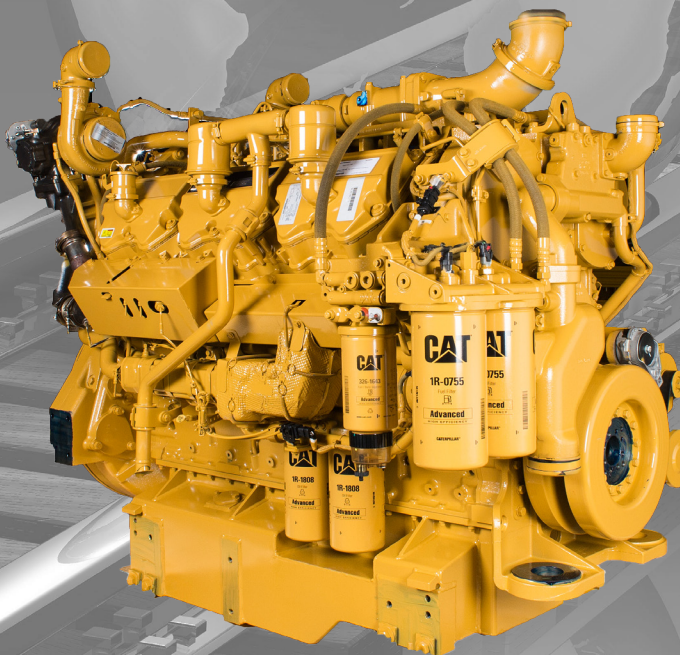




# RAILWAY ENGINE ratings guide



[www.cat-railpower.com](http://www.cat-railpower.com)

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*Caterpillar® diesel engines provide power solutions in four major application sectors of the railway business throughout the world today.*

## CAT ENGINES FOR THE RAIL INDUSTRY

Progress Rail Services, a Caterpillar Company, along with our worldwide Caterpillar Dealer Network, is responsible for the sales and support of Cat engines and systems solutions for the rail industry:

- Locomotive traction power from 200 to 5000 bkW
- Head-end/hotel power from 300 to 725 ekW
- Maintenance of Way power from 8 to 2000 bkW

Caterpillar is the world's largest manufacturer of heavy duty diesel engines and specifically develops locomotive engines based on several key engine platforms.

Rail Industry specialists along with our worldwide Caterpillar Dealer Network provide in-depth leadership and expertise in the development of the application and installation solutions for the railway applications. The increasing complexity of emissions-compliant engines, means this knowledge of locomotives and their operating environment is more critical than ever.

## LOCOMOTIVE TRACTION

**Diesel-Electric** applications use a diesel engine to drive an electric generator/alternator. The generator converts mechanical energy to electrical energy, which is sent to the traction motors that propel the locomotive.

**Diesel-Hydraulic** applications use a diesel engine to drive through a hydrodynamic transmission. Drainable torque converters and fluid couplings are used in different combinations to provide traction over a wide vehicle speed range. There are no wear parts except bearings, which provide smooth acceleration and shifting. Reverse direction operation is achieved by using a sliding change gear or a second set of torque converters and fluid couplings.

## MAINTENANCE OF WAY

**Maintenance of Way** equipment is specialized to maintain tracks and right-of-ways for safe and efficient operation of trains.

## AUXILIARY OR HEAD END POWER

**Auxiliary or Head End Power** is an electric power engine-generator system located either in a locomotive or separate power car in passenger train applications. This power is used for electric lighting, HVAC, and food/beverage service.

## Caterpillar: 80 Years of Engine Manufacturing

This technical experience and ownership of key manufacturing and assembly processes, such as casting and machining critical engine components as well as the complete assembly, test, paint and package of the complete engine or generator set enables Caterpillar to produce high quality, dependable products.

### A quality product starts with quality people and continues with Quality Control measures and In-process validation:

Caterpillar uses stringent hiring guidelines and extensive new employee training and apprenticeship programs

Internal certification of each manufacturing and assembly area with quarterly management reviews and annual audits

Three tier torque program

- Maximum use of DC torque tools to ensure proper bolt tightening
- Monthly certification of torque tools on dynamic bench
- Static bolt torque checks after assembly

Quality Gates with specific checklists for each gate throughout the assembly process that are staffed by Quality control personnel

In Process Validation including:

- Air leak checks during the assembly process
- Every engine is tested to ensure proper engine performance
- Every genset package is tested to ensure proper package performance
- Two Blacklight checks for fuel & oil leaks
- Oil Sample analysis during every test to verify proper operation and assembly
- All engines receive a Pre-Delivery Inspection before leaving the factory

### External facility certification

- Factory-designed components, systems, and engines built at Caterpillar ISO 9001:2008 certified facilities



## DNV BUSINESS ASSURANCE MANAGEMENT SYSTEM CERTIFICATE

Certificate No. CERT-08370-2006-AQ-HOU-ANAB

*This is to certify that*

**Caterpillar, Inc.**  
**Lafayette Engine Center**  
*at*

3701 State Road, Lafayette, IN 47905 USA

*has been found to conform to the Management System Standard:*

**ISO 9001:2008**

*This Certificate is valid for the following product or service ranges:*

**The design and manufacture of large diesel and gas engines and power systems, and the remanufacture of large engines.**

*Initial Certification date:*  
June 09, 1993

*This Certificate is valid until:*  
February 04, 2015

*The audit has been performed under the supervision of*  
**Klaus Petersen**  
*Lead Auditor*



*Place and date:*  
Houston, Texas, February 04, 2012  
*for the Accredited Unit:*  
DET NORSKE VERITAS  
CERTIFICATION INC., HOUSTON TEXAS

**Rudy Frueboes**  
*Management Representative*

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.

HEAD OFFICE: Det Norske Veritas Certification, Inc. 1400 Ravello Drive, Katy, Texas 77449. TEL: (281) 396-1000. FAX: (281) 396-1903

## Customer Support Programs for Cat® Rail Engine Products

Caterpillar offers a variety of integrated solutions to help you protect your investment, minimize owning and operating costs, and maximize up-time. These solutions are specifically tailored to meet your needs.

### Extended Service Coverage (ESC)

Your operation depends on reliable power. That's why you specify Cat® Rail engines. Being prepared means more than having the right engine, it means having service coverage that's as durable and long lasting as the engine.

#### **Cat® Extended Service Coverage helps you stay on budget...**

- Avoid unplanned expenses associated with unexpected repairs
- Protect your investment with coverage for warrantable failure costs
- Minimize downtime with repairs by Cat technicians trained to fix it fast and do it right
- Lock in your repair costs up front
- Program options to fit any budget

#### **...and stay productive**

- Get back to work faster, with engines performing at their best
- Return your engine to original operating specifications, meeting safety and environmental requirements
- Spend more time running your business, less time managing your engines

Extended Service Coverage helps you manage to the bottom line. For total equipment maintenance and repair coverage, combine Extended Service Coverage with a Cat Maintenance Plan for preventive care.

### Advantage Extended Service Coverage

Advantage ESC is an exclusive Cat product for rail engines and gensets in which the standard warranty period has expired. These engines must meet inspection requirements to qualify and must be enrolled after the expiration of the standard warranty period. Age and total use (hours) limitations apply dependant on the engine model to be eligible for this coverage.

### Overhaul Protection Coverage (OPC)

OPC is an exclusive Cat product for rail engines and gensets for protection after a major overhaul. Enrollment is made within 30-days of the completion of the overhaul. The overhaul must be completed as per the requirements outlined in the OPC checklist. Age and total use (hours) limitations apply dependant on the engine model to be eligible for this coverage.

### Customer Support Agreements (CSAs)

Three flexible CSA options are available which can be customized to fit your needs: Inspection, Preventive Maintenance, and Total Maintenance and Repair. The more comprehensive the CSA, the greater the benefits. Caterpillar tests have proven that with CSAs, engine operating time is significantly increased. They ensure that maintenance and repairs are completed by highly skilled technicians and only use Cat parts.

*Contact your nearest Cat dealer for additional details on these programs.*

MAKE REPOWER EASY

Progress Rail Services subsidiary Zeit is a locomotive control specialist that can make any repower project easy and functional.

From simple Engine-Locomotive Interfaces to complete control systems including traction, adhesion and excitation, Zeit provides the right solution.

CPP-03

CPP-03 is an interface between locomotives and Cat Engines.

Connect locomotive signals (throttle, start/stop, etc) to CPP-03 and it will manage the interface to Cat engine using PWM control or CAN J1939 communications, including acceleration and speed control optimized to the locomotive operation.

Using CPP-03 is the easiest way to replace an old engine for a new Cat engine in a locomotive with minimal changes to the original locomotive electrical diagram.

SAL Locomotive Automation System

Hundreds of units are currently running using the SAL system, a proven and reliable control solution to be applied on overhaul and repower projects with several benefits, including performance, reliability and maintainability.

SAL Product Family

The SAL Product Family is composed of three lines and can be applied from a simple switcher locomotive automation to a complex single axle control locomotive.



SAL system RACK and Modules



Man Machine Interface

SAL NANO	SAL LITE	SAL
Switcher Locomotives	Low Cost with a good package of Automation	Overhaul of Freight Locomotives on Main Lines
Engine Interface, Excitation and Adhesion control, Basic Locomotive Protection.	Locomotive logic Control, Engine Interface, Excitation and Adhesion control, Standard Locomotive Protection	Complete Control, Expandible set of sensors, up to 85% reduction of relays, Complete Locomotive Protection.

The three products include sensors, transducers, and TB panels, and can be supplied with low voltage cables specifically designed for each model. The SAL Locomotive Automation System can be applied on any Diesel Electric Locomotive, regardless of the brand and the original technology.

**SD40-2 before and after SAL application**



## Locomotive Engineering

The Zeit team will be pleased to help design a new electrical diagram to repower locomotives and provide the best automation and modernization equipment available.

- Electrical diagrams and documentation
- MMI software development in any language
- Specific customer design functions on SAL system
- Complete low-voltage cabling design and pre-fabrication
- Development of new electrical lockers to repower locomotives

## Contact Information

PROGRESS RAIL - ZEIT

Avenida Iguaçu, 734 - Rebouças  
Curitiba-PR, Brazil  
CEP 80230-020  
+55 41 3046 7100  
[zeit@zeit.eng.br](mailto:zeit@zeit.eng.br)  
[www.zeit.eng.br](http://www.zeit.eng.br)



## Engine Repower — Why Should Old Locomotives be Modernized?

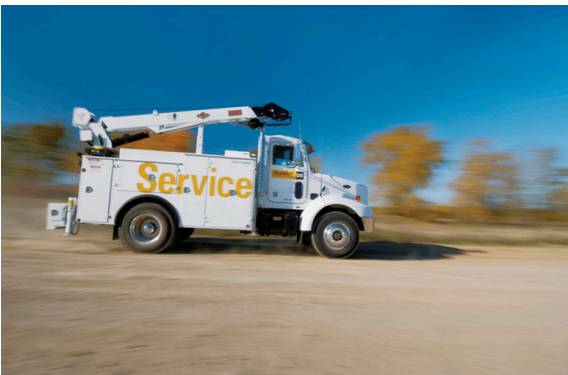
There are large fleets of aging locomotives, many older than 25 years and past the original design life expectation. Operating such locomotives is not only more expensive but also unreliable. Due to high fuel and oil consumption, frequent out-of-service condition, and the fact that many spare parts are no longer manufactured, the continuous rise of operating maintenance costs is an unpleasant reality.

From the driver's point of view, the older locomotives lack current advances in operator comfort and ease of operation. This includes cabin design for reduced noise and vibration, improved visibility, information displays, and accessibility for maintenance and repair.

Ensuring problem-free operation of old locomotives requires major repair work and the location of spare parts, but purchasing a new locomotive is often financially prohibitive. A better choice may be to upgrade, resulting in a big reduction in operational costs while retaining the existing locomotive. The price of an upgraded locomotive is between one- and two-thirds the price of purchasing new, while the performance is fully comparable. Virtually all upgrades are based on the installation of a new engine. The extent of the upgrade depends on the customer's needs.

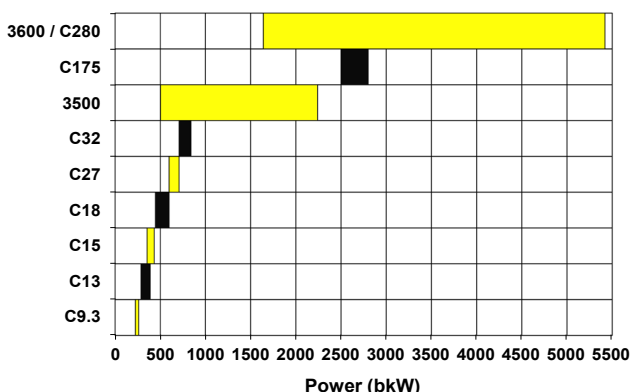
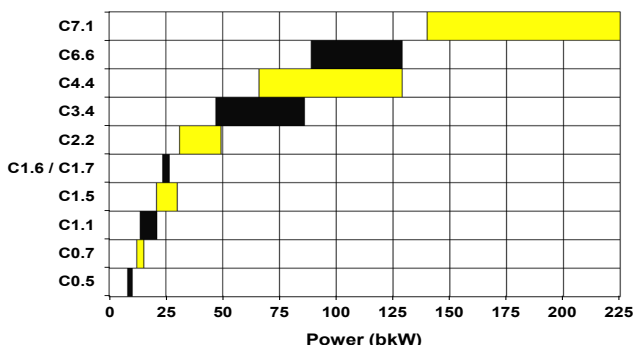
## Worldwide Cat Dealer Network

The reputation of Caterpillar as a quality supplier of engines has been built on our long commitment to service and support. No other engine manufacturer can boast of the worldwide dealer network and parts distribution system that Caterpillar customers have come to rely on. Repowers, new engine installation, service and support -- whatever you need, wherever and whenever you need it, your Cat dealer can provide it. From scheduled maintenance programs to parts and service support, diagnostics and emergency response — the Caterpillar dealer network stands ready with the expertise, technology, and parts to keep you up and running at peak efficiency.





## Railway Diesel Engine Ratings Locomotive Traction and Maintenance of Way



### Rating Conditions

#### Diesel Engines — up to 7.1 liter

All rating conditions are based on ISO/TR14396, inlet air standard conditions with a total barometric pressure of 100 kPa (29.5 in. Hg), with a vapor pressure of 1 kPa (.295 in. Hg), and 25°C (77°F). Performance measured using fuel to EPA specifications in 40 CFR Part 1055 and EU specifications in Directive 97/68/EC with a density of 0.845-0.850 kg/L @ 15° C (59° F) and fuel inlet temperature 40° C (104° F).

#### Diesel Engines — Greater than 7.1 liter

All rating conditions are based on SAE J1995, inlet air standard conditions of 99 kPa (29.31 in. Hg) dry barometer and 25°C (77°F) temperature. Performance measured using a standard fuel with fuel gravity of 35° API having a lower heating value of 42,780 kJ/kg (18,390 btu/lb) when used at 29° C (84.2° F) with a density of 838.9 g/L.

### Abbreviations

API.....	American Petroleum Institute
bhp.....	Brake Horsepower
bkW .....	Brake Kilowatts
EPA.....	Environmental Protection Agency
EU.....	European Union
HEP.....	Head End Power
ISO.....	International Standards Organization
MOW.....	Maintenance of Way
NA.....	Naturally Aspirated
T.....	Turbocharged
TA.....	Turbocharged/Aftercooled
TTA.....	Twin Turbocharged/Aftercooled

## US EPA Originally Manufactured Locomotive Emissions Standards

This chart is supplied for general information only. It should not be construed as legal advice, nor is it a substitute for consulting the published regulatory text. This information is subject to change at any time.

Reference US EPA 40 CFR1033

This chart covers Line-Haul and Switcher locomotive engines

Units are in g/bhp\*hr

	Tier	Date	NOx	PM	HC	CO
Line-Haul	3	2012-2014	5.5	0.10	0.30	1.5
Line-Haul	4	2015 -	1.5	0.03	0.14	1.5
Switcher	3	2011-2014	5.0	0.10	0.60	2.4
Switcher	4	2015 -	1.3	0.03	0.14	2.4

### Notes:

Cycle emissions NOx, PM, HC, CO, g/bhp\*hr

Smoke - Steady-State-20% / 30-sec peak-40% / 3-sec peak-50%, %

opacity, only apply where PM is > 0.05 g/bhp\*hr

No FEL may be higher than a previously applicable Tier

There are notch specific emissions limits, see

For considerations and regulations on remanufactured locomotive emissions standards contact Progress Rail Services. [www.progressrail.com](http://www.progressrail.com)

## US EPA Non-Road Emissions Limits

Units are in g/bkw\*hr

	Tier	Date	NOx	HC	CO	PM
P < 8 kW	4f	2008 -	7.5		8.0	0.60
8 kW <= P < 19 kW	4f	2008 -	7.5		6.6	0.40
19 kW <= P < 37 kW	4f	2013 -	4.7		5.5	0.03
37 kW <= P < 56 kW	4f	2013 -	4.7		5.0	0.03
56 kW <= P < 130 kW	4i	2012 - 2014	3.40	0.19	5.0	0.02
56 kW <= P < 130 kW	4f	2015 -	0.40	0.19	5.0	0.02
130 kW <= P <= 560 kW	4i	2011-2013	2.00	0.19	3.5	0.02
130 kW <= P <= 560 kW	4f	2014 -	0.40	0.19	3.5	0.02
P > 560 kW Non-Genset	4i	2011-2014	3.50	0.40	3.5	0.10
P > 560 kW Non-Genset	4f	2015 -	3.50	0.19	3.5	0.04
560 kW < P <= 900 kW Genset	4i	2011-2014	3.50	0.40	3.5	0.10
560 kW < P <= 900 kW Genset	4f	2015 -	3.50	0.19	3.5	0.04
P > 900 kW Genset	4i	2011-2014	0.67	0.40	3.5	0.10
P > 900 kW Genset	4f	2015 -	0.67	0.19	3.5	0.03

## EU - Locomotive & Railcar Engines

Also valid for EEA countries Iceland, Liechtenstein & Norway.

Switzerland does not require type-approval to 97/68/EC for rail but does require fitment of particulate filter.

**This chart is supplied for general information only. It should not be construed as legal advice, nor is it a substitute for consulting the published regulatory text. This information is subject to change at any time.**

### European Non-Road Mobile Machinery (NRMM) (97/68/EC et seq)

**This chart covers railcar & locomotive engines within NRMM**

All units are in g/bkw\*hr

	Stage	Date	NOx + HC	CO	PM	NOx	HC
<b>Locomotives</b> P > 130 kW	IIIB	2012 -	4.0	3.5	0.025	-	-
<b>Railcars</b> P > 130 kW	IIIB	2012 -	-	3.5	0.025	2.0	0.19

#### Notes:

A locomotive moves passenger carriages or freight wagons or equipment but does not itself carry passengers, freight or equipment.

Required test cycle is 'Specification D' given in Annex III Section 3.7.1.4 of 97/68/EC (as modified by 2004/26/EC) (same as

A railcar is a self-propelled passenger or freight carriage.

Required test cycle is 'Specification A' given in Annex III Section 3.7.1.1 of 97/68/EC (as modified by 2004/26/EC) (same as 8-mode C1-cycle in ISO 8178-4:1996 (E) standard)

Any auxiliary engine or engine powering rail maintenance/construction machines that are neither railcars nor locomotives must be treated as a general variable speed NRMM engine.

Mandated supply of ultra-low sulphur diesel (10 ppm at placing on market, 20 ppm at point of delivery) (for more details see 2009/30/EC amendment to fuels directive 98/70/EC).

### The chart covers auxiliary engines or engines powering rail maintenance machines within NRMM

All units are in g/bkw\*hr

Constant Speed	Stage	Date	NOx + HC	CO	PM	NOx	HC
19 kW ≤ P < 37 kW	IIIA	2007 -	7.5	5.5	0.600	-	-
37 kW ≤ P < 56 kW	IIIA	2008-2012	4.7	5.0	0.400	-	-
37 kW ≤ P < 56 kW	IIIB	2013 -	4.7	5.0	0.025	-	-
56 kW ≤ P < 75 kW	IIIB	2012-2014	-	5.0	0.025	3.30	0.19
56 kW ≤ P < 75 kW	IV	2014 -	-	5.0	0.025	0.40	0.19
75 kW ≤ P < 130 kW	IIIB	2012-2014	-	5.0	0.025	3.30	0.19
75 kW ≤ P < 130 kW	IV	2014 -	-	5.0	0.025	0.40	0.19
130 kW ≤ P < 560 kW	IIIB	2012-2013	-	3.5	0.025	2.00	0.19
130 kW ≤ P < 560 kW	IV	2014 -	-	3.5	0.025	0.40	0.19
Variable Speed	Stage	Date	NOx + HC	CO	PM	NOx	HC
19 kW ≤ P < 37 kW	IIIA	2011 -	7.5	5.5	0.6	-	-
37 kW ≤ P < 56 kW	IIIA	2012 -	4.7	5.0	0.4	-	-
56 kW ≤ P < 75 kW	IIIA	2012 -	4.7	5.0	0.4	-	-
75 kW ≤ P < 130 kW	IIIA	2011 -	4.0	5.0	0.3	-	-
130 kW ≤ P < 560 kW	IIIA	2011 -	4.0	3.5	0.2	-	-

## Locomotive Traction Diesel Engine Rating Definitions

Cat engines are tested extensively in both the laboratory and field to identify engine ratings that will provide optimum performance and engine life under varying job conditions. Through these tests it has been possible to establish various ratings which, when properly applied, will provide the kind of engine performance and life that customers expect.

Detailed knowledge of a customer's engine operating requirements is essential to establish a proper rating match. To determine the acceptability of a particular rating for a customer's application, the following must be known.

- Function of engine
- Driven equipment description
- Load quantification
- Speed quantification
- Time per application cycle
- Hours/year
- Life expectancy (time to overhaul)
- Load factor
- Maximum time at full load/cycle
- Power required
- Aspiration desired
- Parasitic loads
- Ambient conditions — temperature/altitude
- Exhaust manifold type

Using this information along with information provided in this document and by your local Cat dealer, the appropriate rating and engine can be selected with confidence.



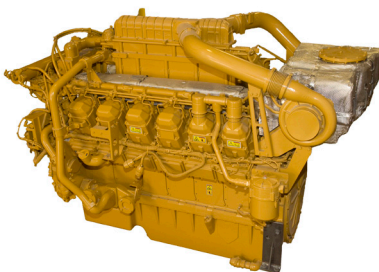


## Locomotive Traction Power Ratings

Engine Model	Low Rating bkW   bhp		High Rating bkW   bhp		Rated Speed rpm	Emissions Tier
C9.3 ACERT™	205	275	280	375	1800-2200	T4 , IIIA , IIIB
C13 ACERT	287	385	388	520	1800-2100	T4 , IIIA , IIIB
C15 ACERT	328	440	444	595	1800-2100	T4 , IIIA , IIIB
C18 ACERT	429	575	597	800	1800-2100	T4 , IIIA , IIIB
C27 ACERT	597	800	858	1150	1800-2100	IIIA , IIIB
C32 ACERT	708	950	1007	1350	1800-2100	T2 , UIC2
3508*	503	675	1000	1341	1300-1800	T3 , IIIA , IIIB
3512*	746	1000	1700	2280	1300-1800	T3 , IIIA , IIIB
3516	1200	1600	2240	3004	1300-1800	T2 , UIC2
G3516B**	895	1200	1104	1480	1500	-
C175-16 ACERT*	2500	3351	2800	3620	1800	IIIA , IIIB
3606 / C280-6	1640	2200	2030	2720	750-1000	UIC2
3608 / C280-8	2180	2925	2710	3635	750-1000	UIC2
3612 / C280-12	3280	4400	4060	5445	750-1000	UIC2
3616 / C280-16	4360	5850	5420	7270	750-1000	UIC2

\*For EU Stage IIIB availability contact your Cat dealer

\*\*For gas engine product offerings contact your Cat dealer





## Maintenance of Way Diesel Engine Rating Definitions

### Explanation of Ratings A, B, C, D, and E:

For an exact determination of the appropriate rating, contact your local Cat® dealer. Engine rating obtained and presented in accordance with ISO3046/1.

#### **IND-A (Continuous)**

Continuous heavy-duty service where the engine is operated at maximum power and speed up to 100% of the time without interruption or load cycling.

#### **IND-B**

For service where power and/or speed are cyclic (time at full load not to exceed 80%).

#### **IND-C (Intermittent)**

Intermittent service where maximum power and/or speed are cyclic (time at full load not to exceed 50%).

#### **IND-D**

For service where maximum power is required for periodic overloads (time at full load not to exceed 10% of the duty cycle).

#### **IND-E**

For service where maximum power is required for a short time for initial starting or sudden overload. For emergency service where standard power is unavailable (time at full load not to exceed 5% of the duty cycle).



## Maintenance of Way Power Ratings

Engine Model	Aspiration	Power kW	Power bhp	Rated Speed rpm
C0.5	NA	8.2-10.2	11.0-13.7	2800-3600
C0.7	NA	12.2-15.3	16.4-20.5	2800-3600
C1.1	NA	13.7-21.0	18.4-28.2	2200-3400
C1.5	NA/T	20.9-30.0	28.0-40.2	2200-3000
C1.6/C1.7	NA	23.6-26.5	31.6-35.5	2400-3000
C2.2	NA/T/TA	31-49.3	41.6-66.1	2200-3000
C3.4	NA/T	47-55	63-74	2500
C3.4b	T/TA	45-86	60-115	2200-2500
C4.4 ACERT	TA	66-110	88-148	2200
C4.4 ACERT	TTA	105-129	141-174	2200
C6.6 ACERT	TA	89-129	119-174	2200
C7.1 ACERT	TA	140-225	188-302	2200
C9.3 ACERT	TA	224-261	300-350	1800-2200
C13 ACERT	TA	287-388	385-520	1800-2100
C15 ACERT	TA	354-433	475-580	1800-2100
C18 ACERT	TA	447-470	600-630	1800-1900
C18 ACERT	TTA	522-597	700-800	1800-1900
C27 ACERT	TA	597-783	800-1050	1800-2100
C32 ACERT	TA	709-895	950-1200	1800-2100
3508*	TA	507-746	680-1000	1200-1800
3508B*	TA	746-820	1000-1100	1800
3512*	TA	761-1119	1020-1500	1200-1800
3512B*	TA	1119-1231	1500-1650	1800
3516*	TA	1011-1492	1355-2000	1200-1800
3516B*	TA	1492-1566	2000-2100	1800

Ratings meet appropriate non-road mobile emissions regulations (EPA Tier 4 Interim, EU Stage IIIB) with corresponding aftertreatment.

\*For emissions compliance on 3500 series engines for MOW applications contact your Cat dealer.

Note: For specific ratings, emissions, regulations and compliance contact your Cat dealer.





## Auxiliary Electric (Head End) Power Diesel Engine Rating Definitions

All ratings shown are subject to manufacturing tolerances of plus or minus three percent. The Typical Load Factor is the sum of the loads a generator set experiences while it is running under load divided by the number of hours it operates under those loads. Extended idling time and the time when the generator set is not operating does not enter into the calculation for load factor.

### PRIME RATING:

Typical Load Factor = 60-70%

Typical Hours/Year = No Limit

Typical Peak Demand = 100% of prime rated kW used occasionally, but for less than 10% of operating hours

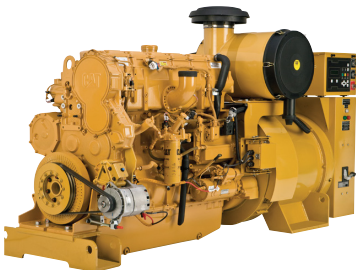
## Auxiliary Electric (Head End) Power Ratings (Prime with fan)

Engine Model	Rating Hz	Power kW	Emissions Tier
C15 ACERT	50	292	Stage II
C15 ACERT	50	328	Stage II
C15 ACERT	50	364	Stage II
C15 ACERT	50	400	Stage II
C15 ACERT	60	320	Tier 3
C15 ACERT	60	365	Tier 3
C15 ACERT	60	410	Tier 3
C15 ACERT	60	455	Tier 2 & Tier 4i
C18 ACERT	50	400	Stage II
C18 ACERT	50	436	Stage II
C18 ACERT	50	508	Stage II
C18 ACERT	50	573	Stage II
C18 ACERT	60	500	Tier 2
C18 ACERT	60	545	Tier 2
C27 ACERT	60	590	Tier 2
C27 ACERT	60	635	Tier 2
C27 ACERT	60	680	Tier 2
C27 ACERT	60	725	Tier 2 & Tier 4i

All 60 Hz ratings are EPA emission certified (non-road mobile regulations)

All 50 Hz ratings are EU emission certified (non-road mobile regulations)

Note: For specific ratings, emissions, regulations and compliance, contact your Cat dealer.



## Additional Literature

Cat C4.4, C4.4 ACERT, and C6.6 ACERT Engines	
Superior Performance and Beyond .....	LEDH6529
Industrial Engine Attachments Guide.....	LEDH6161
Industrial Power Systems Fueled by Innovation.....	LEDH4624
Commercial Diesel Engine Fluids Recommendations.....	SEBU6251
Industrial Engine Ratings Guide (EPA Tier 4i, EU IIIA, EU IIIB).....	LEGH0001
Industrial Engine Ratings Guide .....	LECH3874

## Spec Sheets

C4.4 ACERT Industrial Engine – 61.5-129.4 bkW (81.8-173.5 bhp).....	LEHH0021
C6.6 ACERT Industrial Engine – 89-129.5 bkW (119.4-173.7 bhp).....	LEHH0022
C7.1 ACERT Industrial Engine – 130-225 bkW (175-300 bhp).....	LEHH0006
C9.3 ACERT Industrial Engine – 224-261 bkW (300-350 bhp).....	LEHH0007
C9.3 ACERT Industrial Power Unit – 224-261 bkW (300-350 bhp).....	LEHH0509
C13 ACERT Industrial Engine – 287-354 bkW (385-475 bhp).....	LEHH0008
C13 ACERT Industrial Power Unit – 287-354 bkW (385-475 bhp).....	LEHH0510
C15 ACERT Industrial Engine – 354-433 bkW (475-580 bhp).....	LEHH0009
C15 ACERT Industrial Power Unit – 354-433 bkW (475-580 bhp).....	LEHH0511
C18 ACERT Industrial Engine – 447-522 bkW (600-700 bhp).....	LEHH0010
C18 ACERT Industrial Engine – 563 bkW (755 bhp).....	LEHH0513
C18 ACERT Industrial Engine – 563-597 bkW (755-800 bhp) Tier 4 Final	LEHH0506
C18 ACERT Industrial Power Unit – 447-470 bkW (600-630 bhp).....	LEHH0512
C27 ACERT Industrial Engine – 597-783 bkW (800-1050 bhp) .....	LEHH0011
C32 ACERT Industrial Engine – 709-895 bkW (950-1200 bhp).....	LEHH0013

## Traction Power (Locomotive Engines)

3508C - 920-1000 bkW (1234 - 1341 bhp) EU Stage IIIA.....	LEHR0002
3512C - 1350-1700 bkW (1810 - 2280 bhp) EU Stage IIIA.....	LEHR0003
3512C HD - 1570 bkW (2105 bhp) EPA Tier 3.....	LEHR0004
3516C - 1753 bkW (2350 bhp) EPA Tier 2.....	LEHR6230
3516C HD - 1655-2060 bkW (2219 - 2763 bhp).....	LEHR1863
3508B - 820-970 bkW (1100 - 1300 bhp) .....	LEHR0008
C27 - 708 bkW (950 bhp) EU Stage IIIA.....	LEHR0011
C27 - 708 bkW (950 bhp) EU Stage IIIB.....	LEHR0010
C175-16 - 2800 bkW (3755 bhp) EU Stage IIIA & EPA Tier 2.....	LEHR4835
C175-16 - 2800 bkW (3755 bhp) EU Stage IIIB.....	LEHR0012
C18-563bkW(755bhp)EUStageIIIB.....	LEHR0013

## Head End Power for Railway Applications

C15 ACERT 331-445 bkW (444-597 bhp) 1500 rpm 50 Hz EU Stage II.....	LEHR0001
C15, C18, C27 ACERT 373-824 bkW (500-1105 bhp) 1800 rpm 60 Hz EPA Tier 2 / 3.....	LEHR8068
C15, C27 ACERT 517-824 bkW (693-1105 bhp) 1800 rpm 60 Hz EPA Tier 4i.....	LEHR0005







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Materials and specifications are subject to change without notice.  
Rating ranges listed include the lowest and highest available for a specific engine or family of engines. Load factor and time at rated load and speed will determine the best engine/rating match.  
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