

◀ Product: NO EQUIPMENT SELECTED
Model: NO EQUIPMENT SELECTED
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Special Instruction

Guideline for Unauthorized Modifications to On-Highway Engines{0685, 1000, 1000}

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Engine:Truck All

Introduction

Before you perform any procedure in this Special Instruction, read the information and understand the information that is contained in this Special Instruction.

This Special Instruction is being issued in an effort to address authorized Caterpillar dealer concerns regarding customer engine and customer chassis unauthorized modifications that could impact engine reliability, engine durability and emissions. This Special Instruction impacts new engines, used engines and remanufactured engines. An unauthorized modification is defined as any change to a vehicle chassis or the engine that is not to the manufacturer's original specifications. Examples of unauthorized modifications include, but are not limited to:

- Installation of an aftermarket device or auxiliary device
- Tampering or removing an emissions control device
- Changing engine parameters beyond factory specifications

The failures due to unauthorized modifications are not covered under Caterpillar warranty. Authorized Caterpillar dealers are responsible for completing all root cause failure analysis and determining if warranty should be applied. This Special Instruction is not intended to be all inclusive, but will assist dealers with the investigation and the documentation.

Current Regulatory Agency Requirements

Dealers must ensure that all appropriate personnel are aware of current regulatory agency requirements and possible penalties.

Appropriate personnel - May include, but are not limited to: Service Writers, Service Manager, Technicians, Warranty Department Personnel, TEPS Program Manager, Technical Communicator, Truck Engine Account Managers, and Truck Engine Business Manager.

Due to regulatory agency requirements being continuously updated and improved, the dealer must take responsibility to understand the potential effects of any change. This Special Instruction references the United States Environmental Protection Agency (EPA) as the main regulatory agency in North America. However, compliance with all appropriate local, state and governmental regulatory agencies is required.

Any unauthorized modifications to a vehicle chassis or engine that is not to the manufacturer's original specifications, risks affecting the compliance of the chassis or the engine. Modifications to emission controls may be considered tampering and are prohibited by law if the tampering "render, inoperative any device or element of design" installed on or in a motor vehicle or motor vehicle engine in compliance with EPA regulations.

EPA guidance is available on the EPA website.

www.epa.gov

The EPA website helps a dealer evaluate whether the activities are compliant with EPA tampering regulations. In general, EPA guidance suggests:

- All persons are prohibited from making changes to the hardware or software of a vehicle or engine that would change the emission characteristics from those of the prototype for which the manufacturer obtained emission certification.
- Neither the use of non-original equipment aftermarket parts, nor adjustment of parts in keeping with the manufacturer's maintenance instructions during regular maintenance will be regarded as tampering as long as the dealer has reasonable basis to know that this will not affect emission control performance.
- Dealers and other personnel that perform maintenance are forbidden from actively perpetuating tampering. Thus, the dealer may not replace or repair parts that others have added or modified to render the vehicle or the engine non-conforming. The dealer may work on a vehicle or a engine suspected of having unauthorized changes without other limitation.
- A dealer is not required to, but may, report tampering to the EPA. A dealer is not responsible to return an engine to the certified configuration. A dealer must abstain from repairing or replacing the part of the engine that has been tampered with unless it is returned to the certified configuration.

It may be in the dealer's interest to make a record concerning work performed on engines that have been modified in a manner inconsistent with manufacturer specifications.

Dealer Actions

An authorized Caterpillar dealer is required to only make repairs that keep an engine or a vehicle in emissions compliance. A dealer is responsible to ensure that any repair action taken at the dealership is within all regulatory requirements. Examples of repair actions would include, but are not limited to:

- Programming engine system parameters
- Aftertreatment repairs
- Turbocharger repairs
- Injector repairs

Dealer repair documentation is very important because all dealer repairs are susceptible to audits by regulatory agencies or by Caterpillar.

Reasons to Suspect Modifications

During root cause failure analysis, there are many signs that may lead the technician to suspect potential engine or chassis modifications. If any of the following indicators are evident during repair, further investigation may be required to determine if the suspect modification caused the failure.

Some dealer reported indicators are:

- Auxiliary aftermarket device installed
- Component modification visible
- Unexplained or repeat failures
- Black exhaust smoke or soot
- Excessive heat related failures
- Discoloration of the exhaust manifold or the turbocharger
- Head gasket failure
- ECM settings changed (Examples: FLS/FTS, Injector e-trim codes, flash file, serial number)
- Driver comments
- Turbocharger failure
- Turbocharger wastegate supply line pinched or restricted
- High boost
- High exhaust temperature
- High fuel rate

- Performance complaints
- Incorrect sensor readings or altered sensor readings
- Exhaust aftertreatment removed (Examples: catalytic converter muffler, diesel particulate filter)
- High horsepower
- Rough idle
- Block erosion
- Catastrophic failures
- Extra ports in piping
- High fuel pressure
- Open circuit sensor diagnostics
- Premature engine wear
- Discrepancy in miles driven related to ECM totals
- Indication of improper fueling (Example: Ultralow Sulfur Diesel is required for 2007 model year engines)

Note: The list above is not meant to be all inclusive. Also, not all signs will be obvious during all repairs.

Visual Indicators

The technician must always watch for visual indicators of unauthorized modifications. All unauthorized modifications should be documented in the dealer history folder and considered for possible cause of any failure.

Driver or Owner Interview and Notification

Do not underestimate the importance of the driver or the owner interview throughout the repair process. This Special Instruction has a section labeled ""Customer Communication Regarding Unauthorized Modifications" " that should be used during the driver or the owner interview process. Make a copy of section ""Customer Communication Regarding Unauthorized Modifications" " and distribute as appropriate.

Prior to Repair

Questions should be asked to document the complaint or the reason for the visit. If the interview is not conducted properly, the technician may not be looking for the correct symptom. This can increase

troubleshooting and repair time. Many times the driver or the owner will point out obvious signs that should be considered during failure analysis.

During Repair

Communication with the driver or the owner should continue throughout the repair process as required. If unauthorized modifications are discovered during the repair the customer should be contacted immediately. The customer must be made aware of the findings and any customer responsibilities on decisions that must be made.

After Repair

If proper communication with the customer has taken place throughout the repair, the customer will have a good understanding of any required customer responsibilities and the reason why.

Failure History

A review of the Caterpillar SIMS system engine repair and failure history is a required part of any repair. Unexplained repeat failures and excessive heat or fatigue related failures must be part of any proper failure analysis for root cause.

Documentation

It is suggested that the dealer should always retain proper documentation in their files on all engines repaired, to ensure that information is available for any future inquiries. Future inquiries may come from the customer, other repairing dealers, Caterpillar or government regulatory agencies. This documentation is very important in the case of engines or chassis that may have unauthorized modifications. The following key information should be documented.

Electronic Engine Information

Electronic information from the Engine Control Module (ECM) is required on all warranty claims. This downloaded information provides the dealer a valuable record of engine parameters, system settings, active or logged diagnostic codes and lifetime totals. In many cases it may be appropriate to download the ECM information before and after the repair to document settings as the truck arrived in the shop and when the truck left the shop.

Repair Detail

Details of the repair should be documented in the dealer's work order file for future reference. At a minimum this should always include details of "Complaint", "Cause" and "Correction". If the dealer discovers unauthorized modifications during the repair, proper documentation should be recorded. Proper documentation may include, but is not limited to:

- Pictures
- Detailed description of findings

- Signs that led to the findings
- Why the unauthorized modification is or is not the root cause of the current failure
- Repairs made
- Repairs not made
- Any customer refusing to make the dealer's suggested repairs
- Any actions that your dealership takes on the repair

Caterpillar Service Information Management System (SIMS) Entry

An informational SIMS entry must be made for any engines serial number that the dealer suspects as having unauthorized modifications. The SIMS entry will allow future repairing dealers to be aware of past dealer findings to assist with root cause failure determination. If necessary, dealers will be able to discuss details that may have been documented in the dealer work order file. In order to ensure that all reports are consistent, Caterpillar now requires the repairing dealer to make the following SIMS entry. When reporting the repair, include the following:

- Service report common information section- Input dealer and engine specific information
- Part number - "SP0500" (Non-Caterpillar part)
- Description code - "38" (Info Record)
- Group number - "1280" (Non-Caterpillar part)
- Check box - Check "Non-failure service (informational)"
- Comment - "Auxiliary aftermarket device installed", if an auxiliary device is discovered or "Improper fueling", if improper fueling has been detected or "Unauthorized modification", if any other unauthorized engine modification is discovered.

Caterpillar Claim

If an engine has remaining Caterpillar warranty or extended service coverage, and either has an unauthorized modification present or a SIMS entry notifying you of a potential unauthorized modification, a warranty claim may still be allowed. Remember that authorized Caterpillar dealers are responsible for completing all root cause failure analysis and determining if coverage should be applied. If the current failure is due to a Caterpillar defect in material or workmanship, and not due to the unauthorized modification, the dealer may submit an appropriate claim with all supporting detailed documentation explaining the root cause of the failure. The claim should have all the normal claim details, with the addition of why the failure is not due to the unauthorized modification.

Note: In situations when the dealer is uncertain whether the failure is a warrantable defect, the Caterpillar Service Representative should be involved to assist with failure analysis, including Caterpillar factory Product Support group assistance as required. The intent of this action is to ensure that an accurate decision is made at the time of the repair.

Reporting Requirements

A dealer is not required to, but may, report tampering to the EPA. A dealer is not responsible to return an engine to certified configuration. A dealer must abstain from repairing or replacing the part of the engine that has been modified, unless it is to return to certified configuration.

Additionally, the dealer is not required to report tampering to the local Caterpillar representative, although a SIMS entry is required. However, if a dealer has any questions regarding specific situations or related issues that are not in this publication the Caterpillar Representative is always available for consultation.

Customer Responsibility

The customer is responsible for:

- Maintaining the engine and the vehicle in the certified configuration
- Failures resulting from any use or installation which Caterpillar judges improper
- Failures resulting from attachments, accessory items and parts not sold or approved by Caterpillar
- Failures that result from abuse, neglect or improper repair
- Using fuel that is prescribed by the US EPA and other appropriate regulatory agencies (Example: Model year 2007 and newer Caterpillar On-Highway diesel engines require the use of Ultralow Sulfur Diesel fuel (ULSD) fuel in order to meet the US EPA 2007 emissions regulations for On-Highway diesel engines. Failure to use ULSD in these engines will reduce engine durability and may also damage emission controls.)

Dealer Checklist for Unauthorized Modifications

- Ensure dealer awareness of current regulatory agency requirements and possible fines
- Complete a driver or a owner interview
- Check Caterpillar SIMS system for engine repair and failure history. Repeat failures are critical.
- Check Caterpillar SIMS system for "unauthorized modification" or "auxiliary aftermarket device installed" entries
- If more information is required, contact the previous repairing dealer that completed a SIMS entry for unauthorized modification or auxiliary aftermarket device installed
- Watch for common signs of unauthorized modifications
- Complete detailed root cause failure analysis
- Make proper repair based on root cause failure analysis

- Communicate with the customer throughout all repairs.
- File detailed repair documentation in the dealer work order folder for future reference and proof of proper repair.
- Complete a Caterpillar SIMS entry. Refer to ""Caterpillar SIMS Entry" ".
- Consult your local Caterpillar Representative for any questions regarding specific situations or related issues that are not in this Special Instruction.

Reference Material

- Truck Engine News, SEBD6787, "Responsibilities for Emission Certified Engines"
- Special Instruction, REHS3796, "Inspecting and Repairing the Air Inlet and Exhaust System after Improper Fueling"
- Truck Engine News, SEBD6782, "Responsibilities for Emission Certified Engines"
- Truck Engine News, SEBD6749, "Tampering with Emission Controls"
- Truck Engine News, SEBD6719, "Smoke Emissions from On-Highway Diesel Engines and Roadside Testing"
- RP5580 - US Low NOx Engine Software Reflash <https://truck.cat.com>
- RP5581 - CA Low NOx Engine Software Reflash <https://truck.cat.com>
- US Environmental Protection Agency website <http://www.epa.gov>

Customer Communication Regarding Unauthorized Modifications

At Caterpillar, our objective is to provide you with the best engine owning and operating experience possible. That is why we would like to take this opportunity to answer some of the more frequently asked questions regarding unauthorized modifications made to and possibly affecting your Caterpillar engine. Please contact your local Caterpillar dealer if you have any questions that are not addressed by this publication.

- What is an unauthorized modification?

An unauthorized modification is any change to a vehicle chassis or engine that is not to the manufacturer's original specification. Examples include, but are not limited to: aftermarket device installation, tampering or removing an emissions control device, or changing engine system parameters beyond factory specifications.

- Will an unauthorized modification or aftermarket device void my warranty?

No, a warranty can not be voided. However, if it is determined that a failure is caused by an unauthorized modification and is not due to a failure of Caterpillar material or workmanship, the repair will not be covered under Caterpillar warranty.

- Can unauthorized modifications to my engine or chassis cause engine failure?

Yes, Caterpillar builds engines to the highest design and quality standards, to provide the customer with a product that will have minimal downtime. However, any unauthorized modification to the chassis or the engine system may shorten component life.

- Can unauthorized modifications to my engine or chassis cause my engine to not meet emissions regulations?

Yes, Caterpillar engines meet all required emissions regulations when delivered from the factory. It is the customer's responsibility to maintain the vehicle and the engine within the required emission certification. Any unauthorized modifications greatly increase the possibility of not meeting emission regulations.

- What regulatory fines are possible for violating emission regulations?

Regulating fines vary bases on violation and location. However, as of this publication, dealers or the OEM might be penalized up to \$32,500 per engine for violating the United States Environmental Agency (EPA) emission regulations. Individuals can be penalized up to \$2,750 for violating emission regulations. The emission regulations have been increasing around the world.

- Can unauthorized modifications to my engine or chassis affect the safety of my vehicle?

Yes, any unauthorized modification has the potential of affecting vehicle safety. Examples would be, but are not limited to: aftermarket device installation allowing vehicle speed above safe speed limits and engine performance in excess of chassis limitations.

- Can unauthorized modifications affect vehicle fuel economy?

Yes, Caterpillar designs engines for peak performance and fuel economy. Devices that claim to improve fuel economy are not validated claims, and some devices may additionally adversely affect fuel economy or recorded fuel economy information logged in the ECM.