# Every Track

## Cummins engines for rail applications
## 60 - 3300 hp (45 - 2462 kW)

# Meeting every need of the Rail Industry

Powering a locomotive, railcar, track maintenance machine, or auxiliary power unit is demanding work. That's why you need a Cummins engine that will be ready to work. Every time. When you specify Cummins engines for your rail applications, you get legendary durability, cutting-edge emissions technology, and global support. With over 13,000 Cummins engines running every day in the toughest rail applications, you can be confident you will be ready for every challenge.

## Enhanced durability for every application

Fundamental to the design of all Cummins rail engines is the need for exceptional durability. Ferrous cast ductile iron pistons, micro-finished camshafts, fully sealed wiring harnesses, Cummins Prelub engine protection system and other advanced engineering features ensure the outstanding levels of durability you expect from Cummins. But this commitment to durability goes beyond extending first engine life, as every Cummins rail engine has been designed with a capability for multiple rebuilds with 'as new' performance guaranteed. This is a major benefit in prolonging equipment life without making costly changes to the installation.

## The right power for every installation

With over 13,000 Cummins rail engines in operation worldwide and a product range from 60 - 3300 hp (45 - 2462 kW), Cummins has the experience to provide the right engine for every installation. Recognizing the unique modes of operation of rail equipment, Cummins is focused on providing the highest possible engine availability at the lowest possible operating cost. High speed engine installations can provide major cost savings when replacing older low speed units. Fuel economy is significantly improved, with servicing and reliability concerns minimized for equipment owners. Cummins provides significant benefits whether specifying new equipment or re-powering older equipment. Specialized expertise and support is offered from Cummins dedicated team of engineers to provide an individual solution for each application. With a level of experience no other engine company can match, you can rely on Cummins – every time.

## Global support. Everywhere.

Cummins' customer support capability extends beyond a successful engine installation. All Cummins rail products are supported by an international distribution network with over 5,500 service locations in 160 countries. Whether it is a locomotive running in the deserts of Namibia or a railcar operating in the high altitudes of Tibet, 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.

## No compromise for meeting emissions

Emissions 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, EU emissions limits for locomotives are only partially aligned with US emission standards

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and they vary depending on power output. And track maintenance equipment can 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. Cummins is meeting these challenges with the latest technology and has the ability to provide the most suitable all round package for your rail equipment. With over $400m 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 maximizing 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.

## High performance engines for Locomotives and Railcars

With a comprehensive locomotive engine line up available across the 130 - 3300 hp (97 - 2462 kW) range, Cummins offers an unrivalled 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 cycle and environmental conditions around the world's railways.

## High performance engines for Track Machinery

When you couple our engine lineup spanning 60 - 2700 hp (45 - 2014 kW) with our unparalleled options availability and application engineering expertise, Cummins is the clear choice for your track maintenance equipment.

## High performance engines for Rail Auxiliary Power

When you need auxiliary or head end power for your application, call on Cummins, the worldwide leader in power systems. Whether it be an 80 kW, 50 Hz underfloor generator unit for a railcar or a 1500 kW generator van operating in the Himalayas, Cummins can supply your auxiliary power needs.


**« With over 13,000 Cummins engines in rail applications worldwide, Cummins has unrivalled experience »**

## Locomotives

| | HP Range | kW Range | | HP Range | kW Range |
|---|---|---|---|---|---|
| QSB Series | 130 - 300 | 97 - 224 | KTA38 | 950 - 1200 | 709 - 895 |
| QSL | 250 - 385 | 187 - 287 | QSK38 | 1200 - 1500 | 895 - 1119 |
| QSM11 | 250 - 400 | 187 - 298 | QSK45 | 1200 - 1800 | 895 - 1343 |
| QSX15 | 350 - 667 | 261 - 498 | KTA50 | 1200 - 1600 | 895 - 1194 |
| KTA19 | 450 - 700 | 336 - 522 | QSK50 | 1600 - 2000 | 1194 - 1492 |
| QSK19 | 600 - 800 | 448 - 597 | QSK60 | 2000 - 2700 | 1492 - 2014 |
| QSK23 | 760 - 950 | 567 - 708 | QSK78 | 2700 - 3300 | 2014 - 2462 |
| QST30 | 960 - 1200 | 716 - 895 | | | |

## Railcars/DMUs

| | | | | | |
|---|---|---|---|---|---|
| QSB Series | 200 - 300 | 149 - 224 | N14R | 350 - 518 | 261 - 386 |
| QSL | 250 - 385 | 187 - 287 | QSK19 | 450 - 760 | 336 - 567 |

## Track Machinery

| | | | | | |
|---|---|---|---|---|---|
| B3.3 / QSB3.3 | 60 - 110 | 45 - 82 | QSK19 | 450 - 760 | 336 - 567 |
| QSB Series | 110 - 300 | 82 - 224 | QSK23 | 760 - 950 | 567 - 708 |
| C8.3 | 185 - 260 | 138 - 194 | QST30 | 760 - 1200 | 567 - 895 |
| QSC | 215 - 315 | 160 - 227 | KTA38 | 925 - 1450 | 690 - 1082 |
| QSL | 280 - 385 | 209 - 287 | QSK38 | 1200 - 1500 | 895 - 1119 |
| QSM11 | 250 - 400 | 187 - 298 | QSK45 | 1200 - 2000 | 895 - 1492 |
| QSX15 | 350 - 600 | 261 - 448 | KTA50 / QSK50 | 1400 - 2000 | 1044 - 1492 |
| KTA19 | 450 - 700 | 336 - 522 | QSK60 | 1800 - 2700 | 1343 - 2014 |

## Rail Auxiliary Power

| Family | 50 Hz (kVA) | 60 Hz (kWe) | Family | 50 Hz (kVA) | 60 Hz (kWe) |
|---|---|---|---|---|---|
| B3.3 / QSB3.3 | 32 - 50 | 32 - 45 | QSX15 | 364 - 500 | 364 - 454 |
| B Series / | | | KTA19 | 450 - 500 | 400 - 455 |
| QSB Series | 65 - 200 | 55 - 225 | QSK19 | 500 - 650 | 450 - 545 |
| C8.3 | 182 - 200 | 160 - 228 | QSK23 | 650 - 810 | 590 - 727 |
| QSL | 200 - 300 | 182 - 275 | QST30 | 800 - 1000 | 725 - 910 |
| NTA855 | 320 - 365 | 250 - 260 | | | |

US EPA, EU, and non-emissionized engines are available • Other ratings may be available • Please contact your distributor for more details

# Meet the Cummins Family

## B Series Family

### B3.3 / QSB 3.3
### 60 - 110 hp (45 - 82 kW)

The Cummins B3.3 and QSB3.3 are designed for dependable, long-lasting performance. With ratings from 60 - 100 hp (45 - 82 kW), the B3.3 and QSB3.3 provide outstanding performance and value in a small package. A full range of options allow you to customize the B3.3 and QSB3.3 specifically to the equipment and environment where they will be used.

## QSB Series
### 110 - 300 hp (82 - 224 kW)

The QSB series is based on the highly successful B Series engines and features power ratings from 110 - 300 hp (82 - 224 kW). The QSB Series can be configured to meet a wide variety of worldwide emissions standards including Tier 4 Interim / Stage IIIb. Its compact design makes it ideal

for small locomotives with space and weight constraints, as well as track maintenance machinery and rail auxiliary power applications.

**« The QSM11 is ideally suited to provide the responsive performance required in demanding rail applications »**

## C8.3
## 185 - 260 hp (138 - 194 kW)

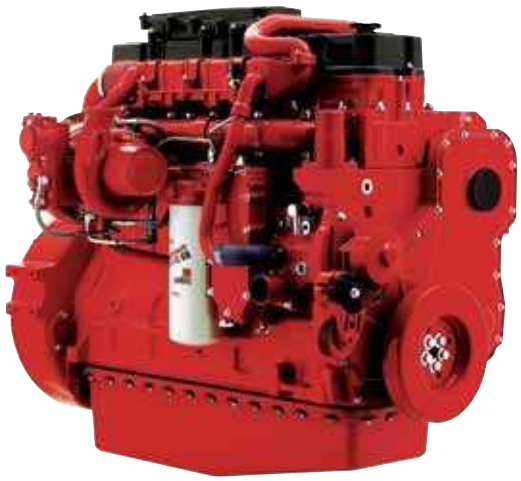
The Cummins C8.3 engine is designed to deliver high reliability and durability in a compact footprint. With power ratings from 185 - 260 hp (138 -194 kW), the 6-cylinder engine has one of the highest power-to-weight ratios of any engine in its class.

## QSC
## 215 - 315 hp (160 - 227 kW)

The Cummins QSC, available with a power range of 215 - 305 hp (160 - 227 kW) meets Tier 3 / Stage IIIA emission standards without compromise. It uses in-cylinder technology, a simple and cost-effective solution that maintains the proven performance, dependability and durability of the QSC while operating cleanly and efficiently.

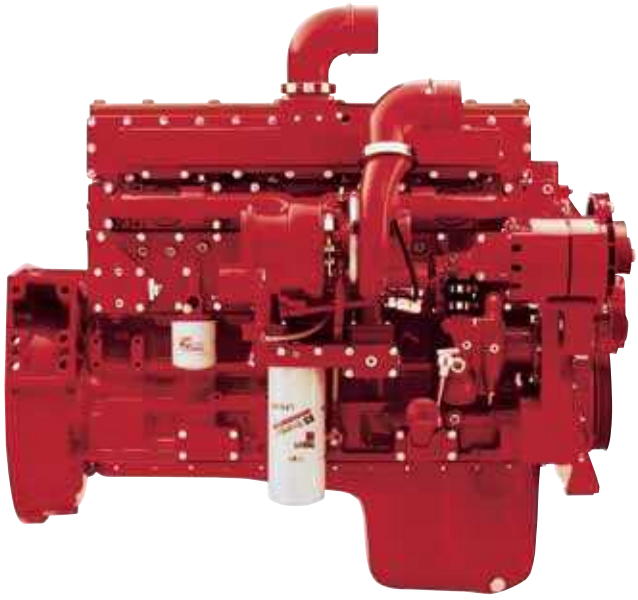
## QSL
## 280 - 385 hp (209 - 287 kW)

The Cummins QSL provides unrivalled power for your rail vehicle when it needs it. With ratings from 280 - 385 hp (209 - 287 kW), the advanced QSL delivers great power to shunting and branchline locomotives and track maintenance machinery. The QSL engine is equipped to meet all worldwide emissions regulations including Tier 4 Interim / Stage IIIB.



## QSM11
## 250 - 400 hp (187 - 298 kW)

The QSM11 is an 11 liter engine with a power range of 250 - 400 hp (187 - 298 kW). This proven heavy-duty performer utilizes Cummins in-cylinder advanced combustion to meet Tier 3 / Stage IIIA emissions. The QSM11 is ideally suited to provide the responsive performance required in demanding rail applications. The electronic control module ensures the engine maintains an optimum balance between load demands and fuel efficiency ensuring high reliability and low running costs in arduous and intensive rail operations.




**« The high efficiency and low emissions of the QSK19 with MCRS makes it ideal for switchers and small locomotives. »**

## QSX15
## 350 - 667 hp (261 - 498 kW)

The heavy duty 15 liter QSX15 has a power output range from 350 - 667 hp (261 - 498 kW), and is

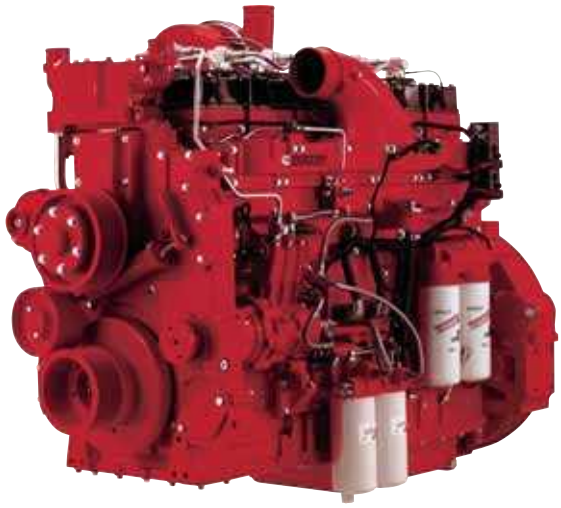

widely used in switching and yard locomotives as well as track machinery. The QSX15 Dual Overhead Camshaft (DOHC) system is capable of injection pressures up to 30,000 psi (2,068 bar) and achieves Tier 3 / Stage IIIA emissions with advanced combustion and air handling. When equipped with cooled EGR and a diesel particulate filter, the QSX15 meets Tier 4 / Stage IIIB locomotive emissions standards with ratings up to 667 hp (498 kW). The high power to weight ratio and heavy duty design makes the QSX15 an excellent choice for small locomotives and track maintenance machinery such as rail grinders and ballast cleaners.

## KTA19
## 450 - 700 hp (336 - 522 kW)

The legendary Cummins KTA19 delivers exceptional reliability for low cost of operation. The KTA19 uses the Cummins PT (Pressure Time) fuel system for unparalleled simplicity and reliability. With ratings up to 700 hp (522 kW), the 19 liter engine is an ideal choice for new or re-power locomotives and track machinery applications around the world. Rail auxiliary power ratings up to 500 kW are available as well.

## QSK19
## 450 - 800 hp ( 336 - 597 kW)

Building on the successful KTA19 platform, the QSK19 is enhanced to meet the toughest demands in the rail market. The 19-liter engine is available from 450 - 800 hp (336 - 597 kW). It's especially suitable for new and re-power locomotive applications. The engine has the ability to be installed in locomotives with single or multiple engine configurations giving increased flexibility for the operator.



Improved power cylinder and available cast-iron Ferrous Cast Ductile (FCD) pistons enable up to 10% increase in durability and reduction in oil consumption by approximately 20% – offering operators an important cost saving.

For Tier 2 / Stage II emission levels, the QSK19 engine is available with High Pressure Injection Fuel System (HPI). The advanced high-pressure fuel injection system ensures clean, powerful and efficient operation. Fuel is injected at pressures exceeding 25,000psi (1723bar) – resulting in better utilization of fuel with fewer emissions and more available power. Whether it is new rail equipment or a repower, the QSK19 engine with HPI provides proven durability and uptime. Every Time.

For Tier 3 / Stage IIIA emissions, the 19-liter engine is available with Modular Common Rail Fuel System (MCRS) with ratings up to 700 hp (522 kW). Also, advanced in-cylinder combustion technology and the Cummins Modular Common Rail Fuel System (MCRS) reduces NOx emissions by 40% while providing responsive power delivery. The QSK19 with MCRS is designed to provide maximum uptime, with a projected life-to-overhaul of up to 300,000 gallons (over 1.1m liters) of fuel burned with no mid-life overhaul required.

### QSK19-R Railcar Engines
### 450 - 760 hp (335 - 567 kW)

With over 10,000 Cummins underfloor engines in service around the world and over 1,600 QSK19-R horizontal engines, the QSK19-R is a

**« The QSK19-R is a unique product in the underfloor railcar diesel market offering unparalleled power, advanced electronics, low emissions and durability »**

development of a rail industry standard. The engine's compact package and underfloor configuration makes it ideal for high speed Diesel Multiple Units (DMU) and railcars. With ratings from 450-760 hp (335-567 kW), the QSK19-R is equipped with heavy duty components which offer class leading durability, reliability and life cycle costs.

The QSK19-R is a unique product in the underfloor railcar diesel market offering unparalleled power, advanced electronics, low emissions and durability which in turn gives the operator benefits of lower than ever life cycle cost, environmental advantages and faster journey times. The horizontal configuration of the 19-liter engine gives ease of access for maintenance at the side of the rail vehicle. It also reduces noise and vibration and increases passenger capacity. By offering high acceleration and high speed capability, journey time is reduced with the renowned durability from Cummins.

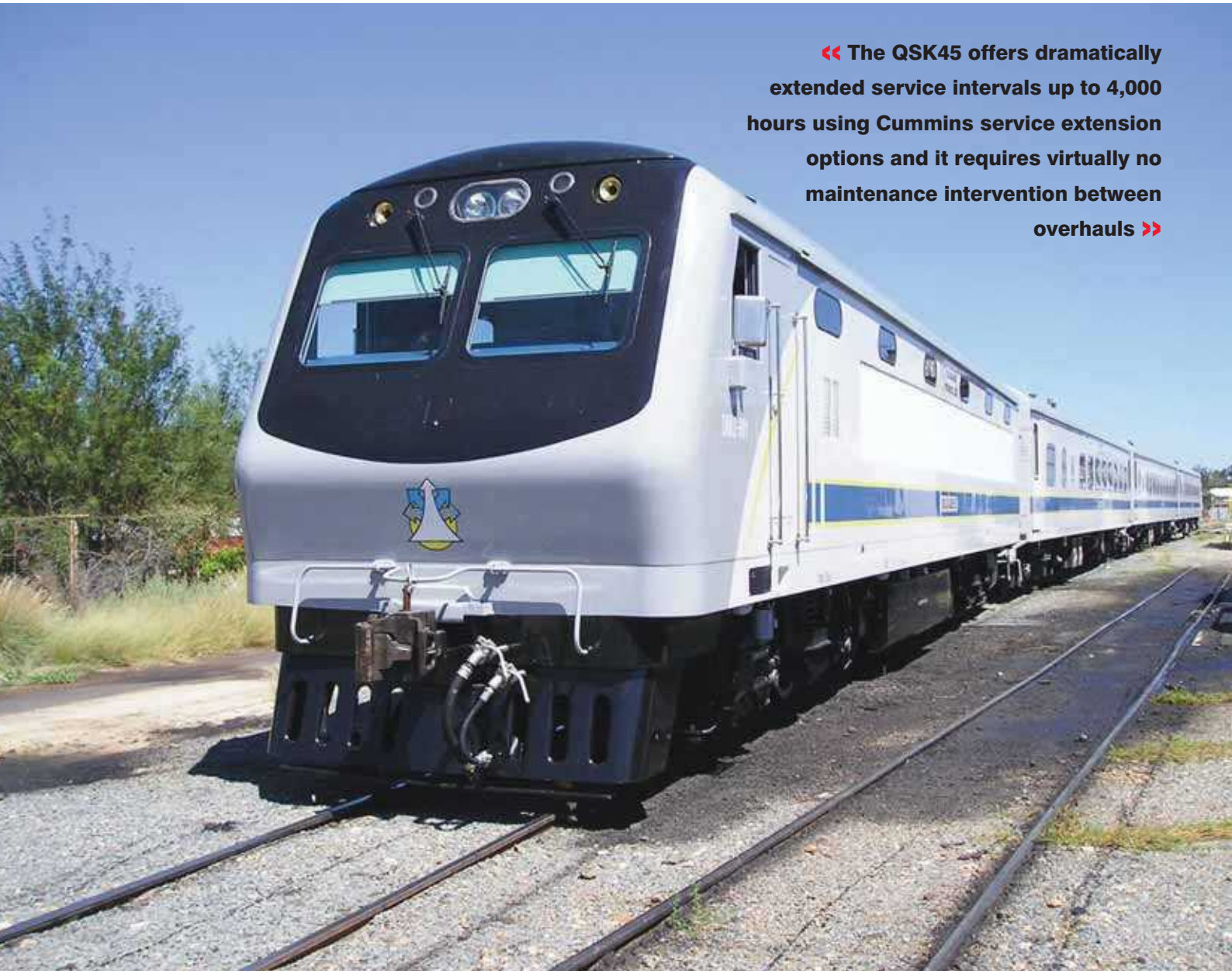
## QSK23
## 760 - 950 hp (567 - 708 kW)

The inline 6 cylinder QSK23 offers class leading life to overhaul in a compact and easy to integrate package. With locomotive and track machinery ratings from 760 - 950 hp (567 - 708 kW), the Tier 2 / Stage IIIA capable 23 liter engine is an excellent choice to power switchers as well as branchline locomotives for passenger or freight operation. High pressure fuel injection and sophisticated air-handling systems give the

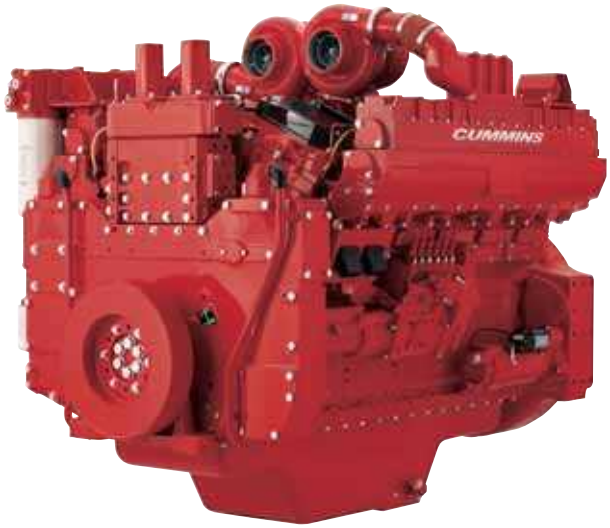
QSK23 excellent responsiveness with low fuel consumption. This means that the engine power is available, whatever the operating conditions of the locomotive, providing reliable low cost service. The QSK23 is also an excellent choice for rail auxiliary power applications, with ratings up to 727 KWe (60Hz) and 810 kVa (50Hz). The QSK23 engine's improved durability and reliability means a life-to-overhaul of up to 385,000 gallons (1.5m liters) of fuel burned with no mid-life overhaul required.

## QST30
## 760 - 1200 hp (567 - 895 kW)

The 30 liter QST30 is available with locomotive and track machinery ratings from 760 - 1200 hp (567 - 895 kW) and rail auxiliary power ratings up to 1000 kVA and 910 kWe. The QST30 is built to withstand the toughest operating conditions in the rail environment. Ductile iron pistons allow



**« The QSK45 offers dramatically extended service intervals up to 4,000 hours using Cummins service extension options and it requires virtually no maintenance intervention between overhauls »**

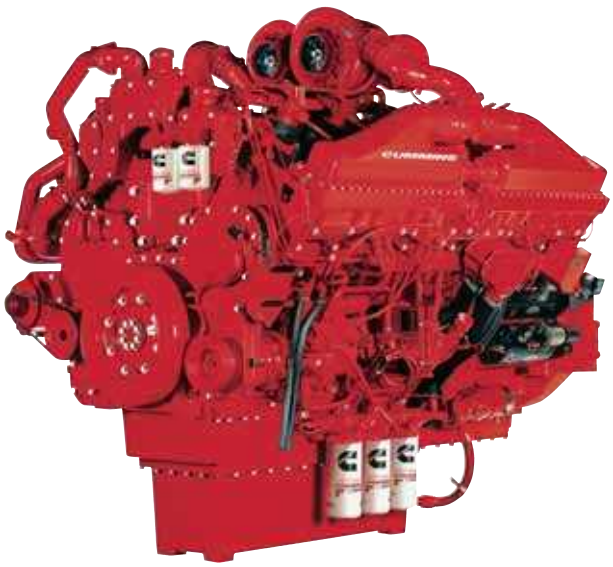

higher power to handle high heat and heavy loads. A swirl port cylinder head reduces emissions and increases low end torque. Its durable design is ready to handle the thermal fatigue experienced in the rail industry and achieve an industry standard leading to 500,000 gallons (1.9m liters) of fuel burned before overhaul with no midlife overhaul required.

### KTA38 / KTA50
### 925 - 2000 hp (690 - 1492 kW)

Using the same Cummins PT (Pressure Time) fuel system as the KTA19, the KTA38 and KTA50 are proven workhorses with many years of experience in the rail business. The V-12 KTA38 is available with ratings up to 1450 hp (1082 kW) while the KTA50 has ratings up to 2000 hp (1492 kW). The KTA38 and KTA50 can be equipped with Cummins electronic controls that provide complete engine monitoring, automatic adjustment for peak performance and fuel efficiency, plus full diagnostics and prognostics.

### QSK38
### 1200 - 1500 hp (895 - 1119 kW)

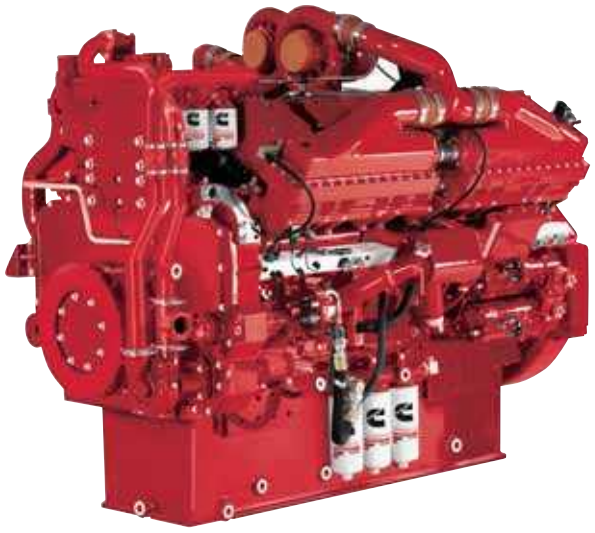
The QSK38 is available in ratings from 1200 - 1500 hp (895 - 1119 kW) and it is capable of Tier 3 / Stage IIIA emissions. The 38-liter engine is equipped with Modular Common Rail Fuel System (MCRS) and uses Cummins Ferrous Cast Ductile (FCD) iron pistons for 675,000 gallons (2.5m liters) to overhaul. Service interval extension technology



include Eliminator and Centinel allowing 1500 hour (92 day) service intervals. Plus, the 38-liter engine is equipped with Advanced Engine Monitoring (AEM) which allows engine performance monitoring on a real time basis.

### QSK45
### 1200 - 2000 hp (895 - 1492 kW)

With power outputs of 1200 - 2000 hp (895 - 1492 kW), the Tier 1 / Stage II QSK45 engine with High Pressure Injection Fuel System (HPI) has been specially configured for both new and re-power locomotive applications up to 80 tonnes requiring a compact engine envelope. With a 38% larger camshaft and an extra-wide gear train, the 45-liter engine gives unrivalled durability for even higher load factors.The QSK45 offers dramatically extended service intervals up to 4,000 hours using Cummins service extension options and it requires virtually no maintenance intervention between overhauls. Also, the 45-liter engine incorporates CENSE™ – Cummins' diagnostic and prognostic engine monitoring system. The projected life to overhaul up to 750,000 gallons (2.8m liters) of fuel burned without any need for mid-life

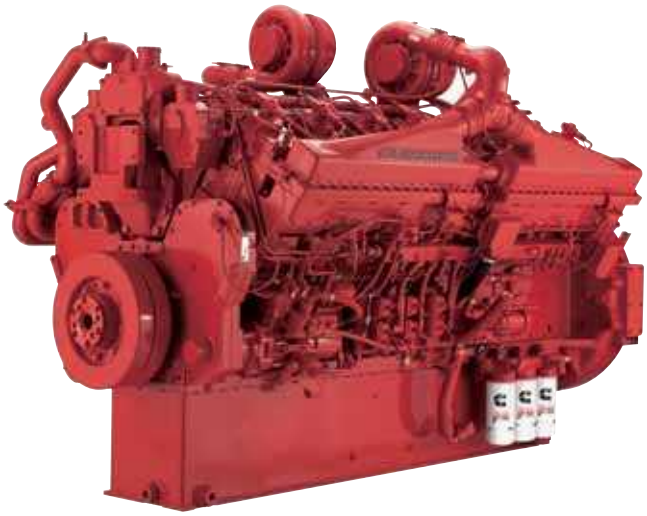


overhaul proves the engine's exceptional durability and reliability.

### QSK50
### 1600 - 2000 hp (1194 - 1492 kW)

For high power rail applications where low emissions are required, the QSK50 engine with Modular Common Rail Fuel System (MCRS) combines the durability of the legendary

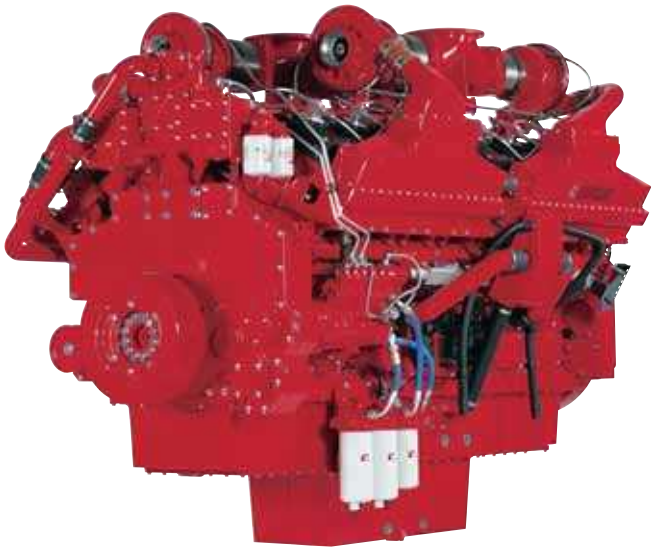
**« For high power rail applications where low emissions are required, the QSK50 engine with Modular Common Rail Fuel System (MCRS) combines the durability of the legendary Cummins K50 with the strength of single-piece ferrous cast ductile iron pistons that provide a 10% longer life-to-overhaul »**



Cummins K50 with the strength of single-piece ferrous cast ductile iron pistons that provide a 10% longer life-to-overhaul. Its V16 configuration offers a power range from 1600 - 2000 hp (1194 - 1492 kW),capable of meeting Tier 3 / Stage IIIA emissions with in-cylinder technology. The Cummins Modular Common Rail Fuel System (MCRS) maintains high injection pressures for exceptional performance at every rpm. This provides enhanced locomotive acceleration and maximum speed for effective train operation.

The 50-liter engine is equipped with Advanced Engine Monitoring (AEM) for preventive maintenance planning. The QSK50 with MCRS has been designed with exceptional durability and performance which allows a life to overhaul of up to 875,000 gallons (3.3m liters) of fuel burned with no mid-life overhaul required.

## QSK60
## 1800 - 2700 hp (1343 - 2014 kW)



The QSK60 has the same design features as the QSK45, but with four additional cylinders. With ratings from 1800 - 2700 hp (1343 - 2014 kW), this engine is used around the world for mainline freight and passenger locomotives. The V-16 configuration of the QSK60, heavy duty components and extended maintenance features help set the standard for high productivity at high rail load factors. Performance and durability are maintained even for intensively used locomotives operating a high number of hours. For more effective fleet management, the 60-liter engine is equipped with CENSE™ – Cummins' diagnostic and prognostic engine monitoring system.


**« The V-16 configuration of the QSK60, heavy duty components and extended maintenance features help set the standard for high productivity at high rail load factors »**

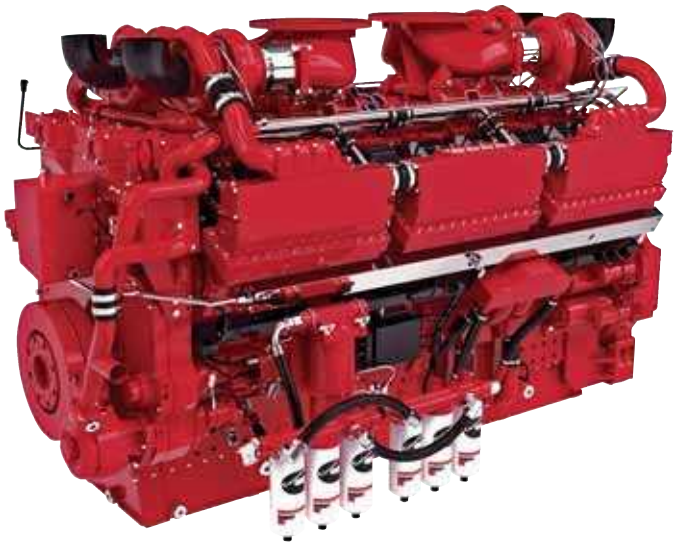
The QSK60 engine has been designed with exceptional durability and performance which allows a life to overhaul of up to 1,000,000 gallons (3.8m liters) of fuel burned with no mid-life overhaul required.

For Tier 1 emissions, the 60-liter engine is fitted with High Pressure Injection Fuel System (HPI). The HPI fuel system allows multiple injection events for cleaner, quieter operation with consistent performance at every rpm.

For Tier 3 / Stage IIIA emissions, the QSK60 engine is available with Modular Common Rail Fuel System (MCRS) for outstanding durability and reliability.

### QSK78
### 2700 - 3300 hp ( 2013 - 2462 kW)

It's one of the most powerful high speed diesel engines in the rail industry with 18 cylinders, and 78 liters displacement. With an output range of 2700 - 3300 hp (2013 – 2460 kW), the V-18 configuration of the QSK78 combines the proven durability of the Cummins K Series with an advanced electronic control system and enhanced durability. The 78-litre engine is specifically designed for the latest generation of low axle-weight rail vehicles with high maximum speeds. Using Cummins service extension technology it has the ability to run up to 4,500 hours between services providing significant cost reductions for the rail operator. The 78-liter engine gives operators of larger locomotives the ability to choose Cummins renowned levels of durability with Tier 2 emissions capability.



# Service Extension Technology

Cummins has the ability to provide factory fitted options which will significantly increase your equipment reliability and availability whilst reducing engine servicing costs.

### Cummins PRELUB™ system

Cummins PRELUB System helps to eliminate wear from cold and hot starts giving longer engine life. It automatically protects the engine by requiring full oil pressure to all major components prior to cranking. Fitted as standard on all Cummins high-horsepower (HHP) locomotive engines it can extend engine life by up to 25%.

### ELIMINATOR™ Filtration system

ELIMINATOR is an engine mounted oil purification system, which eliminates the need for conventional oil filters, saving service time and disposal problems. The system operates under its own hydraulic power with a self-cleaning full-flow filter and a centrifugal separator, which is capable of removing oil particles down to 2 microns or less. It extends oil change intervals to 1000 hours, and removes the need to dispose of old filters.

### CENTINEL™

CENTINEL is an advanced engine oil management system which dramatically increases oil changes intervals up to 4,000 hours, while ensuring even better engine lubrication in the process. Using advanced electronic control technology the system constantly monitors oil quality in relation to duty cycle and load factor demands. CENTINEL removes small amounts of used oil as required and replaces it with new oil from an auxiliary oil tank to maintain lubrication quality at a consistent level. The removed oil becomes a useful energy source as it is blended into the fuel and burned during combustion. This is a major factor in reducing servicing costs.

### Electronics for rail engines

Cummins is a pioneer in the use of electronic control systems and information technology to enable engine users to run their business more effectively. All new Cummins electronic engines feature this system, by far the most advanced electronic management system yet seen on any rail diesel engine.

The system continuously monitors engine performance, adjusting the fuel-to-air mixture to maximize engine response across the whole duty cycle while achieving fuel efficiency and lowest emissions. Plus, the engine Electronic Control Module (ECM), incorporates an industry standard SAE J1939 datalink to accept inputs from all powertrain components, all creating a seamless flow of information shared along a high speed datalink.

With over 60 programmable features, engine performance can be customized to specific operator requirements. Military-standard harnessing allows Cummins Quantum electronic systems to operate in the most severe rail environments with reliability in excess of engine overhaul life. And as 'smart' electronics, they will readily integrate with power interface modules on rail vehicles with isolated electrical returns.

## AEM™ – Advanced Engine Monitoring

Utilizing the latest electronics architecture, Advanced Engine Monitoring (AEM) is offered on all Cummins QSK locomotive engines. The new engine electronic module operates at twice the processing speed of the previous system, fully isolated from any detrimental thermal or vibration loadings. The operator can download and undertake trending analysis with AEM datalogs of engine duty cycle, fuel consumption, load factors, fault snapshots and stop-starts. A progressive auto-derate feature is available as part of the engine protection system, triggered when pre-set threshold limits are exceeded.

## INSITE™ and INFORM™

Rail vehicle productivity can be significantly improved by using Cummins Windows® based INSITE and INFORM software tools for 'smart' diagnostics, trip data and fleet management. Service downtime can be reduced, faults can be rapidly identified and fuel efficiency can be analyzed. Cummins INSITE software minimizes downtime and operational costs by providing rapid diagnostics to instantly pinpoint faults and service needs. It features step-by-step repair directions with precise diagrams. INFORM is a highly effective full fleet management data retrieval tool that aids prediction of service requirements, compares fuel consumption to targets and translates data into easy to use graphs and charts.

## Optimum performance with POWERMATCH

Quantum System electronics allow Cummins to customize the performance of your rail engine to a specific piece of equipment or application. We examine everything from load factors to ambient temperatures to different operating modes. Once we have that profile, we customize the torque curves and power ratings to get your engine and equipment working together for optimum performance.

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 over 5,500 dealer locations, few other engine companies come close to Cummins global support capability. And that support goes even further with QuickServe – our commitment to rapid response. Cummins customers can access on-line a complete portfolio of engine diagnostics, maintenance procedures, repair and parts information.

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Bulletin No: 4951353 Printed in UK 08/10
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