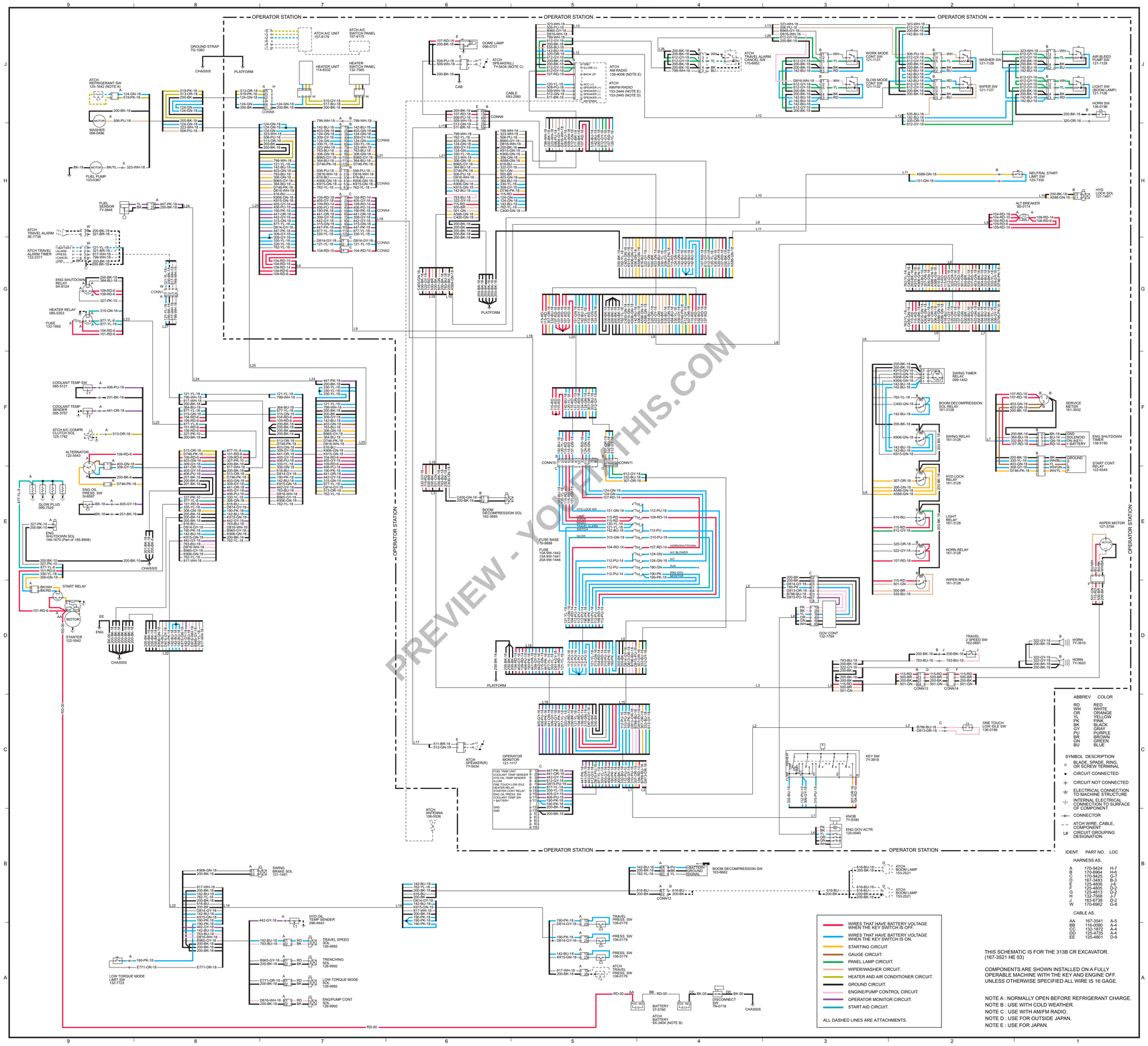
RENR4004-01
16 Page, Color 2



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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Disassembly and Assembly
313B ExcavatorEngine Supplement
Media Number -RENR4014-02 **Publication Date -01/01/2004** **Date Updated -14/01/2004**

i01392783

Valve Mechanism Cover - Remove and Install

SMCS - 1107-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Open the engine hood of the machine. Lock the engine hood in the OPEN position.



Illustration 1 g00734427

2. Remove bolts (1), the washers, and the clamps from the governor control cable.

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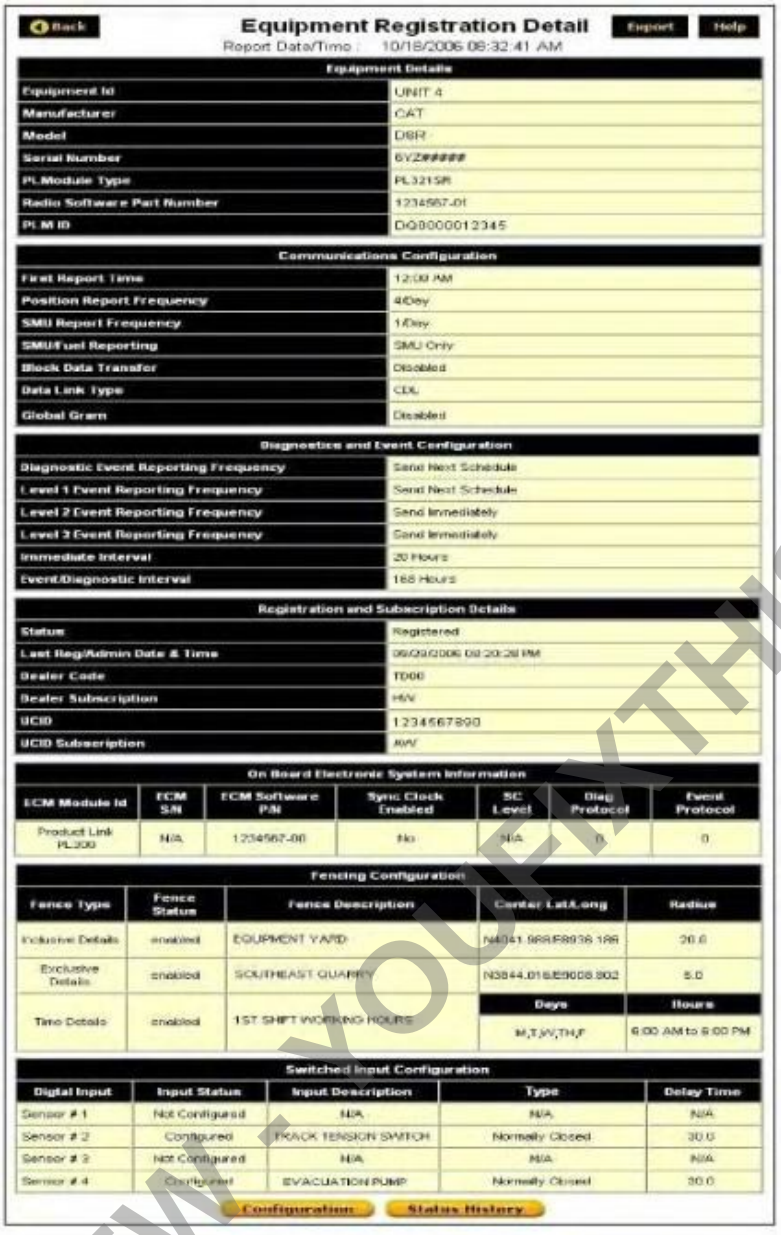


Illustration 3 g01390775

"Equipment Registration Details" screen

Table 3 describes the fields that are found on the "Equipment Registration Detail" screen. Click the "Back" button in order to return to the "General Registry" screen.

Table 3

"Equipment Registration Detail" Screen		
Field	**Description**	**Sample Value**
Equipment Details		
"Equipment Id"	The ID of the equipment upon which the PLM is installed	UNIT 4
"Manufacturer"	The Manufacturer of the equipment	CAT

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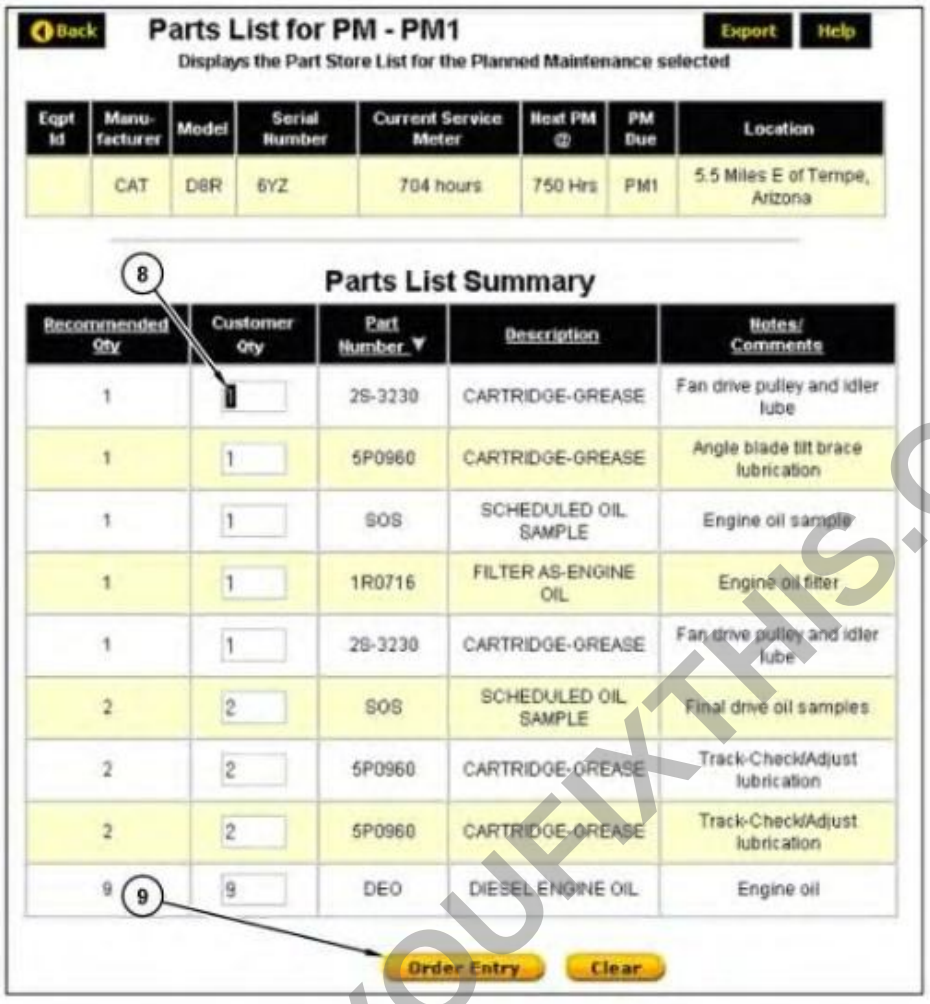


Illustration 7 g01716418

Parts List for PM

(8) "Customer Qty" text fields

(9) "Order Entry" button

In order to view the "Parts List Summary", select the "View Part List" button (7) from the "PM Checklist" screen. Refer to Illustration 5. The "Parts List for PM" screen will be displayed. Refer to Illustration 7.

In order to order the parts through the PartStore system, click the "Order Entry" button (9) . The quantities for the parts in the "Customer Qty" text fields (8) can be edited before placing an order.

"View Planner"

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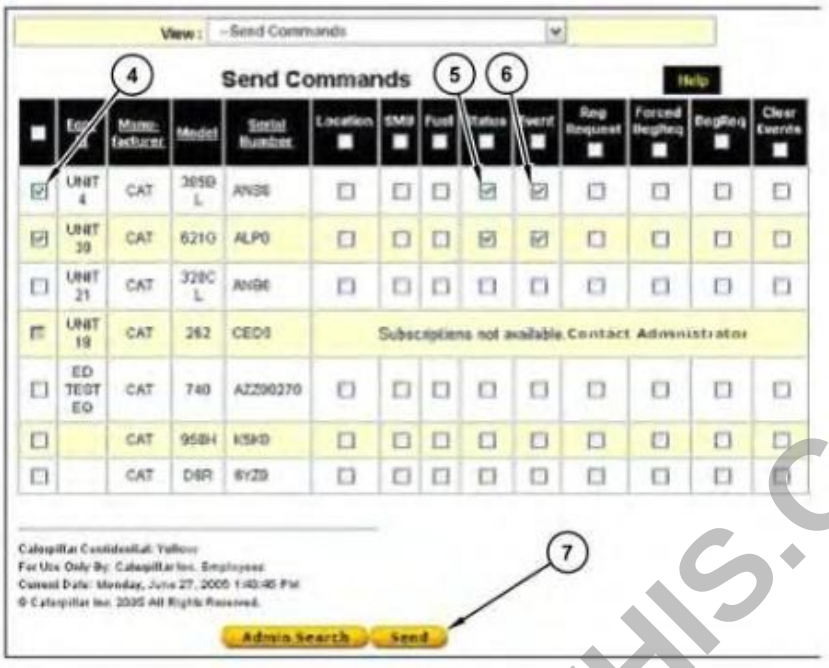


Illustration 12 g01721398

"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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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Systems Operation
EquipmentManager User Guide
Media Number -KENR6303-08 **Publication Date -01/05/2010** **Date Updated -18/05/2010**

i03370084

Fuel Results

SMCS - 7600; 7606

The EquipmentManager software is able to collect data regarding the fuel consumption of your equipment. This data includes the following: fuel level, fuel usage and the history for refueling.

Note: The results that are displayed using "Fuel Results" are not results that are measured. The information that is viewed on the "Fuel Results" screen is calculated information. The calculations are based on the performance maps of the machine. The performance maps define specific performance characteristics of the machine. These characteristics determine the calculated fuel usage at different loading conditions. The result is the cumulative fuel consumption.

In order to view the fuel information for a specific machine, use the following procedure:

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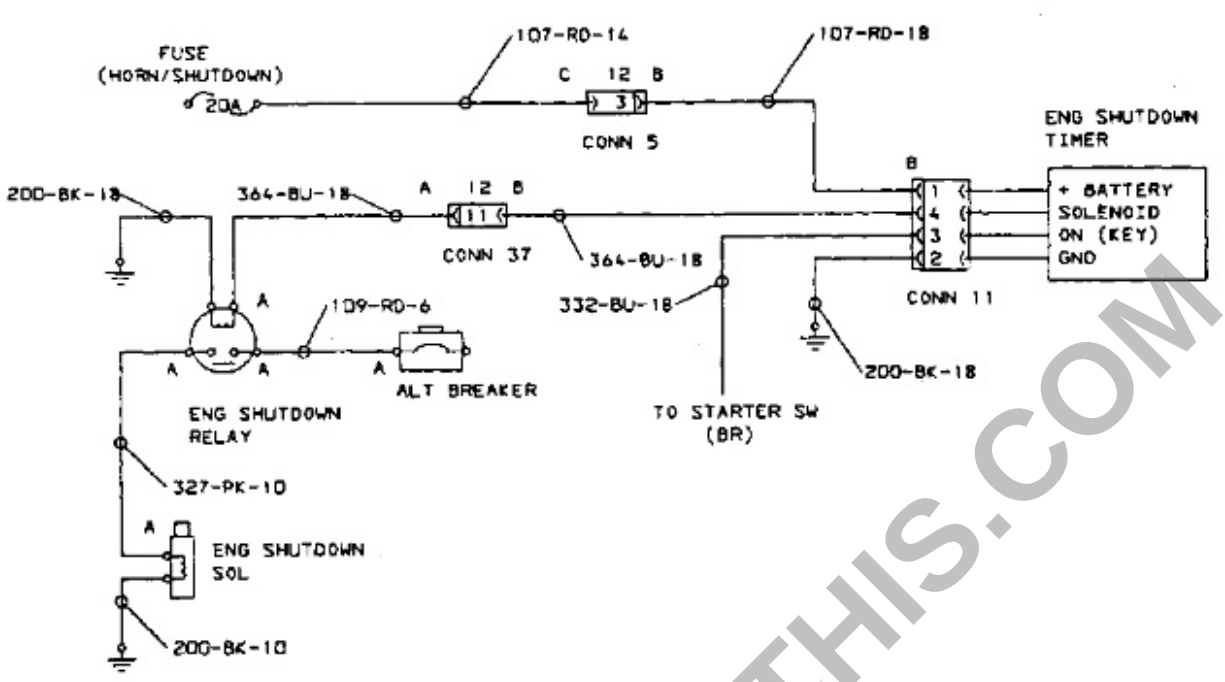


Illustration 2 g00664941

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Stop.

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Troubleshooting
Product Link 121S/300
Media Number -RENR7911-10 **Publication Date -01/06/2013** **Date Updated -27/06/2013**

i04906980

Reports and Messages Not Available

SMCS - 7606-038-RPT

System Operation Description:

There are problems that could be reported with the Product Link System but the problems are not caused by the Product Link System. Check for active diagnostic codes for the Product Link. Correct any diagnostic codes before proceeding. The following items should be visually inspected for damage: module, antenna, radio and cables. Verify that there are no loose connections.

The Product Link system depends on several communication links in order to transfer data from the machine to the office. The following procedures assume that these communication links are operating properly. The proper communication links are listed below:

- The satellite network for VHF communications is operational in the geographic area of concern. The network is operational when messages can travel to the satellite and the messages can travel to the earth and Caterpillar.
- The Product Link system is correctly configured to communicate on the network for VHF communications. This was verified during manufacturing tests.
- The worldwide network of Caterpillar's computers is passing messages to the software for the Caterpillar Equipmentmanager (EM). The system must be registered properly.
- The EM is configured properly and the software is functioning.

The Product Link module or the radio should not be replaced without verifying that these issues have been investigated. Contact your Caterpillar Technical Communicator for aid in resolving these issues. Subscriptions to the Product Link module must be up to the current date.

If messages are not available, 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 Cat ET to the machine.

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

Expected Result:

The ECM (Product Link) is available.

Results:

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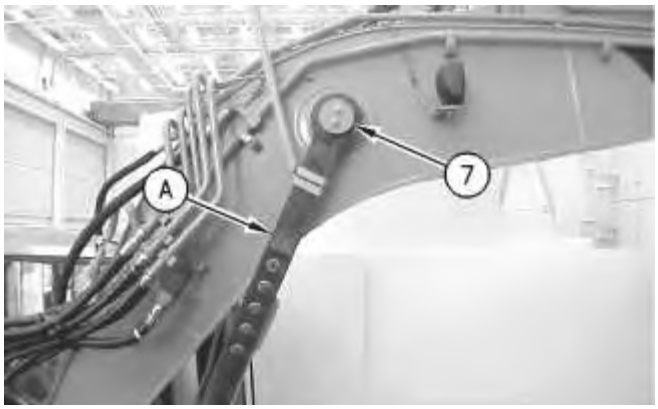


Illustration 5 g00735801

14. Install Tooling (A) on the boom cylinder support pin. Install retaining plate (7). Install the washers and the bolts in retaining plate (7) .

15. Remove the hoist from Tooling (A) .

16. Start the machine. Carefully raise the boom so that there is slight tension on Tooling (A). This will ensure that the boom cylinder will not move while you are lifting the upper frame.

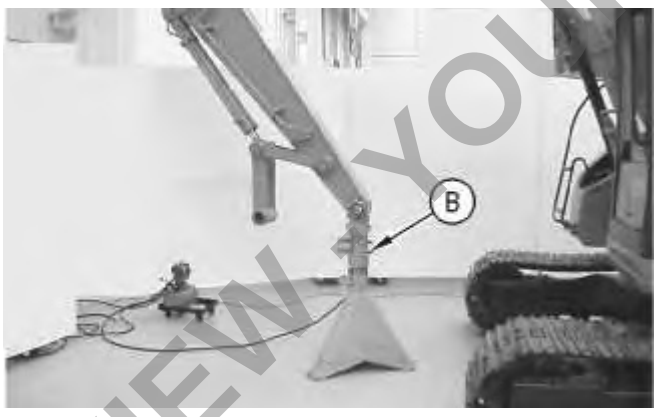


Illustration 6 g00735816

17. Install Tooling (B) under the stick, as shown.

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

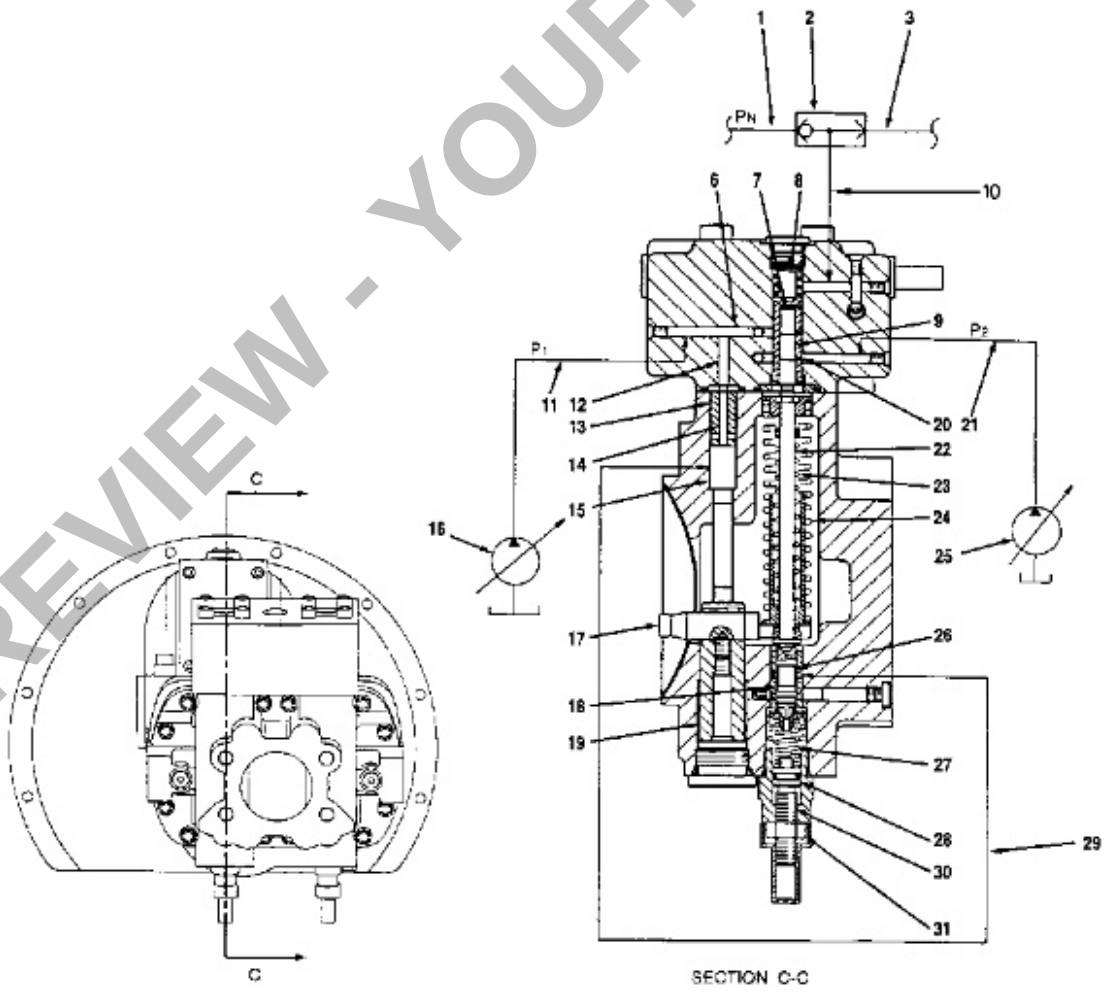
Systems Operation
313B Excavator Hydraulic System
Media Number -RENR4009-00 **Publication Date -01/02/2000** **Date Updated -09/10/2001**

i01233187

Pump Control (Main Hydraulic)

SMCS - 3222; 5070; 5086

Main Pump Regulator



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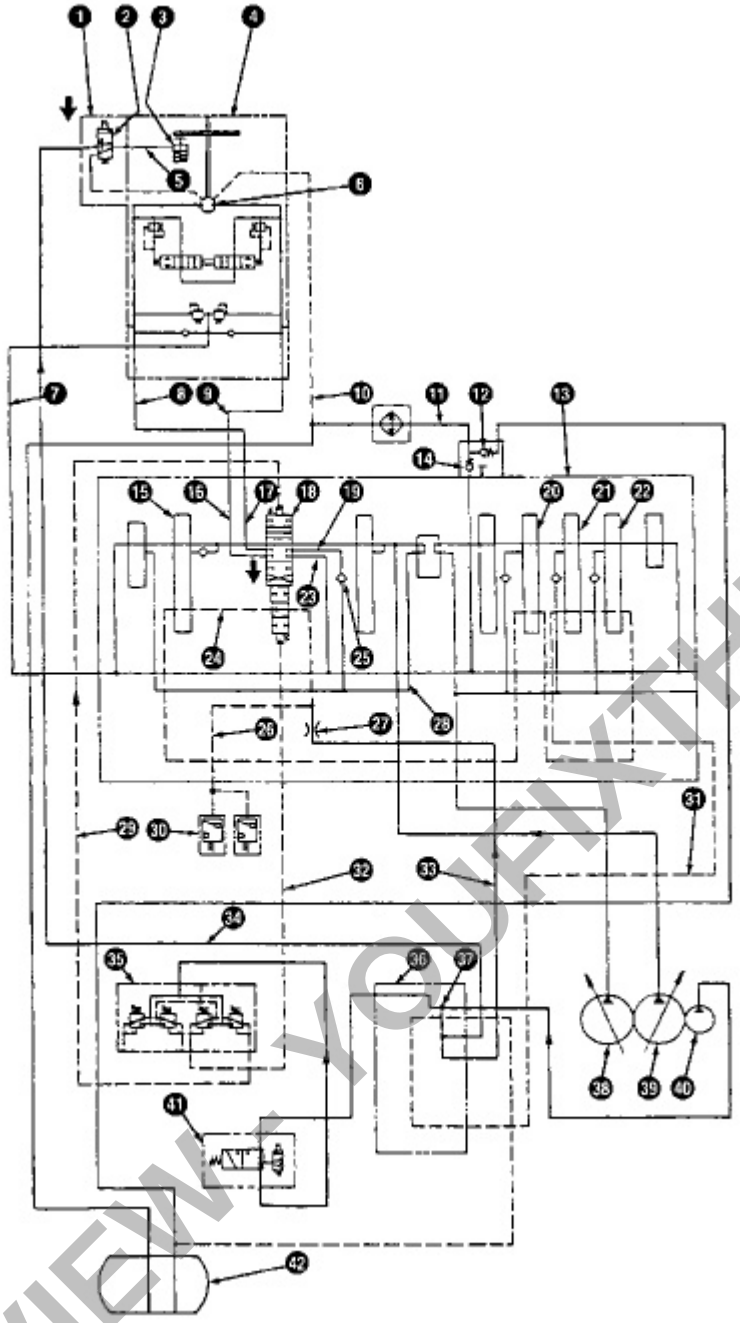


Illustration 1 g00674248

Hydraulic schematic for swing right

(1) Swing parking brake solenoid valve

(2) Spool

(3) Swing parking brake

(4) Swing motor

(5) Passage

(6) Rotary group (swing motor)

(7) Return circuit

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(22) Adjustment screw

(23) Crossover relief valve (reverse left travel)

(24) Locknut

(25) Crossover relief valve (forward left travel)

9. Slowly move the left travel control lever to full FORWARD position and check the pressure gauge reading at pressure tap (2). The pressure setting of crossover relief valve (25) should be 35800 ± 1470 kPa (5200 ± 215 psi).

10. Return the left travel control lever to the NEUTRAL position.

11. In order to adjust crossover relief valve (25), loosen locknut (24) and turn adjustment screw (22) until the pressure gauge reading at pressure tap (2) is 35800 ± 1470 kPa (5200 ± 215 psi).

12. Tighten locknut (24) to a torque of 44 ± 5 N·m (32 ± 4 lb ft).

    Note: Always make final pressure adjustments on pressure rise.

13. Slowly move the left travel control lever to full REVERSE position and check the pressure gauge reading at pressure tap (2). The pressure setting of crossover relief valve (25) should be 35800 ± 1470 kPa (5200 ± 215 psi).

14. Return the left travel control lever to the NEUTRAL position.

15. In order to adjust crossover relief valve (23), loosen locknut (24) and turn adjustment screw (22) until the pressure gauge reading at pressure tap (2) is 35800 ± 1470 kPa (5200 ± 215 psi).

16. Tighten locknut (24) to a torque of 44 ± 5 N·m (32 ± 4 lb ft).

    Note: Always make final pressure adjustments on pressure rise.

17. Return the main relief valve pressure to the specified setting after crossover relief valve pressure setting is attained.

18. In order to adjust the crossover relief valves on the right travel motor, place stopper (21) in the sprocket for the right travel motor. Use the pressure gauge at pressure tap (1) in order to monitor the crossover relief valve pressure settings for the right travel motor. Adjust the crossover relief valves on the right travel motor in the same manner as the adjustment for the left travel motor.

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Illustration 15 g00728531

16. Remove bolts (25) and the washers. Remove drain tube (26) .

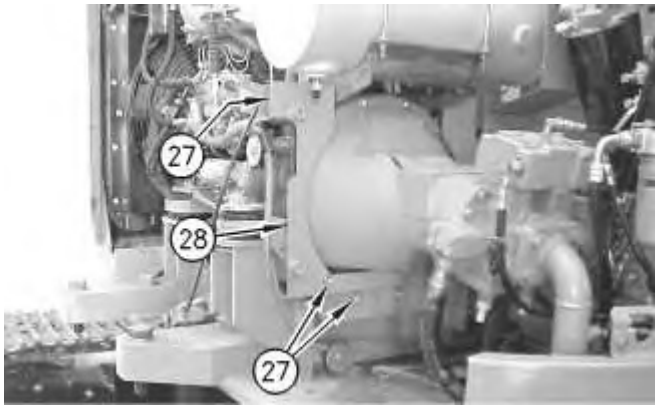


Illustration 16 g00728560

17. Remove bolts (27) and the washers. Remove cover (28) .

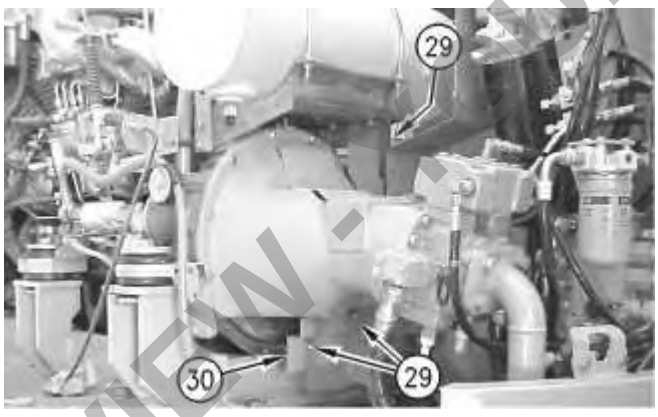


Illustration 17 g00728567

18. Remove bolts (29) and the washers. Remove cover (30) .

Note: Cap all hydraulic lines and cap all hydraulic fittings that are disconnected in order to prevent oil loss. This will also keep contaminants out of the hydraulic system.

Note: Mark all hydraulic lines that are disconnected for installation purposes.

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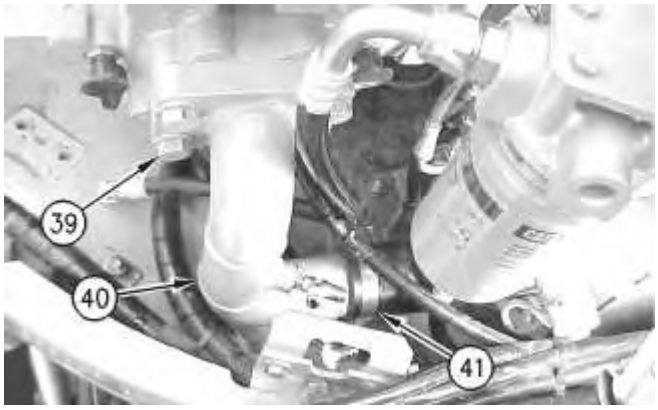


Illustration 9 g00728614

6. Install bolts (39) in suction tube (40) .
7. Tighten hose clamp (41) on the suction line.

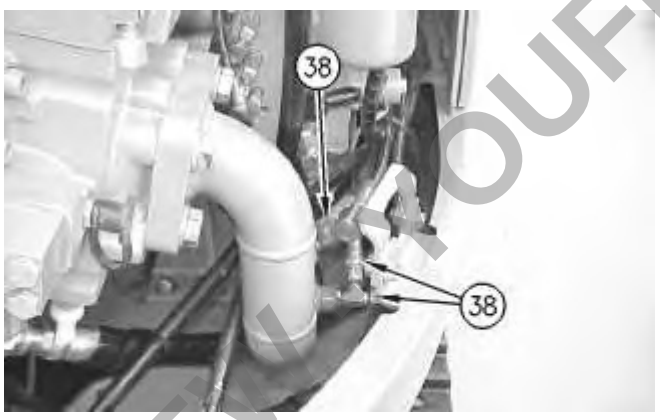


Illustration 10 g00728603

Note: The number of hydraulic lines that are connected to the suction line will vary.

8. Connect hoses (38) to the suction line.

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Illustration 9 g00653585

12. Use the following procedure in order to make a preload adjustment of bearing (82), as follows:

    a. Tighten nut (81) until there is no gap between the main housing and bearing (82) .

    b. Rotate ring gear (59) several times.

    c. Turn nut (81) until the rotational torque of ring gear (59) is 21 ± 5 N·m (15 ± 4 lb ft).

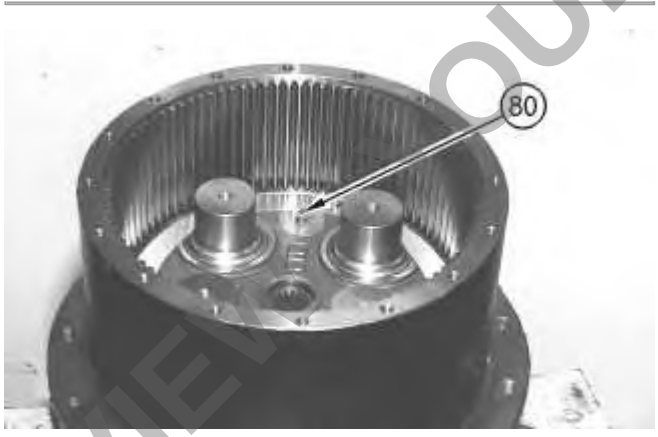


Illustration 10 g00653581

13. Install pin (80) .

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Disassembly and Assembly
313B ExcavatorEngine Supplement
Media Number -RENR4014-02 **Publication Date -01/01/2004** **Date Updated -14/01/2004**

i01380173

Engine and Main Hydraulic Pump - Remove

SMCS - 1024-011

Removal Procedure

Start By:

A. Remove the counterweight.

Reference: Refer to Disassembly and Assembly, "Counterweight - Remove and Install".

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
(A)	6V-3145	Load Leveling Beam	1
(B)	8S-9906	Ratchet Puller	1

WARNING

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, turn the battery disconnect switch to the OFF position and remove the key. If the machine is not equipped with a battery disconnect switch, disconnect the battery cables from the battery and tape the battery clamps.

Place a do not operate tag at the battery disconnect switch location to inform personnel that the machine is being worked on.

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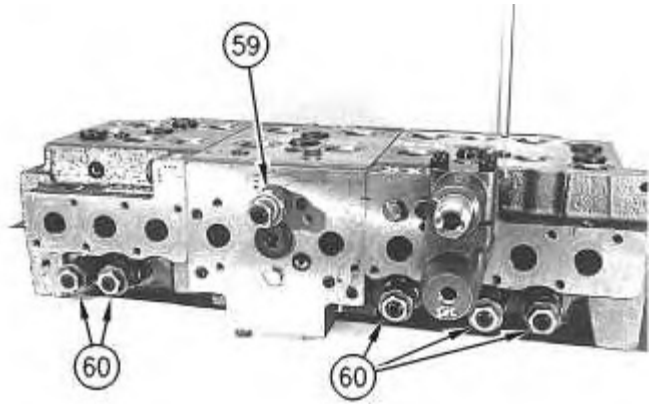


Illustration 16 g00660487

25. Remove valve (59). Remove valves (60) .

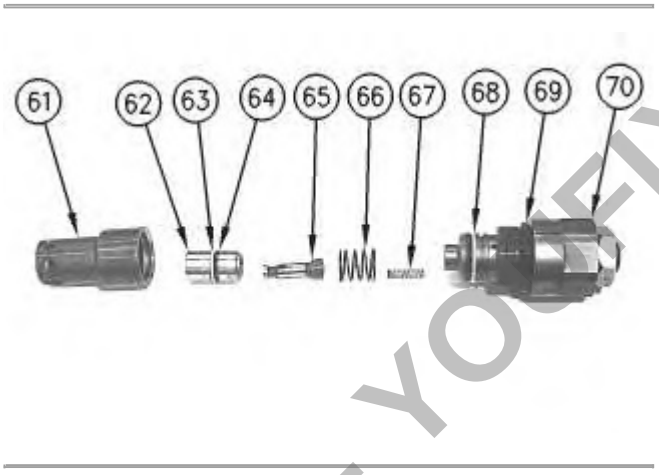


Illustration 17 g00660493

26. Remove valve (61), sleeve (62), O-ring seal (63), backup ring (64), valve (65), spring (66), and spring (67). Remove O-ring seal (68) and O-ring seal (69) from cap (70). Use the same procedure to disassemble valves (59) and (60) .

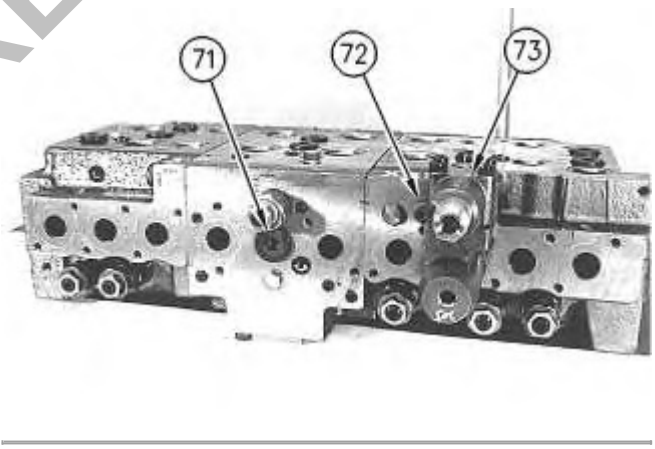


Illustration 18 g00660498

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Disassembly and Assembly
313B Excavator Machine Systems
Media Number -RENR4003-02 **Publication Date -01/01/2004** **Date Updated -23/01/2004**

i01401921

Boom - Install

SMCS - 6501-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
(A)	8S-7640	Stand	2
	8S-7631	Tube	2
	8S-7615	Pin	2
	8S-8048	Saddle	2
(B)	9U-5342	Pin Driver Cap	1

Note: Make sure that the pin bores in the boom and in the upper frame are clean and free of dirt prior to the installation of the boom.

1. Apply a thin coat of **5P-0960** Molybdenum Grease on the bearings and on the seals in the boom.

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Systems Operation
All Products Air Conditioning and Heating R134a for All Caterpillar Machines
Media Number -SENR5664-22 **Publication Date -01/08/2012** **Date Updated -13/08/2012**

i02980711

Identifying the Heating System

SMCS - 7304; 7309

Identifying the Heating System

The heating system can be identified as either a water valve control system or a blend door control system. The control system for the water valve regulates the amount of hot engine coolant that is circulated through the heater coil. The control system for the blend door regulates the amount of air that is routed through the heater coil. Both the water valve and the blend door can be regulated through either a mechanical cable or through an electronic actuator.

Heating System with Water Valve Control

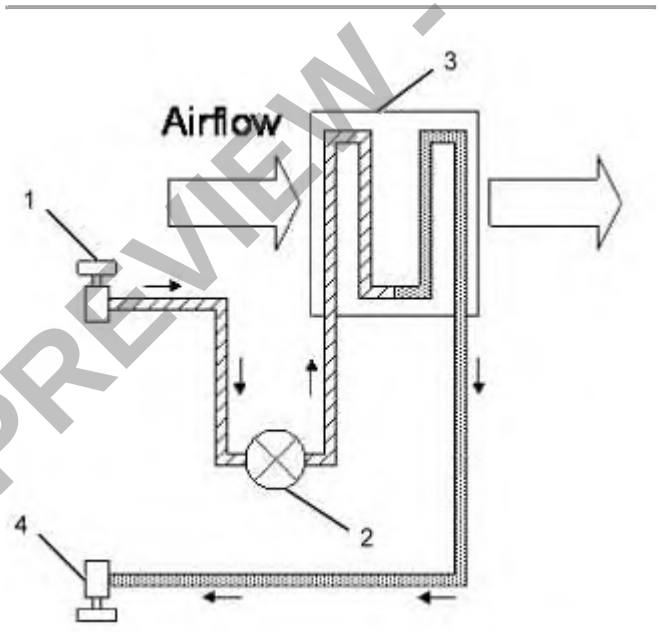


Illustration 1 g01510721

(1) Outlet valve for the engine cooling system

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Table 1

Required Tools		
Part Number	**Part Description**	**Quantity**
4C-4874	Heater Blanket As	1

Relationship Between Temperature and Pressure (R-134a Refrigerant)

Table 2 can be used in order to determine the pressure level and contamination level of a container of refrigerant. Table 2 can also be used for an air conditioning system that is not operating. This same system must be stabilized to the ambient temperature. In order to stabilize an air conditioning system at the ambient temperature, the machine must not operate for 10 to 12 hours. The machine must not be stored in direct sunlight.

If the pressure that is measured at any specific temperature does not match the pressure that is given in the chart, the following problems may exist:

- Contaminants in the system
- Incorrect refrigerant

Table 2

Relationship Between Temperature and Pressure (R-134a Refrigerant)	
Temperature °C (°F)	**Pressure kPa (psi) [1]**
-18 °C (0.0 °F)	44 kPa (6.4 psi)
-17° C (2.0 °F)	51 kPa (7.4 psi)
-16 °C (4.0 °F)	59 kPa (8.5 psi)
-14 °C (6.0 °F)	66 kPa (9.6 psi)
-13 °C (8.0 °F)	74 kPa (10.7 psi)
-12 °C (10.0 °F)	82 kPa (11.9 psi)
-11 °C (12.0 °F)	90 kPa (13.1 psi)
-10 °C (14.0 °F)	99 kPa (14.3 psi)

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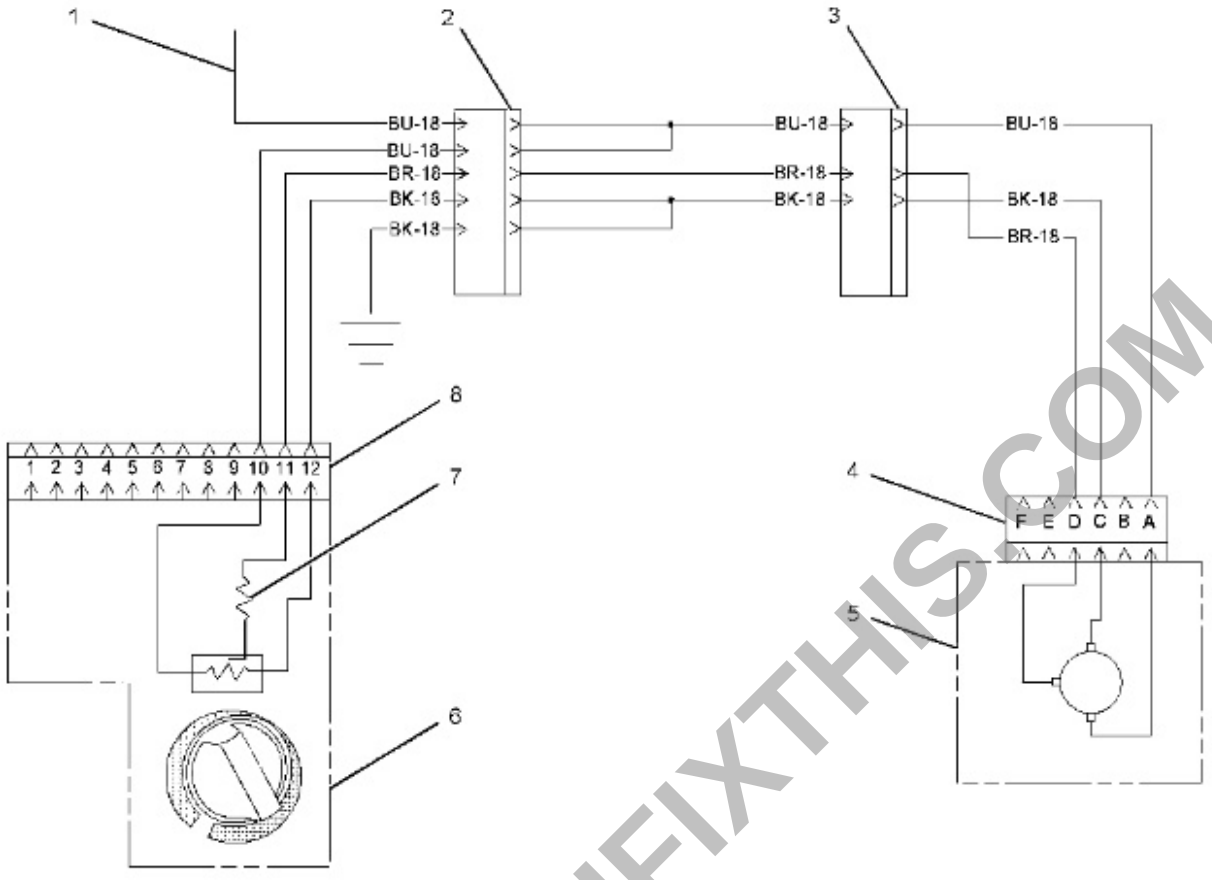


Illustration 3 g01366758

Typical view of the Electronic water valve control system with a HVAC panel and a 12 volt regulated power supply

(1) 12 VDC from DC to DC converter

(2) Deutsch connector (pin number will vary depending on the application)

(3) Deutschconnector (pin number will vary depending on the application)

(4) Packard six pin connector

(5) Electronic rotational actuator

(6) HVAC panel assembly

(7) In-line series resister

(8) 12 pin Deutsch connector

1. Turn off the power supply.
2. Disconnect Packard connector (4) .
3. Connect the leads of the multimeter to pin (A) and pin (C) of Packard connector (4). Select the DC voltage setting of the multimeter.
4. Turn on the power supply. The multimeter should read approximately 12 VDC.
5. Connect the leads of the multimeter to pin (C) and pin (D) of Packard connector (4). In a counterclockwise direction, fully rotate the dial of HVAC panel assembly (6). In a clockwise

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Product: EXCAVATOR
Model: 313B EXCAVATOR BAS
Configuration: 313B CR EXCAVATOR BAS00001-UP (MACHINE)

Disassembly and Assembly

All Products Air Conditioning and Heating R134a for All Caterpillar Machines

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

i02998486

Refrigerant Expansion Valve - Remove and Install

SMCS - 7320-010-EV

To replace the expansion valve, use the procedure that follows. Refer to Service Manual, SENR5664, "Troubleshooting Heating and Air Conditioning Control System" before service work is performed on the air conditioning system.

1. Recover the refrigerant.

   Note: Cap all disconnected lines and hoses.

2. Remove the insulation and the clip. The insulation and the clip hold the sensing bulb to the evaporator outlet pipe.

3. Disconnect the sensing line for pressure from the evaporator outlet pipe.

4. Loosen and remove the two connections at the expansion valve. Remove the expansion valve.

   Note: Check the O-ring seals. The seals must be in good condition and the seals must be properly lubricated with the correct refrigerant oil before assembly.

5. Install the expansion valve for replacement and tighten the two connections.

6. Tighten the pressure sensing connection on the evaporator outlet pipe.

7. Use a **8P-6355** Clip to hold the sensing bulb onto the evaporator outlet pipe. The sensing bulb should be as close to the coil as possible. The bulb should be upstream of the pressure sensing connection on the evaporator outlet pipe. The **5P-7070** Insulation should be wrapped tightly around the clip, the sensing bulb and the outlet pipe. There should be no insulation between the bulb and the outlet pipe.

8. Tighten all the connections correctly.

9. Evacuate the system. Refer to the Service Manual, SENR5664, "Refrigerant System - Evacuate" section in testing and adjusting.

10. Charge the system with the correct amount of refrigerant by weight. Refer to the Service Manual, SENR5664, "Refrigerant System - Charge" section in testing and adjusting.

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Illustration 52 g00653472

11. Install plate (64) .
12. Apply **9S-3263** Thread Lock Compound on bolts (63). Install bolts (63). Tighten the bolts to a torque of 69 ± 5 N·m (51 ± 4 lb ft).
13. Install washer (62) .



Illustration 53 g00653465

Note: Make sure that the machined surface of the ring gear and the cover are clean and free of dirt and debris.

14. Apply **1U-8846** Sealant on the machined surface of the ring gear (59) .
15. Position cover (61) on the ring gear in the original position.
16. Install the washers and bolts (60). Tighten the bolts to a torque of 35 ± 2 N·m (26 ± 1 lb ft).

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		70 ± 11 N·m (52 ± 8 lb ft)
1	1 1/2	100 ± 15 N·m (74 ± 11 lb ft)
1 1/4	1 1/2	110 ± 17 N·m (81 ± 13 lb ft)
1 1/2	1 1/2	120 ± 18 N·m (89 ± 13 lb ft)
2	1 1/2	160 ± 24 N·m (118 ± 18 lb ft)

Note: Use 50 percent of the torque values from Table 1 when fitting, plug, or the port material is nonferrous.

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