











C27

Caterpillar. The difference counts.™

C15

CATERPILLAR®

Superior Engine Parts Improve Engine Performance.

Caterpillar knows engine parts must endure incredible stresses and extreme temperatures. That's why we continually improve design and manufacturing processes. We want to ensure Cat[®] engine components work together as a complete system and can be remanufactured for a second life. Test after test identifies critical differences between Cat engine parts and competitive parts—differences that allow Cat engine components to improve engine performance, increase productivity and reduce your owning and operating costs.

Caterpillar. The difference counts.

Cat Dealers define world-class product support. We offer you the right parts and service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire fleet up and running to maximize your equipment investment.

CATERPILLAR®



-HEADS Special tolerances and processes increase wear material.

- Rigid manufacturing tolerances provide smooth sealing surfaces for resistance to warping, cracking and wear.
- Special cleaning processes ensure internal passages are free of core sand and metal shavings, which results in less wear and longer life.

CRANKSHAFTS

- Precision balanced to provide longer life
- Heat treated by a patented hardening process for high strength and outstanding wear characteristics
- Precise journal grinding ensures exact bearing fit for reduced friction and long life

CRANKSHAFT SEALS

- For 3400, C15 and C27 engines
- Eliminate leakage
- Easier installation
- Longer seal life

VALVES Quality materials and metallurgy provide increased strength.

- High strength material allows the valve to flex for more fatigue strength.
- Proper forging process prevents "laps" or inclusions for better fatigue strength.

HEAD GASKETS Long-lasting materials improve durability and sealing.

- Fire rings made of stainless steel materials increase durability for longer life.
- Graphite-facing material significantly improves sealing capability for resistance to failure.

INTEGRAL SEALS

Robust fluid seals significantly reduce leaks.

- Sealing capability virtually eliminates gasket leaks.
- Carrier improves bolt torque retention.
- Gaskets are easy to install and bolt into place.



RINGS Heat treatment and proper fit ensure long life and less wear.

- Heat treatment provides maximum hardness, which extends life.
- Rings fit precisely into piston ring grooves, reducing ring band wear.
- Plasma-coated top ring

PISTONS

- Improved structural capability of the single piece forged steel piston simplifies assembly and eliminates the number of parts.
- Plasma coated top ring is designed to reduce ring and liner wear.
- New oil jet with higher oil velocity provides more concentrated cooling.

BEARINGS

Even oil distribution and proper clearances help prevent failure.

- Precise crush height allows proper oil flow and clearance for resistance to failure.
- Consistent wall thickness ensures uniform oil distribution and proper clearance for longer life.

Cat vs. Competitive Components.

On the surface, some competitive components may look like Cat components, but a closer look reveals important differences.



Cat Liners The uniform cross-hatch pattern on Cat liners allow proper ring seal and even oil distribution for less wear.



Competitive Liners The inconsistent honing patterns on competitive liners may cause irregular oil distribution and faster ring wear.



Competitive Head Oversized, unthreaded missing water holes, blocked passages and core sand in other willfit heads could lead to leaks and inadequate cooling.









LINERS

Manufacturing and heat-treat processes provide better wear resistance and extends life.

- Roll burnishing eliminates flange cracking and increases strength.
- Control flange head thickness to guarantee a precise match to the block

FLUIDS

High quality fluids improve performance and extend equipment life

 Each lubricant and coolant is field tested and approved to ensure it meets specific performance and cooling requirements.

FILTERS

High quality Cat air, oil and fuel filters reduce wear and lower costs

- Properly changing filters regularly and selecting the right filters can help you maintain engine cleanliness and reduce component wear.
- Air filters feature a radial seal design that prevents dirt, soot, sand and other contaminants from entering your machine.
- Oil filters work in unison with fluids to provide the highest level of filtration cleanliness, performance and protection.
- Fuel filters prevent fuel system wear caused by dirt in the fuel.

FRACTURED ROD Reduced machining steps and controlled machining process increases quality.

- Perfectly matched joint surfaces allow rods to accept higher loads.
- Fractured uneven surface helps locate rod end and cap, eliminating the need for locating dowel.
- Automatic bolt insertion and fastening equipment ensures cap and rod stay together, eliminating possibility of mismatched cap and rod during material handling.

COOLANT

Selecting the right coolant for your cooling system reduces engine problems.

The cooling system maintains the correct engine temperature by removing unwanted heat generated by combustion and friction, preventing excessive wear and engine failure.

Cat extended life coolant helps prevent overheating, overcooling and other cooling system problems. It lasts twice as long as traditional coolant and it eliminates the need for supplemental coolant additives.

RADIATOR Designed to ensure maximum cooling system performance and life.

At repair time, we'll help you install the correct Cat radiator for your engine and application so you can reduce downtime and improve engine performance. Caterpillar's radiator designs all provide maximum heat transfer at the lowest resistance:

- Conventional
- Folded core
- Improved multiple row module
- Advanced module cooling system
- Aluminum construction

THERMOSTAT

Regulating temperature prevents overcooling and engine damage

Preventing an engine from overcooling is just as important as preventing it from overheating. Our thermostat regulates jacket water temperature to keep the engine running at a normal operating temperature after preventing overcooling. The new thermostat also contains a lipseal to prevent contamination and help retain grease.

WATERPUMP

Built to extremely tight metal-to-metal clearances.

Our quality water pumps are designed for remanufacturability, which leads to fast, lower-cost repairs. Precise manufacturing allows for peak system efficiency. The pumps are tested to match stringent performance and endurance requirements.

Regular Engine Maintenance Increases Engine Life

Following a regular engine maintenance routine can have a huge impact on your bottom line—minimizing failures, reducing downtime and increasing equipment resale value. Effective engine life cycle management is achieved through a team effort that includes your regular maintenance program and our wide range of products and services. By analyzing repair indicators, inspection results and S•O•S[™] data, we can catch problems before they lead to major repairs and unscheduled downtime. Working together, we can maximize engine productivity, extend component life and lower your operating costs.





Engine Maintenance

To reduce downtime and repair expenses, it is critical that you develop an effective engine maintenance program that helps you make the right maintenance decisions at the right time.

Site Operations and Maintenance Advisor (SOMA) improves operating and maintenance practices

This computer-based application will perform an assessment of your site operation and maintenance practices and identify the estimated life to before-failure repairs. SOMA can perform up to three levels of analysis ranging from a high-level analysis to an in-depth analysis of more than 130 operating and maintenance factors. We can help you improve your operating and maintenance practices using SOMA.



Preventive maintenance (PM) program minimizes downtime and costs

PM is at the heart of an effective engine management program, helping you identify problems early to minimize downtime and repair costs.

We can make your PM program easy with:

- lube and maintenance guides.
- convenient PM kits.
- checklists for daily walk-arounds.
- PM software programs.



S•O•S[™] program reduces owning and operating costs

Our S•O•S program monitors performance, schedules regular inspections and performs a comprehensive analysis that delivers cost-effective solutions to help you reduce downtime and manage your equipment more effectively.

Monitors Performance

- · Identifies excessive wear
- · Identifies contaminated fluids
- measures wear materials and dirt.
- detects water, fuel and antifreeze in oil.
- · measures soot, oxidation and sulfur contaminants

Regular Inspections

- · Forecasts wear-related problems
- · Evaluates repair indicators
- Allows for repair before failure
- Customizes checklists for your operators
- · Conducts technical analysis and repair determination inspections

Comprehensive analysis

- · Interprets results
- Provides proven tools to help you manage your equipment more effectively

Accurate records help you improve profitability

An accurate record-keeping system with full documentation on machine history, component life and cost information will help you identify high cost or problem areas, track workflow, control costs and increase machine resale value. We offer both manual and electronic record-keeping systems to help you with this process.







Scheduling program keeps your engines up and running

Effective scheduling helps you get maintenance done on time—so you catch problems before they lead to failure, avoiding unscheduled downtime. We make scheduling easy with time and cost record booklets or software programs.

Reliable Engine Repair Reduces Engine Downtime

Your engine will eventually need service—even if you follow a regular maintenance program. Fortunately, most engine problems give advanced warning, allowing you to repair before failure. Before-failure repairs can get your equipment back to work sooner, cost as little as one-fifth the price of after-failure repairs and be scheduled at your convenience. We also offer a variety of economical after-failure repairs. Our professional technicians are trained to evaluate your engine's condition and recommend cost-effective repair options. We'll use our best-in class service capabilities and excellent parts availability to get your machine up and running quickly and reliably.



Engine Repair Options

If your engine maintenance program identifies a problem, we offer a variety of before-failure and after-failure repair options that will get your machines back up and running quickly. We'll help you determine the best strategy to minimize downtime and reduce costs.

Full Line of Repair Offering

- New
- Reman
- Exchange
- Emission Retrofit
- Certified Engine Rebuild
- Dealer Rebuild
- Used and Rental









Caterpillar® Emissions Retrofit Solutions For Strict Emissions Requirements.

Each day, state and local emissions requirements are getting more strict. The likelihood is that your company faces new emissions clauses within bid specifications and tighter site and permit requirements—not to mention considerably increased enforcement efforts. By choosing to retrofit your Cat machine engine, you can take the lead in how you do business and, more importantly, avoid the loss of contracts due to non-adherence.

Cat Dealers offer numerous integrated Caterpillar Emissions Retrofit Solutions to help you achieve immediate emissions reductions. These effective solutions will help you minimize downtime and extend the life of your machine investments. The key Caterpillar Emissions Solutions are:

- Engine Repowers Emissions Upgrades
- Catalyzed Converter/ Mufflers



Particulate Filters

In addition to these integrated solutions, Cat Dealers can help you combine Cat rental machines with your other equipment to meet emissions requirements. All of these options are reliable and durable, and an exceptional value.

Available Cost-Effective Retrofit Solutions

Cat Dealers are experts at identifying the solutions that will meet your retrofit needs in the most cost-effective manner. However, in order to capitalize on your fleet's best opportunities for reducing emissions, it will be helpful to discuss the following with your Dealer:

- Targeted emissions
- Immediate retrofit need
- Targeted emissions levels
- Fleet profile
- · Key models and serial numbers

Generally, the right solution follows these guidelines:

- Repower machines or upgrade the engine to a lower emissions level for significant NOx reduction
- Use catalyzed converter/mufflers or particulate filters to lower machine emissions
- Consider replacing certain older machines

Today's well-maintained diesel engines should not emit excessive visible smoke. The presence of smoke emissions equates to higher operating and maintenance costs as well as reduced fuel economy and engine life. It's not just about meeting site and permit requirements. Retrofitting can lower the total cost of owning your fleet.

How to get started

The first step is discussing your options with your Cat Dealer.

Learn more about the latest requirements:

- Diesel Technology Forum: www.dieselforum.com
- Diesel Net: www.dieselnet.com
- EPA Voluntary Retrofit: www.epa.gov/otaq/retrofit
- California Air Resources Board: www.arb.ca.gov

ACERT[™] Technology Meets Regulations and Maintains Performance

Cat Engines with ACERT[™] Technology reduce emissions at the point of combustion via a systems approach to air management, electronics and fuel systems. Over 250 patents earned through the years of research and testing protect ACERT Technology.

Building Blocks of ACERT Technology

The system's solution to meet emissions regulations applies to several areas of engine design. We call these systems the "building blocks." With ACERT Technology, each building block can be tailored to match a particular engine in a specific application.

Air management includes the proven technology of crossflow cylinder heads and wastegate turbochargers. A simple, efficient system that provides good fuel economy without any reliability worries.

Fuel is introduced to the combustion chamber in a number of controlled microbursts to precisely regulate the combustion process. The result is a more complete burn at lower temperatures. You get excellent performance and long engine life.

The ADEM A4TM Electronic Controller acts as the engine's brain by precisely regulating fuel delivery, airflow and other engine functions. The first generation of Cat ADEM electronic controllers were introduced in 1993. You can be confident knowing your engine will operate reliably at peak performance – regardless of changing demands.







What ACERT means for you

For all of its advanced technology, ACERT delivers some very easy-to-understand benefits that mean a lot to Cat engine and machine customers:

ACERT means you deal with largely proven systems that your service people already understand.

ACERT means dependable engines with the reliability, low operating costs and long life you expect from Caterpillar.

ACERT means your engines and machines meet regulatory standards without trouble-prone complexity.

ACERT means your people need to adapt to only a single emissions reduction technology, a technology that won't become obsolete in just a few years.

Committed to Service and Support

We're committed to helping you maximize your productivity and lower your costs. We're committed to your success.

Ask us how a Customer Support Agreement can help us work together to achieve the results you want.

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