

Special Instruction**Aftertreatment Outlet NOx Sensor Internal Water Shield Installation {108U}**

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i06577165

Aftertreatment Outlet NOx Sensor Internal Water Shield Installation {108U}

SMCS - 108U

On Highway Truck

CT660S (S/N: TJD1-UP; TEJ1-UP; TEM1-UP; TEP1-UP; TRR1-UP; TEY1-UP; TEZ1-UP)

CT680 (S/N: TWT1-UP; TKW1-UP; TRX1-UP; TRZ1-UP)

CT681 (S/N: TWJ1-UP)

Truck

CT660S (S/N: TRY1-UP)

Introduction

Do not perform any procedure in this Special Instruction until you have read the information and you understand the information.

Description

Water intrusion can cause the malfunction or failure of the aftertreatment outlet NOx sensor on vertical exhaust configurations. See below for a list of feature codes for vertical exhaust configurations on Cat vehicles. The recommended repair is to install a rain shield which prevents water from traveling down vertical exhausts from contacting the outlet NOx sensor. Follow the diagnostic steps in this article to determine if your vehicle should be repaired by installing the aftertreatment rain shield in the outlet of the Selective Catalytic Reduction (SCR) catalyst.

Vertical exhaust configuration feature codes:

- 07BJU
- 07BJX
- 07DXM

Symptoms**Diagnostic Trouble Codes And Dashboard Indicator Lights**

Table 1

SPN	FMI	Code Description	Lamp
3226	4	Aftertreatment 1 Outlet NOx Sensor Circuit - Voltage Below Normal or Shorted to Low Source	Amber
3226	10	Aftertreatment 1 Outlet NOx Sensor - Abnormal Rate of Change	Amber
5031	10	Aftertreatment 1 Outlet NOx Sensor Heater - Abnormal Rate of Change	Amber

Customer Observations or Concerns

Customers may experience a Malfunction Indicator Light (MIL) and possible reduced engine performance.

Required Tools

Table 2

Tool Description
8 mm (5/16 in) Drill bit
End wrench
Center punch
Cleaning solvent
Electrical drill
Flathead screwdriver
Masking tape
Metal file
Needle nose pliers
Rubber gloves
Ruler of at least 6 inches
Safety Glasses
Sand paper 40-60 grit
Shop towels
Stir stick

Service Parts Information

Table 3

Qty	Part Number	Part Name
1	435-2880	Circuit Board As
2	435-4269	Film
1	435-3074	Gasket
1	536-2108	High Temperature Sealant

Diagnostic Steps

Table 4

Troubleshooting Test Step	Value	Results
1. Verify the concern of the customer.		<p>Result: There are codes from Table ***#i06564440/i06564440.1*** that are active.</p> <p>Repair: Follow the steps below in the "Repair" section to</p>

<p>A. Use a PC with the engine diagnostic software to read the fault codes.</p>	<p>Fault Codes</p>	<p>install a water shield. Diagnose the NOx Out sensor using the steps in the appropriate diagnostic manual.</p>
<p>Are the fault codes from Table ***#i06564440/i06564440.1*** active?</p>		<p>Result: There are not any codes present from Table ***#i06564440/i06564440.1*** .</p>

Repair Steps

WARNING

A diesel particulate filter will become extremely hot during engine operation. A hot diesel particulate filter can cause a burn hazard which could result in personal injury. Allow adequate cooling time before working on or near the diesel particulate filter.

Removal Procedure

1. Remove the aftertreatment SCR assembly from the chassis. Refer to the Disassembly and Assembly manual for the appropriate procedure.

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Illustration 1
(1) Outlet NOx sensor

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2. Remove outlet NOx sensor (1) from the SCR.

Inspection, Drilling, and Cleaning Procedure

Note: Do not use a metallic object to clean the SCR catalyst. Metal will scratch the surface of the SCR catalyst which may cause excessive diesel fluid build-up.

Note: Do not use any chemical solvents or cleaners to clean the internal metal surface. Possible damage to the SCR catalyst may occur.

Note: Every SCR catalyst unit has a drain hole which allows water that has accumulated in the unit to drain out of the system. A plugged drain hole can cause an outlet NOx sensor to malfunction. The drain hole must be clear of debris, dirt, or any other material.

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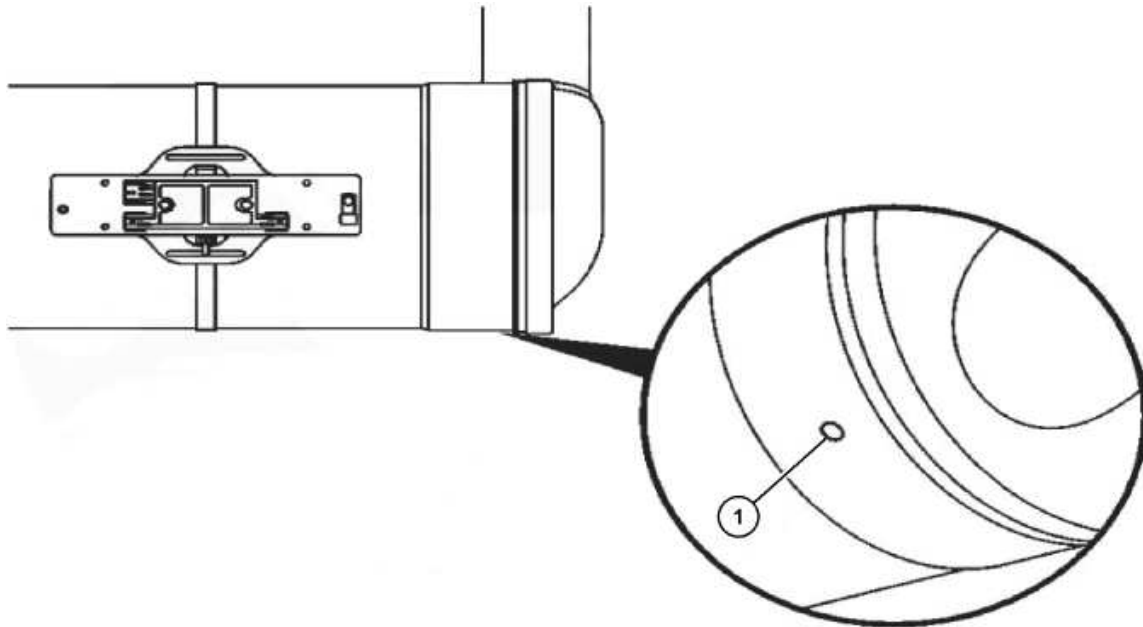


Illustration 2
(1) SCR drain hole

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1. Clean the dirt and debris from SCR drain hole (1).
-

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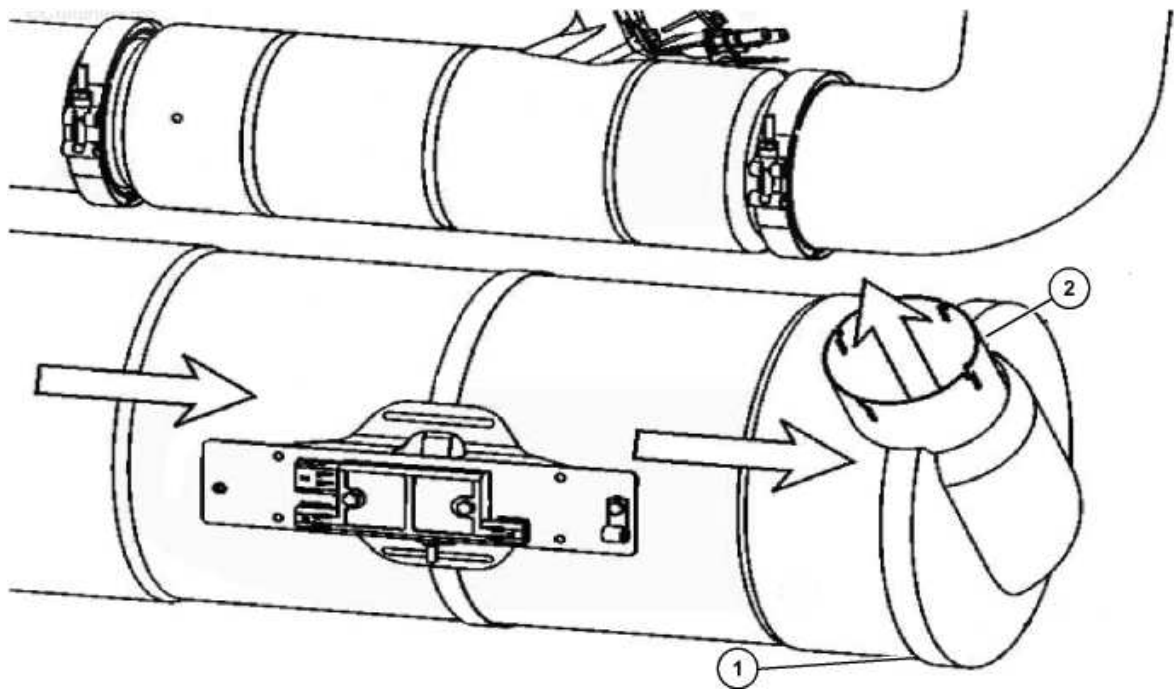


Illustration 3

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- (1) SCR drain hole
- (2) SCR catalyst outlet

- a. The drain hole (1) is oriented in the lowest section of the SCR catalyst outlet (2) pointing towards the ground.

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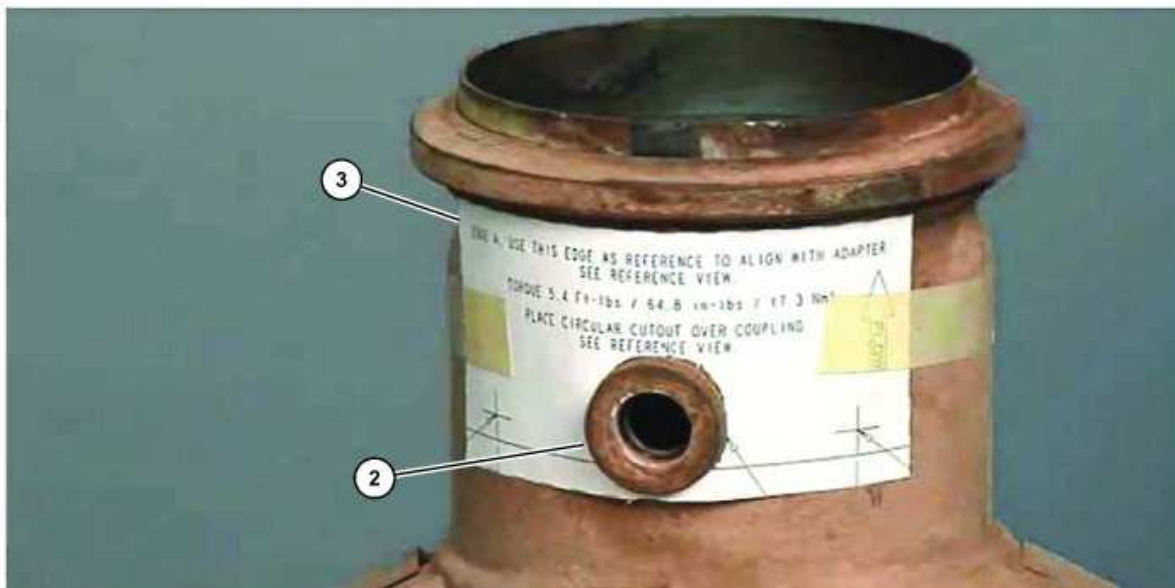


Illustration 4

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- (2) SCR catalyst outlet
- (3) Template

- Cut template (3) for either a Marmon or Torca joint.

Note: The template has information for selection of the proper joint.

- Attach the appropriate template to the SCR catalyst outlet pipe as shown in the illustration above.

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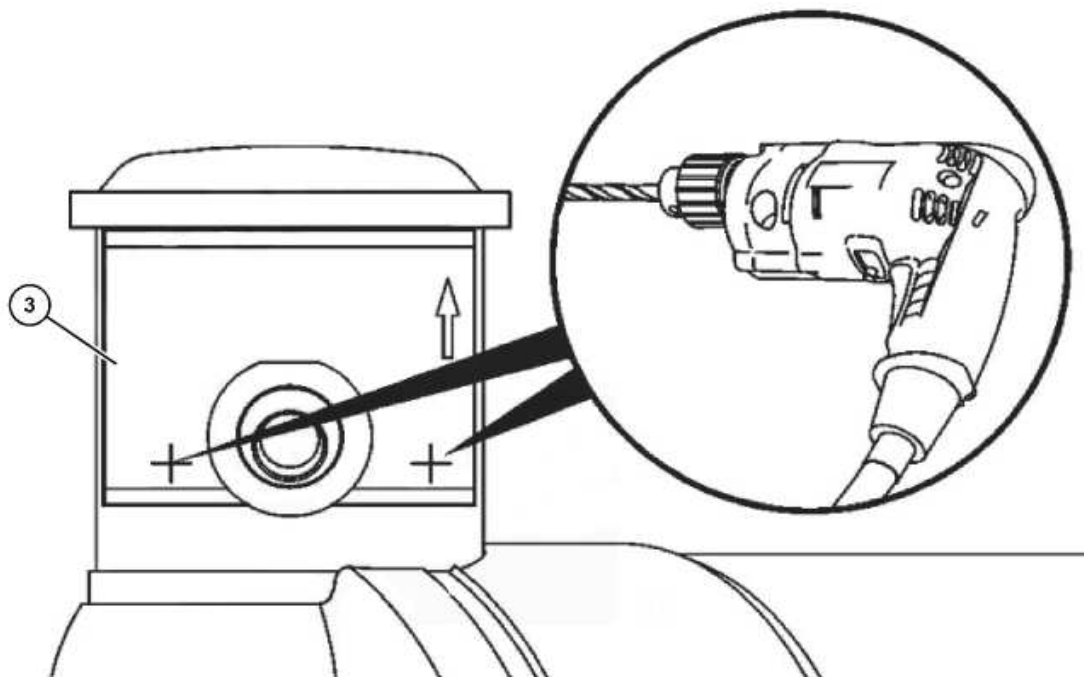


Illustration 5
(3) Template

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- Use a center punch to mark the designated locations on template (3).
- Drill holes using the specified bit size from the template.
- Remove the template from SCR catalyst outlet pipe.
- Remove any burrs from the holes that were drilled using a metal file.
- Clean the metal shavings out of the SCR catalyst.

Note: Any shavings left in the SCR catalyst could clog the drain hole.

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Illustration 6

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- (4) Sensing wheel cup screen
- (5) Masking tape

9. Mask off sensing wheel cup screen area (4) using masking tape (5) as seen in the illustration above.
10. Roughen up the smooth surfaces of the SCR catalyst pipe on either side and directly above the sensing wheel cup area using 40 or 60 grit sand paper.
11. Roughen up the top of the outlet NOx sensor internal water shield surface using 40 to 60 grit sand paper.

⚠ WARNING

Use all cleaning solutions with care and in a well ventilated area. Always wear eye protection when using cleaning solutions. Failure to follow the precautions provided by the manufacturer on using, storing and disposing of any cleaning solution can result in bodily injury.

12. Use a cleaning solvent to clean the surfaces thoroughly from oil, grease, dirt, corrosion, or other contaminants.

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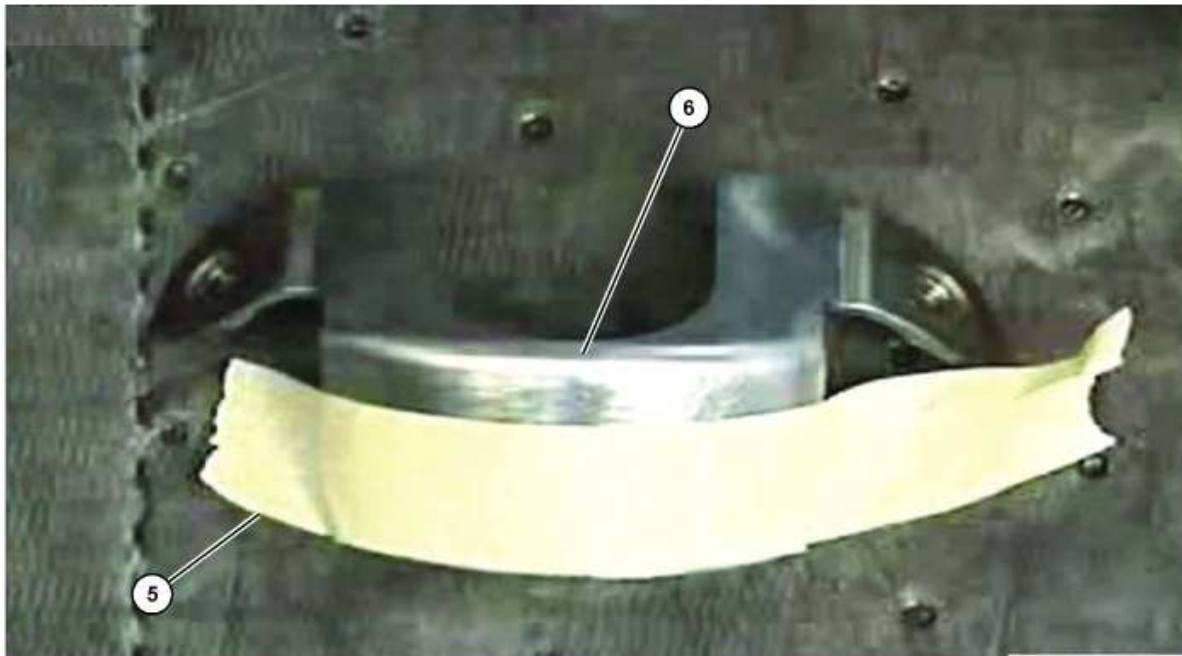


Illustration 7

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- (5) Masking tape
- (6) Outlet NOx sensor internal water shield

13. Attach masking tape (5) to the outlet NOx sensor internal water shield (6). Leave 1 inch of exposed metal as shown in Illustration 7.

Installation

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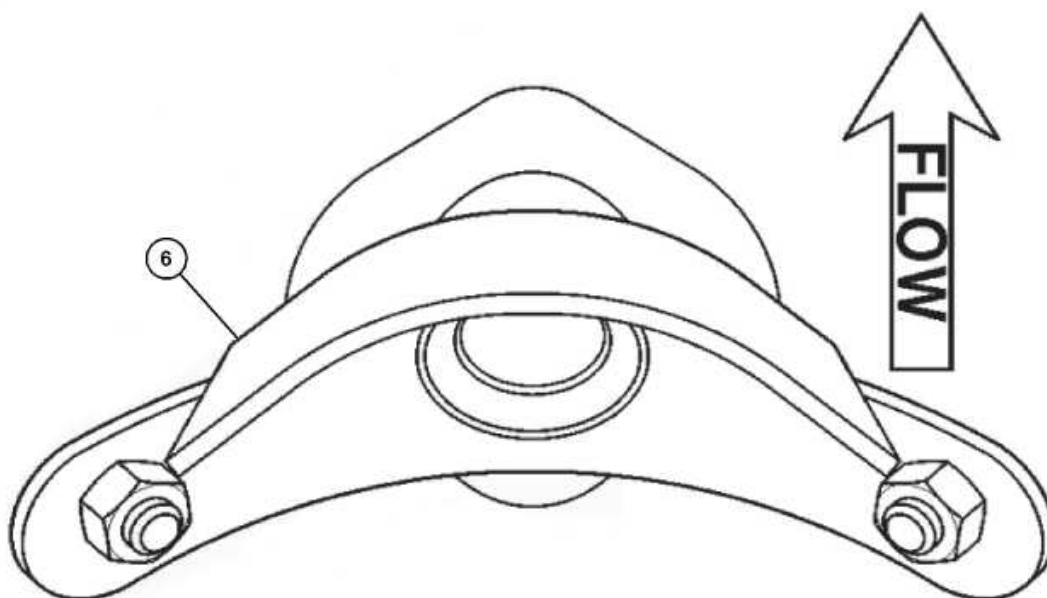


Illustration 8
(6) Outlet NOx sensor internal water shield

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1. Orient outlet NOx sensor internal water shield (6) towards the SCR catalyst outlet. Refer to Illustration 8 with the directional air flow arrow.
2. Install two cap screws and washers from the outside and hand tighten. Tighten the caps screws to 7.3 N·m (65 lb in).

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Illustration 9
(2) SCR catalyst outlet pipe
(5) Masking tape
(6) Outlet NOx sensor internal water shield

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3. Attach masking tape (5) to SCR catalyst outlet pipe (2).
 - a. Apply the masking tape 1 in high by 4 in wide about 1 in above outlet NOx sensor internal water shield (6).

Note: The masking tape will help remove excessive high temperature sealant.

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Illustration 10
(7) High temperature sealant

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- Mix high temperature sealant (7) through for 1 minute.

Note: Do not allow the high temperature sealant to fall into the SCR catalyst during application.

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Illustration 11
(2) SCR catalyst outlet pipe
(5) Masking tape

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- (6) Outlet NOx sensor internal water shield
- (7) High temperature sealant

Note: All surfaces must be free of oil, grease, dirt, corrosion, and other contaminants before using the high temperature sealant.

5. With rubber gloves, use a finger or application tool to apply high temperature sealant (7) evenly to seal the gap between SCR catalyst outlet pipe (2) and outlet NOx sensor internal water shield (6).

Note: make sure that the sealant completely fills the gap or air pockets can form and bonding will fail.

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Illustration 12
(7) High temperature sealant

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6. Remove excess high temperature sealant using a rag or gloved hand.
7. Remove the masking tape from the SCR catalyst outlet and internal water shield.

Note: Masking tape must be removed before the high temperature sealant hardens. At room temperature, the sealant will harden in around 4 hours.

8. Install the outlet NOx sensor.
9. Install the SCR catalyst assembly.
10. For the high temperature sealant to cure, run a stationary regeneration after installing the SCR catalyst assembly.