

Systems Operation

3054 Engine for Caterpillar Built Machines

Media Number -SEN5816-12

Publication Date -01/08/2004

Date Updated -10/08/2004

103586566

Air Inlet and Exhaust System

SMCS - 1050

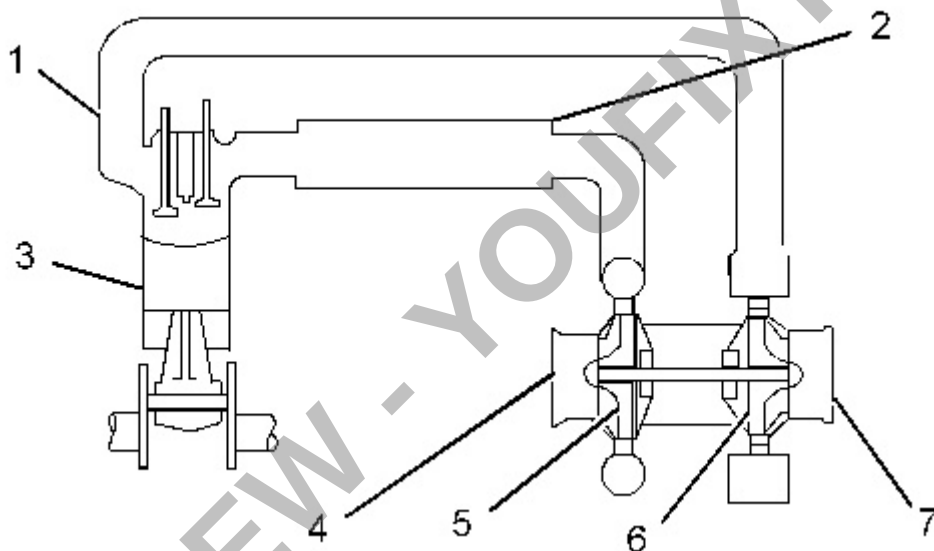


Illustration 1

g01914622

Air inlet and exhaust system (typical example)

- (1) Exhaust manifold
- (2) Inlet manifold
- (3) Engine cylinders
- (4) Air inlet
- (5) Turbocharger compressor wheel
- (6) Turbocharger turbine wheel
- (7) Exhaust outlet

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101547052

Basic Engine

SMCS - 1200

Cylinder Block and Cylinder Head

The cylinder block has four cylinders which are arranged in-line. The cylinder block provides support for the full length of the dry cylinder liners. The cylinder liners are a press fitted part. The cylinder liners are pressed into the cylinder block. The cylinder liners have a flame ring above the flange.

The cylinder block has five main bearings which support the crankshaft. Thrust washers on both sides of the center main bearing control the end play of the crankshaft.

A cylinder head gasket is used between the engine block and the cylinder head in order to seal combustion gases, water, and oil.

The engine has a cast iron cylinder head. An inlet valve and an exhaust valve for each cylinder are controlled by a pushrod valve system. The ports for the inlet and the exhaust valves are on the right side of the cylinder head.

Pistons, Rings, and Connecting Rods

The pistons have a Fastram combustion chamber in the top of the piston in order to provide an efficient mix of fuel and air. The piston pin is off-center in order to reduce the noise level.

The pistons have two compression rings and an oil control ring. The groove for the top ring has a hard metal insert in order to reduce wear of the groove. The skirt has a layer of graphite in order to reduce wear.

The correct piston height is important in order to ensure that the piston does not contact the cylinder head. The correct piston height also ensures the efficient combustion of fuel which is necessary in order to conform to requirements for emissions.

A piston and connecting rod are matched to each cylinder. The piston height is controlled by the length of the connecting rod. Seven different lengths of connecting rods are available in order to attain the correct piston height. The different lengths of connecting rods are made by machining the small end bearing off-center in order to form an eccentric bearing. The amount of the

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101361725

Cooling System

SMCS - 1350

The coolant flows from the bottom of the radiator to the gear-driven centrifugal water pump. The water pump is installed on the front cover. The fuel injection pump gear drives the gear of the water pump.

The water pump forces the coolant through a passage in the front cover to the front of the cylinder block. The coolant flows to a passage in the left side of the cylinder block. The coolant then flows to the rear of the cylinder block.

The engine oil cooler is installed on the left side of the engine. A line is connected between the housing of the water temperature regulator and the engine oil cooler. Some of the coolant from the water pump flows through this line to the following components:

- The plates in the engine oil cooler
- A line to the cylinder block
- The coolant passages for the cylinders
- The cylinder head

The coolant exits the cylinder head at the front. The coolant then flows into the water temperature regulator housing. If the water temperature regulator is closed, the coolant goes directly through a bypass to the inlet side of the water pump. If the water temperature regulator is open, the bypass is closed and the coolant flows to the top of the radiator.

The water temperature regulator opens fully when the engine reaches normal operating temperature. When the water temperature regulator is fully open, the flow to the radiator is maximum. However, the water temperature regulator does not close the flow of coolant into the cylinder head.

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101178998

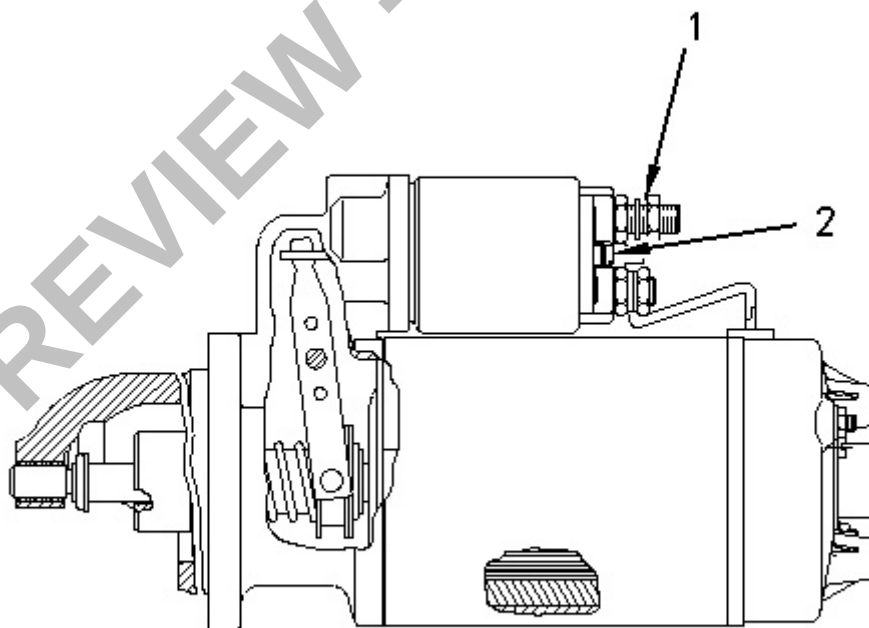
Electrical System

SMCS - 1400; 1550; 1900

The electrical system is a negative ground system.

The charging circuit operates when the engine is running. The alternator in the charging circuit produces direct current for the electrical system.

Starting Motor



Testing and Adjusting 3054 Engine for Caterpillar Built Machines

Media Number -SEN5816-12

Publication Date -01/08/2004

Date Updated -10/08/2004

101522705

Air Inlet Heater - Test

SMCS - 1090-081

Tests For The Air Inlet Heater

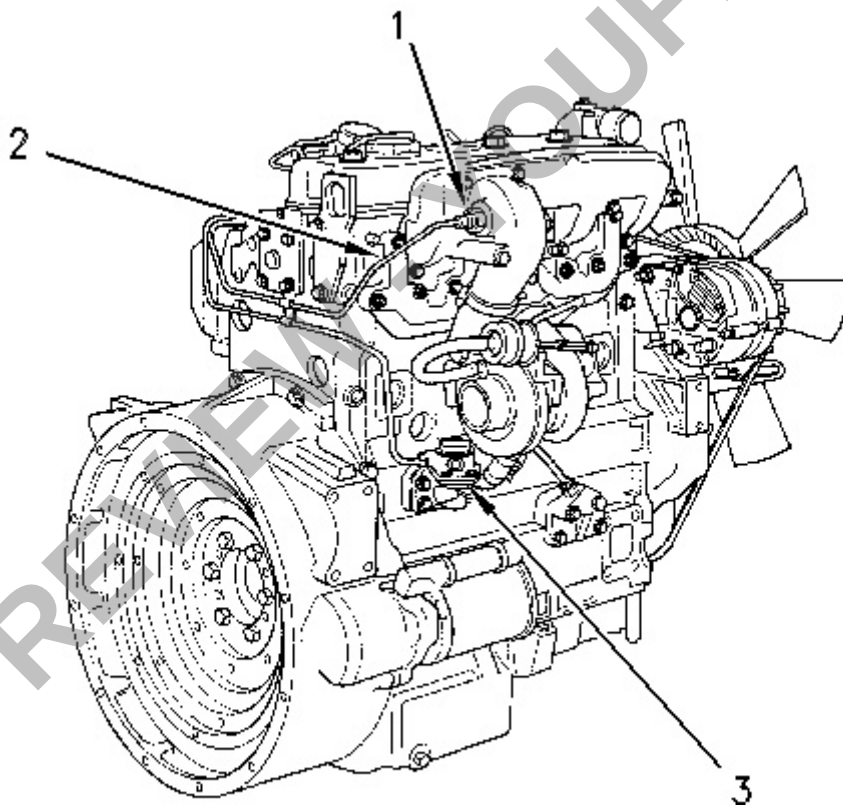


Illustration 1

g00538493

Right side of the engine

Troubleshooting Alternator - Bosch K1/N1

Media Number -SEN3685-02

Publication Date -01/09/2013

Date Updated -16/09/2013

105087470

General Information

SMCS - 1405

Often when problems with the charging system are being investigated, the alternator is not the problem. If a low battery condition is present, test the batteries first. Refer to Special Instruction, SEHS7633, "Battery Test Procedure" for more information. If the engine cranks slowly, then test the starting system. Refer to Service Magazine, SEPD0020, "Testing The Starter On The Engine" for more information. If a warning indicator for the charging system is ON, see Service Magazine, SEBD1751, "Difference Between Alternator Indicator In Electronic Monitoring System (EMS) And Low Voltage Indicator In Operating Monitoring System (OMS)". When a problem with the charging system is suspected, then complete the testing that is described in Diagnostic Function, "Charging System".

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Specifications

3054 Engine for Caterpillar Built Machines

Media Number -SEN5815-11

Publication Date -01/11/2005

Date Updated -17/11/2005

Engine Design

SMCS - 1201

Type 1 Engines and 9RM Engines

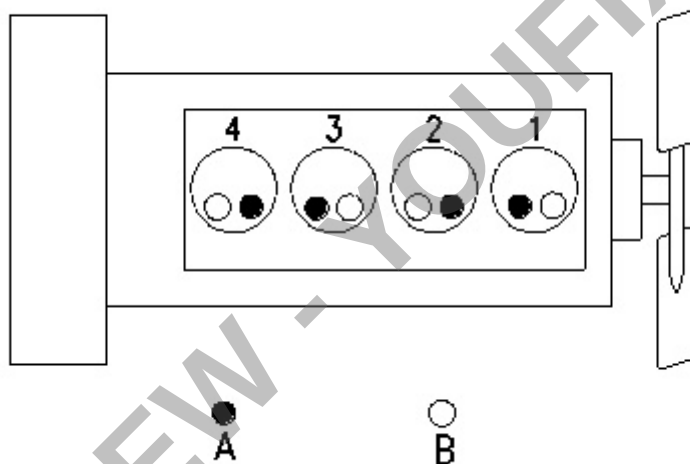


Illustration 1

g00296342

Cylinder and valve location for Type 1 engines and 9RM engines

(A) Exhaust valves

(B) Inlet valves

Note: Type 1 engines can be identified in two ways. The first method refers to Illustration 1. When the valve cover is removed, look at the cylinder head valves. Type 1 engines have two exhaust valves in a row and two inlet valves that are in a row.

The second method does not require the removal of the valve cover. Refer to the inlet manifold and the exhaust manifold. Type 1 engines have two exhaust ports in a row and two inlet ports that are in a row.

Disassembly and Assembly 312B Excavator Machine Systems

Media Number -REN1113-01

Publication Date -01/06/1999

Date Updated -29/11/2001

101071497

Counterweight - Remove and Install

SMCS - 7056-011; 7056-012

Removal Procedure

1. Start the machine. Place the bucket on the ground. Stop the engine.
2. Open the hood of the machine.



Illustration 1

g00363768

3. Fasten a suitable lifting device to the counterweight, as shown.

Systems Operation

3054 Engine for Caterpillar Built Machines

Media Number -SEN5816-12

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Date Updated -10/08/2004

i04040165

Fuel System

SMCS - 1250

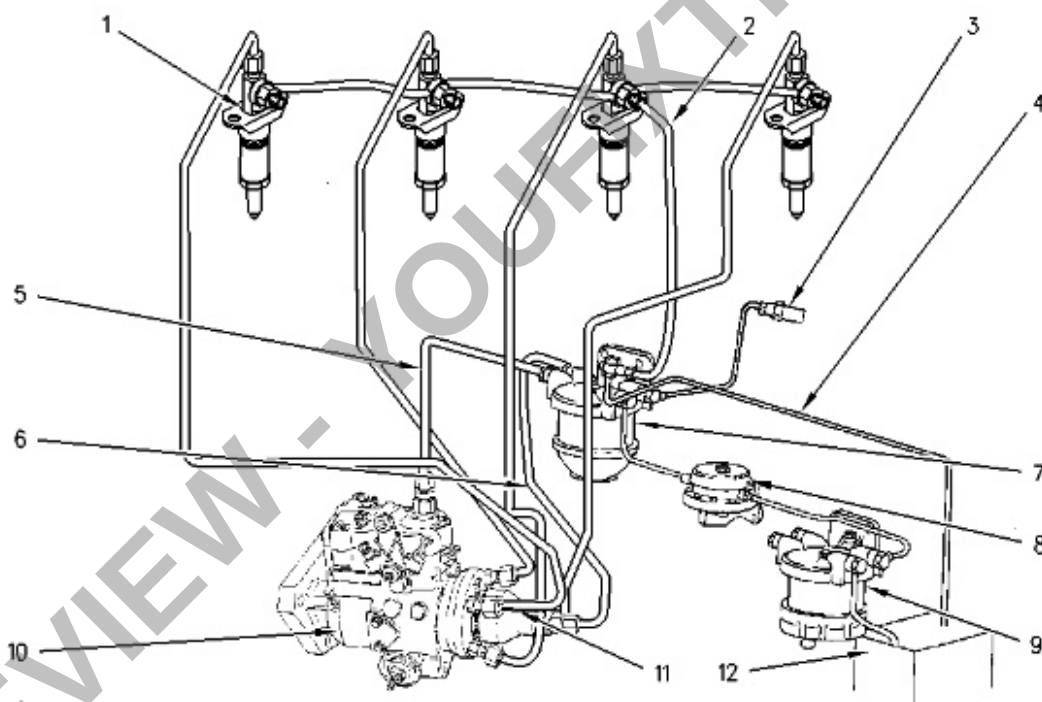


Illustration 1

g00849199

Diagram of the basic fuel system (typical example)

- (1) Fuel injection nozzles
- (2) Fuel return line from fuel injection nozzles
- (3) Air inlet heater
- (4) Fuel return line from fuel filter
- (5) Fuel return line from fuel injection pump
- (6) Supply line

Systems Operation

312B Excavator Attachments

Media Number -REN1106-00

Publication Date -01/06/1998

Date Updated -09/10/2001

i00799462

One-Way Hydraulic Flow Operation

SMCS - 5050

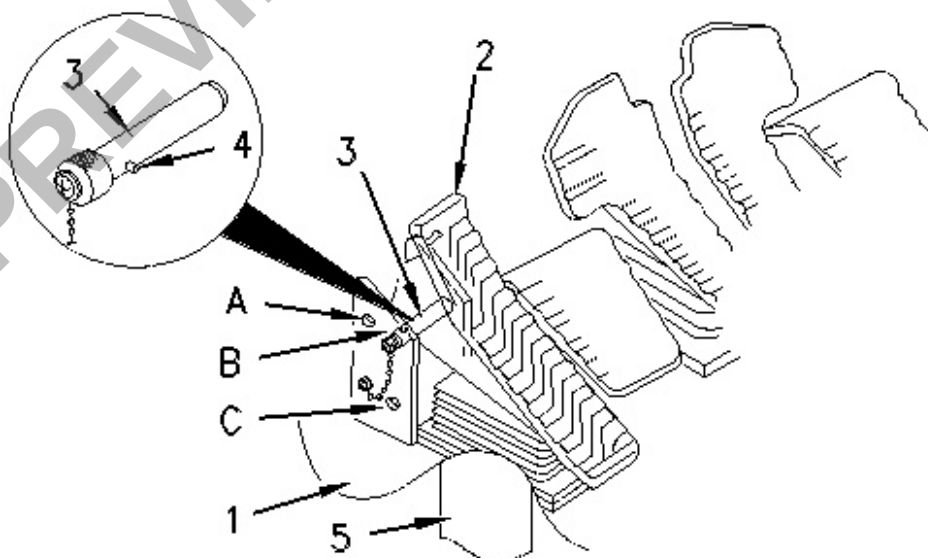
Note: Refer to Schematic, RENR1111, "Single Action, One Pump" for the hydraulic schematic.

Note: The two pump flow system can be used with an attachment.

The one-way hydraulic flow system is for attachments that require one-way pressurized hydraulic flow. A hydraulic hammer is a good example. The following components are the main components of the one-way hydraulic flow system:

- Pilot oil lines
- Hydraulic control group
- Front lines
- Attachment relief valve

The operation of the main control valve is identical to the standard control lines.



Specifications

312B and 312B L Excavator Attachment Specifications

Media Number -REN1103-00

Publication Date -01/11/1997

Date Updated -09/10/2001

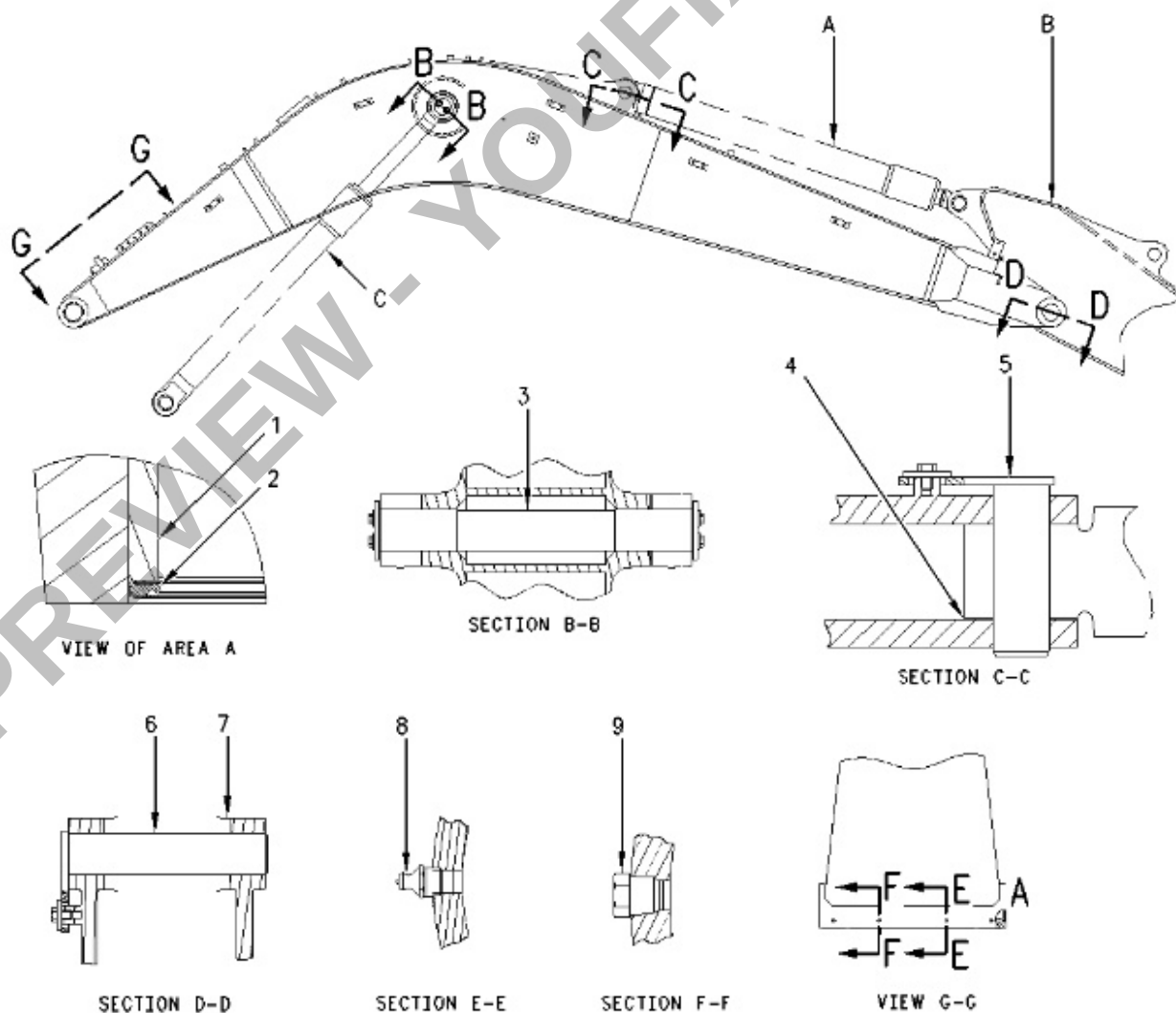
i00677582

Boom

SMCS - 6501

S/N - 2KW1-UP

S/N - 9FS1-UP



Systems Operation

3054 Engine for Caterpillar Built Machines

Media Number -SEN5816-12

Publication Date -01/08/2004

Date Updated -10/08/2004

i01546967

Lubrication System

SMCS - 1300

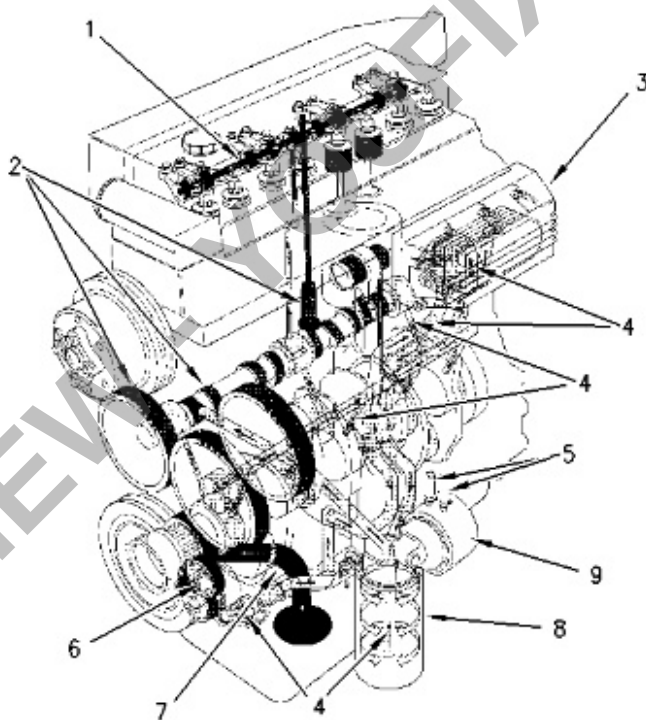


Illustration 1

g00803940

Engine Oil Flow Of The Lubrication System

- (1) Reduced oil pressure
- (2) Splash lubrication
- (3) Baffle type of engine oil cooler (if equipped)

Systems Operation

All Products Air Conditioning and Heating R134a for All Caterpillar Machines

Media Number -SEN5664-22

Publication Date -01/08/2012

Date Updated -13/08/2012

103861420

Service Intervals

SMCS - 7000; 7309; 7320



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.

Systems Operation

312B Excavator Attachments

Media Number -REN1106-00

Publication Date -01/06/1998

Date Updated -09/10/2001

i00830351

Auxiliary Control (Medium Pressure Circuit)

SMCS - 5000

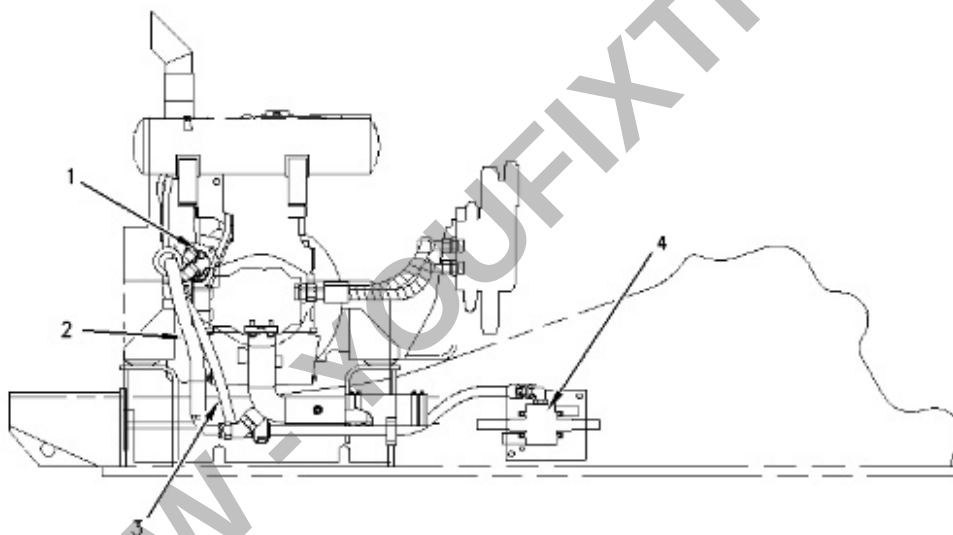


Illustration 1

g00402340

- (1) Pump
- (2) Line from hydraulic tank
- (3) Line to medium pressure relief valve
- (4) Medium pressure relief valve

The medium pressure circuit is capable of providing two-way hydraulic flow for attachments such as tilting buckets, rotation for crushers, etc.

The medium pressure circuit is electronically activated by a switch on the left implement control lever in the cab. Oil is drawn by pump (1) from the hydraulic tank through line (2). The hydraulic oil is supplied to medium pressure relief valve (4) through line (3). The front lines connect with the hydraulic lines which control the movement of the tool.

Testing and Adjusting

**308B, 311B, 312B, 315B, 317B, 318B, 320B, 322B, 325B, 330B, M325B and W330B
Excavators Engine and Pump Control**

Media Number -REN1998-06

Publication Date -01/10/2004

Date Updated -06/10/2004

i01237603

Communication Problem Between Controller and Monitor - Troubleshoot - A201, A202 And A203

SMCS - 1931-035; 7490-035

Troubleshooting

All Products Air Conditioning and Heating R134a for All Caterpillar Machines

Media Number -SEN5664-22

Publication Date -01/08/2012

Date Updated -13/08/2012

105026830

Required Tools

SMCS - 7309

Table 1

Required Tools	
Part Number	Part Description
Recovery, Recycling, and Recharging Systems	
285-7352	Refrigerant Service Unit (Recovery/Recycling/Recharging) (115 V / 60 Hz)
285-7353	Refrigerant Service Unit (Recovery/Recycling/Recharging) (220-240 V / 50 Hz)
208-1338	Refrigerant Service Unit (Recovery)
197-1915	Refrigerant Service Unit (230 V / 50/60 Hz)
208-1317	Refrigerant Filter-Dryer
Charging Scales and Manifold Gauges	
168-1959	Electronic Charging Scale (115 V / 60 Hz)
168-1961	Electronic Charging Scale (220-240 V / 50 Hz)
168-1958	Electronic Charging Scale (Battery)
208-1341	Manifold Gauge Set
Tanks and Hoses	
300-3526	Refrigerant Tank (22.7 kg (50 lb))
208-1352	Heater Blanket As
272-3090	Refrigerant Charging Hose
208-1332	Refrigerant Hose

Disassembly and Assembly 312B Excavator Machine Systems

Media Number -REN1113-01

Publication Date -01/06/1999

Date Updated -29/11/2001

102154175

Duo-Cone Conventional Seals - Install

SMCS - 7561-012

Installation Procedure

When the Duo-Cone Seals are installed and assembled, you must use the correct procedures. The Duo-Cone Seal may fail from one or more mistakes that are made during assembly or during installation of the seal components.

Reference: Special Instruction, SEHS8364, "Assembly and Installation of Conventional Duo-cone Seals"

Reference: Special Instruction, SEHS8484, "Tool and Specification Chart for Conventional Duo-Cone Seals"

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	6V-3075	Dial Indicator	1
	6V-6167	Contact Point	1
	3P-1565	Collet Assembly	1
	165-8958	Dial Indicator Base	1
B	169-0503	Installation Kit	1

Correct Assembly of Conventional Duo-Cone Seals

Systems Operation

All Products Air Conditioning and Heating R134a for All Caterpillar Machines

Media Number -SEN5664-22

Publication Date -01/08/2012

Date Updated -13/08/2012

102991866

Cab Pressurization and Filtration System

SMCS - 7320; 7342

Caterpillar machines with an enclosed cab area need to provide adequate air flow to the operator inside the cab area so that a standard air pressure is met. Maintaining a proper air pressure level is accomplished by ensuring that the appropriate seals are used. When the appropriate seals are correctly installed, the cab will be pressurized by the ventilation system. See Troubleshooting, SENR5664, "Troubleshooting Cab Pressurization and Filtration System" for tips on resolving problems.

Maintaining the proper pressurization level in the cab area is important to the health of the operator because changes to the air pressure may lead to problems with breathing. Low pressure can cause dust to enter the cab and the Heating Ventilation Air Conditioning (HVAC) system, which can lead to premature system deterioration. Low pressure is often caused by improper sealing of the cab. Poor sealing of the cab requires an increase in the fresh air flow to maintain pressurization. The increase in fresh air flow will lead to a lower air conditioning and heater performance. The increase in fresh air flow will also lead to increased intervals in filter service. Additional noise that is entering the cab can also result from poor sealing of the cab.

Cab sealing objectives for the operator cab environment are for the cab to pressurize to a minimum of 50 Pa (0.2 inch of H₂O) with no more than 76 m³/hr (45 cfm) () of fresh air flow. The minimum cab fresh air flow while the ventilation system is operating on any fan speed is 43 m³/hr (25 cfm). This objective satisfies the requirements for fresh air flow from SAE J1503 and ISO 10263-4. In HVAC systems with a mode door that controls the balance of fresh air and recirculation air, the control shall be set to minimum fresh air flow while measuring cab pressure.

The air flow of a HVAC system is used to pressurize a cab as the air flow passes through different components. First, outside air is drawn into the HVAC compartment after being filtered for dust particles. Air is drawn in with the help of a blower fan. The blower fan pulls air or pushes air across the heater and/or the evaporator coil. The air flow is then directed into the ventilation ducts of the system. The air flow travels into the environment of the cab through the directional louvers. Finally, the air inside the cab area returns to the HVAC system through the recirculation filter.

Some ventilation systems can be enhanced by using different options. One option that is available for a wide variety of Caterpillar machines is the inclusion of a powered precleaner unit. As part of the pressurized system of the cab, a precleaner removes additional dirt/dust from the fresh air flow that is entering the cab. This provides extended life for the filter to the fresh air filter. These precleaners are coupled with higher efficiency fresh air filters in order to prevent finer particles of

Torque Specifications

Torque Specifications

Media Number -SEN3130-14

Publication Date -01/01/2013

Date Updated -09/01/2013

103508884

Metric (ISO) Fasteners

SMCS - 7553

Metric (ISO) Nuts and Bolts

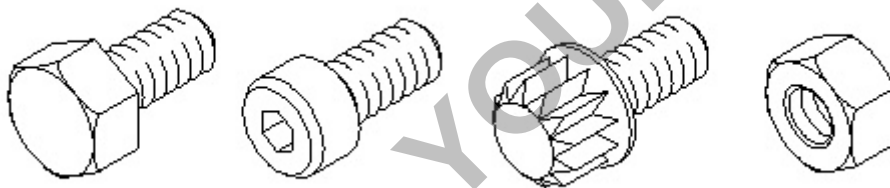


Illustration 1

g00909614

Note: The following table has the recommended standard torque values for metric nuts and bolts for use on all Caterpillar equipment and Mitsubishi engines.

Table 1

Thread Size mm	Torque
M6	$12 \pm 3 \text{ N}\cdot\text{m}$ ($105 \pm 27 \text{ lb in}$)
M8	$28 \pm 7 \text{ N}\cdot\text{m}$ ($250 \pm 62 \text{ lb in}$)
M10	$55 \pm 10 \text{ N}\cdot\text{m}$ ($41 \pm 7 \text{ lb ft}$)
M12	$100 \pm 20 \text{ N}\cdot\text{m}$ ($75 \pm 15 \text{ lb ft}$)
M14	

Disassembly and Assembly 312B Excavator Machine Systems

Media Number -REN1113-01

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Date Updated -29/11/2001

101911215

Track Adjuster - Remove

SMCS - 4157-011

Removal Procedure

Start By:

- A. Remove the front idler and the recoil spring. Refer to Disassembly and Assembly, "Front Idler and Recoil Spring - Remove".

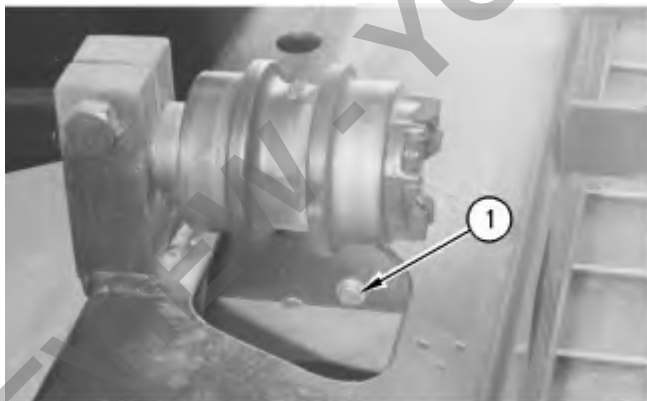


Illustration 1

g00562605

1. Remove two bolts (1) and the washers that hold the track adjuster to the undercarriage frame.

Specifications

312B and 312B L Excavator Attachment Specifications

Media Number -REN1103-00

Publication Date -01/11/1997

Date Updated -09/10/2001

100563498

Bucket

SMCS - 6102; 6523; 6525

S/N - 2KW1-UP

S/N - 9FS1-UP

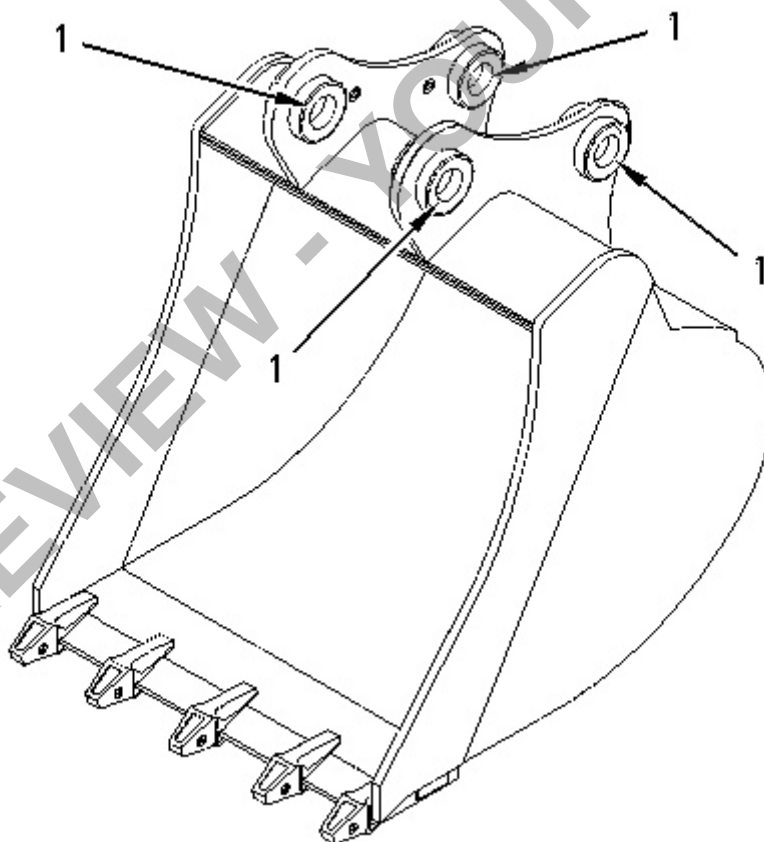


Illustration 1

g00278641

(1) Bucket pin bore ... 65.00+0.19 mm (2.559+0.007 inch)

Schematic

312 and 312B Excavators
Medium Pressure with Blade
Hydraulic System (Attachment)

6BL1-Up
2KW1-Up
9NW1-Up

FLUID POWER SYMBOLS																						
BASIC COMPONENT SYMBOLS																						
PUMP or MOTOR	FLUID CONDITIONER	SPRING	CONTROL VALVES	RESTRICTION	LINE RESTRICTION (FIXED)	2-SECTION PUMP	PUMP VARIABLE AND PRESSURE COMPENSATED	VARIABILITY	SPRING (ADJUSTABLE)	LINE RESTRICTION (VARIABLE)	PRESSURE COMPENSATION											
HYDRAULIC ENERGY TRIANGLES	PNEUMATIC ENERGY TRIANGLES	LINE RESTRICTION (VARIABLE)	ATTACHMENT																			
VALVES																						
VALVE ENVELOPES								VALVE PORTS														
ONE POSITION	TWO POSITION	THREE POSITION					TWO-WAY	THREE-WAY	FOUR-WAY													
CONTROL VALVES						CHECK VALVES																
NORMAL POSITION	SHIFTED POSITION	INFINITE POSITION				BASIC SYMBOL	SPRING LOADED	SHUTTLE	PILOT CONTROLLED													
MEASUREMENT						ROTATING SHAFTS																
PRESSURE	TEMPERATURE	FLOW				UNIDIRECTIONAL	BIDIRECTIONAL															
FLUID STORAGE RESERVOIRS																						
VENTED	PRESSURIZED	RETURN ABOVE FLUID LEVEL	RETURN BELOW FLUID LEVEL																			
COMBINATION CONTROLS																						
SOLENOID	SOLENOID OR MANUAL	SOLENOID AND PILOT	SOLENOID AND PILOT OR MANUAL	SERVO	THERMAL	DETENT																
MANUAL CONTROL SYMBOLS																						
PUSH-PULL LEVER	MANUAL SHUTOFF	GENERAL MANUAL	PUSH BUTTON	PEDAL	SPRING																	
PILOT CONTROL SYMBOLS																						
RELEASED PRESSURE				REMOTE SUPPLY PRESSURE																		
EXTERNAL RETURN	INTERNAL RETURN	SIMPLIFIED	COMPLETE	INTERNAL SUPPLY PRESSURE																		
ACCUMULATORS				CROSSING AND JOINING LINES				HYDRAULIC AND PNEUMATIC CYLINDERS														
SPRING LOADED	GAS CHARGED			LINES CROSSING	LINES JOINING			SINGLE ACTING	DOUBLE ACTING													
HYDRAULIC PUMPS				HYDRAULIC MOTORS				INTERNAL PASSAGEWAYS														
FIXED DISPLACEMENT	VARIABLE DISPLACEMENT NON-COMPENSATED	VARIABLE DISPLACEMENT NON-COMPENSATED			FIXED DISPLACEMENT	VARIABLE DISPLACEMENT NON-COMPENSATED	VARIABLE DISPLACEMENT NON-COMPENSATED	INFINITE POSITIONING	THREE POSITION	TWO POSITION	FLOW ALLOWED IN EITHER DIRECTION											
UNIDIRECTIONAL	UNIDIRECTIONAL	UNIDIRECTIONAL			UNIDIRECTIONAL	UNIDIRECTIONAL	UNIDIRECTIONAL	FLOW ALONG DIRECTION	PARALLEL FLOW	CROSS FLOW	FLOW ALLOWED IN EITHER DIRECTION											
BIDIRECTIONAL	BIDIRECTIONAL	BIDIRECTIONAL			BIDIRECTIONAL	BIDIRECTIONAL	BIDIRECTIONAL															

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Electrical Symbols Table			
Hydraulic Symbols (Electrical)			
Transducer (Fluid)	Transducer (Gas / Air)	Generator	Electric Motor
Pressure Switch	Pressure Switch (Adjustable)	Temperature Switch	Electrical Wire
Electrical Symbols (Electrical)			
Pressure Symbol	Temperature Symbol	Level Symbol	Flow Symbol
Wire Number Identification Codes			
Electrical Schematic Example		Hydraulic Schematic Example	
<p>Current Standard</p> <p>Harness identification code This example indicates wire 135 in harness "AG".</p> <p>325-AG135 PK-14</p> <p>Wire Color: AG, Wire Gauge: 14</p> <p>Previous Standard</p> <p>325-PK-14</p> <p>Wire Color: PK, Wire Gauge: 14</p>		<p>Current Standard</p> <p>Circuit Number Identification: 325-PK</p> <p>Wire Color: PK</p> <p>(EXAMPLE VALVE)</p>	

the turbine wheel (15) . Then, the exhaust gas flows out of the turbine housing (14) through the exhaust outlet (16) .

The turbine wheel and the compressor wheel (10) are installed on the same shaft. Therefore, the turbine wheel and the compressor wheel rotate at the same rpm. The compressor wheel is enclosed by the compressor housing (9) . The compressor wheel compresses the inlet air (8) . The inlet air flows into the engine cylinders through the inlet valves of the cylinders.

The oil from the main gallery of the cylinder block flows through the oil inlet port (12) in order to lubricate the turbocharger bearings (11) and (13) . The pressurized oil passes through the bearing housing of the turbocharger. The oil is returned through the oil outlet port (17) to the oil pan.

Some turbochargers have a wastegate. The wastegate is controlled by the boost pressure. This allows some of the exhaust to bypass the turbocharger at higher engine speeds. The wastegate is a type of flapper valve that automatically opens at a preset level of boost pressure in order to allow exhaust gas to flow around the turbine. The wastegate allows the design of the turbocharger to be more effective at lower engine speeds.

The wastegate is controlled by a diaphragm. One side of this diaphragm is open to the atmosphere. The other side of this diaphragm is open to the manifold pressure.

An air/fuel ratio control is installed between the turbocharger and the fuel injection pump. The air/fuel ratio control performs the following functions:

- The fuel is limited on acceleration in order to prevent an overspeed condition.
- The generation of black smoke is reduced.
- The fuel efficiency is improved and emissions are reduced at low boost when the fuel rack is limited for low power output.

The air/fuel ratio control is a nonserviceable part. Adjustment and repairs should only be done by a Caterpillar Dealer.

Cylinder Head And Valves

The valves and the valve mechanism control the flow of the air and the exhaust gases in the cylinder during engine operation. The cylinder head assembly has two valves for each cylinder. Each valve has one valve spring. The ports for the inlet valves are on the left side of the cylinder head. The ports for the exhaust valves are on the right side of the cylinder head. Steel valve seat inserts are installed in the cylinder head for both the inlet and the exhaust valves. The valve seat inserts can be replaced.

The valves move along valve guides. The valve guides can be replaced. The exhaust valve guide has a counterbore in order to prevent the seizure of the valve stem. The seizure of the valve stem is caused by a buildup of carbon under the head of the valve.

The inlet and the exhaust valves are opened and closed by the rotation and movement of the following components:

- Crankshaft
- Camshaft

Testing and Adjusting

Product Link - PL522/523

Media Number -REN8143-02

Publication Date -01/07/2013

Date Updated -23/07/2013

i03995042

Electrical Connector - Inspect

SMCS - 7553-040-WW

ReferenceSpecial Instruction, SEHS9615, "Servicing DT Connectors".

ReferenceSpecial Instruction, REHS0148, "Listing Of Deutsch Connector Components"

ReferenceSpecial Instruction, SEHS9065, "Use Of CE Connector Tools".

ReferenceService Magazine, SEPD034227 January 97, "Field Repair Of Single Wire Breaks In Harnesses (Sealed Splice)".

ReferenceService Magazine, SEPD037128 July 97, "Protection Of Unsealed Electrical Terminations For Machines In Corrosive Applications".

ReferenceService Magazine, SEPD047324 May 99, "New DT Connector Plugs With Improved Seal Retention".

ReferenceService Magazine, SEPD054509 October 00, "Dielectric Grease Should Not Be Used In Electrical Connectors".

ReferencePocket Guide, SEBD0402, "Guidelines For Routing And Installing Wire Harness Assemblies".

Use this procedure under the following situation:

Use the following steps to help determine if the connector is the cause of the problem. If a problem is found in the electrical connector, repair the connector and verify that the problem has been corrected.

The following background information is related to this procedure:

Many of the operational procedures and the diagnostic code procedures in this troubleshooting guide will instruct you to check a specific electrical connector.

Intermittent electrical problems are often caused by poor connections. Always check for an active diagnostic code before breaking any connections. Also, always check for an active diagnostic code after the connector is reconnected in order to verify that the problem disappears.

Simply disconnecting the connectors and then reconnecting the connectors can temporarily solve a problem at times. If reconnecting the connectors solves the problem, likely causes are loose



Illustration 3

g00372455

5. Remove four O-ring seals (4) from the solenoid valve .

Installation Procedure

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

1. Check the condition of the O-ring seals that are used in the valve body. If the O-ring seals are worn or damaged, use new parts for replacement.
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