



Keep Your Business Competitive

Caterpillar Emissions Solutions

CATERPILLAR®

Cost-Effective Solutions

Emissions retrofits are solutions that allow you to work without worrying about regulatory compliance.

With all the work you do, you don't want to think about complying with emissions regulations. But you should – now – because government funding will not last forever.

Many local, state and regional regulatory bodies are passing laws that mandate compliance. And if your equipment doesn't meet emissions standards, it can cost you money, time and lost opportunities.

Your Cat® Dealer is up to date and ready to help you with emissions solutions to meet your specific needs.

Caterpillar Emissions Solutions. Proven.

An emissions retrofit is a cost-effective way to bring your existing machine or engine into compliance. A retrofit enables you to:

- > Meet emissions standards in your area
- > Avoid fines, penalties and work stoppages
- > Bid for contracts that require emissions compliance

Caterpillar Emissions Solutions provides time-tested, job-proven retrofit options. They help you protect your business and stay competitive while minimizing costs and downtime.

Contact your local Cat® Dealer for more information.



Improving Air Quality

It's a simple fact: emissions from off-road, on-highway and stationary diesel equipment are a factor in the quality of the air we breathe.

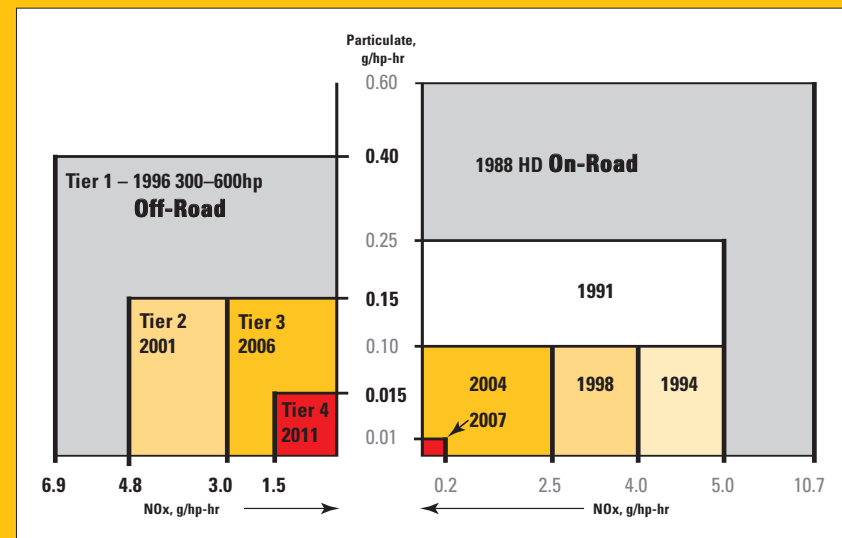
In 1970, the Clean Air Act established the U.S. Environmental Protection Agency (EPA) and gave it the authority to regulate the emissions from newly manufactured diesel engines. The engine and vehicle manufacturers are required to comply with these regulations.

Recently, many local and state agencies have imposed emissions requirements on existing, or in-use, diesel-powered vehicles and equipment. It is the responsibility of the vehicle owner to comply with these requirements.

Emissions Retrofit - EPA Definition

The Environmental Protection Agency defines an emissions retrofit as "The adaptation of emissions reductions technologies to existing products to reduce emissions output."

-www.epa.gov (EPA Website)



Emissions Requirements On-Road vs. Off-Road

Caterpillar® Leadership

Caterpillar is taking the lead in meeting these requirements, while helping Cat equipment users do their part to maintain air quality. New Cat off-road machines feature Cat Engines with ACERT™ Technology. ACERT ensures that your new Cat equipment will meet current and future emissions standards.

Retrofits from Caterpillar Emissions Solutions provide cost-effective compliance options for your existing Cat-powered equipment. Cat Emissions Retrofits are also available for a range of competitively powered equipment.

Your Cat Dealer can help you choose the best retrofit options for every piece of equipment you own.

Your work affects local air quality.



Why Should I Comply?



Compliance with emissions regulations is not a choice. It's mandatory. Noncompliance penalties in many areas include:

- > Hefty fines
- > Stepped-up enforcement by local and state agencies
- > Bid specifications and site permits that require diesel emissions reductions
- > Decreased profit margins and potential job loss
- > Legal actions, litigation costs and lost time

Compliance Incentives

The good news is there are government funds available to help equipment owners comply with emissions regulations. Your Cat Dealer can tell you more about these programs. Time is limited, so take advantage of them soon.



Emissions Retrofit Benefits

Caterpillar Emissions Solutions and your local Cat Dealer are committed to finding the right solutions for your needs. All solutions are designed to help you:

- > Keep compliance costs to a minimum
- > Limit downtime while retrofits are performed
- > Extend the life of your machines
- > Protect your current business
- > Prepare for future opportunities

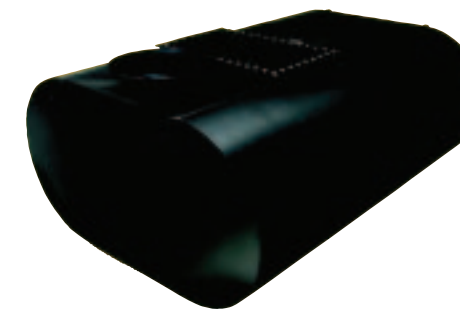
Critical Requirements

All Caterpillar Emissions Solutions are customized to your needs. They are tailored for the regulations in your work area, the type of machines you own and the type of work you do.

To help you explore your compliance options, your Cat Dealer will need the following information:

- > Equipment ages and specifications
- > Model and serial numbers
- > Applicable bid specifications for your area

With this information, your Cat Dealer will be able to recommend the right solutions for your situation.



Finding the Right Solution

There are a number of Caterpillar emissions solutions to choose from. The best option (or mix of options) for you depends on your equipment, applications, local emissions requirements and more. Recommended solutions may include:

1 Engine Repower – Replacing your existing engine with a new, lower-emissions engine.

2 Engine Upgrade Group – Upgrading an existing engine using lower emissions components.

3 Aftertreatment – Treating exhaust gases to reduce harmful emissions.

Expertise and Experience

Your Cat Dealer offers information about the federal, regional and local emissions standards in your area, along with:

- > Experienced, Cat-trained technicians
- > Outstanding service facilities
- > Excellent parts availability

Working with the Caterpillar Emissions Solutions, your Cat Dealer can provide what you need to achieve and maintain compliance.

Cat Emissions Solutions for: Off-Road Machines

Caterpillar emissions retrofits for mobile off-road machines fall into four categories:

- > **Engine Repowers** replace your entire engine with a new, lower-emissions Cat Engine. Engine Repower solutions are available for many classes of Cat machines.
 - To save downtime, consider doing an Engine Repower at the same time as another major replacement or overhaul.
- > **Engine Upgrade Groups** utilize your current engine core. A range of upgrades replaces existing parts with new components that deliver lower emissions. This can be an effective, lower-cost option in many cases.
 - Performing an Engine Upgrade during engine overhaul saves downtime and may help reduce overall costs.
 - Your Cat Dealer can help you choose the best options for your off-road equipment.
- > **Oxidation Catalysts** create a chemical reaction with exhaust gases as they pass over the catalyst material. This reaction reduces some of the particulate matter. It also converts a large portion of carbon monoxide, hydrocarbons and other emissions into carbon dioxide and water.
- > **Diesel Particulate Filters** use special filters to reduce particulate matter (*PM*), carbon monoxide and hydrocarbon emissions. Exhaust backpressure is maintained through passive regeneration, a process that automatically removes particulate buildup.
 - Cat Diesel Particulate Filter solutions include a diagnostic module for backpressure, exhaust temperature monitoring and datalogging.
 - The type of solution appropriate for a specific application depends on the configuration of the machine's exhaust system and the specific emissions targeted by applicable emissions regulations.
 - Your Cat Dealer can help you choose the best solution and can advise you on the best installation options for your situation. Cat DPFs are EPA-verified solutions.

On-Highway Vehicles

Two types of Caterpillar Emissions Solutions are available for on-highway trucks and buses: oxidation catalysts and particulate filters.

- > **Oxidation Catalysts** create a chemical reaction with exhaust gases as they pass over the catalyst material. This reaction reduces some of the particulate matter. It also converts a large portion of carbon monoxide, hydrocarbons and other emissions into carbon dioxide and water.
- > **Diesel Particulate Filters** use special filters to reduce particulate matter (*PM*), carbon monoxide and hydrocarbon emissions. Exhaust backpressure is maintained through passive regeneration, a process that automatically removes particulate buildup.
 - Cat Diesel Particulate Filter solutions include a diagnostic module for backpressure, exhaust temperature monitoring and datalogging.
 - The type of solution appropriate for a specific application depends on the configuration of the vehicle's exhaust system and the specific emissions targeted by applicable emissions regulations.
 - Your Cat Dealer can help you choose the best solution and can advise you on the best installation options for your situation. Cat utilizes EPA/CARB-verified technology.

Stationary Equipment

Caterpillar emissions retrofits for your stationary equipment are tailored for Cat 3400, 3500 and 3600 diesel and gas engines. Solutions can also be customized for many non-Cat engine applications.

Aftertreatment Options

- Three types of Cat Aftertreatment retrofits are available for stationary engines:
 - > **Oxidation Catalysts** create a chemical reaction with exhaust gases as they pass over the catalyst material. This reaction reduces some of the particulate matter. It also converts a large portion of carbon monoxide, hydrocarbons and other emissions into carbon dioxide and water.
 - Available for diesel and natural gas engines, Cat Oxidation Catalysts come with a standard Caterpillar warranty.
 - > **Selective Catalytic Reduction** effectively reduces emissions of nitrogen oxides (*NOx*). By injecting urea (*a non-hazardous form of ammonia*) into the hot exhaust stream, this process reduces most exhaust emissions to harmless nitrogen and water vapor.
 - Available for diesel and natural gas engines, Cat Selective Catalytic Reduction comes with a standard Caterpillar warranty. It requires limited maintenance only during normal engine service routines.
 - > **Diesel Particulate Filters** use special filters to reduce particulate matter (*PM*), carbon monoxide and hydrocarbon emissions. Exhaust backpressure is maintained through passive regeneration, a process that automatically removes particulate buildup. Available only for diesel engines, Cat Diesel Particulate solutions requires a diagnostic module for backpressure and exhaust temperature monitoring.

Reduce Emissions. Stay Competitive.

Caterpillar Emissions Solutions provides the information, products and services you need to comply with emissions regulations, reduce risk and protect your business for the future.

For more information, contact your Cat Dealer or visit www.cat.com/emissionsolutions.



This project was undertaken pursuant to an agreement with the United States in connection with settlement of disputed claims in an enforcement action under the Clean Air Act.

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