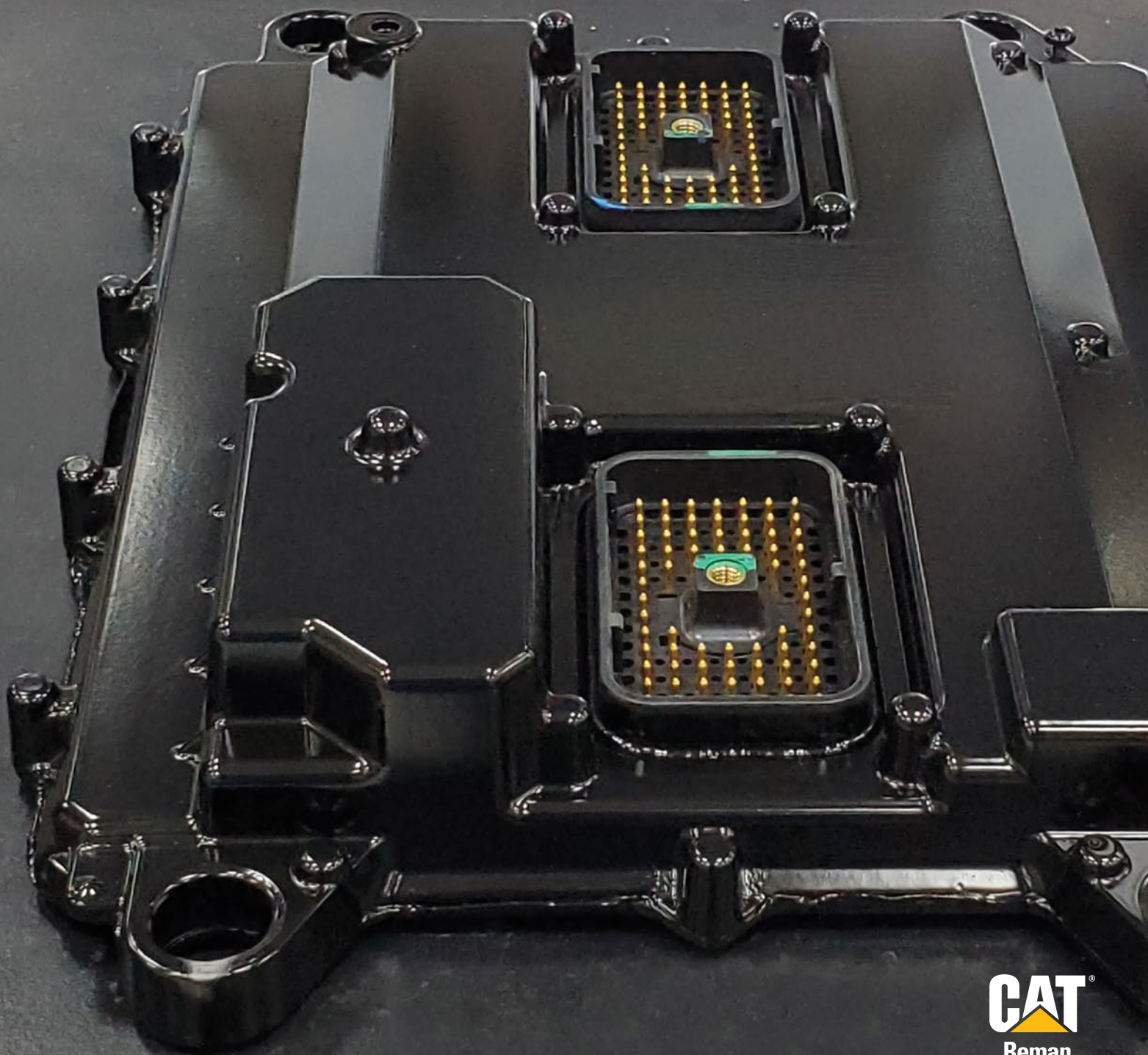


CAT[®] REMAN

ELECTRONIC COMPONENTS

EXPAND CONTROL OVER YOUR EQUIPMENT WITH
COST-EFFECTIVE, LIKE NEW REPAIR OPTIONS.





REMANUFACTURED ELECTRONIC COMPONENTS

RETAKE COMMAND WITH LIKE NEW CAPABILITIES

Renew the health and capacity of your equipment through the repair and replacement options of Cat® Reman. Find drop-in solutions for a variety of applications — including comprehensive electronics offerings — with off-the-shelf availability **for more than 8,000 parts, components and kits.**

It's never been easier to connect your electronics needs to a streamlined solution powered by Caterpillar. Within the global network of **more than 2,300 authorized Cat locations**, dealers carry a wide range of Cat Reman electronic products, like engine control modules, displays, inverters, joysticks, sensors and other components.

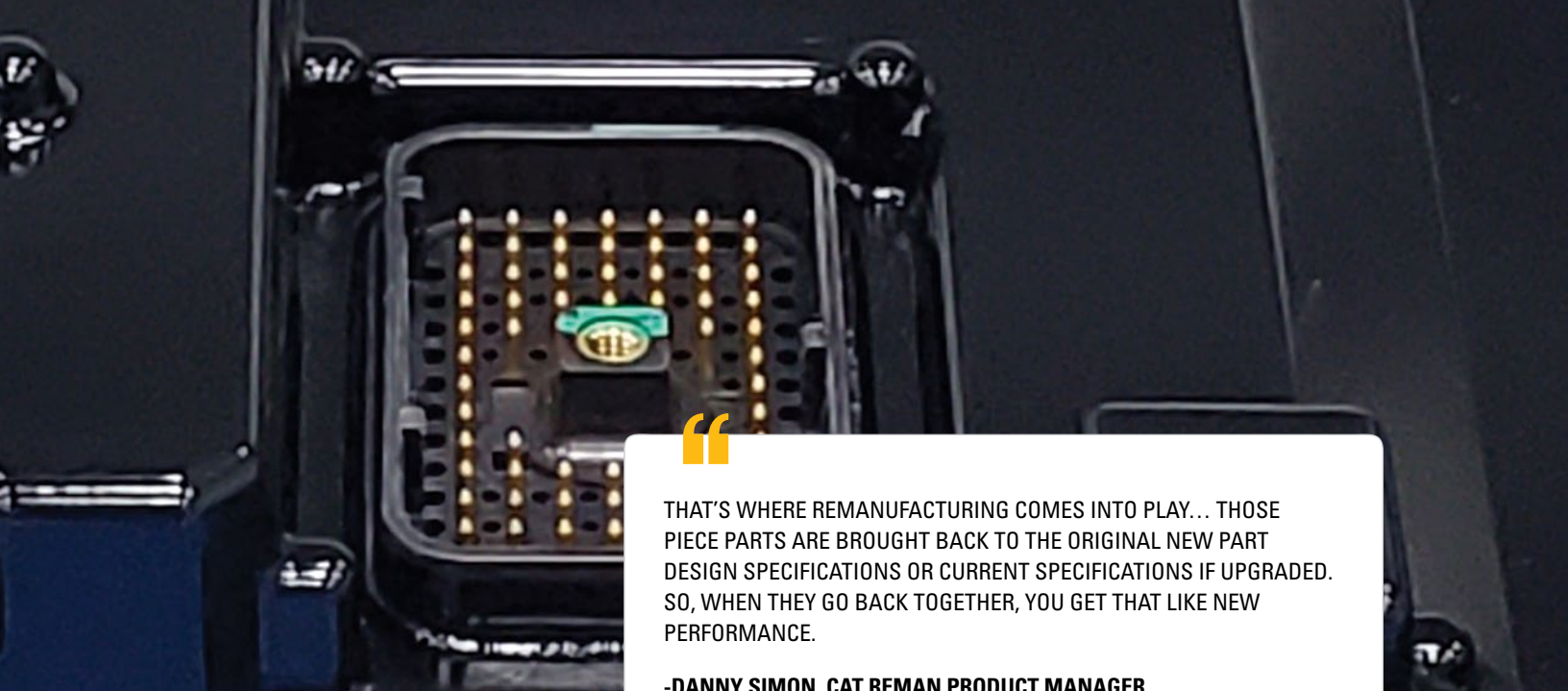
Cat Reman products are remanufactured using state-of-the-art salvage technology and incorporate the latest engineering updates. They also come with a same-as-new, 12-month Caterpillar Limited Warranty¹. At up to 60% off the cost of new products, Cat Reman gives another life to your asset and increases your potential gains at a reasonable price point — all at your convenience.



NEED MORE THAN A REBUILD? CHOOSE CAT REMAN.

Electronic parts need to be replaced from time to time. That's why Cat Reman products can serve as a cost-effective solution for your part replacement needs, especially when completing a more intensive repair. For instance, choosing a Cat Reman alternator or electronic control unit could help your next overhaul or rebuild stay within your budget. Since all Cat Reman products incorporate the latest components and performance upgrades, you won't be cutting corners.

But how does Caterpillar remanufacture parts to high-quality standards? Once Caterpillar receives and accepts a returned core — i.e., a used electronic component — the core is disassembled and inspected for wear points and failure modes such as PCBs, components, connectors and housings. Each aspect of this process includes a visual inspection, component testing and component replacement, as needed.



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THAT’S WHERE REMANUFACTURING COMES INTO PLAY... THOSE PIECE PARTS ARE BROUGHT BACK TO THE ORIGINAL NEW PART DESIGN SPECIFICATIONS OR CURRENT SPECIFICATIONS IF UPGRADED. SO, WHEN THEY GO BACK TOGETHER, YOU GET THAT LIKE NEW PERFORMANCE.

-DANNY SIMON, CAT REMAN PRODUCT MANAGER

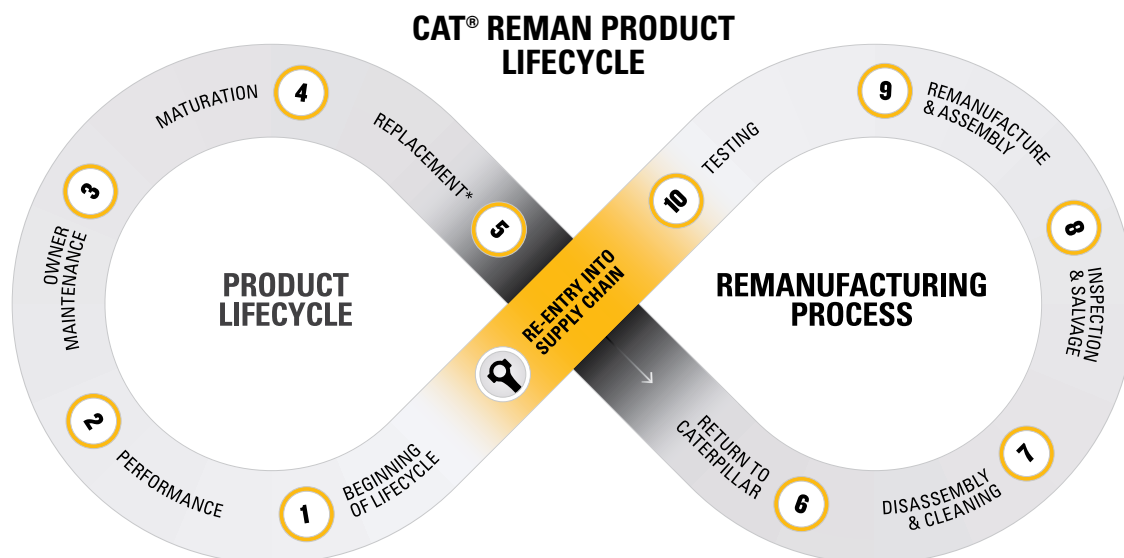
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REVIVE YOUR EQUIPMENT. REPLENISH THE SUPPLY.

SUSTAINABLE BENEFITS FOR VALUABLE PRODUCTS

Electronic components are a vital part of Caterpillar product offerings — all of which are supported by our circular economy. A customer’s used, viable core enters a Caterpillar remanufacturing facility as an old, worn part and exits as a like new product.

The Caterpillar circular economy endures thanks to our commitment to **sustainability**. We aim to protect your equipment as well as the valuable resources that make its production possible. The Cat Reman process **emits 61% fewer greenhouse gases** and **uses 85% less energy, material and water** than the manufacture of new products².



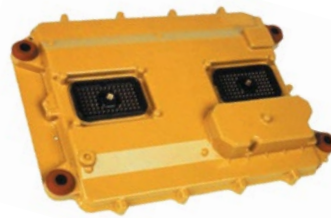
*It is recommended to replace before failure.
Replacements after failure may result in partial credit.



STAY CONNECTED TO THE INNER WORKINGS OF YOUR EQUIPMENT

Electronics represent much of the future of our business. To meet the needs of tomorrow, Caterpillar offers electronic solutions for each industry we serve, from Construction to Mining to Energy & Transportation and beyond.

Here's a selection of Cat Reman electronic parts and components:



ELECTRONICS

- + Alternators
- + Electronic Control Units (ECUs)
- + Electronic Control Modules (ECMs)
- + Instrument Clusters
- + Inverters
- + Joysticks
- + Product Link
- + Sensors
- + Starters
- + Cat Vision Systems

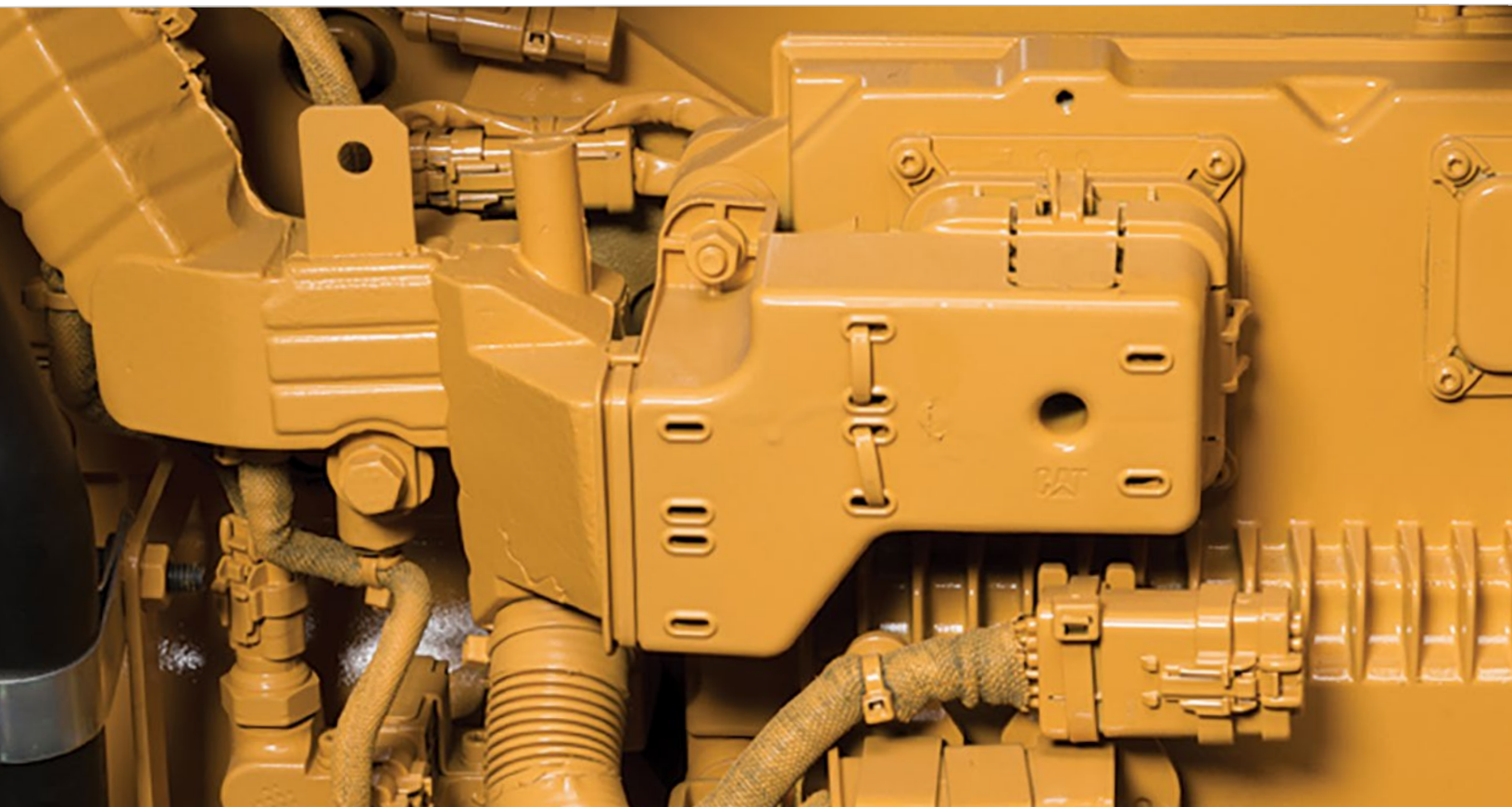
DISPLAYS

- + Electronic Modular Control Panels (EMCPs)
- + Electronic Monitoring System (EMS)
- + Graphic & Information Displays

LEGACY PRODUCTS

- + A2, A3, A4 ECMs
- + Electronic Ignition System (EIS)
- + Programmable Electronic Engine Controls (PEECs)

Reach out to your local authorized Cat dealer to confirm which parts may be available and/or applicable to your needs.



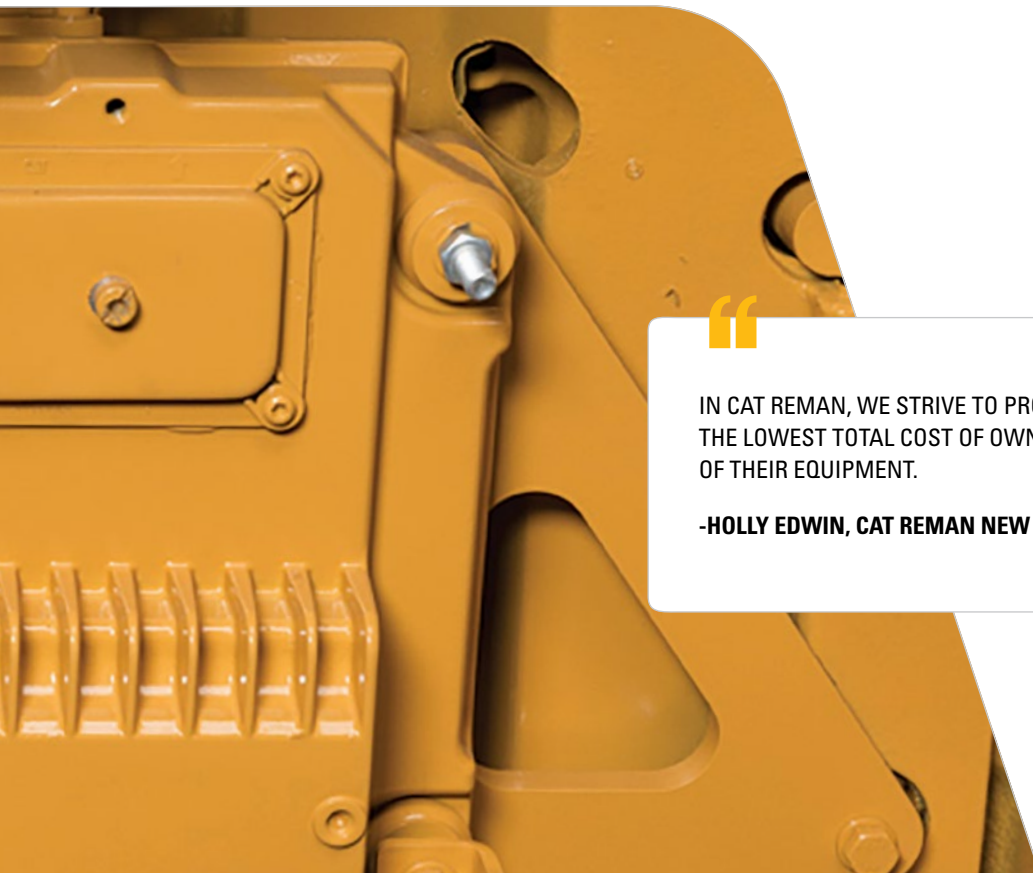
WHAT SETS **CAT REMAN** ELECTRONIC PARTS APART?

As with other Cat Reman options, remanufactured Cat electronic components offer a like new level of control thanks to several key factors:

- + Delivered and supported through Caterpillar's Global Dealer logistic network
- + Extensive testing to ensure smooth performance
- + Lower price points and lower total cost of ownership when compared to new
- + Incorporation of the latest design elements and product improvements
- + Same-as-new, 12-month Caterpillar Limited Warranty¹

Cat Reman electronic components — like graphic displays, starters and alternators as well as machine and engine controllers — are remanufactured to respond to intensive demands and harsh climates. They power through corrosion, excessive dust, extreme temperatures, humidity, shock, severe vibration and thermal cycles.

With an extensive array of hardware and software options to remanufacture, Cat Reman engineers and technicians have standardized a disassembly and reassembly process that works in tandem with cutting-edge salvage techniques. Supported by the latest product improvements, high-quality Cat Reman electronic parts are made to meet the standards and software requirements set by the Institute of Printed Circuits.



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IN CAT REMAN, WE STRIVE TO PROVIDE THE CUSTOMER WITH THE LOWEST TOTAL COST OF OWNERSHIP OVER THE LIFECYCLE OF THEIR EQUIPMENT.

-HOLLY EDWIN, CAT REMAN NEW PRODUCT INTRODUCTION MANAGER

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FULFILL YOUR ELECTRONIC NEEDS

EXCHANGE A USED CORE FOR A CAT REMAN COMPONENT

Whether you're planning an equipment rebuild or experiencing downtime with an offline electronic component, your dealer can offer you customized support.

When a component reaches the end of its lifecycle and a Cat Reman product is purchased, the Cat customer may return their core to their dealer in exchange for a core refund³. Even if the component is damaged, a customer may still be eligible for Partial Core Credit as we can, in some instances, remanufacture certain components, chips and wirings within the returned core.

This incentive helps customers turn viable core into a cost reduction instead of waste, and helps keep our supply chain stocked with products to meet customer needs.

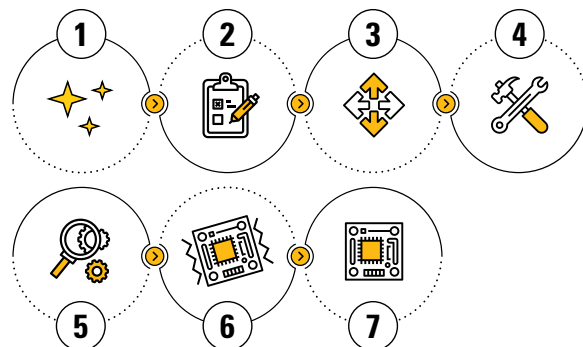
MOVING ELECTRONIC PARTS THROUGH THE CAT REMAN PROCESS

THE CATERPILLAR CIRCULAR ECONOMY IN ACTION

Now, let's detail the remanufacturing process from the perspective of an electronic component, like an electronic control module (ECM).

Once the core is inspected and approved by your dealer, it's sent to a core processing facility for further inspection. Then, the viable core is forwarded to a Cat Reman plant for salvaging and remanufacturing.

1. When an ECM first arrives at our facility, it's received and sorted, then washed and sandblasted to remove excess dirt and paint. Every core receives a barcode for internal tracking purposes.
2. The ECM undergoes flashing and diagnosing, with an additional test to ascertain the current performance of the ECM.
3. The team disassembles and salvages the ECM — removing screws, covers and housing around the printed circuit board.
4. The ECM moves on to repair and validation, where Cat Reman technicians enact software and design updates, replacing and/or upgrading components before subjecting the ECM to both electrical and physical inspections.
5. A final inspection validates the latest updates and repairs before the ECM is reassembled.
6. A vibration test simulates on-machine average loading and a leak test (seal integrity test) validates any imperfections in the housing. A plug is installed on the unit, and a memory wash clears the ECM of any stored records so no data remains on the like new component.
7. The part is painted, engraved with a Cat Reman part number, packaged and shipped.





REMANUFACTURED TO LAST. BACKED BY A CATERPILLAR LIMITED WARRANTY¹.

CAT REMAN ELECTRONIC COMPONENTS ARE DESIGNED TO PROVIDE **LASTING CONTROL** OVER YOUR EQUIPMENT THROUGHOUT ITS LIFECYCLE. AS WITH OTHER CAT REMAN PRODUCTS, THEY RECEIVE THE **SAME PROTECTION** AS NEW COMPONENTS THROUGH OUR 12-MONTH CATERPILLAR LIMITED WARRANTY¹. THIS COVERS CATERPILLAR DEFECTS IN MATERIAL AND/OR WORKMANSHIP, AND RESULTANT DAMAGE¹.

Contact your dealer to learn more about the warranty, core exchange and other exclusive Cat Reman details. With world-class support, your dealer can help you find the services, solutions and electronic parts needed to get the most out of your equipment.

Discover more information, resources and repair options at www.cat.com/reman.

¹Warranty can vary by model and application; limitations may apply. For complete details about the applicable Caterpillar Limited Warranty, contact an authorized Cat dealer.

²Represents environmental impacts from remanufacturing process for a Cat Reman engine and components as compared to manufacturing a new, comparable engine and components. Does not include impacts elsewhere in our value chain. Based on a 2006 study done by Caterpillar on a 3412 cylinder head.

³Core Acceptance Criteria (CAC) vary by component and are subject to change. Partial core refunds are available for some Cat Reman components. See your Cat Dealer for specific information.



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