSB4.5	173	129		■	■	■	■	■	
B4.5	200	149				■			■
QSB6.7	300	224		■	■	■	■	■	
B6.7	326	243				■			■
QSL9	380	283		■	■	■	■	■	
L9	430	321				■			■
QSX11.9	460	343			■			■	
QSG12	513	382				■		■	
X12	513	382				■			■
QSX15	675	503	■	■	■	■	■	■	
X15	675	503				■			
QSK19	800	596	■	■		■			■
QSK23	1050	783	■			■			■
QST30	1500	1118	■			■			■
QSK50	2500	1864	■			■			■

GLOBAL SUPPORT TO KEEP YOU MOVING.

At Cummins, we recognise that it's not just about investing in the best engine technology. Equally important is the investment we make in our service support. With a network of approximately 6000 dealer locations, few other engine companies come close to Cummins global support capability.

Cummins customer support capability extends beyond a successful engine installation. Whether the application is running in the deserts of Namibia or operating in the mountains of Alaska, there's a Cummins location near you. Dedicated Cummins rail technicians can offer parts and service support anywhere around the world, where and when our customers need it.

Our support goes even further with QuickServe – our commitment to rapid response. Cummins customers can access online a complete portfolio of engine diagnostics, maintenance procedures, repair and parts information. You can rely on Cummins to keep you moving in a world that's Always On.



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