CATERPILLAR®

Service Repair Manual

Model

432E BACKHOE LOADER

Product: BACKHOE LOADER
Model: 432E BACKHOE LOADER BXE
Configuration: 432E Backhoe Loader Parallel Lift Side Shift Boom BXE00001-UP (MACHINE) POWERED BY 3054C Engine

Disassembly and Assembly
3054C Engines for Caterpillar Built Machines
Media Number -SENR5069-18 **Publication Date -01/05/2015** **Date Updated -19/09/2018**

i02308847

V-Belts - Remove and Install

SMCS - 1357-010

Removal Procedure

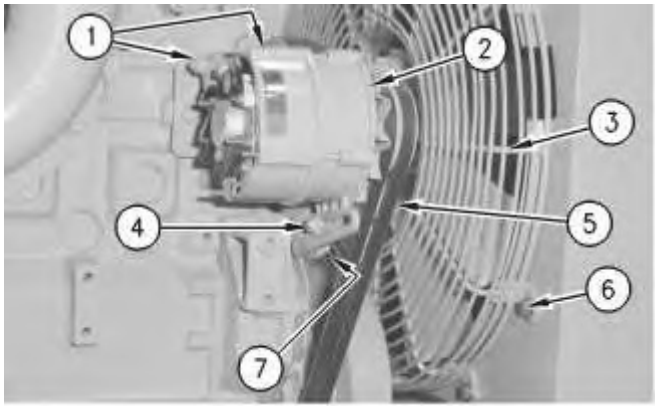

Illustration 1 g00932341
Typical example

1. If necessary, remove the setscrews (6) that fasten the fan guard (3) to the fan shroud. Remove the fan guard (3).
2. Loosen the nut (1), the clamping screw (4), and the setscrew (7). Slide the alternator (2) toward the engine.

   Note: If the nut (1) is loose on the setscrew, remove the nut and discard the nut.
3. Maneuver the V-belts (5) around the fan and remove the V-belts.

   Note: Never replace one V-belt. Always replace sets of V-belts, if equipped.

Installation Procedure

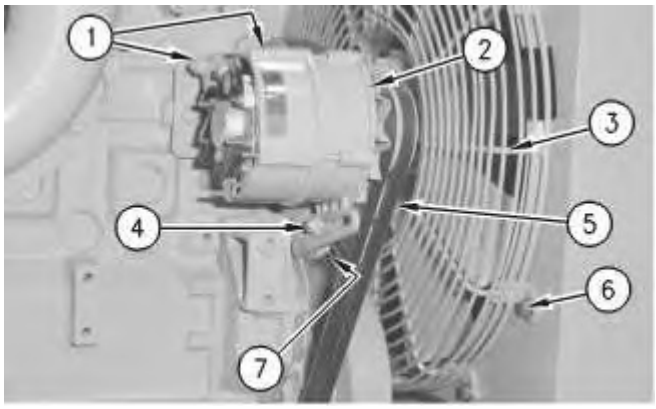

Illustration 2 g00932341

Typical example

1. Install the V-belts (5) behind the fan and on the correct pulleys.
2. Adjust the tension on the V-belts (5) by moving the alternator (2) away from the engine. After the correct belt tension is set, tighten the clamping screw (4) to a torque of 78 N·m (58 lb ft). Refer to Testing and Adjusting, "V-Belt - Test" for the correct tension of the V-belts.

   Note: If the V-belt cannot be checked with a gauge, press on the V-belt at the center of the longest free length in order to check the deflection. Under a moderate amount of pressure, the V-belt should have a deflection of 10.0 mm (0.40 inch).
3. Tighten the setscrew (7) to a torque of 22 N·m (16 lb ft).
4. If necessary, install a new nut (1). Tighten the nut to a torque of 22 N·m (16 lb ft).
5. If the fan guard was previously removed, put the fan guard (3) in position on the fan shroud. Install the setscrews (6) that fasten the fan guard to the fan shroud.

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i02308856

Fan - Remove and Install

SMCS - 1356-010

Removal Procedure

Start By:

a. Remove the V-Belts. Refer to Disassembly and Assembly, "V-Belts - Remove and Install".

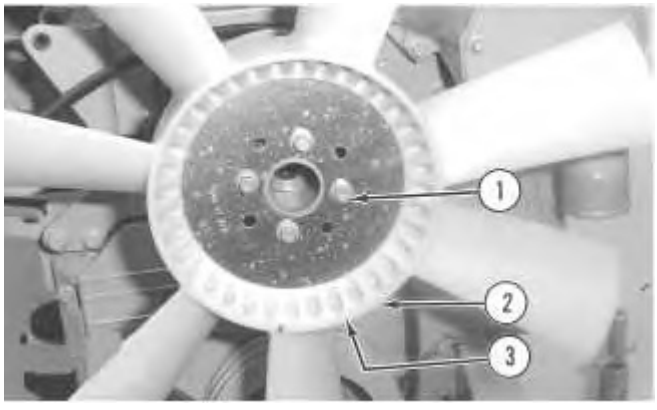

Illustration 1 g00542576

1. Remove the setscrews (1).
2. Remove the fan (2).
3. If equipped, remove the extension (3).

Illustration 2 g00907071

4. Remove the fan pulley (4).

Installation Procedure

1. Inspect the condition of the fan pulley (4) and the fan (2). If necessary, replace the fan pulley or the fan.

Illustration 3 g00907071

2. Install the fan pulley (4).

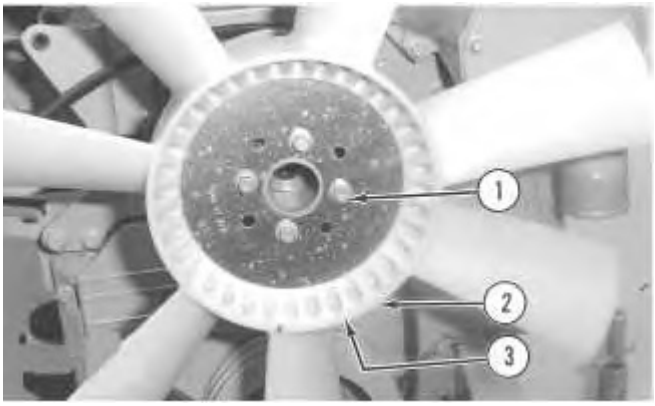

Illustration 4 g00542576

3. If equipped, install the extension (3).
4. Install the fan (2).
5. Install the setscrews (1). Tighten the setscrews (1) to a torque of 12 N·m (9 lb ft).

End By:

a. Install the V-Belts. Refer to Disassembly and Assembly, "V-Belts - Remove and Install".

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i02308860

Fan Drive - Remove and Install

SMCS - 1359-010; 1386-010

Removal Procedure

Start By:

a. Remove the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".

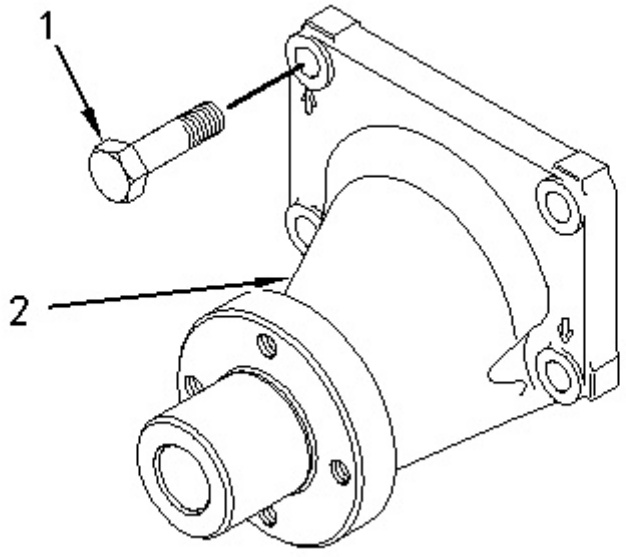

Illustration 1 g00944500

1. Remove the setscrews (1) from the fan drive (2).
2. Remove the fan drive (2).

Installation Procedure

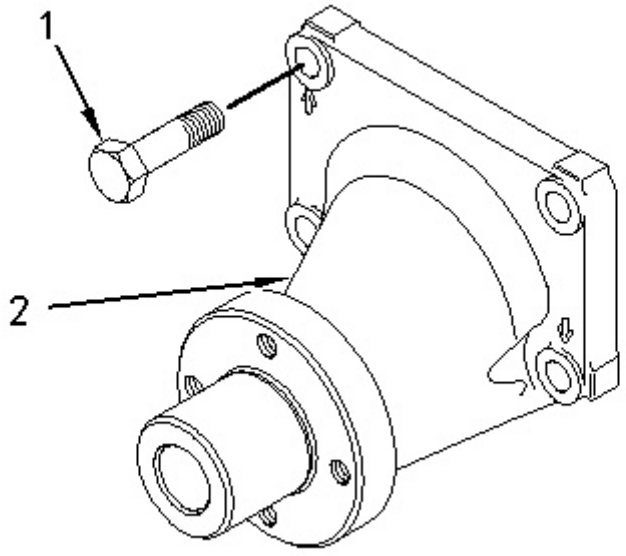

Illustration 2 g00944500

1. Position the fan drive (2) on the front face of the cylinder block with the shaft toward the bottom of the mounting flange.
2. Install the setscrews (1). Tighten the setscrews to a torque of 44 N·m (32 lb ft).

End By:

a. Install the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".

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i02308906

Alternator - Remove

SMCS - 1405-011

Removal Procedure

1. Turn the battery disconnect switch to the OFF position.

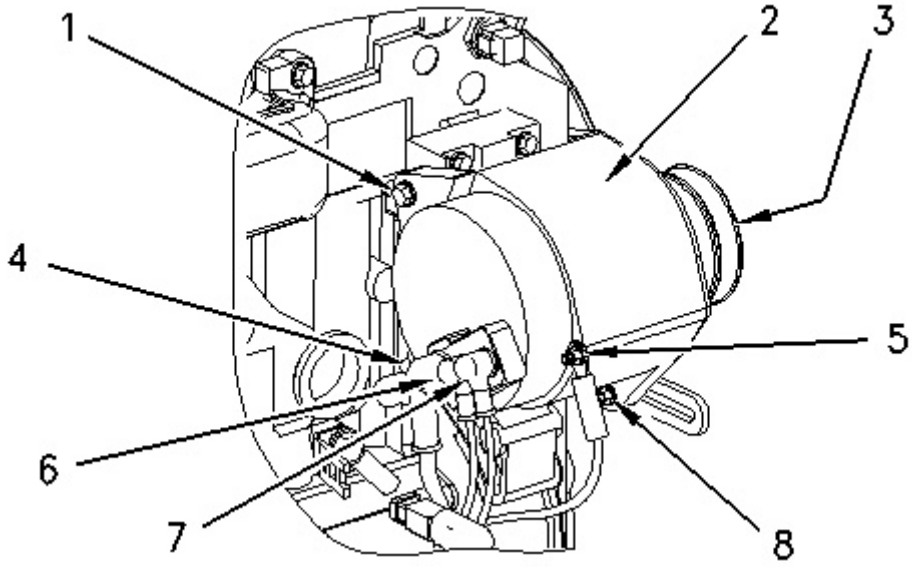

Illustration 1 g00999883
Typical Example

2. Place an index mark on all of the harness assemblies that are connected to the alternator.
3. Disconnect the harness assemblies (4), (6), and (7) from the alternator.
4. Disconnect the ground harness assembly (5) from the alternator.
5. Loosen the nut and the setscrew (1).

6. Remove the clamp screw (8) and slide the alternator (2) toward the engine. Remove the V-belts from the alternator pulley.

7. Remove the setscrew (1) from the alternator bracket. Remove the alternator (2) from the engine.

8. If necessary, remove the nut (3) and the alternator pulley from the alternator.

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i02309551

Alternator - Install

SMCS - 1405-012

Installation Procedure

Note: If the alternator pulley was removed, install the alternator pulley and the nut (3). Tighten the nut to a torque of 80 ± 10 N·m (59 ± 7 lb ft).

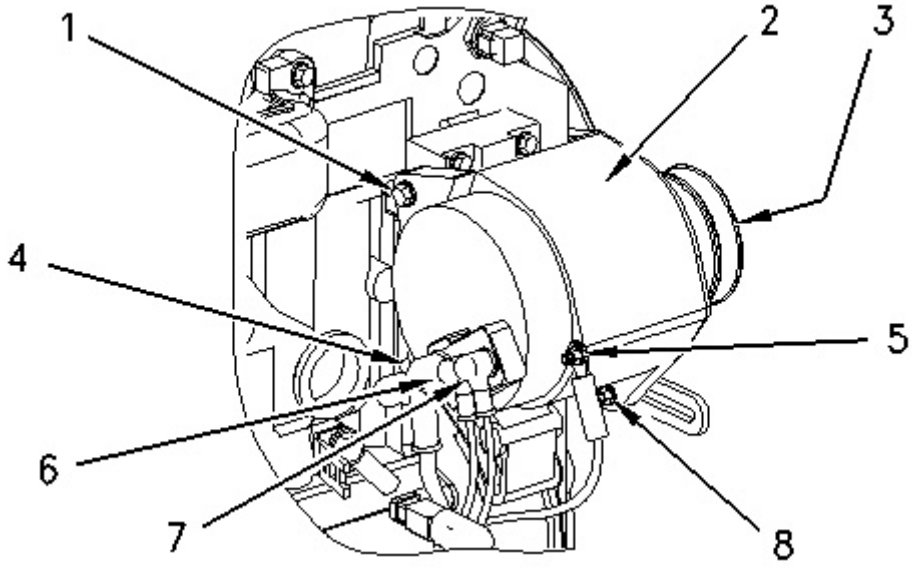

Illustration 1 g00999883
Typical Example

1. Put the alternator (2) in position on the engine.
2. Install the nut and the setscrew (1). Tighten the nut finger tight.

3. Install the clamp screw (8) through the adjustment bracket and into the alternator. Do not tighten the clamp screw (8) at this time.

4. Install the V-belts on the alternator pulley. Adjust the tension on the V-belts by moving the alternator (2) away from the engine. Tighten the clamp screw (8) after the correct tension is made. Refer to Testing and Adjusting, "V-Belt - Test" for the correct tension of the V-belts.

   Note: If the V-belt cannot be checked with a gauge, press on the V-belt at the center of the longest free length in order to check the deflection. Under a moderate amount of pressure, the V-belt should have a deflection of 10 mm (0.40 inch).

5. Tighten the nut and the setscrew (1).

6. Connect the harness assemblies (4), (6), and (7) to the alternator.

7. Connect the ground harness assembly (5) to the alternator.

8. Turn the battery disconnect switch to the ON position.

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i02309785

Electric Starting Motor - Remove and Install

SMCS - 1453-010

Removal Procedure

Note: The procedure for removal of the 12 volt electric starting motor and the 24 volt electric starting motor is identical. Refer to illustration 1 or 2.

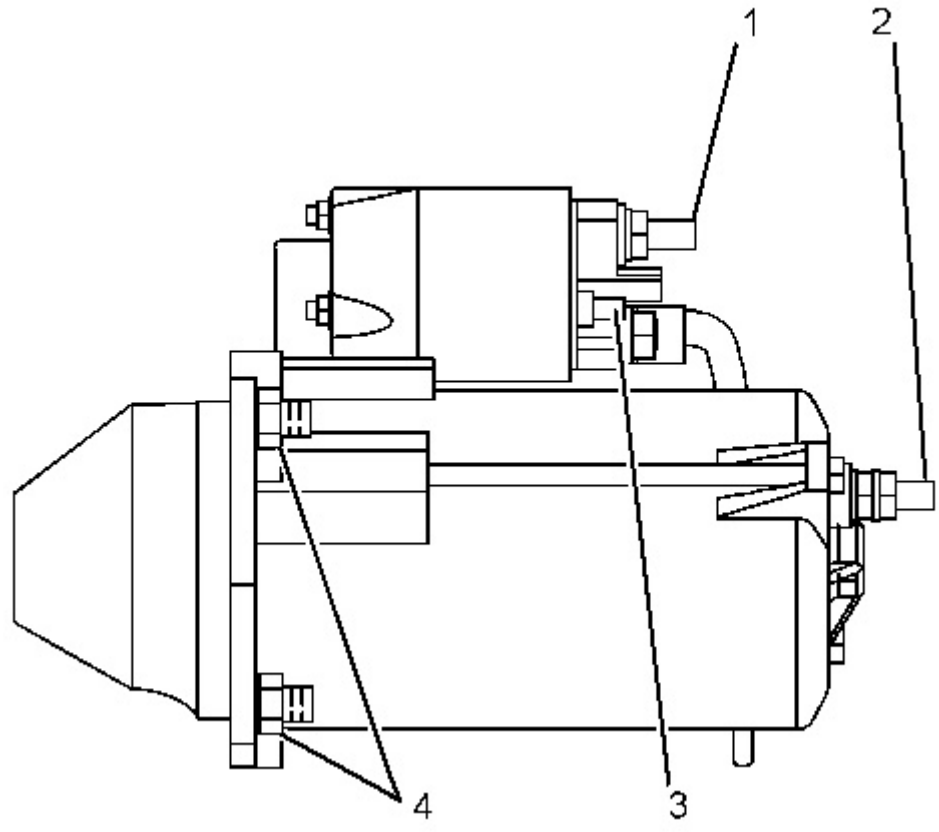

Illustration 1 g01157125

12 Volt Starting Motor

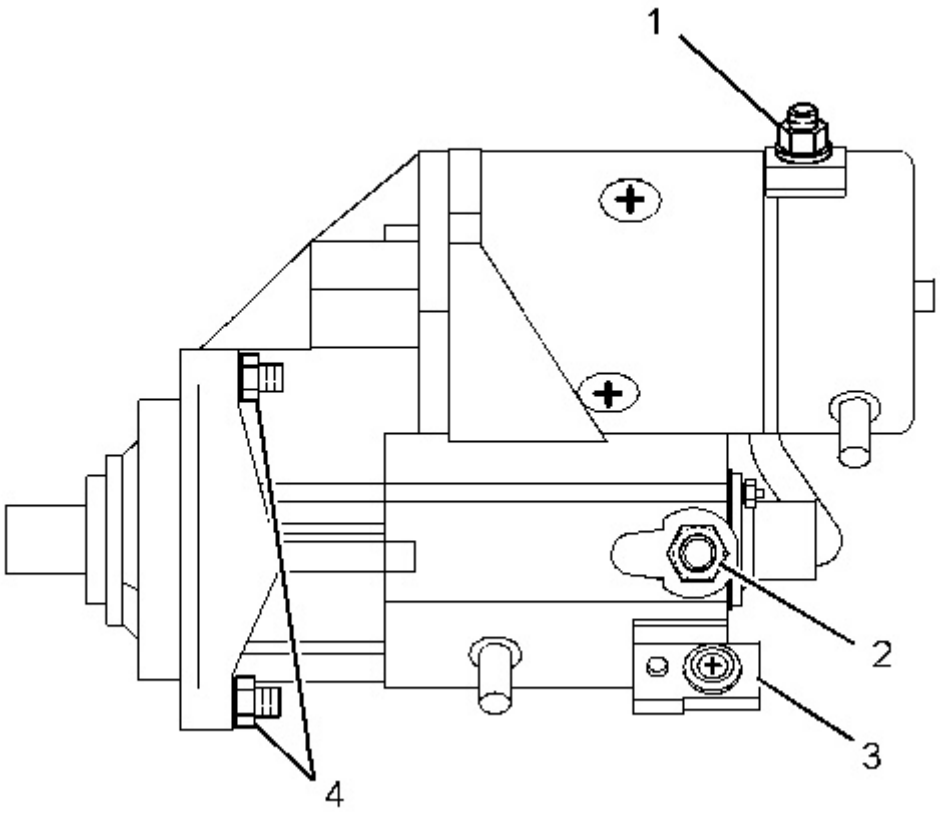

Illustration 2 g01157126

1. Turn the battery disconnect switch to the OFF position.
2. Place an identification mark on all of the harness assemblies that are connected to the starting motor.
3. Disconnect the harness assemblies (1), (2) and (3) from the starting motor.
4. Remove the nuts (4) from the studs.
5. Remove the starting motor (4) from the flywheel housing.

Installation Procedure

Note: The procedure for installation of the 12 volt electric starting motor and the 24 volt electric starting motor is identical. Refer to illustration 3 or 4.

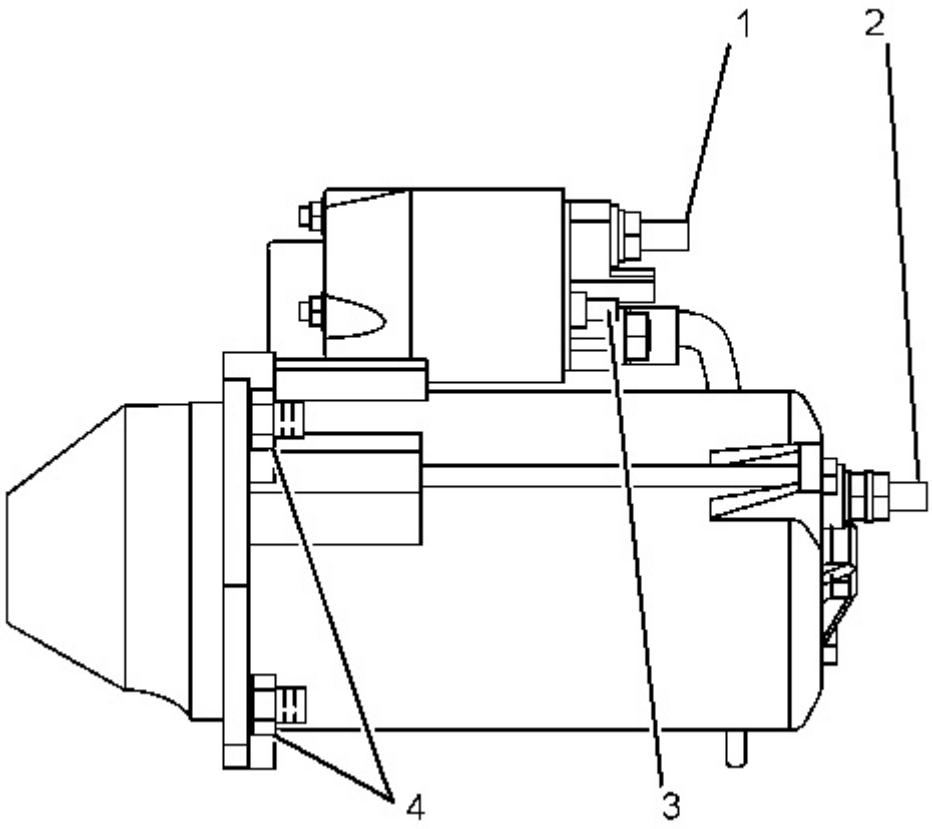

Illustration 3 g01157125

12 Volt Starting Motor

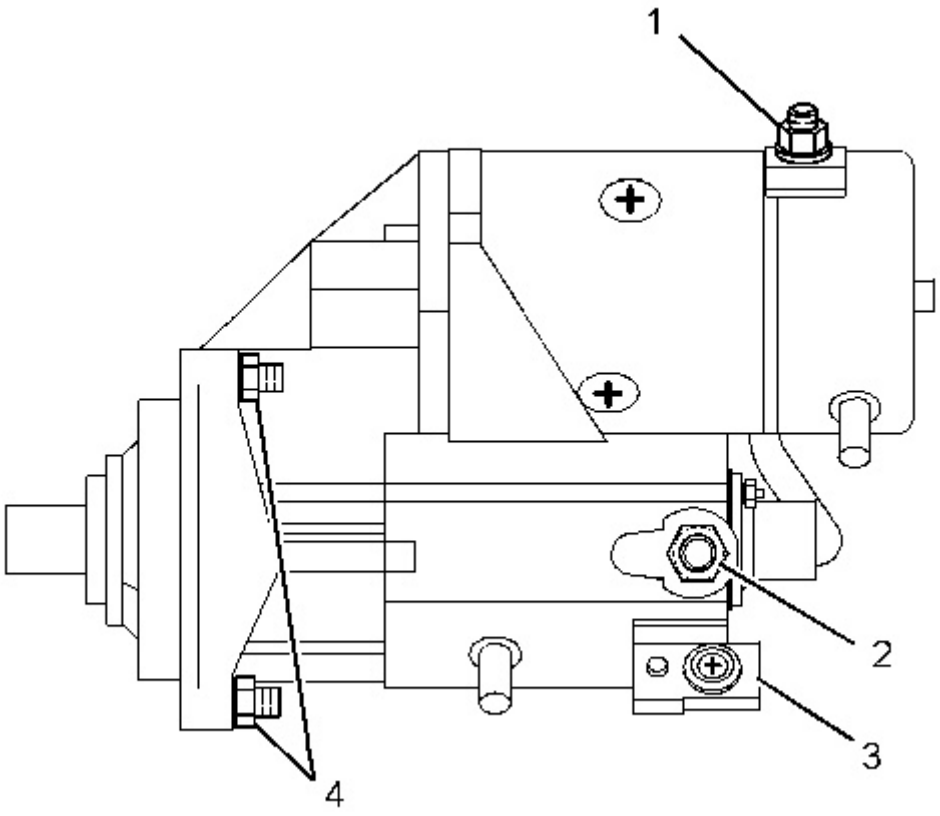

Illustration 4 g01157126

1. Install the starting motor (4) on the flywheel housing.
2. Install the nuts (4) on the studs. Tighten the nuts to a torque of 44 N·m (32 lb ft).
3. Connect the harness assemblies (1), (2), and (3) to the electric starting motor.
4. Turn the battery disconnect switch to the ON position.

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i05907617

General Information

SMCS - 1808; 7309

Refrigeration System

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.

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.

- All refrigerant lines that are metal or flexible hose must be free of sharp bends. Also, do not use a refrigerant line that is kinked. Sharp bends will cause a restriction in the refrigerant flow. Restrictions in the refrigerant lines are identified by cold spots or frost on the line at the location of the restriction. Restrictions in the lines reduce the performance and the efficiency of the system.
- The radius of bends in the flexible hose must never be less than ten times the outside diameter of the hose.
- Do not allow the flexible hoses to come within 63.5 mm (2.50 inch) of the exhaust manifold.
- The hoses need to be inspected yearly for leaks and for hardness. Conduct a leak test on all the hoses and the lines. Refer to the Testing and Adjusting, "Refrigerant Leakage - Test" section. Replace hoses if leaks or hardness are in the hoses. Replace hoses with new hose that is sealed and free of contaminants.
- The correct use of wrenches is important when connections are made. The type of wrench that is used is also important. Only use wrenches that are made for use with tube-type fittings. When a hose is connected or disconnected from the system, use a wrench on the fitting and use a wrench on the nut. When a metal line is connected or disconnected from the system, use a wrench on the fitting and use a wrench on the nut.
- Install protective plugs or protective caps on all components and hoses that are disconnected or removed.
- O-ring seals and O-ring seats must be in good condition. Small cuts, scratches, or particles of dirt will cause a leak in the system. Put new mineral oil (397-7507) on all new O-ring seals at the time of installation. Do not use any sealant on connections.
- Dust caps on the compressor block fittings are the primary seals on the air conditioning system.
- All machines should have an identification tag that specifies the refrigerant charge for the machine. The tag should be located in the operator compartment.

- If water is in the vents, check the non-return valve. If water leaks from the air conditioning system, check the non-return valve. The non-return valve should have the proper position and the proper direction.
- If engine coolant is leaking into the operator compartment, check for loose clamps on the heater hoses.

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i05907618

Machine Preparation for Disassembly and Assembly

SMCS - 7320-017

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.

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.

NOTICE

Never weld or solder any charged components.

Note: Before you conduct a performance check, refer to the Troubleshooting, "Visual Inspection (Troubleshooting)" section.

Note: Refer to the Troubleshooting, "Machine Preparation for Troubleshooting" section before service work is performed on the air conditioning system.

When the service work is done on the air conditioning system, the service work must keep the system clean and free from contamination. Plugs and caps must be used in order to close the components and hoses when the components and hoses are open. The plugs and caps protect the system from dirt and air (moisture). Only new refrigerant oil of the correct viscosity and new refrigerant can be added to the system. For the correct oil, refer to the Specifications section of this manual. Any other material or any other substance is considered non-condensable and the material will contaminate the system. Keep the work area clean.

- Dust caps on the refrigerant compressor block fitting are the primary seal on the air conditioning system.
- All machines should have an identification tag in the cab that specifies the proper refrigerant charge for the machine.

When replacement or repair of components and hoses are required, perform the following procedure:

1. Remove the refrigerant charge. Measure the amount of oil recovered. Refer to the Testing and Adjusting, "Refrigerant Recovery" and Testing and Adjusting, "Refrigerant Oil - Test" section, for proper procedures.
2. Remove the component or remove the hose that is being repaired or replaced. Install protective plugs on components or hoses that are left exposed to the air.
3. Replace any damaged component or hose.

4. Use the following table in order to determine the amount of oil that is lost during individual replacements of components. Follow the process provided in Testing and Adjusting, "Refrigerant Oil - Test" to calculate the correct amount of oil needed for the system.

Table 1

Oil Capacities for Component Replacements	
Accumulator	30 mL (1 fl oz)
Compressor	Refer to the Testing and Adjusting, "Refrigerant Compressor Oil - Check" section.
Condenser	30 mL (1 fl oz)
Evaporator	90 mL (3 fl oz)
In-Line Dryer (1) before any oil is installed	30 mL (1 fl oz)
Receiver-Dryer	30 mL (1 fl oz)

(1) Refer to the Disassembly and Assembly, "In Line Refrigerant Dryer - Remove and Install"

5. Refer to the Testing and Adjusting, "Refrigerant System - Evacuate" section.

6. Refer to the Testing and Adjusting, "Refrigerant System - Charge" section.

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i05907621

Air Conditioner Lines - Remove and Install

SMCS - 1808-010

WARNING

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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.

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.

NOTICE

Never weld or solder any charged components.

Care must be taken during removal of air conditioner lines. Before disconnecting any tube fittings, refer to Testing and Adjusting, "Refrigerant Recovery" in order to recover all refrigerant from the system.

Place dust caps on all hoses and fittings upon disconnecting.

Do not fold or twist hoses when you are routing the new hoses onto the machine. Damage can occur to the inner layers of the hoses and damage can cause premature failure.

Reassemble fittings by using the correct torque values for assembly of the air conditioning unit. Refer to Specifications, SENR3130, "Torque Specifications" in order to find the correct torque value.

Use the following procedure to reassemble the connections.

Proper Technique for Assembly

Illustration 1 g01519272

1. Drip clean mineral oil onto the clean O-ring.

Illustration 2 g01519286

2. Place the O-ring on fitting.

Illustration 3 g01519288

3. Oil the O-ring again.

Illustration 4 g01519290

4. Align fittings and ensure that the seal is seated correctly. Hand tighten the fittings together.

   Note: DO NOT CROSS THREAD.

Illustration 5 g01519291

5. Tighten the connection with proper torque. Use a wrench to avoid twisting parts.

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i05907622

Refrigerant Compressor - Remove and Install

SMCS - 1802-010

Removal

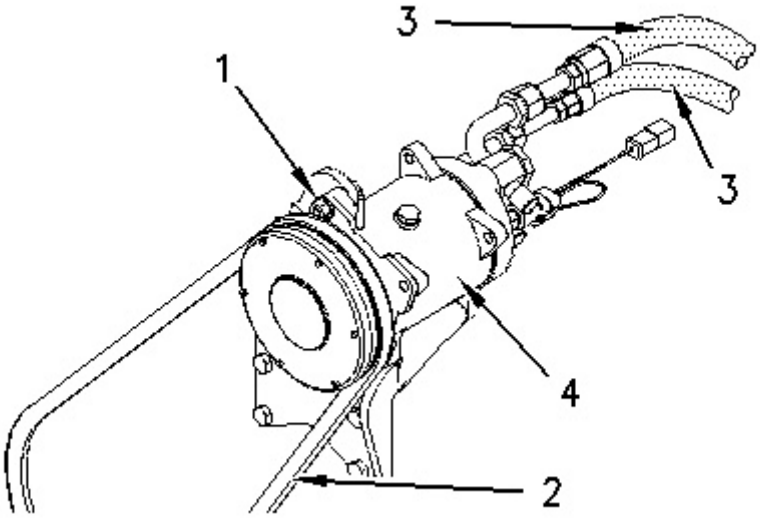

Illustration 1 g00742981

(1) Bolt

(2) Drive belt

(3) Suction and discharge hoses

(4) Compressor

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first, and then click the above link

to download the complete manual.

Thank you so much for reading

1. Remove the refrigerant charge. Refer to the Testing and Adjusting, "Refrigerant Recovery" section.
2. Disconnect electrical wires from the magnetic clutch.
3. Loosen all the mounting bolts and loosen the belt tightener (if equipped). Remove drive belt (2) .
4. Disconnect hoses (3) and put plugs or caps on the hoses. Put plugs or caps on the fittings of the compressor. Put identification marks on the hoses. The marks will ensure that the hoses will be connected correctly at a later time.
5. Remove all the mounting bolts and remove the compressor (4) . The weight of the compressor is approximately 18 kg (40 lb).

Installation

1. Check the amount and condition of the oil in the compressor (4) . Refer to the Testing and Adjusting, "Refrigerant Compressor Oil-Test" section.
2. Inspect the drive belt (2) . If the drive belt (2) is damaged or worn replace the belt.
3. Install the compressor (4) . Do not tighten the mounting bolts until drive belt (2) is installed and adjusted.
4. Connect the discharge and the suction hoses (3) to the discharge and suction ports on the compressor.
5. Connect the electrical wires to the magnetic clutch.
6. Evacuate the system. Refer to the Testing and Adjusting, "Refrigerant System - Evacuate" section.
7. Charge the system. Refer to the Testing and Adjusting, "Refrigerant System - Charge" section.
8. For the correct system operation, refer to the Troubleshooting Section in this manual.

   Note: Refer to the Specifications, "Refrigerant Compressor" in the Section for the correct belt tension.
9. For the oil level in the system, refer to Service Manual, "Refrigerant Compressor Oil - Check".