i02558839

Air Inlet and Exhaust System

SMCS - 1050

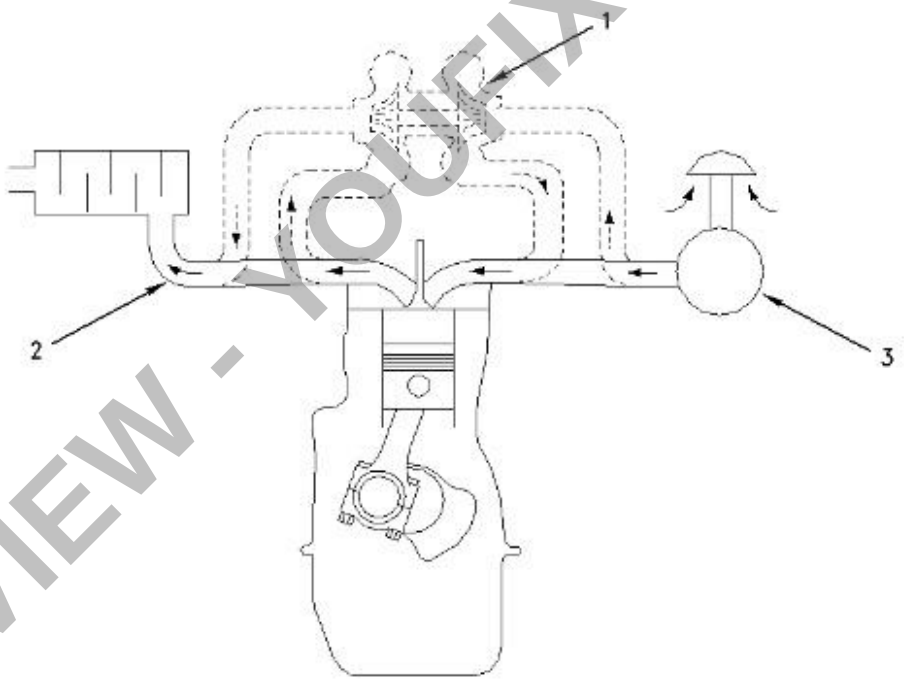


Illustration 1 g00987178

Flow diagram of the air inlet and exhaust system

(1) Turbocharger

(2) Exhaust

(3) Air inlet

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S/N - SCP1-UP

S/N - TAR1-UP

S/N - TPE1-UP

S/N - ZSA1-UP

Table 1

Diameter of Crankshaft Journal (Bearing Surface) For Connecting Rod Bearings	
Original Size Journal [1]	57.955 to 57.970 mm (2.2817 to 2.2823 inch)
Undersize Journal 0.25 mm (0.010 inch)	57.705 to 57.720 mm (2.2718 to 2.2724 inch)
Undersize Journal 0.50 mm (0.020 inch)	57.455 to 57.470 mm (2.2620 to 2.2626 inch)
Undersize Journal 0.75 mm (0.030 inch)	57.205 to 57.220 mm (2.2522 to 2.2528 inch)

[1] Regrind the connecting rod bearing journals to the next undersize dimension if the repair limit of 57.800 mm (2.2756 inch) is exceeded.

The clearance between a new connecting rod bearing and a new connecting rod bearing journal is the following value. ... 0.030 to 0.090 mm (0.0012 to 0.0035 inch)

Service limit for clearance between a connecting rod bearing and a connecting rod bearing journal ... 0.200 mm (0.0079 inch)

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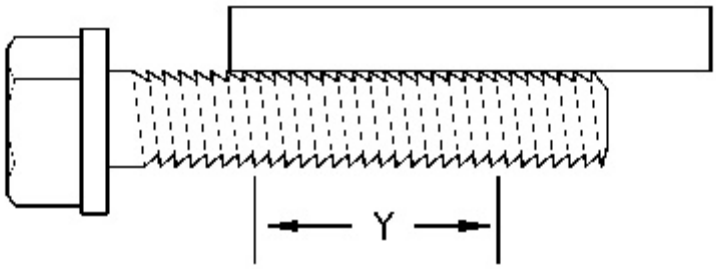


Illustration 3 g00951563

3. Clean the threads and inspect the threads of the cylinder head bolts.

   Note: Do not use the bolts if there is any visual reduction in the diameter of the Threads (Y) that has not been engaged with the cylinder block. Use a straight edge to check the bolts.

4. Lubricate the threads and the shoulder of the cylinder head bolts with clean engine oil before installation.

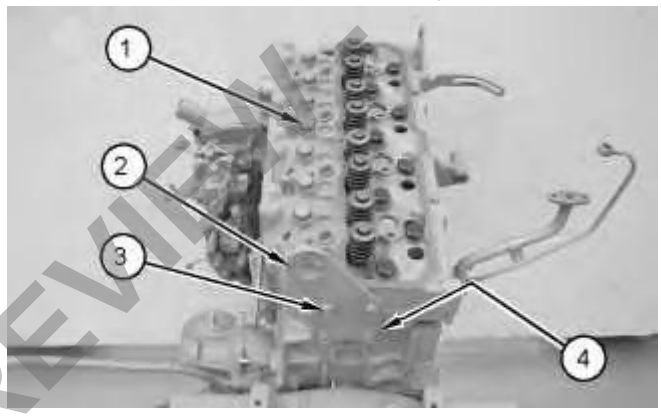


Illustration 4 g01034839

5. Install bracket (2) and O-ring seal (4). Install bolts (3) .

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S/N - SCP1-UP

S/N - TAR1-UP

S/N - TPE1-UP

S/N - ZSA1-UP

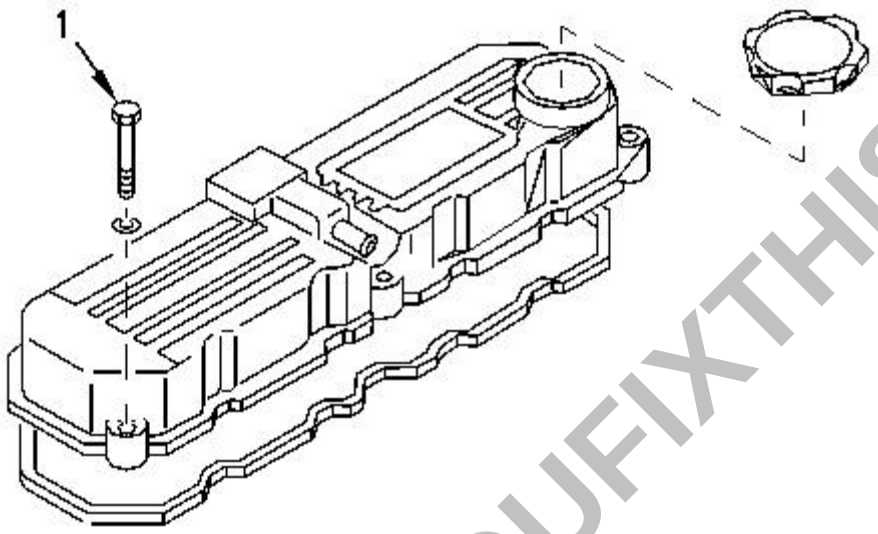


Illustration 1 g00984870

(1) Tighten the bolts for the valve mechanism cover to the following torque. ... 10 to 13 N·m (7 to 10 lb ft)

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- Software - Uninstall - "Immobilizer" Feature
- Electrical Connector - Inspect
- Electronic Control Module (ECM) - Flash Program
- Electronic Control Module (ECM) - Replace
- Glossary of Terms
- System Schematic

Product Link - PL522/523 - RENR8143

- Electronic Control Module (ECM) - Flash Program
- Electronic Control Module (ECM) - Replace
- Electrical Connector - Inspect
- Wiring Harness (Open Circuit) - Test
- Wiring Harness (Short Circuit) - Test
- Specifications
- System Schematic

Product Link 121S/300 - RENR7911

- Electronic Control Module (ECM) - Flash Program
- Electronic Control Module (ECM) - Replace
- Electrical Connector - Inspect
- Wiring Harness (Open Circuit) - Test
- Wiring Harness (Short Circuit) - Test
- Specifications
- System Schematic

Troubleshooting

247B, 257B, 267B, 277B and 287B Multi Terrain Loaders and 216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders Auxiliary Hydraulic Electronic Control System - RENR6418

- General Information
- Service Tools
- Electrical Component and Connector Locations
- Diagnostic Capabilities
- Diagnostic Code List
- MID 106 - CID 0168 - FMI 03
- MID 106 - CID 0168 - FMI 04
- MID 106 - CID 1180 - FMI 03
- MID 106 - CID 1180 - FMI 05
- MID 106 - CID 1180 - FMI 06
- MID 106 - CID 1181 - FMI 03

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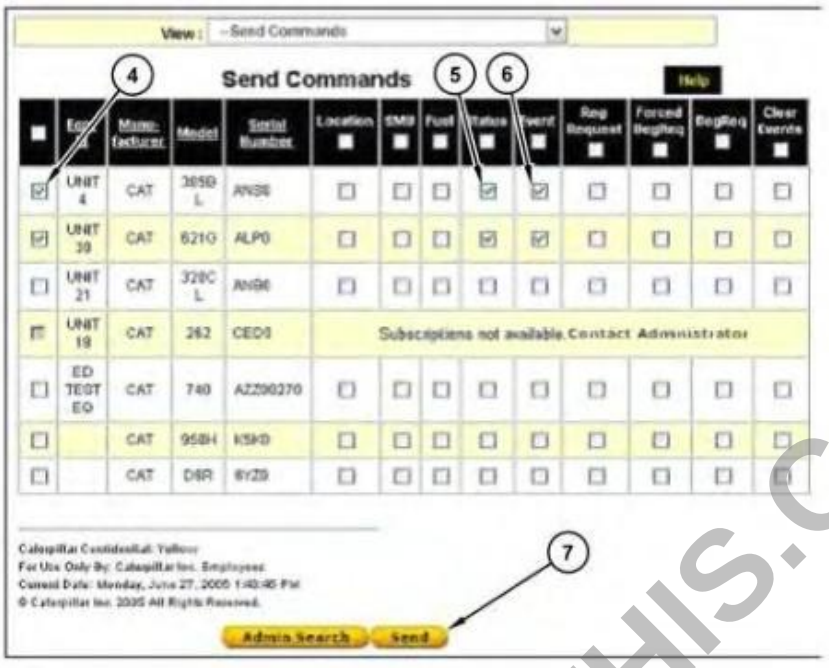


Illustration 12 g01721398

"Send Commands"

(4) Check boxes

(5) "Status" check box

(6) "Event" check box

(7) "Send" button

3. In order to send commands, select the check box that corresponds to the machine from the most left column. In the remaining columns, select the check box that corresponds to the type of command.

   Note: Selecting the check box (4) in the first column of the "Send Commands" table automatically selects the "Status" check box (5) and "Event" check box (6) for that selected item. Because the "Status" command returns reports about "Location", "SMU" and "Fuel", there is no reason to send any of these three commands if "Status" is selected.

   Table 7 describes the type of commands that can be sent.

Table 7

"Send Commands" Options

Subscriptions				
Asset Watch	**Maint. Watch**	**Health Watch**	**Command**	**Description**
X			Location	Sends report with location information of machine.
X			SMU	Sends report with information about current Service Meter Units.
		X	Fuel	

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i03348523

Active Fleet

SMCS - 7600; 7606

This report provides information of the customer and the equipment, the details from the last report, and Product Link details. This report can be run at the Universal Customer ID (UCID) level or the dealership level. While feature level search results are limited to the 999 equipment, this report has no limit and can be generated to aid in audits, maintenance, and administration of the customer or dealers Product Link population.

In order to generate the "Active Fleet Report", refer to the following procedure:

1. From either the "Reports" section of the "Administration" screen or the "View" drop-down menu, select "Active Fleet Report". The "Active Fleet Report" screen will be displayed.



Illustration 1 g01724615

"Active Fleet Report" screen

2. Select a customer from the "UCID" drop-down menu in order to create a report for the customer or allow "All Dealer Machines" to remain selected in the "UCID" drop-down menu in order to generate the report for all equipment and customers for your dealership. Select "Export". Refer to Illustration 1.

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Illustration 6 g01397858

Note: The Status can be changed to any value. A status of "Action", "Monitor", or "Normal" enables the event to remain outstanding. This state will be reflected on the "Exception Dashboard" screen and on the "Event Summary" screen.

3. Click in the box under the "Notes/Comments" column.
4. Type a message in order to describe the reason for the update. The message should describe actions that were taken in order to address the event.
5. Click "Save" in order to update the status of the alarm .

"Setup Fence"

The "Setup Fence" screen allows you to configure the following: inclusive parameters for the fence, exclusive parameters for the fence and parameters for time for the fence. The procedures that follow will demonstrate the features of the "Setup Fence" screen.

Preliminary Steps

1. Navigate to the "Time and Geographic Fencing" screen. Locate your machine from the list of machines. Click in the box in the left hand column next to your machine in order to configure the fence for that machine.
2. Click the "Setup Fence" button. The "Setup Fence " configuration screen will appear. This screen will allow you to add fences for the selected machine. Determine the type of fence required for the application. Follow the procedure for the type of fence selected in order to configure the fence for the machine.

Add Inclusive Geographic Fence

To create an inclusive geographic fence in a map, use the procedure that follows.

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i04905804

Spare Input Configure

SMCS - 7606-IV

The "Digital Input Configurations" should be verified. Once verified, the "Digital Input Configurations" should be changed if required. These values are used to configure the digital sensors "#1", "#2", "#3", and "#4" of the Product Link system. Refer to Systems Operation, Troubleshooting, Testing and Adjusting, "Spare Inputs" for an example of types of switches. Refer to the Systems Operation, Troubleshooting, Testing and Adjusting, "System Schematic" for an example of a wiring diagram for the inputs.

Note: The following information is applicable to all four of the digital inputs.

"Digital Input Configuration"



Illustration 1 g01361917

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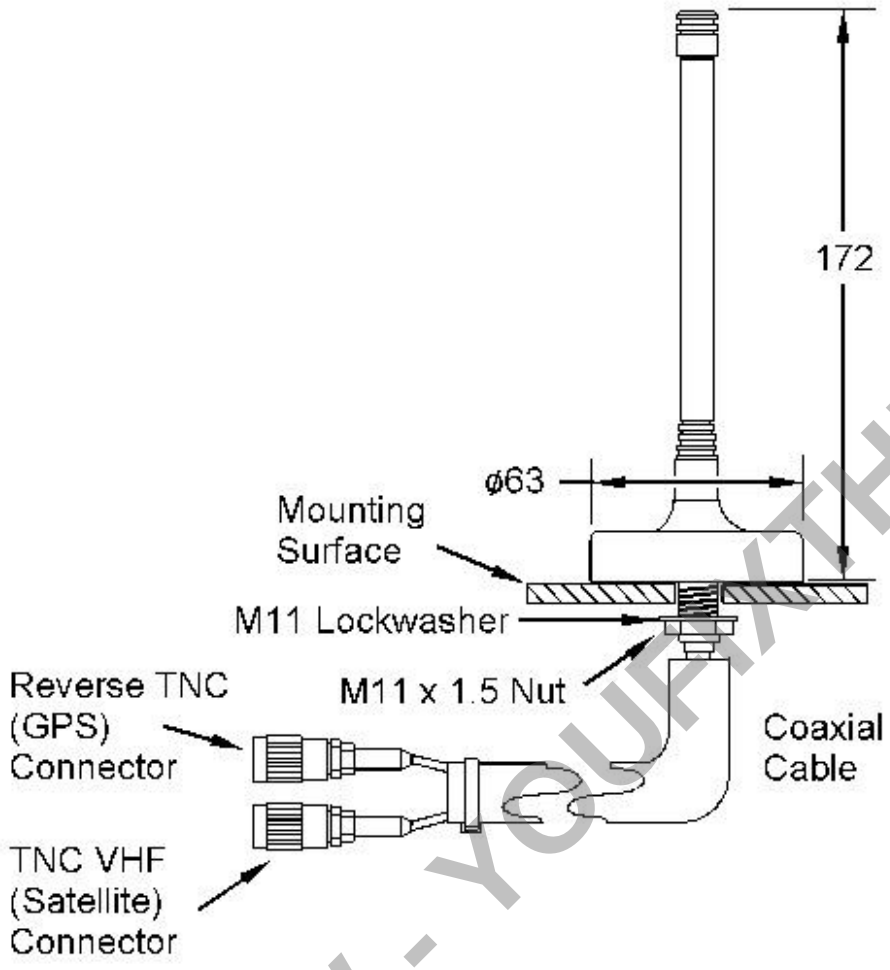


Illustration 3 g01130025

"Hard Mount" Antenna

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i01665943

Lost Key

SMCS - 7631-038-KEY

Lost Key

1. Use another valid key to start the machine.
2. Program another key into the control module. Refer to the Testing and Adjusting, "Key - Program" section of this manual for additional information.
3. Contact your Caterpillar dealer.

Note: If a key is lost, the key should be deleted from the list of authorized keys.

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There is likely to be a problem with the systems GPS. Proceed with the following steps in order to determine the cause:

Test Step 1. ACCESS THE PRODUCT LINK THROUGH CATERPILLAR ELECTRONIC TECHNICIAN (CAT ET).

A. Connect the Cat ET service tool to the machine.

B. Verify that the ECM (Product Link) is available.

Expected Result:

The ECM (Product Link) is available.

Results:

- **OK -** The ECM (Product Link) is available. Proceed to Test Step 3.
- **NOT OK -** The ECM (Product Link) is not present in the Cat ET screen.

  Repair: Verify that the wiring for the Product Link has been installed correctly. Check the wiring with a multimeter. If the ECM (Product Link) is not available, refer to Systems Operation, Troubleshooting, Testing and Adjusting, "Electronic Service Tool Does Not Communicate with ECM".

  STOP

Test Step 2. VERIFY IF THE MACHINE HAS MOVED

Verify if the machine has moved more than the configured minimum distance ("Position Report Minimum Location Change") since the last known Position Report.

Expected Result:

The machine has not moved.

Results:

- **OK -** The machine has moved less than the configured minimum distance ("Position Report Minimum Location Change") since the last known position report. Therefore, the machine has not sent any position reports.**STOP**
- **NOT OK -** The machine has moved more than the "Position Report Minimum Location Change" or machine movement is unknown. Proceed to Test Step 3.

Test Step 3. VERIFY THAT THE PRODUCT LINK MODULE IS IN POWER MODE 1.

A. Select "Status Parameters" for Cat ET.

B. Verify that the "Power Mode Status" is "Power Mode 1". Verify that the "Key Switch Status" is "On".

Expected Result:

The machine is in "Power Mode 1" and "Key Switch On".

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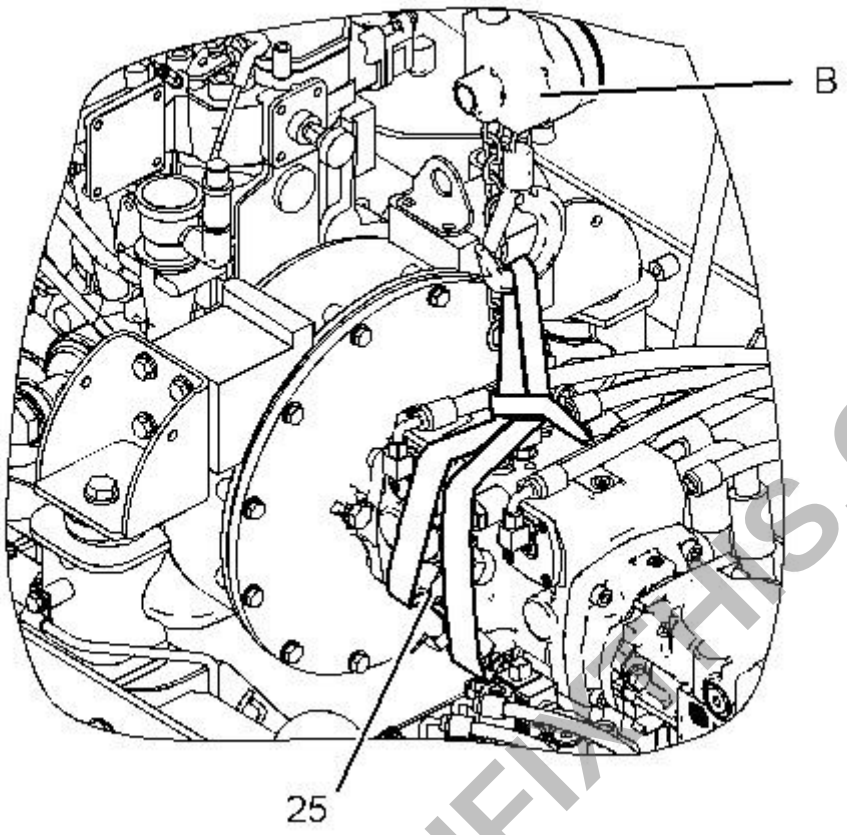


Illustration 11 g01040555

11. Attach a suitable lifting device to pump (25) and Tooling (B) to support the pump when the engine is removed.

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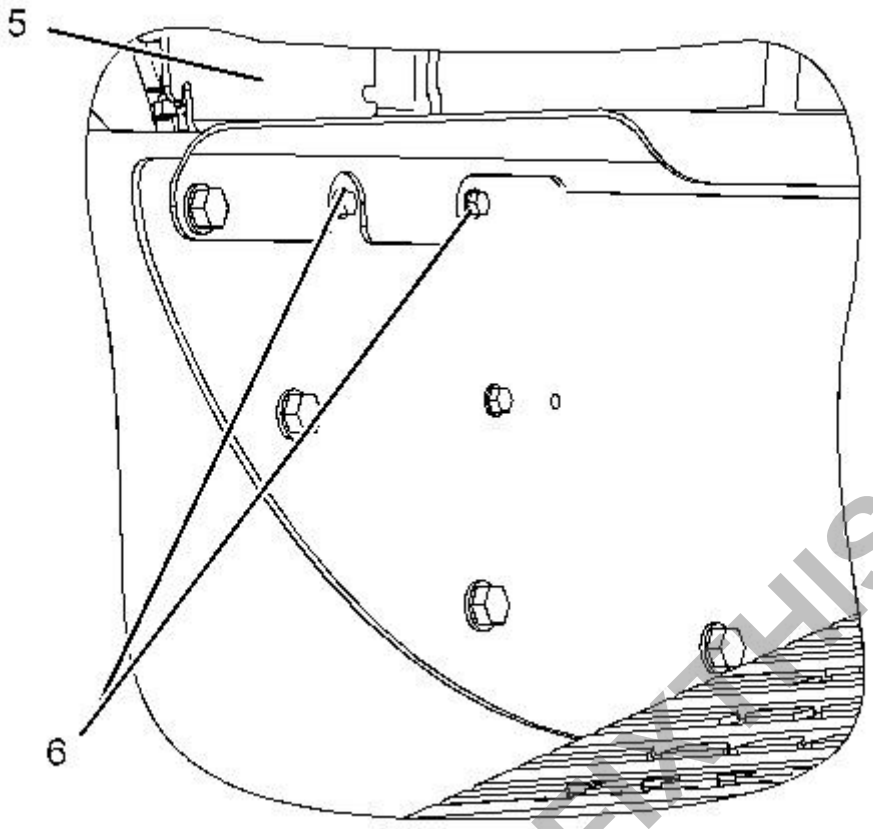


Illustration 18 g01067909

9. Move console (5) into position. Install bolts (6) .

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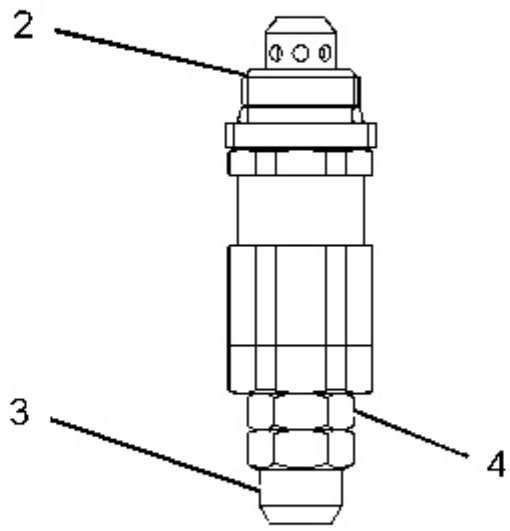


Illustration 4 g01355287

(2) Main relief valve for the work tool (Type 1)

(3) Cap

(4) Locknut

13. Remove end cap (3) from main relief valve (2) .
14. Loosen locknut (4). The adjustment screw is under the end cap (3). Turn the adjustment screw clockwise in order to increase the relief valve setting. Turn the adjustment screw counterclockwise in order to decrease the relief valve setting.
15. Tighten locknut (4) and install cap (3) .
16. Lower the cab and repeat steps 5 through 10.

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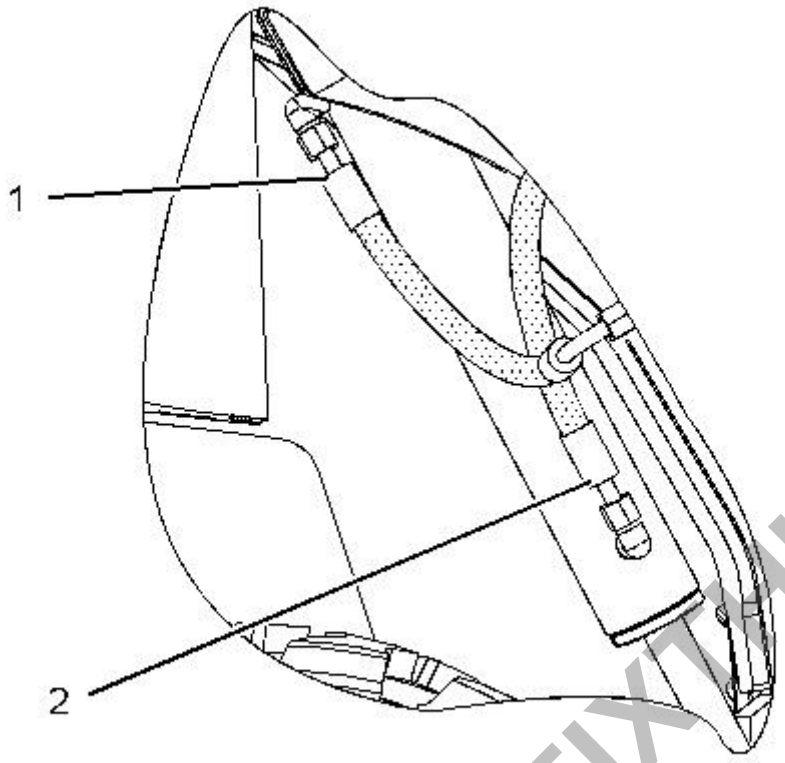


Illustration 2 g01062279

2. Connect hose assembly (2). Connect hose assembly (1) .
3. Repeat the previous two steps for the other side.

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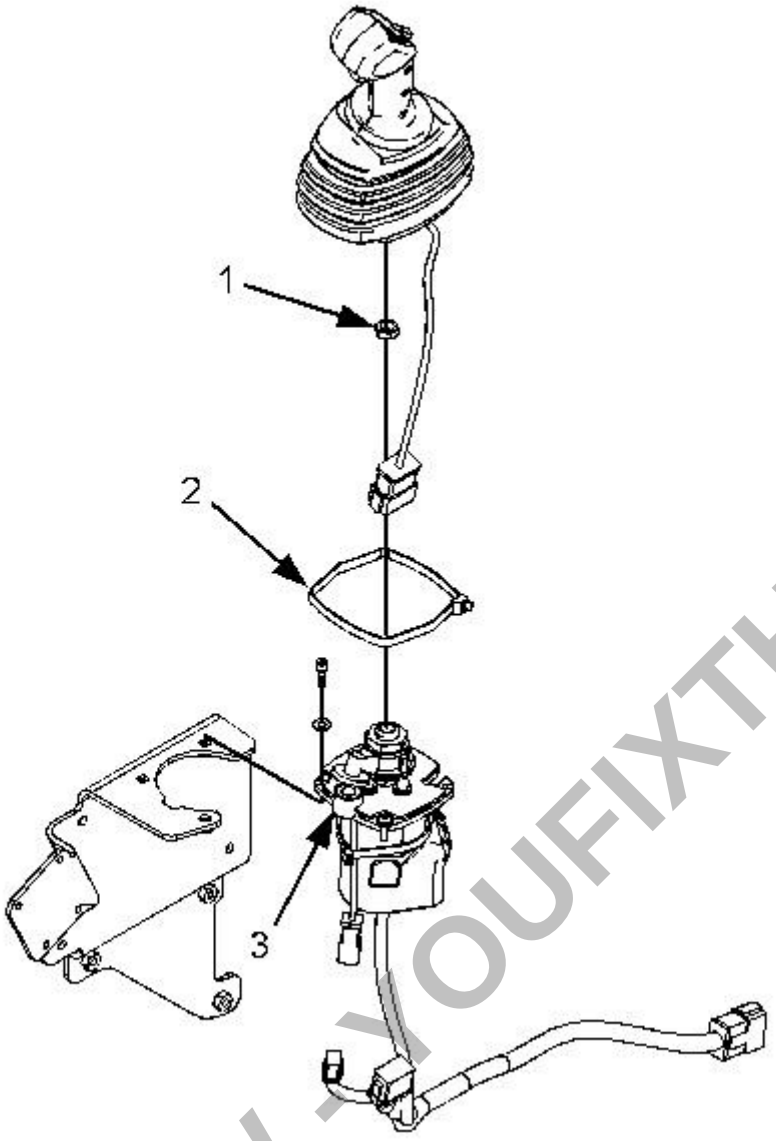


Illustration 1 g01017843

(1) Before installation, apply **155-0695** Thread Lock Compound to the threads. Torque for the nut 40 ± 5 N·m (30.0 ± 4.0 lb ft)

(2) As shown, orient the strap. Securely tighten the strap around the bottom of the boot.

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The switches tell the ECM that the operator wants to energize the auxiliary hydraulic solenoid (A1) or the auxiliary hydraulic solenoid (A2).

The switches are momentary, normally open switches. When the switch (A1) is actuated a ground is placed on pin 62 of the ECM. When the switch (A2) is actuated a ground is placed on pin 53 of the ECM.

The ECM monitors the status of the switches. When both switches are grounded at the same time the ECM will indicate a diagnostic code.

Switch (Continuous Flow)

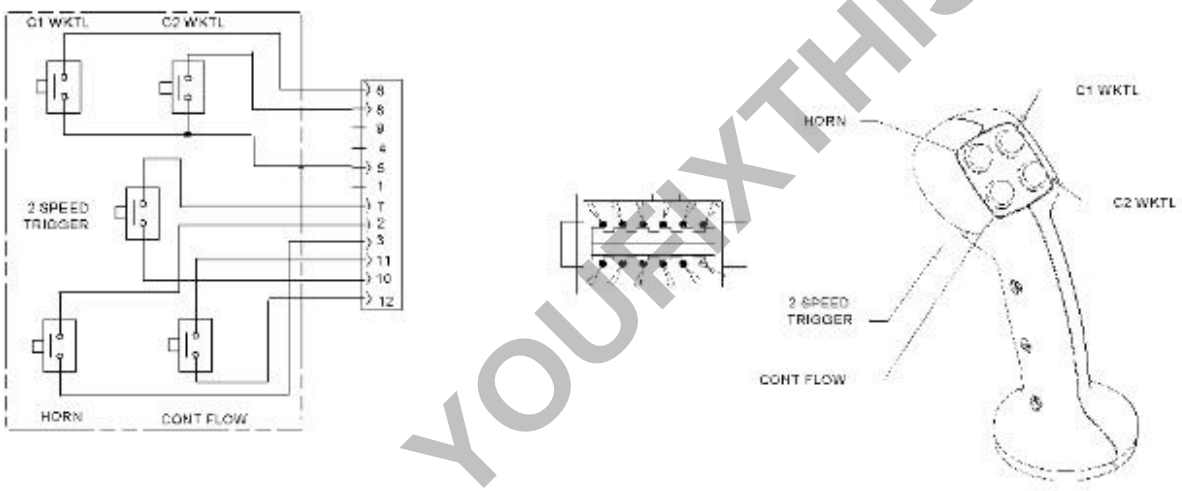


Illustration 11 g01035819

Schematic of the continuous flow switch

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WARNING

Personal injury can result from hot coolant. Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

The air conditioning systems on Caterpillar machines use pressure switches in order to protect the air conditioning system. Some air conditioning systems on Caterpillar machines use pressure switches and the on delay timer assembly for the refrigerant compressor in order to protect the air conditioning system. Arc suppressors protect other electrical components in the air conditioning system. Arc suppressors are applied in order to discharge electrical inductance when the compressor disengages. Failure of the arc suppressor can affect the reliability of the pressure switch. Failure of the arc suppressor may cause failure of the pressure switch.

The following procedures are for the testing of the on delay timer assembly, pressure switches, and components of the arc suppressor.

Table 1

Required Tools	
Part Number	**Part Description**
146-4080	Digital Multimeter (RS-232)

On Delay Timer Assembly for the Refrigerant Compressor Tests

In order to diagnose a faulty on delay timer assembly for the refrigerant compressor, the engine start switch must be in the ON position and the air conditioning switch activated.

Note: The on delay timer assembly will delay the power supply to the compressor clutch coil for 30 seconds after the air conditioning switch is activated.

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Media Number -SENR5664-22 Publication Date -01/08/2012 Date Updated -13/08/2012

i03862392

Visual Inspection (Troubleshooting)

SMCS - 7320-035

WARNING

Personal injury can result from contact with refrigerant.

This system is under pressure at all times, even if the engine is not running. Heat should never be applied to a charged system.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use caution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, evacuate the system recovering the refrigerant before removing the fitting.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Before any checks of the air conditioning and heating system are made, move the machine to a smooth horizontal surface. Lower all implements to the ground. Make sure the transmission is in neutral or park and that the parking brake is engaged. Keep all other personnel away from the machine or where they can be seen.

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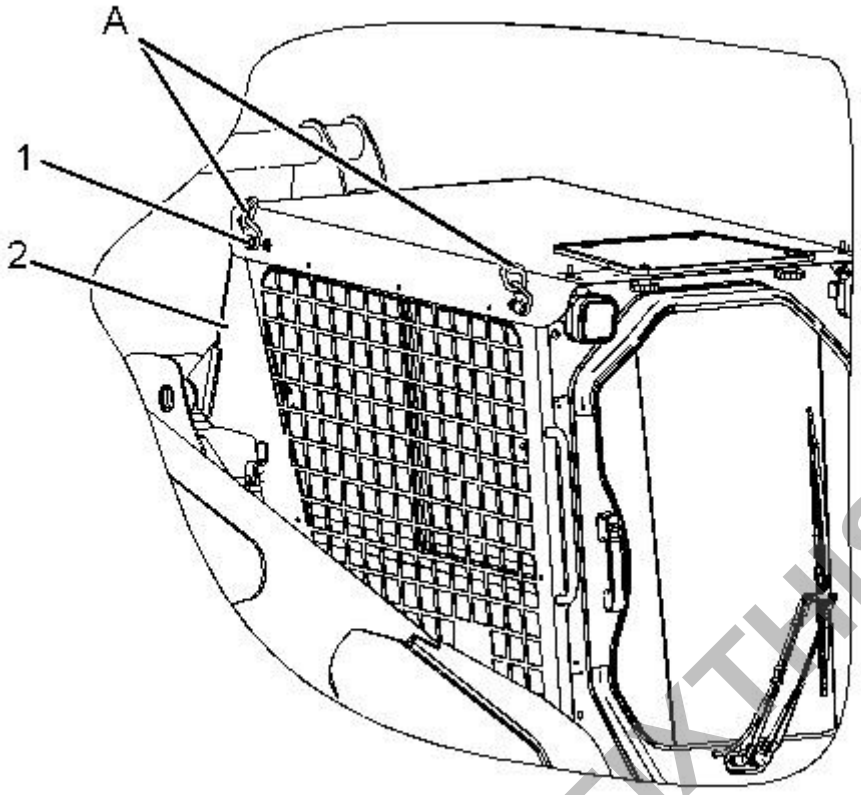


Illustration 1 g01056642

1. Remove bolts (1). Install Tooling (A) onto cab (2). Repeat this step for both sides of the machine.
2. Raise the cab. Refer to Disassembly and Assembly, "Cab - Tilt".

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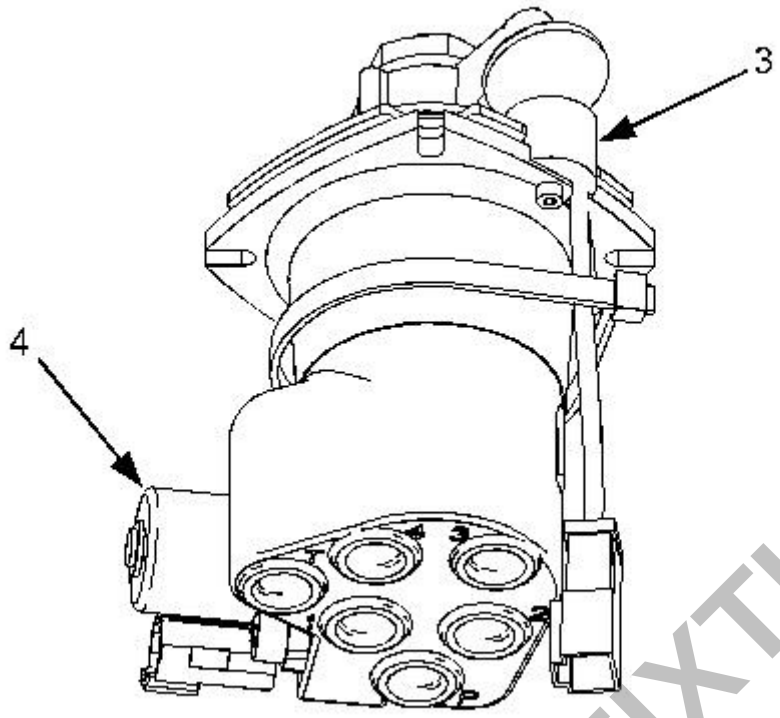


Illustration 2 g01018094

(3) **172-0970** Coil

Minimum temperature for operation ... -20 °C (-4.0 °F)
Maximum temperature for operation at the maximum voltage ... 121 °C (250.0 °F)
Nominal voltage for operation ... 12 VDC
Maximum voltage for operation ... 14.5 VDC
Minimum voltage for operation ... 9.8 VDC
Nominal current for operation with the winding at 20 °C (68.0 °F) ... 1.2 Amperes
Maximum current for operation with the winding at -20 °C (-4.0 °F) ... 1.8 Amperes

(4) **195-9700** Solenoid Valve Gp

Nominal voltage for operation ... 12 VDC
Maximum voltage for actuation with a temperature of 121 °C (250.0 °F) ... 14.5 VDC
Minimum voltage for actuation with the coil at 25 °C (77.0 °F) ... 9 VDC
Maximum wattage for continuous duty with the coil at a temperature of 121 °C (250.0 °F) ... 13.3 Watts
Resistance for the coil at a temperature of 25° ± 5°C (77.0° ± 9.0°F) ... 10 ± 0.5 Ohms

Note: The electric control module must be configured to accept the pulse width modulation from the handle.

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Disassembly and Assembly
267B, 277B and 287B
Multi Terrain Loaders Power Train
Media Number -RENR4884-09 Publication Date -01/04/2010 Date Updated -15/04/2010

i02044857

Hydraulic System Pressure - Release

SMCS - 4350-553-PX; 5050-553-PX

Release Procedure

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the work tools have been lowered to the ground, and the oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

1. Lower the armrest.
2. Turn the engine start switch to the ON position. Disengage the parking brake.
3. Press each side of the auxiliary hydraulic control switch (A1 and A2) for one to two seconds in order to release the auxiliary system pressure. Keep the joystick control in the NEUTRAL position while you press the auxiliary hydraulic control switch (A1 and A2).
4. Engage the parking brake.
5. Start the engine and run the engine for at least 15 seconds in order to recharge the accumulator.
6. Turn the engine start switch to the OFF position.

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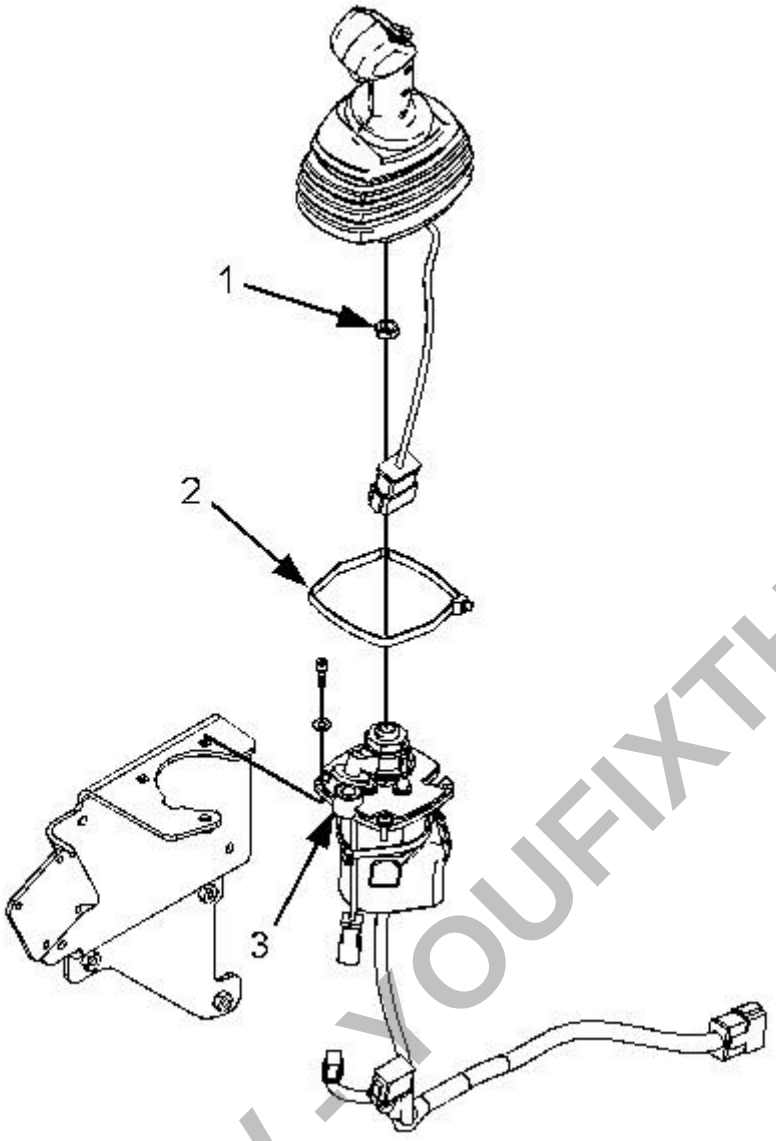


Illustration 1 g01017843

(1) Before installation, apply **155-0695** Thread Lock Compound to the threads. Torque for the nut 40 ± 5 N·m (30.0 ± 4.0 lb ft)

(2) As shown, orient the strap. Securely tighten the strap around the bottom of the boot.

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Illustration 1 g01061352

1. Attach a suitable lifting device to undercarriage (2) .
2. Remove bolts (1) .
3. Use the suitable lifting device to remove undercarriage (2). The weight of undercarriage (2) is approximately 523 kg (1154 lb).
4. Use a suitable lifting device to remove drive frame (3). The weight of drive frame (3) is approximately 408 kg (900 lb).

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