



Operation and Maintenance Manual

226B SKID STEER LOADER MJH

Operation and Maintenance Manual

Foreword

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Product: SKID STEER LOADER
Model: 226B SKID STEER LOADER MJH
Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
(MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual Caterpillar Machine Fluids Recommendations

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Foreword

Literature Information

This manual should be stored in the operator's compartment in the literature holder or seat back literature storage area.

The information contained in this document is the most current information available for coolant, fuels, and lubricants. Special lubricants are required for some machine compartments. Refer to the Operation and Maintenance Manual for your machine for any special lubrication requirements.

Whenever a question arises regarding the machine, this publication, or the Operation and Maintenance Manual, please consult any Caterpillar dealer for the latest available information.

Safety

Refer to the Operation and Maintenance Manual for your machine for all safety information. Read and understand the basic safety precautions listed in the Safety Section. In addition to safety precautions, this section identifies the text and locations of warning signs used on the machine.

Read and understand the basic precautions listed in the Safety Section before operating or performing lubrication, maintenance and repair on the machine.

Maintenance

Refer to the Operation and Maintenance Manual for your machine to determine all maintenance requirements.

Maintenance Interval Schedule

Use the Maintenance Interval Schedule in the Operation and Maintenance Manual for your machine to determine servicing intervals. Calendar intervals shown (daily, weekly, monthly, etc.) can be used instead of service hour meter intervals if they provide more convenient servicing schedules and approximate the indicated service hour meter reading. Recommended service should always be performed at the interval that occurs first.

Under extremely severe, dusty or wet operating conditions, more frequent lubrication than is specified in the Maintenance Interval Schedule might be necessary.

Extended Engine Oil Drains and Warranty

Failures that result from extended oil drain periods are not Caterpillar factory defects and therefore are not covered by Caterpillar's warranty. In addition, failures that result from not using the recommended oil type are not Caterpillar factory defects and therefore are not covered by Caterpillar's warranty.

Refer to the applicable Operation and Maintenance Manual for standard oil drain periods and to the Maintenance Section, "Lubricant Specifications" of this publication for engine oil type and viscosity grade recommendations.

To reduce the potential risk of failures associated with extended oil drain periods; it is recommended that oil drain intervals only be extended based on oil analysis, and subsequent engine inspections. Oil analysis alone does not provide an indication of the rate of formation of lacquer, varnish and/or carbon on pistons and other engine surfaces. The only accurate way to evaluate specific oil performance in a specific engine and application that utilizes extended oil drain periods is to observe the effects on the engine components. This involves tear-down inspections of engines that have run to their normal overhaul period with extended oil drain intervals. Following this recommendation will help ensure that excessive component wear does not take place in a given application.

NOTICE

Light loads, low hour accumulation, and excessive idling time can contribute to excessive water in the crankcase oil. Corrosive damage, piston deposits and increased oil consumption can also result. If oil analysis is not done or the results are ignored, the potential for corrosive damage and piston deposits increases. Refer to the appropriate Operation and Maintenance Manual for guidance.

Note: Failures that result from extended oil drain periods are not warrantable failures, regardless of use of this recommended procedure. Failures that result from extended engine oil drain periods are considered improper use under the warranty.

Aftermarket Products and Warranty

NOTICE

When auxiliary devices, accessories or consumables (filters, oil, additives, catalysts, fuel, etc.) made by other manufacturers are used on Caterpillar products, the Caterpillar warranty is not affected simply because of such use. Failures that result from the installation or usage of other manufacturers auxiliary devices, accessories or consumables, however, are not Caterpillar factory defects and therefore are NOT covered by Caterpillar's warranty.

Caterpillar is not in a position to evaluate the many auxiliary devices, accessories or consumables promoted by other manufacturers and their effect on Caterpillar products. Installation or use of such items is at the discretion of the customer who assumes ALL risks for the effects that result from this usage.

Furthermore, Caterpillar does not authorize the use of its

trade name, trademark, or logo in a manner which implies our endorsement of these aftermarket products.

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Sat Jan 28 2012 04:41:11 GMT-0800 (

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 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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i02857061

Safety Messages

SMCS - 7000; 7405

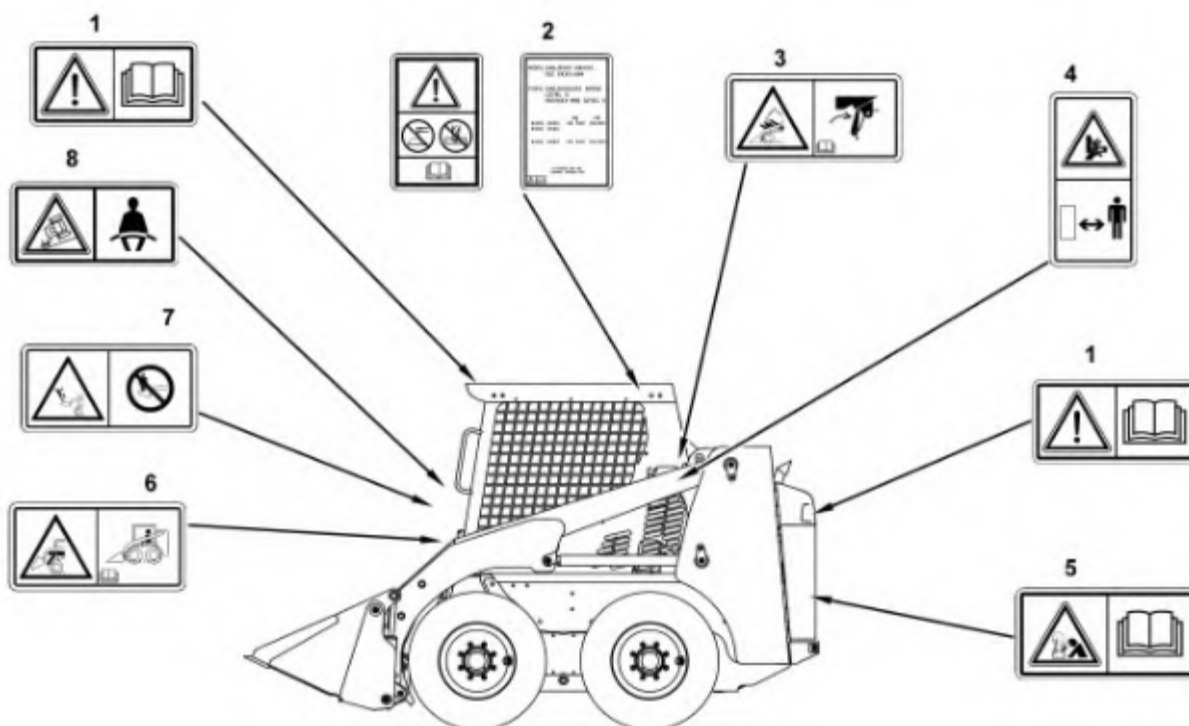


Illustration 1

g01428625

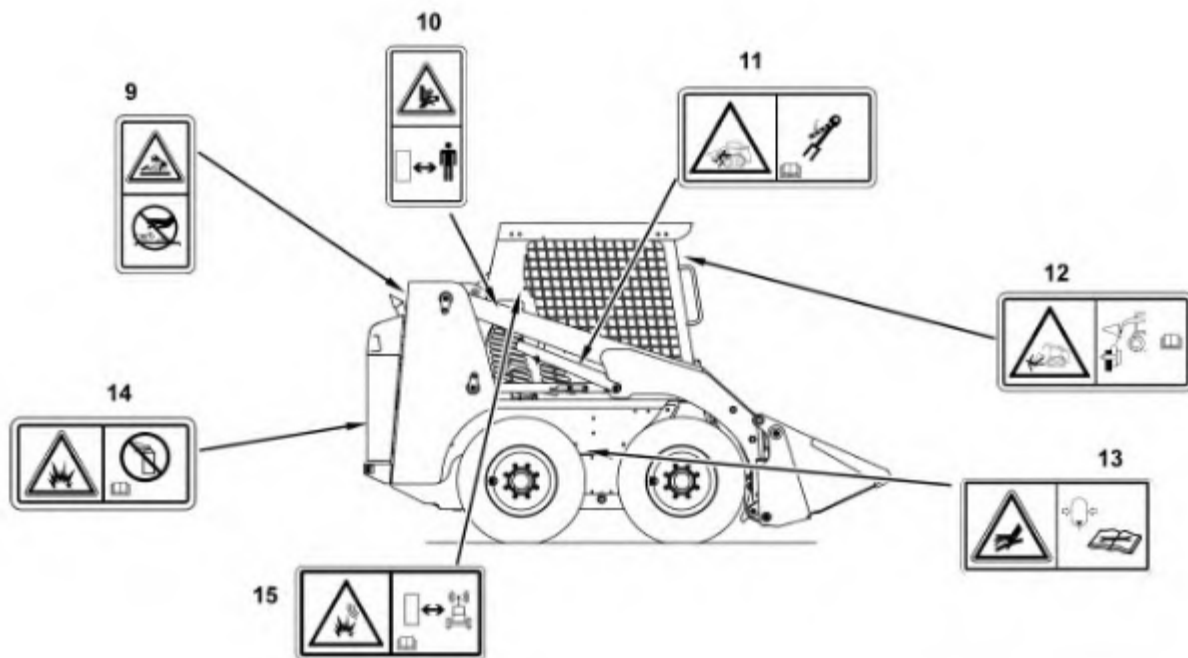


Illustration 2

g01423202

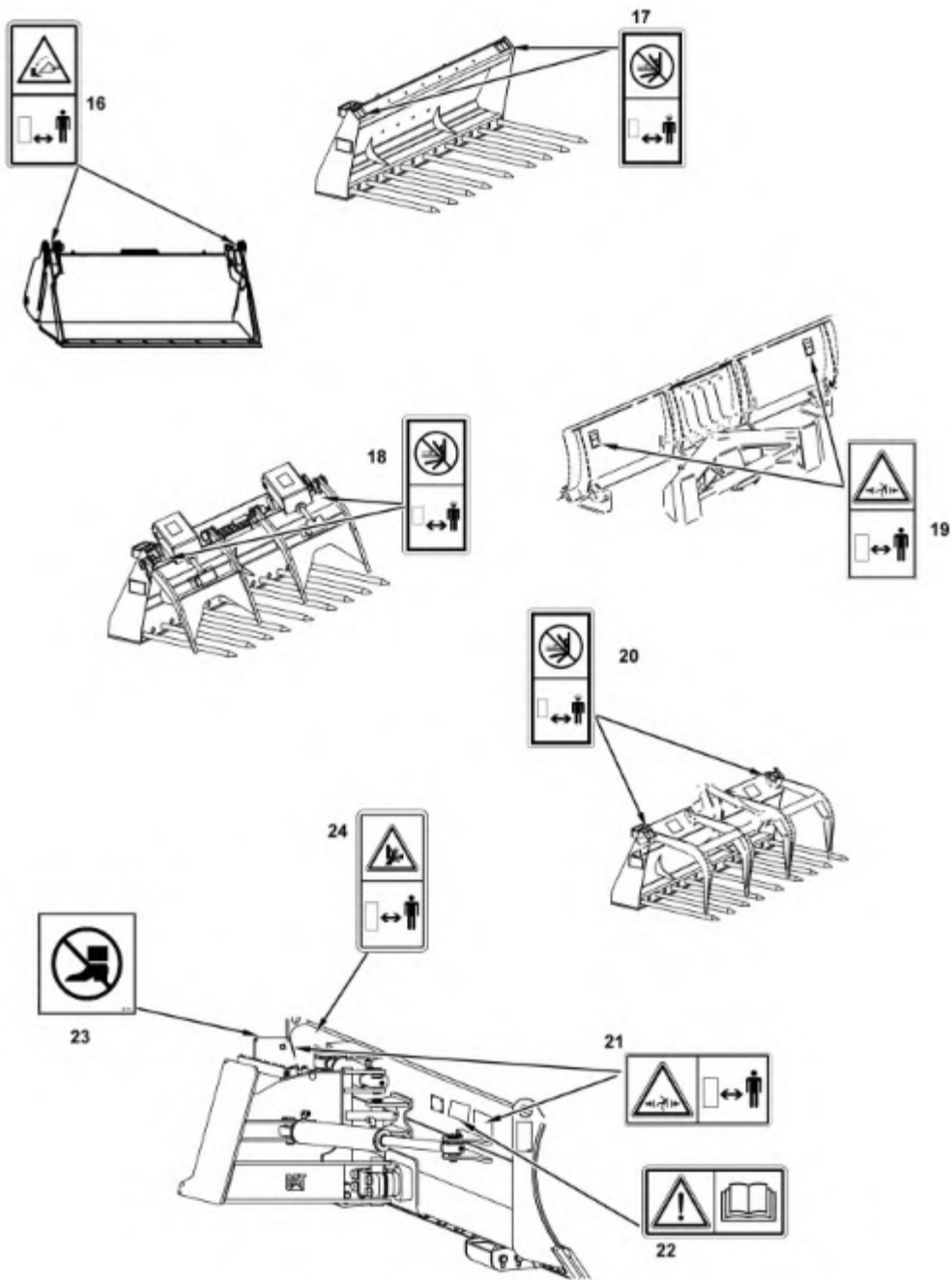


Illustration 3

g01433202

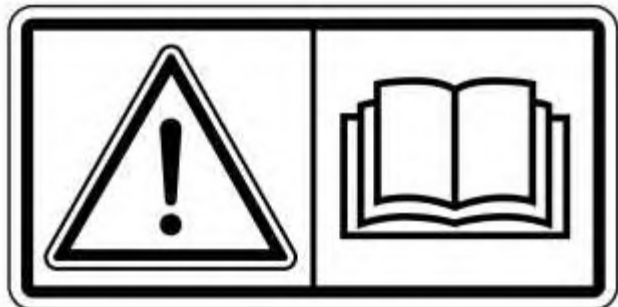
There are several specific safety messages on this machine. The exact location of the hazards and the description of the hazards are reviewed in this section. Please become familiarized with all safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages if you cannot read the words. Replace the illustrations if the illustrations are not legible. When you clean the safety messages, use a cloth, water and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the safety messages. Solvents, gasoline, or harsh chemicals could loosen the adhesive that secures the safety message. Loose adhesive will allow the safety message to fall.

Replace any safety message that is damaged, or missing. If a safety message is attached to a part that is replaced, install a safety message on the replacement part. Any Caterpillar dealer can provide new safety messages.

Do Not Operate (1)

This warning message is located inside the cab on the upper left side. This warning message is located also on the engine.



g01370904

WARNING

Read and understand the instructions and warnings in the operation and maintenance manuals. Contact any Caterpillar dealer for replacement manuals. Proper care is your responsibility.

Be alert! Know work conditions. Note and avoid all hazards and obstructions. Keep by-standers away when operating.

Fasten seat belt and lower armrest.

Make certain all controls are in neutral position and start engine.

Disengage parking brake.

Machine controls are active.

Failure to follow the instructions or heed the warnings could result injury or death.

Rollover Protective Structure/Falling Object Protective Structure (2)

This warning film and the certification film are located inside the cab on the upper left side.



g01211895

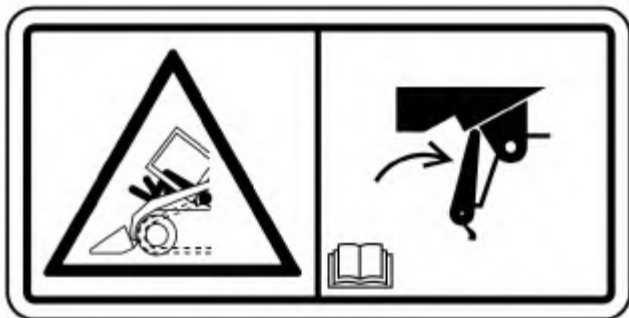
WARNING

Structural damage, an overturn, modification, alteration, or improper repair can impair this structure's protection capability thereby voiding this certification. Do not weld on or drill holes in the structure. Consult a Caterpillar dealer to determine this structure's limitations without voiding its certification.

This machine has been certified to the standards that are listed on the certification plate. The maximum mass of the machine, which includes the operator and the attachments without a payload, should not exceed the mass on the certification film.

Cab Support (3)

This warning message is located on the left side of the machine near the cab support lever. This warning message is also located inside the cab on the lower left side.



g01427440

WARNING

Do not go beneath cab unless cab is empty and support lever is engaged.

Failure to follow the instructions or heed the warnings could result in injury or death.

Crush Hazard (4)

This warning is located on the loader arms of the machines that are equipped with extended reach.



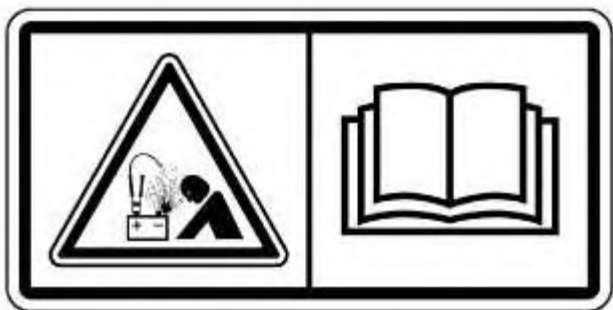
g01378775

! WARNING

No clearance for person in this area during operation. Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.

Batteries (5)

This warning message is located on the inside of the engine access door.



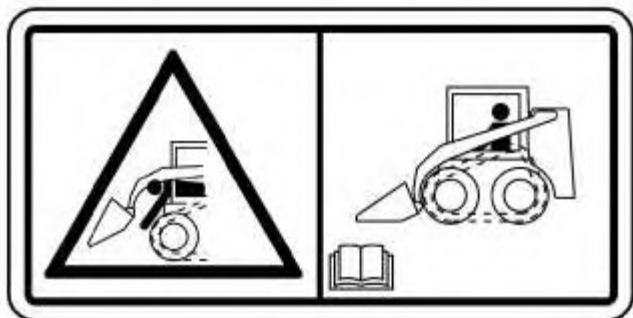
g01370909

WARNING

Improper jumper cable connections can cause explosion resulting in personal injury. Batteries may be located in separate compartments, always connect positive (+) cable to positive (+) terminal of battery connected to starter solenoid and negative (-) cable from external source to engine block or frame.

Stay Inside Operator Station (6)

This warning message is located below the operator seat.



g01427449

WARNING

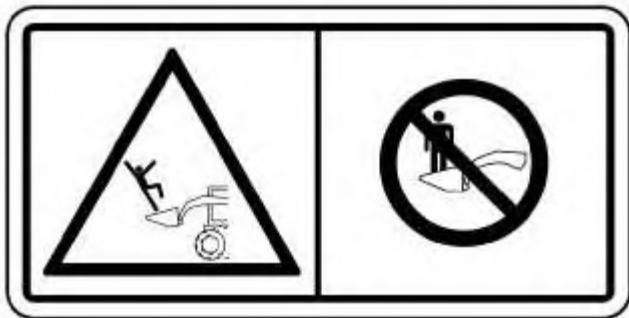
Keep your body inside the operator station while operating the loader.

Never work with your arms, feet or legs beyond the operator station.

Failure to follow the instructions or heed the warnings will result in injury or death.

Never Permit Riders (7)

This warning message is located below the operator seat.



g01427444

WARNING

Never permit riders.

Never use work tool for a work platform.

Failure to follow the instructions or heed the warnings could result in injury or death.

Seat Belt (8)

This warning message is located below the operator seat.



g01370908

WARNING

A seat belt should be worn at all times during machine operation to prevent serious injury or death in the event of an accident or machine overturn. Failure to wear a seat belt during machine operation may result in serious injury or death.

Refer to Operation and Maintenance Manual, "Seat Belt" for more information.

Pressurized System (9)

This warning message is located below the radiator cap.



g01378799

WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

Crush Hazard (10)

This warning is located on the loader arms.



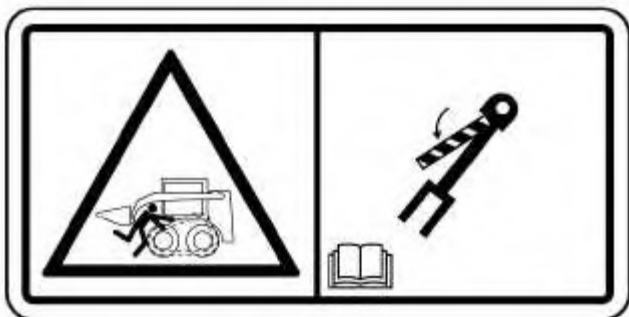
g01378775

! WARNING

No clearance for person in this area during operation.
Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.

Brace for the Loader Lift Arms (11)

This warning message is located on the brace for the loader lift arms.



g01427443

! WARNING

Loader lift arm brace must be in place when working under raised lift arms.

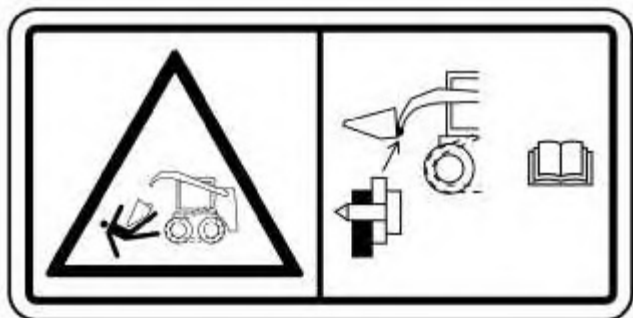
Failure to follow the instructions or heed the warnings

could result in injury or death.

Refer to Operation and Maintenance Manual, "Loader Lift Arm Brace Operation" for operating information.

Work Tool Coupler (12)

This warning message is located inside the cab on the upper left side.



g01427447

! WARNING

Improper Attachment of the Work Tool could result in injury or death.

Do not operate the machine without confirmation that the coupler pins are fully engaged. Follow the operating procedures in the Operation and Maintenance Manual.

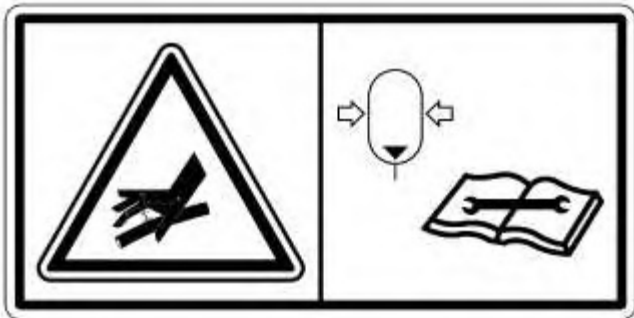
Tilt the work tool downward.

Put down pressure on the work tool.

Move the machine backward. Ensure that the work tool has not separated from the coupler assembly.

Accumulator (13)

This warning message is located near the accumulator underneath the cab.



g01370912

WARNING

Accumulator may contain high pressure oil. Do not service the accumulator or any hydraulic lines until all of the pressure has been relieved. See the Service Manual for proper procedures. Failure to heed this warning could result in injury or death.

Aerosol Starting Aid (14)

This warning message is located on top of the fuel pump housing.



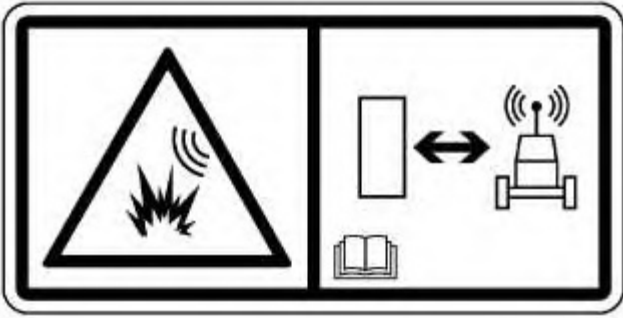
g01372254

WARNING

Do not use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury.

Product Link (15)

This safety message is located inside the cab on the right hand window.



g01370917

WARNING

This machine is equipped with a Caterpillar Product Link communication device which must be deactivated within 12 m (40 ft) of a blast zone. Failure to do so could result in serious injury or death.

Multipurpose Bucket (16)

These warning messages are located on the front of the multipurpose bucket.



g01389199

WARNING

No clearance for person in this area during operation. Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.

Utility Fork (17)

These warning messages are located on top of the fork carriage.



g01381064

 **WARNING**

**No clearance for person in this area during operation.
Severe injury or death from impalement could occur. Stay
away from the work tool while it is in operation.**

Industrial Grapple Fork (18)

These warning messages are located on top of the fork carriage.



g01381064

! WARNING

No clearance for person in this area during operation.
Severe injury or death from impalement could occur. Stay away from the work tool while it is in operation.

Angle Blade (19)

These warning messages are located on the back side of the blade.



g01377717

! WARNING

No clearance for person in this area during operation.
Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.

Utility Grapple Fork (20)

These warning messages are located on top of the fork carriage.



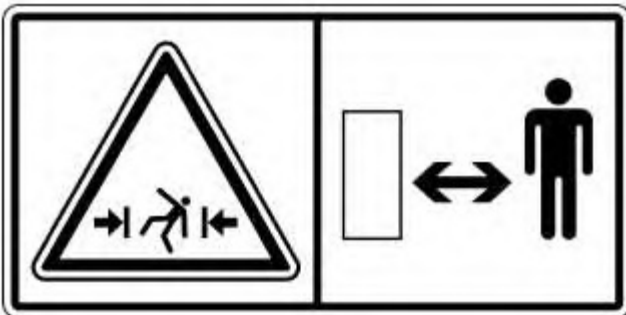
g01381064

WARNING

No clearance for person in this area during operation.
Severe injury or death from impalement could occur. Stay away from the work tool while it is in operation.

Dozer Blade (21)

These warning messages are located on the back side of the blade.



g01371644

WARNING

No clearance for person in this area during operation.
Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.

Dozer Blade (22)

This warning is located on right hand side on the back of the blade.



g01370904

WARNING

DO NOT OPERATE OR WORK ON THIS MACHINE UNLESS YOU HAVE READ AND UNDERSTAND THE INSTRUCTIONS AND WARNINGS IN THE OPERATION AND MAINTENANCE MANUALS. FAILURE TO FOLLOW THE INSTRUCTIONS OR HEED THE WARNINGS COULD RESULT IN INJURY OR DEATH. CONTACT ANY CATERPILLAR DEALER FOR REPLACEMENT MANUALS. PROPER CARE IS YOUR RESPONSIBILITY.

Dozer Blade (23)

This warning message is located on top of the dozer blade.



! WARNING

Falling Hazard - Area may be oily and slippery. Do not step on cylinders. Serious injury or death could occur from a fall.

Dozer Blade (24)

This warning message is located on top of the dozer blade.



g01378775

! WARNING

No clearance for person in this area during operation. Severe injury or death from crushing could occur. Stay away from the work tool while it is in operation.



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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i03557602

General Hazard Information

SMCS - 7000

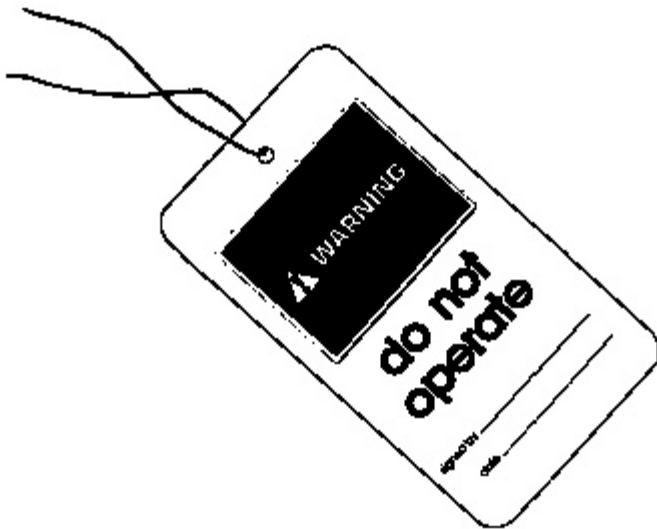


Illustration 1

g00104545

Attach a "Do Not Operate" warning tag or a similar warning tag to the start switch or to the controls before you service the equipment or before you repair the equipment. These warning tags (Special Instruction, SEHS7332) are available from your Caterpillar dealer.

Know the width of your equipment in order to maintain proper clearance when you operate the equipment near fences or near boundary obstacles.

Be aware of high voltage power lines and power cables that are buried. If the machine comes in contact with these hazards, serious injury or death may occur from electrocution.



Illustration 2

g00702020

Wear a hard hat, protective glasses, and other protective equipment, as required.

Do not wear loose clothing or jewelry that can snag on controls or on other parts of the equipment.

Make sure that all protective guards and all covers are secured in place on the equipment.

Keep the equipment free from foreign material. Remove debris, oil, tools, and other items from the deck, from walkways, and from steps.

Secure all loose items such as lunch boxes, tools, and other items that are not a part of the equipment.

Know the appropriate work site hand signals and the personnel that are authorized to give the hand signals. Accept hand signals from one person only.

Do not smoke when you service an air conditioner. Also, do not smoke if refrigerant gas may be present. Inhaling the fumes that are released from a flame that contacts air conditioner refrigerant can cause bodily harm or death. Inhaling gas from air conditioner refrigerant through a lighted cigarette can cause bodily harm or death.

Never put maintenance fluids into glass containers. Drain all liquids into a suitable container.

Obey all local regulations for the disposal of liquids.

Use all cleaning solutions with care. Report all necessary repairs.

Do not allow unauthorized personnel on the equipment.

Unless you are instructed otherwise, perform maintenance with the equipment in the servicing position. Refer to Operation and Maintenance Manual for the procedure for placing the equipment in the servicing position.

When you perform maintenance above ground level use appropriate devices such as ladders or man lift machines. If equipped, use the machine tie-downs and use approved fall arrest harnesses and lanyards.

Pressurized Air and Water

Pressurized air and/or water can cause debris and/or hot water to be blown out. This could result in personal injury.

When pressurized air and/or pressurized water is used for cleaning, wear protective clothing, protective shoes, and eye protection. Eye protection includes goggles or a protective face shield.

The maximum air pressure for cleaning purposes must be reduced to 205 kPa (30 psi) when the nozzle is deadheaded and the nozzle is used with an effective chip deflector and personal protective equipment. The maximum water pressure for cleaning purposes must be below 275 kPa (40 psi).

Trapped Pressure

Pressure can be trapped in a hydraulic system. Releasing trapped pressure can cause sudden machine movement or attachment movement. Use caution if you disconnect hydraulic lines or fittings. High pressure oil that is released can cause a hose to whip. High pressure oil that is released can cause oil to spray. Fluid penetration can cause serious injury and possible death.

Fluid Penetration

Pressure can be trapped in the hydraulic circuit long after the engine has been stopped. The pressure can cause hydraulic fluid or items such as pipe plugs to escape rapidly if the pressure is not relieved correctly.

Do not remove any hydraulic components or parts until pressure has been relieved or personal injury may occur. Do not disassemble any hydraulic components or parts until pressure has been relieved or personal injury may occur. Refer to the Service Manual for any procedures that are required to relieve the hydraulic pressure.

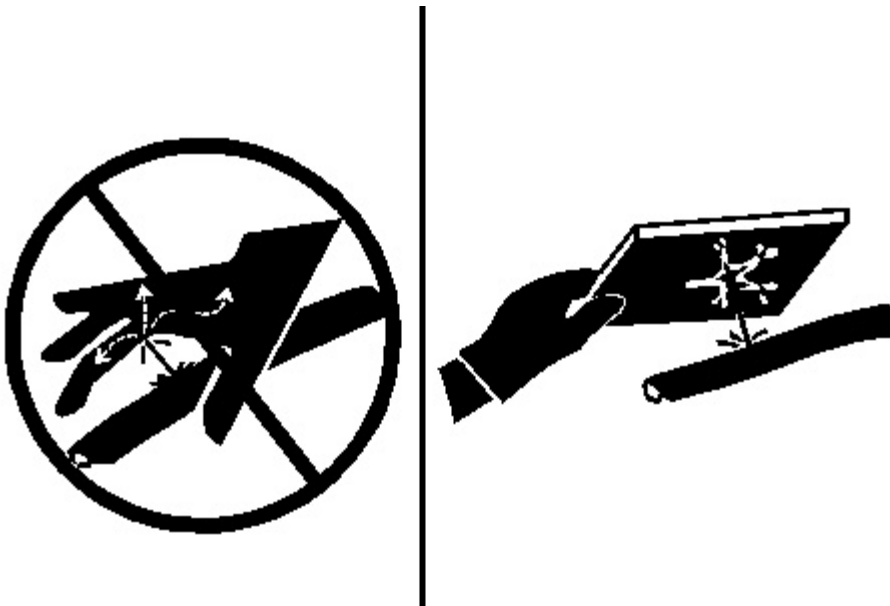


Illustration 3

g00687600

Always use a board or cardboard when you check for a leak. Leaking fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, you must get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.

Containing Fluid Spillage

Care must be taken in order to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the equipment. Prepare to collect the fluid with suitable containers before opening any compartment or disassembling any component that contains fluids.

Refer to Special Publication, NENG2500, "Caterpillar Dealer Service Tool Catalog" for the following items:

- Tools that are suitable for collecting fluids and equipment that is suitable for collecting fluids
- Tools that are suitable for containing fluids and equipment that is suitable for containing fluids

Obey all local regulations for the disposal of liquids.

Asbestos Information

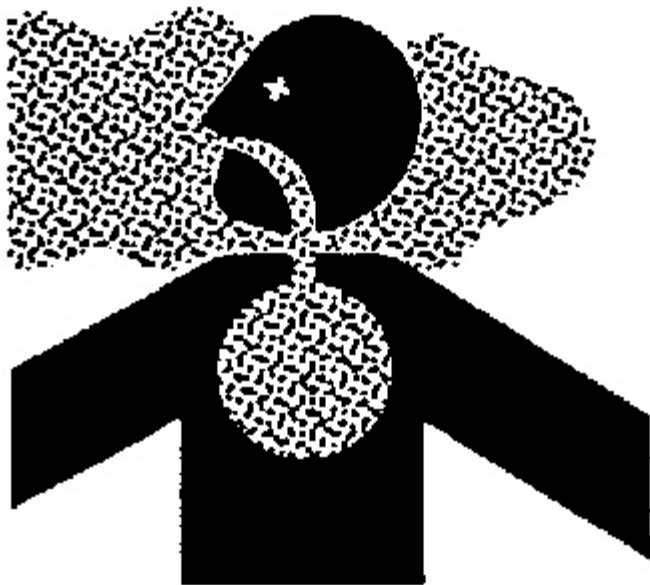


Illustration 4

g00702022

Caterpillar equipment and replacement parts that are shipped from Caterpillar are asbestos free. Caterpillar recommends the use of only genuine Caterpillar replacement parts. Use the following guidelines when you handle any replacement parts that contain asbestos or when you handle asbestos debris.

Use caution. Avoid inhaling dust that might be generated when you handle components that contain asbestos fibers. Inhaling this dust can be hazardous to your health. The components that may contain asbestos fibers are brake pads, brake bands, lining material, clutch plates, and some gaskets. The asbestos that is used in these components is usually bound in a resin or sealed in some way. Normal handling is not hazardous unless airborne dust that contains asbestos is generated.

If dust that may contain asbestos is present, there are several guidelines that should be followed:

- Never use compressed air for cleaning.
- Avoid brushing materials that contain asbestos.
- Avoid grinding materials that contain asbestos.

- Use a wet method in order to clean up asbestos materials.
- A vacuum cleaner that is equipped with a high efficiency particulate air filter (HEPA) can also be used.
- Use exhaust ventilation on permanent machining jobs.
- Wear an approved respirator if there is no other way to control the dust.
- Comply with applicable rules and regulations for the work place. In the United States, use Occupational Safety and Health Administration (OSHA) requirements. These OSHA requirements can be found in "29 CFR 1910.1001".
- Obey environmental regulations for the disposal of asbestos.
- Stay away from areas that might have asbestos particles in the air.

Dispose of Waste Properly

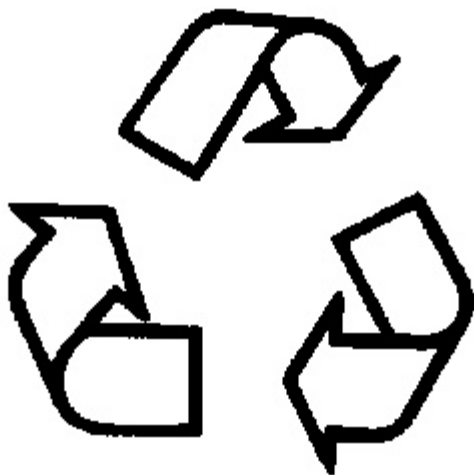


Illustration 5

g00706404

Improperly disposing of waste can threaten the environment. Potentially harmful fluids should be disposed of according to local regulations.

Always use leakproof containers when you drain fluids. Do not pour waste onto the ground, down a drain, or into any source of water.



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i01359664

Crushing Prevention and Cutting Prevention

SMCS - 7000

Support the equipment properly before you perform any work or maintenance beneath that equipment. Do not depend on the hydraulic cylinders to hold up the equipment. Equipment can fall if a control is moved, or if a hydraulic line breaks.

Do not work beneath the cab of the machine unless the cab is properly supported.

Unless you are instructed otherwise, never attempt adjustments while the machine is moving or while the engine is running.

Never jump across the starter solenoid terminals in order to start the engine. Unexpected machine movement could result.

Whenever there are equipment control linkages the clearance in the linkage area will change with the movement of the equipment or the machine. Stay clear of areas that may have a sudden change in clearance with machine movement or equipment movement.

Stay clear of all rotating and moving parts.

If it is necessary to remove guards in order to perform maintenance, always install the guards after the maintenance is performed.

Keep objects away from moving fan blades. The fan blade will throw objects or cut objects.

Do not use a kinked wire cable or a frayed wire cable. Wear gloves when you handle wire cable.

When you strike a retainer pin with force, the retainer pin can fly out. The loose retainer pin can injure personnel. Make sure that the area is clear of people when you strike a retainer pin. To avoid injury to your eyes, wear protective glasses when you strike a retainer pin.

Chips or other debris can fly off an object when you strike the object. Make sure that no one can be injured by flying debris before striking any object.



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i01329099

Burn Prevention

SMCS - 7000

Do not touch any part of an operating engine. Allow the engine to cool before any maintenance is performed on the engine. Relieve all pressure in the air system, in the oil system, in the lubrication system, in the fuel system, or in the cooling system before any lines, fittings or related items are disconnected.

Coolant

When the engine is at operating temperature, the engine coolant is hot. The coolant is also under pressure. The radiator and all lines to the heaters or to the engine contain 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.

Check the coolant level only after the engine has been stopped.

Ensure that the filler cap is cool before removing the filler cap. The filler cap must be cool enough to touch with a bare hand. Remove the filler cap slowly in order to relieve pressure.

Cooling system conditioner contains alkali. Alkali can cause personal injury. Do not allow alkali to contact the skin, the eyes, or the mouth.

Oils

Hot oil and hot components can cause personal injury. Do not allow hot oil to contact the skin. Also, do not allow hot components to contact the skin.

Remove the hydraulic tank filler cap only after the engine has been stopped. The filler cap must be cool enough to touch with a bare hand. Follow the standard procedure in this manual in order to remove the hydraulic tank filler cap.

Batteries

Electrolyte is an acid. Electrolyte can cause personal injury. Do not allow electrolyte to contact the skin or the eyes. Always wear protective glasses for servicing batteries. Wash hands after touching the batteries and connectors. Use of gloves is recommended.



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Fire Prevention and Explosion Prevention

SMCS - 7000



Illustration 1

g00704000

General

All fuels, most lubricants, and some coolant mixtures are flammable.

To minimize the risk of fire or explosion, Caterpillar recommends the following actions.

Always perform a Walk-Around Inspection, which may help you identify a fire hazard. Do not operate a machine when a fire hazard exists. Contact your Caterpillar dealer for service.

Understand the use of the primary exit and alternative exit on the machine. Refer to Operation and Maintenance Manual, "Alternative Exit".

Do not operate a machine with a fluid leak. Repair leaks and clean up fluids before resuming machine operation. Fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire. A fire may cause personal injury or death.

Remove flammable material such as leaves, twigs, papers, trash, etc. These items may accumulate in the engine compartment or around other hot areas and hot parts on the machine.

Keep the access doors to major machine compartments closed and access doors in working condition in order to permit the use of fire suppression equipment, in case a fire should occur.

Clean all accumulations of flammable materials such as fuel, oil and debris from the machine.

Do not operate the machine near any flame.

Keep shields in place. Exhaust shields (if equipped) protect hot exhaust components from oil spray or fuel spray in case of a break in a line, in a hose, or in a seal. Exhaust shields must be installed correctly.

Do not weld or flame cut on tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting. Ensure that the components are properly grounded in order to avoid unwanted arcs.

Dust that is generated from repairing nonmetallic hoods or fenders may be flammable and/or explosive. Repair such components in a well ventilated area away from open flames or sparks. Use suitable Personal Protection Equipment (PPE).

Inspect all lines and hoses for wear or deterioration. Replace damaged lines and hoses. The lines and the hoses should have adequate support and secure clamps. Tighten all connections to the recommended torque. Damage to the protective cover or insulation may provide fuel for fires.

Store fuels and lubricants in properly marked containers away from unauthorized personnel. Store oily rags and flammable materials in protective containers. Do not smoke in areas that are used for storing flammable materials.



Illustration 2

g00704059

Use caution when you are fueling a machine. Do not smoke while you are fueling a machine. Do not fuel a machine near open flames or sparks. Always stop the engine before fueling. Fill the fuel tank outdoors. Properly clean areas of spillage.

Follow practices for safe fueling that are described in the "Operation" section of the Operation and Maintenance Manual section and follow local regulations. Never store flammable fluids in the operator compartment of the machine.

Battery and Battery Cables

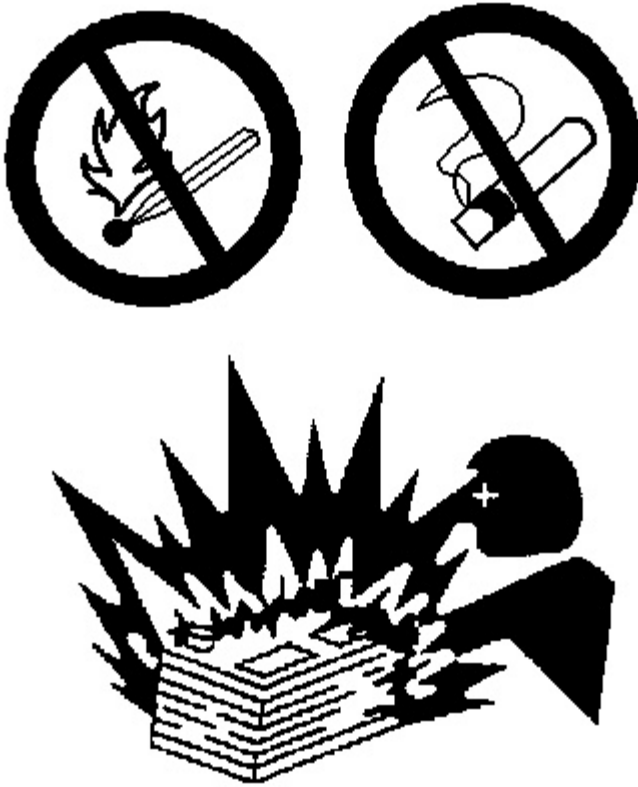


Illustration 3

g00704135

Caterpillar recommends the following in order to minimize the risk of fire or an explosion related to the battery.

Do not operate a machine if battery cables or related parts show signs of wear or damage. Contact your Caterpillar dealer for service.

Follow safe procedures for engine starting with jump start cables. Improper jumper cable connections can cause an explosion that may result in injury. Refer to Operation and Maintenance Manual, "Engine Starting with Jump Start Cables" for specific instructions.

Do not charge a frozen battery. This may cause an explosion.

Gases from a battery can explode. Keep any open flames or sparks away from the top of a battery. Do not smoke in battery charging areas.

Never check the battery charge by placing a metal object across the terminal posts. Use a voltmeter or a hydrometer.

Daily inspect battery cables that are in visible areas. Identify cables, clips, straps, and other restraints for damage. Replace these items if necessary. Look for signs of the following, which can occur over time due to use and environmental factors:

- Fraying
- Abrasion
- Cracking

- Discoloration
- Cuts on the insulation of the cable
- Fouling
- Corroded terminals, damaged terminals, and loose terminals

Replace damaged battery cable(s) and replace any related parts. Eliminate any fouling, which may have caused insulation failure or related component damage or wear. Ensure that all components are reinstalled correctly.

An exposed wire on the battery cable may cause a short to ground if the exposed area comes into contact with a grounded surface. A battery cable short produces heat from the battery current, which may be a fire hazard.

An exposed wire on the ground cable between the battery and the disconnect switch may cause the disconnect switch to be bypassed if the exposed area comes into contact with a grounded surface. This may result in an unsafe condition for servicing the machine. Repair components or replace components before servicing the machine.



WARNING

Fire on a machine can result in personal injury or death. Exposed battery cables that come into contact with a grounded connection can result in fires. Replace cables and related parts that show signs of wear or damage. Contact your Caterpillar dealer.

Wiring

Check electrical wires daily. If any of the following conditions exist, replace parts before you operate the machine.

- Fraying
- Signs of abrasion or wear
- Cracking
- Discoloration
- Cuts on insulation
- Other damage

Make sure that all clamps, guards, clips, and straps are reinstalled correctly. This will help to prevent vibration, rubbing against other parts, and excessive heat during machine operation.

Attaching electrical wiring to hoses and tubes that contain flammable fluids or combustible fluids should be avoided.

Consult your Caterpillar dealer for repair or for replacement parts.

Keep wiring and electrical connections free of debris.

Lines, Tubes and Hoses

Do not bend high pressure lines. Do not strike high pressure lines. Do not install any lines that are bent or damaged. Use the appropriate backup wrenches in order to tighten all connections to the recommended torque.

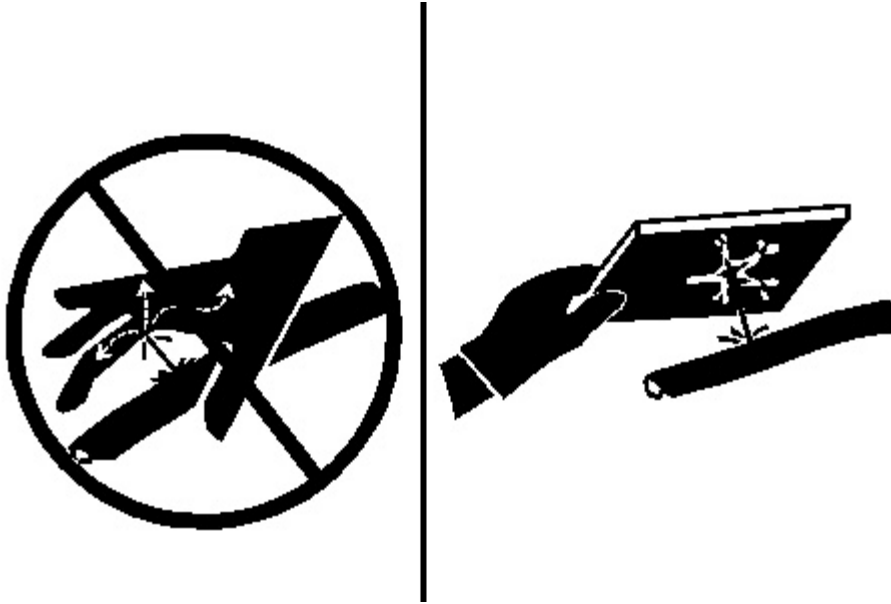


Illustration 4

g00687600

Check lines, tubes and hoses carefully. Wear Personal Protection Equipment (PPE) in order to check for leaks. Always use a board or cardboard when you check for a leak. Leaking fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, you must get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.

Replace the affected parts if any of the following conditions are present:

- End fittings are damaged or leaking.
- Outer coverings are chafed or cut.
- Wires are exposed.
- Outer coverings are swelling or ballooning.
- Flexible parts of the hoses are kinked.
- Outer covers have exposed embedded armoring.
- End fittings are displaced.

Make sure that all clamps, guards, and heat shields are installed correctly. During machine operation, this will help to prevent vibration, rubbing against other parts, excessive heat, and failure of lines, tubes and hoses.

Do not operate a machine when a fire hazard exists. Repair any lines that are corroded, loose or damaged.

Leaks may provide fuel for fires. Consult your Caterpillar dealer for repair or for replacement parts. Use genuine Caterpillar parts or the equivalent, for capabilities of both the pressure limit and temperature limit.

Ether

Ether (if equipped) is commonly used in cold weather applications. Ether is flammable and poisonous.

Follow the correct cold engine starting procedures. Refer to the section in the Operation and Maintenance Manual with the label "Engine Starting".

Do not spray ether into an engine if the machine is equipped with a thermal starting aid for cold weather starting.

Use ether in well ventilated areas. Do not smoke while you are replacing an ether cylinder or while you are using an ether spray.

Do not store ether cylinders in living areas or in the operator compartment of a machine. Do not store ether cylinders in direct sunlight or in temperatures above 49° C (120.2° F). Keep ether cylinders away from open flames or sparks.

Dispose of used ether cylinders properly. Do not puncture an ether cylinder. Keep ether cylinders away from unauthorized personnel.

Fire Extinguisher

As an additional safety measure, keep a fire extinguisher on the machine.

Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher regularly. Follow the recommendations on the instruction plate.

Consider installation of an aftermarket Fire Suppression System, if the application and working conditions warrant the installation.



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i01820946

Fire Extinguisher Location

SMCS - 7000; 7419

Make sure that a fire extinguisher is on the machine. Make sure that you are familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher. Obey the recommendations on the instruction plate.

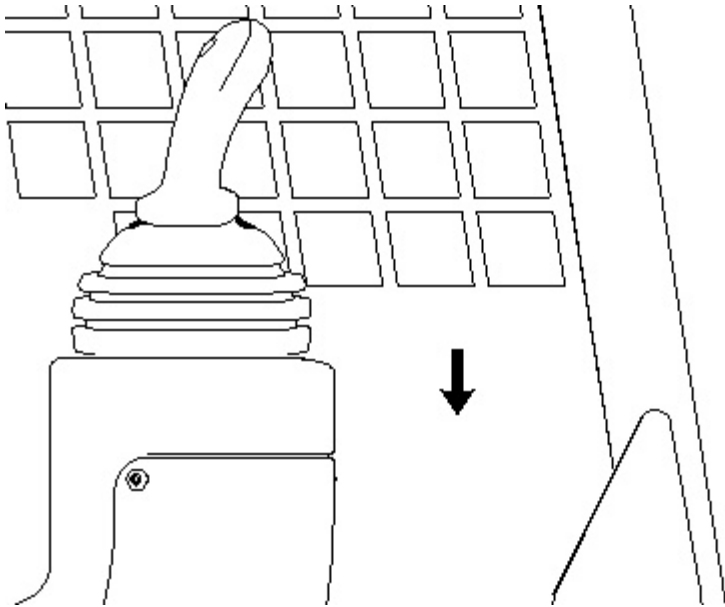


Illustration 1

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Mount the fire extinguisher on the left side of the cab floor in front of the console for the speed/direction control. Consult your Caterpillar dealer for the proper procedure for mounting the fire extinguisher.



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Electrical Storm Injury Prevention

SMCS - 7000

When lightning is striking in the vicinity of the machine, the operator should never attempt the following procedures:

- Mount the machine.
- Dismount the machine.

If you are in the operator's station during an electrical storm, stay in the operator's station. If you are on the ground during an electrical storm, stay away from the vicinity of the machine.

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Before Starting Engine

SMCS - 1000; 7000

Start the engine only from the operator compartment. Never short across the starter terminals or across the batteries. Shorting could damage the electrical system by bypassing the engine neutral start system.

Inspect the condition of the seat belt and of the mounting hardware. Replace any parts that are worn or damaged. Regardless of appearance, replace the seat belt after three years of use. Do not use a seat belt extension on a retractable seat belt.

Adjust the seat so that full pedal travel can be achieved with the operator's back against the back of the seat.

Make sure that the machine is equipped with a lighting system that is adequate for the job conditions. Make sure that all machine lights are working properly.

Before you start the engine and before you move the machine, make sure that no one is underneath the machine, around the machine, or on the machine. Make sure that the area is free of personnel.



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Visibility Information

SMCS - 7000

Before you start the machine, perform a walk-around inspection in order to ensure that there are no hazards around the machine.

While the machine is in operation, constantly survey the area around the machine in order to identify potential hazards as hazards become visible around the machine.

Your machine may be equipped with visual aids. Some examples of visual aids are Closed Circuit Television (CCTV) and mirrors. Before operating the machine, ensure that the visual aids are in proper working condition and that the visual aids are clean. Adjust the visual aids using the procedures that are located in this Operation and Maintenance Manual. If equipped, the Work Area Vision System shall be adjusted according to Operation and Maintenance Manual, SEBU8157, "Work Area Vision System".

It may not be possible to provide direct visibility on large machines to all areas around the machine. Appropriate job site organization is required in order to minimize hazards that are caused by restricted visibility. Job site organization is a collection of rules and procedures that coordinates machines and people that work together in the same area. Examples of job site organization include the following:

- Safety instructions
- Controlled patterns of machine movement and vehicle movement
- Workers that direct traffic to move when it is safe
- Restricted areas
- Operator training
- Warning symbols or warning signs on machines or on vehicles
- A system of communication
- Communication between workers and operators prior to approaching the machine

Modifications of the machine configuration by the user that result in a restriction of visibility shall be evaluated.



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Engine Starting

SMCS - 1000; 7000

If a warning tag is attached to the start switch or to the controls, do not start the engine. Also, do not move any controls.

Move all hydraulic controls to the HOLD position before you start the engine.

Diesel engine exhaust contains products of combustion which can be harmful to your health. Always start the engine in a well ventilated area. Always operate the engine in a well ventilated area. If you are in an enclosed area, vent the exhaust to the outside.

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Before Operation

SMCS - 7000

Video tapes and safety information are available in English for the machine. A list of some of the material is available in the Operation and Maintenance Manual, "Reference Material". Consult your Caterpillar dealer in order to obtain copies of the material. The information should be reviewed by every person that operates the machine.

Clear all personnel from the machine and from the area.

Clear all obstacles from the path of the machine. Beware of hazards such as wires, ditches, etc.

Make sure that all windows are clean. Secure all doors in the closed position. Secure the windows in the open position or in the shut position.

Make sure that the machine horn, the backup alarm and all other warning devices are working properly.

Fasten the seat belt securely. Lower the armrest.

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Operation

SMCS - 7000

Only operate the machine while you are in the seat. The seat belt must be fastened while you operate the machine. Only operate the controls while the engine is running.

Before you move the machine, you must be certain that no one will be endangered.

While you operate the machine and the work tool slowly in an open area, check for proper operation of all controls and all protective devices.

Do not allow riders on the machine.

Note any needed repairs during machine operation. Report any needed repairs.

Use Caterpillar Approved Work Tools on this machine. Obey all the lift restrictions. Refer to Operation and Maintenance Manual, "Caterpillar Approved Work Tools" for the approved work tools and the lift restriction information.

Carry work tools low. Lower the lift arms fully. Tilt back the work tool in order to keep the work tool off of the ground. Do not go close to the edge of a cliff, an excavation, or an overhang.

If the machine begins to sideslip downward on a grade, immediately remove the load and turn the machine downhill.

Avoid any conditions that can lead to tipping the machine. The machine can tip when you work on hills, on banks and on slopes. Also, the machine can tip when you cross ditches, ridges or other unexpected obstacles.

Avoid operating the machine across the slope. When possible, operate the machine up the slopes and down the slopes.

Maintain control of the machine. Do not overload the machine beyond the machine capacity.

Never straddle a wire cable. Never allow personnel to straddle a wire cable.

Know the maximum dimensions of your machine.

Always keep the Rollover Protective Structure (ROPS) installed during machine operation.

This machine is designed to operate in the ambient temperature range of -32 °C (-25 °F) to 43 °C (109.4 °F).⁴⁷

Observe all applicable local government regulations when you use the Skid Steer Loader to lift heavy objects.

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Work Tools

SMCS - 6700

Only use work tools that are approved by Caterpillar for use on Caterpillar machines. Refer to the Operation and Maintenance Manual, "Caterpillar Approved Work Tools".

If you are in doubt about the compatibility of a particular work tool with your machine, consult your Caterpillar dealer.

Make sure that all necessary guarding is in place on the host machine and on the work tool.

Keep all windows and doors closed on the host machine. Always wear protective glasses. Always wear the protective equipment that is recommended in the work tool's operation manual. Wear any other protective equipment that is required for the operating environment.

To prevent personnel from being struck by flying objects, ensure that all personnel are out of the work area.

While you are performing any maintenance, any testing, or any adjustments to the work tool stay clear of the following areas: cutting edges, pinching surfaces and crushing surfaces.



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Parking

SMCS - 7000

Park on a level surface. If you must park on a grade, chock the machine.

1. Move the speed/direction control lever slowly to the HOLD position in order to stop the machine.
2. Move the governor control lever to the LOW IDLE position.
3. Lower the loader arms and tilt the linkage so that the work tool rests firmly on the ground.
4. Move the hydraulic control levers to the HOLD position.
5. Turn the engine start switch key to OFF position and remove the key.
6. Raise the armrest and exit the machine.



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Slope Operation

SMCS - 7000

Machines that are operating safely in various applications depend on these criteria: the machine model, configuration, machine maintenance, operating speed of the machine, conditions of the terrain, fluid levels and tire inflation pressures. The most important criteria are the skill and judgment of the operator.

A well trained operator that follows the instructions in the Operation and Maintenance Manual has the greatest impact on stability. Operator training provides a person with the following abilities: observation of working and environmental conditions, feel for the machine, identification of potential hazards and operating the machine safely by making appropriate decisions.

When you work on side hills and when you work on slopes, consider the following important points:

Speed of travel - At higher speeds, forces of inertia tend to make the machine less stable.

Roughness of terrain or surface - The machine may be less stable with uneven terrain.

Direction of travel - Avoid operating the machine across the slope. When possible, operate the machine up the slopes and operate the machine down the slopes. Place the heaviest end of the machine uphill when you are working on an incline.

Mounted equipment - Balance of the machine may be impeded by the following components: equipment that is mounted on the machine, machine configuration, weights and counterweights.

Nature of surface - Ground that has been newly filled with earth may collapse from the weight of the machine.

Surface material - Rocks and moisture of the surface material may drastically affect the machine's traction and machine's stability. Rocky surfaces may promote side slipping of the machine.

Slippage due to excessive loads - This may cause downhill tracks or downhill tires to dig into the ground, which will increase the angle of the machine.

Width of tracks or tires - Narrower tracks or narrower tires further increase the digging into the ground which causes the machine to be less stable.

Implements attached to the drawbar - This may decrease the weight on the uphill tracks. This may also decrease the weight on the uphill tires. The decreased weight will cause the machine to be less stable.

Height of the working load of the machine - When the working loads are in higher positions, the stability of the machine is reduced.

Operated equipment - Be aware of performance features of the equipment in operation and the effects on machine stability.

Operating techniques - Keep all attachments or pulled loads low to the ground for optimum stability.

Machine systems have limitations on slopes - Slopes can affect the proper function and operation of the various machine systems. These machine systems are needed for machine control on slopes.

Note: Safe operation on steep slopes may require special machine maintenance. Excellent skill of the operator and proper equipment for specific applications are also required. Consult the Operation and Maintenance Manual sections for the proper fluid level requirements and intended machine use.



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Equipment Lowering with Engine Stopped

SMCS - 7000

Before lowering any equipment with the engine stopped, clear the area around the equipment of all personnel. The procedure to use will vary with the type of equipment to be lowered. Keep in mind most systems use a high pressure fluid or air to raise or lower equipment. The procedure will cause high pressure air, hydraulic, or some other media to be released in order to lower the equipment. Wear appropriate personal protective equipment and follow the established procedure in the Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped" in the Operation Section of the manual.

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Sound Information and Vibration Information

SMCS - 7000

Sound Level Information

The operator Equivalent Sound Pressure Level (Leq) is 89 dB(A) when "ANSI/SAE J1166 OCT 98" is used to measure the value for an enclosed cab. This is a work cycle sound exposure level. The cab was properly installed and maintained. The test was conducted with the cab doors and the cab windows closed.

Hearing protection may be needed when the machine is operated with an open operator station for extended periods or in a noisy environment. Hearing protection may be needed when the machine is operated with a cab that is not properly maintained or when the doors and windows are open for extended periods or in a noisy environment.

The average exterior sound pressure level is 72 dB(A) when the "SAE J88Apr95 - Constant Speed Moving Test" procedure is used to measure the value for the standard machine. The measurement was conducted under the following conditions: distance of 15 m (49.2 ft) and "the machine moving forward in an intermediate gear ratio".

Sound Level Information for Machines in European Union Countries and in Countries that Adopt the "EU Directives"

The dynamic operator sound pressure level is 89 dB(A) when "ISO 6396:1992" is used to measure the value for an enclosed cab. The cab was properly installed and maintained. The test was conducted with the cab doors and the cab windows closed.

"The European Union Physical Agents (Vibration) Directive 2002/44/EC"

Vibration Data for Skid Steer Loaders

Information Concerning Hand/Arm Vibration Level

When the machine is operated according to the intended use, the hand/arm vibration of this machine is below 2.5 meter per second squared.

Information Concerning Whole Body Vibration Level

This section provides vibration data and a method for estimating the vibration level for skid steer loaders.

Note: Vibration levels are influenced by many different parameters. Many items are listed below.

- Operator training, behavior, mode and stress
- Job site organization, preparation, environment, weather and material
- Machine type, quality of the seat, quality of the suspension system, attachments and condition of the equipment

It is not possible to get precise vibration levels for this machine. The expected vibration levels can be estimated with the information in Table 2 in order to calculate the daily vibration exposure. A simple evaluation of the machine application can be used.

Estimate the vibration levels for the three vibration directions. For typical operating conditions, use the average vibration levels as the estimated level. With an experienced operator and smooth terrain, subtract the Scenario Factors from the average vibration level in order to obtain the estimated vibration level. For aggressive operations and severe terrain, add the Scenario Factors to the average vibration level in order to obtain the estimated vibration level.

Note: All vibration levels are in meter per second squared.

Table 1

"ISO Reference Table A - Equivalent vibration levels of whole body vibration emission for earthmoving equipment."							
Machine Type	Typical Operating Activity	Vibration Levels			Scenario Factors		
		X axis	Y axis	Z axis	X axis	Y axis	Z axis
Skid Steer Loader	load and carry motion	0,86	0,73	0,93	0,30	0,33	0,35

Note: Refer to "ISO/TR 25398 Mechanical Vibration - Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines" for more information about vibration. This publication uses data that is measured by international institutes, organizations and manufacturers. This document provides information about the whole body exposure of operators of earthmoving equipment. Refer to Operation and Maintenance Manual, SEBU8257, "The European Union Physical Agents (Vibration) Directive 2002/44/EC" for more information about machine vibration levels.

The Caterpillar suspension seat meets the criteria of "ISO 7096". This represents vertical vibration level under severe operating conditions. This seat is tested with the input "spectral class EM9". The seat has a transmissibility factor of "SEAT<0.9".

The whole body vibration level of the machine varies. There is a range of values. The low value is 0.5 meter per second squared. The machine meets the short term level for the design of the seat in "ISO 7096". The value is 1.59 meter per second squared for this machine.

Guidelines for Reducing Vibration Levels on Earthmoving Equipment

Properly adjust machines. Properly maintain machines. Operate machines smoothly. Maintain the conditions of the terrain. The following guidelines can help reduce the whole body vibration level:

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer's recommendations.
 - a. Tire pressures
 - b. Brake and steering systems
 - c. Controls, hydraulic system and linkages
3. Keep the terrain in good condition.
 - a. Remove any large rocks or obstacles.
 - b. Fill any ditches and holes.
 - c. Provide machines and schedule time in order to maintain the conditions of the terrain.
4. Use a seat that meets "ISO 7096". Keep the seat maintained and adjusted.
 - a. Adjust the seat and suspension for the weight and the size of the operator.
 - b. Inspect and maintain the seat suspension and adjustment mechanisms.
5. Perform the following operations smoothly.
 - a. Steer
 - b. Brake
 - c. Accelerate.
 - d. Shift the gears.
6. Move the attachments smoothly.
7. Adjust the machine speed and the route in order to minimize the vibration level.
 - a. Drive around obstacles and rough terrain.
 - b. Slow down when it is necessary to go over rough terrain.
8. Minimize vibrations for a long work cycle or a long travel distance.
 - a. Use machines that are equipped with suspension systems.
 - b. Use the ride control system on skid steer loaders.
 - c. If no ride control system is available, reduce speed in order to prevent bounce.
 - d. Haul the machines between workplaces.
9. Less operator comfort may be caused by other risk factors. The following guidelines can be effective in order to provide better operator comfort:
 - a. Adjust the seat and adjust the controls in order to achieve good posture.
 - b. Adjust the mirrors in order to minimize twisted posture.

- c. Provide breaks in order to reduce long periods of sitting.
- d. Avoid jumping from the cab.
- e. Minimize repeated handling of loads and lifting of loads.
- f. Minimize any shocks and impacts during sports and leisure activities.

Sources

The vibration information and calculation procedure is based on "ISO/TR 25398 Mechanical Vibration - Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines". Harmonized data is measured by international institutes, organizations and manufacturers.

This literature provides information about assessing the whole body vibration exposure of operators of earthmoving equipment. The method is based on measured vibration emission under real working conditions for all machines.

You should check the original directive. This document summarizes part of the content of the applicable law. This document is not meant to substitute the original sources. Other parts of these documents are based on information from the United Kingdom Health and Safety Executive.

Refer to Operation and Maintenance Manual, SEBU8257, "The European Union Physical Agents (Vibration) Directive 2002/44/EC" for more information about vibration.

Consult your local Caterpillar dealer for more information about machine features that minimize vibration levels. Consult your local Caterpillar dealer about safe machine operation.

Use the following web site in order to find your local dealer:

Caterpillar, Inc.
www.cat.com



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

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Guards - Operator Protection

SMCS - 7150-MCH; 7325

There are different types of guards that are used to protect the operator. The machine and the machine application determines the type of guard that should be used.

A daily inspection of the guards is required in order to check for structures that are bent, cracked or loose. Never operate a machine with a damaged structure.

The operator becomes exposed to a hazardous situation if the machine is used improperly or if poor operating techniques are used. This situation can occur even though a machine is equipped with an appropriate protective guard. Follow the established operating procedures that are recommended for your machine.

Rollover Protective Structure (ROPS), Falling Object Protective Structure (FOPS) or Tip Over Protection Structure (TOPS)

The ROPS/FOPS Structure (if equipped) on your machine is specifically designed, tested and certified for that machine. Excavators are not equipped with ROPS structures. Any alteration or any modification to the ROPS/FOPS Structure could weaken the structure. This places the operator into an unprotected environment. Modifications or attachments that cause the machine to exceed the weight that is stamped on the certification plate also place the operator into an unprotected environment. Excessive weight may inhibit the brake performance, the steering performance and the ROPS. The protection that is offered by the ROPS/FOPS Structure will be impaired if the ROPS/FOPS Structure has structural damage. Damage to the structure can be caused by an overturn, a falling object, a collision, etc.

Do not mount items (fire extinguishers, first aid kits, work lights, etc) by welding brackets to the ROPS/FOPS Structure or by drilling holes in the ROPS/FOPS Structure. Welding brackets or drilling holes in the ROPS/FOPS Structures can weaken the structures. Consult your Caterpillar dealer for mounting guidelines.

The Tip Over Protection Structure (TOPS) is another type of guard that is used on mini hydraulic excavators. This structure protects the operator in the event of a tipover. The same guidelines for the inspection, the maintenance and the modification of the ROPS/FOPS Structure are required for the Tip Over Protection Structure.

Other Guards (If Equipped)

Protection from flying objects and/or falling objects is required for special applications. Logging applications and demolition applications are two examples that require special protection.

A front guard needs to be installed when a work tool that creates flying objects is used. Mesh front guards that are approved by Caterpillar or polycarbonate front guards that are approved by Caterpillar are available for machines with a cab or an open canopy. On machines that are equipped with cabs, the windshield should also be closed. Safety glasses are recommended when flying hazards exist for machines with cabs and machines with open canopies.

If the work material extends above the cab, top guards and front guards should be used. Typical examples of this type of application are listed below:

- Demolition applications
- Rock quarries
- Forestry products

Additional guards may be required for specific applications or work tools. The Operation and Maintenance Manual for your machine or your work tool will provide specific requirements for the guards. Consult your Caterpillar dealer for additional information.



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
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Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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i03022785

Rated Load

SMCS - 6001; 6136; 6542; 7000

Bucket Rated Load

WARNING

Failure to comply to the rated load can cause possible personal injury or property damage. Review the rated load of a particular work tool before performing any operation. Make adjustments to the rated load as necessary for non-standard configurations.

Note: Rated loads should be used as a guide. Attachments, uneven ground conditions, soft ground conditions, or poor ground conditions have effects on rated loads. The operator is responsible for being aware of these effects.

WARNING

Machine stability is affected by many factors, including the type of work tool and the position of a work tool.

Machine stability and machine control can be significantly affected if a work tool is not installed. Operating a machine without a work tool can lead to loss of control or tipping of the machine which could result in serious injury or death.

When you operate a machine without a work tool, avoid the following conditions:

- excessive speed
- sharp turns
- abrupt implement movement

- slopes and uneven ground

Rated loads are based upon a standard machine with the following conditions:

- lubricants
- full fuel tank
- 75 kg (165 lb) operator
- 10 x 16.5 tires on 216B, 226B, and 232B machines
- 12 x 16.5 tires on 236B, 242B, 246B, 248B, 252B, 262B and 268B machines

Rated loads will vary with different attachments. Contact your Caterpillar dealer regarding the rated load for specific attachments.

The rated operating capacity is defined by the SAE standard "J818" (May 1987) and by the ISO 5998 (1986) as no more than 50% of the static tipping load.

The corresponding dump clearance is given for each bucket at maximum lift height and at a 40 degree dump angle. The reach is given for each bucket at maximum lift height and at a 40 degree dump angle. Clearance is measured from the ground to the bucket edge in order to dump the load. The reach is measured from the front tire to the bucket edge.

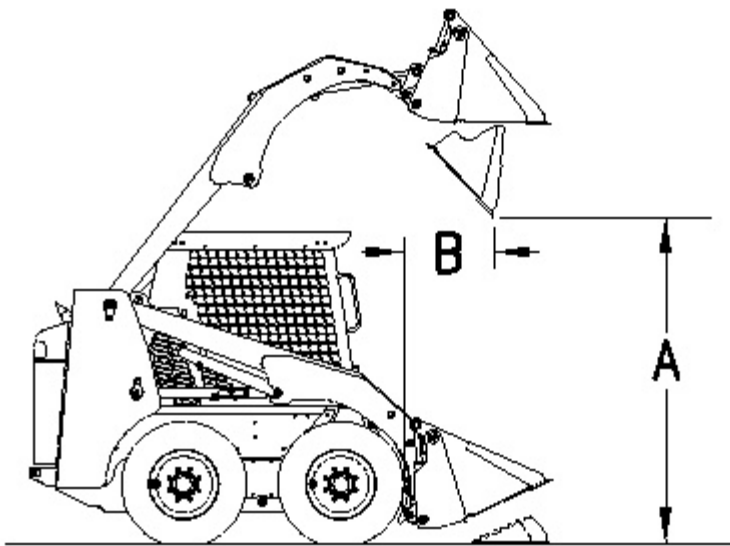


Illustration 1

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Dimension (A) represents the dump clearance. Dimension (B) represents the reach.

The following tables provide the rated operating loads (R.O.C) for the standard machine configuration with a bucket.

Table 1

General Purpose Buckets				
Part	165-6152	165-6153	165-6154	199-7720

	Number				
	Width	1524 mm (60 inch)	1676 mm (66 inch)	1829 mm (72 inch)	1981 mm (78 inch)
	Rated Volume	0.36 m ³ (0.47 yd ³)	0.40 m ³ (0.52 yd ³)	0.44 m ³ (0.57 yd ³)	0.48 m ³ (0.62 yd ³)
	Bucket Weight	200 kg (441 lb)	216 kg (476 lb)	224 kg (494 lb)	238 kg (525 lb)
Models					
216B	R.O.C	592 kg (1305 lb)	582 kg (1283 lb)	NR	NR
226B	R.O.C	629 kg (1387 lb)	620 kg (1367 lb)	NR	NR
226B ⁽¹⁾	R.O.C	633 kg (1396 lb)	623 kg (1373 lb)	NR	NR
232B	R.O.C	838 kg (1848 lb)	828 kg (1825 lb)	824 kg (1817 lb)	NR
236B	R.O.C	852 kg (1878 lb)	843 kg (1859 lb)	838 kg (1848 lb)	831 kg (1832 lb)
242B	R.O.C	876 kg (1931 lb)	866 kg (1909 lb)	861 kg (1898 lb)	NR
242B ⁽¹⁾	R.O.C	894 kg (1971 lb)	884 kg (1949 lb)	880 kg (1940 lb)	NR
246B	R.O.C	891 kg (1964 lb)	881 kg (1942 lb)	877 kg (1933 lb)	869 kg (1916 lb)
248B	R.O.C	893 kg (1969 lb)	883 kg (1947 lb)	879 kg (1938 lb)	871 kg (1920 lb)
252B	R.O.C	1206 kg (2659 lb)	1195 kg (2635 lb)	1191 kg (2626 lb)	1183 kg (2608 lb)
262B	R.O.C	1206 kg (2659 lb)	1195 kg (2635 lb)	1191 kg (2626 lb)	1183 kg (2608 lb)

268B	R.O.C	1206 kg (2659 lb)	1195 kg (2635 lb)	1191 kg (2626 lb)	1183 kg (2608 lb)
216B and 226B	(B)	609 mm (2.0 ft)	609 mm (2.0 ft)	NR	NR
232B	(B)	767 mm (2.5 ft)	768 mm (2.5 ft)	768 mm (2.5 ft)	NR
242B	(B)	733 mm (2.4 ft)	733 mm (2.4 ft)	734 mm (2.4 ft)	NR
236B, 246B and 248B	(B)	596 mm (2.0 ft)	596 mm (2.0 ft)	596 mm (2.0 ft)	596 mm (2.0 ft)
252B, 262B and 268	(B)	857 mm (2.8 ft)	857 mm (2.8 ft)	857 mm (2.8 ft)	857 mm (2.8 ft)
216B and 226B	(A)	2113 mm (6.9 ft)	2113 mm (6.9 ft)	NR	NR
232B	(A)	2273 mm (7.5 ft)	2273 mm (7.5 ft)	2273 mm (7.5 ft)	NR
242B	(A)	2313 mm (7.6 ft)	2312 mm (7.6 ft)	2312 mm (7.6 ft)	NR
236B, 246B and 248B	(A)	2336 mm (7.7 ft)	2336 mm (7.7 ft)	2336 mm (7.7 ft)	2336 mm (7.7 ft)
252B, 262B and 268B	(A)	2426 mm (8.0 ft)	2426 mm (8.0 ft)	2426 mm (8.0 ft)	2426 mm (8.0 ft)

(1) Machines that are Equipped with High Flow Hydraulics

Table 2

Multipurpose Buckets					
	Part Number	154-5004	154-5008	154-5010	199-8320
	Width	1524 mm (60 inch)	1676 mm (66 inch)	1829 mm (72 inch)	1981 mm (78 inch)
	Rated Volume	0.30 m ³ (0.39)	0.34 m ³ (0.44)	0.37 m ³ (0.48)	0.40 m ³ (0.52)

		yd ³)	yd ³)	yd ³)	yd ³)
	Bucket Weight	331 kg (730 lb)	349 kg (770 lb)	368 kg (811 lb)	388 kg (855 lb)
Models					
216B	R.O.C	523 kg (1153 lb)	512 kg (1129 lb)	NR	NR
226B	R.O.C	560 kg (1235 lb)	549 kg (1210 lb)	NR	NR
226B ⁽¹⁾	R.O.C	563 kg (1241 lb)	552 kg (1217 lb)	NR	NR
232B	R.O.C	765 kg (1687 lb)	755 kg (1664 lb)	746 kg (1645 lb)	NR
236B	R.O.C	779 kg (1717 lb)	769 kg (1695 lb)	760 kg (1676 lb)	754 kg (1662 lb)
242B	R.O.C	802 kg (1768 lb)	792 kg (1746 lb)	783 kg (1726 lb)	NR
242B ⁽¹⁾	R.O.C	820 kg (1808 lb)	810 kg (1786 lb)	801 kg (1766 lb)	NR
246B	R.O.C	817 kg (1801 lb)	807 kg (1779 lb)	798 kg (1759 lb)	792 kg (1746 lb)
248B	R.O.C	819 kg (1806 lb)	809 kg (1784 lb)	800 kg (1764 lb)	794 kg (1751 lb)
252B	R.O.C	NR	1116 kg (2460 lb)	1107 kg (2441 lb)	1104 kg (2434 lb)
262B	R.O.C	NR	1116 kg (2460 lb)	1107 kg (2441 lb)	1104 kg (2434 lb)
268B	R.O.C	1127 kg (2485 lb)	1116 kg (2460 lb)	1107 kg (2441 lb)	1104 kg (2434 lb)
216B and 226B	(B)	613 mm (2.0 ft)	613 mm (2.0 ft)	NR	NR

232B	(B)	775 mm (2.5 ft)	776 mm (2.5 ft)	777 mm (2.5 ft)	NR
242B	(B)	741 mm (2.4 ft)	742 mm (2.4 ft)	743 mm (2.4 ft)	NR
236B, 246B and 248B	(B)	600 mm (2.0 ft)	600 mm (2.0 ft)	600 mm (2.0 ft)	600 mm (2.0 ft)
252B, 262B and 268B	(B)	860 mm (2.8 ft)	860 mm (2.8 ft)	860 mm (2.8 ft)	860 mm (2.8 ft)
216B and 226B	(A)	2106 mm (6.9 ft)	2106 mm (6.9 ft)	2106 mm (6.9 ft)	2106 mm (6.9 ft)
232B	(A)	2262 mm (7.4 ft)	2261 mm (7.4 ft)	2260 mm (7.4 ft)	2259 mm (7.4 ft)
242B	(A)	2301 mm (7.5 ft)	2300 mm (7.5 ft)	2299 mm (7.5 ft)	2298 mm (7.5 ft)
236B, 246B and 248B	(A)	2330 mm (7.6 ft)	2330 mm (7.6 ft)	2330 mm (7.6 ft)	2330 mm (7.6 ft)
252B, 262B and 268B	(A)	2419 mm (7.9 ft)	2419 mm (7.9 ft)	2419 mm (7.9 ft)	2419 mm (7.9 ft)

(1) Machines that are equipped with High Flow Hydraulics

Table 3

Multipurpose Buckets with Bolt on Edge and Debris Guard									
	P/N	325-7040		325-7050		325-7060		325-7070	
	Weight	374 kg	824 lb	397 kg	876 lb	421 kg	928 lb	444 kg	979 lb
Models	Bucket	1524 mm	60 inch	1676 mm	66 inch	1829 mm	72 inch	1981 mm	78 inch
216B	R.O.C 50%	497 kg	1095 lb	485 kg	1068 lb	NR	NR	NR	NR
226B	R.O.C 50%	533 kg	1175 lb	521 kg	1149 lb	NR	NR	NR	NR
	HF R.O.C 50%	536 kg	1181 lb	524 kg	1154 lb	NR	NR	NR	NR
232B	R.O.C 50%	734 kg	1618 lb	723 kg	1593 lb	711 kg	1566 lb		

								NR	NR
236B	R.O.C 50%	748 kg	1649 lb	736 kg	1621 lb	723 kg	1593 lb	714 kg	1574 lb
242B	R.O.C 50%	791 kg	1743 lb	780 kg	1719 lb	767 kg	1691 lb	NR	NR
	HF R.O.C 50%	809 kg	1782 lb	798 kg	1758 lb	785 kg	1731 lb	NR	NR
246B	R.O.C 50%	786 kg	1733 lb	774 kg	1705 lb	761 kg	1677 lb	752 kg	1658 lb
248B	R.O.C 50%	788 kg	1737 lb	776 kg	1710 lb	763 kg	1681 lb	754 kg	1662 lb
252B	R.O.C 50%	NR	NR	1076 kg	2371 lb	1063 kg	2342 lb	1056 kg	2327 lb
262B	R.O.C 50%	NR	NR	1076 kg	2371 lb	1063 kg	2342 lb	1056 kg	2327 lb
268B	R.O.C 50%	1091 kg	2404 lb	1076 kg	2371 lb	1063 kg	2342 lb	1056 kg	2327 lb

Table 4

Dirt Buckets					
	Part Number	165-6155	165-6156	165-6157	188-3526
	Width	1372 mm (54 inch)	1524 mm (60 inch)	1676 mm (66 inch)	1829 mm (72 inch)
	Rated Volume	0.30 m ³ (0.39 yd ³)	0.34 m ³ (0.44 yd ³)	0.37 m ³ (0.48 yd ³)	0.41 m ³ (0.53 yd ³)
	Bucket Weight	131 kg (289 lb)	141 kg (311 lb)	166 kg (366 lb)	179 kg (395 lb)
Models					
216B	R.O.C	644 kg (1420 lb)	637 kg (1404 lb)	625 kg (1378 lb)	NR
226B	R.O.C	683 kg (1506 lb)	676 kg (1490 lb)	664 kg (1464 lb)	NR
226B ⁽¹⁾	R.O.C	686 kg (1512 lb)	679 kg (1497 lb)	667 kg (1471 lb)	NR

232B	R.O.C	897 kg (1978 lb)	889 kg (1960 lb)	878 kg (1936 lb)	871 kg (1920 lb)
236B	R.O.C	NR	903 kg (1991 lb)	892 kg (1967 lb)	885 kg (1951 lb)
242B	R.O.C	935 kg (2061 lb)	928 kg (2046 lb)	916 kg (2019 lb)	910 kg (2006 lb)
242B ⁽¹⁾	R.O.C	954 kg (2103 lb)	947 kg (2088 lb)	935 kg (2061 lb)	929 kg (2048 lb)
246B	R.O.C	NR	943 kg (2079 lb)	931 kg (2053 lb)	924 kg (2037 lb)
248B	R.O.C	NR	945 kg (2083 lb)	933 kg (2057 lb)	927 kg (2044 lb)
252B	R.O.L	NR	NR	1254 kg (2765 lb)	1248 kg (2751 lb)
262B	R.O.C	NR	NR	1254 kg (2765 lb)	1248 kg (2751 lb)
268B	R.O.C	NR	1266 kg (2791 lb)	1254 kg (2765 lb)	1248 kg (2751 lb)
216B and 226B	(B)	569 mm (1.9 ft)	569 mm (1.9 ft)	569 mm (1.9 ft)	569 mm (1.9 ft)
232B	(B)	729 mm (2.4 ft)	730 mm (2.4 ft)	730 mm (2.4 ft)	731 mm (2.4 ft)
242B	(B)	694 mm (2.3 ft)	695 mm (2.3 ft)	695 mm (2.3 ft)	696 mm (2.3 ft)
236B, 246B and 248B	(B)	NR	555 mm (1.8 ft)	558 mm (1.8 ft)	558 mm (1.8 ft)
252B, 262B and 268B	(B)	819 mm (2.7 ft)	819 mm (2.7 ft)	822 mm (2.7 ft)	822 mm (2.7 ft)
216B and 226B	(A)	2148 mm (7.0 ft)	2148 mm (7.0 ft)	2148 mm (7.0 ft)	2148 mm (7.0 ft)

232B	(A)	2314 mm (7.6 ft)	2314 mm (7.6 ft)	2313 mm (7.6 ft)	2313 mm (7.6 ft)
242B	(A)	2355 mm (7.7 ft)	2354 mm (7.7 ft)	2353 mm (7.7 ft)	2353 mm (7.7 ft)
236B, 246B, 248B	(A)	2377 mm (7.8 ft)	2377 mm (7.8 ft)	2374 mm (7.8 ft)	2374 mm (7.8 ft)
252B, 262B and 268B	(A)	NR	2469 mm (8.1 ft)	2465 mm (8.1 ft)	2465 mm (8.1 ft)

(1) Machines that are equipped with High Flow Hydraulics

Table 5

Utility Buckets				
	Part Number	165-8835	165-8746	165-8747
	Width	1524 mm (60 inch)	1676 mm (66 inch)	1829 mm (72 inch)
	Rated Volume	0.42 m ³ (0.55 yd ³)	0.47 m ³ (0.61 yd ³)	0.51 m ³ (0.67 yd ³)
	Bucket Weight	211 kg (465 lb)	226 kg (498 lb)	240 kg (529 lb)
Models				
216B	R.O.C	589 kg (1299 lb)	582 kg (1283 lb)	NR
226B	R.O.C	627 kg (1382 lb)	620 kg (1367 lb)	NR
226B ⁽¹⁾	R.O.C	630 kg (1389 lb)	623 kg (1374 lb)	NR
232B	R.O.C	836 kg (1843 lb)	829 kg (1828 lb)	822 kg (1812 lb)
236B	R.O.C	851 kg (1876 lb)	843 kg (1859 lb)	836 kg (1843 lb)
242B	R.O.C	874 kg (1927 lb)	866 kg (1909 lb)	859 kg (1894 lb)
242B ⁽¹⁾	R.O.C	892 kg (1967 lb)	885 kg (1951 lb)	878 kg (1936 lb)

246B	R.O.C	889 kg (1960 lb)	882 kg (1945 lb)	875 kg (1929 lb)
248B	R.O.C	892 kg (1967 lb)	884 kg (1949 lb)	877 kg (1934 lb)
252B	R.O.C	NR	1197 kg (2639 lb)	1191 kg (2626 lb)
262B	R.O.C	NR	1197 kg (2639 lb)	1191 kg (2626 lb)
268B	R.O.C	1205 kg (2657 lb)	1197 kg (2639 lb)	1191 kg (2626 lb)
216B and 226B	(B)	644 mm (2.1 ft)	644 mm (2.1 ft)	NR
232B	(B)	800 mm (2.6 ft)	800 mm (2.6 ft)	801 mm (2.6 ft)
242B	(B)	765 mm (2.5 ft)	766 mm (2.5 ft)	766 mm (2.5 ft)
236B, 246B and 248B	(B)	628 mm (2.1 ft)	630 mm (2.1 ft)	630 mm (2.1 ft)
252B, 262B and 268B	(B)	889 mm (2.9 ft)	889 mm (2.9 ft)	889 mm (2.9 ft)
216B and 226B	(A)	2089 mm (6.9 ft)	2089 mm (6.9 ft)	NR
232B	(A)	2245 mm (7.4 ft)	2245 mm (7.4 ft)	2244 mm (7.4 ft)
242B	(A)	2285 mm (7.5 ft)	2284 mm (7.5 ft)	2284 mm (7.5 ft)
236B, 246B and 248B	(A)	2315 mm (7.6 ft)	2312 mm (7.6 ft)	2312 mm (7.6 ft)
252B, 262B and 268B	(A)	2399 mm (7.9 ft)	2399 mm (7.9 ft)	2399 mm (7.9 ft)

(1) Machines that are equipped with High Flow Hydraulics

Table 6

Light Material Buckets				
	Part Number	164-7416	167-7417	220-4991
	Width	1829 mm (72 inch)	1981 mm (78 inch)	2133 mm (84 inch)

	Rated Volume	0.69 m ³ (0.90 yd ³)	0.75 m ³ (0.98 yd ³)	0.81 m ³ (1.06 yd ³)
	Bucket Weight	257 kg (566 lb)	272 kg (600 lb)	286 kg (631 lb)
Models				
216B	R.O.C	605 kg (1334 lb)	NR	NR
226B	R.O.C	645 kg (1422 lb)	NR	NR
226B ⁽¹⁾	R.O.C	648 kg (1429 lb)	NR	NR
232B	R.O.C	866 kg (1909 lb)	858 kg (1892 lb)	851 kg (1876 lb)
236B	R.O.C	881 kg (1942 lb)	873 kg (1925 lb)	866 kg (1909 lb)
242B	R.O.C	907 kg (2000 lb)	899 kg (1982 lb)	892 kg (1967 lb)
242B ⁽¹⁾	R.O.C	927 kg (2044 lb)	919 kg (2026 lb)	912 kg (2011 lb)
246B	R.O.C	922 kg (2033 lb)	914 kg (2015 lb)	907 kg (2000 lb)
248B	R.O.C	924 kg (2037 lb)	916 kg (2019 lb)	909 kg (2004 lb)
252B	R.O.C	1258 kg (2773 lb)	1250 kg (2756 lb)	1243 kg (2740 lb)
262B	R.O.C	1258 kg (2773 lb)	1250 kg (2756 lb)	1243 kg (2740 lb)
268B	R.O.C	1258 kg (2773 lb)	1250 kg (2756 lb)	1243 kg (2740 lb)
216B and 226B	(B)	677 mm (2.2 ft)	NR	NR
232B	(B)	832 mm (2.7 ft)	832 mm (2.7 ft)	832 mm (2.7 ft)
242B	(B)	797 mm (2.6 ft)	798 mm (2.6 ft)	798 mm (2.6 ft)
236B, 246B and 248B	(B)	662 mm (2.2 ft)	662 mm (2.2 ft)	662 mm (2.2 ft)

252B, 262B and 268B	(B)	919 mm (3.0 ft)	919 mm (3.0 ft)	919 mm (3.0 ft)
216B and 226B	(A)	2063 mm (6.8 ft)	2063 mm (6.8 ft)	2063 mm (6.8 ft)
232B	(A)	2214 mm (7.3 ft)	2213 mm (7.3 ft)	2213 mm (7.3 ft)
242B	(A)	2253 mm (7.4 ft)	2253 mm (7.4 ft)	2253 mm (7.4 ft)
236B, 246B and 248B	(A)	2285 mm (7.5 ft)	2285 mm (7.5 ft)	2285 mm (7.5 ft)
252B, 262B and 268B	(A)	2369 mm (7.8 ft)	2369 mm (7.8 ft)	2369 mm (7.8 ft)

(1) Machines that are equipped with High Flow Hydraulics

Table 7

Industrial Grapple Buckets (1)				
	Part Number	157-7223	157-7224	157-7225
	Width	1524 mm (60 inch)	1676 mm (66 inch)	1829 mm (72 inch)
	Bucket Weight	398 kg (877 lb)	413 kg (910 lb)	427 kg (941 lb)
Models				
216B	R.O.C	528 kg (1164 lb)	520 kg (1146 lb)	NR
226B	R.O.C	567 kg (1250 lb)	560 kg (1235 lb)	NR
226B (2)	R.O.C	571 kg (1259 lb)	563 kg (1241 lb)	NR
232B	R.O.C	787 kg (1735 lb)	779 kg (1717 lb)	772 kg (1702 lb)
236B	R.O.C	800 kg (1764 lb)	792 kg (1746 lb)	784 kg (1728 lb)
242B	R.O.C	827 kg (1823 lb)	819 kg (1806 lb)	812 kg (1790 lb)
242B (2)	R.O.C	846 kg (1865 lb)	838 kg (1848 lb)	831 kg (1832 lb)
246B	R.O.C	840 kg (1852 lb)	832 kg (1834 lb)	824 kg (1817 lb)
248B	R.O.C	842 kg (1856 lb)	834 kg (1839 lb)	826 kg (1821 lb)

252B	R.O.C	NR	1164 kg (2566 lb)	1157 kg (2551 lb)
262B	R.O.C	NR	1164 kg (2566 lb)	1157 kg (2551 lb)
268B	R.O.C	1172 kg (2584 lb)	1164 kg (2566 lb)	1157 kg (2551 lb)
216B and 226B	(B)	612 mm (2.0 ft)	612 mm (2.0 ft)	NR
232B	(B)	781 mm (2.6 ft)	781 mm (2.6 ft)	782 mm (2.6 ft)
242B	(B)	747 mm (2.5 ft)	747 mm (2.5 ft)	748 mm (2.5 ft)
236B, 246B and 248B	(B)	599 mm (2.0 ft)	599 mm (2.0 ft)	599 mm (2.0 ft)
252B, 262B and 268B	(B)	861 mm (2.8 ft)	861 mm (2.8 ft)	861 mm (2.8 ft)
216B, 226B, 228B	(A)	2114 mm (6.9 ft)	2114 mm (6.9 ft)	2114 mm (6.9 ft)
232B	(A)	2265 mm (7.4 ft)	2264 mm (7.4 ft)	2263 mm (7.4 ft)
242B	(A)	2303 mm (7.6 ft)	2303 mm (7.6 ft)	2302 mm (7.6 ft)
236B, 246B and 248B	(A)	2338 mm (7.7 ft)	2338 mm (7.7 ft)	2338 mm (7.7 ft)
252B, 262B and 268B	(A)	2427 mm (8.0 ft)	2427 mm (8.0 ft)	2427 mm (8.0 ft)

(1) The rated capacity is calculated with a full bucket of dirt. Grasping objects with the grapple will lower the rated capacity.

(2) Machines that are equipped with High Flow Hydraulics

Table 8

Utility Grapple Buckets ⁽¹⁾			
	Part Number	165-8729	165-8730
	Width	1676 mm (66 inch)	1829 mm (72 inch)
	Bucket Weight	330 kg (727 lb)	344 kg (758 lb)
Models			

216B	R.O.C	535 kg (1180 lb)	NR
226B	R.O.C	573 kg (1263 lb)	NR
226B ⁽²⁾	R.O.C	576 kg (1270 lb)	NR
232B	R.O.C	783 kg (1726 lb)	776 kg (1711 lb)
236B	R.O.C	796 kg (1755 lb)	789 kg (1739 lb)
242B	R.O.C	820 kg (1808 lb)	814 kg (1795 lb)
242B ⁽²⁾	R.O.C	839 kg (1850 lb)	832 kg (1834 lb)
246B	R.O.C	835 kg (1841 lb)	828 kg (1825 lb)
248B	R.O.C	837 kg (1845 lb)	830 kg (1830 lb)
252B	R.O.C	1151 kg (2538 lb)	1144 kg (2522 lb)
262B	R.O.C	1151 kg (2538 lb)	1144 kg (2522 lb)
268B	R.O.C	1151 kg (2538 lb)	1144 kg (2522 lb)
216B and 226B	(B)	644 mm (2.1 ft)	644 mm (2.1 ft)
232B	(B)	805 mm (2.6 ft)	806 mm (2.6 ft)
242B	(B)	771 mm (2.5 ft)	772 mm (2.5 ft)
236B, 246B and 248B	(B)	630 mm (2.1 ft)	630 mm (2.1 ft)
252B, 262B and 268B	(B)	889 mm (2.9 ft)	889 mm (2.9 ft)
216B and 226B	(A)	2089 mm (6.9 ft)	2089 mm (6.9 ft)
232B	(A)	2240 mm (7.3 ft)	2240 mm (7.3 ft)
242B	(A)	2279 mm (7.5 ft)	2279 mm (7.5 ft)

236B, 246B and 248B	(A)	2312 mm (7.6 ft)	2312 mm (7.6 ft)
252B, 262B and 268B	(A)	2399 mm (7.9 ft)	2399 mm (7.9 ft)

(1) The rated capacity is calculated with a full bucket of dirt. Grasping objects with the grapple will lower the rated capacity.

(2) Machines that are equipped with High Flow Hydraulics

Rated Loads for Forks

WARNING

Failure to comply to the rated load can cause possible personal injury or property damage. Review the rated load of a particular work tool before performing any operation. Make adjustments to the rated load as necessary for non-standard configurations.

Note: Rated loads should be used as a guide. Attachments, uneven ground conditions, soft ground conditions, or poor ground conditions have effects on rated loads. The operator is responsible for being aware of these effects.

The rated operating capacity is defined by SAE J1197 FEB 91 and EN474. The rated operating capacity is the least amount of weight of the following conditions:

- 50% of the full static tipping load on a hard, smooth, level surface
- The minimum lifting capacity

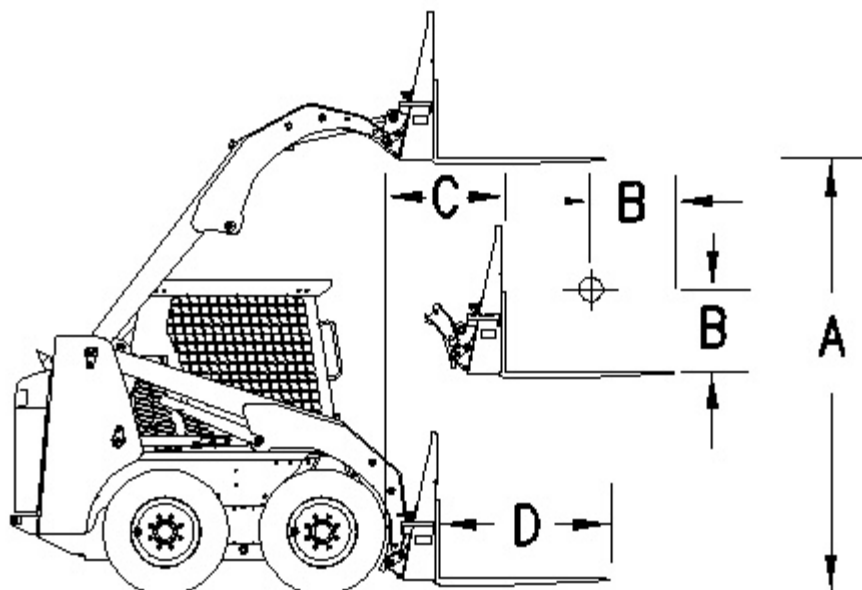


Illustration 2

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Dimension (A) represents the maximum fork height. Dimension (B) represents the load center. Dimension (C) represents the reach. Dimension (D) represents the fork tine length.

The maximum fork height (ground to top face of fork) is given for a pallet fork that is horizontal at maximum lift height. The reach (front tires to front face of fork) is given for a pallet fork that is horizontal maximum reach.

Rated loads are based upon a standard machine with the following conditions:

- 10 x 16.5 tires on 216B, 226B and 232B machines
- 12 x 16.5 tires on 236B, 242B, 246B, 248B, 252B, 262B and 268B machines
- full fuel tank
- 75 kg (165 lb) operator
- Caterpillar fork

The following tables provide the rated operating loads R.O.C for the standard machine configuration with a fork.

Table 9

Rated Operating Load with a Pallet Fork 216B and 226B Machines								
Fork	(D)	(B)	R.O.C 216B	R.O.C 226B	R.O.C 226 ⁽¹⁾	(A)	(C)	Weight
151-5134	910 mm (36 inch)	455 mm (18 inch)	463 kg (1021 lb)	493 kg (1087 lb)	495 kg (1091 lb)	2712 mm (8.9 ft)	763 mm (2.5 ft)	184 kg (406 lb)
149-1412	1070 mm (42 inch)	535 mm (21 inch)	436 kg (961 lb)	464 kg (1023 lb)	467 kg (1030 lb)	2712 mm (8.9 ft)	763 mm (2.5 ft)	194 kg (428 lb)
161-2437	1220 mm (48 inch)	610 mm (24 inch)	413 kg (911 lb)	439 kg (968 lb)	442 kg (974 lb)	2712 mm (8.9 ft)	763 mm (2.5 ft)	203 kg (448 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 10

Rated Operating Load with a Pallet Fork 232B and 242B Machines								
Fork	(D)	(B)	R.O.C 232B	R.O.C 242B	R.O.C 242B ⁽¹⁾	(A)	(C)	Weight
151-5134	910 mm (36 inch)	455 mm (18 inch)	654 kg (1442 lb)	682 kg (1504 lb)	695 kg (1532 lb)	2860 mm (9.4 ft)	709 mm (2.3 ft)	184 kg (406 lb)
149-								

1412	1070 mm (42 inch)	535 mm (21 inch)	618 kg (1363 lb)	644 kg (1420 lb)	657 kg (1448 lb)	2860 mm (9.4 ft)	709 mm (2.3 ft)	194 kg (428 lb)
161- 2437	1220 mm (48 inch)	610 mm (24 inch)	587 kg (1294 lb)	611 kg (1347 lb)	624 kg (1376 lb)	2860 mm (9.4 ft)	709 mm (2.3 ft)	203 kg (448 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 11

Rated Operating Load with a Pallet Fork 236B, 246B and 248B Machines								
Fork	(D)	(B)	R.O.C 236B	R.O.C 246B	R.O.C 248B	(A)	(C)	Weight
151- 5134	910 mm (36 inch)	455 mm (18 inch)	671 kg (1479 lb)	702 kg (1548 lb)	704 kg (1552 lb)	2972 mm (9.8 ft)	824 mm (2.7 ft)	184 kg (406 lb)
149- 1412	1070 mm (42 inch)	535 mm (21 inch)	636 kg (1402 lb)	665 kg (1466 lb)	667 kg (1471 lb)	2972 mm (9.8 ft)	824 mm (2.7 ft)	194 kg (428 lb)
161- 2437	1220 mm (48 inch)	610 mm (24 inch)	605 kg (1334 lb)	633 kg (1396 lb)	635 kg (1400 lb)	2972 mm (9.8 ft)	824 mm (2.7 ft)	203 kg (448 lb)

Table 12

Rated Operating Load with a Pallet Fork 252B, 262B and 268B Machines								
Fork	(D)	(B)	R.O.C 252B	R.O.C 262B	R.O.C 262B	(A)	(C)	Weight
151- 5134	910 mm (36 inch)	455 mm (18 inch)	940 kg (2072 lb)	940 kg (2072 lb)	940 kg (2072 lb)	3107 mm (10.2 ft)	737 mm (2.4 ft)	184 kg (406 lb)
149- 1412	1070 mm (42 inch)	535 mm (21 inch)	891 kg (1964 lb)	891 kg (1964 lb)	891 kg (1964 lb)	3107 mm (10.2 ft)	737 mm (2.4 ft)	194 kg (428 lb)
161- 2437	1220 mm (48 inch)	610 mm (24 inch)	849 kg (1872 lb)	849 kg (1872 lb)	849 kg (1872 lb)	3107 mm (10.2 ft)	737 mm (2.4 ft)	203 kg (448 lb)

Table 13

**Rated Operating Load with a Utility Fork
216B and 226B Machines**

Fork	Width	(B)	R.O.C 216B	R.O.C 226B	R.O.C 226 ⁽¹⁾	Weight
165-8732	1676 mm (66 inch)	314 mm (12 inch)	500 kg (1102 lb)	532 kg (1173 lb)	535 kg (1180 lb)	195 kg (430 lb)
165-8737	1829 mm (72 inch)	314 mm (12 inch)	NR	NR	NR	217 kg (478 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 14

**Rated Operating Load with a Utility Fork
232B and 242B Machines**

Fork	Width	(B)	R.O.C 232B	R.O.C 242B	R.O.C 242B ⁽¹⁾	Weight
165-8732	1676 mm (66 inch)	314 mm (12 inch)	707 kg (1559 lb)	737 kg (1625 lb)	752 kg (1658 lb)	195 kg (430 lb)
165-8737	1829 mm (72 inch)	314 mm (12 inch)	699 kg (1541 lb)	729 kg (1607 lb)	744 kg (1640 lb)	217 kg (478 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 15

**Rated Operating Load with a Utility Fork
236B, 246B and 248B Machines**

Fork	Width	(B)	R.O.C 236B	R.O.C 246B	R.O.C 248B	Weight
165-8732	1676 mm (66 inch)	314 mm (12 inch)	723 kg (1594 lb)	756 kg (1667 lb)	758 kg (1671 lb)	195 kg (430 lb)
165-8737	1829 mm (72 inch)	314 mm (12 inch)	715 kg (1576 lb)	747 kg (1647 lb)	749 kg (1651 lb)	217 kg (478 lb)

Table 16

**Rated Operating Load with a Utility Fork
252B, 262B and 268B Machines**

Fork	Width	(B)	R.O.C 252B	R.O.C 262B	R.O.C 268B	Weight
165-8732	1676 mm (66 inch)	314 mm (12 inch)	1013 kg	1013 kg	1013 kg	195 kg (430 lb)

	inch)	inch)	(2233 lb)	(2233 lb)	(2233 lb)	lb)
165-8737	1829 mm (72 inch)	314 mm (12 inch)	1005 kg (2216 lb)	1005 kg (2216 lb)	1005 kg (2216 lb)	217 kg (478 lb)

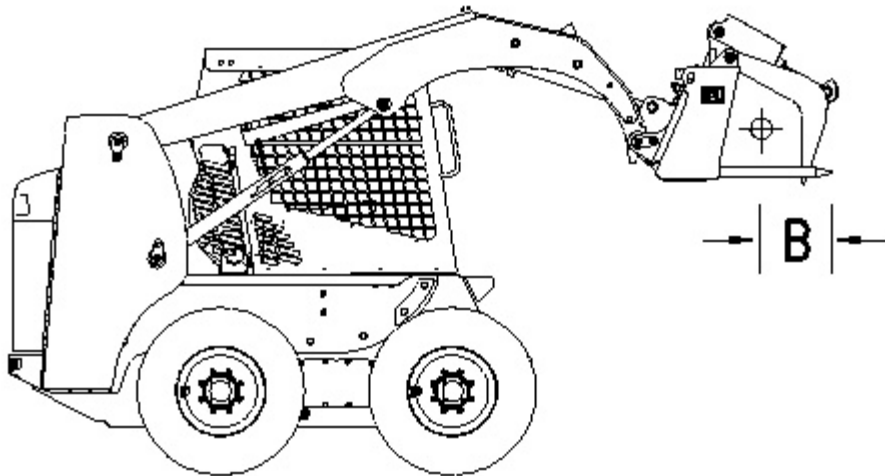


Illustration 3

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Dimension (B) represents the load center.

Table 17

**Rated Operating Load with a Utility Grapple Fork
216B and 226B Machines**

Fork	Width	(B)	R.O.L 216B	R.O.L 226B	R.O.L 226B ⁽¹⁾	Weight
165-8727	1676 mm (66 inch)	313.5 mm (12.3 inch)	452 kg (997 lb)	483 kg (1065 lb)	486 kg (1071 lb)	299 kg (659 lb)
165-8728	1829 mm (72 inch)	313.5 mm (12.3 inch)	NR	NR	NR	321 kg (708 lb)

(1) Machines that are Equipped with High Flow Hydraulics

Table 18

**Rated Operating Load with a Utility Grapple Fork
232B and 242B Machines**

Fork	Width	(B)	R.O.L 232B	R.O.L 242B	R.O.L 242B ⁽¹⁾	Weight
165-8727	1676 mm (66 inch)	313.5 mm (12.3 inch)	658 kg (1451 lb)	689 kg (1519 lb)	704 kg (1552 lb)	299 kg (659 lb)

	inch)	inch)	lb)	lb)	lb)	lb)
165-8728	1829 mm (72 inch)	313.5 mm (12.3 inch)	649 kg (1431 lb)	680 kg (1499 lb)	695 kg (1532 lb)	321 kg (708 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 19

Rated Operating Load with a Utility Grapple Fork 236B, 246B and 248B Machines						
Fork	Width	(B)	R.O.C 236B	R.O.C 246B	R.O.LC 248B	Weight
165-8727	1676 mm (66 inch)	313.5 mm (12.3 inch)	674 kg (1486 lb)	707 kg (1559 lb)	709 kg (1563 lb)	299 kg (659 lb)
165-8728	1829 mm (72 inch)	313.5 mm (12.3 inch)	665 kg (1466 lb)	697 kg (1537 lb)	699 kg (1541 lb)	321 kg (708 lb)

Table 20

Rated Operating Load with a Utility Grapple Fork 252B, 262B and 268B Machines						
Fork	Width	(B)	R.O.C 252B	R.O.C 262B	R.O.C 262B	Weight
165-8727	1676 mm (66 inch)	313.5 mm (12.3 inch)	965 kg (2128 lb)	965 kg (2128 lb)	965 kg (2128 lb)	299 kg (659 lb)
165-8728	1829 mm (72 inch)	313.5 mm (12.3 inch)	956 kg (2108 lb)	956 kg (2108 lb)	956 kg (2108 lb)	321 kg (708 lb)

Table 21

Rated Operating Load with a Industrial Grapple Fork 216B and 226B Machines						
Fork	Width	(B)	R.O.C 216B	R.O.C 226B	R.O.C 226B⁽¹⁾	Weight
162-8139	1676 mm (66 inch)	279.5 mm (11.0 inch)	357 kg (787 lb)	388 kg (855 lb)	391 kg (862 lb)	485 kg (1070 lb)

(1) Machines that are equipped with High Flow Hydraulics

Table 22

Rated Operating Load with a Industrial Grapple Fork 232B and 242B Machines						
			R.O.C 232B	R.O.C 242B	R.O.C	

Fork	Width	(B)			242 (1)	Weight
162-8139	1676 mm (66 inch)	279.5 mm (11.0 inch)	561 kg (1237 lb)	591 kg (1303 lb)	606 kg (1336 lb)	485 kg (1070 lb)

(1) Machines that are Equipped with High Flow Hydraulics

Table 23

Rated Operating Load with a Industrial Grapple Fork 236B, 246B and 248B Machines						
Fork	Width	(B)	R.O.C 236B	R.O.C 246B	R.O.C 248B	Weight
162-8139	1676 mm (66 inch)	279.5 mm (11.0 inch)	576 kg (1270 lb)	608 kg (1340 lb)	610 kg (1345 lb)	485 kg (1070 lb)
163-4812	1829 mm (72 inch)	279.5 mm (11.0 inch)	555 kg (1224 lb)	587 kg (1294 lb)	589 kg (1299 lb)	533 kg (1175 lb)

Table 24

Rated Operating Load with a Industrial Grapple Fork 252B, 262B and 268B Machines						
Fork	Width	(B)	R.O.C 252B	R.O.C 262B	R.O.C 268B	Weight
162-8139	1676 mm (66 inch)	279.5 mm (11.0 inch)	863 kg (1903 lb)	863 kg (1903 lb)	863 kg (1903 lb)	485 kg (1070 lb)
163-4812	1829 mm (72 inch)	279.5 mm (11.0 inch)	842 kg (1856 lb)	842 kg (1856 lb)	842 kg (1856 lb)	533 kg (1175 lb)

Rated Load with a Material Handling Arm

WARNING

Failure to comply to the rated load can cause possible personal injury or property damage. Review the rated load of a particular work tool before performing any operation. Make adjustments to the rated load as necessary for non-standard configurations.

Note: Rated loads should be used as a guide. Attachments, uneven ground conditions, soft ground conditions, or poor ground conditions have effects on rated loads. The operator is responsible for being aware of these effects.

The maximum placement height (ground line to the chain hook) and maximum reach (front of machine to

the chain hook) are given for the highest position of the material handling arm.

The rated operating capacity (R.O.C.) is the least amount of weight of the following conditions:

- 50% of the full static tipping load on a hard, smooth, level surface
- The minimum lifting capacity
- The material handling arm has a structural capacity of 907 kg (2000 lb).

The following tables provide the rated operating loads for the standard machine configuration that is equipped with the following items:

- 10 x 16.5 tires on 216B, 226B, and 232B machines
- 12 x 16.5 tires on 236B, 242B, 246B, 248B, 252B, 262B and 268B machines
- full fuel tank
- 75 kg (165 lb) operator
- Caterpillar Material Handling Arm

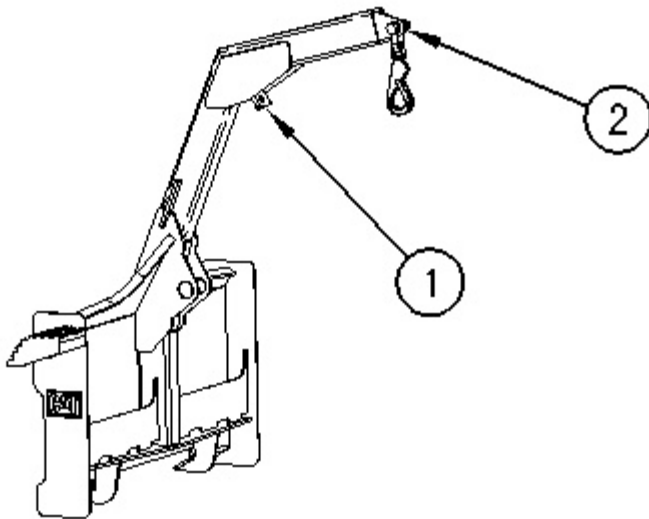


Illustration 4

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Lifting point 1 (1)

Lifting point 2 (2)

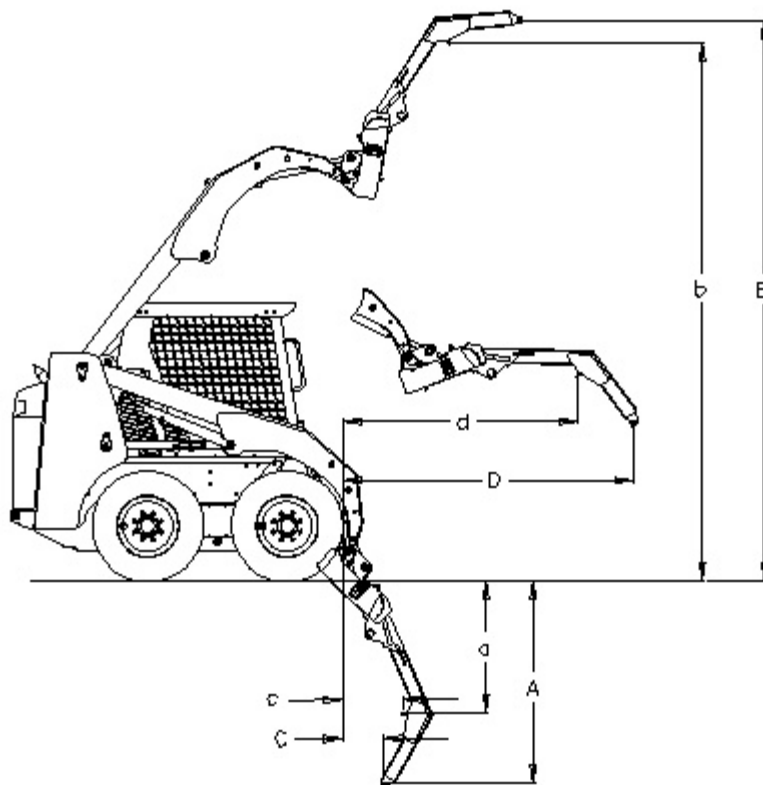


Illustration 5

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Dimension (A) represents the clearance at the full down position from Lifting Point 2. Dimension (a) represents the clearance at the full down position from Lifting Point 1. Dimension (B) represents the clearance at maximum height from Lifting Point 2. Dimension (b) represents the clearance at maximum height from Lifting Point 1. Dimension (C) represents the minimum reach from Lifting Point 2. Dimension (c) represents the minimum reach from Lifting Point 1. Dimension (D) represents the maximum reach from Lifting Point 2. Dimension (d) represents the maximum reach from Lifting Point 1.

Table 25

Rated Operating Load for Material Handling Arm 179-7201 216B and 226B Machines						
	Lifting Point 1 (1)			Lifting Point 2 (2)		
	216B	226B	226 (1)	216B	226B	226B (1)
R.O.C	373 kg (822 lb)	396 kg (873)	398 kg (877 lb)	308 kg (679 lb)	327 kg (721 lb)	329 kg (725 lb)
Clearance at Full Down	a -950 mm (-3.1 ft)	a -949 mm (-3.1 ft)	a -949 mm (-3.1 ft)	A -1336 mm (-4.3 ft)	A -1335 mm (-4.3 ft)	A -1335 mm (-4.3 ft)
Clearance at Maximum Height	b 4028 mm (13.2 ft)	b 4029 mm (13.2 ft)	b 4029 mm (13.2 ft)	B 4480 mm (14.6 ft)	B 4481 mm (14.7 ft)	B 4481 mm (14.7 ft)

Minimum Reach	c 418 mm (1.3 ft)	c 418 mm (1.3 ft)	c 418 mm (1.3 ft)	C 593 mm (1.9 ft)	C 593 mm (1.9 ft)	C 593 mm (1.9 ft)
Maximum Reach	d 1615 mm (5.2 ft)	d 1614 mm (5.2 ft)	d 1614 mm (5.2 ft)	D 2069 mm (6.7 ft)	D 2067 mm (6.7 ft)	D 2066 mm (6.7 ft)

(1) Machines that are Equipped with High Flow Hydraulics

Table 26

Rated Operating Load for Material Handling Arm 179-7201 232B and 242B Machines						
	Lifting Point 1 (1)			Lifting Point 2 (2)		
	232B	242B	242B ⁽¹⁾	232B	242B	242B ⁽¹⁾
R.O.C	521 kg (1149 lb)	540 kg (1191 lb)	551 kg (1215 lb)	430 kg (948 lb)	445 kg (981 lb)	455 kg (1003 lb)
Clearance at Full Down	-946 mm (- 3.1 ft)	-907 mm (- 3.0 ft)	-907 mm (- 3.0 ft)	-1440 mm (-4.7 ft)	-1402 mm (- 4.6 ft)	-1402 mm (- 4.6 ft)
Clearance at Maximum Height	4118 mm (13.5 ft)	4157 mm (13.6 ft)	4157 mm (13.6 ft)	4357 mm (14.3 ft)	4395 mm (14.4 ft)	4395 mm (14.4 ft)
Minimum Reach	570 mm (1.9 ft)	542 mm (1.8 ft)	542 mm (1.8 ft)	452 mm (1.5 ft)	425 mm (1.4 ft)	425 mm (1.4 ft)
Maximum Reach	1627 mm (5.3 ft)	1594 mm (5.2 ft)	1594 mm (5.2 ft)	2070 mm (6.8 ft)	2038 mm (6.7 ft)	2038 mm (6.7 ft)

(1) Machines that are Equipped with High Flow Hydraulics

Table 27

Rated Operating Load with a Material Handling Arm 179-7201 236B, 246B and 248B Machines						
	Lifting Point 1 (1)			Lifting Point 2 (2)		
	236B	246B	248B	236B	246B	248B
R.O.C	543 kg (1197 lb)	567 kg (1250 lb)	569 kg (1254 lb)	451 kg (994 lb)	471 kg (1038 lb)	473 kg (1043 lb)
Clearance at Full Down	(a) -964 mm (- 3.1 ft)	(a) -964 mm (- 3.1 ft)	(a) -964 mm (- 3.1 ft)	(A) -1196 mm (- 3.9 ft)	(A) -1196 mm (- 3.9 ft)	(A) -1196 mm (- 3.9 ft)

Clearance at Maximum Height	(b) 4296 mm (14 ft)	(b) 4298 mm (14 ft)	(b) 4290 mm (14 ft)	(B) 4744 mm (15 ft)	(B) 4746 mm (15 ft)	(B) 4747 mm (15 ft)
Minimum Reach	(c) 456 mm (1.5 ft)	(c) 456 mm (1.5 ft)	(c) 456 mm (1.5 ft)	(C) 638 mm (2.1 ft)	(C) 638 mm (2.1 ft)	(C) 638 mm (2.1 ft)
Maximum Reach	(d) 1679 mm (5 ft)	(d) 1678 mm (5 ft)	(d) 1677 mm (5 ft)	(D) 2136 mm (7 ft)	(D) 2135 mm (7 ft)	(D) 2134 mm (7 ft)

Table 28

Rated Operating Load with a Material Handling Arm 179-7201 252B, 262B and 268B Machines						
	Lifting Point 1 (1)			Lifting Point 2 (2)		
	252B	262B	268B	252B	262B	268B
R.O.C	749 kg (1651 lb)	749 kg (1651 lb)	749 kg (1651 lb)	607 kg (1338 lb)	607 kg (1338 lb)	607 kg (1338 lb)
Clearance at Full Down	(a) -985 mm (- 3.2 ft)	(a) -985 mm (- 3.2 ft)	(a) -985 mm (- 3.2 ft)	(A) -1474 mm (-4.8 ft)	(A) -1474 mm (- 4.8 ft)	(A) -1474 mm (- 4.8 ft)
Clearance at Maximum Height	(b) 4440 mm (14.6 ft)	(b) 4440 mm (14.6 ft)	(b) 4440 mm (14.6 ft)	(B) 4887 mm (16.0 ft)	(B) 4887 mm (16.0 ft)	(B) 4887 mm (16.0 ft)
Minimum Reach	(c) 483 mm (1.6 ft)	(c) 483 mm (1.6 ft)	(c) 483 mm (1.6 ft)	(C) 345 mm (1.1 ft)	(C) 345 mm (1.1 ft)	(C) 345 mm (1.1 ft)
Maximum Reach	(d) 1649 mm (5.4 ft)	(d) 1649 mm (5.4 ft)	(d) 1649 mm (5.4 ft)	(D) 2090 mm (6.9 ft)	(D) 2090 mm (6.9 ft)	(D) 2090 mm (6.9 ft)



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

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i02401968

Specifications

SMCS - 7000

The specifications that are given herein describe the machine as the machine is manufactured by Caterpillar Inc. The machine is full of fluids. The machine is equipped with all options. The weight does not include the operator, work tools, or other attachments.

Intended Use

This machine is classified as a Skid Steer Loader with wheels or tracks as described in "ISO 6165:2001". This machine normally has a front mounted bucket or another work tool for the principle intended functions of digging, loading, lifting, carrying, and moving material such as earth, crushed rock or gravel. Additional work tools allow this machine to perform other specific tasks.

Application/Configuration Restrictions

Refer to Operation and Maintenance Manual, "Machine Data" below for information about maximum machine weight.

Refer to Operation and Maintenance Manual, "Caterpillar Approved Work Tools" for information about acceptable work tools.

Lift arm height restrictions will be found in the Operation and Maintenance Manual for the appropriate work tool.

The maximum fore and aft slope for proper lubrication is 25 degrees continuous and 35 degrees intermittent.

Table 1

Intermittent Times	
Engine Model	Time in minutes
3024	15
3044	2

Note: Refer to the Operation and Maintenance Manual, "Identification Information" for the engine model

number. Also, the engine model number is located on the serial number plate on the engine.

This machine is approved for use in environments with no explosive gases.

Machine Data

Table 2

Sales Model	Maximum Machine Weight	Length	Height	Width
216B	4155 kg (9160 lb)	2557 mm (101 inch)	1977 mm (78 inch)	1664 mm (66 inch)
226B	4215 kg (9293 lb)	2557 mm (101 inch)	1977 mm (78 inch)	1664 mm (66 inch)
226B ⁽¹⁾	4310 kg (9502 lb)	2557 mm (101 inch)	1977 mm (78 inch)	1664 mm (66 inch)
232B	4540 kg (10009 lb)	2750 mm (108 inch)	1969 mm (78 inch)	1664 mm (66 inch)
236B	4790 kg (10560 lb)	2831 mm (111 inch)	2082 mm (82 inch)	1794 mm (71 inch)
242B	4620 kg (10185 lb)	2750 mm (108 inch)	1987 mm (78 inch)	1684 mm (66 inch)
242B ⁽¹⁾	4660 kg (10274 lb)	2750 mm (108 inch)	1987 mm (78 inch)	1684 mm (66 inch)
246B	4850 kg (10692 lb)	2381 mm (94 inch)	2082 mm (82 inch)	1794 mm (71 inch)
248B	5305 kg (11696 lb)	2381 mm (94 inch)	2082 mm (82 inch)	1794 mm (71 inch)
252B	5150 kg (11354 lb)	2906 mm (114 inch)	2082 mm (82 inch)	1794 mm (71 inch)
262B	5150 kg (11354 lb)	2906 mm (114 inch)	2082 mm (82 inch)	1794 mm (71 inch)
268B	5600 kg (12346 lb)	2906 mm (114 inch)	2082 mm (82 inch)	1794 mm (71 inch)



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Plate Locations and Film Locations

SMCS - 1000; 7000

The Product Identification Number (PIN) will be used to identify a powered machine that is designed for an operator to ride.

Caterpillar products such as engines, transmissions and motorized work tools that are not designed for an operator to ride are identified by Serial Numbers.

For quick reference, record the identification numbers in the spaces that are provided below the illustration.

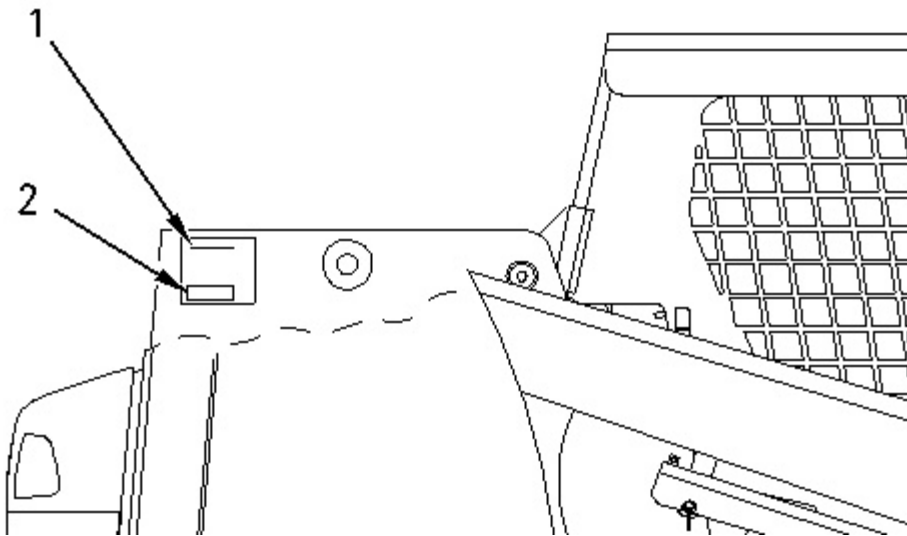


Illustration 1
 247 267 277

g00902931

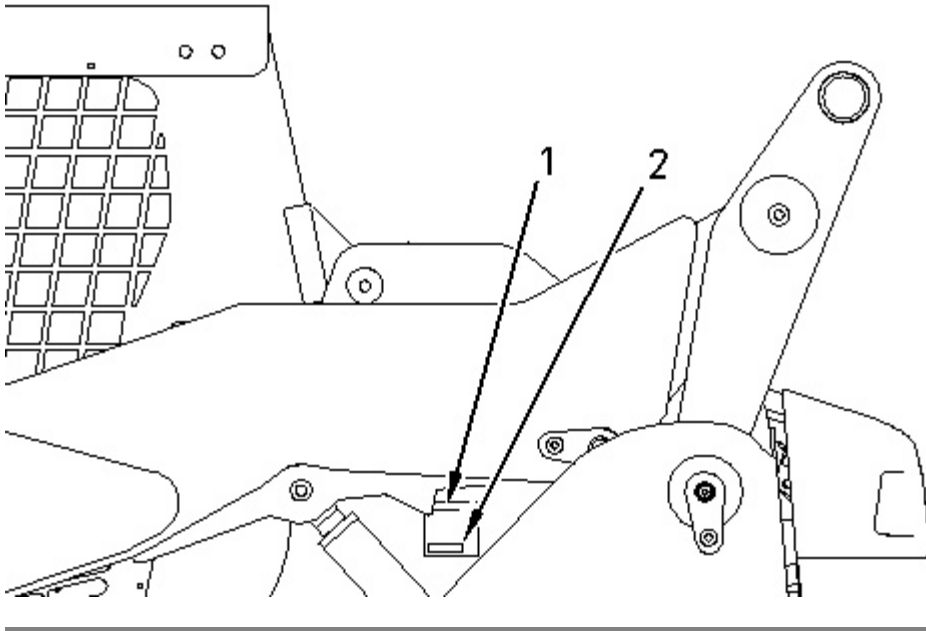


Illustration 2
257

g00902975

(1) Machine PIN _____

(2) CE Plate

- PIN _____
- Model _____
- Power (kW) _____
- Weight (kg) _____

The engine serial number plate is located on the engine.

- Engine Serial Number _____

Engine Serial Number _____



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Emissions Certification Film

SMCS - 1000; 7000; 7405

Note: This information is pertinent in the United States, in Canada and in Europe.

The emission certification films are located on the engine.

Typical examples are shown.

Perkins		IMPORTANT ENGINE INFORMATION			
ENGINE FAMILY		INITIAL INJECTION TIMING			
ENGINE TYPE		FUEL RATE AT ADVERTISED kW		mm ³ /STROKE	
ENGINE NO.		DISPLACEMENT		L	96
ADVERTISED kW AT RPM		IDLE RPM			
VALVE LASH COLD (INCHES)		EXH. INLET		EII	24
EMISSION CONTROL SYSTEM		e11-97/68			
SETTINGS ARE TO BE MADE WITH ENGINE AT NORMAL OPERATING TEMPERATURE TRANSMISSION IN NEUTRAL					
THIS ENGINE CONFORMS TO U.S. EPA AND CALIFORNIA REGULATIONS LARGE NON-ROAD COMPRESSION-IGNITION ENGINES					
THIS ENGINE IS CERTIFIED TO OPERATE ON COMMERCIALY AVAILABLE DIESEL FUEL					
3181A007					


The EPA/EU Emissions Certification Film
(if applicable) is located either on the side,
the top, or the front of the engine.

Perkins		RENSEIGNEMENTS IMPORTANTS SUR LE MOTEUR			
FAMILLE DU MOTEUR		CALAGE D'INJECTION INITIAL			
TYPE DE MOTEUR		TAUX D'INJECTION AU kW ANNONCÉ		MM ³ /COURSE	
NO DU MOTEUR		CYLINDRÉE		L	96
kW ANNONCÉ À TR/MIN		RALENTI TR/MIN			
JEU DES SOUPAPES À FROID (POUCES)		ÉCHAP ADMISSION		EII	24
DISPOSITIF ANTIPOLLUTION		e11-97/68			
LES RÉGLAGES DOIVENT ÊTRE FAITS AVEC LE MOTEUR À LA TEMPÉRATURE DE FONCTIONNEMENT NORMALE BOÎTE DE VITESSES AU POINT MORT					
CE MOTEUR EST CONFORME AUX NORMES AMÉRICAINES EPA ET AUX RÉGLEMENTATIONS DE LA CALIFORNIE GROS MOTEURS HORS-ROUTE À COMPRESSION-ALLUMAGE					
CE MOTEUR EST HOMOLOGUÉ POUR FONCTIONNER AVEC DU CARBURANT DIESEL DU COMMERCE					
3181A007					

L'AUTOCOLLANT D'HOMOLOGATION DU DISPOSITIF ANTIPOLLUTION EPA/UE
(SELON ÉQUIPEMENT) EST SITUÉ SOIT SUR LE CÔTÉ, SOIT SUR LE DESSUS DU MOTEUR
SOIT SUR LE DEVANT DU MOTEUR.

Illustration 1
3024 engine

g00937288


IMPORTANT ENGINE INFORMATION
 ENGINE DISPLACEMENT (6.4 LITRE)
 ENGINE FAMILY-2MVXL06.4DDD
 RATED OUTPUT 147HP/1800RPM
 LOW IDLE SPEED (BARF ENGINE) — RPM
 FUEL INJECTION TIMING 6° BTDC
 VALVE LASH (COLD) 0.0098 INCH
 FUEL RATE AT RATED OUTPUT 90.4 mm³/s
 THIS ENGINE CONFORMS TO 2002
 CALIFORNIA & U.S. EPA REGULATIONS FOR
 OFF-ROAD COMPRESSION-IGNITION ENGINES.
 THIS ENGINE IS CERTIFIED TO
 OPERATE ON COMMERCIALY AVAILABLE
 DIESEL FUEL.
 MITSUBISHI HEAVY INDUSTRIES, LTD.
 34393-30701

EPA Emission Film

RENSEIGNEMENTS IMPORTANTS SUR LE MOTEUR
 CYLINDRÉE MOTEUR (6,4
 LITRES)
 FAMILLE DU MOTEUR 2MVXL06.4DDD
 PUISSANCE NOMINALE 147 HP/1800 TR/MIN
 VITESSE AU RALENTI (MOTEUR NU) ----- TR/MIN
 CALAGE DE L'INJECTION 6° AVANT LE PMH
 JEU DES SOUPAPES (À FROID) 0,0098 PO
 TAUX D'INJECTION À LA PUISSANCE NOMINALE
 90,4 mm³/course
 CE MOTEUR EST CONFORME AUX RÉGLEMENTATIONS 2002
 DE LA CALIFORNIE ET DES AMÉRICAINES EPA
 POUR LES MOTEURS HORS-ROUTE À COMPRESSION-
 ALLUMAGE.
 CE MOTEUR EST HOMOLOGUÉ POUR FONCTIONNER AVEC
 DU CARBURANT DIESEL DU COMMERCE.
 MITSUBISHI HEAVY INDUSTRIES, LTD.
 34393-30701

Illustration 2

g00993817

Emission Certification Film for the EPA

3044 engine

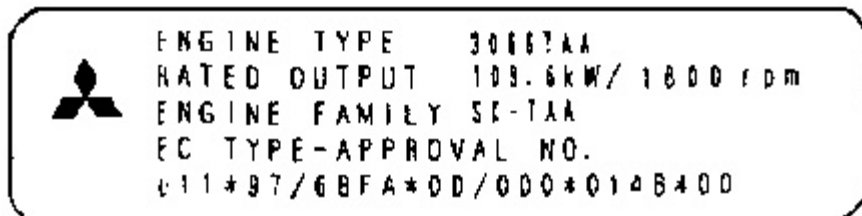


Illustration 3

g00995945

Emission Certification Film for the European Union

3044 engine

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Mounting and Dismounting

SMCS - 7000

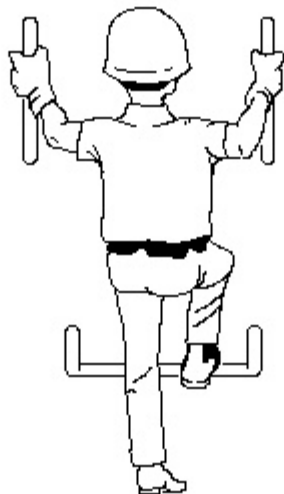


Illustration 1
 Typical example

g00037860

Mount the machine and dismount the machine only at locations that have steps and/or handholds. Before you mount the machine, clean the steps and the handholds. Inspect the steps and handholds. Make all necessary repairs.

Face the machine whenever you get on the machine and whenever you get off the machine.

Maintain a three-point contact with the steps and with the handholds.

Note: Three-point contact can be two feet and one hand. Three-point contact can also be one foot and two hands.

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not

carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

Alternate Exit

Machines that are equipped with cabs have alternate exits. For additional information, see Operation and Maintenance Manual, "Alternate Exit".

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Daily Inspection

SMCS - 1000; 7000

NOTICE

Accumulated grease and oil on a machine is a fire hazard. Remove this debris with steam cleaning or high pressure water, at least every 1000 hours or each time any significant quantity of oil is spilled on a machine.

Note: For maximum service life of the machine, make a thorough daily inspection before you operate the machine. Inspect the machine for leaks. Remove any debris from the engine compartment and the undercarriage. Ensure that all guards, covers, and caps are secured. Inspect all hoses and belts for damage. Make the needed repairs before you operate the machine.

Perform the following procedures on a daily basis.

- Operation and Maintenance Manual, "Engine Oil Level - Check"
- Operation and Maintenance Manual, "Cooling System Level - Check"
- Operation and Maintenance Manual, "Radiator Core - Clean"
- Operation and Maintenance Manual, "Hydraulic System Oil Level - Check"
- Operation and Maintenance Manual, "Fuel System Water Separator - Drain"
- Operation and Maintenance Manual, "Lift Arm and Cylinder Linkage - Lubricate"
- Operation and Maintenance Manual, "Tilt Cylinder Bearings and Bucket Linkage Bearings - Lubricate"
- Operation and Maintenance Manual, "Quick Coupler - Inspect"
- Operation and Maintenance Manual, "Work Tool Mounting Bracket - Inspect"
- Operation and Maintenance Manual, "Backup Alarm - Test"

Refer to the Maintenance Section for the detailed procedures. Refer to the Maintenance Interval Schedule

for a complete list of scheduled maintenance.

Refer to the following service interval charts and service intervals for additional maintenance information.

216B, 226B, 236B, 246B, and 248B Service Interval Chart

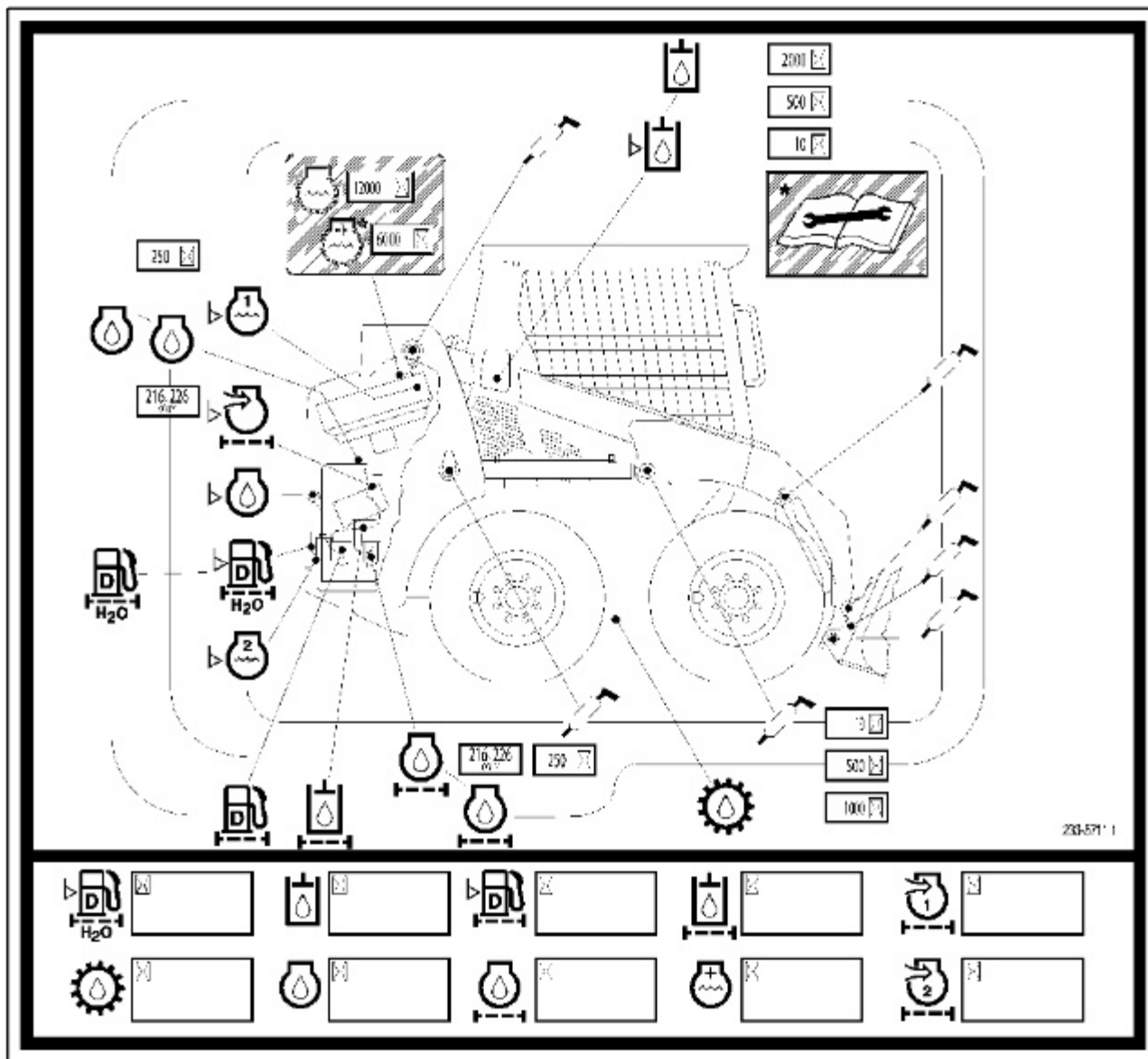


Illustration 1

g01043235

232B, 242B, 252B, 262B, and 268B Service Interval Chart

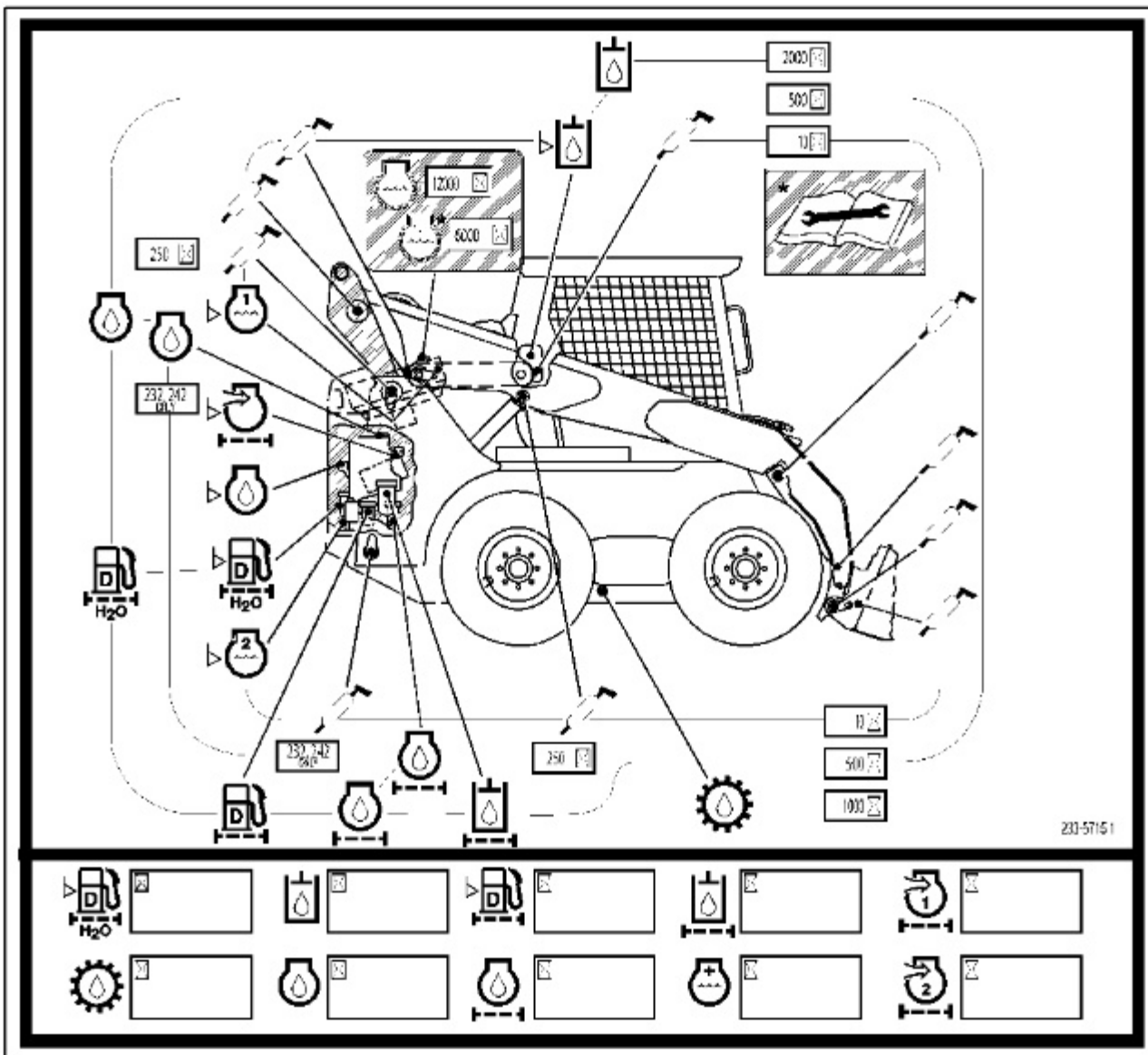


Illustration 2

g01043341


Service Intervals





Engine air filter primary element - Clean the primary air filter element or replace the primary air filter element. The alert indicator for the air filter indicates when servicing is necessary.





Engine air filter secondary element - Replace the secondary air filter element with every third change of the primary air filter element or replace the secondary air filter element when it is necessary.


 **Grease zerk** - Lubricate the designated locations after every ten service hours or at the end of each day.


 **Hydraulic oil level check** - Check the hydraulic oil level at the sight gauge after every ten service hours or at the end of each day.

 **Engine oil level check** - Check the engine oil level after every ten service hours or at the end of each day.

 **Fuel system water separator** - Drain the water separator after every ten service hours or at the end of each day.

 **Coolant level (radiator)** - Check the coolant level in the radiator at the sight gauge after every ten service hours or at the end of each day.

 **Coolant level (reservoir)** - Check the coolant level in the coolant reservoir after every ten service hours or at the end of each day.

 **Engine Air Filter Service Indicator** - Check the indicator after every ten service hours or at the end of each day.

Engine oil - Change the engine oil after



every 250 service hours or every year for the 216B, 226B, 232B and 242B machines. Change the engine oil after every 500 service hours or every year for the 236B, 246B, 248B, 252B, 262B and 268B machines.



Fuel System Filter/Water Separator Element - Replace the filter after every 500 service hours or every three months.



Engine oil filter - Change the filter after every 500 service hours or every three months.



Hydraulic oil filter - Change the filter after every 500 service hours or every three months.



Hydraulic oil - Change the hydraulic oil after every 2000 service hours or every year.



Coolant additive - Add the extender to the extended life coolant after every 6000 service hours or every 3 years.



Cooling system coolant - Change the ELC (Extended Life Coolant) after every 12,000 hours or every 6 years.



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i02798459

Alternate Exit

SMCS - 7000

S/N - BXM1-4224

S/N - HEN1-6749

S/N - LBA1-UP

S/N - MJH1-10474

S/N - PAT1-UP

S/N - PDT1-UP

S/N - RLL1-6799

S/N - SCH1-2474

S/N - SCL1-UP

S/N - SCP1-4599

Rear Window

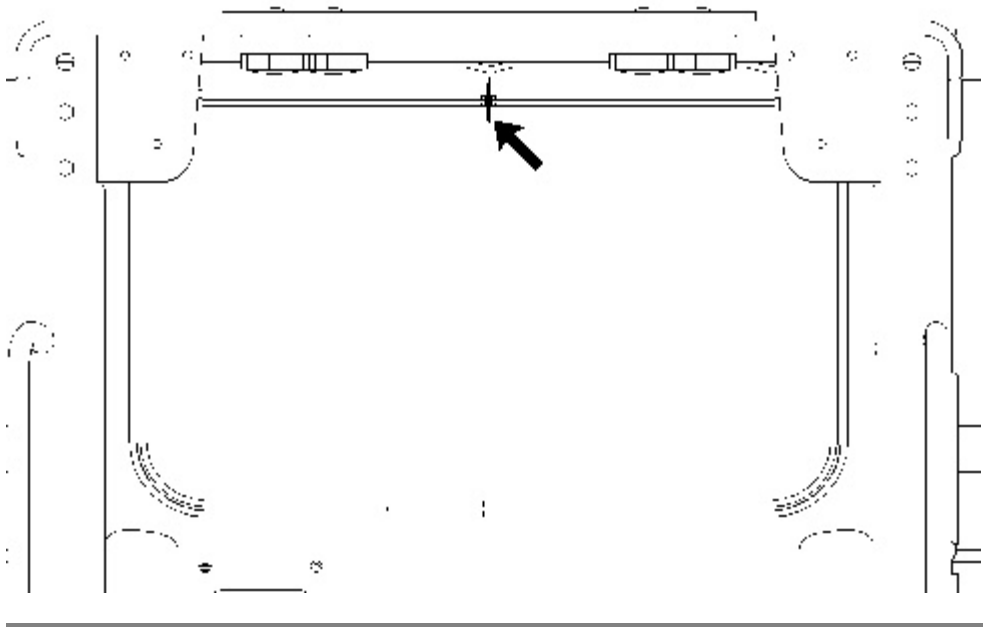


Illustration 1

g00929616

The opening in the rear of the machine serves as an alternate exit. The window (if equipped) will need to be removed in order to use the alternate exit.

The window can be removed by pulling on the ring at the top of the window. This will remove the seal that holds the window in place. When the seal is taken out, carefully remove the window.

Front Door (if equipped)

Note: This procedure includes the following serial numbers:

- MJH 1833-UP
- HEN 5286-UP
- PAT 4826-UP
- BXM 3395-UP
- SCP 3563-UP
- PDT 4370-UP
- MTL 4071-UP
- SLK 6029-UP
- CYC 1425-UP
- MDH 4920-UP
- ZSA 4183-UP
- SCL 1824-UP
- LBA 1841-UP

- RLL 5038-UP
- SCH 1997-UP

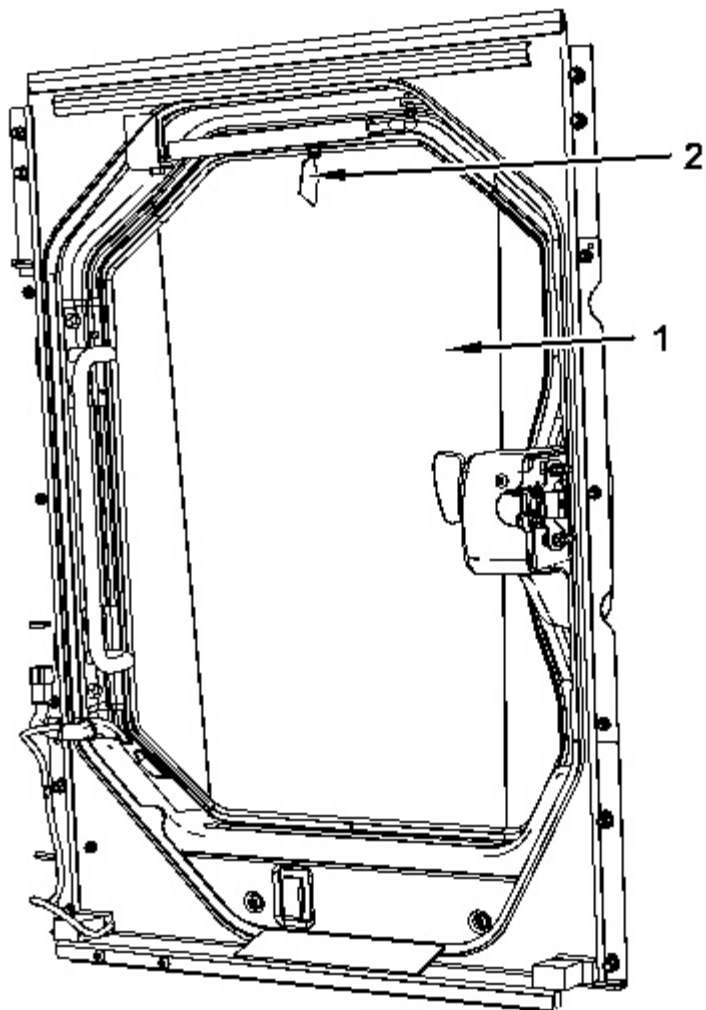


Illustration 2

g01398188

If the machine is equipped with a polycarbonate door, the opening (1) in the door may serve as an alternate exit. The window will need to be removed in order to use the alternate exit.

The window can be removed by pulling on the ring (2) at the top of the window. This will remove the seal that holds the window in place. When the seal is taken out, carefully remove the window.



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Seat Belt

SMCS - 7327

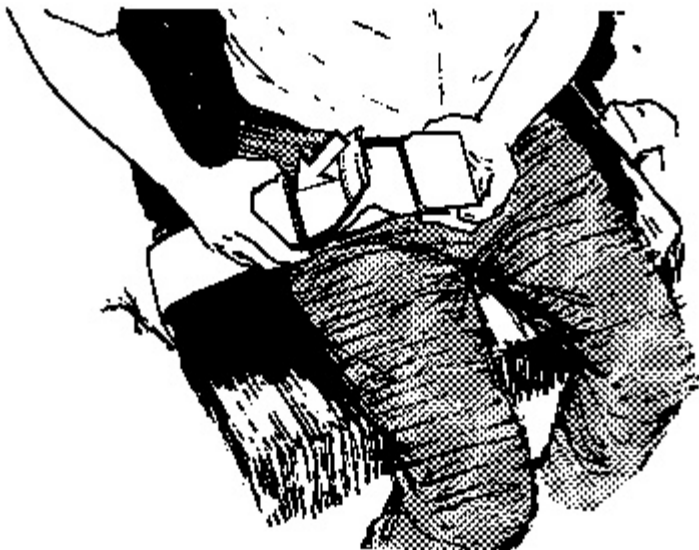
Note: This machine was equipped with a seat belt when the machine was shipped from Caterpillar. At the time of installation, the seat belt and the instructions for installation of the seat belt meet the SAE J386 and ISO 6683 standards. See your Caterpillar dealer for all replacement parts.

Always check the condition of the seat belt and the condition of the mounting hardware before you operate the machine.

Seat Belt Adjustment for Non-Retractable Seat Belts

Adjust both ends of the seat belt. The seat belt should be snug but comfortable.

Lengthening the Seat Belt



1. Unfasten the seat belt.

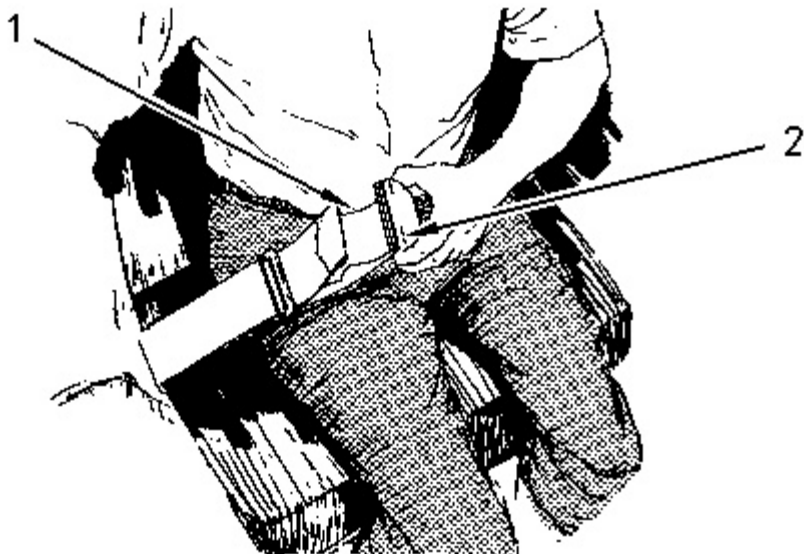


Illustration 2

g00932817

2. To remove the slack in outer loop (1) , rotate buckle (2) . This will free the lock bar. This permits the seat belt to move through the buckle.
3. Remove the slack from the outer belt loop by pulling on the buckle.
4. Loosen the other half of the seat belt in the same manner. If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

Shortening the Seat Belt

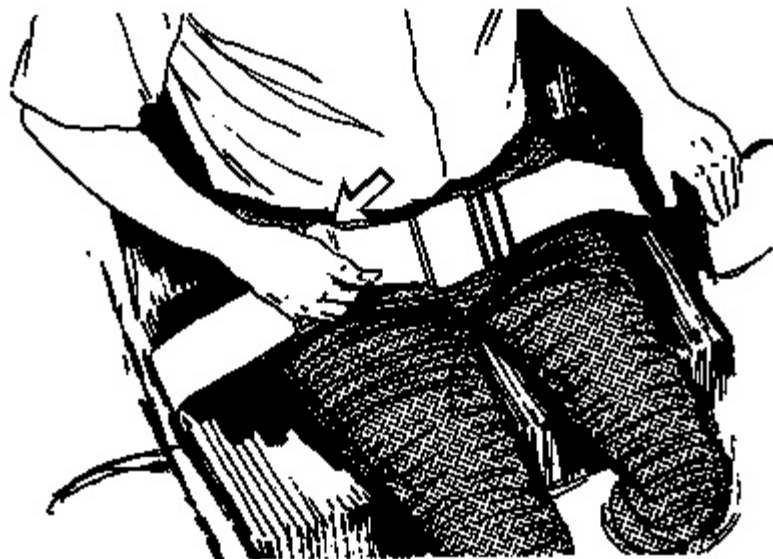


Illustration 3

g00100713

1. Fasten the seat belt. Pull out on the outer belt loop in order to tighten the seat belt.
2. Adjust the other half of the seat belt in the same manner.
3. If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

Fastening The Seat Belt

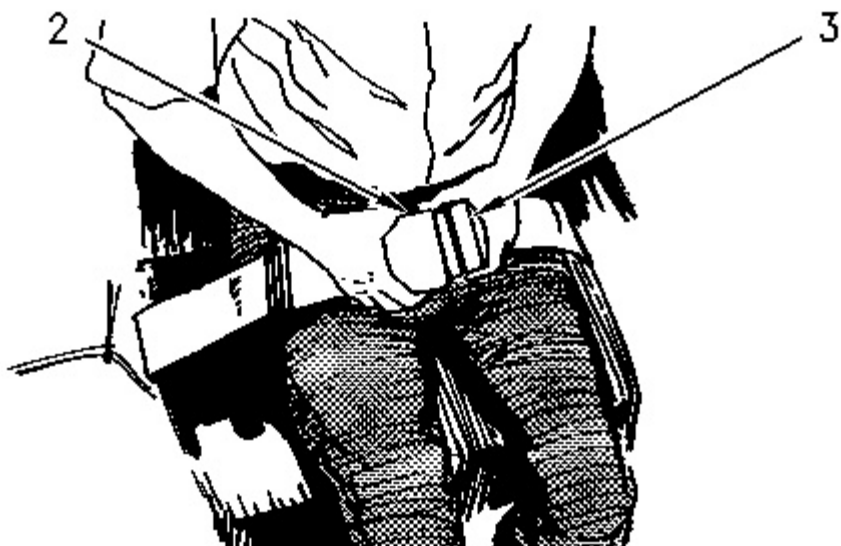


Illustration 4

g00932818

Fasten the seat belt catch (3) into the buckle (2) . Make sure that the seat belt is placed low across the lap of the operator.

Releasing The Seat Belt

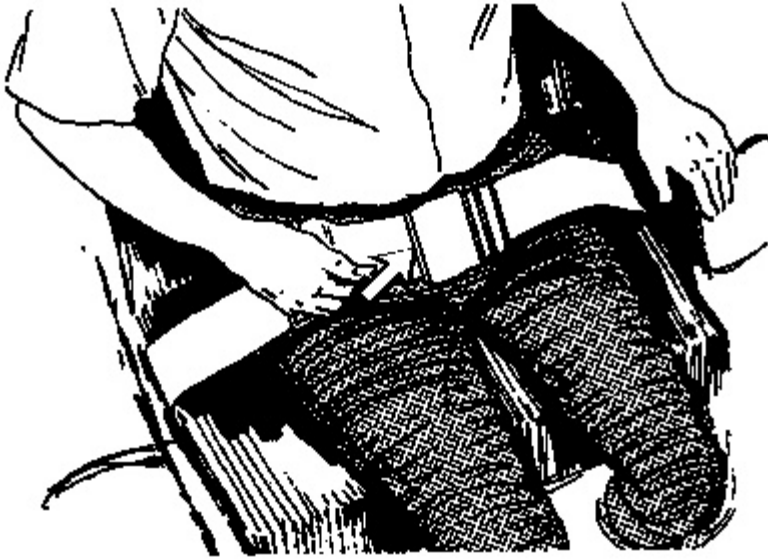


Illustration 5

g00100717

Pull up on the release lever. This will release the seat belt.

Seat Belt Adjustment for Retractable Seat Belts

Fastening The Seat Belt

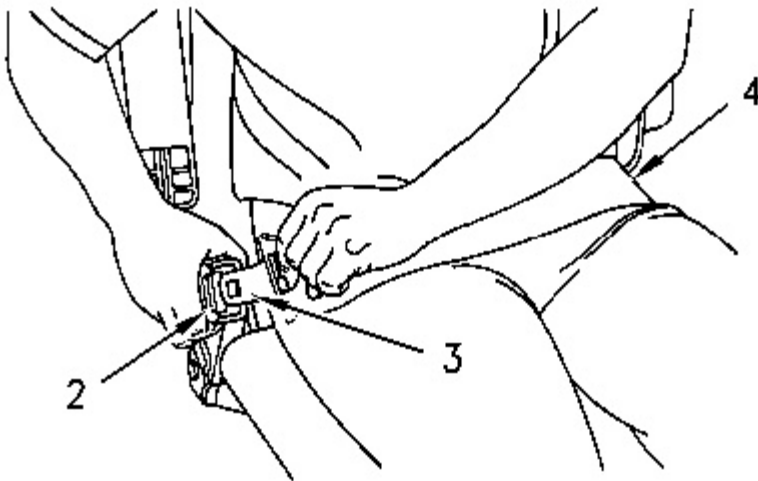


Illustration 6

g00867598

Pull seat belt (4) out of the retractor in a continuous motion.

Fasten seat belt catch (3) into buckle (2) . Make sure that the seat belt is placed low across the lap of the operator.

The retractor will adjust the belt length and the retractor will lock in place. The comfort ride sleeve will allow the operator to have limited movement.

Releasing The Seat Belt

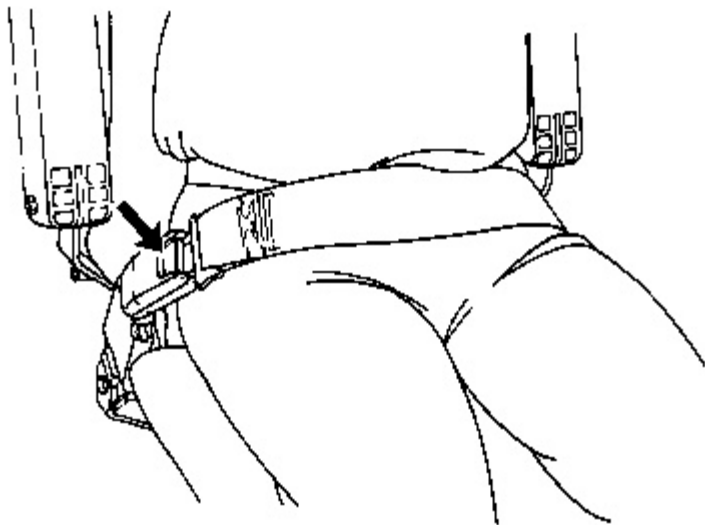


Illustration 7

g00039113

Push the release button on the buckle in order to release the seat belt. The seat belt will automatically retract into the retractor.

Extension of the Seat Belt

WARNING

When using retractable seat belts, do not use seat belt extensions, or personal injury or death can result.

The retractor system may or may not lock up depending on the length of the extension and the size of the person. If the retractor does not lock up, the seat belt will not retain the person.

Longer, non-retractable seat belts and extensions for the non-retractable seat belts are available.

Caterpillar requires only non-retractable seat belts to be used with a seat belt extension.

Consult your Caterpillar dealer for longer seat belts and for information on extending the seat belts.



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Operator Controls

SMCS - 7300; 7451

Note: Your machine may not be equipped with all of the controls that are discussed in this topic.

Note: Your machine may be equipped with a Dedicated Dual Direction Control Kit. The Dedicated Dual Direction Control Kit changes the control of the work tool and the movement of the machine. The other functions of the joysticks are not affected by the Dedicated Dual Direction Control Kit. Refer to the topic Dedicated Dual Direction Control Kit for details.

Note: Simple hydromechanical work tools may be shipped without hydraulic oil. Uneven movement may occur until all the air has been removed from the work tool. You may need to add hydraulic oil to the machine after the machine fills the circuits of the work tool. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level - Check" for the proper procedure for checking the hydraulic oil level.

Note: If the machine is not equipped with a cab that is enclosed, Caterpillar recommends the use of a flying object guard. If the machine is equipped with an enclosed cab, operate the machine with the cab door in the CLOSED position.

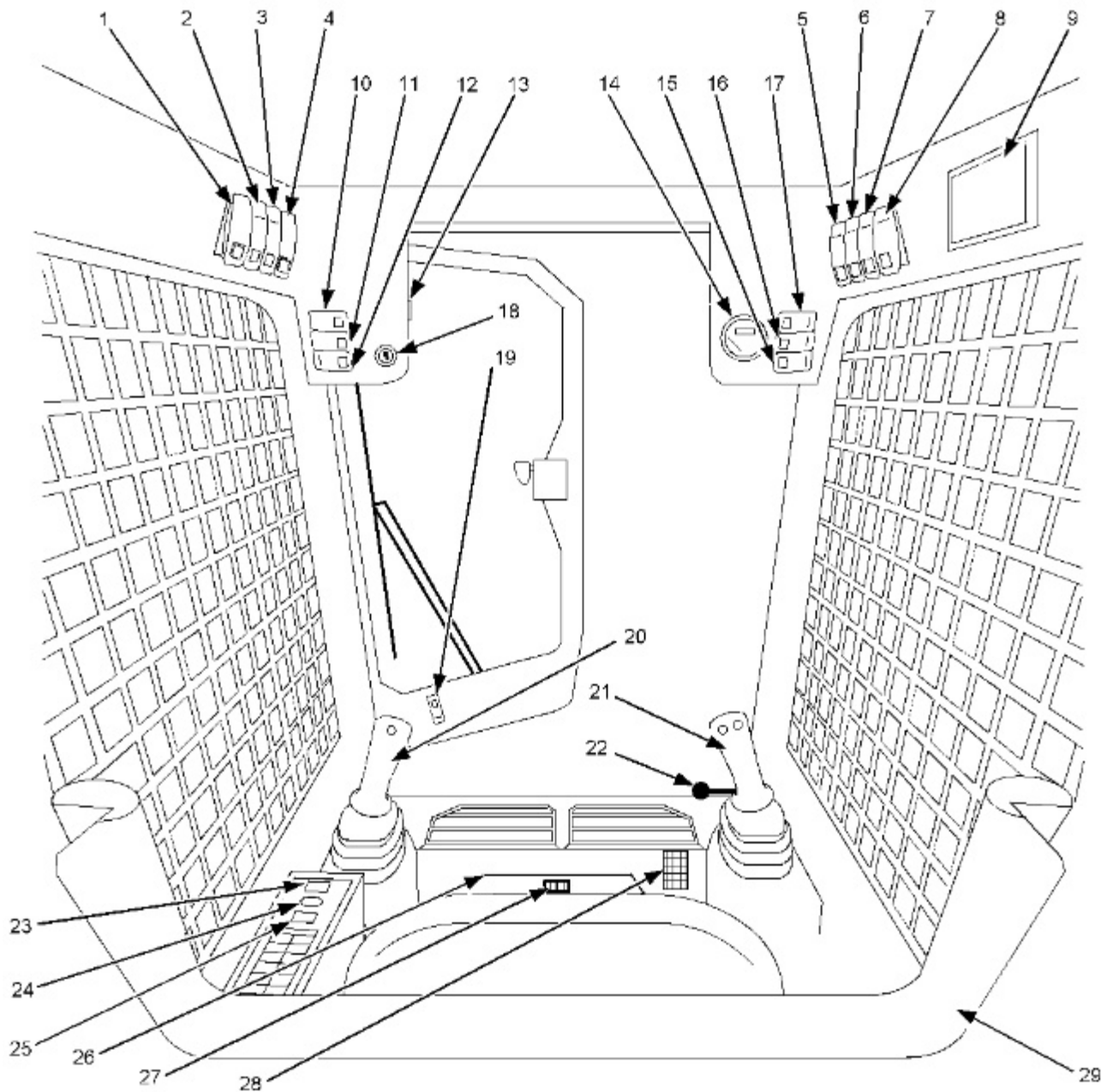


Illustration 1

g01014075

- (1) Auxiliary Hydraulic Pressure Release
- (2) Automatic Level Control
- (3) Auxiliary Electrical Control
- (4) Work Tool Coupler Control
- (5) Roding Lights
- (6) Hazard Flashers
- (7) Hydraulic Lockout and Interlock Override
- (8) Beacon Switch
- (9) Cab Light
- (10) Glow Plug Starting Aid

- (11) Parking Brake
- (12) Auxiliary Hydraulic Mode
- (13) Service Hour Meter
- (14) Fuel Level Gauge
- (15) Rear Work Lights
- (16) Front Work Lights
- (17) Turn Signals
- (18) Engine Start Switch
- (19) Window Wiper and Window Washer
- (20) Joystick Control
- (21) Joystick Control
- (22) Governor Control
- (23) Fan Speed Control
- (24) Temperature Control
- (25) Air Conditioning Control
- (26) Seat Adjustment
- (27) Suspension Seat
- (28) Accelerator Control
- (29) Interlock Control

Auxiliary Hydraulic Pressure Release (1)



WARNING

Personal injury or death can result from the work tool falling.

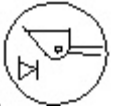
Fully lower the loader arms before you release the hydraulic system pressure.

Auxiliary Hydraulic Pressure Release - Push up on the locking tab and press the bottom of the switch in order to release the pressure in the Standard Flow Auxiliary Circuit and the High Flow Auxiliary Circuit (if equipped). Hold the switch for four seconds and release the switch.

Note: The pressure in the secondary circuit is not affected by this switch. Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation : Secondary Auxiliary Circuit" for the procedure to release the pressure.

Note: The operator must remain in the seat with the armrest in the LOWERED position in order for the control to function.

Automatic Level Control (2)



Automatic Level Control - The Automatic Level Control maintains the selected angle of the work tool as the loader lift arms are raised. Press on the bottom of the switch in order to activate the automatic level control. Press on the top of the switch in order to deactivate the automatic level control.

Note: The Automatic Level Control keeps a load at the selected angle when the lift arms are raised. The Automatic Level Control is not designed to maintain the selected angle of the work tool when the lift arms are lowered.

Auxiliary Electrical Control (3)

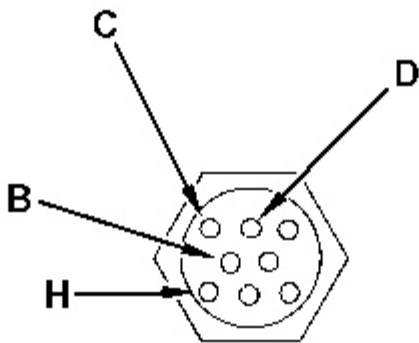


Illustration 2

g01107114

Typical electrical connection on the loading arm



Auxiliary Electrical Control - The auxiliary electrical control supplies continuous electrical power to pin (H) that is located on the loader arm. Press on the bottom of the switch in order to turn on electrical power. Press on the top of the switch in order to turn off electrical power.

Work Tool Coupler Control (4)

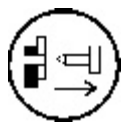


WARNING

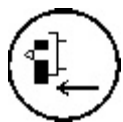
Improper Attachment of the Work Tool could result in injury or death.

Do not operate the machine without confirmation that the coupler pins are fully engaged. Follow the operating procedures in the Operation and Maintenance Manual.

Work Tool Coupler Control - The work tool coupler control controls the engagement of the coupler pins.



Disengaged - Pull the red button downward and press the bottom of the switch. Hold the switch in the downward position until the coupler pins disengage.



Engaged - Press the top of the switch and hold the top of the switch until the coupler pins engage.

Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation" for the proper procedure for the work tool coupler.

Roading Lights (5)



Roading Lights - Move the switch to the middle position in order to turn on the control panel lights and position lights. Press on the bottom of the switch in order to turn on the front low beams. Press on the top of the switch in order to turn off the lights.

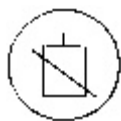
Hazard Flashers (6)



Hazard Flasher Control - Press on the top of the switch in order to activate the hazard flashers. Press on the bottom of the switch in order to deactivate the hazard flashers.

Hydraulic Lockout and Interlock Override (7)

Hydraulic Lockout - Press the top of the



switch. This will disable the hydraulic functions. Press the top of the switch again in order to activate the hydraulic functions.

Note: Activate the hydraulic shutoff when you are roading the machine in order to prevent unplanned movement of the work tool and the loader arms.

Interlock Override - The interlock override allows the auxiliary hydraulic circuits to function with the armrest in the RAISED position. First activate the continuous flow control that is located on the left side joystick. Refer to the section "Joystick and Auxiliary Hydraulic Controls" for detailed information. Press the bottom of the interlock override switch. This will activate the interlock override function. In order to turn off the interlock override and continuous flow, press the bottom of the switch again.



NOTICE

Do not leave the machine unattended while you have the interlock override function activated.

A switch is provided on the cab door that prevents implement operations when the cab door is open. If you choose to operate without the cab door, you must install a jumper wire between Terminal 4 and Terminal 5 in the wiring harness connector for the Window Wiper. Refer to Special Instruction, REHS1738, "Installing the Cab Door and Mounting Group" for more information about the cab door.

Note: When the door is installed, remove the jumper wire from the connector plug before you connect the harness. Damage to the door could occur if the jumper is left in place.

Beacon Switch (8)

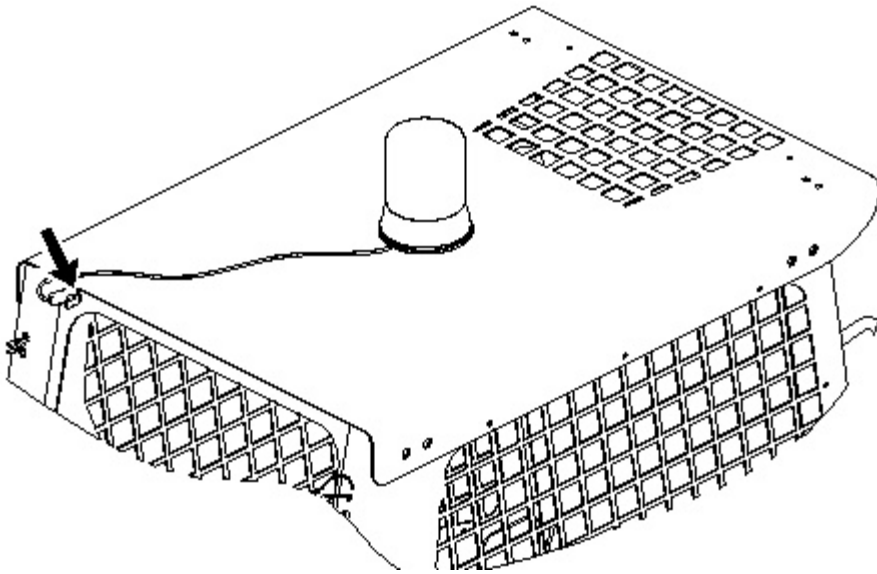


Illustration 3

g00897909



Beacon - Press on the bottom of the switch in order to turn on the beacon. Press the top of the switch in order to turn off the beacon. The receptacle for the beacon is located on the upper left corner on the rear of the cab.

Cab Dome Light (9)



Cab Dome Light - Press on either side of the light in order to turn on the light. Move the light to the middle position in order to turn off the light.

Glow Plug Starting Aid (10)



Glow Plug Starting Aid - Refer to Operation and Maintenance Manual, "Engine Starting" for the starting procedure with glow plugs.

Parking Brake Control (11)



Parking Brake Control - Press on the right side of the switch in order to engage or disengage the parking brake.

Note: The parking brake will engage when the engine is stopped. The parking brake will engage when the armrest is moved to the RAISED position. The parking brake will engage when the operator leaves the operator seat for an extended period of time.

Auxiliary Hydraulic Mode (12)

NOTICE

High flow should not be continuously operated on machines that are equipped with high flow hydraulics. The high flow can be operated continuously on machines that are equipped with high flow and high pressure hydraulics.

Note: High flow will not operate if rabbit mode has been selected with the two speed control. High flow mode also requires an electrical connection that is located on the loader arm. Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation" or Operation and Maintenance Manual, "Work Tool Operation" for additional details.

Connect the work tool harness to the electrical plug on the loader arm.

Note: If your High Flow work tool does not have a wiring harness, a Jumper Plug needs to be installed on the electrical plug for the work tool control. Without this Jumper Plug, the machine will not provide High Flow to the work tool. Please refer to your Parts Manual for the current part number for the Jumper Plug.



Auxiliary Hydraulic Mode - Press the right side of the switch in order to select high flow. The indicator light will illuminate. Move the thumb wheel that is located on the right side joystick in order to supply hydraulic oil flow to the auxiliary hydraulic lines. Press the left side of the switch in order to select standard flow. The indicator light will not be illuminated. Move the thumb wheel that is located on the right side joystick in order to supply hydraulic oil flow to the auxiliary hydraulic lines. Refer to the section "Joystick and Auxiliary Hydraulic Controls" for additional details.

Note: The thumb wheel must be moved to full displacement in order to achieve maximum pressure and flow for the following models: 248B, 268B and 287B High Flow.

Service Hour Meter (13)

Service Hour Meter - The service hour



meter should be used to determine service hour maintenance intervals.

Fuel Level Gauge (14)



Fuel Level Gauge - The needle in the yellow range indicates low fuel.

Rear Work Lights (15)



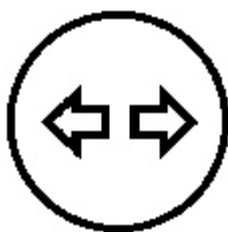
Rear Work Lights - Press the left side of the switch in order to turn on the lights. Press the right side of the switch in order to turn off the lights.

Front Work Lights (16)



Front Work Lights - Press the left side of the switch in order to turn on the lights. Press the right side of the switch in order to turn off the lights.

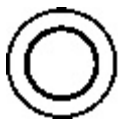
Turn Signals (17)



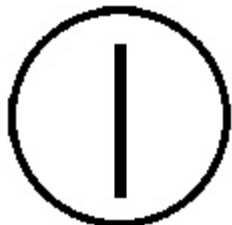
Turn Signals - Press on the left side of the switch in order to turn on the left turn signals. Press on the right side of the switch in order to turn on the right turn signals. Move the switch to the middle position in order to turn off the turn signals.

Engine Start Switch (18)

OFF - Insert the engine start switch key only from the OFF position and remove the engine start switch key only from the OFF position. Turn the engine start switch key to the OFF position in order to stop the engine. In the OFF position, there is no power to most electrical circuits on the machine. The



cab lights, panel lights, tail lights, working lights (if equipped) and fuel gauge light are operational even when the engine start switch is in the OFF position.



ON - Turn the engine start switch key clockwise to the ON position in order to activate all of the cab circuits.



START - Turn the engine start switch key clockwise to the START position in order to crank the engine. Release the engine start switch key after the engine starts and the engine start switch key returns to the ON position.

Note: If the engine fails to start, the engine start switch key must be returned to the OFF position in order to attempt to start the engine again.

Window Wiper and Window Washer (19)



Window Wiper and Window Washer - Move the switch to the middle position in order to turn on the wiper. Press on the right side of the switch in order to operate the washer. Press on the left side of the switch in order to turn off the wipers.

Joystick Control (20)

Refer to the section "Joystick and Auxiliary Hydraulic Controls" for detailed information.

Joystick Control (21)

Refer to the section "Joystick and Auxiliary Hydraulic Controls" for detailed information.

Governor Control (22)

Governor Control - Use the governor control when you want to set a constant engine speed. Move the lever forward in order to increase engine speed. Move the lever backward in order to decrease engine speed.



High Idle



Low Idle

Fan Speed Control (23)



Fan Speed Control

Temperature Control (24)



Temperature Control

Air Conditioner Control (25)



Air Conditioner Control

Seat Adjustment (26)



Seat Adjustment

Suspension Seat (27)

Suspension Seat



Accelerator Control (28)



Accelerator Control - Push down on the accelerator pedal in order to increase engine speed. Release the accelerator pedal in order to decrease engine speed. The accelerator pedal will return to the setting of the governor control.

Interlock Control (29)

Interlock Control - Move the armrest to the RAISED position in order to lock out the hydraulic controls.

Note: When the armrest is moved to the RAISED position, the parking brake will engage. Move the armrest to the LOWERED position and push the switch for the parking brake in order to activate the hydraulic controls.

Note: When you start the engine, the parking brake must be disengaged in order for the hydraulic controls to be activated. If the armrest is raised and then lowered during operation, you must disengage the parking brake in order for the hydraulic controls to be activated.

Machine Security System (If Equipped)

NOTICE

This machine is equipped with a Caterpillar Machine Security System (MSS) and may not start under certain conditions. Read the following information and know your machine's settings. Your Caterpillar Dealer can identify your machine settings.



Machine Security System (MSS) - Machines that are equipped with a Caterpillar Machine Security System (MSS) can be identified by a decal in the operator station. MSS is designed to prevent theft of the machine or unauthorized operation.

Basic Operation

MSS may be programmed to read a standard Caterpillar key or an electronic key. The electronic key contains an electronic chip within the plastic housing for the key. Each key emits a unique signal to the MSS. The keys can be identified by a gray housing or a yellow housing. MSS can have programmed settings to require an electronic key or a standard Caterpillar key for starting during certain periods of time.

When the key start switch of the machine is turned to the ON position, the ECM will read the unique ID that

is stored in the electronic key. The ECM will then compare this ID to the list of authorized keys. The following table tells the operator the status for starting the machine. The status light is located near the key start switch.

Table 1

Green light	The machine will start.
Red light	The key is not authorized.

Note: MSS will not shut down the machine after the machine has started.

Security Management

The MSS has the capability to allow you to program the system to automatically activate at different time periods with different keys. The MSS can also be programmed to reject a specific electronic key after a selected date and time. When you turn the key to the OFF position and the MSS is active, you have a 30 second interval in order to restart the machine with an unauthorized key. Also if the machine stalls, there is a 30 second interval for restarting the machine. This 30 second interval is counted from the time of turning the key to the OFF position.

Note: Know your machine's settings because the use of an electronic key is no guarantee that the machine can be restarted.

An expiration date can be set for each electronic key that is contained in the list of keys for the machine. The key will no longer start the machine when the internal clock in the security system passes the expiration date. Each entry in the list of keys can have a different expiration date.

Spare keys are available from your dealer. Before a key can operate the machine, the MSS must be set to accept that particular key. Contact your Caterpillar dealer for information on additional features of the MSS.

Joystick and Auxiliary Hydraulic Controls

The joystick controls the functions that are listed below. Your machine may not be equipped with all of the controls that are discussed in this topic.

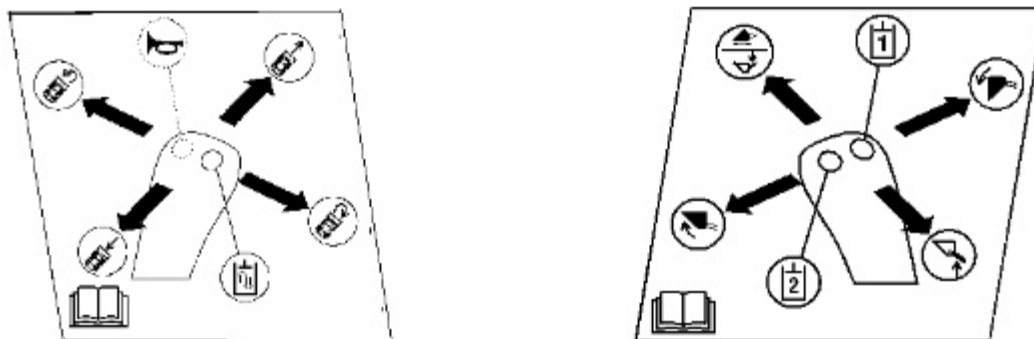


Illustration 4

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Instruction Decals A - Instruction Decal for Left Hand Joystick and Instruction Decal for Right Hand Joystick

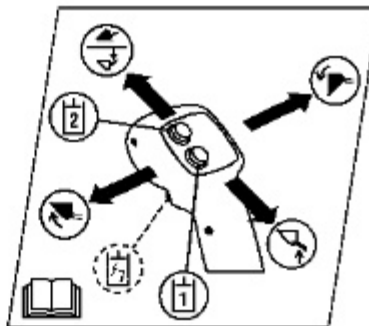
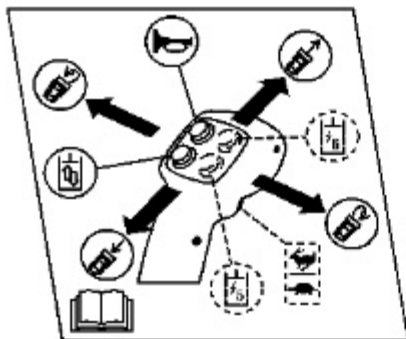


Illustration 5

g01112439

Instruction Decals B - Instruction Decal for Left Hand Joystick and Instruction Decal for Right Hand Joystick

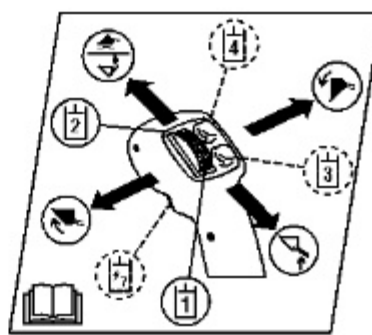
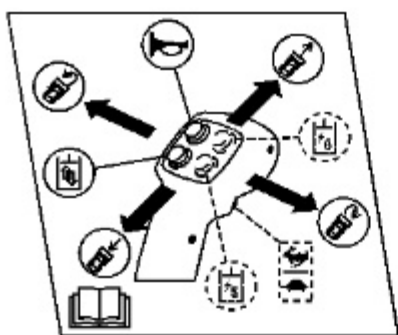


Illustration 6

g01112442

Instruction Decals C - Instruction Decal for Left Hand Joystick and Instruction Decal for Right Hand Joystick with Thumb Wheel

Forward



Forward Travel - Push the joystick forward in order to travel forward.

Backward



Backward Travel - Pull back on the joystick in order to travel in reverse.

Right Turn



Right Turn - Move the joystick to the right in order to turn the machine to the right.

Left Turn



Left Turn - Move the joystick to the left in order to turn the machine to the left.

Dump



Dump - Move the joystick to the right in order to tilt the bucket downward.

Raise



Raise - Pull the joystick backward in order to raise the bucket.

Tilt Back



Tilt Back - Move the joystick to the left in order to tilt the bucket upward.

Lower



Lower - Push the joystick forward in order to lower the bucket.

Float



Float - Push the joystick forward into the detent in order for the bucket to follow the contour of the ground.

Horn



Horn - Press the switch in order to sound the horn. Use the horn in order to alert personnel.

Two Speed Control

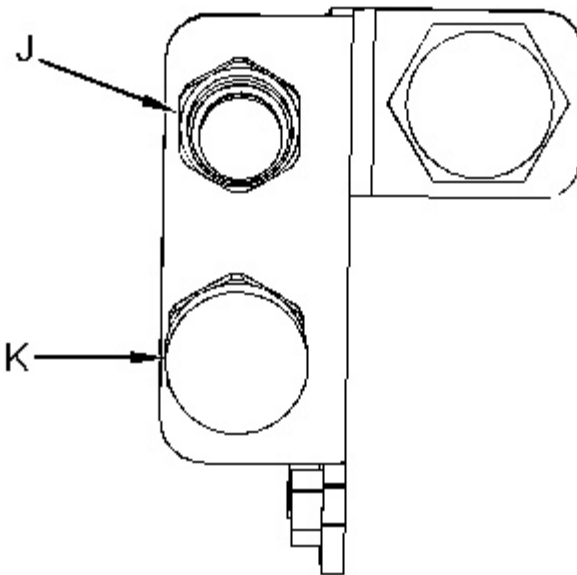
Note: If rabbit mode is selected, the high flow control will not operate.



Two Speed - Press the switch on the front of the left hand joystick in order to activate rabbit mode.

Note: Keep the work tool close to the ground when you travel in rabbit mode. This will maximize the stability of the machine.

Auxiliary Hydraulic Controls



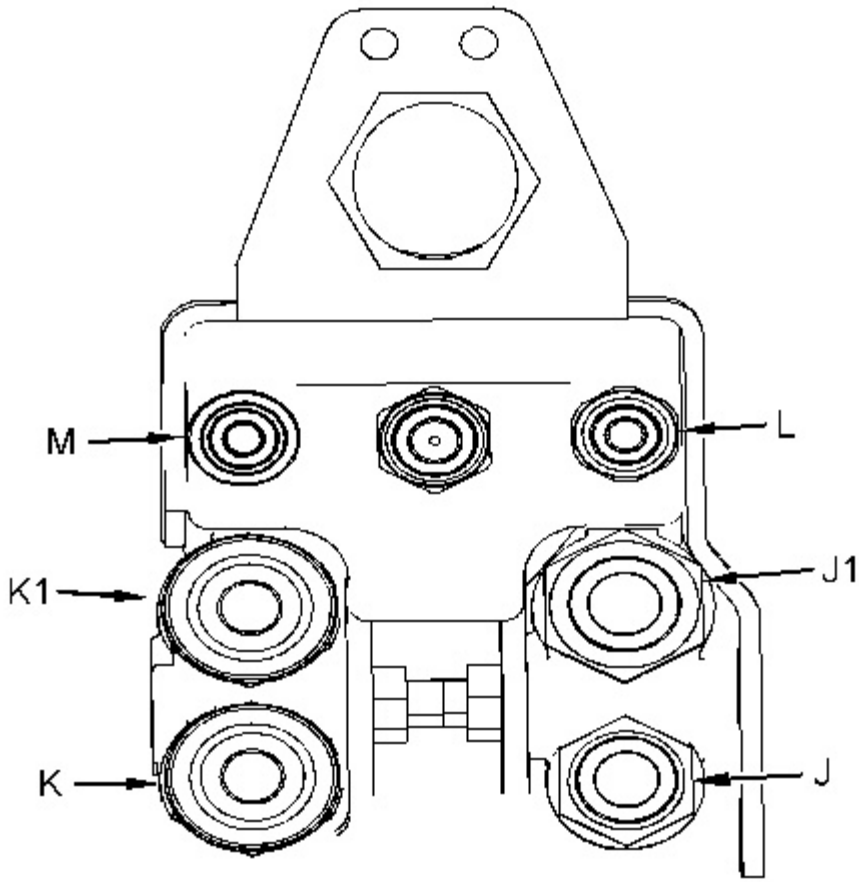


Illustration 8
226B, 242B and 257B High Flow

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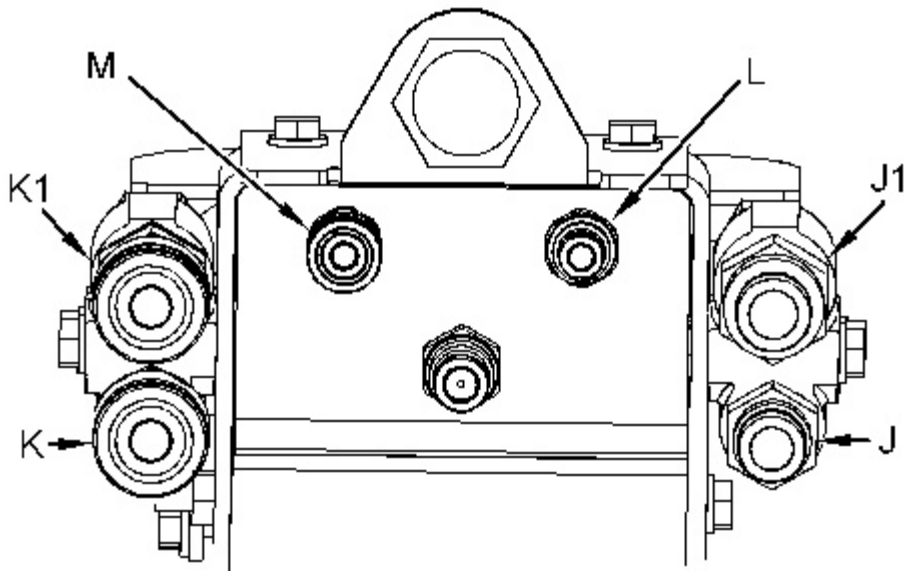


Illustration 9

g01106742



Auxiliary Hydraulic Control (A1) - This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Engage the control in order to provide hydraulic oil flow to the connector (K). For high flow work tools, engage the control in order to provide hydraulic oil flow to the connector (K1) .



Auxiliary Hydraulic Control (A2) - This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Engage the control in order to provide hydraulic oil flow to the connector (J). For high flow work tools, engage the control in order to provide hydraulic oil flow to the connector (J1) .



Secondary Auxiliary Hydraulic Control (C-) - This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Press the control in order to provide hydraulic oil flow to the connector (M) .



Secondary Auxiliary Hydraulic Control (C+) - This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Press the control in order to provide hydraulic oil flow to the connector (L) .

Auxiliary Electrical Control

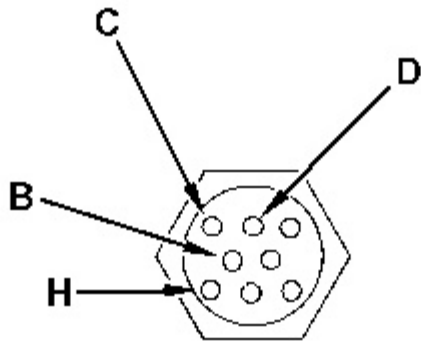


Illustration 10

g01107114

Typical electrical connection on the loading arm



Auxiliary Electrical Control (C2) - This control provides electrical power in order to control a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to the pin (D). Release the switch in order to deactivate the control.



Auxiliary Electrical Control (C1) - This control provides electrical power in order to control a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to pin (C). Release the switch in order to deactivate the control.



Right Hand Trigger - Pull the trigger and hold the trigger on the right hand joystick in order to provide electrical power to pin (B). Release the trigger in order to deactivate the control.

Continuous Flow Control

Continuous Flow - The continuous flow control supplies continuous flow of hydraulic fluid to the auxiliary hydraulic circuit without continuously holding the auxiliary hydraulic control. Press one of the two auxiliary hydraulic switches that are located on the right side joystick. Press the continuous flow switch on the left hand



joystick and release the continuous flow switch. Immediately release the auxiliary hydraulic switch after you release the continuous flow switch. The continuous flow function will be activated if the operator releases the auxiliary hydraulic switch within one second of releasing the continuous flow switch. Press on either the auxiliary hydraulic control or the continuous flow switch in order to stop the flow to the auxiliary circuit.

Dedicated Dual Direction Control Kit

Note: The following illustrations reflect the operation of the joysticks when the machine is equipped with a Dedicated Dual Direction Control Kit. The Dedicated Dual Direction Control Kit changes the control of the work tool and the movement of the machine. The other functions of the joysticks are not affected by the Dedicated Dual Direction Control Kit. The Dedicated Dual Direction Control Kit may be used with standard joysticks or optional joysticks.

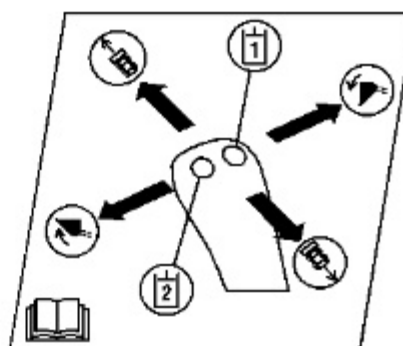
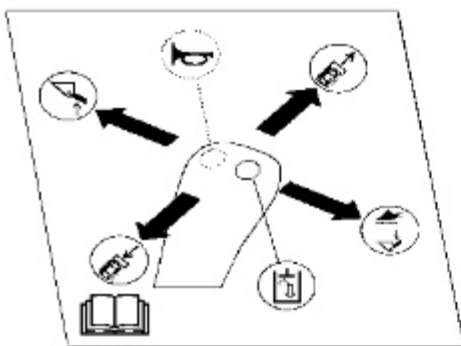


Illustration 11

g01112348

Instruction Decals A - Instruction Decal for Left Hand Dual Direction Control Joystick and Instruction Decal for Right Hand Dual Direction Control Joystick

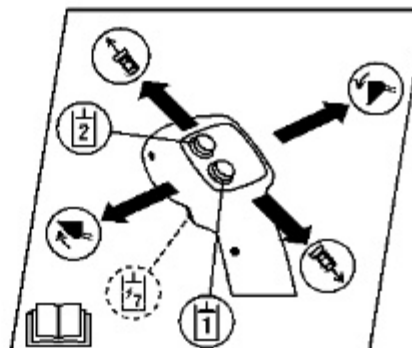
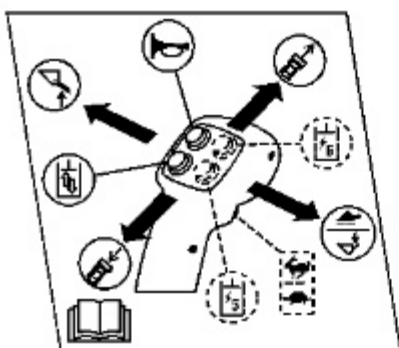


Illustration 12

g01112448

Instruction Decals B - Instruction Decal for Left Hand Dual Direction Control Joystick and Instruction Decal for Right Hand Dual Direction Control Joystick

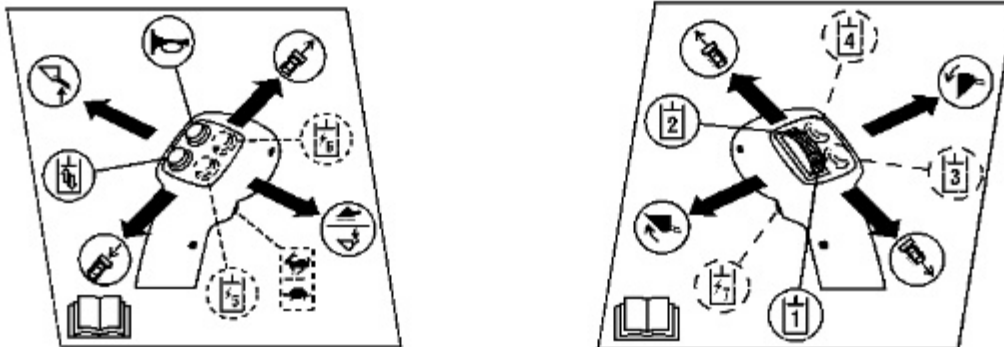


Illustration 13

g01112451

Instruction Decals C - Instruction Decal for Left Hand Dual Direction Control Joystick and Instruction Decal for Right Hand Dual Direction Control Joystick with Thumb Wheel

Forward



Forward - Push both joysticks forward in order to move the machine forward.

Reverse



Reverse - Pull both joysticks backward in order to move the machine backward.

Right Turn

Push the left joystick forward in order to turn the machine to the right.

Push the left joystick forward and pull the right joystick backward in order to rapidly turn the machine to the right.

Left Turn

Push the right joystick forward in order to turn the machine to the left.

Push the right joystick forward and pull the left joystick backward in order to rapidly turn the machine to the left.

Float



Float - Move the joystick to the right into the detent in order for the bucket to follow the contour of the ground.

Lower



Lower - Move the joystick to the right in order to lower the bucket.

Raise



Raise - Move the joystick to the left in order to raise the bucket.

Dump



Dump - Move the joystick to the right in order to tilt the bucket downward.

Tilt Back



Tilt Back - Move the joystick to the left in order to tilt the bucket upward.



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

Publication Date -01/07/2007

Date Updated -16/07/2007

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Alert Indicators

SMCS - 7450; 7451

The alert indicators are located on the left side and right side overhead consoles.

Note: Your machine may not be equipped with all of the indicators that are discussed in this topic.

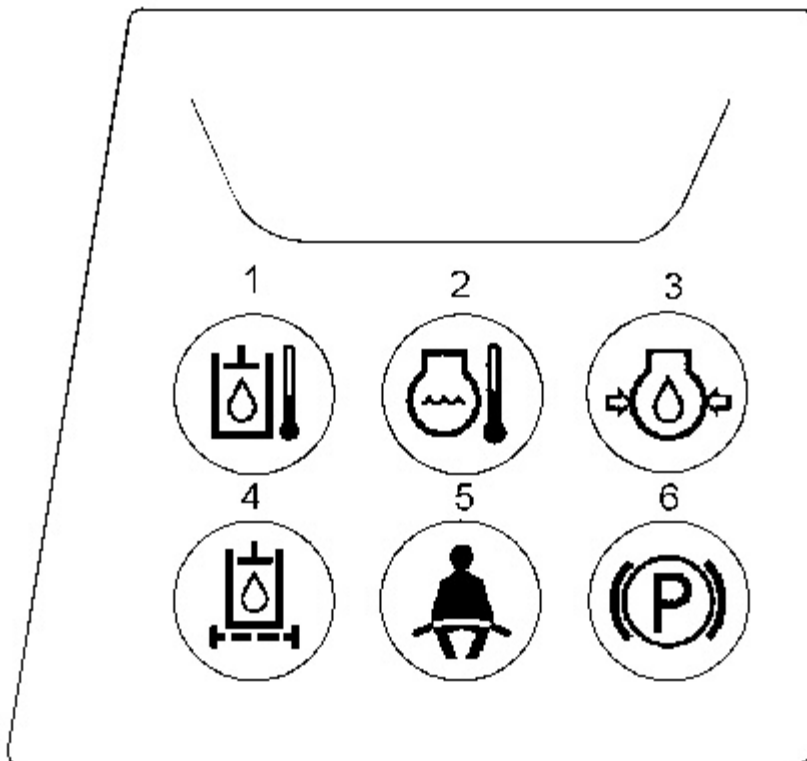


Illustration 1
 Left side

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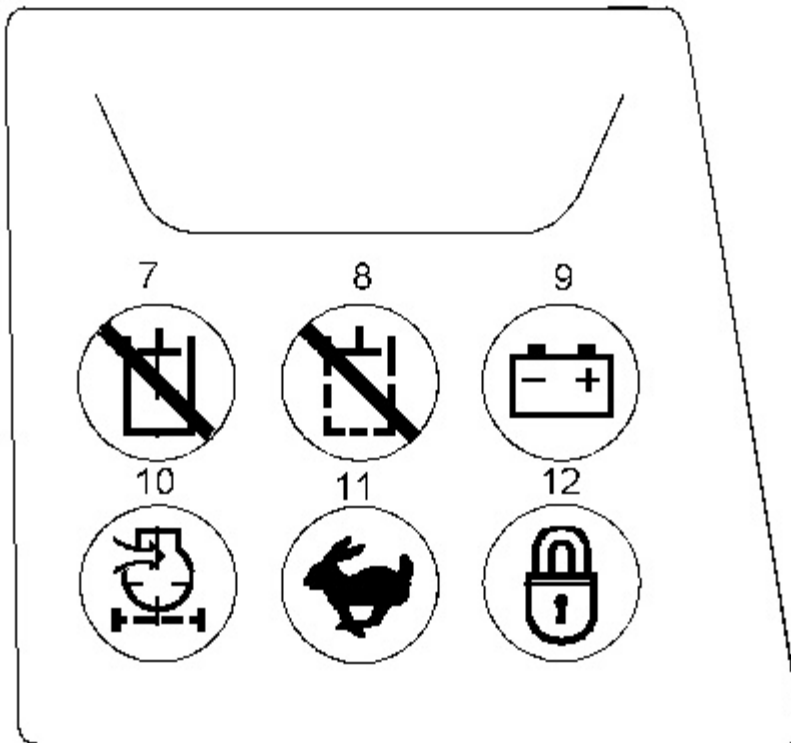


Illustration 2
Right Side

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Hydraulic Oil Temperature (1) - This alert indicator will light and an audible alert will sound when the temperature of the hydraulic oil is too high. If this indicator comes on, stop the machine immediately. Stop the engine and investigate the problem.



Engine Coolant (2) - This alert indicator will light and an audible alert will sound when the engine coolant temperature is too high. If this alert indicator comes on, stop the machine immediately. Stop the engine and investigate the cause.



Engine Oil Pressure (3) - This alert indicator will light and an audible alert will sound when the engine oil pressure is low. If this alert indicator comes on, stop the machine immediately. Stop the engine and investigate the cause.



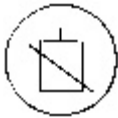
Hydraulic Oil Filter (4) - This indicator will light when the hydraulic oil filter is not functioning properly. Stop the machine and replace the oil filter. The indicator will stay on until the hydraulic oil has warmed up. Do not operate the machine until the light turns off.



Seat and Armrest (5) - This alert indicator will light when the armrest is in the RAISED position. The alert indicator will light when the operator gets out of the operator seat. The alert indicator should go out when the operator is in the operator seat and the armrest is in the LOWERED position.



Parking Brake (6) - This alert indicator will light when the parking brake is engaged. The alert indicator should come on during start-up. The alert indicator should go out when the parking brake is disengaged.



Implement Lockout (7) - This alert indicator will light when the implement lockout control is activated.



Interlock Override (8) - This alert indicator will light when interlock override is activated.



Charging System (9) - This alert indicator will light if there is a malfunction in the electrical system. If this alert indicator comes on, the system voltage is too high for normal machine operation or too low for normal machine operation.

If electrical loads are high and the engine speed is near low idle, increase the engine speed to high idle. This will generate more output from the alternator. If the alert indicator for the electrical system turns off within one minute, the electrical system is probably operating in a normal manner. However, the electrical system may be overloaded during periods of low engine speeds.

Increase the engine idle speed with the governor lever in order to compensate for a higher electrical load on the system.

If this procedure does not cause the alert indicator to turn off, move to a convenient location. Investigate the cause (loose alternator belt, broken alternator belt, faulty batteries, etc).



Engine Air Filter (10) - This alert indicator will light if the engine air filter becomes restricted.



Rabbit Mode (11) - This alert indicator will light when rabbit mode is selected with the two-speed control.



Machine Security System (12) - This alert indicator will light when the machine security system is activated.



Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

Publication Date -01/07/2007

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i02747467

Engine Starting

SMCS - 1000; 7000



WARNING

Do not use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury.

It is important to prepare the machine for operation in temperatures that are below 0 °C (32 °F). It is also important to follow the appropriate warm up procedures when the machine is operated in temperatures that are below 0 °C (32 °F).

Machine preparation for cold weather includes using the correct hydraulic system oil. The factory fills the hydraulic system with 10W hydraulic oil which has a minimum operating temperature of -20 °C (-4 °F). If the machine will be operated at temperatures below -20 °C (-4 °F), the 10W oil must be replaced with 0W30 hydraulic oil in order to provide the proper oil viscosity. Refer to Operation and Maintenance Manual, "Lubricant Viscosities and Refill Capacities". Refer to Operation and Maintenance Manual, SEBU5898, "Cold Weather Recommendations for Caterpillar Machines". Refer to Operation and Maintenance Manual, SEBU6250, "Caterpillar Machine Fluids Recommendations".

NOTICE

Keep the engine speed low until the engine oil pressure alert indicator goes out. If the alert indicator does not go out within ten seconds, stop the engine and investigate the cause before you try to start the engine again. Failure to do so can cause engine damage.

NOTICE

If you fail to follow the steps described in this section, damage to the engine or damage to the hydraulic system may occur.

1. Fasten the seat belt.
2. Pull the armrest downward.
3. Move the governor control lever to the low idle position.
4. Before the engine is started, check for the presence of bystanders or maintenance personnel. Ensure that all personnel are clear of the machine. Briefly sound the forward horn before you start the engine.
5. Turn the engine start switch key to the ON position.

NOTICE

Do not operate the glow plugs for more than 30 seconds at one time. Damage to the glow plugs could occur.

6. Press the glow plug switch and hold the switch for the time specified in the following tables:

Table 1

216B, 226B, 232B, 242B, 247B, 257B	
Ambient Temperature	Preheat time for the Glow Plugs
greater than 0 °C (32 °F)	6 seconds
0 °C (32 °F) to -18 °C (0 °F)	10 seconds
-19 °C (-2 °F) or colder	30 seconds

Table 2

236B, 246B, 248B, 252B, 262B, 268B, 267B, 277B, 287B	
Ambient Temperature	Preheat Time for the Glow Plugs
-9 °C (15 °F) or colder	10 seconds

Note: For ambient temperatures of -27 °C (-16 °F) or colder it is recommended to use a jacket water heater in addition to glow plugs.

NOTICE

Do not crank the engine for more than 30 seconds. Allow the electric starting motor to cool for two minutes before cranking the engine again.

7. Release the glow plug switch momentarily.
8. Turn the engine start switch key to the START position in order to start the engine. Press the glow plug switch and hold the switch during engine cranking in order to assist starting. Release the key and release the glow plug switch after the engine has started.
9. Run the engine for 5 minutes. The engine should run smoothly at low idle. The engine should run smoothly as speed is gradually increased to high idle. Allow the white smoke to disperse before you proceed with normal operation.
10. Disengage the parking brake.
11. Run the engine at half throttle. Hold the work tool control in the TILT BACK position for thirty seconds. Release the control for thirty seconds. Hold the work tool control in the LOWER position for thirty seconds. Release the control for thirty seconds. Perform the procedure for three minutes.

Note: If you are operating the machine below 0 °C (32 °F), perform the procedure for eight minutes.

NOTICE

Do not use the hydraulic interlock override function to warm up the machine.

12. Keep all personnel away from the machine. Move the machine very slowly to an open area. Repeat Step 11 as you move the machine back and forth for 3 m (10 ft).

Note: More warm up time may be required if the hydraulic functions are sluggish.



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i02459745

Operation Information

SMCS - 7000

General Information

1. Adjust the operator's seat.
2. Fasten the seat belt.
3. Lower the armrest.
4. Start the engine and allow the machine to warm up. Refer to Operation and Maintenance Manual, "Engine Starting".
5. Disengage the parking brake.
6. Raise all lowered work tools and attachments in order to negotiate any obstacles.
7. Smoothly move the speed and direction control for the desired direction and speed.

To prevent injury, make sure that no people are working on the machine or near the machine. To prevent injury, keep the machine under control at all times.

Do not allow the machine to overspeed when you go downhill. Move the speed control lever toward the HOLD position in order to reduce the speed of the machine when you are going downhill. For additional information, refer to "Operating on a Slope".

Always put the heaviest end of the machine uphill when you are working on an incline.

The loader arms of the machine should be fully lowered onto the stops when you are digging with the machine. Digging with the loader arms in the fully lowered position will transfer the stress that is placed on the loader arm into the frame.

Note: Caterpillar does NOT recommend the use of steel tracks over tires on any model of skid steer loader. Work tools may not engage the work tool coupler properly. Work tools may not properly engage the ground. The loader arms may contact the steel tracks which will cause damage to the machine.

Operating on a Slope

When it is possible, avoid operating the machine across a slope. When it is possible, operate the machine up a slope and down a slope. Never exceed a slope that is greater than 25 degrees for continuous fore/aft slope operation and 35 degrees intermittent fore/aft operation. The 3044 engine has an intermittent rating of 2 minutes and the 3024 engine has an intermittent rating of 15 minutes. Do not turn the machine while you are operating on a slope.

When it is necessary to travel across a slope, the following steps should always be followed:

1. Stop the machine. Turn the machine slowly while you are backing down the slope.

Note: Do not back up a hill in order to turn.

2. Position the machine so that the front of the machine faces the direction for travel that is desired.



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i02696057

Work Tool Coupler Operation

SMCS - 6129; 7000



WARNING

Improper Attachment of the Work Tool could result in injury or death.

Do not operate the machine without confirmation that the coupler pins are fully engaged. Follow the operating procedures in the Operation and Maintenance Manual.

Attaching the Work Tool

Note: Before you install the work tool, inspect the coupler and the work tool mounting bracket for any wear or for any damage. Ensure that the work tool mounting bracket and the face of the coupler are clean. Ensure that the coupler has no accumulation of material. Refer to Operation and Maintenance Manual, "Quick Coupler - Inspect" and Operation and Maintenance Manual, "Work Tool Mounting Bracket - Inspect" for inspection procedures.

1. Position the work tool on a level surface. Move the hydraulic lines (if equipped) for the work tool and electrical lines (if equipped) away from the work tool mounting bracket.

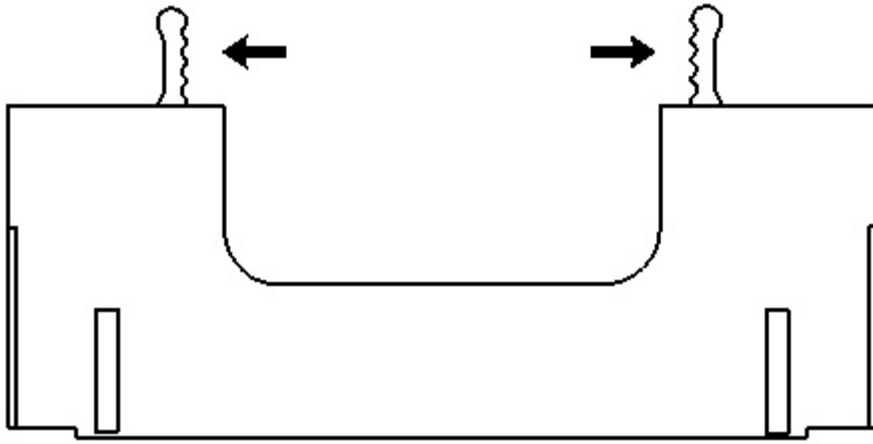


Illustration 1

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2. If the machine is equipped with a manual coupler, ensure that the levers for the coupler are in the DISENGAGED position. If the machine is equipped with a hydraulic quick coupler refer to Operation and Maintenance Manual, "Operator Controls" for details on the location and the operation of the hydraulic quick coupler control.
3. Enter the machine.
4. Fasten the seat belt and lower the armrest.
5. Start the engine.
6. Disengage the parking brake.
7. Tilt the quick coupler assembly forward.

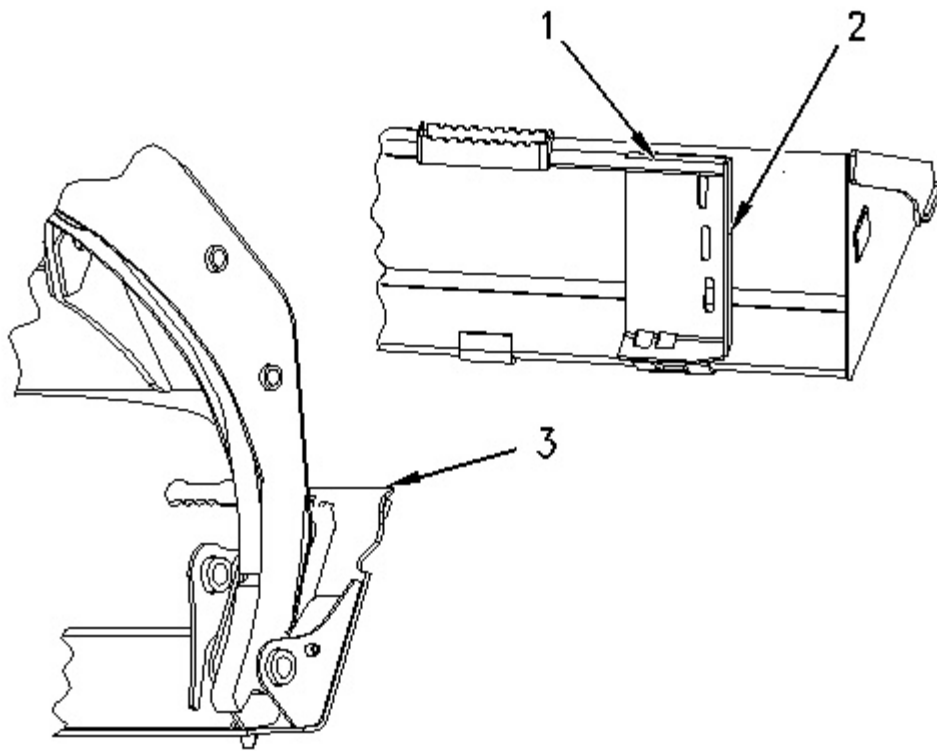


Illustration 2

g00929878

8. Align the quick coupler assembly (3) between the outer plates (2) of the mounting bracket. Move the quick coupler assembly under the angled plate (1) of the mounting bracket and rack back the work tool.
9. Fully lower the loader arms.
10. Tilt the work tool forward until the work tool is slightly off the ground.
11. Turn the engine start switch key to the OFF position in order to stop the engine.
12. If the work tool requires hydraulics, the hydraulic system pressure must be released before you connect the work tool. Refer to the section "Auxiliary Hydraulic Pressure Release".
13. Exit the machine.

Note: If you are installing a material handling arm that is not equipped with the optional center step, do not exit the machine. A second person needs to perform steps 14 through step 16.

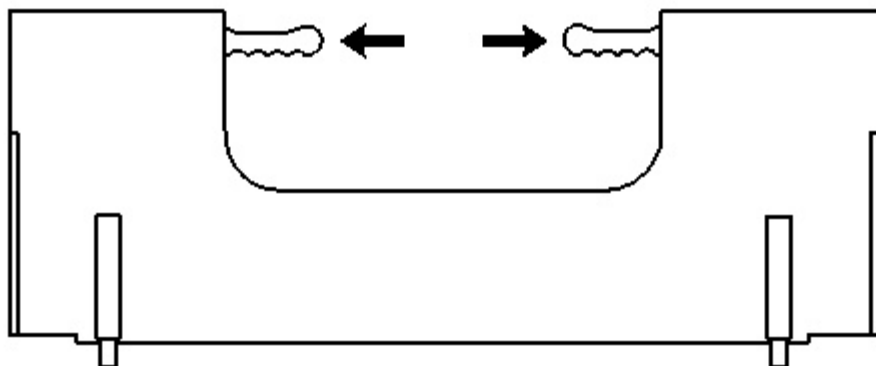


Illustration 3

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14. Engage the coupler pins. If the machine is equipped with a manual coupler, ensure that the levers for the coupler are in the ENGAGED position. If the machine is equipped with a hydraulic quick coupler refer to Operation and Maintenance Manual, "Operator Controls" for details on engaging the coupler pins.
 15. If the work tool requires hydraulics, refer to the following procedure in order to connect the hydraulic hoses.
-

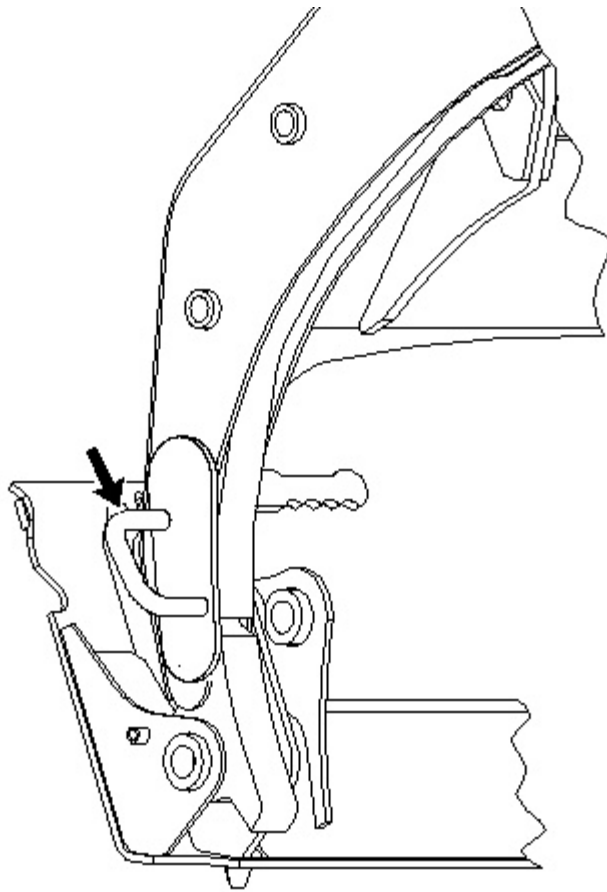


Illustration 4

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- a. Route the hydraulic hoses through the hose guide on the machine in order to prevent damage to the hoses. Not all work tools require the hydraulic hoses to be routed through the hose guide. The work tool Operation and Maintenance Manual will inform you if the hydraulic hoses need to be routed through the hose guide. Caterpillar work tools require the hoses to be routed through the hose guide.
- b. Ensure that the quick connect couplers are clean.
- c. Connect the auxiliary hydraulic hoses for the work tool to the machine. Twist the collar of the quick connect coupler for one quarter of a turn in order to secure the hydraulic connections. If the work tool uses High Flow hydraulics, refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic Controls" for operating details.

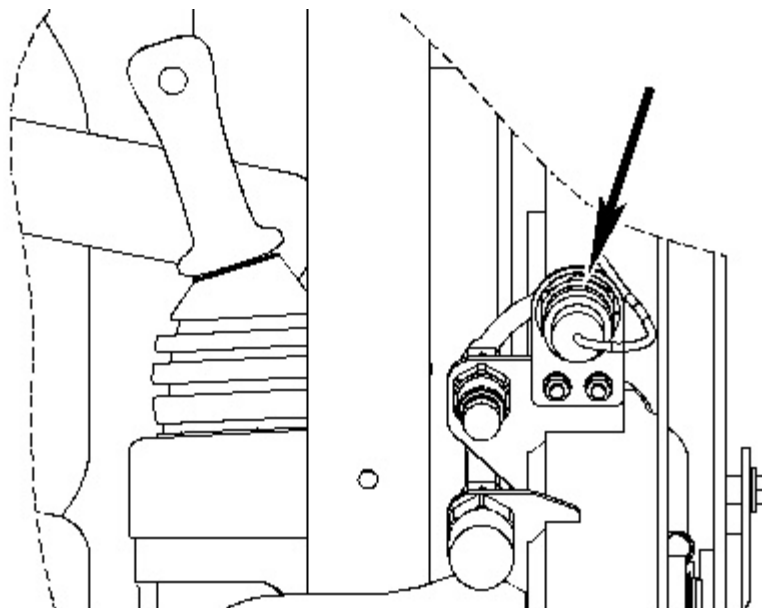


Illustration 5
Standard Auxiliary Connection

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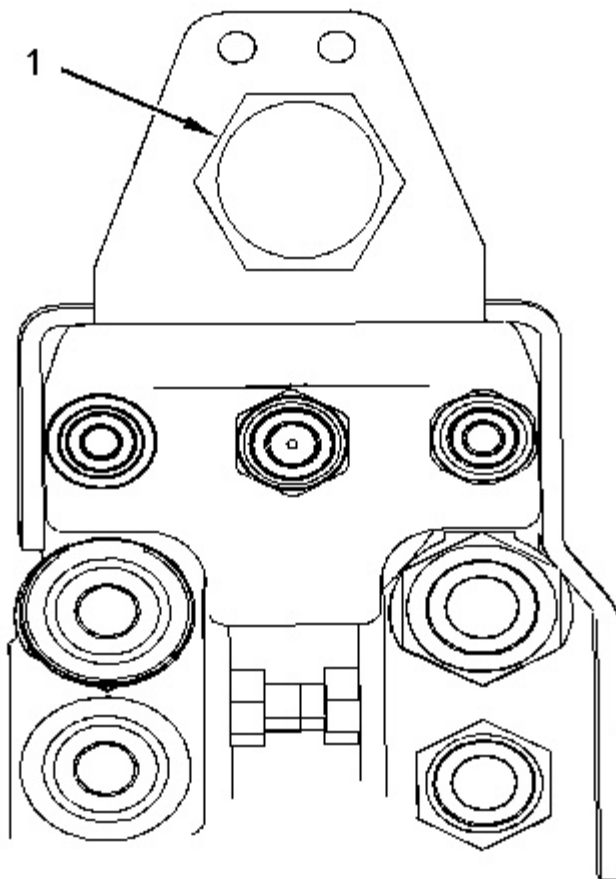


Illustration 6
226B, 242B, and 257B with High Flow option

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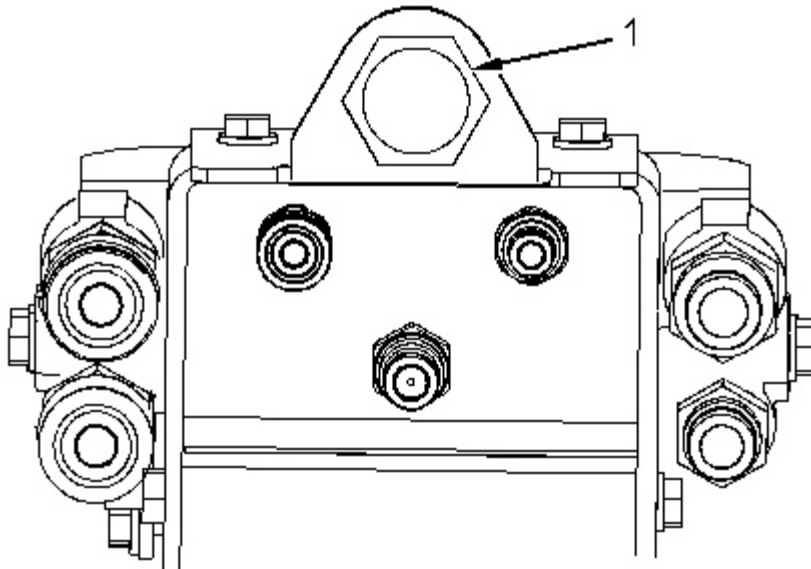


Illustration 7
248B, 268B, and 287B with High Flow option

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- d. If the work tool is equipped with electrical lines, then route the electrical lines with the hydraulic hoses and connect the wire harness to the electrical connector (1) on the host machine. Check the connections in order to ensure that the connections are properly secured. Check the connections on the work tool in order to ensure that the connections are in the correct receptacle.

Note: If your High Flow work tool does not have a wiring harness, a Jumper Plug needs to be installed on the electrical plug (1) for the work tool control. Without this Jumper Plug, the machine will not provide high flow to the work tool. Please refer to your Parts Manual for the current part number for the Jumper Plug.

- e. If the work tool is equipped with a water line, then connect the water line from the work tool to the connector on the machine. Move the water line to a position that is away from the work tool mounting bracket.

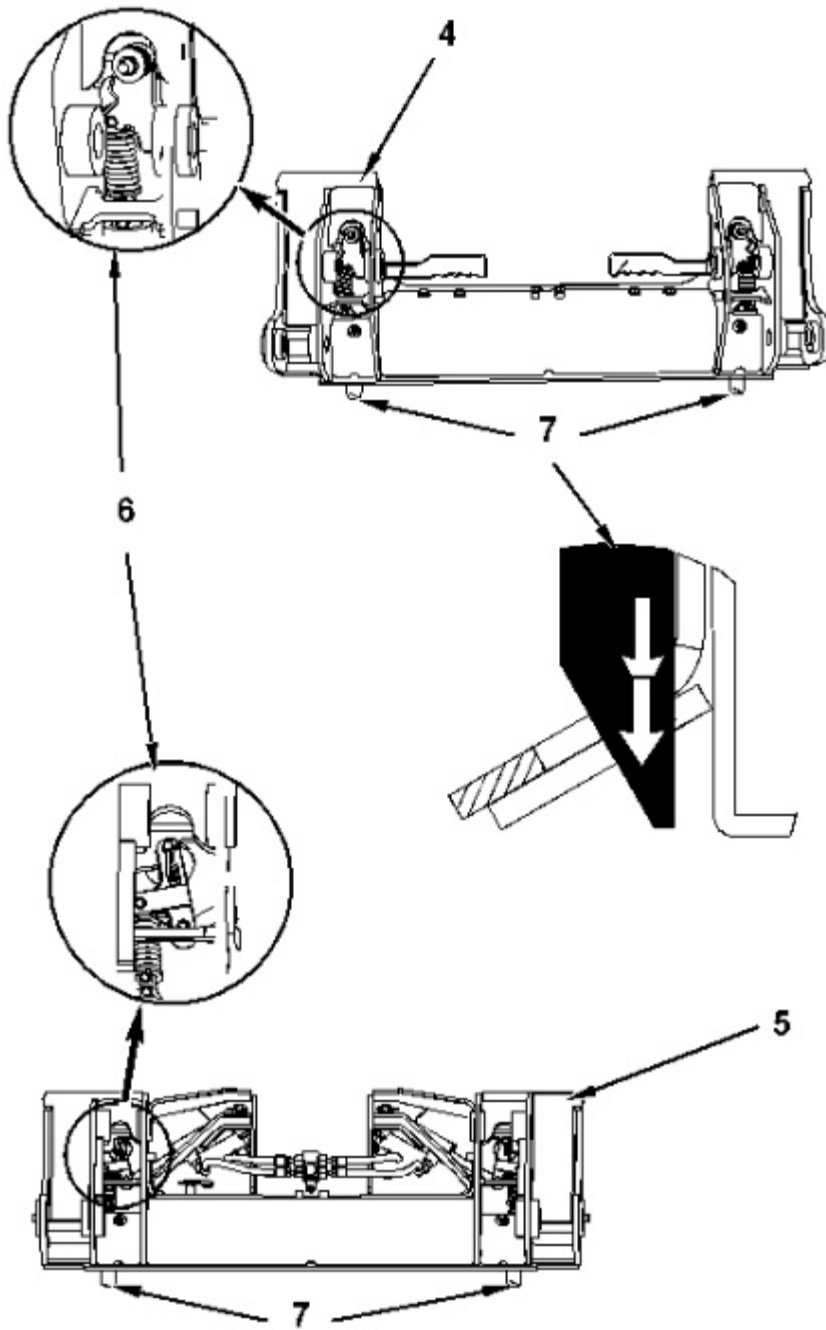


Illustration 8

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- (4) Manual Work Tool Coupler
- (5) Hydraulic Work Tool Coupler
- (6) Lever for the Coupler Pin
- (7) Coupler Pins

16. Visually ensure that both coupler pins are extending out of the holes in the work tool mounting bracket.
17. Use the following procedure to verify engagement of the coupler pins.
 - a. Enter the machine.

- b. Fasten the seat belt and lower the armrest.
- c. Start the engine.
- d. Disengage the parking brake.
- e. Keep the work tool close to the ground.
- f. Activate the tilt control in order to tilt the work tool downward.
- g. Apply down pressure on the work tool.

Note: The work tool Operation and Maintenance Manual will inform you if forward pressure should not be applied on a work tool.

- h. Move the machine backward. Ensure that the coupler pins do not disengage from the work tool.
18. Test the work tool for leaks and for proper operation.

Removing the Work Tool



WARNING

Disengaging the coupler pins will release the work tool from control of the operator.

Serious injury or death may result from disengaging the work tool when it is in an unstable position or carrying a load.

Place the work tool in a safe position before disengaging the coupler pins.

NOTICE

Auxiliary hoses for work tools must be disconnected before the quick coupler is disengaged.

Pulling the work tool with the auxiliary hoses could result in damage to the host machine or the work tool.

1. Position the machine on level ground.
2. Lower the work tool to the ground.
3. Rack back the work tool until the work tool is slightly off the ground.
4. Turn the engine start switch key to the OFF position in order to stop the engine.
5. If the work tool requires hydraulics the hydraulic system pressure must be released. Refer to the section "Releasing the Auxiliary Hydraulic System Pressure".

6. Perform Step 7 through Step 12 only after you have released the hydraulic system pressure.

7. Disconnect the auxiliary hydraulic hoses from the machine.

Note: If protective caps are available, install protective caps over the quick connect couplers.

8. If hoses are routed through the hose guide, remove the hoses from the hose guide. Move the hoses to a position that is away from the work tool mounting bracket.

Note: Connect the hoses for the work tool together. Connecting the hoses together will reduce the probability of contaminating the hydraulic system. Connecting the hoses together will reduce the buildup of pressure in the hoses. Connecting the hoses together will ease the connection of the hoses to the machine.

9. If the work tool is equipped with an electrical line, then disconnect the wire harness from the connector on the machine. If protective caps are available, install protective caps over the electrical connectors.

10. If the auxiliary electrical line is routed through the hose guide, remove the line from the hose guide. Move the auxiliary electrical line to a position that is away from the work tool mounting bracket.

11. If the work tool is equipped with a water line, then disconnect the water line from the connector on the machine. Move the water line to a position that is away from the work tool mounting bracket.

12. Exit the machine.

Note: If you are removing a material handling arm that is not equipped with an optional center step, do not exit the machine. A second person needs to perform step 13.

13. Disengage the coupler pins. If the machine is equipped with a manual coupler, ensure that the levers for the coupler are in the DISENGAGED position. If the machine is equipped with a hydraulic quick coupler, refer to Operation and Maintenance Manual, "Operator Controls" for details on disengaging the coupler pins with the hydraulic quick coupler control.

14. Enter the machine.

15. Fasten the seat belt and lower the armrest.

16. Start the engine.

17. Disengage the parking brake.

18. As you slowly back away from the mounting bracket, tilt the quick coupler assembly forward until the top of the quick coupler assembly clears the angled plate.

19. Back away from the work tool.

Releasing the Auxiliary Hydraulic System Pressure

NOTICE

If the work tool is equipped with an Operation and Maintenance Manual, follow the procedure that is described in the Operation and Maintenance Manual for that work tool. Damage to the work tool and the host machine may occur if you do not follow the proper

installation procedure.

Refer to Operation and Maintenance Manual, "Operator Controls : Auxiliary Hydraulic Pressure Release".

Standard Flow Auxiliary Circuit and the High Flow Auxiliary Circuit (if equipped)

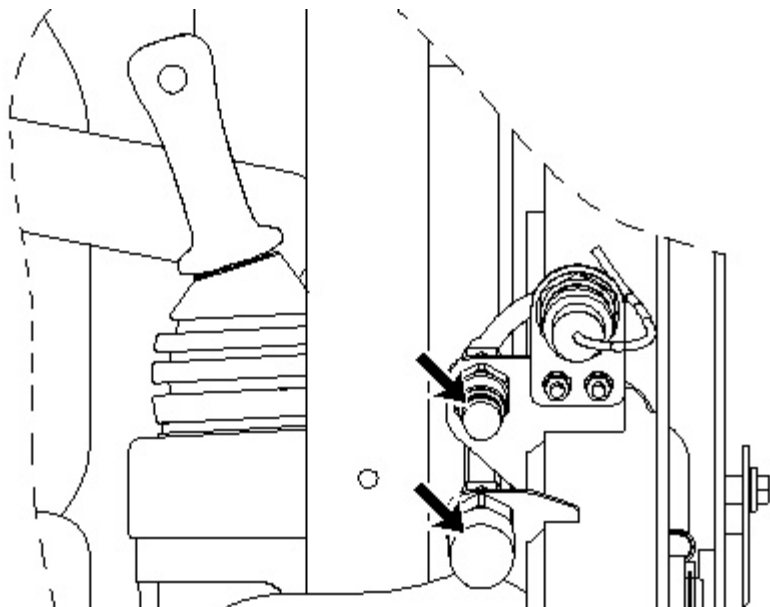


Illustration 9
Auxiliary quick connectors

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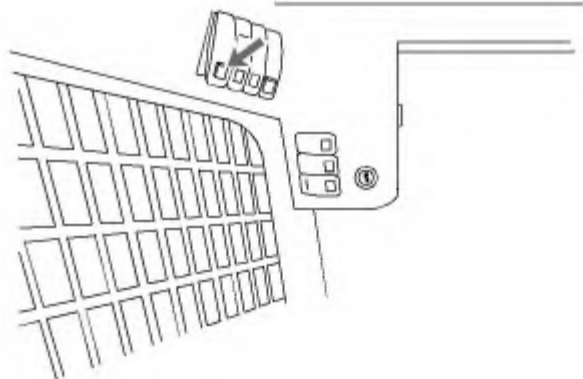


Illustration 10
Auxiliary Hydraulic Pressure Release

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1. Stop the engine.
2. Move the engine start switch to the ON position and release the parking brake.
3. Push up on the locking tab and press the bottom of the switch in order to release the pressure in the Standard Flow Auxiliary Circuit and the High Flow Auxiliary Circuit (if equipped). Hold the switch for

four seconds and release the switch.

Note: The pressure in the secondary circuit is not affected by this switch.

Note: The operator must remain in the seat with the armrest in the LOWERED position in order for the control to function.

4. Move the engine start switch to the OFF position.

Secondary Auxiliary Circuit

The pressure in the secondary circuit is released with the following procedure:

If electrical power is available and the accumulator is charged, the pressure can be released from the operator station with the work tool control.

1. Fasten the seat belt. Lower the armrest.
2. Turn the engine start switch key to the ON position.
3. Release the parking brake.
4. Activate the controls for the secondary auxiliary function. Activate the controls several times in order to release all the pressure. Refer to Operation and Maintenance Manual, "Auxiliary Hydraulic Controls" for information about the controls.

If the pressure is not released, the accumulator is not charged. It is possible to recharge the accumulator by running the engine or cranking the engine for a period of fifteen seconds. Repeat step 3 and 4.



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Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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i01964204

Material Handling Arm Operation

SMCS - 6542; 6700; 7000

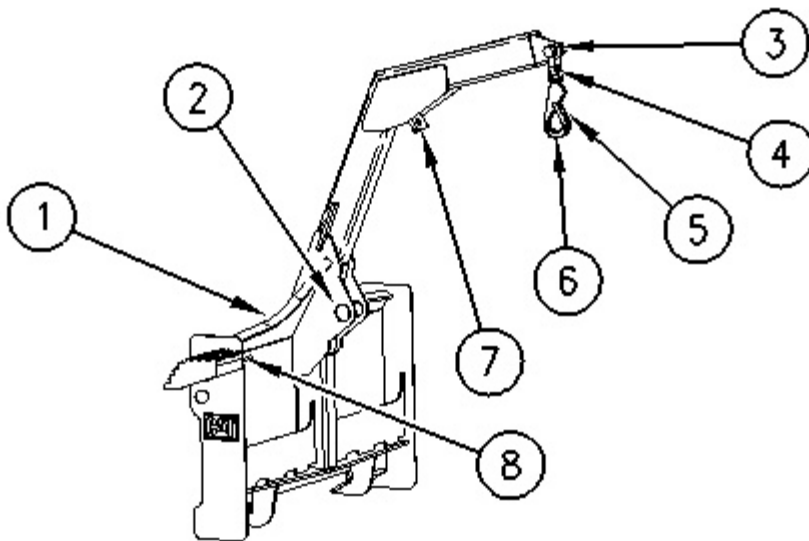


Illustration 1

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- (1) Location of Optional Center Step
- (2) Tie-Down Point
- (3) Lifting Point 2
- (4) Shackle
- (5) Hook Clasp
- (6) Hook
- (7) Lifting Point 1
- (8) Stored location of Position Lock Pin

Inspect the material handling arm and the attachments for wear and damage. Ensure that the load is properly attached to the material handling arm before you operate the machine.

Note: The physical size and the weight of the load determines the lifting point that is appropriate. Whenever it is possible, use the lifting point 1. This will improve the stability and this will reduce the movement of the load. Refer to the Operation and Maintenance Manual, "Material Handling Arm Rated Load" for the limitations on the weight.

Note: Use only Caterpillar **9V-2714** Hook and Caterpillar **9V-2715** Shackle to attach a load to the material handling arm. Never use an open hook. Use a line that is rated for 2.5 times the weight of the load.

WARNING

Do not allow anyone to be near a suspended load unless the position lock pin is installed. If the lift arms must be raised to handle a tall load, do not allow anyone to be near the suspended load unless the lift arms are blocked. Failure to follow the instructions or heed the warnings could result in injury or death.

Two Person Operation

Attaching A Load

1. Verify that the load does not exceed the weight limit. Refer to the Operation and Maintenance Manual, "Material Handling Arm Rated Load" for the rated load capacities.
 2. Keep all personnel out of the work area at all times, except when you are attaching or removing a load.
 3. Enter the machine. Start the engine.
 4. Disengage the parking brake.
-

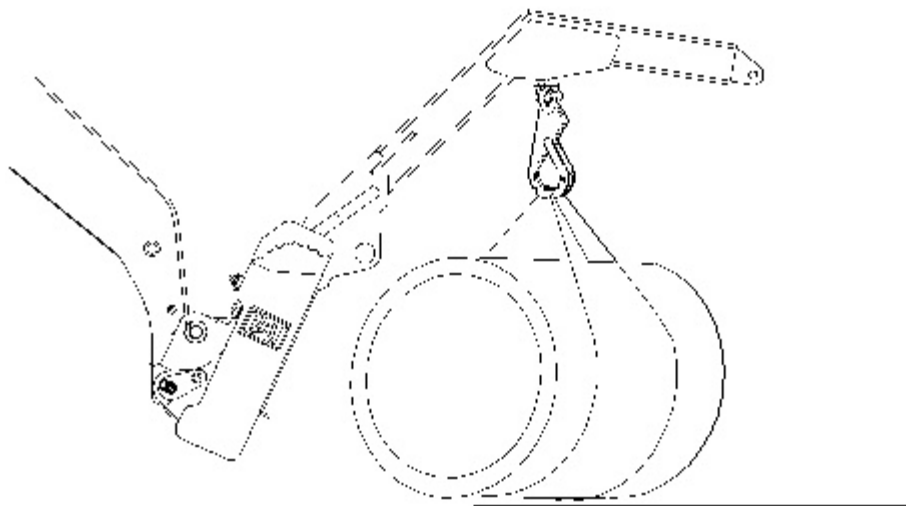


Illustration 2

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5. Keep the loader arms in the fully lowered position. Slowly position the material handling arm until either lifting point 1 or the lifting point 2 is directly above the load.
6. Tilt the material handling arm forward until the hook is slightly higher than the load in order to minimize swinging of the load.
7. Stop the engine.
8. Wait as the second person attaches the load securely to the hook. The second person needs to ensure that the hook clasp is in the locked position.
9. Ensure that ALL personnel have left the work area.
10. Start the engine.
11. Disengage the parking brake.
12. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.
13. Stop the engine.

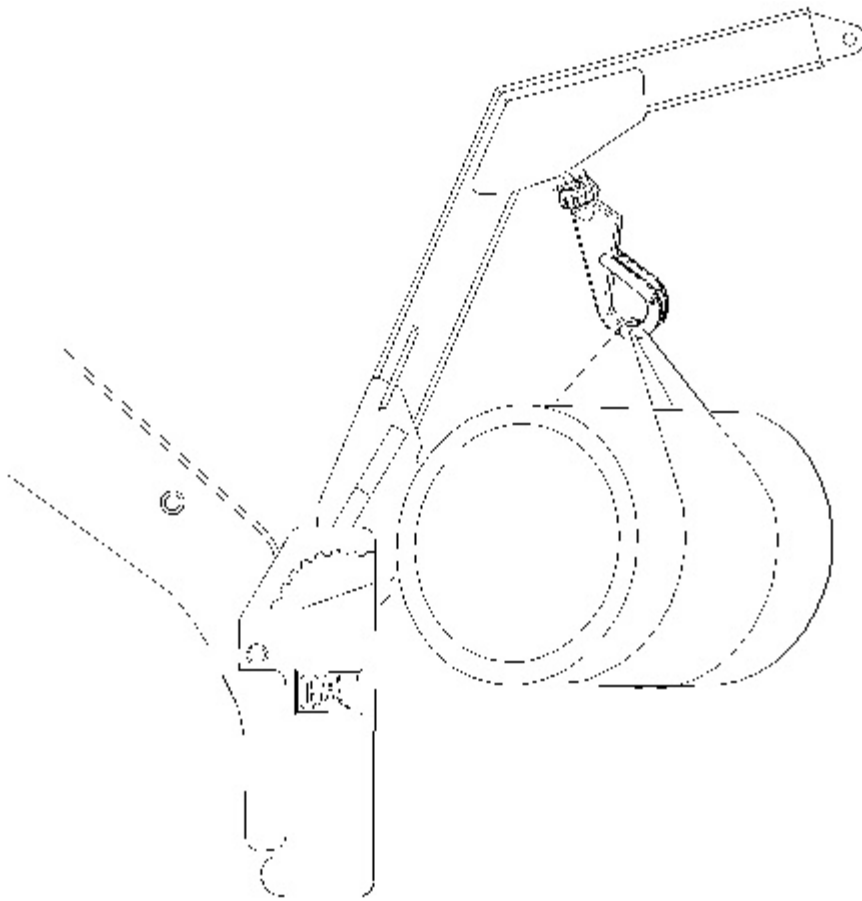


Illustration 3

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14. Wait as the second person installs the position lock pin through the hole in the material handling arm and the hole in the loader arm of the machine.

Note: This will prevent the material handling arm from tilting forward.

15. Wait as the second person secures the load to the tie-down points with a suitable line in order to minimize load swing.

Note: Do not move the load when you are securing the load. Do not pull the load toward the material handling arm when you are securing the load to the tie-down points.

16. Wait as the second person removes the position lock pin. Wait as the second person places the pin in the STORED position on the material handling arm.

Removing a Load

1. Slowly tilt back the material handling arm until the material handling arm is fully tilted back. Lower the loader arms fully.
2. Stop the engine.
3. Wait as the second person installs the position lock pin through the hole in the material handling arm and the hole in the loader arm of the machine.
4. Wait as the second person removes the line that secures the load to the tie-down points.
5. Wait as the second person removes the position lock pin. Wait as the second person places the pin in

the STORED position on the material handling arm.

6. Remove all personnel from the work area.
7. Start the engine.
8. Disengage the parking brake.
9. Lower the load to the ground.
10. Stop the engine.
11. Wait as the second person removes the load from the hook.
12. Remove all personnel from the work area.
13. Start the engine.
14. Disengage the parking brake.
15. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.
16. Back away from the load.

One Person Operation

Note: The material handling arm must be equipped with a center step in order to do the one person operation.

Attaching the Load

1. Verify that the load does not exceed the weight limit. Refer to the Operation and Maintenance Manual, "Material Handling Arm Rated Load" for the rated load capacities.
 2. Keep all personnel out of the work area at all times, except when you are attaching or removing a load.
 3. Enter the machine. Start the engine.
 4. Disengage the parking brake.
-

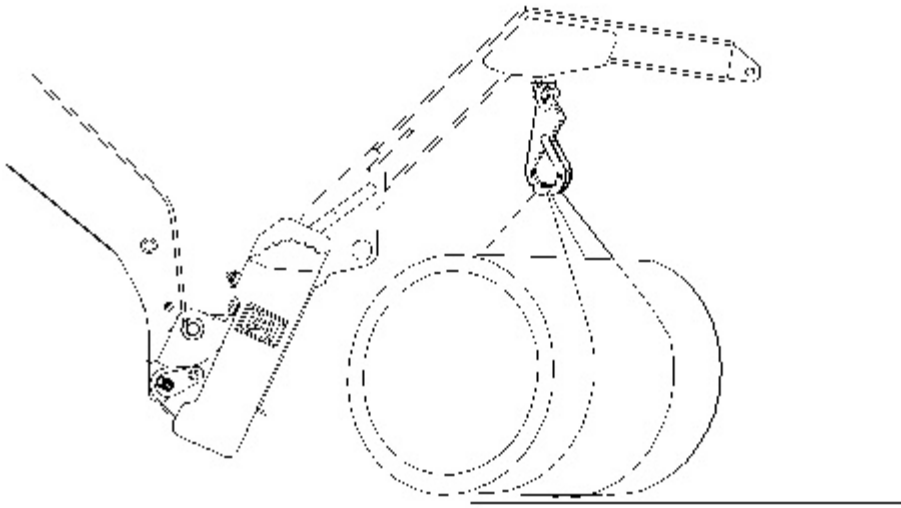


Illustration 4

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5. Keep the loader arms in the fully lowered position. Slowly position the material handling arm until either lifting point 1 or lifting point 2 is directly above the load.
6. Tilt the material handling arm forward until the hook is slightly higher than the load in order to minimize swinging of the load.
7. Stop the engine. Exit the machine.
8. Attach the load securely to the hook. Ensure that the hook clasp is in the LOCKED position.
9. Keep all personnel out of the work area.
10. Enter the machine. Start the engine.
11. Disengage the parking brake.
12. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.
13. Stop the engine. Exit the machine.

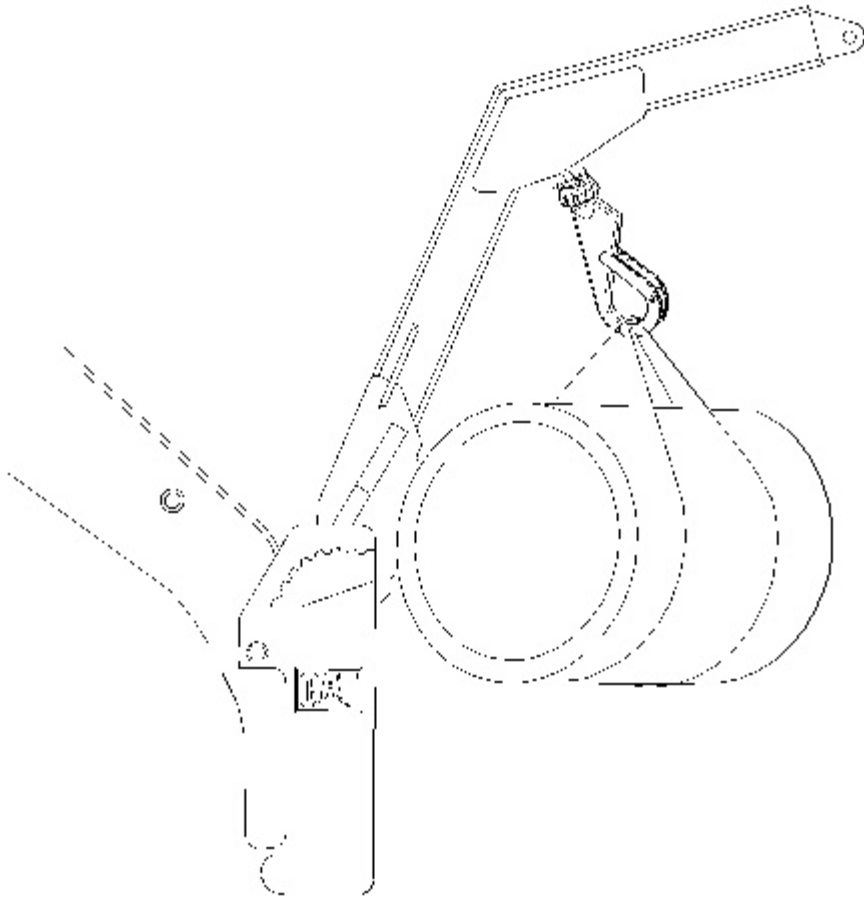


Illustration 5

g01020535

14. Install the position lock pin through the hole in the material handling arm and the hole in the loader arm of the machine.
15. Secure the load to the tie-down points with a suitable line in order to minimize load swing.

Note: Do not move the load when you are securing the load. Do not pull the load toward the material handling arm when you are securing the load to the tie-down points.

16. Remove the position lock pin and place the pin in the STORED position on the material handling arm.

Removing a Load

1. Fully tilt back the material handling arm. Fully lower the loader arms.
2. Stop the engine. Exit the machine.
3. Install the position lock pin through the hole in the loader arm of the machine.
4. Remove the line that secures the load to the tie-down points .
5. Remove the position lock pin and place the pin in the STORED position on the material handling arm.
6. Keep all personnel out of the work area.
7. Enter the machine. Start the engine.
8. Disengage the parking brake.

9. Lower the load to the ground.
10. Stop the engine. Exit the machine.
Note: Make sure that the load is stable.
11. Remove the load from the hook.
12. Keep all personnel out of the work area.
13. Enter the machine. Start the engine.
14. Disengage the parking brake.
15. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.
16. Back away from the load.

Traveling with a Load

1. Ensure that all personnel have left the work area.
2. Start the engine.
3. Disengage the parking brake.
4. Raise the load so that the load is slightly off of the ground.
5. Slowly travel to the destination. Keep the load as close to the ground as possible. Travel up slopes with the load uphill. Travel down slopes with the load uphill. Do not travel across slopes.



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 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

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i01878348

Pallet Forks Operation

SMCS - 6700; 7000

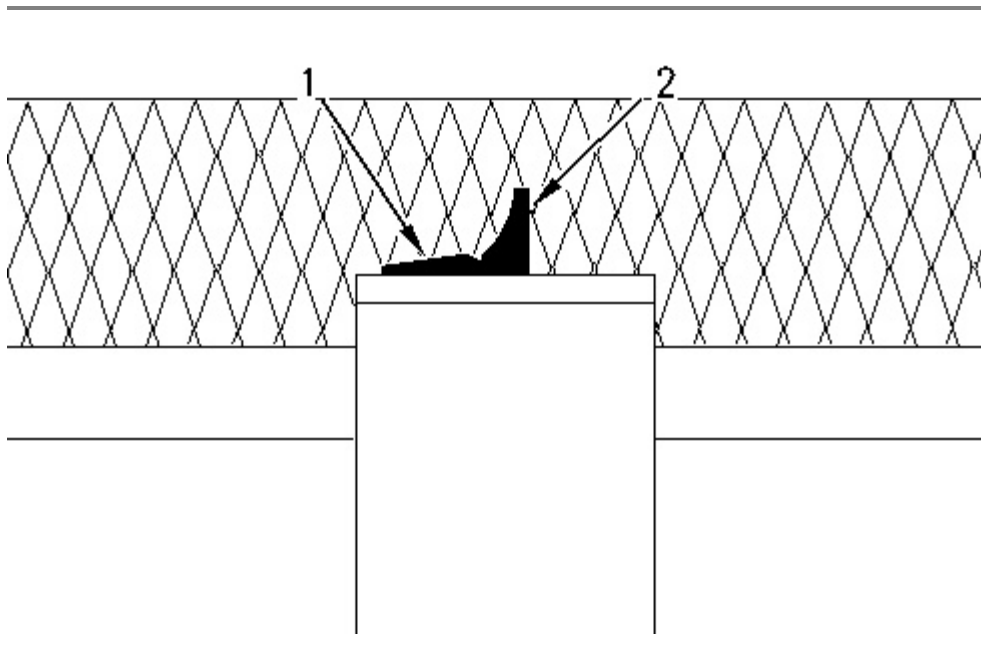


Illustration 1

g00955937

The "type 1" pin that is in the unlocked position (2) and the locked position (1) .

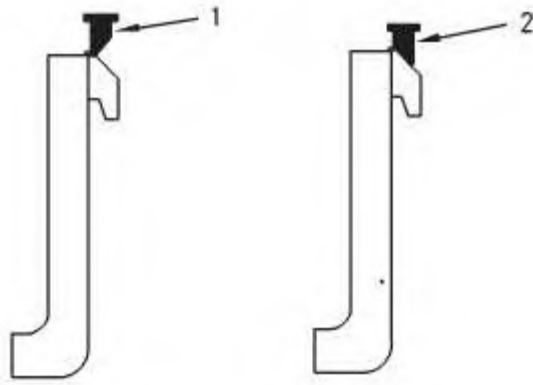


Illustration 2

g00955964

The "type 2" pin that is in the unlocked position (1) and the locked position (2) .

1. Put the fork tines in the Unlocked position. Space the fork tines as far as possible from each other.
2. Put the fork tines in the Locked position.
3. Slowly, move the machine into position and engage the load. The machine should be square with the load. Space the forks evenly between the pallet stringers.
4. Move the machine forward until the load contacts the carriage.
5. Lift the load carefully.
6. Slowly, move the machine in reverse until the load is clear enough to lower.
7. Carefully lower the load while you tilt the forks back to the travel position.

Travel with the load as low as possible while you still maintain ground clearance.

Travel with the load uphill on upgrades and on downgrades.



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i02728693

Work Tool Operation

SMCS - 6700; 7000

The following table describes the functionality of approved Caterpillar work tools.

Refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic Controls" for the location and operation of the joystick controls that are referenced below.

Note: All of the work tool functions that are described below are viewed from the left side of the machine.

While you operate the machine and the work tool slowly in an open area, check for proper operation of all controls and all protective devices on the machine and the work tool.

Note: During initial operation, unexpected motion may occur due to air in the hydraulic system. Cycle the hydraulic system approximately 5 times in order to purge air out of the circuit. You may need to add hydraulic oil to the machine after the machine fills the hydraulic circuits of the work tool. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level - Check" for the proper procedure for checking the hydraulic oil level.

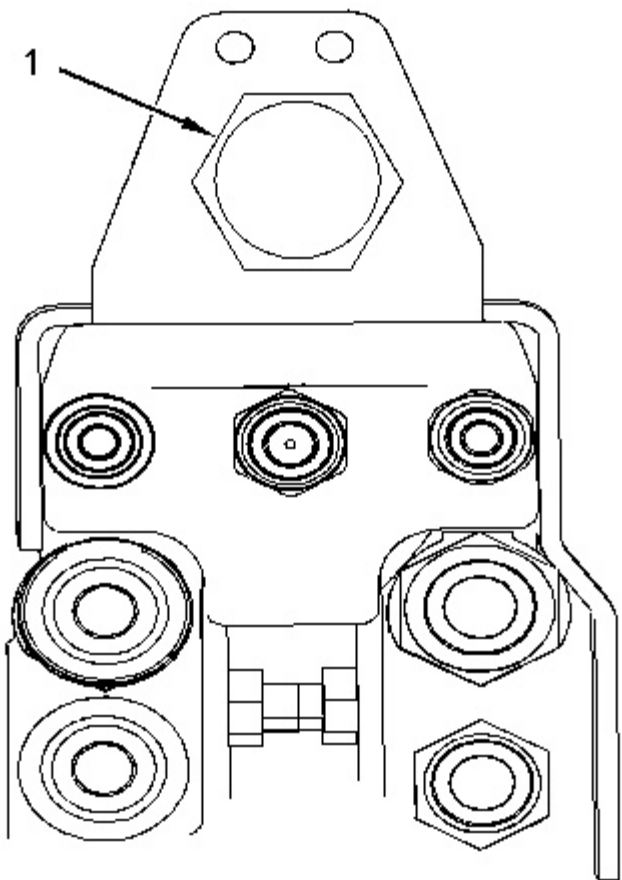


Illustration 1
226B, 242B and 257B High Flow

g01109579

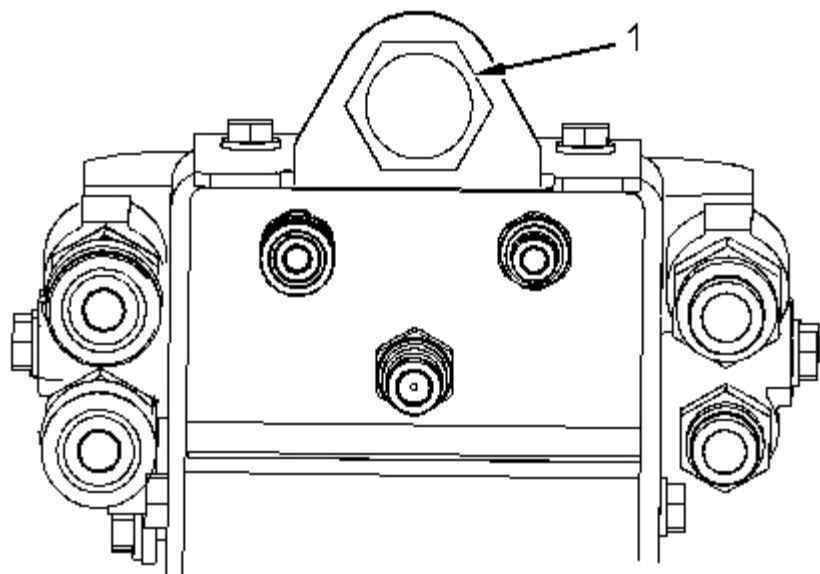


Illustration 2
248B, 268B, 277B and 287B High Flow

g01109580

For all High Flow work tools, refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic

Controls". Connect the wiring harness to the electrical plug (1) .

Note: If your High Flow work tool does not have a wiring harness, a Jumper Plug needs to be installed on the electrical plug (1) for the work tool control. Without this Jumper Plug, the machine will not provide High Flow to the work tool. Please refer to your Parts Manual for the current part number for the Jumper Plug. The affected machines are in the following list:

- 226B High Flow
- 242B High Flow
- 248B (XPS)
- 268B (XPS)
- 257B High Flow
- 287B (XPS)

Simple Hydromechanical Work Tools

Work tools in the following table are approved by Caterpillar. Refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic Controls" for the location and operation of the joystick controls that are referenced in the table.

Please read the manual and understand the instructions and warnings in the Operation and Maintenance Manual for these work tools. Consult your Caterpillar dealer for replacement manuals. Proper care is your responsibility.

Table 1

Operation of Caterpillar Simple Hydromechanical Work Tools									
Work Tool	Joystick Control								Actions
	A	5	6	1	2	3	4	7	
Multipurpose Bucket				X					The bucket clam closes.
					X				The bucket clam opens.
All Grapple tools				X					The grapple closes.
					X				The grapple opens.
Angle Blade					X				The blade angles to the left.
				X					The blade angles to the right.
Dozer Blade					X				The blade angles to the left.

				X						The blade angles to the right.
		X			X					The blade tilts down to the left.
		X		X						The blade tilts down to the right.
			X		X					The blade tilts down to the left and the blade angles to the left.
			X	X						The blade tilts down to the right and the blade angles to the right.

Proper operation of the work tool is your responsibility. Do not use the work tool improperly.

Please follow the instructions that are listed below in order to safely use the grapple tools.

- Do not pry with one rake tine. Use multiple rake tines in order to loosen material.
- Remove the work tool from the machine before you lift the host machine. Refer to Operation and Maintenance Manual, "Lifting and Tying Down the Machine" for details.
- Do not place the weight of the host machine on the grapples in the open position.

Complex Hydromechanical Work Tools

Note: For the functionality of Caterpillar Complex Work Tools, please read the Operation and Maintenance Manual for the work tool.

Consult your Caterpillar dealer for replacement manuals. Please read all the safety messages and understand all the safety messages for each work tool.



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i01992184

Stopping the Engine

SMCS - 1000; 7000

NOTICE

Stopping the engine immediately after it has been working under load, can result in overheating and accelerated wear of the engine components.

Refer to the following procedure, to allow the engine to cool, and to prevent excessive temperatures in the turbocharger housing (if equipped), which could cause oil coking problems.

1. Operate the engine for five minutes at low idle with no load.
Note: This allows hot areas in the engine to cool gradually. This will extend the engine life.
2. Move the joysticks into the HOLD position.
3. Turn the engine start switch key to the OFF position.
4. Relieve the pressure in the auxiliary hydraulic system. Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation" for details.
5. Ensure that the engine start switch key is in the OFF position after the pressure in the auxiliary hydraulic system has been relieved.
6. Cover the exhaust opening after the machine has cooled down.



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i01958400

Stopping the Engine if an Electrical Malfunction Occurs

SMCS - 1000; 7000

S/N - BXM1-4224

S/N - HEN1-6549

S/N - LBA1-UP

S/N - MJH1-10574

S/N - PAT1-UP

S/N - PDT1-UP

S/N - RLL1-6799

S/N - SCH1-2474

S/N - SCL1-UP

S/N - SCP1-4599

1. Lower the work tool to the ground.
 2. Raise the armrest. Unfasten the seat belt. Exit the machine.
 3. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
-

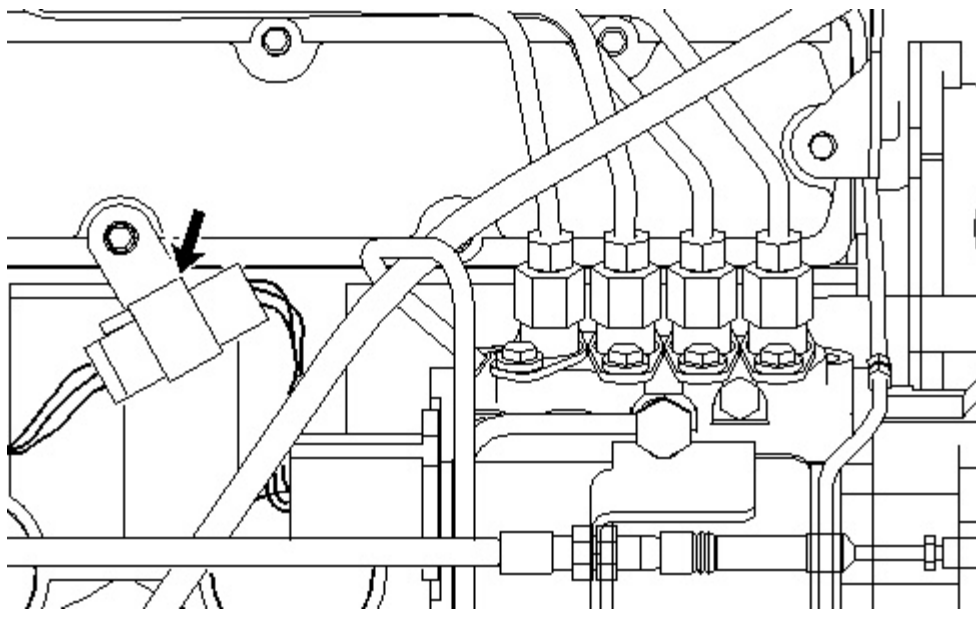


Illustration 1
The connector for the 3024 engine

g00953400

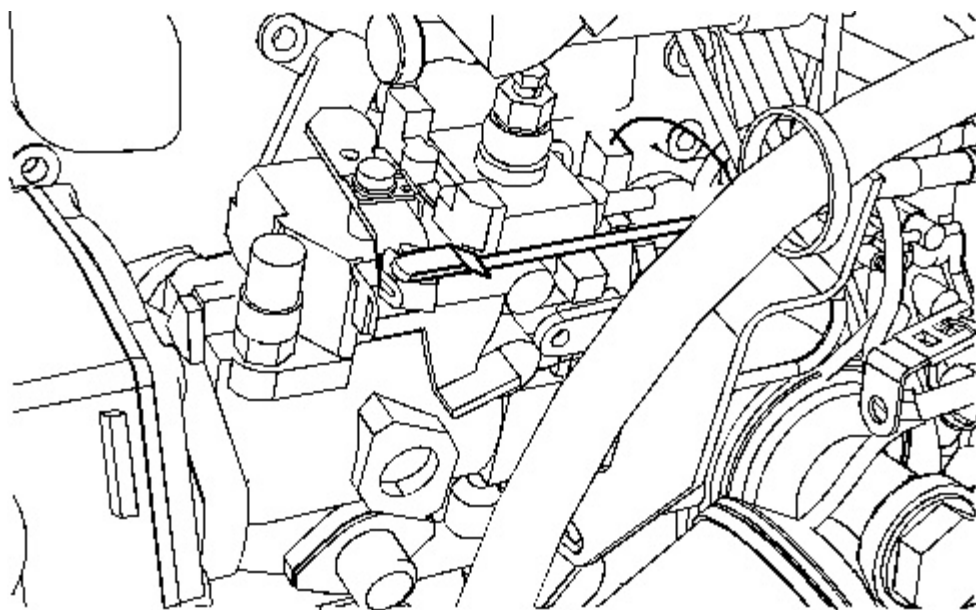


Illustration 2
The connector for the 3044 engine

g01017850

4. Unplug the connector for the fuel shutoff solenoid.

Note: Do not operate the machine until the malfunction has been corrected.



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i02541109

Equipment Lowering with Engine Stopped

SMCS - 6700; 7000



WARNING

Personal injury or death can result from a work tool falling.

Keep personnel away from the front of the machine when lowering the work tool.

Before lowering any equipment with the engine stopped, clear the area around the equipment of all personnel. The procedure will vary with the type of equipment that is lowered. Keep in mind that most systems use a high pressure fluid or air in order to raise or lower the equipment. The procedure will cause high pressure air, hydraulic fluid, or some other media to be released in order to lower the equipment. Wear appropriate personal protective equipment. Use the first procedure if the accumulator is charged. The second procedure and the third procedure are used if the accumulator is not charged.

Lowering the Equipment with the Accumulator Charged

If electrical power is available and the accumulator is charged, the loader arms can be lowered from the operator station with the work tool control.

1. Fasten the seat belt. Lower the armrest.
2. Turn the engine start switch key to the ON position.
3. Push the parking brake switch.
4. Slowly move the work tool control to the LOWER position in order to slowly lower the loader arms.

If the loader arms do not lower, the accumulator is not charged. It is possible to recharge the accumulator by cranking the engine for a period of fifteen seconds. Repeat step 3 and 4.

If there is no electrical power the loader arms must be lowered by using the procedure that is explained next.

Alternate Lowering the Equipment



WARNING

Personal injury can result from oil under high pressure.

DO NOT allow high pressure oil to contact skin.

Wear appropriate protective equipment while working with high pressure oil systems.

The loader arms must be lowered manually if the accumulator is not charged or if there is no electrical power.

Use this alternate method for the machines with the following serial numbers:

- (MJH1-6882)
- (HEN1-4474)
- (PAT1-4106)
- (BXM1-2808)
- (SCP1-2964)
- (PDT1-3617)
- (MTL1-3374)
- (SLK1-5156)
- (CYC1-1209)
- (MDH1-4184)
- (ZSA1-3475)
- (SCL1-1533)
- (LBA1-1528)
- (RLL1-4080)
- (SCH1-1784)

Do not go under the raised lift arm without the brace for the loader lift arm in the LOCKED position. Use the alternate exit if the brace for the loader lift arm cannot be installed on raised lift arms.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".

Note: Make sure that there are no people near the front or sides of the machine.

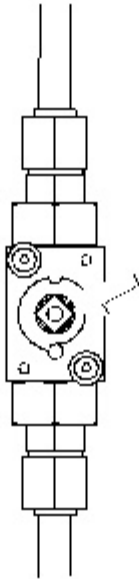


Illustration 1

g01018070

2. The bypass valve is located in the engine compartment. Slowly turn the square stem on the bypass valve in a clockwise direction. The square stem should be rotated 90 degrees. Allow the loader arms to lower until the work tool is on the ground.
3. Slowly turn the square stem on the bypass valve in a counterclockwise direction until the stem stops. The square stem should be rotated 90 degrees.
4. Close the engine access door.
5. Make the necessary repairs before you operate the machine.

Alternate Lowering the Equipment



Personal injury can result from oil under high pressure.

DO NOT allow high pressure oil to contact skin.

Wear appropriate protective equipment while working with high pressure oil systems.

The loader arms must be lowered manually if the accumulator is not charged or if there is no electrical power.

Use this alternate method for the machines with the following serial numbers:

- (MJH6883-UP)
- (HEN4475-UP)
- (PAT4107-UP)

- (BXM2809-UP)
- (SCP2965-UP)
- (PDT3618-UP)
- (MTL3375-UP)
- (SLK5157-UP)
- (CYC1210-UP)
- (MDH4185-UP)
- (ZSA3476-UP)
- (SCL1534-UP)
- (LBA1529-UP)
- (RLL4081-UP)
- (SCH1785-UP)

Do not go under the raised lift arm without the brace for the loader lift arm in the LOCKED position. Use the alternate exit if the brace for the loader lift arm cannot be installed on raised lift arms.

Note: Make sure that there are no people near the front or sides of the machine.

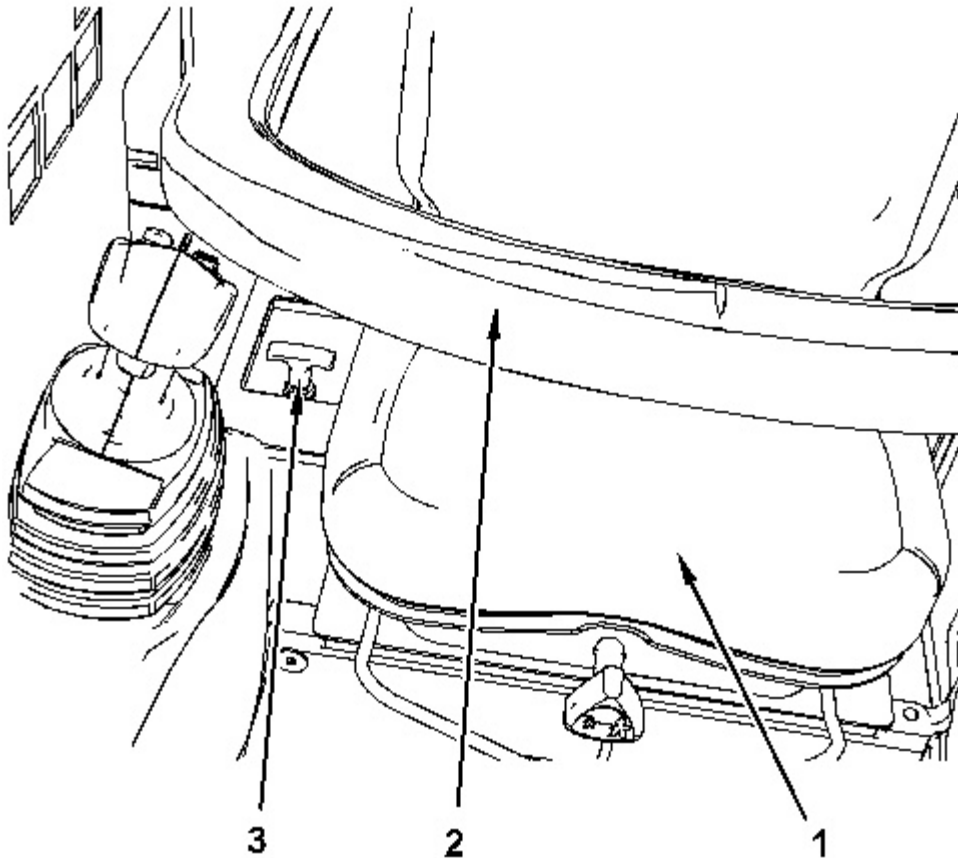


Illustration 2

g01272578

The bypass valve handle is located next to the operator seat on the right side.

(1) Seat

(2) Armrest

(3) Bypass valve handle

1. Pull up on the handle. Push the handle in order to stop the loader arms, if necessary.
2. Allow the loader arms to lower until the work tool is on the ground.
3. Push the handle in order to return the handle to the original position.
4. Make the necessary repairs before you operate the machine.



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i01956123

Machine Storage Procedure

SMCS - 7000

NOTICE

If long term storage for a period of time exceeding one year is necessary, contact your local Caterpillar dealer for the preferred procedure to use in your specific case.

This machine may be stored for one year or less in a temperature range of -32 °C (-25.6 °F) to 43 °C (109.4 °F).

To store machines in ambient temperatures between -20 °C (-4.0 °F) to 43 °C (109.4 °F), refer to Special Instructions, SEHS9031, "Storage Procedure for Caterpillar Products".

To store machines in ambient temperatures between -32 °C (-26 °F) and -21 °C (-6 °F), refer to the following publications and topics:

- Special Instructions, SEHS9031, "Storage Procedure For Caterpillar Products"
- Operation and Maintenance Manual, SEBU5898, "Cold Weather Recommendations for Caterpillar Machines"

Note: Do not use the steps that are listed in Special Instructions, SEHS9031 in order to maintain the fuel system.

Use the following steps to maintain the fuel system.

1. Drain the fuel tank. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel Tank Water and Sediment - Drain".
2. Drain the water separator and replace the element. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel System Water Separator Element - Replace".
3. Fill the fuel tank so that the fuel tank is at least 20% full with Calibration Fluid.
4. Prime the fuel system. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel System Prime".

5. Start the engine and run at low idle for approximately 15 minutes in order to allow the calibration fluid to flush the diesel fuel from the system.
6. Turn off the engine.
7. Add .15 mL (0.02 oz) of commercial biocide for every 1 L (0.3 US gal) of calibration fluid to the fuel tank. Seal all openings to the fuel tank in order to prevent evaporation of the preservative.



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i01632001

Shipping the Machine

SMCS - 7000

Investigate the travel route for overpass clearances. Make sure that there will be adequate clearance.

Before you load the machine and before you unload the machine remove ice, snow, or other slippery material from the loading dock and from the trailering surface. Removal of ice, snow, or other slippery material will help prevent the slipping of the machine as you load the machine. Removing ice, snow, or other slippery material will help prevent the machine from moving in transit.

NOTICE

Obey all state and local laws governing the weight, width and length of a load.

Make sure the cooling system has proper antifreeze if moving machine to a colder climate.

Observe all regulations governing wide loads.

Do not use a fork lift to lift the machine. Using a fork lift to move your machine can result in property damage.

Choose the flattest ground when you load the machine or when you unload the machine.

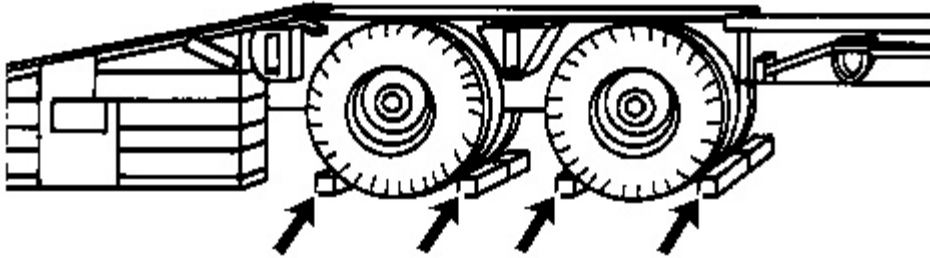


Illustration 1

g00040011

1. Before you load the machine chock the trailer wheels or the rail car wheels. Before you unload the machine chock the trailer wheels or the rail car wheels.
2. When you use loading ramps, make sure that the loading ramps have adequate length, adequate width, and adequate strength. In addition, make sure that the surface of the loading ramps are clean. This will help prevent the machine from sliding in all types of weather conditions. This will allow the machine to move on the ramps smoothly.
3. Maintain the slope of the loading ramps within 15 degrees of the ground.
4. Minimize any step between the base of the loading ramps and the ground.
5. Clean the tracks on the machine in order to prevent any slippage.

Loading the Machine

1. Position the machine so that the heaviest end of the machine is going up the ramps first.
2. Use caution when you travel over the areas around the loading ramp joints. Maintain the balance point of the machine. Keep the work tool low.
3. After you load the machine onto the trailer be sure that the machine is properly positioned on the trailer bed.
4. Lower the work tool to the floor of the transport vehicle.
5. Turn the engine start switch key to the OFF position in order to stop the engine.
6. Turn the engine start switch key to the ON position. Push the parking brake switch.
7. Move all hydraulic control levers while you are pressing several times on each side of the auxiliary hydraulic control (if equipped) in order to relieve hydraulic pressure.
8. Move all hydraulic control levers to the HOLD position.

9. Turn the engine start switch key to the OFF position. Remove the engine start switch key.
10. Move the armrest to the RAISED position. Unfasten the seat belt.
11. Attach any vandalism protection.
12. Refer to the Operation and Maintenance Manual, "Lifting and Tying Down the Machine" for information on tying down the machine.
13. Cover the exhaust opening when the machine has cooled down.

Unloading the Machine

1. Position the machine so that the machine can drive straight down the loading ramps. Position the machine so that the heaviest end of the machine goes down the ramps last.
2. Use caution when you travel over the areas around the loading ramp joints in order to maintain the balance point of the machine. Keep the work tool low.



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i01956162

Roading the Machine

SMCS - 7000

Perform a thorough Daily Inspection. Refer to Operation and Maintenance Manual, "Daily Inspection".

Check with the proper officials in order to obtain the required licenses and other similar items.

Ensure that your machine is equipped to comply with roading regulations.

Travel at a moderate speed. Observe all speed limitations when you road the machine.

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i02868871

Lifting and Tying Down the Machine

SMCS - 7000

NOTICE

Improper lifting or tiedowns can allow load to shift and can cause injury and damage.

Lifting the Machine

The single point lifting eye and the four-point lifting group are available for the machine.

Use one of the lifting attachments in order to lift the machine. Do not attach both lifting devices to the machine at the same time.

For lifting the machine, use properly rated cables and properly rated slings. Position the crane for a level machine lift. Do not drag the machine with a crane.

Note: Do not exceed the weight limit that is on the film in Illustration 1. This film is located on the outside of the right hand side of the cab.

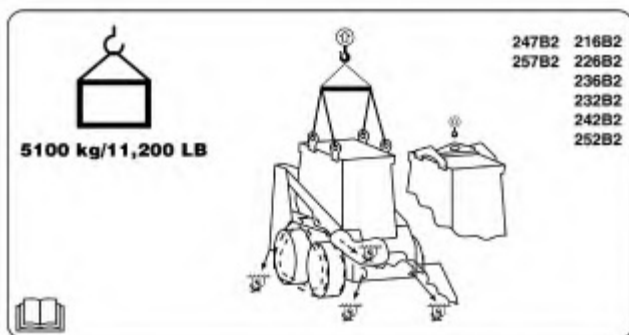


Illustration 1

g01427450

The machine can be lifted with a bucket that is not hydraulic. The machine can be lifted with a pallet fork that is not hydraulic. All other work tools must be removed from the machine before the machine is lifted.

Do not allow any personnel in the area around the machine.

Lifting from a Single Point

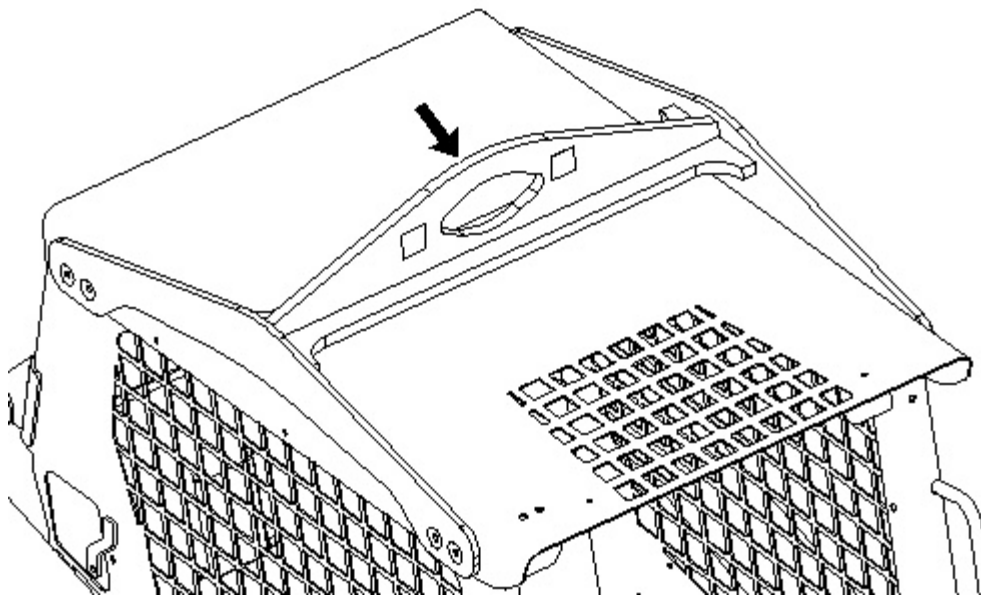


Illustration 2
Single point lifting eye

g00930025

Lifting from Four Points

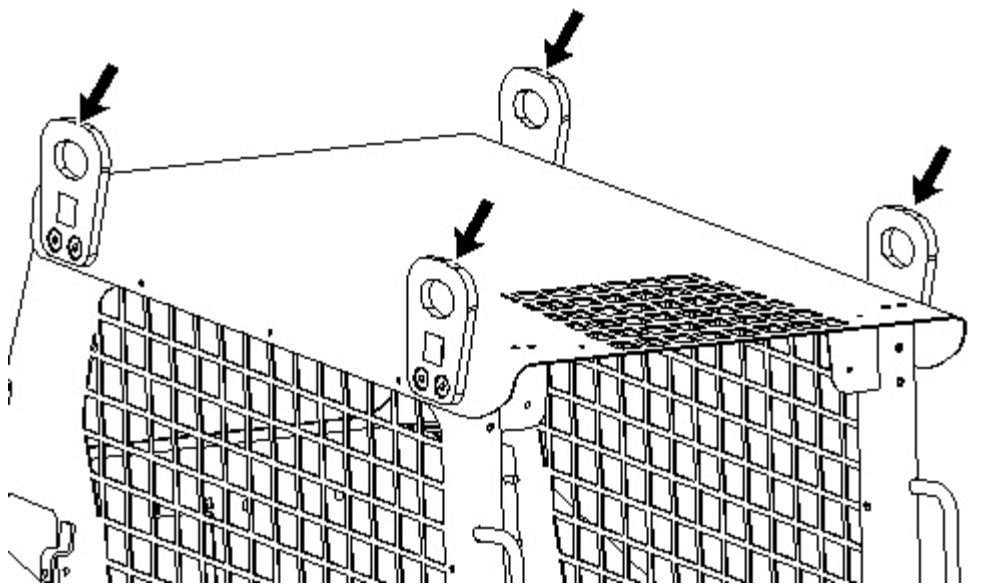


Illustration 3
Four-point lifting group

g00930032

When the four-point lifting group is used, the chain for each leg should be a minimum of 1 m (3.3 ft) in length.

Please refer to the Caterpillar Parts Manual for the current part number for the lifting device for your machine. The parts manuals are listed in the Operation and Maintenance Manual, "Reference Information Section".

Tying Down the Machine

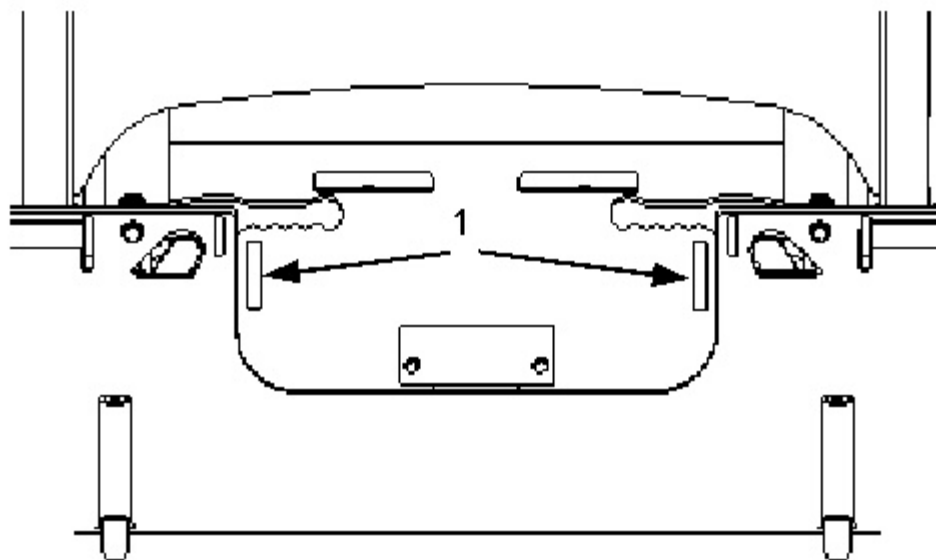


Illustration 4

g01019061

The two front eyes (2) are provided for tie-downs.

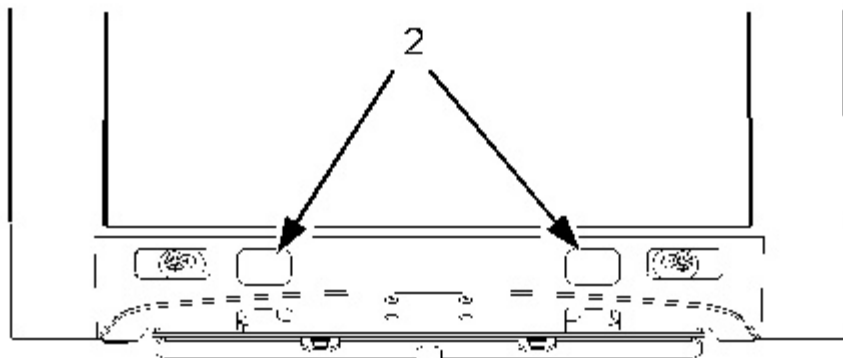


Illustration 5

g01019063

The two rear eyes (2) are provided for tie-downs.

Install tie-downs at all four locations. Place chocks in front of the machine and behind the machine.

Consult your Caterpillar dealer for shipping instructions for your machine.

Lifting the Grapple Rake

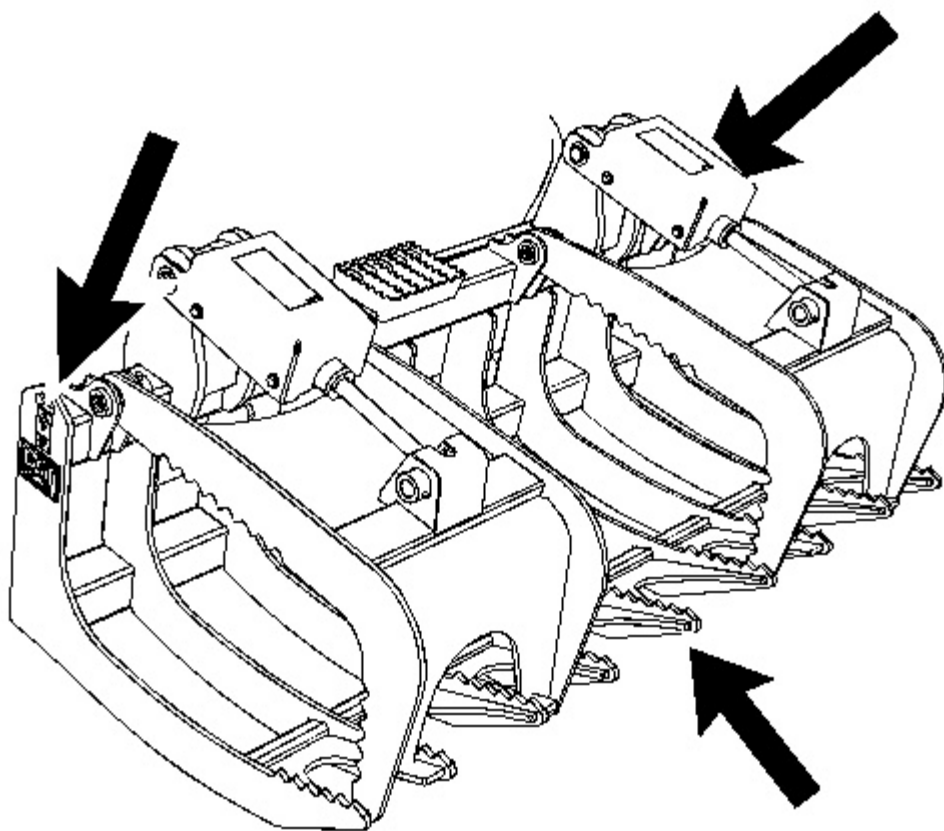


Illustration 6

g01368478

Use properly rated cables and properly rated slings for lifting work tools. Position the crane for a level lift. Do not drag the work tool with a crane.

Note: The approximate weight of the 1829 mm (72 inch) Grapple Rake is 458 kg (1010 lb). The approximate weight of the 2134 mm (84 inch) Grapple Rake is 506 kg (1116 lb).

Use 2 hooks in the lifting eyes on the frame. Use a sling around the front torque tube at the center rake tine.



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i01961474

Towing the Machine

SMCS - 7000

If the machine is disabled, the machine should be lifted onto a trailer in order to be transported. Refer to Operation and Maintenance Manual, "Lifting and Tying Down the Machine" for the lifting procedure.

Retrieval of Machine

If the machine cannot be lifted, use the following guidelines in order to retrieve the machine.

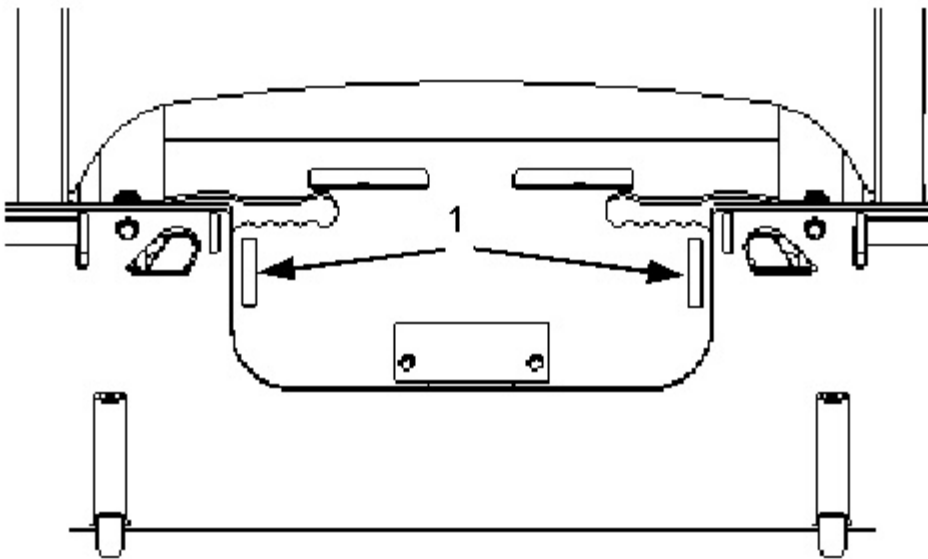


Illustration 1

g01019061

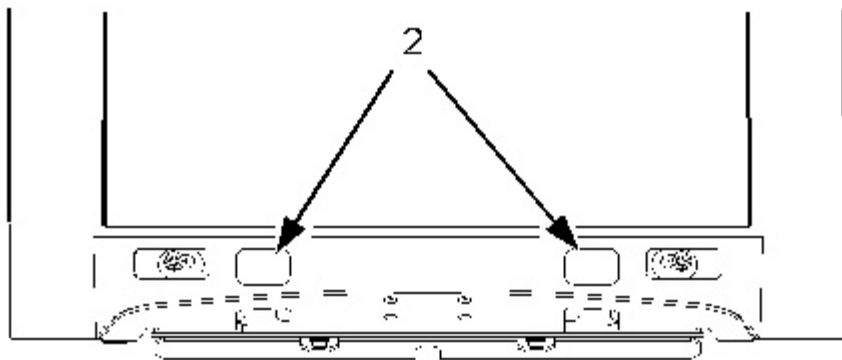


Illustration 2

g01019063

- The strength of the line should be at least 1.5 times the gross weight of the machine.
- Provide shielding in order to protect the operator if the line breaks.
- Attach the line to the towing eyes. Two towing eyes (1) are located on the front of the machine and two towing eyes (2) are located on the rear of the machine. Do not attach the line to any other point on the machine. Do not attach the line to only one towing eye when you are retrieving the machine.
- If a single line is used to pull the machine, then the line must be a minimum of 3 m (10 ft). If two lines are used to pull the machine, then each line must be a minimum of 1.5 m (5.0 ft).
- Do not exceed a maximum pull angle of 20 degrees in any direction.

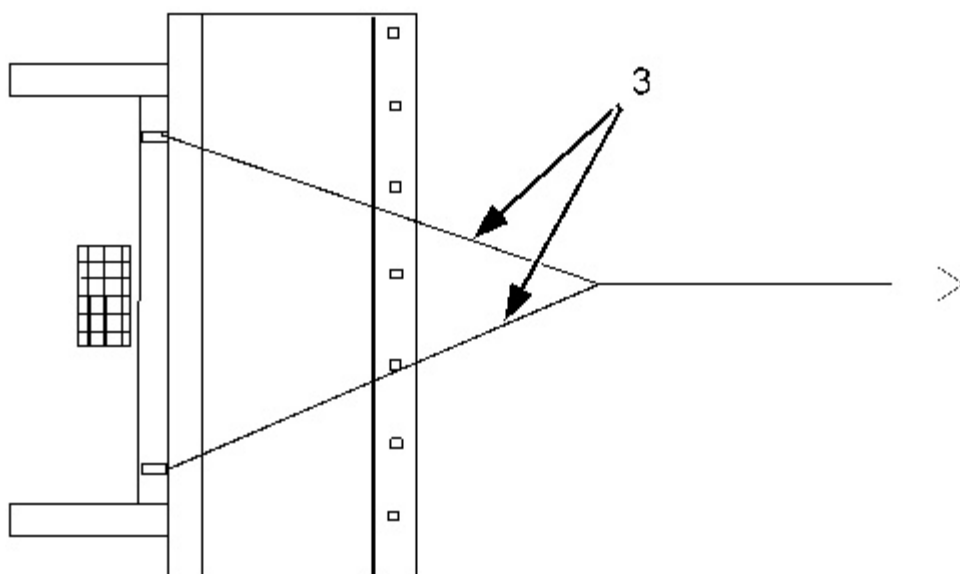


Illustration 3

g01019066

Each of the lines (3) must be a minimum of 1.5 m (5.0 ft).

NOTICE

Do not drag the machine for long distances. Damage to the tracks or the tires may occur.

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Sat Jan 28 2012 03:59:47 GMT-0800 (

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Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

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216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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i02065056

Engine Starting with Jump Start Cables

SMCS - 1000; 1401; 7000

WARNING

Batteries give off flammable fumes that can explode resulting in personal injury.

Prevent sparks near the batteries. They could cause vapors to explode. Do not allow the jump start cable ends to contact each other or the machine.

Do not smoke when checking battery electrolyte levels.

Electrolyte is an acid and can cause personal injury if it contacts skin or eyes.

Always wear eye protection when starting a machine with jump start cables.

Improper jump start procedures can cause an explosion resulting in personal injury.

Always connect the positive (+) to positive (+) and the negative (-) to negative (-).

Jump start only with an energy source with the same voltage as the stalled machine.

Turn off all lights and accessories on the stalled machine. Otherwise, they will operate when the energy source is connected.

NOTICE

To prevent damage to engine bearings and to electrical circuits when you jump start a machine, do not allow the

stalled machine to touch the machine that is used as the electrical source.

Severely discharged maintenance free batteries do not fully recharge from the alternator after jump starting. The batteries must be charged to proper voltage with a battery charger. Many batteries thought to be unusable are still rechargeable.

Use only equal voltage for starting. Check the battery and starter voltage rating of your machine. Use only the same voltage for jump starting. Use of a welder or higher voltage damages the electrical system. This machine has a 12 volt starting system. Use only the same voltage for jump starting.

Refer to Special Instruction, SEHS7633, "Battery Test Procedure" available from your Caterpillar dealer, for complete testing and charging information.

1. Engage the parking brake. Lower the work tools to the ground.
Reference: Refer to Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped".
2. Move all control levers to the HOLD or NEUTRAL position.
3. Turn the engine start switch key to the OFF position and turn all accessory switches to the OFF position.
4. Move the machine that is being used as an electrical source near the stalled machine so that the jump start cables reach the stalled machine. **Do not allow the machines to contact each other.**
5. Stop the engine of the machine that is being used as an electrical source. If you are using an auxiliary power source, turn off the charging system.
6. Ensure that battery caps on both machines are tight and correctly placed. Ensure that batteries in the stalled machine are not frozen.
7. Connect the positive jump start cable to the positive cable terminal of the discharged battery.
Do not allow the positive cable clamps to contact any metal except for the battery terminals.
8. Connect the other positive end of the jump start cable to the positive cable terminal of the electrical source.
9. Connect one negative end of the jump start cable to the negative cable terminal of the electrical source.
10. Connect the other negative end of the jump start cable to the engine block or to the frame of the stalled machine. **Do not connect the jump start cable to the battery post. Do not allow the jump start cables to contact the battery cables, the fuel lines, the hydraulic lines, or any moving parts.**
11. Start the engine of the machine that is being used as an electrical source or energize the charging system on the auxiliary power source.

12. Wait at least two minutes before you attempt to start the stalled machine. This will allow the battery in the stalled machine to partially charge.
13. Attempt to start the stalled engine.

Reference: For the correct starting procedure, refer to Operation and Maintenance Manual, "Engine Starting".

14. After the stalled engine starts, disconnect the negative jump start cable from the stalled machine.
15. Disconnect the negative jump start cable from the negative terminal of the electrical source.
16. Disconnect the positive jump start cable from the positive terminal of the electrical source.
17. Disconnect the positive jump start cable from the positive terminal of the stalled machine.
18. Conclude the failure analysis on the starting system of the stalled machine and/or on the charging system of the stalled machine. Check the machine while the engine is running and the charging system is in operation.



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i01961574

Access Doors and Covers

SMCS - 7273-572; 7273-573

Engine Access Door

Note: A pinch point exists between the top of the engine access door and the radiator guard. Keep hands away from this area when you close the engine access door.

The engine access door is located on the back of the machine.

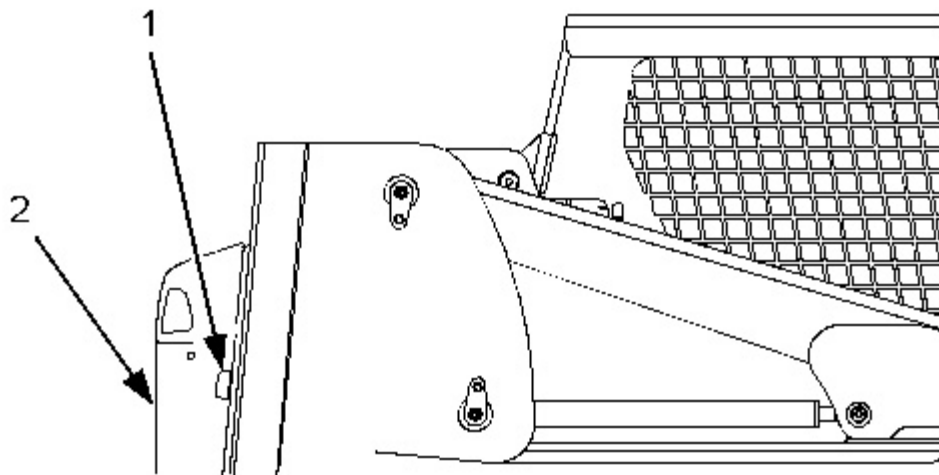


Illustration 1

g01019131

1. Pull the release lever (1) in order to open the engine access door (2) .

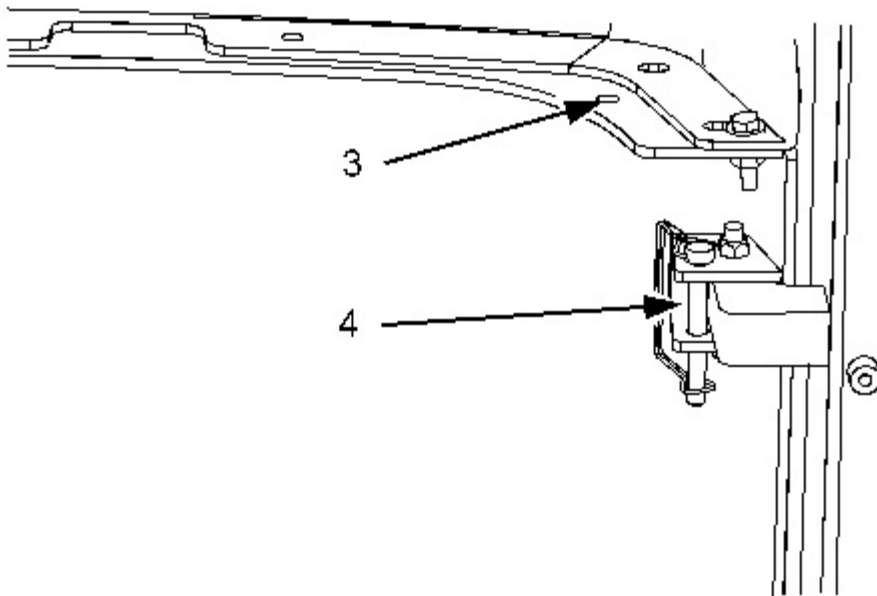


Illustration 2

g01019162

2. Move the retaining pin from the stored position (3) and put the retaining pin in the locked position (4). This will prevent the engine access door from closing inadvertently.
3. In order to close the engine access door, put the retaining pin in the stored position.
4. Close the engine access door.



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i02015033

Cab Tilting

SMCS - 7301-506; 7301-509

WARNING

Do not go beneath cab unless cab is empty and support lever is engaged.

Failure to follow the instructions or heed the warnings could result in injury or death.

WARNING

Do not tilt the cab using an open door. The door must be closed and latched when lifting the cab. The door may become dislodged from its hinges and may cause serious personal injury or death.

Tilting the Cab Upward

1. Park the machine on level ground.

Note: Empty the water tank (if equipped) before you tilt the cab.

2. Lower the loader arms fully. If you tilt the cab upward with the loader lift arms in the RAISED position, you must engage the brace for the loader lift arms. See Operation and Maintenance Manual, "Loader Lift Arm Brace Operation" for the process for engaging the brace for the loader lift arms.
3. Turn the engine start switch key to the OFF position.
4. Place supports under the rear of the machine in order to support the machine while the cab is tilted.

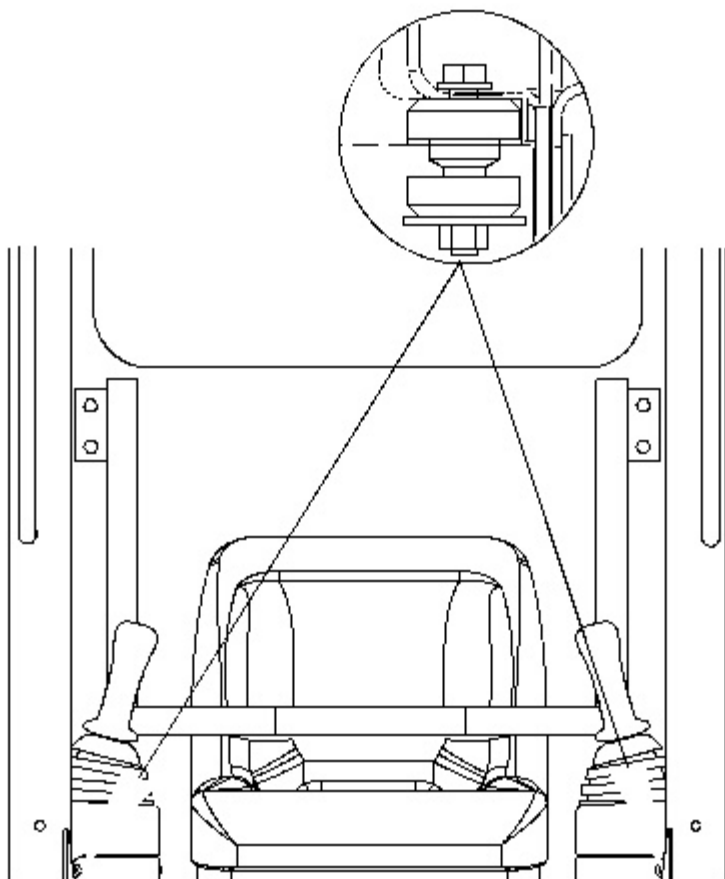


Illustration 1

g01025254

5. Remove the two front bolts for the ROPS.
6. Close the cab door and ensure that the door is latched.
7. Tilt the cab upward. Stand on the ground when you tilt the cab.

Note: More than one person may be needed to tilt the cab.

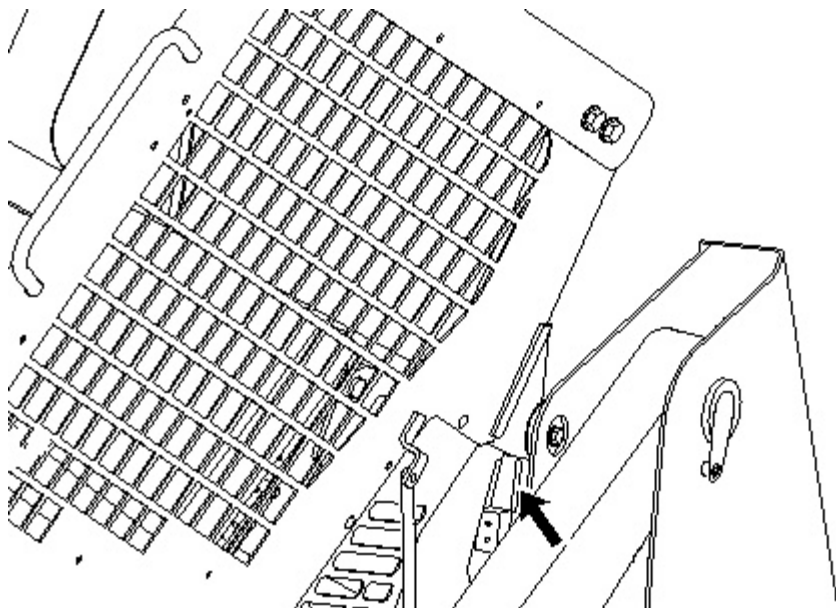


Illustration 2

g00954946

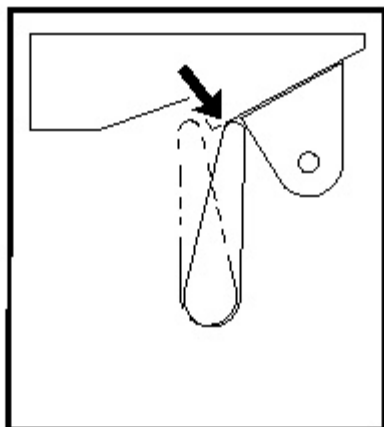


Illustration 3

g00952728

The cab support lever is in the ENGAGED position.

8. Make sure that the cab support lever is in the ENGAGED position.

Tilting the Cab Downward

Note: More than one person may be needed to tilt the cab.

1. Ensure that all persons are not under the cab. Remove all of the tools and unsecured items that are underneath the cab.

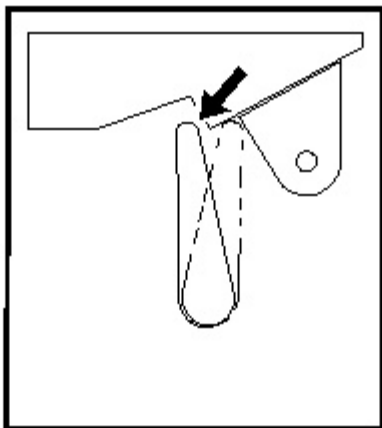


Illustration 4

g00952719

The cab support lever is shown in the DISENGAGED position.

2. Tilt the cab upward. Move the cab support lever to the DISENGAGED position.
3. Tilt the cab downward and install the bolts for the ROPS. Torque the bolts to 125 ± 20 N·m (92 ± 15 lb ft).
4. Remove the supports from the rear of the machine.

Application Guide for Gas Struts

The struts that support the cab are matched to the weight of the cab. Refer to this chart for the correct strut if the configuration of the cab is changed.

Table 1

Cab	Gas Strut
Standard Cab	152-2682
Standard Cab + Cab Door	152-2682 + 152-2683
Standard Cab + Cab Door + Lifting Bracket (Single Point) ⁽¹⁾	152-2682 + 152-2683
Standard Cab + Lifting Bracket (Single Point)	152-2682 + 152-2683
Standard Cab + Lifting Brackets (Four Point)	152-2682

Standard Cab + FOPS 2 (1)	152-2682
Standard Cab + Lifting Brackets (Four Point) + FOPS 2 (1)	152-2682
Standard Cab + Lifting Bracket (Single Point) + FOPS 2 (1)	152-2682 + 152-2683
Standard Cab + Cab Door + Lifting Brackets (Four Point)	152-2682 + 152-2683

(1) This configuration requires manual assistance in order to raise the cab.



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Loader Lift Arm Brace Operation

SMCS - 6119-011-AB; 6119-012-AB

WARNING

Loader lift arm brace must be in place when working under raised lift arms.

Failure to follow the instructions or heed the warnings could result in injury or death.

Engage the Lift Arm Brace (Radial Lift)

1. Empty the work tool. Remove the work tool. Park the machine on level ground. Lower lift arms to the ground. Stop the engine and exit the machine.

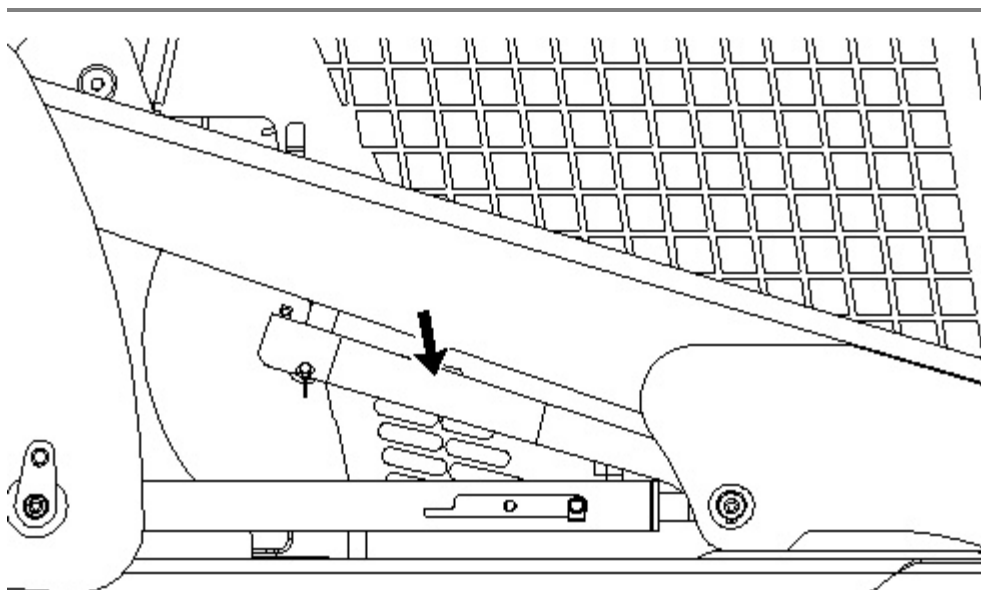


Illustration 1

g00930196

2. Remove the pin that holds the lift arm brace in the stored position.
3. Lower the lift arm brace to rest on the cylinder housing.
4. Mount the machine. Secure the seat belt and lower the armrest. Start the engine.
5. Raise the lift arms until the brace falls onto the cylinder rod. Slowly lower the lift arms until the brace stops movement.

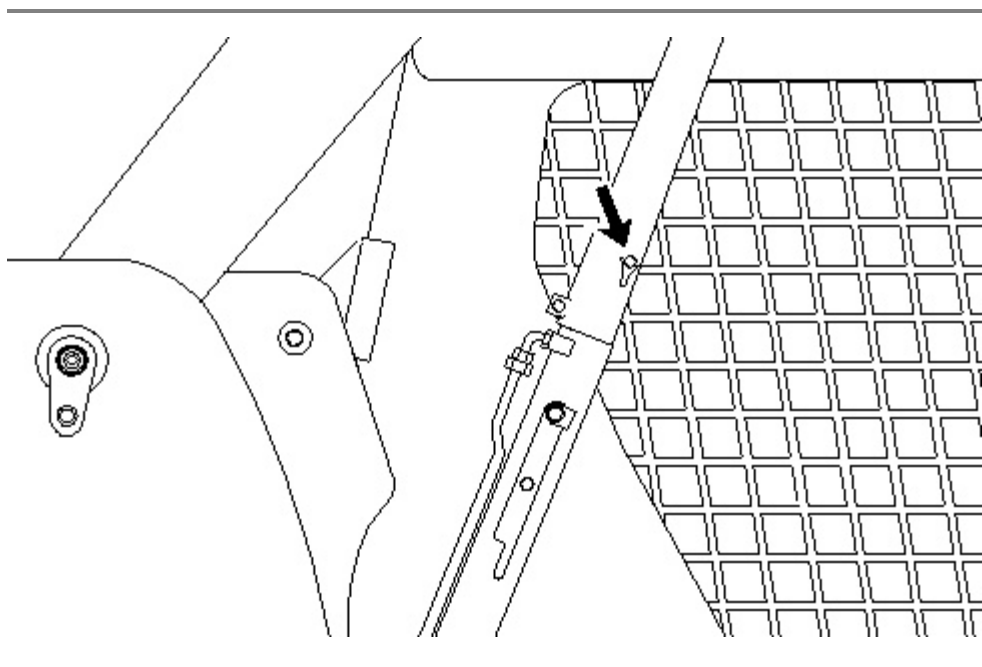


Illustration 2

g00952492

6. Stop the engine. Exit the machine. Secure the retaining pin through the brace below the cylinder rod.

Disengage the Lift Arm Brace (Radial Lift)

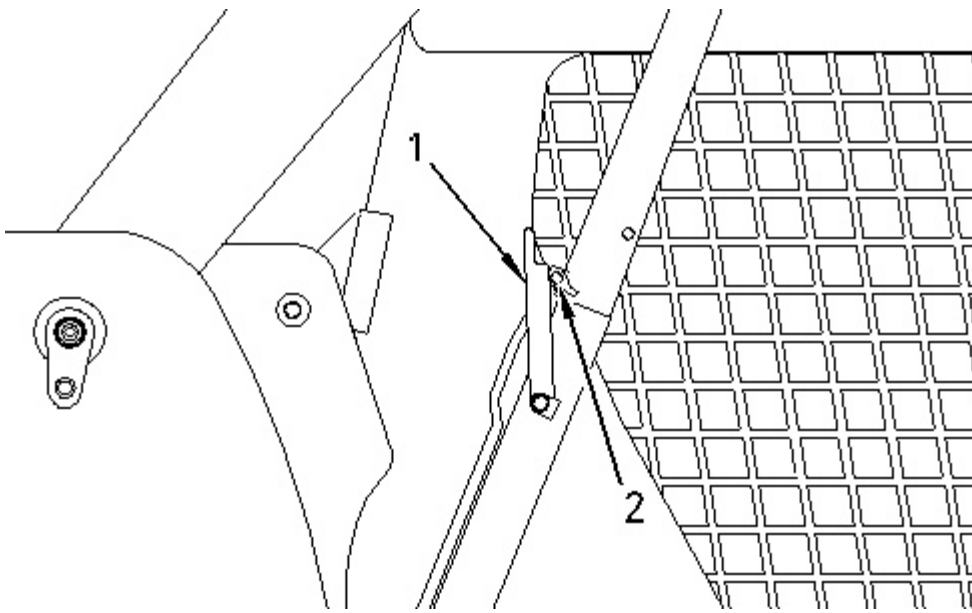


Illustration 3

g00952586

1. Remove the retaining pin from the brace and install the pin (2) in the holding block.
2. Detach and swing the pivot lever (1) clockwise onto the retaining pin.
3. Mount the machine. Secure the seat belt and lower the armrest. Start the engine.

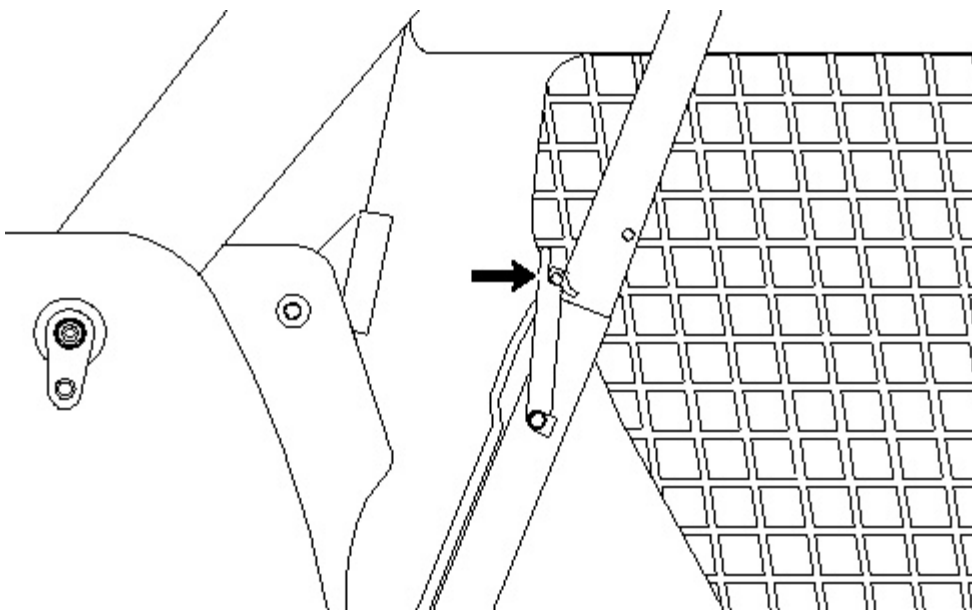


Illustration 4

g00952609

4. Slowly raise the loader lift arms until the lever engages the retaining pin.
5. Slowly lower the lift arms to the ground. Stop the engine. Exit the machine.
6. Raise and secure the brace to the lift arm with the retaining pin.

7. Install the pivot lever into the STORED position.

Engage the Lift Arm Brace (Extended Lift)

1. Empty the work tool. Remove the work tool. Park the machine on level ground. Raise the lift arms to maximum height.
2. Remain in the seat with the seat belt fastened until the brace is installed.

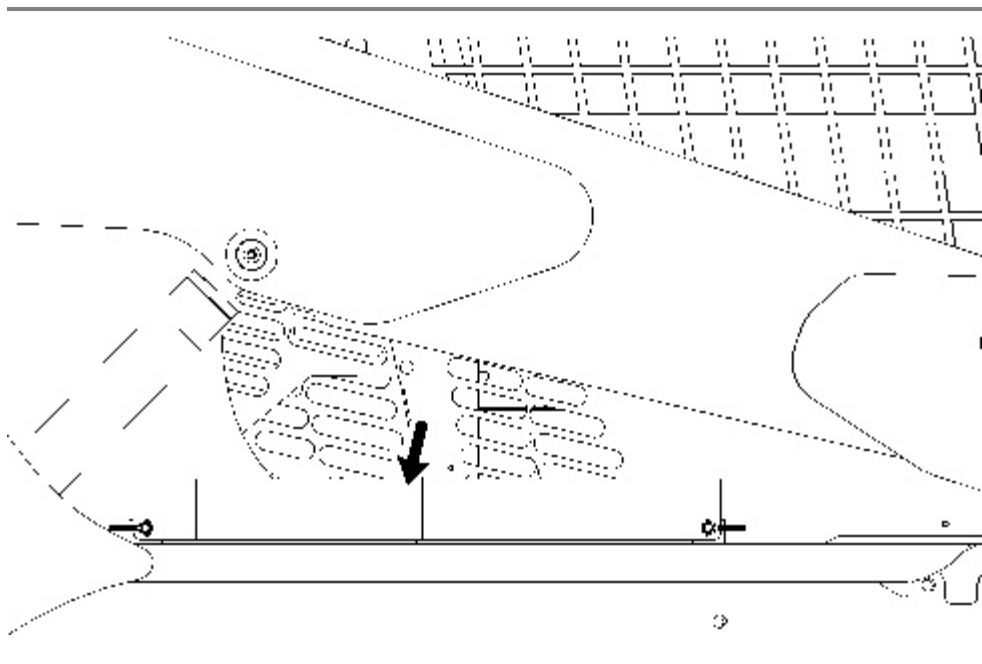
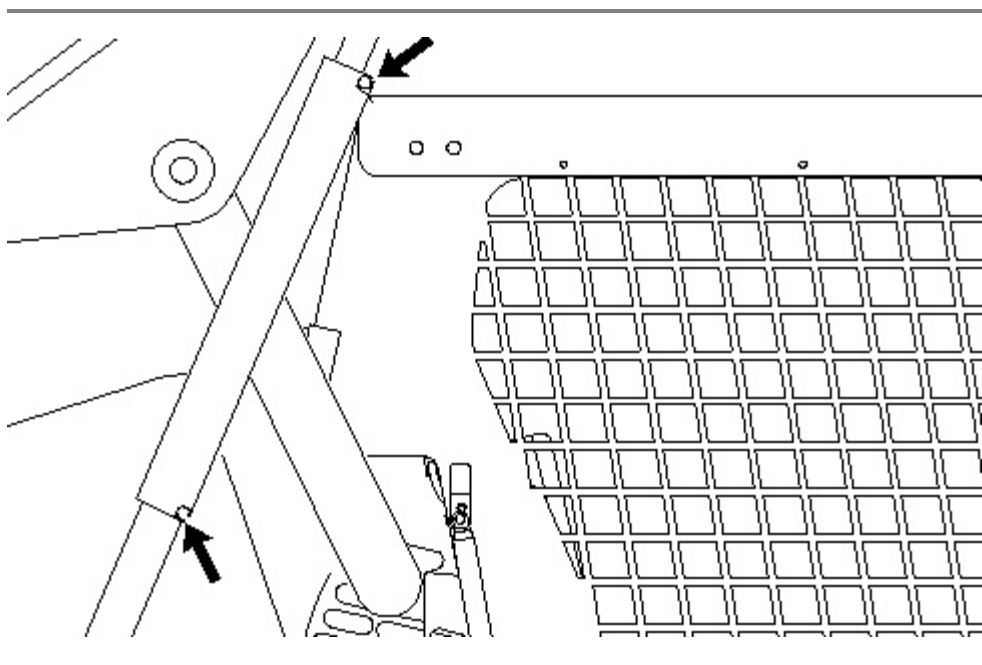


Illustration 5

g00930202

3. A second person must remove the brace from the storage position by removing the retaining pins.



4. The second person should then install the brace over the rod of one of the lift cylinders.
5. Lower the loader arms slowly until the brace is held tightly between the rod and the cylinder.
6. Secure the two retaining pins through the brace below the rod.

Disengage the Lift Arm Brace (Extended Lift)

1. Mount the machine. Fasten the seat belt. Lower the armrest and remain in the seat until the brace is removed.
2. Slowly raise the lift arms until the brace is free.
3. A second person must remove the retaining pins and the brace from the rod.
4. Slowly lower the lift arms to the ground.
5. The second person should return the brace to the storage location. Attach the brace with the retaining pins.



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i01961858

Radiator Tilting

SMCS - 1353-506; 1353-509

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".

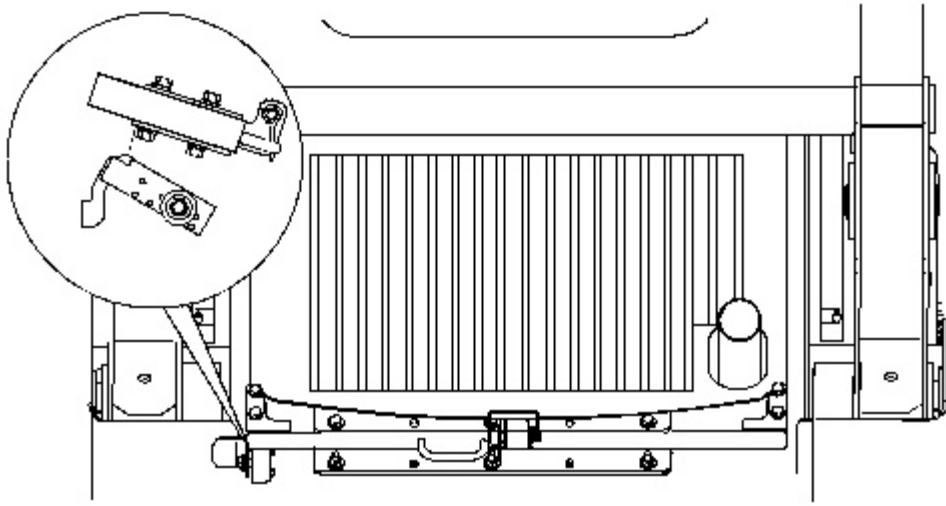


Illustration 1

g01019329

2. The release lever for the radiator latch is located on the left side or the right side of the radiator. Pull the release lever for the radiator latch. Tilt the radiator upward.

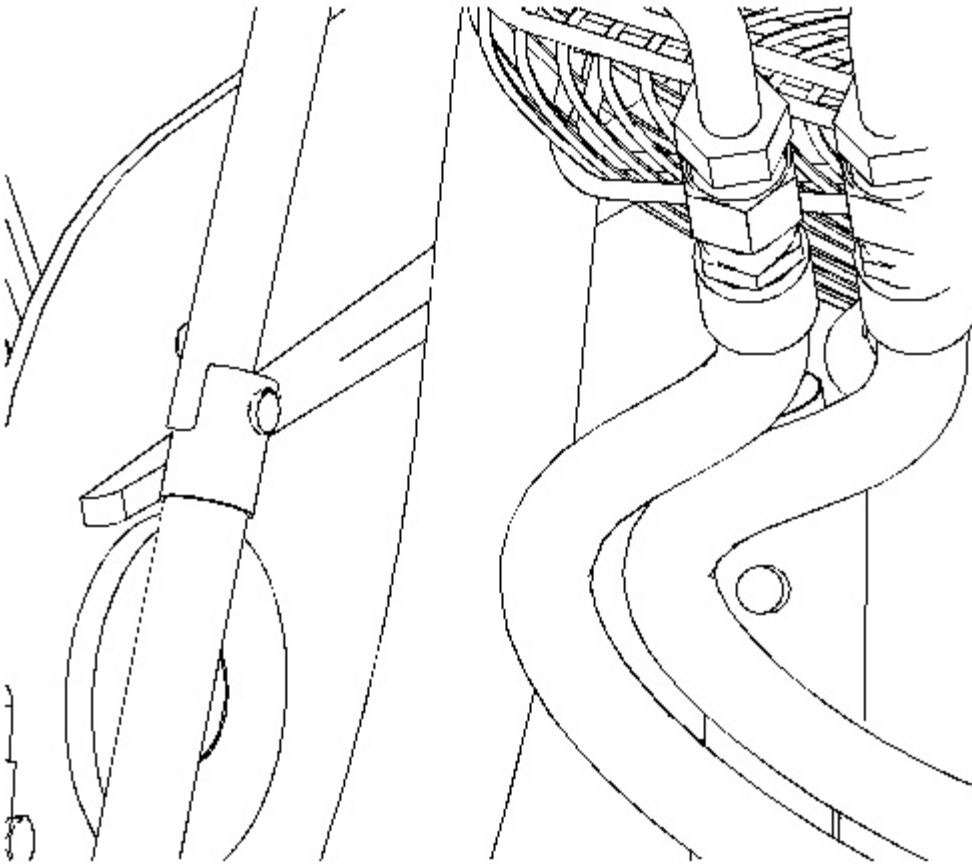


Illustration 2

g01028581

3. The strut lock is located on the right side or the left side of the engine compartment. Make sure that the strut lock is in the LOCKED position.
4. In order to tilt the radiator downward, push the strut lock to the left.
5. Tilt the radiator downward. Make sure that the radiator is in the LOCKED position.
6. Close the engine access door.

Tilting the Radiator Guard

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".

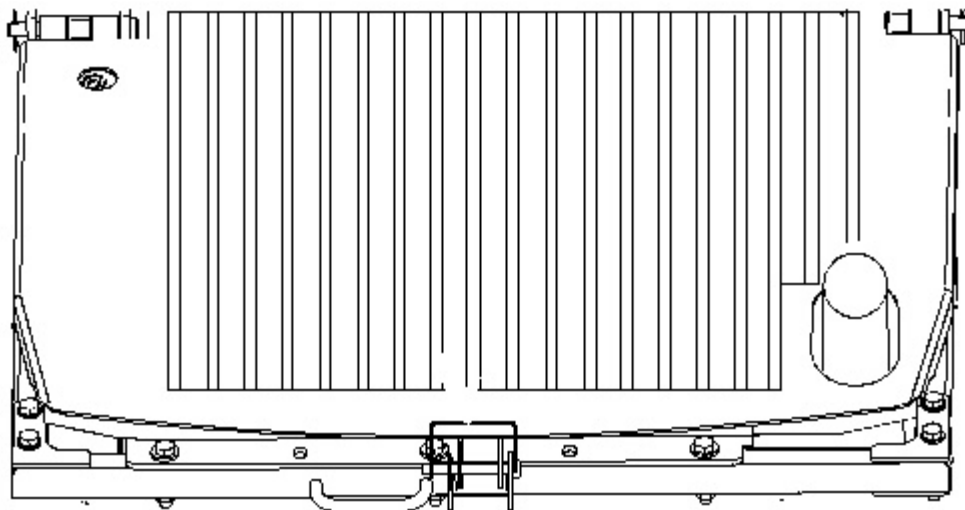


Illustration 3

g01019340

2. Remove the retaining pin from the radiator guard. Tilt the radiator guard upward.
3. In order to tilt the radiator guard downward, pull down on the radiator guard and install the retaining pin.



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Lubricant Viscosities

SMCS - 7581

The proper oil viscosity grade is determined by the minimum outside temperature when the machine is started. The proper oil viscosity grade is also determined by the maximum outside temperature while the machine is operated. Use the column that has the title of "Min" on the table to determine the oil viscosity grade that is required for starting a cold machine. Use the column that has the title of "Max" on the table to determine the oil viscosity grade for operating the machine at the highest temperature that is anticipated. Use the oil with the highest viscosity that is allowed for the ambient temperature when you start the machine.

Machines that are continuously operated should use the oils with the higher viscosity in the final drives and differentials in order to maintain the highest possible oil film thickness. Consult your Caterpillar dealer if additional information is needed.

Table 1

Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Classification	Oil Viscosities	°C		°F	
			Min	Max	Min	Max
Engine Crankcase for all Machines ^{(1) (2)} and Drive Chain Boxes	Cat DEO Multigrade Cat DEO SYN Cat Arctic DEO SYN ⁽³⁾ Cat ECF-1 ⁽⁴⁾ API CG-4 Multigrade ⁽⁵⁾	SAE 0W-20	-40	10	-40	50
		SAE 0W-30	-40	30	-40	86
		SAE 0W-40	-40	40	-40	104
		SAE 5W-30	-30	30	-22	86
		SAE 5W-40	-30	50	-22	122
		SAE 10W-30 ⁽⁶⁾	-18	40	0	104

		SAE 10W-40	-18	50	0	122
		SAE 15W-40	-9.5	50	15	122
Hydraulic Systems, Hydrostatic Transmission	Cat HYDO Cat DEO Cat MTO Cat TDTO Cat TDTO-TMS Cat DEO SYN Cat Arctic DEO SYN Cat Arctic TDTO Cat ECF-1 Cat BIO HYDO (HEES) API CG-4 API CF commercial TO-4 commercial BF-1	SAE 0W-20	-40	40	-40	104
		SAE 0W-30	-40	40	-40	104
		SAE 0W-40	-40	40	-40	104
		SAE 5W-30	-30	40	-22	104
		SAE 5W-40	-30	40	-22	104
		SAE 10W	-20	40	-4	104
		SAE 30	10	50	50	122
		SAE 10W-30	-20	40	-4	104
		SAE 15W-40	-15	50	5	122
		Cat MTO	-25	40	-13	104
		Cat BIO HYDO (HEES)	-40	43	-40	110
		Cat TDTO-TMS	-20	50	-4	122
External Lubrication Points	Advanced 3Moly	NLGI Grade 2	-20	40	-4	104

- (1) Supplemental heat is recommended for cold-soaked starts below the minimum ambient temperature. Supplemental heat may be required for cold-soaked starts that are above the minimum temperature that is stated, depending on the parasitic load and other factors. Cold-soaked starts occur when the engine has not been operated for a period of time, allowing the oil to become more viscous due to cooler ambient temperatures.
- (2) API CF oils are not recommended for Caterpillar 3500 Series and smaller Direct Injection (DI) diesel engines. API CF-4 oils are not recommended for Caterpillar machine diesel engines.
- (3) Cat Arctic DEO SYN is an SAE 0W-30 viscosity grade oil.
- (4) API CI-4, API CI-4 PLUS, and API CH-4 oils are acceptable if the requirements of Caterpillar's ECF-1 (Engine Crankcase Fluid specification - 1) are met. API CI-4, API CI-4 PLUS, and API CH-4 oils that have not met the requirements of Caterpillar's ECF-1 specification may cause reduced engine life.
- (5) API CG-4 oils are acceptable for use in all Caterpillar machine diesel engines. When API CG-4 oils are used, the oil change interval should not exceed 250 hours. API CG-4 oils that also meet API CI-4, API CI-4 PLUS, or API CH-4 must also meet the requirements of the Caterpillar ECF-1 specification.
- (6) SAE 10W-30 is the preferred viscosity grade for the 3116, 3126, C7, C-9 and the C9 diesel engines when the ambient temperature is between -18° C (0° F) and 40° C (104° F).



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i02019812

Capacities (Refill)

SMCS - 7560

Table 1

Approximate Refill Capacities 216B, 226B, 232B and 242B Machines			
Compartment or System	Liters	US Gallons	Imperial Gallons
Engine Crankcase 3024	7.5	2.0	1.6
Hydraulic Tank	35.0	9.3	7.7
Cooling System 216B and 232B	9.0	2.4	2.0
Cooling System 226B and 242B	10.5	2.8	2.3
Fuel Tank 216B and 226B	65.0	17.2	14.3
Fuel Tank 232B and 242B	69.0	18.2	15.2
Each Drive Chain Box 216B and 226B	6.0	1.6	1.3
Each Drive Chain Box 232B and 242B	8.0	2.1	1.8

Table 2

Approximate Refill Capacities 236B, 246B, 248B, 252B, 262B and 268B Machines			
Compartment or System	Liters	US Gallons	Imperial Gallons
Engine Crankcase 3044	9.0	2.4	2.0

Hydraulic Tank	35.0	9.3	7.7
Cooling System	12.5	3.3	2.7
Fuel Tank	90.0	23.8	19.8
Each Drive Chain Box 236B, 246B, 248B	7.5	2.0	1.6
Each Drive Chain Box 252B, 262B, 268B	8.0	2.1	1.8



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S·O·S Information

SMCS - 1000; 7000; 7542-008

S·O·S Services is a highly recommended process for Caterpillar customers to use in order to minimize owning and operating cost. Customers provide oil samples, coolant samples, and other machine information. The dealer uses the data in order to provide the customer with recommendations for management of the equipment. In addition, S·O·S Services can help determine the cause of an existing product problem.

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for detailed information concerning S·O·S Services.

Refer to the Operation and Maintenance Manual, "Maintenance Interval Schedule" for a specific sampling location and a service hour maintenance interval.

Consult your Caterpillar dealer for complete information and assistance in establishing an S·O·S program for your equipment.

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i02000840

Welding on Machines and Engines with Electronic Controls

SMCS - 1000; 7000

Proper welding procedures are necessary in order to avoid damage to the electronic controls and to the bearings. When possible, remove the component that must be welded from the machine or the engine and then weld the component. If you must weld near an electronic control on the machine or the engine, temporarily remove the electronic control in order to prevent heat related damage. The following steps should be followed in order to weld on a machine or an engine with electronic controls.

1. Turn off the engine. Place the engine start switch in the OFF position.
2. If equipped, turn the battery disconnect switch to the OFF position. If there is no battery disconnect switch, remove the negative battery cable at the battery.

NOTICE

Do NOT use electrical components (ECM or ECM sensors) or electronic component grounding points for grounding the welder.

3. Clamp the ground cable from the welder to the component that will be welded. Place the clamp as close as possible to the weld. Make sure that the electrical path from the ground cable to the component does not go through any bearing. Use this procedure in order to reduce the possibility of damage to the following components:
 - o Bearings of the drive train
 - o Hydraulic components
 - o Electrical components
 - o Other components of the machine
4. Protect any wiring harnesses from the debris which is created from welding. Protect any wiring harnesses from the splatter which is created from welding.
5. Use standard welding procedures in order to weld the materials together.



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 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

Publication Date -01/07/2007

Date Updated -16/07/2007

i02743768

Maintenance Interval Schedule

SMCS - 7000

S/N - BXM1-4224

S/N - MJH1-10574

S/N - RLL1-6799

S/N - SCH1-2474

When Required

[Battery - Recycle](#)
[Battery or Battery Cable - Inspect/Replace](#)
[Blade Frame - Adjust](#)
[Bucket Cutting Edges - Inspect/Replace](#)
[Bucket Tips - Inspect/Replace](#)
[Cab Air Filter - Clean/Replace](#)
[Circuit Breakers and Fuses - Reset/Replace](#)
[Engine Air Filter Primary Element - Clean/Replace](#)
[Engine Air Filter Secondary Element - Replace](#)
[Fuel System Priming Pump - Operate](#)
[Fuel Tank Cap - Clean](#)
[Fuel Tank Water and Sediment - Drain](#)
[Lower Machine Frame - Clean](#)
[Oil Filter - Inspect](#)
[Tire Segment - Replace](#)
[Window Washer Reservoir - Fill](#)
[Window Wiper - Inspect/Replace](#)
[Windows - Clean](#)

Every 10 Service Hours or Daily

[Backup Alarm - Test](#)
[Cooling System Level - Check](#)
[Engine Oil Level - Check](#)
[Fuel System Primary Filter \(Water Separator\) - Drain](#)
[Hydraulic System Oil Level - Check](#)

[Lift Arm and Cylinder Linkage - Lubricate](#)
[Quick Coupler - Inspect](#)
[Radiator Core - Clean](#)
[Seat Belt - Inspect](#)
[Tilt Cylinder Bearings and Bucket Linkage Bearings - Lubricate](#)
[Tire Inflation - Check](#)
[Wheel Nuts - Tighten](#)
[Work Tool - Lubricate](#)
[Work Tool Mounting Bracket - Inspect](#)

Every 125 Service Hours

[Engine Oil Sample - Obtain](#)

Every 250 Service Hours or Monthly

[Belts - Inspect/Adjust/Replace](#)

Every 250 Service Hours or 1 Year

[Engine Oil and Filter - Change](#)

Every 500 Service Hours

[Hydraulic Oil Sample - Obtain](#)

Every 500 Service Hours or 3 Months

[Drive Chain Tension - Check/Adjust](#)

Every 500 Service Hours or 6 Months

[Fuel System Primary Filter \(Water Separator\) Element - Replace](#)
[Hydraulic System Oil Filter - Replace](#)

Every 1000 Service Hours

[Engine Valve Lash - Check](#)

Every 1000 Service Hours or 6 Months

[Drive Chain Case Oil - Change](#)
[Engine Crankcase Breather - Clean](#)
[Rollover Protective Structure \(ROPS\) and Falling Object Protective Structure \(FOPS\) - Inspect](#)

Every 2000 Service Hours

[Refrigerant Dryer - Replace](#)

Every 2000 Service Hours or 1 Year

[Fuel Injection Timing - Check](#)

[Hydraulic System Oil - Change](#)

Every 3000 Service Hours or 2 Years

[Cooling System Water Temperature Regulator - Replace](#)

Every 3 Years After Date of Installation or Every 5 Years After Date of Manufacture

[Seat Belt - Replace](#)

Every 6000 Service Hours or 3 Years

[Cooling System Coolant Extender \(ELC\) - Add](#)

Every 12 000 Service Hours or 6 Years

[Cooling System Coolant \(ELC\) - Change](#)

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Sat Jan 28 2012 04:24:30 GMT-0800 (

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Product: SKID STEER LOADER
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i01017495

Backup Alarm - Test

SMCS - 7406-081

To prevent injury, make sure that no people are working on the machine or near the machine. To prevent injury, keep the machine under control at all times.

1. Get into the operator's seat. Fasten the seat belt and pull the armrest downward.
2. Start the engine.
3. Disengage the parking brake.
4. Move the speed/direction control lever to the REVERSE position.

The backup alarm (if equipped) should sound immediately. The backup alarm should continue to sound until the speed/direction control lever is returned to the HOLD position or to the FORWARD position.



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i00993589

Battery - Recycle

SMCS - 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

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i01719520

Battery or Battery Cable - Inspect/Replace

SMCS - 1401-040; 1401-510; 1401-561; 1402-040; 1402-510

1. Turn the engine start switch to the OFF position. Turn all switches to the OFF position.
2. Disconnect the negative battery cable from the starter.

Note: Do not allow the disconnected battery cable to contact the frame of the machine.

3. Disconnect the negative battery cable at the battery.
4. Perform the necessary repairs. Replace the cable or the battery, as needed.
5. Connect the negative battery cable at the battery.
6. Connect the battery cable to the starter of the machine.
7. Install the engine start switch key.

Repeat the process for the positive battery cable.



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i01957641

Belts - Inspect/Adjust/Replace

SMCS - 1357-025; 1357-040; 1357-510

If a new belt is installed, check the belt adjustment after 30 minutes of operation. A belt is considered to be used after 30 minutes of operation.

1. Stop the engine in order to inspect the belt.
2. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".

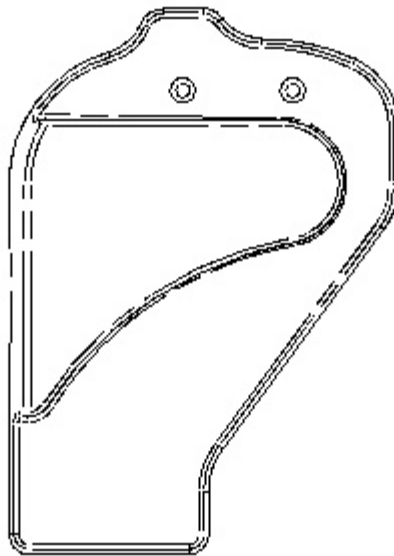


Illustration 1

g01017605

3. Remove the guard for the V-belt.
-

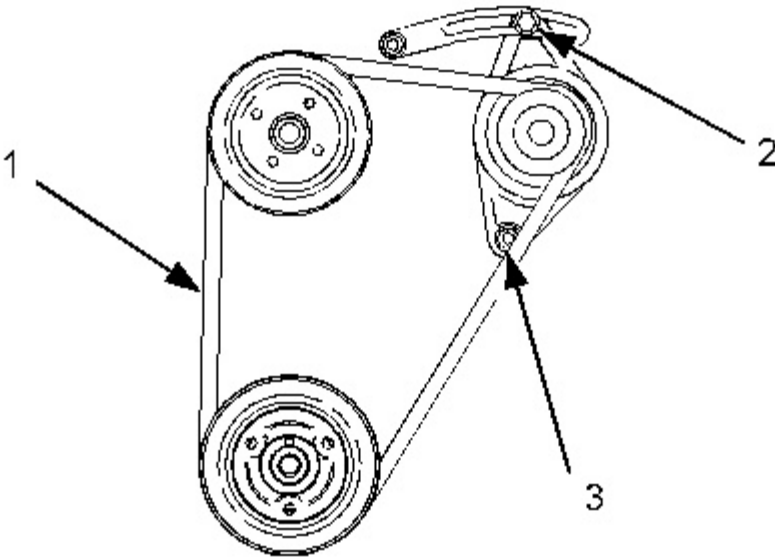


Illustration 2

g01017632

4. Inspect the condition of the belt (1) and the adjustment of the belt. The belt should deflect 10 mm (0.39 inch) under a straight pull of 44 N (10 lb). This measurement should be taken between the alternator pulley and the crankshaft pulley.

Note: A **144-0235** Borroughs Belt Tension Gauge may be used to measure belt tension. This measurement should be taken between the alternator pulley and the crankshaft pulley. Refer to the following table for belt tension.

Table 1

Belt Tension Initial	Belt Tension Used
534 ± 22 N (120 ± 5 lb)	400 ± 44 N (90 ± 10 lb)

5. Loosen the mounting bolt (2). Loosen the adjusting locknut (3) .
6. Move the alternator until the correct tension is reached.
7. Tighten the adjusting locknut. Tighten the mounting bolt.
8. Recheck the belt deflection. If the amount of deflection is incorrect, repeat step 4 to step 7.
9. Install the guard for the V-belt.
10. Close the engine access door.



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i02549571

Blade Frame - Adjust

SMCS - 6060-025-BG

Height Adjustment

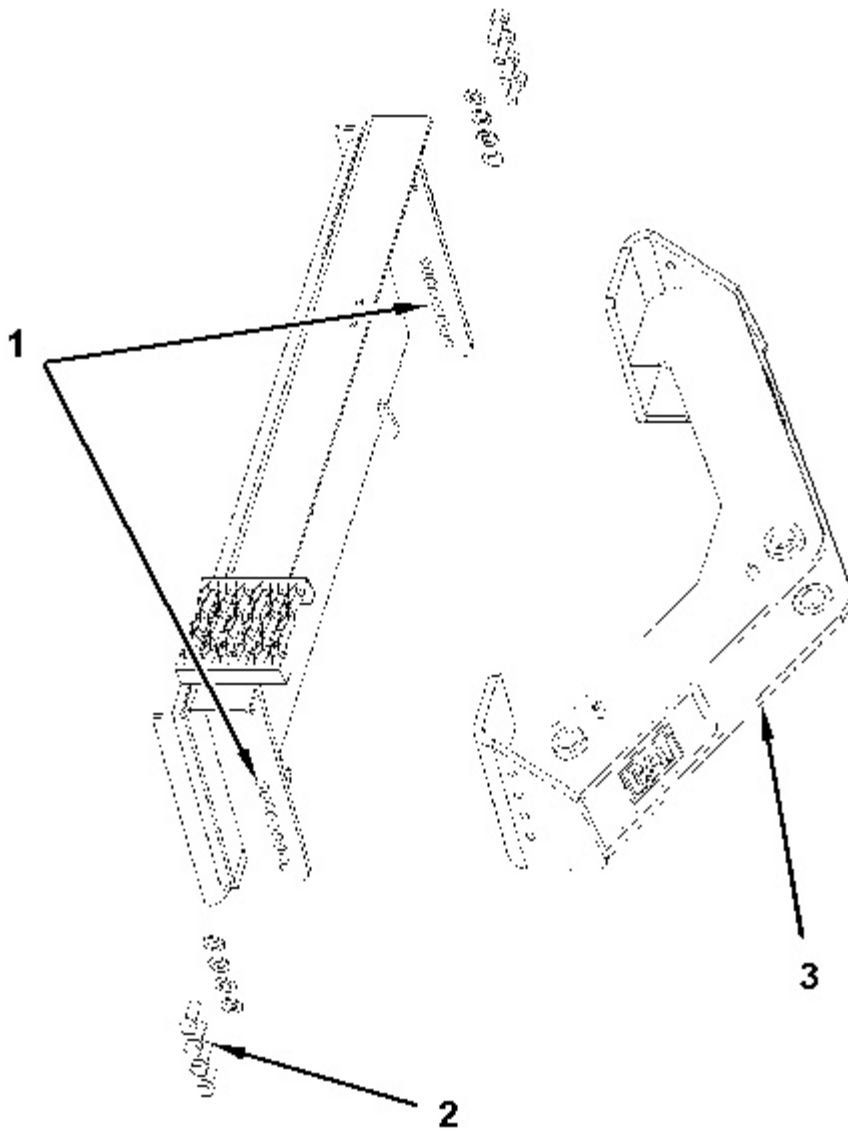


Illustration 1

g01161532

(1) Height Adjustment for the Frame

(2) Adjusting Bolts

(3) Frame

The height of the frame may be adjusted in order to compensate for the wear on the cutting edge. The front portion of the frame needs to be lowered as the cutting edge wears. Remove the bolts (2) and lower the frame (3). Install the bolts. This will keep the blade level with the ground and this will prevent the blade from digging into the ground.

Note: In order to properly adjust the blade, the work tool coupler needs to be vertical. The position of the pivot point of the blade is perpendicular to the ground. Follow this procedure in order to ensure that the cutting edge will remain flat on the ground during operation.

Trunnion Joint

Note: The trunnion is a dry joint. Adding grease to the trunnion simply attracts abrasive particles. The

tightness of the joint should be monitored. Shims should be removed when the joint becomes too loose. This may be indicated by excessive movement in the blade.

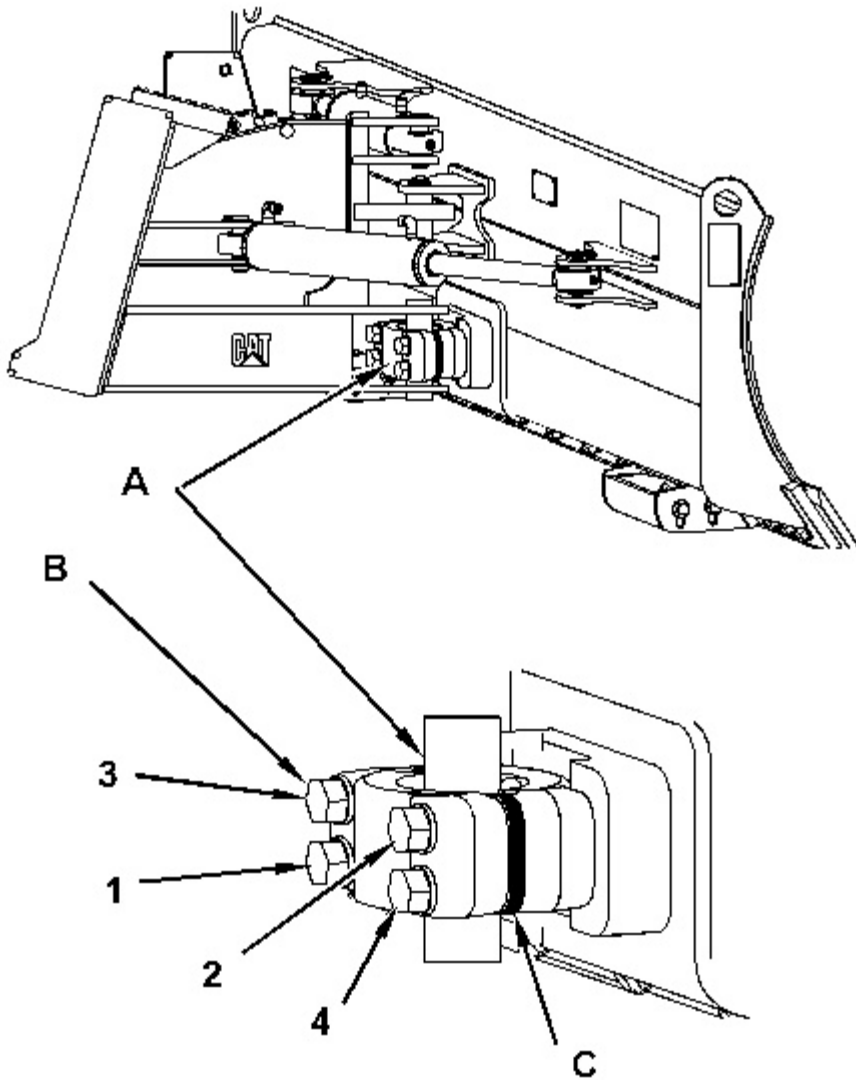


Illustration 2

g01173519

(A) Trunnion Joint

(B) Bolts

(C) Shims

- Remove the four retaining bolts (B) and the cap.
- Remove the necessary shims.
- Replace the cap and bolts.
- The tightening sequence is shown in illustration 2.
- Torque the bolts to 530 ± 70 N·m (391 ± 52 lb ft).



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i01743875

Bucket Cutting Edges - Inspect/Replace

SMCS - 6801-040; 6801-510



WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket cutting edges.

1. Lower the lift arms fully. Tilt back the bucket so that the bucket cutting edge is accessible.
2. Place blocks under the raised edge of the bucket.
3. Remove the bolts. Remove the cutting edge and the end bits.
4. Clean the contact surfaces.
5. Use the opposite side of the cutting edge, if this side is not worn.
6. Install a new cutting edge, if both edges are worn.
7. Install the bolts.
8. Remove the blocks that are under the bucket.
9. After a few hours of operation, check the bolts for proper torque.



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i01764331

Bucket Tips - Inspect/Replace

SMCS - 6805-040; 6805-510



WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket cutting edges.

1. Lower the lift arms fully. Tilt back the bucket so that the bucket tips are accessible.
2. Place blocks under the raised edge of the bucket.
3. Remove the mounting bolts. Remove the bucket tips.
4. Clean the mounting surface.
5. Replace the bucket tips.
6. Install the bolts.
7. Remove the blocks that are under the bucket.
8. After a few hours of operation, check the bolts for proper torque.



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i01962545

Cab Air Filter - Clean/Replace - If Equipped

SMCS - 7342-070; 7342-510

Fresh Air Filter

1. Raise the loader lift arms. Install the brace for the loader lift arm. Refer to Operation and Maintenance Manual, "Loader Lift Arm Brace Operation".

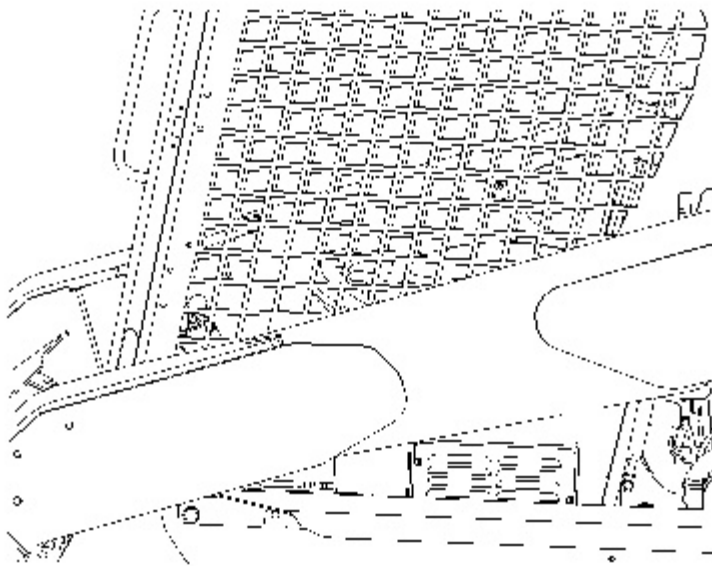


Illustration 1

g01019732

2. Remove the filter cover.
3. Remove the seal from the cover and inspect the seal. If the seal is damaged replace the seal.
4. Remove the air filter element from the cover and clean the filter element with low pressure air. Replace the element if the element is damaged.

5. Install the seal onto the filter cover and install the filter element.
6. Install the filter cover on the machine.
7. Remove the brace for the loader lift arms and return the brace to the stored position. Refer to Operation and Maintenance Manual, "Loader Lift Arm Brace Operation".

Recirculation Filter

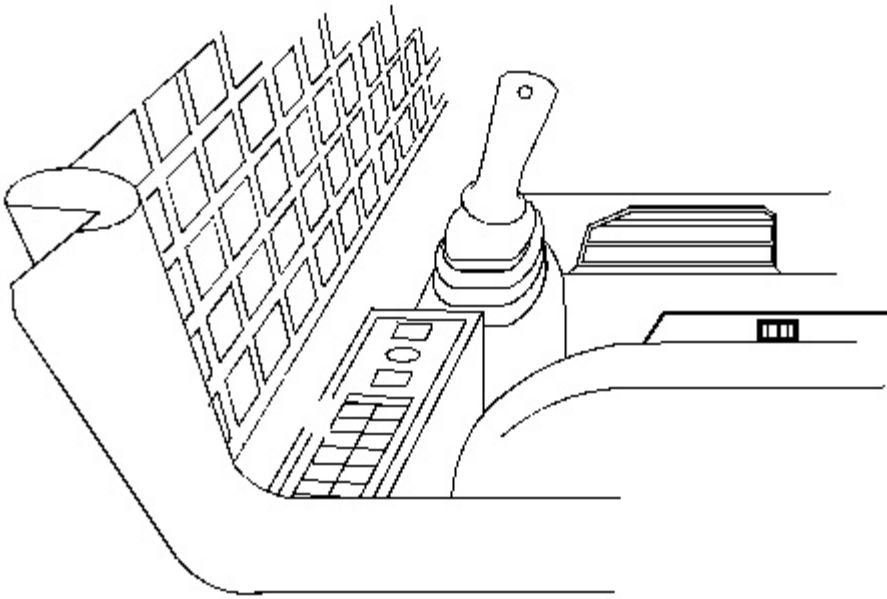


Illustration 2

g01024691

1. Remove the cover in order to access the air filter element.
2. Remove the air filter element and clean the element with soap and water. Replace the element if the element is damaged.
3. Install the element and replace the cover.



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i02873702

Circuit Breakers and Fuses - Reset/Replace

SMCS - 1417-510; 1420-529

Fuses - Fuses protect the electrical system from damage that is caused by overloaded circuits. Replace the fuse if the element separates. If the element of a new fuse separates, check the circuit. Repair the circuit, if necessary.

NOTICE

Replace the fuses with the same type and size only.
 Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical
 problem may exist. Contact your Caterpillar dealer

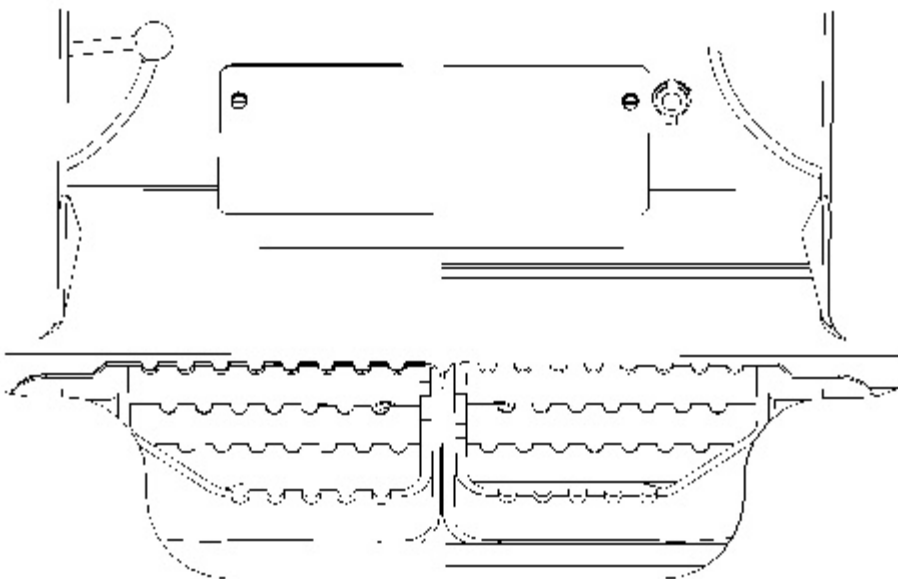


Illustration 1

g01019673

The fuse panel is located behind the cover underneath the seat. Remove the cover in order to access the fuse panel.

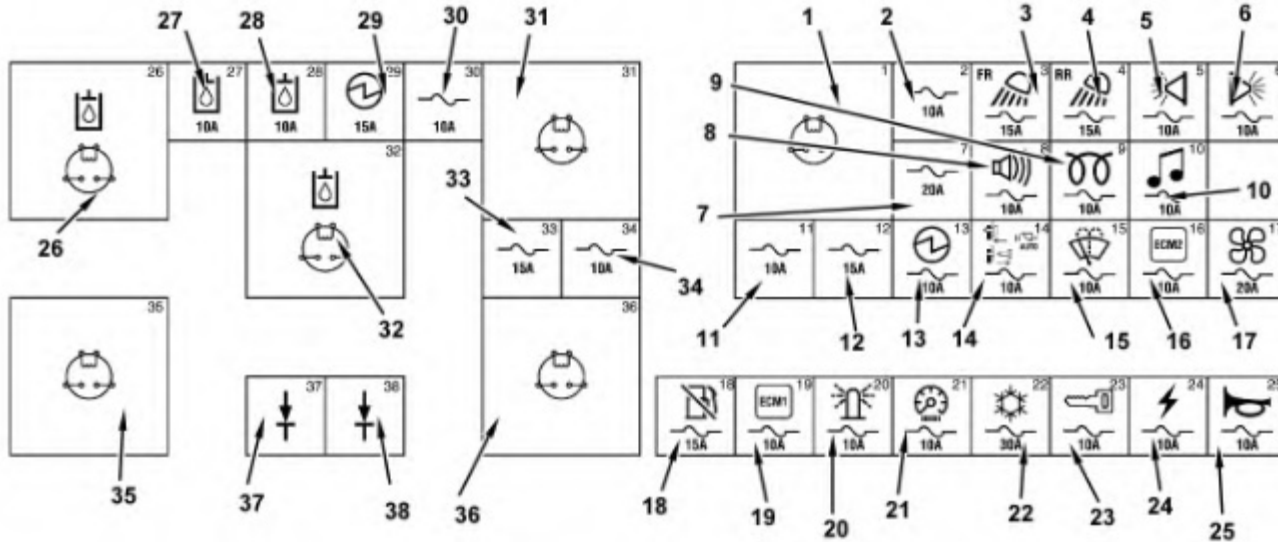


Illustration 2

g01430673

Fuses and Relays

• Fuses

- (2) Finger Trigger for the Work Tool
- (3) Front Work Lights
- (4) Rear Work Lights
- (5) Left Tail Lamp
- (6) Right Tail Lamp
- (7) Spare
- (8) Backup Alarm
- (9) Cold Start
- (10) Radio
- (11) Spare
- (12) Spare
- (13) 12 volt power socket
- (14) Hydraulic Quick Coupler
- (15) Wiper
- (16) Auxiliary Hydraulic ECM

- (17) HVAC Blower Fan and the Solenoid for the Compressor
 - (18) Fuel Shutoff solenoid
 - (19) Interlock ECM
 - (20) Beacon
 - (21) Gauges
 - (22) The fan for the air conditioner condenser
 - (23) Ignition Switch
 - (24) Miscellaneous Power
 - (25) Horn
 - (27) Auxiliary Hydraulic C-
 - (28) Auxiliary Hydraulic C+
 - (29) Auxiliary Tools
 - (30) Auxiliary Electrical Control C1
 - (33) Spare
 - (34) Auxiliary Electrical Control C2
 - **Relays**
 - (1) Finger Trigger for the Work Tool
 - (26) Auxiliary Hydraulic C-Solenoid
 - (31) Auxiliary Electric Control C1
 - (32) Auxiliary Hydraulic C+Solenoid
 - (35) ECM signal for the Auxiliary Hydraulic C+ and the Auxiliary Hydraulic C-
 - (36) Auxiliary Electric Control C2
 - **Diodes**
 - (37) C-
 - (38) C+
-

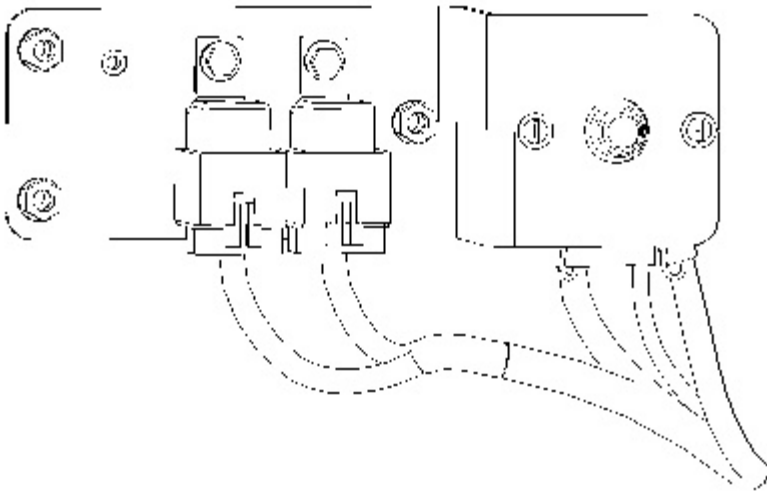


Illustration 3
Circuit Breaker

g01019607

The main circuit breaker is located in the engine compartment on the left side. Press the switch and release the switch in order to reset the circuit breaker.



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i01961213

Cooling System Coolant (ELC) - Change

SMCS - 1395-044-NL

WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE

Mixing ELC with other products will reduce the effectiveness of the coolant.

This could result in damage to cooling system components.

If Caterpillar products are not available and commercial products must be used, make sure they have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants and Caterpillar Extender.

Note: The machine was shipped from the factory with Extended Life Coolant (ELC) in the cooling system.

For information about the addition of Extender to your cooling system, see the Operation and Maintenance Manual, "Cooling System Coolant (ELC) Extender - Add" or consult your Caterpillar dealer.

Drain the coolant whenever the coolant is dirty or whenever the coolant is foaming.

The radiator cap is located under the radiator guard on the top of the engine compartment.

Allow the machine to cool before you change the coolant.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Raise the radiator guard. Refer to Operation and Maintenance Manual, "Radiator Tilting".

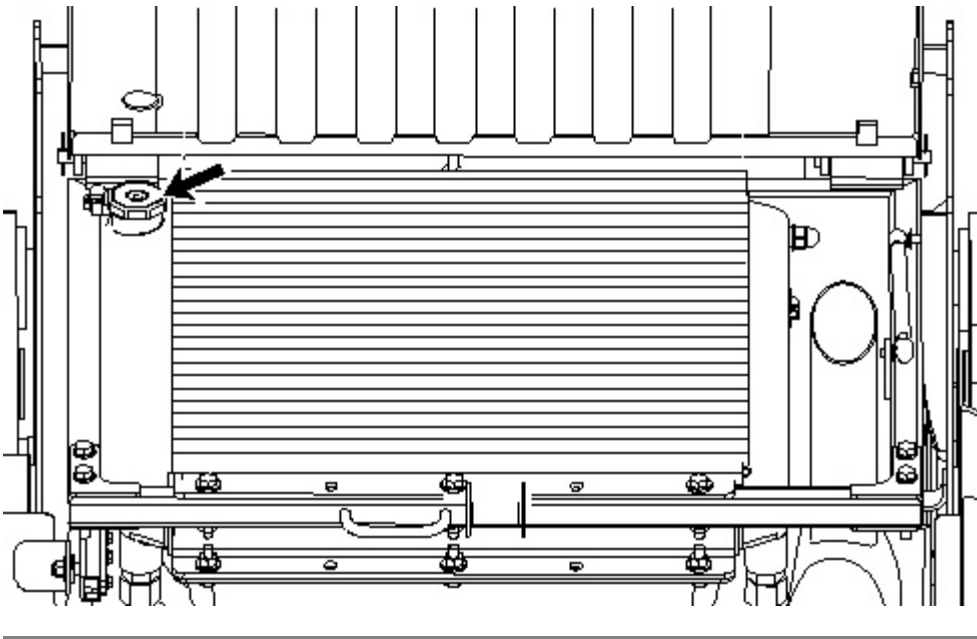


Illustration 1

g00956151

Note: The radiator cap is located on the left side of the radiator on machines that are equipped with the 3024 engine. The radiator cap is located on the right side of the radiator on machines that are equipped with the 3044 engine.

3. Slowly loosen the radiator cap in order to relieve system pressure. Remove the radiator cap.
-

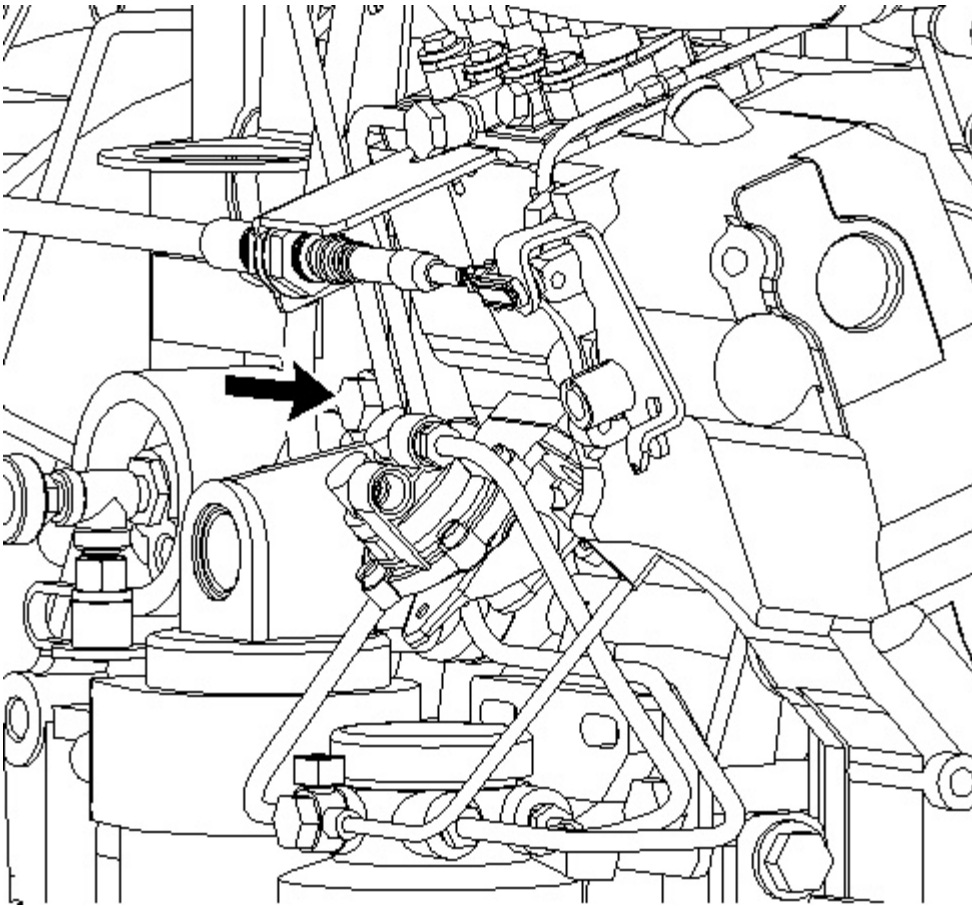


Illustration 2
3024 drain valve

g00954319

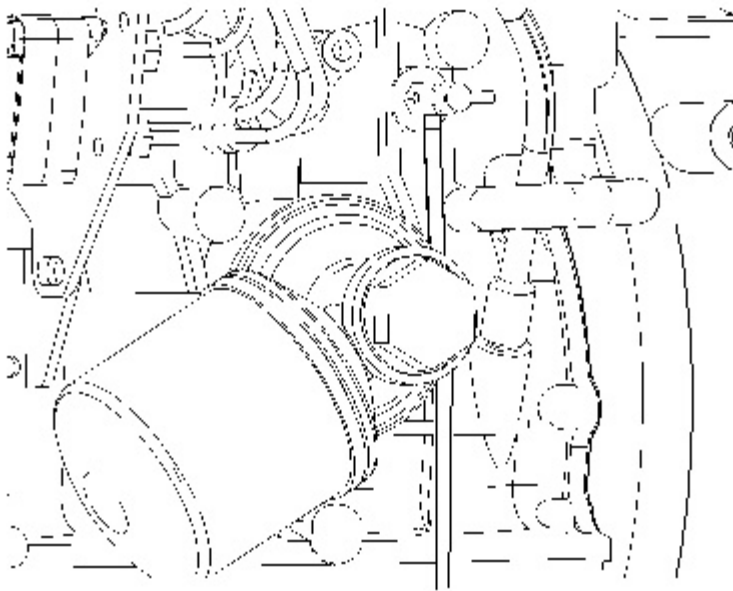


Illustration 3
3044 drain valve

g01018862

4. Remove the drain plug and allow the coolant to drain into a suitable container.

5. Install the drain plug.
6. Replace the thermostat. See Operation and Maintenance Manual, "Cooling System Water Temperature Regulator - Replace" for the process for replacing the thermostat.
7. Add the coolant solution. Refer to Operation and Maintenance Manual, "Capacities - (Refill)". Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Note: Premix the coolant solution before filling the cooling system. The coolant solution should contain 50 percent coolant and 50 percent distilled water.

Note: Add the coolant solution at a maximum rate of five liters per minute. This will reduce the chance of trapping air inside the engine block. A large amount of trapped air can cause localized heating to occur upon start-up. Localized heating may result in engine damage, which may lead to failure of the engine.

8. Start the engine. Run the engine without the radiator cap until the thermostat opens and the coolant level stabilizes.

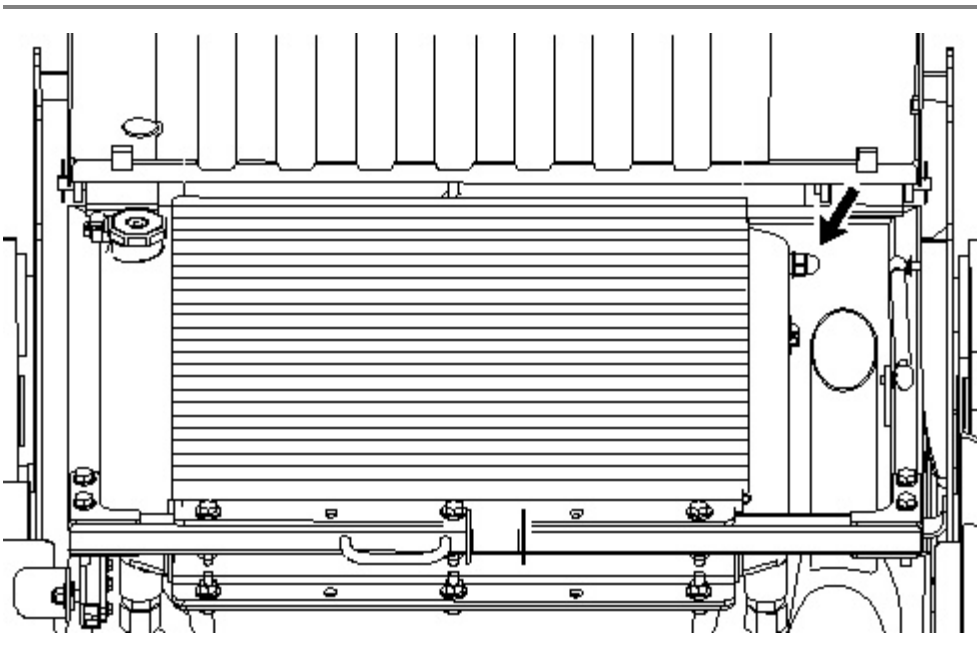


Illustration 4

g00956179

Note: The sight gauge for the coolant level is located on the right side of the radiator on machines that are equipped with the 3024 engine. The sight gauge for the coolant level is located on the left side of the radiator on machines that are equipped with the 3044 engine.

9. Maintain the coolant level in the sight gauge.
10. Stop the engine. Inspect the radiator cap and the gasket. Replace the cap if the cap or the gasket is damaged. Install the radiator cap.
11. Pull the radiator guard downward.
12. Close the engine access door.



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i01962081

Cooling System Coolant Extender (ELC) - Add

SMCS - 1352-544-NL

WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

When a Caterpillar Extended Life Coolant is used, an extender must be added to the cooling system periodically.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Tilt the radiator guard upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".

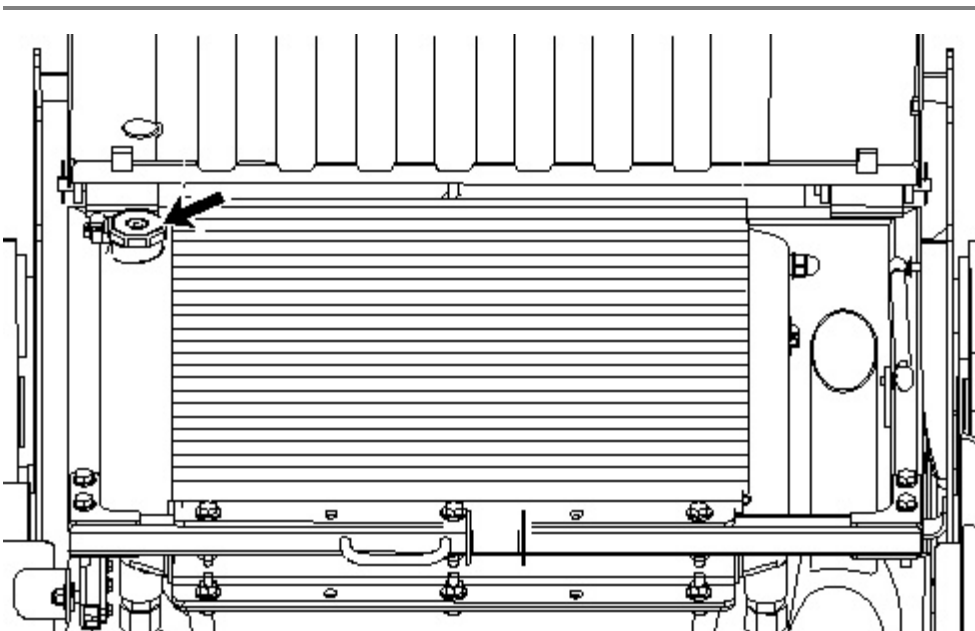


Illustration 1

g00956151

Note: The radiator cap is located on the left side of the radiator on machines that are equipped with the 3024 engine. The radiator cap is located on the right side of the radiator on machines that are equipped with the 3044 engine.

3. Slowly loosen the radiator cap in order to relieve system pressure. Remove the radiator cap.
4. If necessary, drain enough coolant from the radiator in order to allow the addition of the coolant additive.
5. Add 0.17 L (0.18 qt) of cooling system additive.
6. Inspect the radiator cap and the gasket. If the cap or the gasket is damaged, replace the cap. Install the radiator cap.

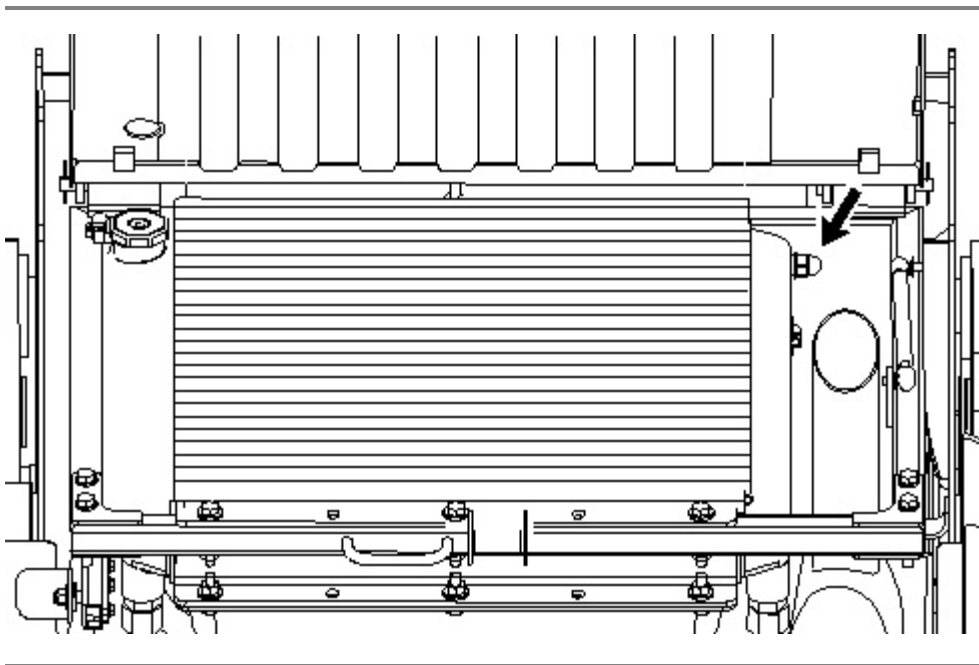


Illustration 2

g00956179

Note: The sight gauge for the coolant level is located on the right side of the radiator on machines that are equipped with the 3024 engine. The sight gauge for the coolant is located on the left side of the radiator on machines that are equipped with the 3044 engine.

7. Check the coolant level in the sight gauge on the radiator. Maintain the coolant level to the top of the sight gauge with the radiator in the LOWERED position.
8. Tilt the radiator guard downward.
9. Close the engine access door.

For additional information on the addition of extender, see Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".



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i01959244

Cooling System Level - Check

SMCS - 1350-040-HX; 1350-535-FLV; 1382-070; 1382-510

WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Tilt the radiator guard upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".

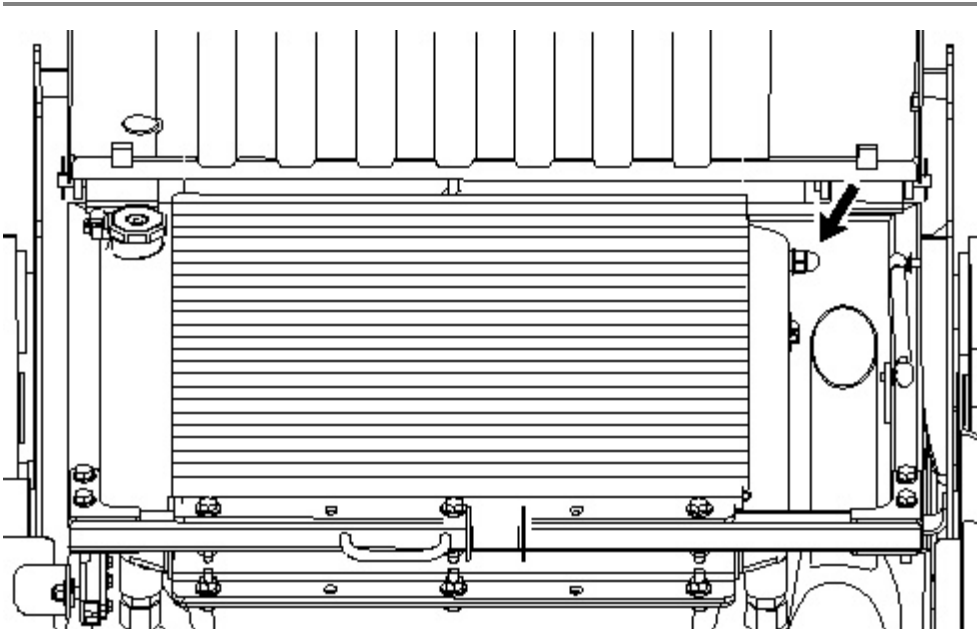


Illustration 1

g00956179

Note: The sight gauge for the coolant level is located on the right side of the radiator on machines that are equipped with the 3024 engine. The sight gauge for the coolant level is located on the left side of the radiator on machines that are equipped with the 3044 engine.

- Maintain the coolant to the top of the sight gauge with the radiator in the LOWERED position.

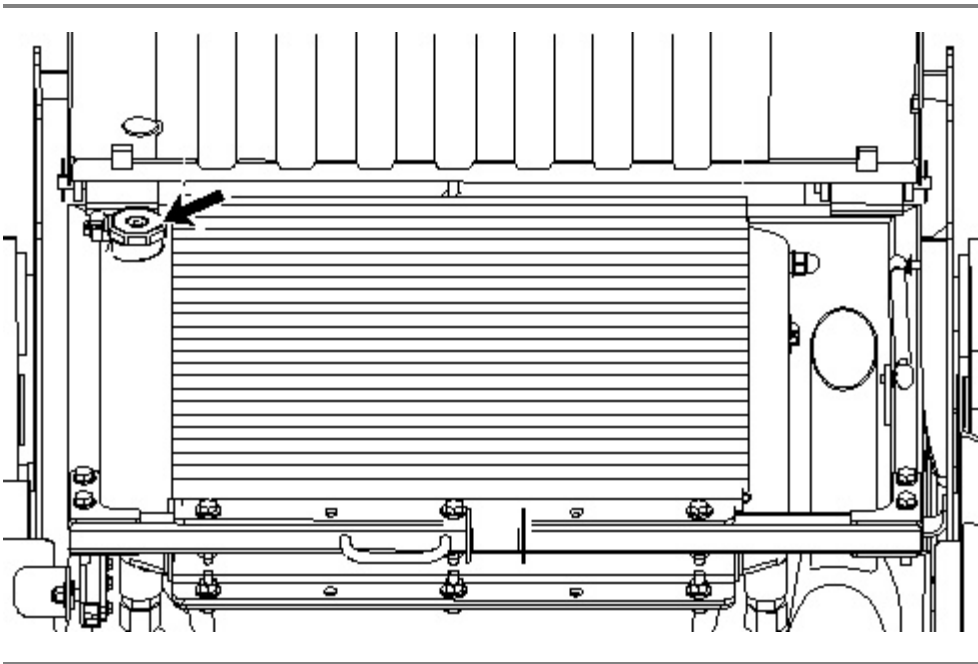


Illustration 2

g00956151

Note: The radiator cap is located on the left side of the radiator on machines that are equipped with the 3024 engine. The radiator cap is located on the right side of the radiator on machines that are equipped with the 3044 engine.

- If you need to add coolant to the radiator, Remove the radiator cap slowly in order to relieve system pressure.

Note: Inspect the cooling system hoses for any leaks, cracks, or signs of deterioration. Replace any damaged hoses.

- Inspect the radiator cap and the gasket. Replace the cap if the cap or the gasket is damaged. Install the radiator cap.
- Tilt the radiator guard downward.

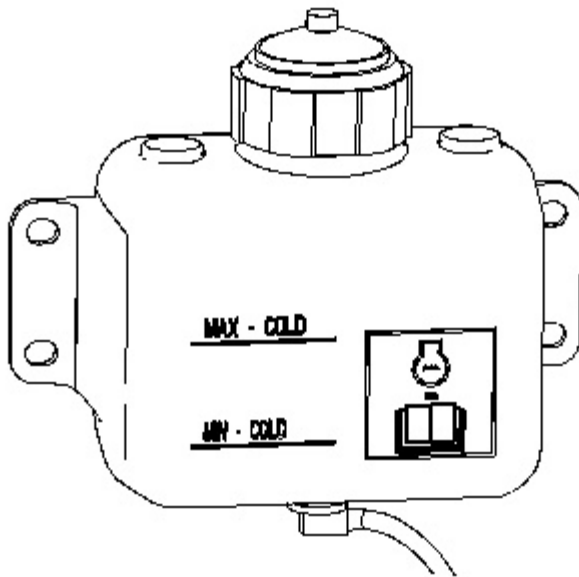


Illustration 3

g01018341

7. The coolant reservoir is located on the left side of the engine compartment or the left side of the engine access door. Maintain the coolant level in the coolant reservoir between the "MIN" and "MAX" lines.
8. Close the engine access door.



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i01958427

Cooling System Water Temperature Regulator - Replace

SMCS - 1355-510; 1393-010

Replace the thermostat on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system. Failure to replace the engine's thermostat on a regularly scheduled basis could cause severe engine damage.

The thermostat should be replaced after the cooling system has been cleaned. Replace the thermostat while the cooling system is completely drained or while the cooling system coolant is drained to a level that is below the thermostat housing.

Caterpillar engines incorporate a shunt design cooling system. It is mandatory to always operate the engine with a thermostat.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Drain the coolant from the machine. See Operation and Maintenance Manual, "Cooling System Coolant (ELC) - Change" for the procedure to drain the cooling system.

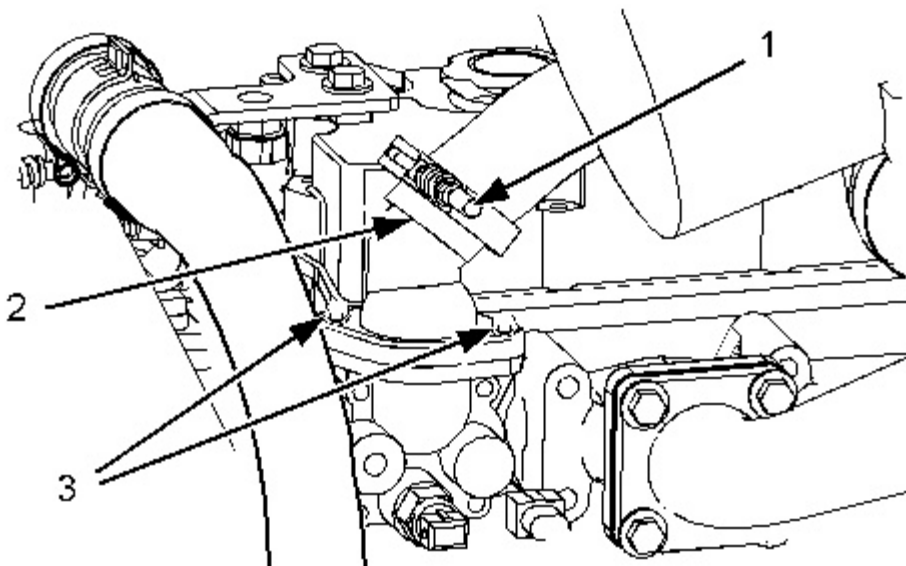


Illustration 1
3024 engine

g01018412

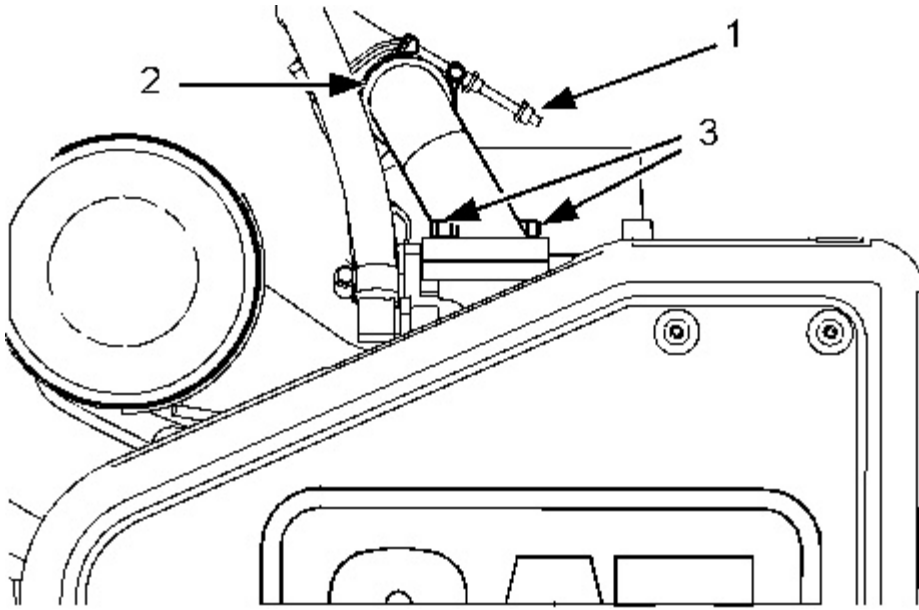


Illustration 2
3044 engine

g01018146

3. Loosen the hose clamp (1) and remove the hose from the thermostat housing assembly (2) .
4. Remove the two bolts (3) from the thermostat housing assembly. Remove the thermostat housing assembly.
5. Remove the seal and the thermostat from the thermostat housing assembly.
6. Install a new thermostat and a new seal. Install the thermostat housing assembly on the engine cylinder head.
7. Install the hose. Tighten the hose clamp.
8. Refill the cooling system. See Operation and Maintenance Manual, "Capacities - (Refill)". Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for coolant information.
9. Close the engine access door.



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i01990833

Drive Chain Case Oil - Change

SMCS - 3261-543-OC; 3261-544-OC

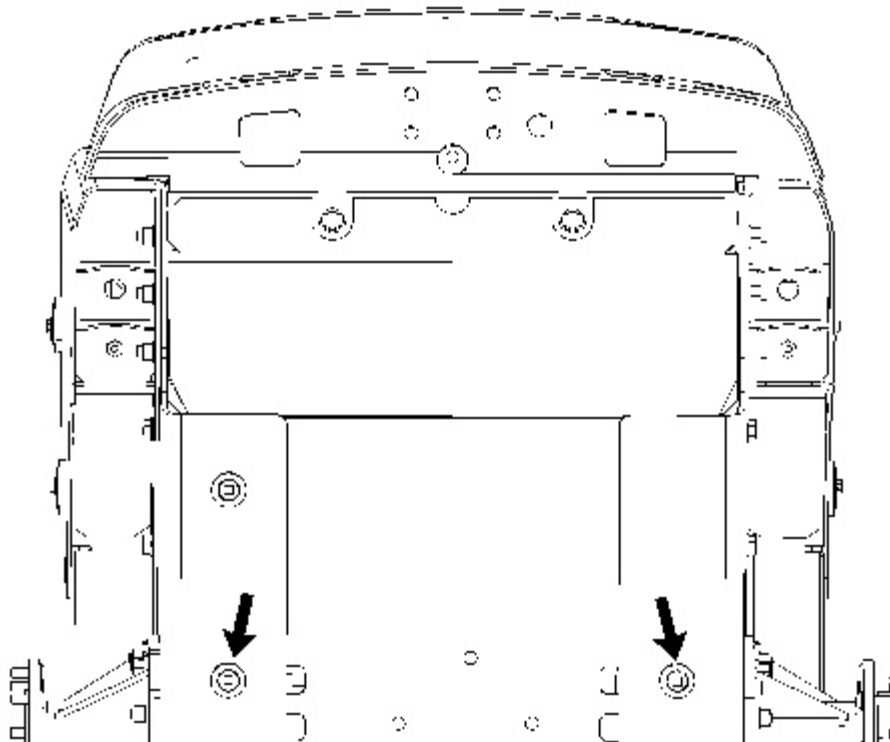


Illustration 1

g01025459

The plugs for the drive chain cases as the plugs are viewed from the underside of the machine.

1. Remove the drain plug for the left drive chain case and the right drive chain case. Allow the oil to drain into a suitable container.

2. Apply **169-5464** Quick Cure Primer and **5P-3413** Pipe Sealant to the threads on the drain plugs. Install the drain plugs.

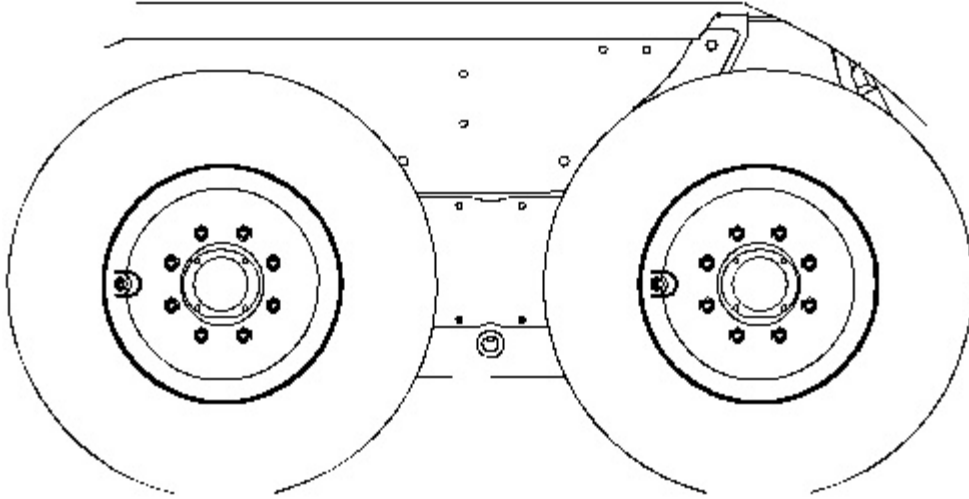


Illustration 2

g01025470

3. Remove the filler plug for the right side drive chain case. Fill the drive chain case with oil to the bottom of the threads on the fill port. Refer to Operation and Maintenance Manual, "Lubricant Viscosities" and Operation and Maintenance Manual, "Refill Capacities".
4. Apply **169-5464** Quick Cure Primer and **5P-3413** Pipe Sealant to the threads on the filler plug. Install the filler plug.
5. Repeat the process for the left side drive chain case.

Drive Chain Case Breathers

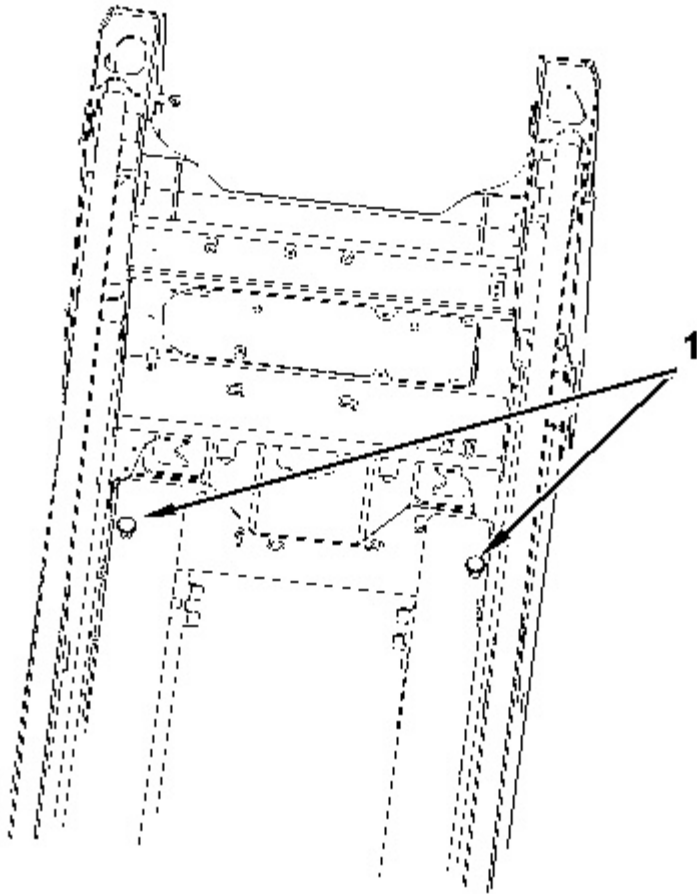


Illustration 3

g01031152

The breathers for the drive chain cases are located underneath the cab (1). Refer to Operation and Maintenance Manual, "Cab Tilting".

Remove the breathers and inspect the breathers when the oil in the drive chain cases is changed. In order to clean the breathers, use solvent and low pressure air. If the breather is badly plugged, replace the breather.



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i02881645

Drive Chain Tension - Check/Adjust

SMCS - 3261-025; 3261-535

Note: Steel tracks that go over the tires should only be used with pneumatic tires. When you use steel tracks that go over tires or any drive train device except tires, the interval for checking the drive chains should be reduced to every 100 Service Hours. The use of rubber tracks that go over the tires is not recommended.

Note: There are four drive chains on the skid steer loader that must be checked and adjusted.

1. Park the machine on level ground and stable ground.
2. Chock the rear tires.
3. Use an appropriate floor jack to lift the front of the machine so that the front tires are off of the ground. Block up the front of the machine with two **1U-9758** Jack Stands .

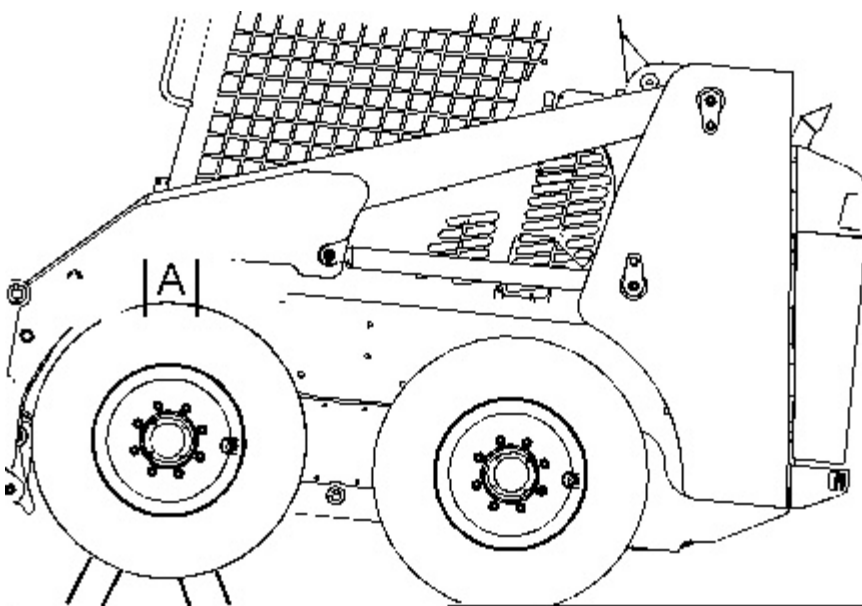


Illustration 1

g01025514

4. Rotate the wheel forward and backward. Measure the total free play (A) .

Note: If the total free play does not exceed 15 mm (0.6 inch) the chain tension does not need further inspection. If the total free play exceeds 15 mm (0.6 inch), you should continue with the inspection.

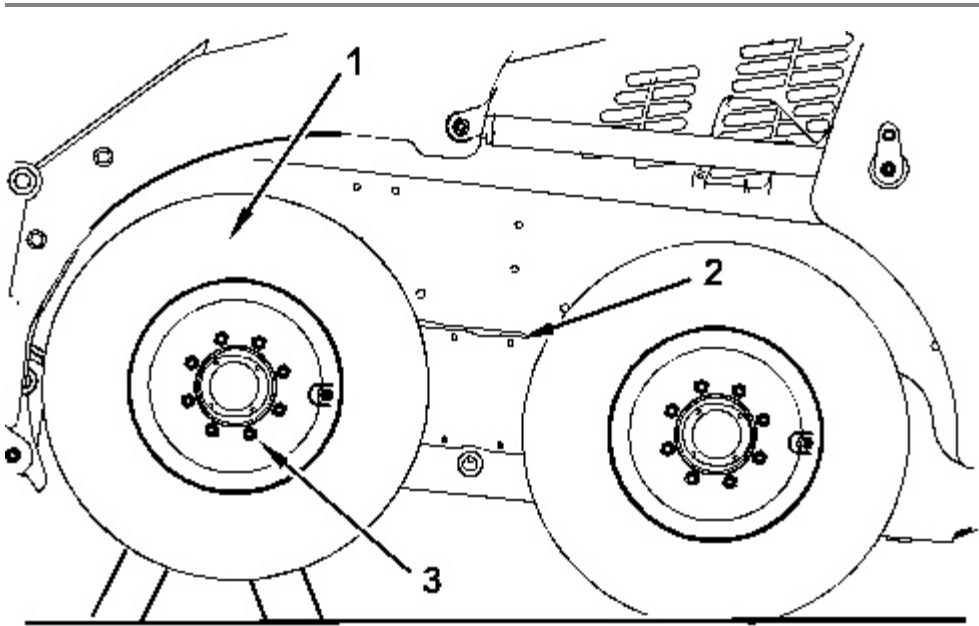


Illustration 2

g01025547

5. Remove the eight wheel nuts (3) . Use an appropriate nylon lifting strap and a hoist in order to remove the tire and rim (1) . The weight of the standard tire and rim is 51 kg (113 lb).
6. Remove bolts and the cover (2) for the drive chain case.

Note: Remove the sealant from the cover and from the machine.

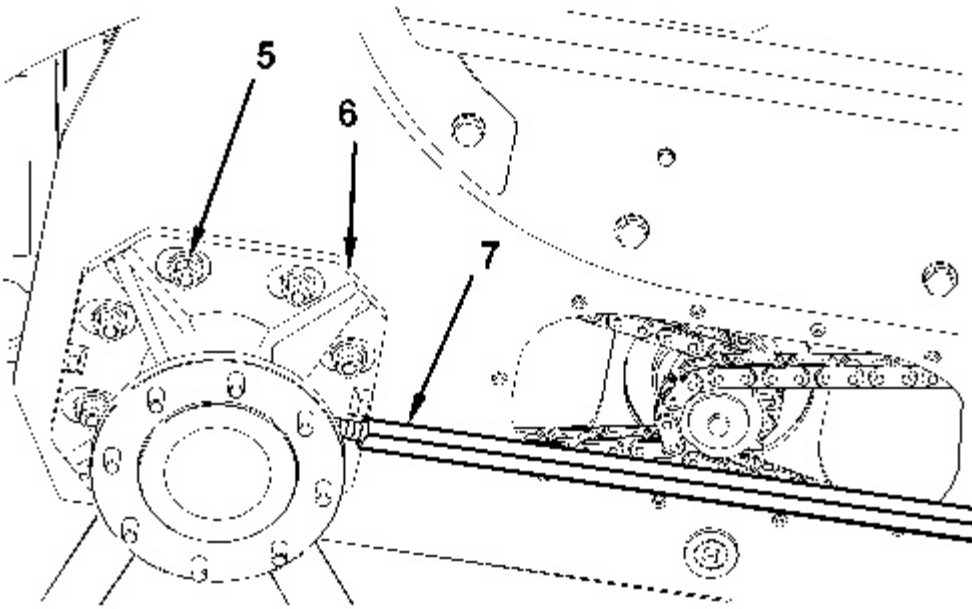


Illustration 3

g01025571

7. Loosen the eight bolts (5) for the axle housing. Place **159-3337** Chain Tension Adjuster (7) between the axle housings (6) .

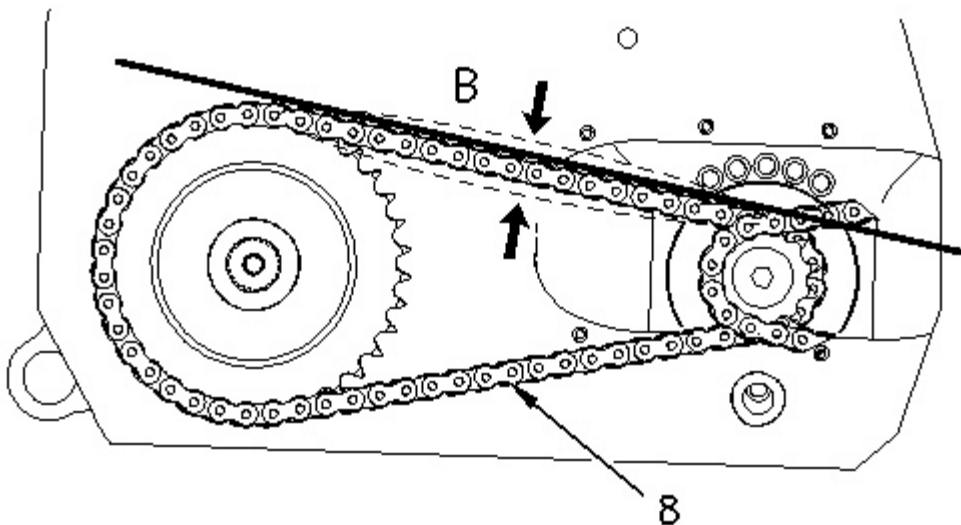


Illustration 4

g00867842

8. Rotate the axle in order to ensure that the chain (8) is taut below the sprockets. Place a straight edge across the top of the sprockets. Measure the total amount of movement in the chain (B) . Set the chain tension so that there is a total of 15 mm (0.6 inch) movement in the chain. This is equal to 7.5 mm (0.3 inch) of movement above the straight edge and 7.5 mm (0.3 inch) of movement below the straight edge.

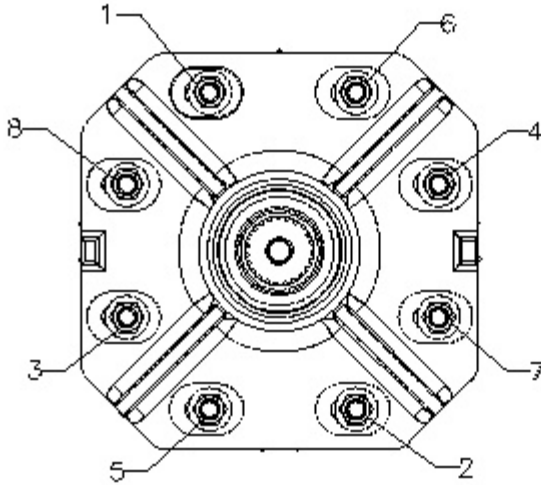


Illustration 5

g00554036

9. Tighten the bolts for the axle housing in the order that is shown above to 160 ± 15 N·m (118 ± 11 lb ft). Turn the nuts an additional $60 \pm 5^\circ$ in the same order.
10. Remove the chain tension adjuster.
11. Install the bolts and the cover for the drive chain case.

Note: Use **8T-9022** Silicone Gasket in order to seal the cover to the machine.
12. Use an appropriate nylon lifting strap and a hoist in order to position the tire and rim to the axle. The weight of the tire and rim is 51 kg (113 lb). Refer to Operation and Maintenance Manual, "Wheel Nuts - Tighten" for the procedure to tighten the wheel nuts.
13. Lower the front of the machine to the ground. Repeat the procedure on the opposite side of the machine if it is necessary.
14. Repeat the adjustment procedure on the rear drive chains if it is necessary.



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i01961088

Engine Air Filter Primary Element - Clean/Replace

SMCS - 1054-070-PY; 1054-510-PY

NOTICE

Never service the air cleaner when the engine is running, to avoid engine damage.

NOTICE

Caterpillar recommends certified air filter cleaning services that are available at Caterpillar dealers. The Caterpillar cleaning process uses proven procedures to assure consistent quality and sufficient filter life.

Observe the following recommendations if you attempt to clean the filter element:

Never tap or strike the filter element in order to remove dust.

Never wash the filter element.

Use low pressure compressed air in order to remove the dust from the filter element. Air pressure must not exceed 206 kPa (30 psi). Direct the air flow up the pleats and down the pleats from the inside of the filter element. Take extreme care in order to avoid tearing or voiding the pleats.

Service the air filter elements when the alert indicator for air filter restriction lights. Refer to Operation and Maintenance Manual, "Alert Indicators".

1. Open the engine access door.

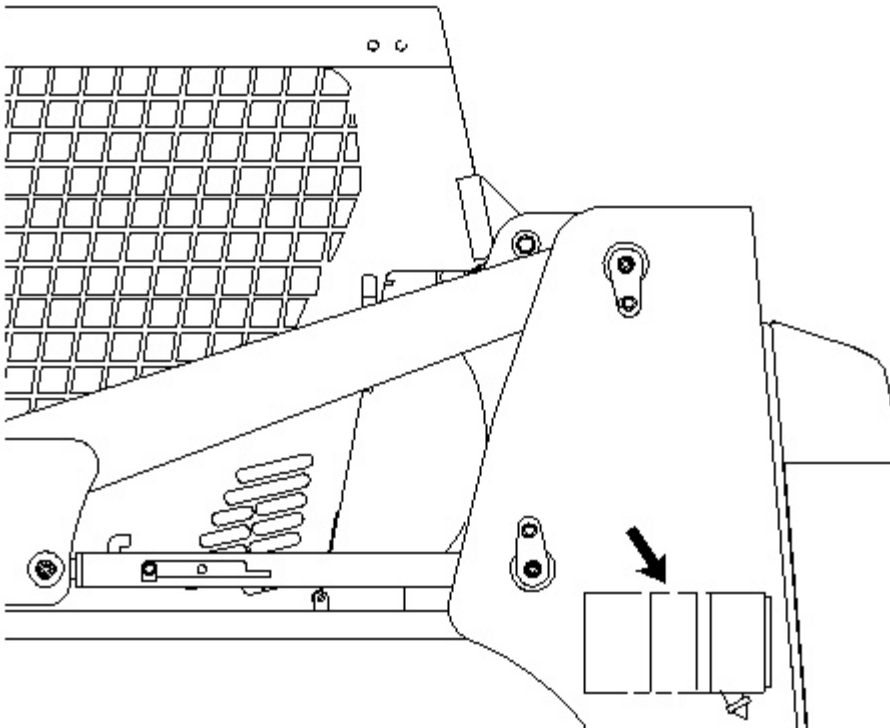


Illustration 1

g00891467

2. The air filter housing is located on the left side of the engine compartment on machines that are equipped with the 3024 engine. The air filter housing is located on the right side of the engine compartment on machines that are equipped with the 3044 engine.

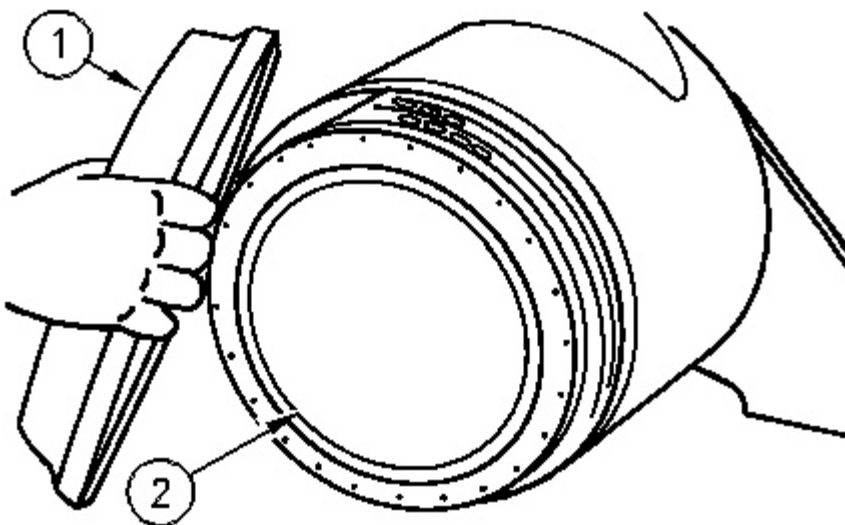


Illustration 2

g00101864

3. Unlatch the air cleaner housing cover (1). Rotate the cover and remove the cover.
4. Remove the primary filter element (2) .
5. Install a clean filter element into the filter housing and install the cover for the filter housing.
6. Close the engine access door.
7. Start the engine. The alert indicator for air filter restriction should turn off. If the alert indicator continues to light, replace the secondary air filter. Refer to Operation and Maintenance Manual, "Engine Air Filter Secondary Element - Replace".



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i02020796

Engine Air Filter Secondary Element - Replace

SMCS - 1054-510-SE

NOTICE

Always replace the secondary air filter element. Never attempt to reuse it by cleaning. The secondary air filter element should be replaced at the time the primary element is serviced for the third time. The secondary filter element should also be replaced if the alert indicator for air filter restriction lights.

1. Open the engine access door.
-

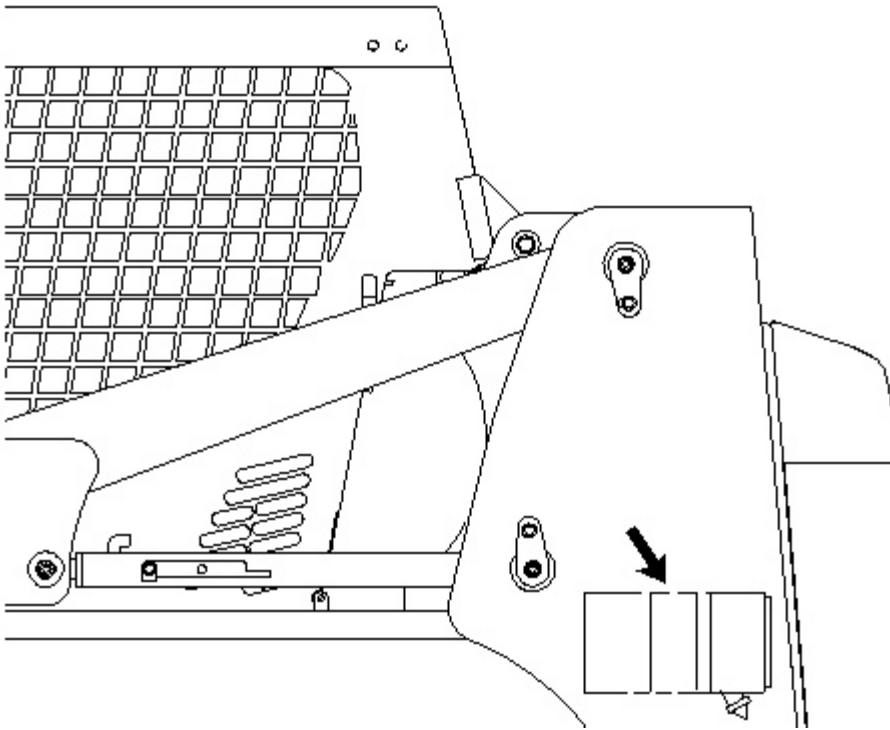


Illustration 1

g00891467

2. The air filter housing is located on the left side of the engine compartment on machines that are equipped with the 3024 engine. The air filter housing is located on the right side of the engine compartment on machines that are equipped with the 3044 engine.

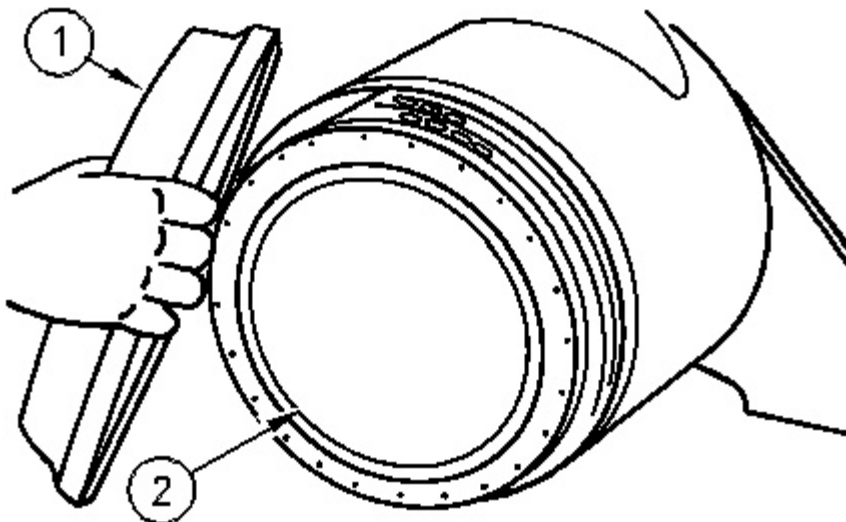


Illustration 2

g00101864

3. Unlatch the air cleaner housing cover (1). Rotate the cover and remove the cover.
4. Remove the primary filter element (2) .

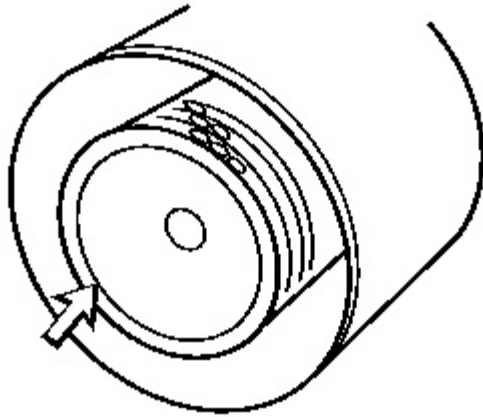


Illustration 3

g00038606

5. Remove the secondary filter element.
6. Cover the air inlet opening. Clean the inside of the air cleaner housing.
7. Inspect the gasket between the air inlet pipe and the air cleaner housing. Replace the gasket if the gasket is damaged.
8. Uncover the air inlet opening. Install a new secondary element.
9. Install the primary element and the air cleaner housing cover.
10. Close the engine access door.



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i01959002

Engine Oil Level - Check

SMCS - 1348-535-FLV

NOTICE

Do not overfill the crankcase. Engine damage can result.

1. Stop the engine and allow the oil to drain back into the oil pan.
 2. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
 3. Tilt the radiator upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".
-

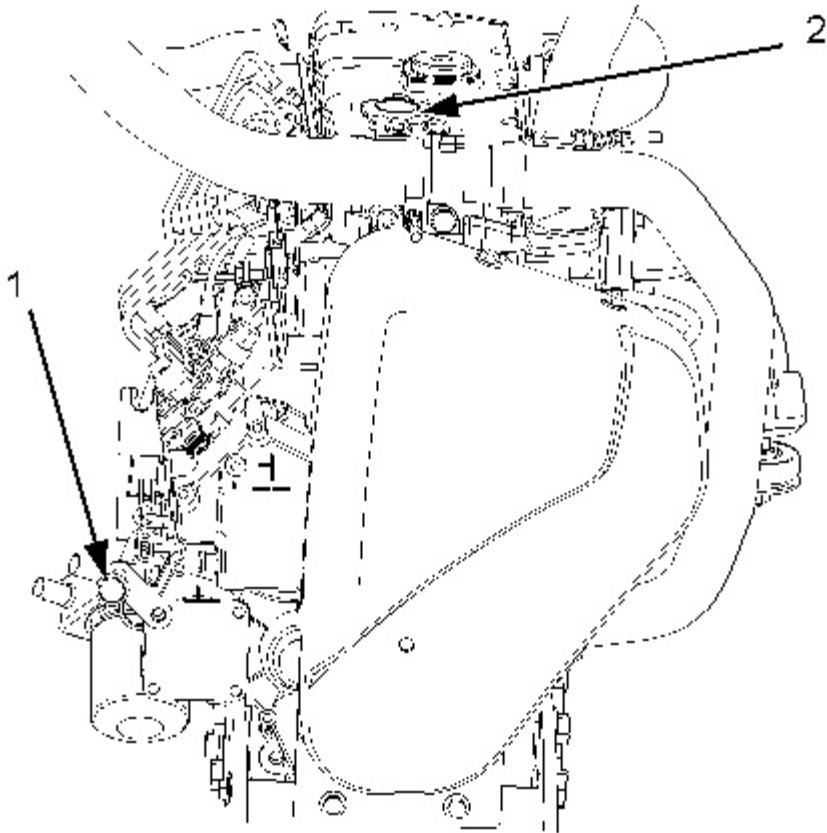


Illustration 1
3024 engine

g01018561

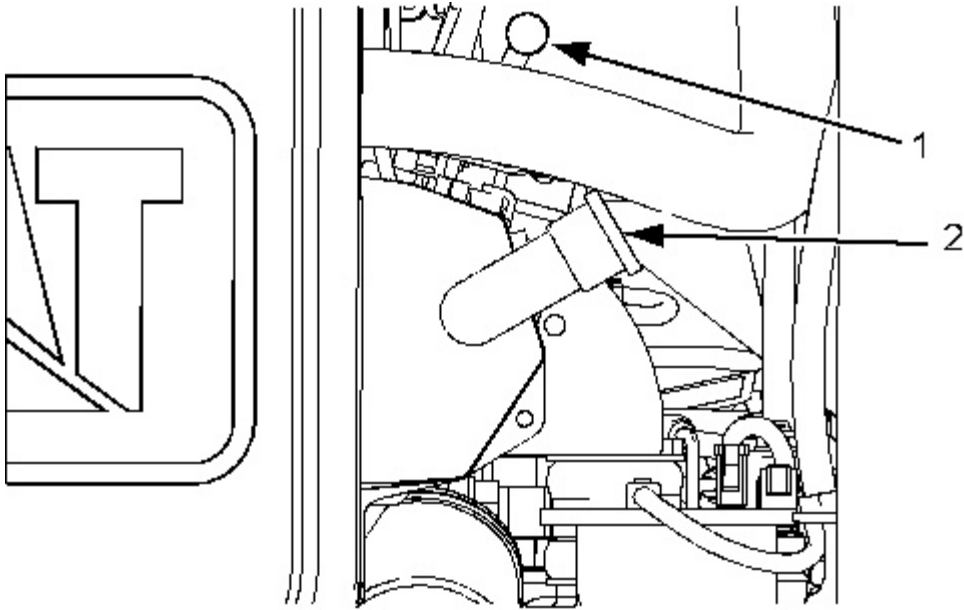


Illustration 2
3044 engine

g01018171

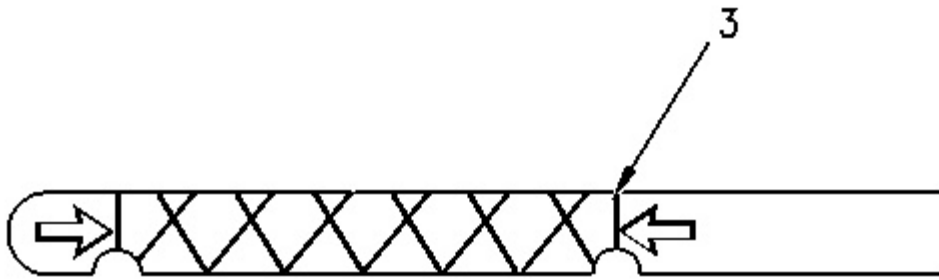


Illustration 3

g00850465

4. Maintain the oil level to the "FULL" mark (3) on the dipstick (1) .
5. If necessary, remove the oil filler cap (2) and add oil.
6. Clean the oil filler cap and install the oil filler cap.
7. Tilt the radiator downward.
8. Close the engine access door.



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i01959048

Engine Oil Sample - Obtain

SMCS - 1348-554-SM; 7542-008

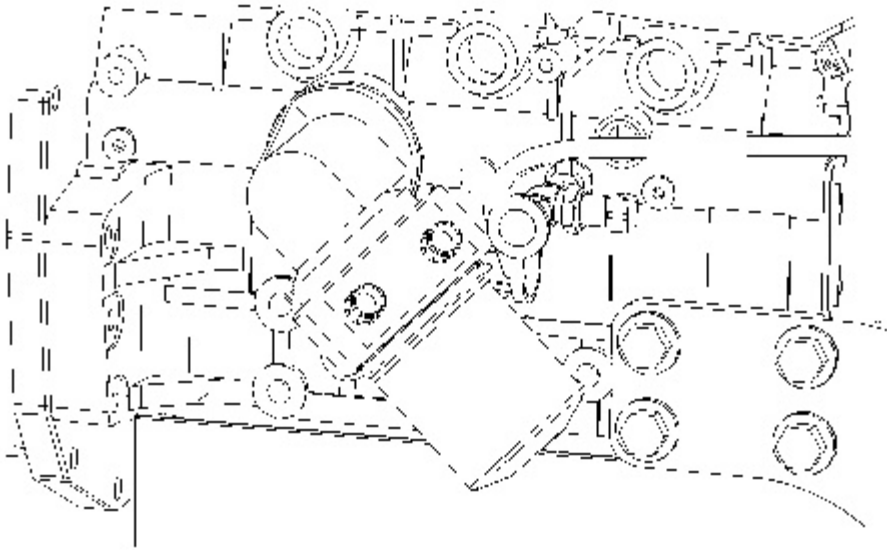


Illustration 1
3024 engine

g01018202

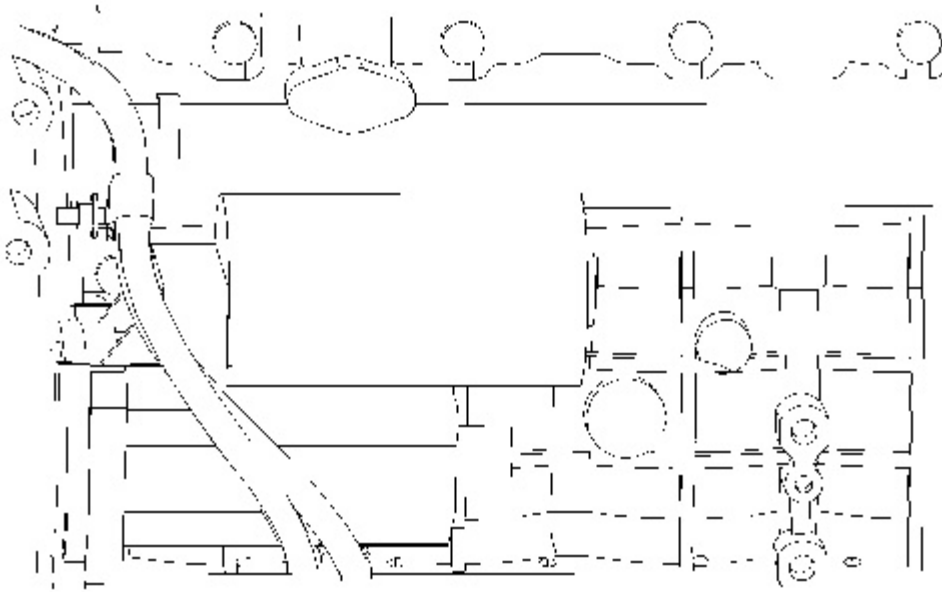


Illustration 2
3044 engine

g01018203

The sampling port for the engine oil is located on the left side of the engine block.



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i02811482

Engine Oil and Filter - Change

SMCS - 1308-510; 1348-044

S/N - BXM1-4224

S/N - MJH1-10574

S/N - RLL1-6799

S/N - SCH1-2474

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The normal oil change interval for the machine is Every 250 Service Hours or every year when the following conditions are met:

- Caterpillar oil, API Specification CI-4, CH-4 or CG-4 multigrade oil is used.
- Caterpillar filters are used.
- The altitude does not exceed 2300 m (7545 ft).
- Sulfur content in the fuel is between 0.05% and 0.50%.

An oil change interval of Every 200 Service Hours or every six months is required when the following conditions occur:

- Caterpillar oil, API Specification CI-4, CH-4 or CG-4 multigrade oil is not used.
- The altitude exceeds 2300 m (7545 ft).
- Sulfur content in the fuel is between 0.50% and 1.00%.

An oil change interval of Every 125 Service Hours is required when the following condition occurs:

- Sulfur content in the fuel is above 1.00%.

Refer to the results of the S·O·S oil analysis in order to determine if the oil change interval should be decreased. Consult your Caterpillar Dealer for detailed information regarding the optimum oil change interval.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Tilt the radiator upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".

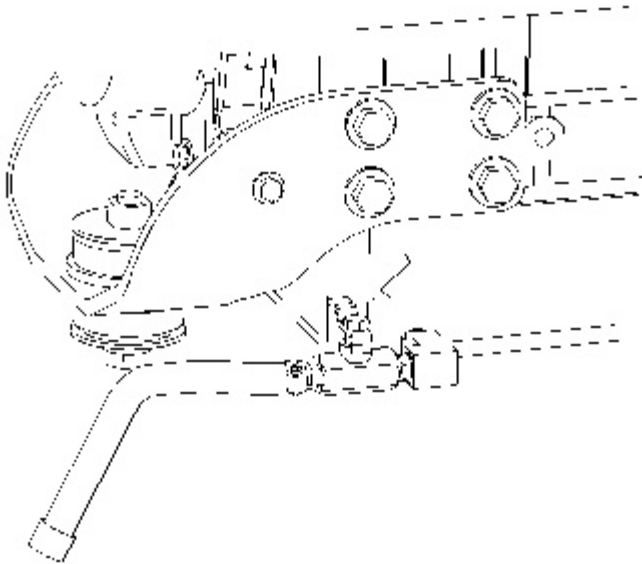


Illustration 1
3024 engine

g01022394

Note: The crankcase drain is located on the right side of the oil pan.

3. Pull the drain hose for the crankcase through the opening in the rear of the machine and remove the plug in the end of the drain hose. Open the crankcase drain valve and drain the oil into a suitable container. Close the crankcase drain valve. Install the plug in the drain hose.
-

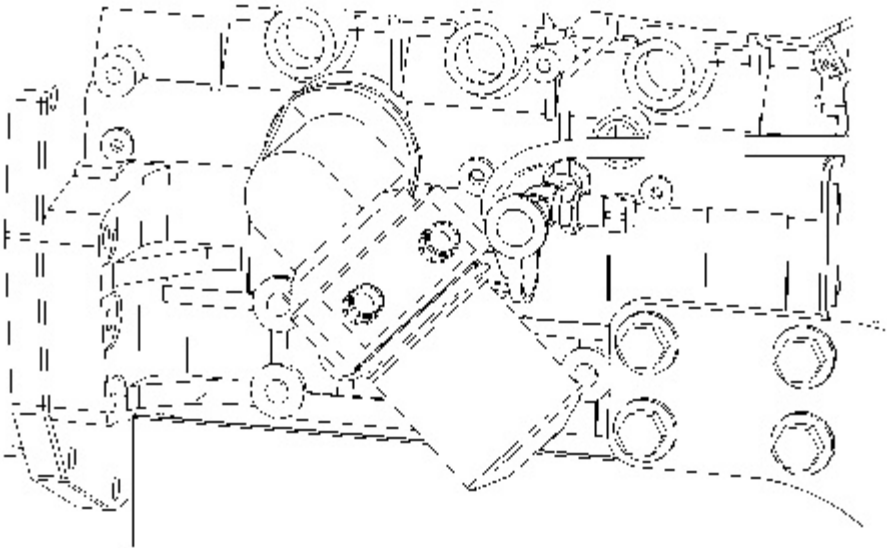


Illustration 2
3024 engine

g01022354

4. Remove the filter element with a **187-2718** Filter Wrench. Refer to Operation and Maintenance Manual, "Oil Filter - Inspect" in order to inspect the used filter for debris.
5. Apply a thin film of clean engine oil to the sealing surface of the new filter element.
6. Install a new engine oil filter hand tight until the seal of the engine oil filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the engine oil filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the engine oil filter, use the rotation index marks as a guide.

7. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

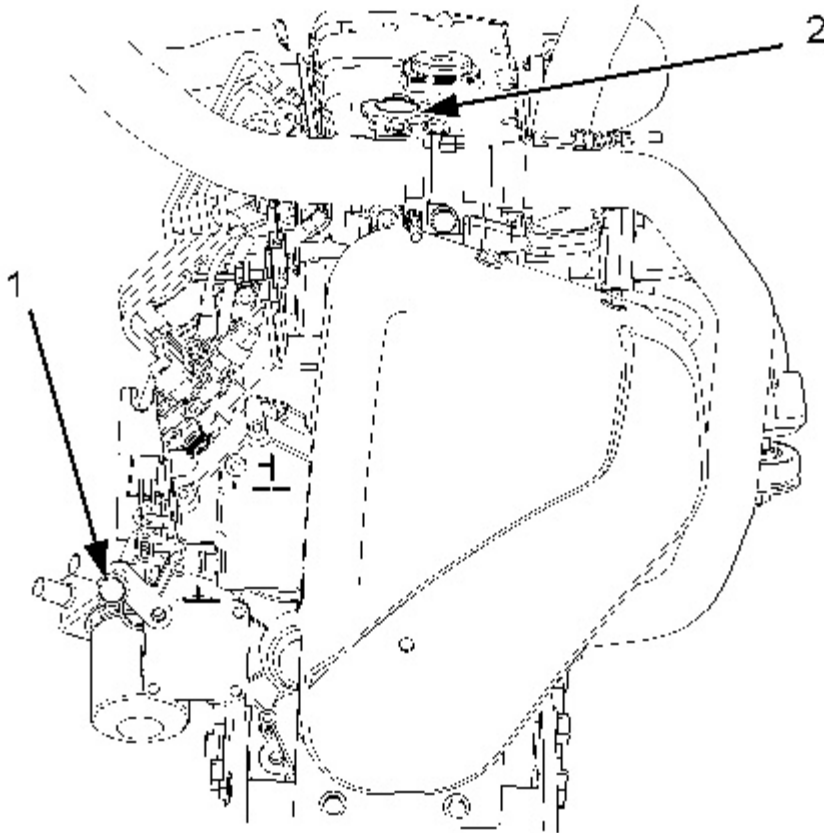


Illustration 3
3024 engine

g01018561

8. Remove the oil filler plug (1). Fill the crankcase with new oil. See Operation and Maintenance Manual, "Lubricant Viscosities" and Operation and Maintenance Manual, "Refill Capacities". Clean the oil filler plug and install the oil filler plug.
 9. Start the engine and allow the oil to warm. Check for leaks.
-



Illustration 4

g00849728

10. Stop the engine and allow the oil to drain back into the oil pan. Fill the crankcase to the "FULL" mark on the dipstick (1). **Do not exceed the "FULL" mark on the dipstick.** Add oil or drain oil if it is necessary.
11. Tilt the radiator downward.
12. Close the engine access door.



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i02022498

Engine Crankcase Breather - Clean

SMCS - 1317-070

S/N - BXM1-4224

S/N - MJH1-10574

S/N - RLL1-6799

S/N - SCH1-2474

Note: Ensure that the area around the vent hole on the breather cover is clean and that the vent hole is not restricted. Ensure that the components of the breather assembly are seated in the correct positions. Otherwise, engine damage could result.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Tilt the radiator upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".

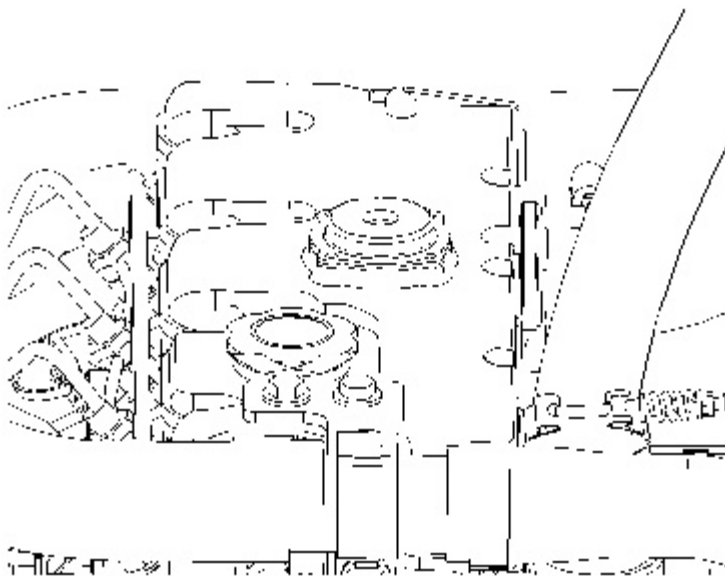


Illustration 1

g01018945

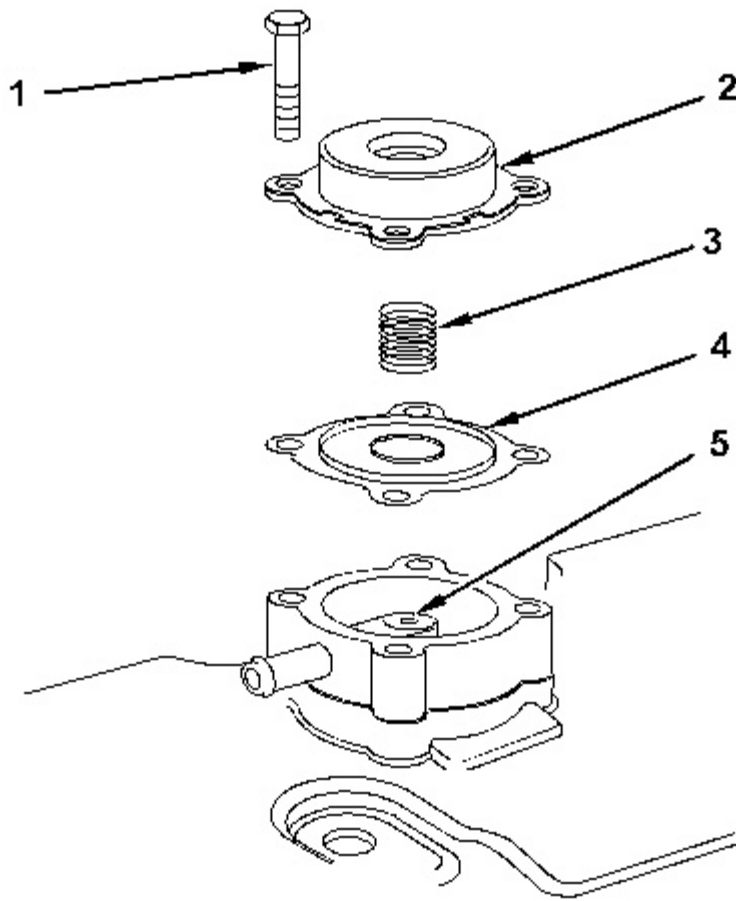


Illustration 2

g01044243

3. The breather is located on top of the valve cover on the 3024 engine. Remove the screws (1). Remove the breather cover (2) .
4. Remove the diaphragm assembly (4). Remove the spring (3). The diaphragm assembly consists of the diaphragm and the locating ring.
5. Clean the cavity for the breather (5) .
6. Remove the gauze that is located below the cavity for the breather.
7. Clean the following items with a clean diesel fuel:
 - o Breather
 - o Breather cover
 - o Diaphragm assembly
 - o Location ring assembly
 - o Spring

- Gauze
8. Allow the parts to dry. Pressure air may be used to dry the parts.
 9. Install the gauze and install the components of the breather. Install the breather cover.
 10. Tilt the radiator downward.
 11. Close the engine access door.



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216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

Media Number -SEBU7731-08

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i01020861

Engine Valve Lash - Check

SMCS - 1105-025

Refer to the Service Manual for the complete adjustment procedure for the engine valve lash.

A qualified mechanic should adjust the engine valve lash and the fuel injector timing because special tools and training are required.

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Sat Jan 28 2012 04:24:25 GMT-0800 (

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Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

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i00916186

Fuel Injection Timing - Check

SMCS - 1251-531

Note: The correct fuel timing specification is found on the Engine Information Plate. Fuel timing specifications may vary for different engine applications and/or for different power ratings.

A qualified mechanic should adjust the fuel injection timing because special tools and training are required.

Refer to the Service Manual for the complete adjustment procedure for the fuel injection timing. Refer to your Caterpillar dealer for the complete adjustment procedure for the fuel injection timing.

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i02645127

Fuel System Primary Filter (Water Separator) - Drain

SMCS - 1263-543

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The fuel system water separator is located in the left side of the engine compartment.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
-

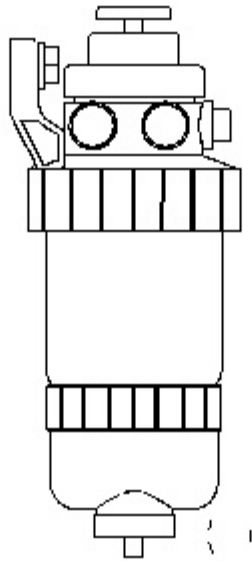


Illustration 1

g01023095

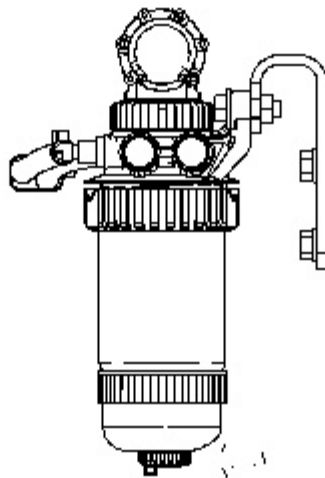


Illustration 2

g01023096

2. Loosen the drain valve on the bottom of the water separator. Allow the water and the sediment to drain into a suitable container.
3. Tighten the drain valve by hand. Do not tighten the drain valve with a tool. Damage to the valve or to the seals may occur.
4. Close the engine access door.



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i02645133

Fuel System Primary Filter (Water Separator) Element - Replace

SMCS - 1260-510-FQ; 1263-510-FQ

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: This unit has a dual purpose. The element serves as a water separator and a fuel filter.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
-

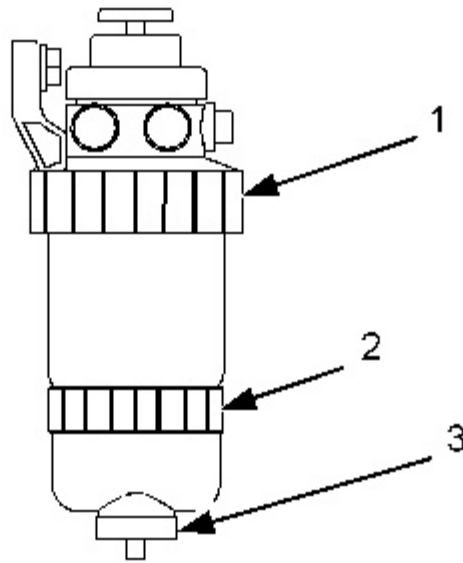


Illustration 1

g01017292

Fuel Filter/Water Separator for the 3024 engine that is located on the left side of the engine compartment

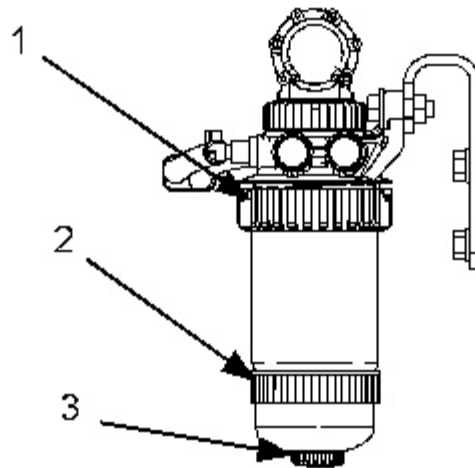


Illustration 2

g01017293

Fuel Filter/Water Separator for the 3044 engine that is located on the right side of the engine compartment

2. Open the drain on the fuel filter/water separator (3). Allow the water and fuel to drain into a suitable container.
3. Close the drain valve by hand. Do not tighten the drain valve with a tool. Damage to the valve or to the seals may occur.
4. Support the fuel filter/water separator and rotate the locking ring (1) counterclockwise. Remove the fuel filter/water separator.
5. Rotate the locking ring (2) counterclockwise. Remove the bowl assembly.

6. Clean the mounting base for the fuel filter/water separator.
7. Clean the bowl assembly for the fuel/water separator.
8. Install the bowl assembly onto the new fuel/water separator and rotate the locking ring clockwise.
9. Install the new fuel filter/water separator onto the mounting base. Rotate the locking ring clockwise in order to fasten the fuel filter/water separator to the mounting base.
10. Prime the fuel system in order to fill the fuel filter/water separator with fuel. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate".
11. Close the engine access door.



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i02509334

Fuel System Priming Pump - Operate

SMCS - 1258-548

3024 Engine

The fuel priming pump is located on top of the fuel filter/water separator.

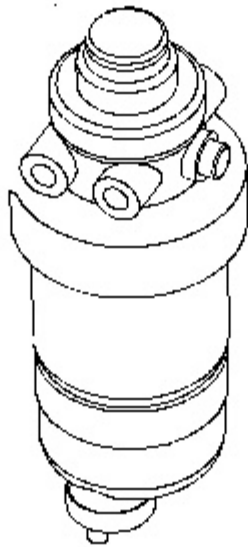


Illustration 1

g01019689

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Push down on the top of the fuel priming pump plunger and release the fuel priming pump plunger in order to operate the fuel priming pump. Operate the fuel priming pump plunger in order to fill the new filter element with fuel. Continue to pump until increased resistance is felt. This resistance will indicate that the filter element is full of fuel.

3. Attempt to start the engine. If the engine starts and the engine runs rough or the engine misfires, operate the engine at low idle until the engine runs smoothly. If the engine fails to start or if the engine continues to misfire or smoke repeat the priming procedure.
4. Close the engine access door.

3044 Engine

Machines that are equipped with the 3044 engine are equipped with a fuel transfer pump that is electric.

1. Momentarily turn the engine start switch to the START position and then return the engine start switch to the ON position.

Note: Do not start the engine. This operation only starts the fuel pump.

2. Leave the engine start switch in the ON position for thirty seconds.
3. Attempt to start the engine. If the engine starts and the engine runs rough or the engine misfires, operate the engine at low idle until the engine runs smoothly. If the engine fails to start or if the engine continues to misfire or smoke, repeat the priming procedure.



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i01819309

Fuel Tank Cap - Clean

SMCS - 1273-070-Z2

1. Remove the fuel cap.

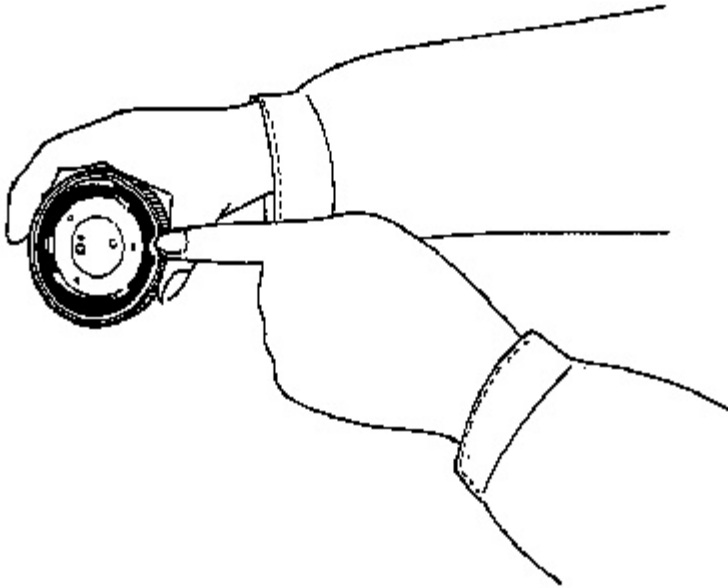


Illustration 1

g00104238

2. Inspect the cap. Replace the cap if the cap is damaged.
3. Wash the fuel cap in a clean, nonflammable solvent and dry the fuel cap.
4. Put a light coating of fuel on the cap gasket.
5. Install the fuel cap.



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i01971189

Fuel Tank Water and Sediment - Drain

SMCS - 1273-543-M&S

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: Drain the water and the sediment from the fuel tank when the tank is almost empty.

1. Slowly remove the fuel tank cap in order to relieve the tank pressure.
-

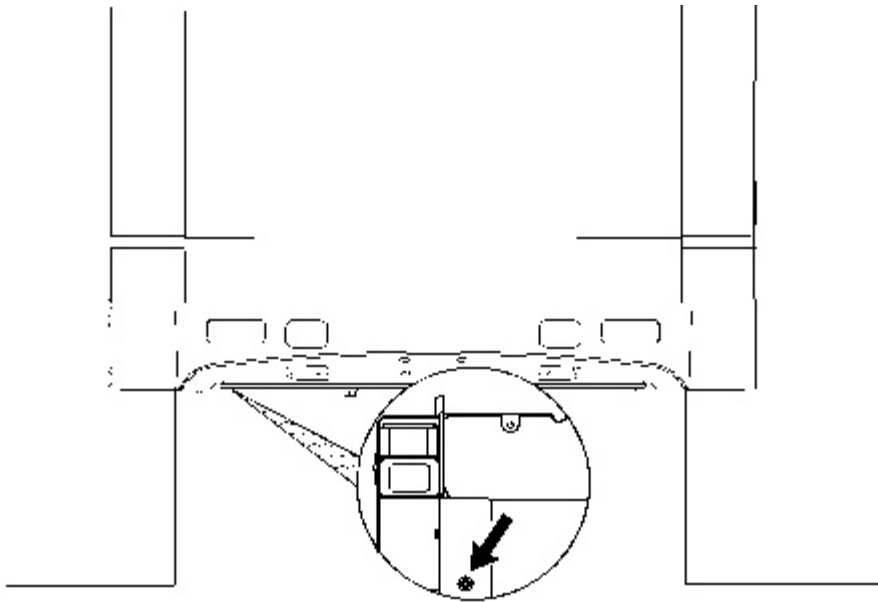


Illustration 1

g01023153

2. The fuel tank drain plug is located underneath the machine at the left rear corner. Loosen the plug.
3. Allow the water and the sediment to drain into a suitable container.
4. Install the fuel tank drain plug.

Note: Apply **5P-3413** Pipe Sealant to the threads on the drain plug.

5. Install the fuel tank cap.



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i01957445

Hydraulic Oil Sample - Obtain

SMCS - 5050-008; 7542-008

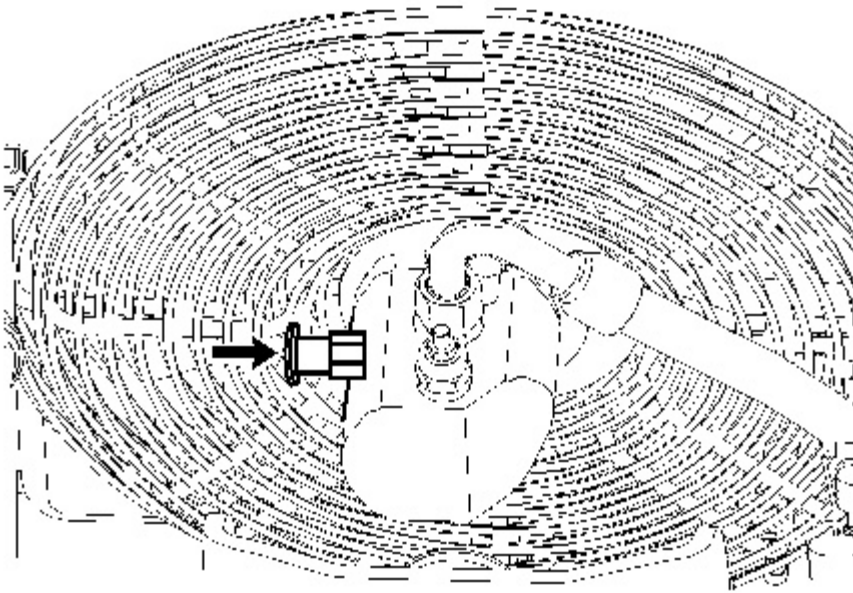


Illustration 1

g01026057

The sampling port for the hydraulic oil is located on the fan motor.

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i01962605

Hydraulic System Oil - Change

SMCS - 5095-044

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

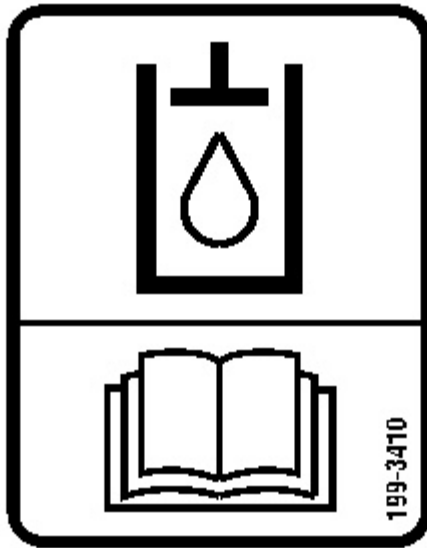


Illustration 1

g00956818

Note: This film is located near the hydraulic filler cap on machines that are filled with synthetic oil.

Operate the machine for a few minutes in order to warm the hydraulic system oil.

WARNING

Personal injury or death can result without releasing all of the hydraulic pressure.

Release all the pressure from the hydraulic system before any lines are disconnected.

The machine should be on level ground. Lower the bucket to the ground and apply slight downward pressure. Engage the parking brake and stop the engine. Keep the armrest lowered. Turn the engine start switch key to the ON position. Push the parking brake switch. Move all of the hydraulic control levers while you press several times on each side of the auxiliary hydraulic control (if equipped) in order to relieve hydraulic pressure. Move the engine start switch key to the OFF position.

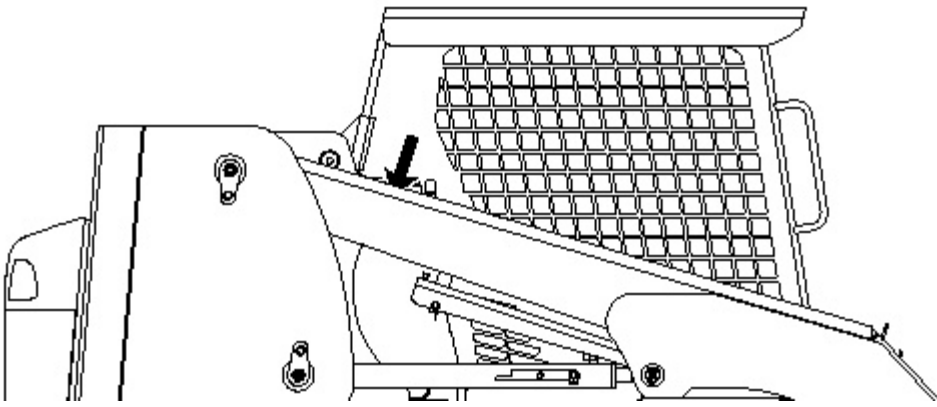


Illustration 2

g00926534

1. Remove the hydraulic tank filler cap.

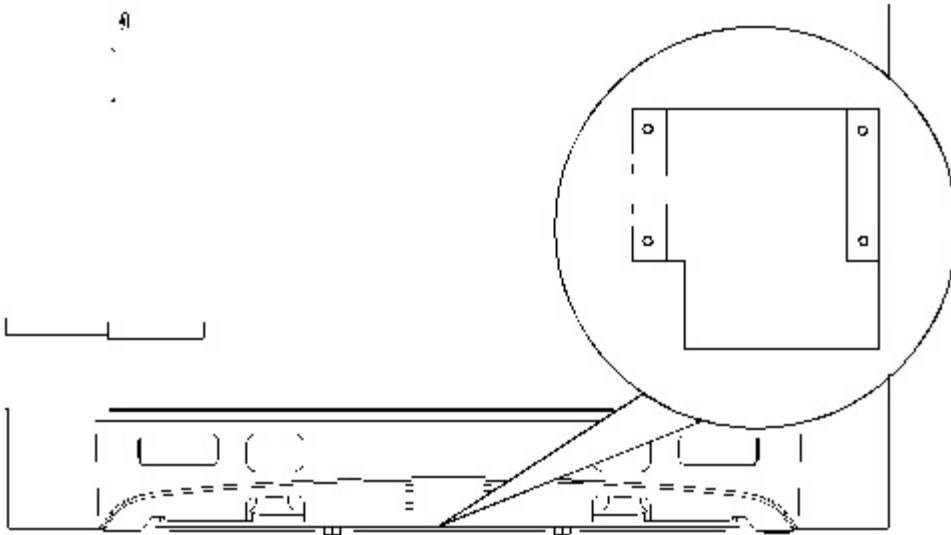


Illustration 3

g01021146

2. Remove the access panel in the belly guard underneath the machine.

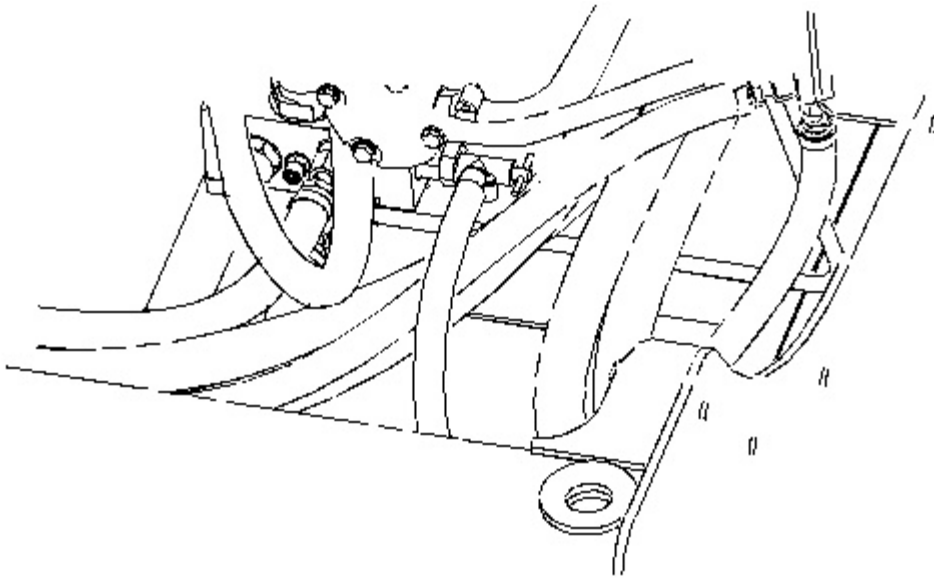


Illustration 4

g01030411

3. Remove the plug from the end of the drain hose. Pull the drain hose through the access panel in the belly guard. Open the drain valve and drain the oil into a suitable container.
4. Close the drain valve and pull the drain hose back into the machine. Install the drain plug into the drain hose.
5. Change the hydraulic system filter. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Filter - Change".
6. Fill the hydraulic system oil tank. Refer to Operation and Maintenance Manual, "Lubricant Viscosities" and Operation and Maintenance Manual, "Capacities (Refill)".
7. Maintain the hydraulic oil level approximately in the middle of the sight gauge.

Check the oil level with the loader arms in the fully lowered position.

Note: The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps.

8. Install the hydraulic tank filler cap.



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i02742828

Hydraulic System Oil Filter - Replace

SMCS - 5068-510

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. 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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

The hydraulic oil filter is located in the engine compartment.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
-

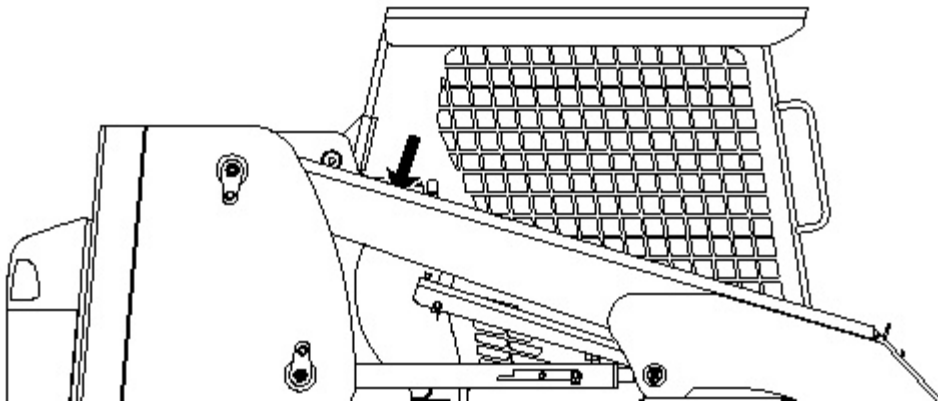


Illustration 1

g00926534

2. Remove the hydraulic tank filler cap.

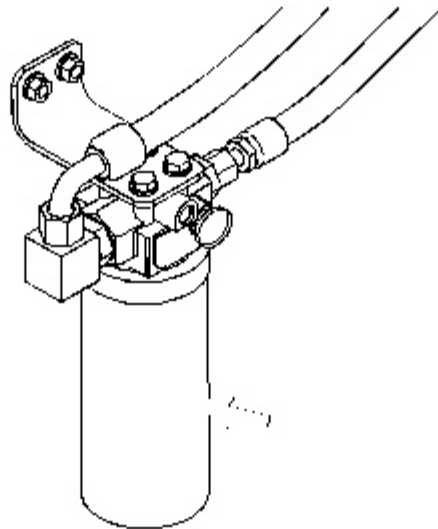


Illustration 2

g01017252

The hydraulic filter is located on the left side of the engine compartment.

3. Remove the filter with a strap type wrench.

Note: Place a suitable nonconductive container under the hydraulic oil filter. Use this container in order to catch any oil that may spill from the filter or the filter element mounting base.

4. Clean the filter element mounting base. Remove any part of the filter element gasket that remains on the filter element mounting base.
5. Apply a light coat of oil to the gasket of the new filter element gasket.

6. Install a new filter hand tight until the seal of the filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the filter, use the rotation index marks as a guide.

7. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

8. Maintain the hydraulic oil level to the middle of the sight gauge. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level - Check". **Do not overfill the hydraulic tank.**
9. Inspect the gasket on the hydraulic tank filler cap for damage. Replace the hydraulic tank filler cap, if necessary. Install the hydraulic tank filler cap.
10. Close the engine access door.



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i01957050

Hydraulic System Oil Level - Check

SMCS - 5095-535-FLV

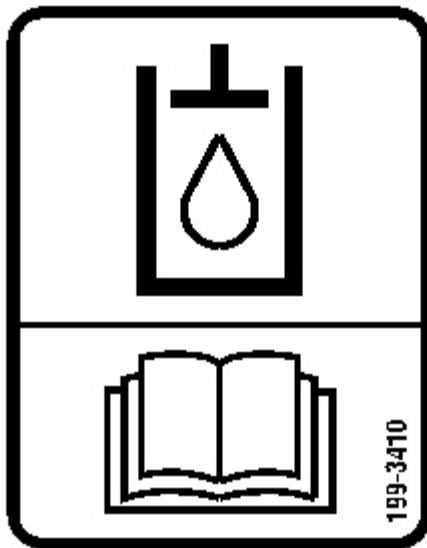


Illustration 1

g00956818

Note: This film is located near the hydraulic filler cap on machines that are filled with synthetic oil.

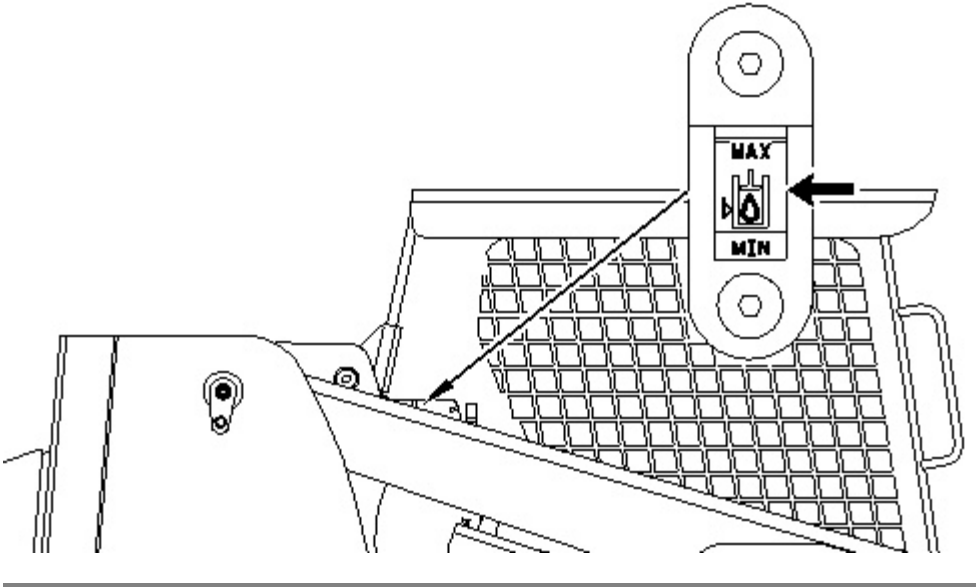


Illustration 2

g00926177

1. Park the machine on level ground.
2. Lower the work tool to the ground. Turn off the engine.
3. Wait for about five minutes before checking the level of the hydraulic oil.
4. Maintain the oil level to the middle of the sight gauge. **Do not overfill the hydraulic tank.**



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i01957078

Lift Arm and Cylinder Linkage - Lubricate

SMCS - 5102-086-BD; 6107-086-BD

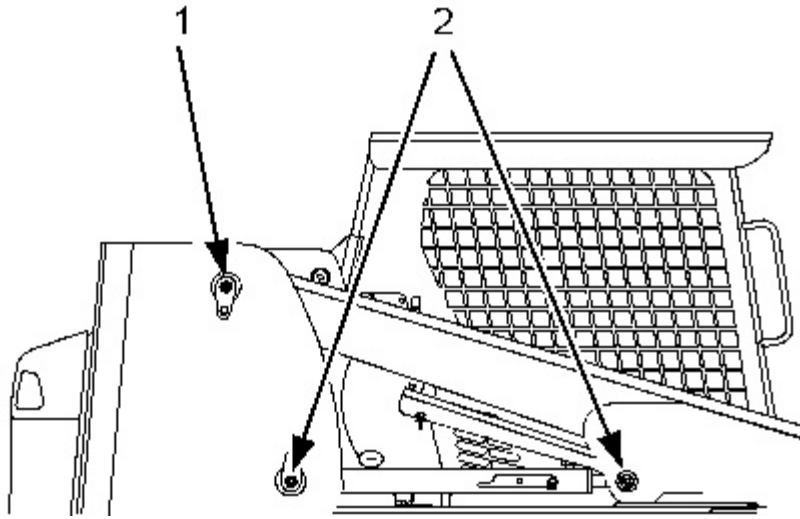


Illustration 1
Radial Lift

g01017352

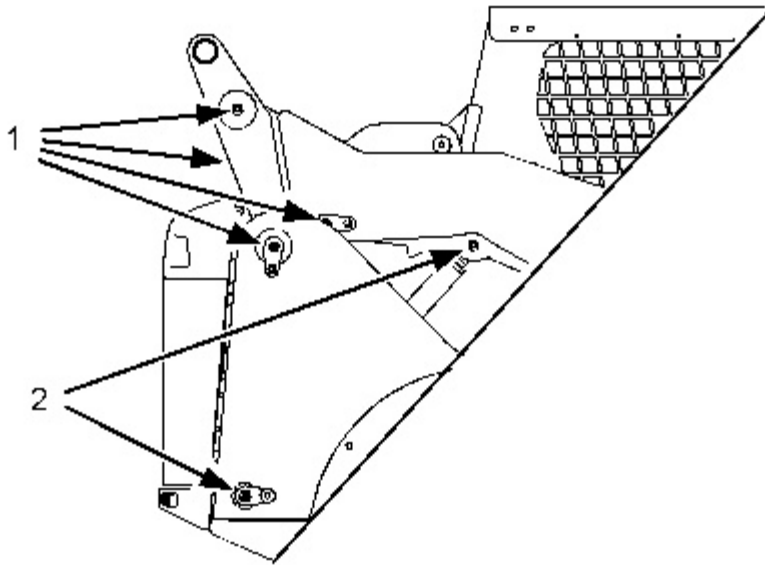


Illustration 2
Extended Reach

g01017361

Apply lubricant to the grease fittings (1) for the lift arm linkage.

Apply lubricant to the grease fittings (2) for the lift cylinder bearings.

Repeat the process for the opposite side of the machine.



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i01963869

Lower Machine Frame - Clean

SMCS - 7050-070

1. Tilt the cab upward. Refer to Operation and Maintenance Manual, "Cab Tilting".

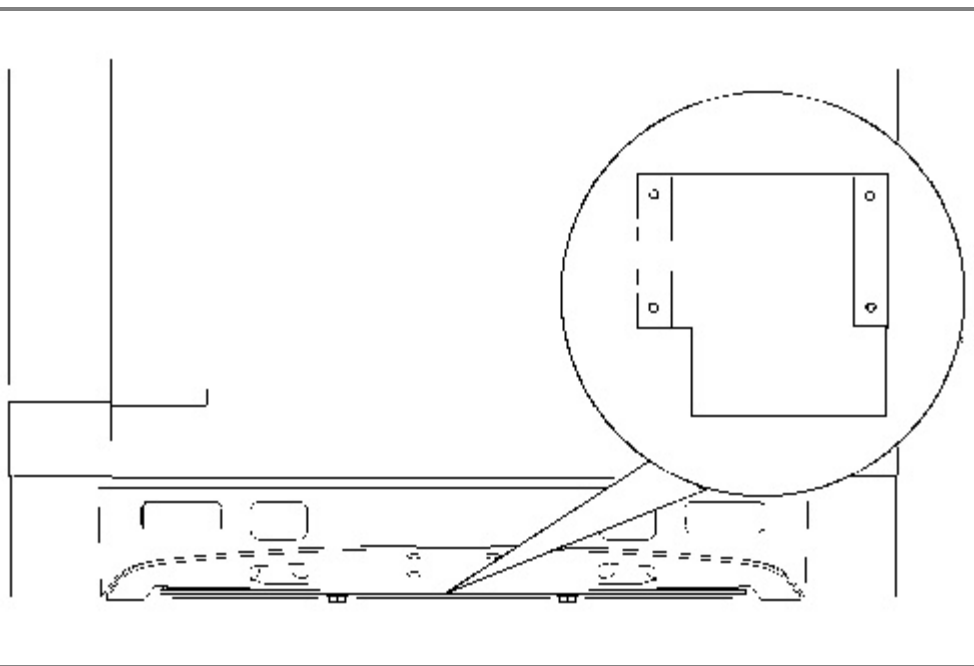


Illustration 1

g01020241

2. Remove the access panel in the frame that is located underneath the machine.
3. Remove any debris or dirt from the inside of the frame.
4. Reinstall the access panel and tilt the cab downward.



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i02106227

Oil Filter - Inspect

SMCS - 1308-507; 3067-507; 5068-507

Inspect a Used Filter for Debris

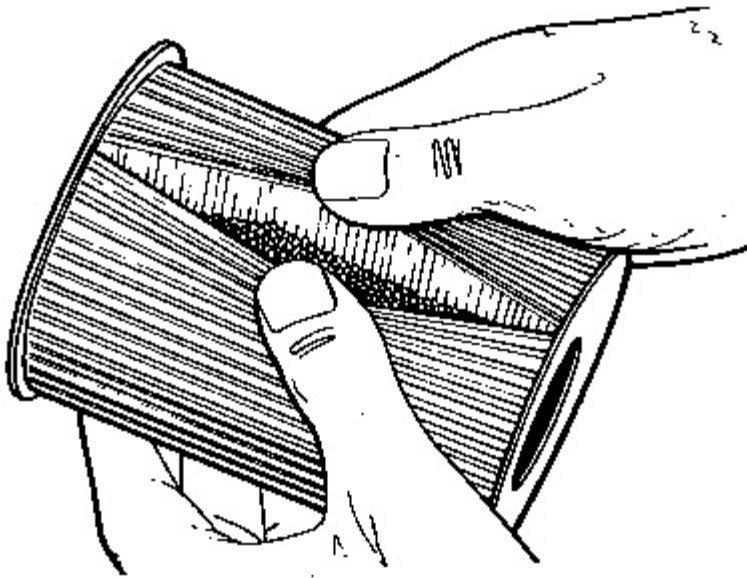


Illustration 1

g00100013

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod

bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.



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i01734746

Quick Coupler - Inspect

SMCS - 6129-040

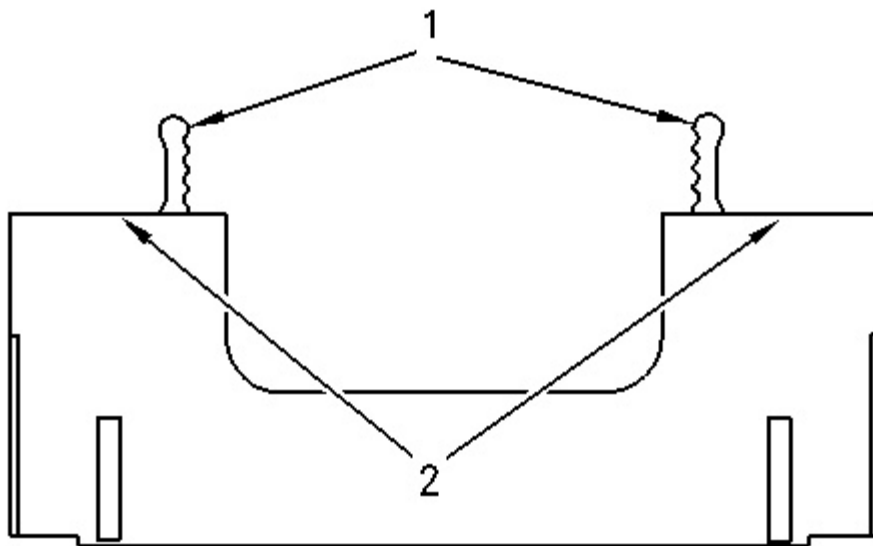


Illustration 1

g00889446

1. Move the quick coupler levers (1) to the disengaged position. Ensure that the levers are not bent or broken.
2. Check the top edges of the quick coupler assembly (2) for wear or for damage.

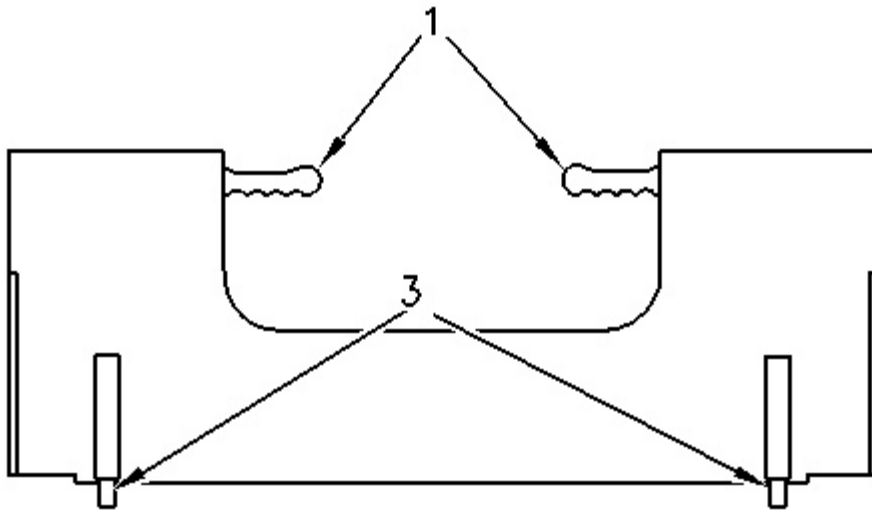


Illustration 2

g00889412

3. Move the quick coupler levers (1) to the engaged position. Ensure that the levers move freely without restriction.
4. Make sure that the coupler pins (3) extend through the bottom of the quick coupler assembly. Check the pins for wear and check the pins for damage.
5. Move the quick coupler levers to the disengaged position.

If any wear is suspected or damage is suspected, consult your Caterpillar dealer before you use a work tool.



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i01488851

Radiator Core - Clean

SMCS - 1353-070-KO

The radiator is located at the rear of the machine above the engine compartment.

1. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".
2. Tilt the radiator guard upward. Refer to Operation and Maintenance Manual, "Radiator Tilting".

NOTICE

When you are using compressed air or high pressure water to clean the radiator fins, ensure that the air or water is directed parallel to the fins. If the compressed air or high pressure water is not directed parallel to the radiator fins, the radiator fins could be bent or damaged.

Note: You can use compressed air, high pressure water, or steam to remove dust and other debris from the radiator fins. However, the use of compressed air is preferred.

3. Clean the radiator core.

NOTICE

Do not clean a running fan with high pressure water. Fan blade failure can result.

4. Remove any dirt or debris from the fan, the fan hub, the oil cooler, the radiator guard and the fan guard.

Note: Dirt or debris on the cooling fan can cause an imbalance.

5. Tilt the radiator guard downward.

6. Close the engine access door.

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Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

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Media Number -SEBU7731-08

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i01968724

Refrigerant Dryer - Replace - If Equipped

SMCS - 7322-510

WARNING

Personal injury can result from contact with refrigerant.

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 precaution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

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.

Use a certified recovery and recycling cart to properly remove the refrigerant from the air conditioning system.

NOTICE

If the refrigerant system has been open to the outside air (without being plugged) for more than 30 minutes, the receiver-dryer must be replaced. Moisture will enter an

open refrigerant system and cause corrosion which will lead to component failure.

Refer to Service Manual, SENR5664, "Air Conditioning and Heating R-134a For All Caterpillar Machines" for the proper procedure to change the receiver-dryer assembly and for the procedure to reclaim the refrigerant gas.

Note: The receiver-dryer must also be replaced when the air conditioning system is evacuated.

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i02798931

Rollover Protective Structure (ROPS) and Falling Object Protective Structure (FOPS) - Inspect

SMCS - 7323-040; 7325-040

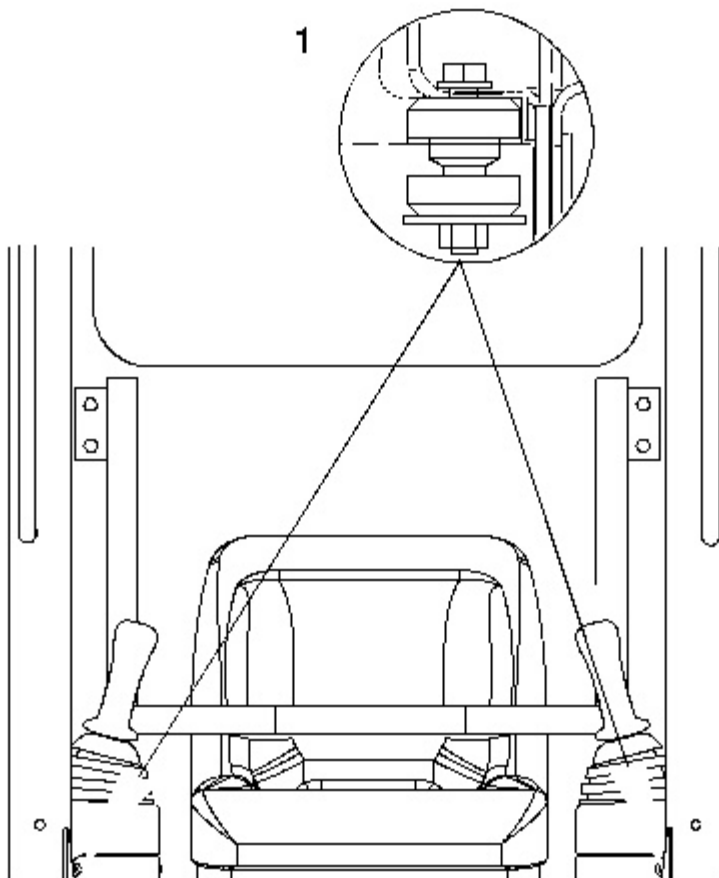


Illustration 1

(1) Front ROPS retaining bolt (one bolt per side)

g01022156

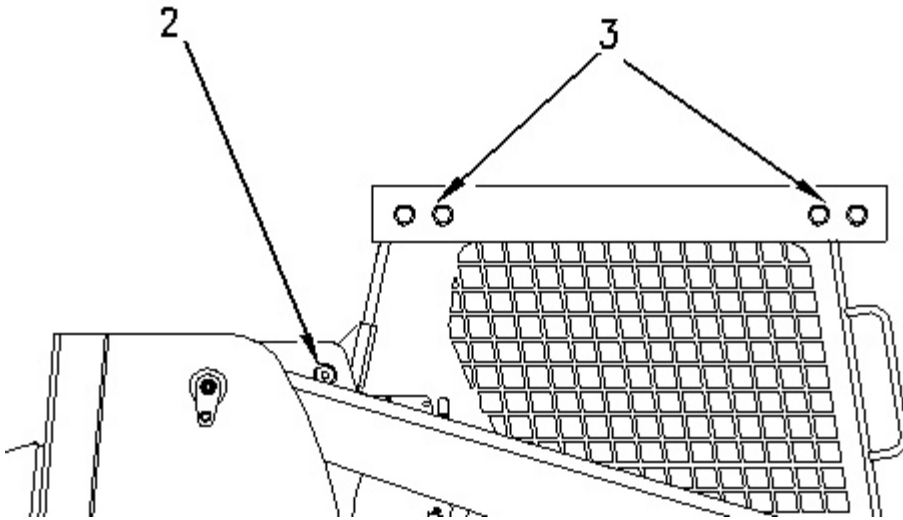


Illustration 2

g00925477

(2) Rear ROPS retaining bolt (one bolt per side)

(3) Retaining bolts for the FOPS 2

Note: There is a total of four retaining bolts for the ROPS. There is a total of eight retaining bolts for the FOPS 2.

1. Inspect the ROPS and the FOPS for loose bolts. Tighten the bolts (1) to the following torque 125 ± 10 N·m (92 ± 7 lb ft). Tighten the bolts (2) to the following torque 55 ± 5 N·m (41 ± 4 lb ft). Tighten the bolts (3) to the following torque 240 ± 40 N·m (177 ± 30 lb ft). ROPS and the FOPS for damaged bolts or missing bolts. Replace any damaged bolts or missing bolts with original equipment parts only.
2. Operate the machine on a rough surface. Replace the ROPS mounting supports if the ROPS emits a noise. Replace the ROPS mounting supports if the ROPS rattles.

Do not straighten the ROPS or the FOPS. Do not repair the ROPS or the FOPS by welding reinforcement plates to the ROPS or the FOPS.

Consult your Caterpillar dealer for repair of any cracks in the ROPS or the FOPS.

Inspect the Flying Object Guard (if equipped) for damage.

Consult your Caterpillar dealer for repair of any cracks in the Flying Object Guard.



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i02429589

Seat Belt - Inspect

SMCS - 7327-040

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.

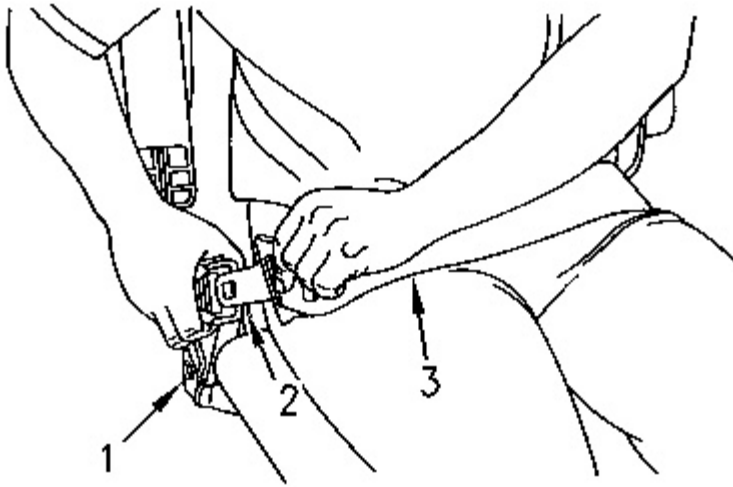


Illustration 1
 Typical example

g00932801

Check the seat belt mounting hardware (1) for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect the seat belt (3) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

Note: Within three years of the date of installation or within five years of the date of manufacture, replace

the seat belt. Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

If your machine is equipped with a seat belt extension, also perform this inspection procedure for the seat belt extension.



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i01970036

Seat Belt - Replace

SMCS - 7327-510

Within three years of the date of installation (2) or within five years of the date of manufacture (1), replace the seat belt. Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to each seat belt.

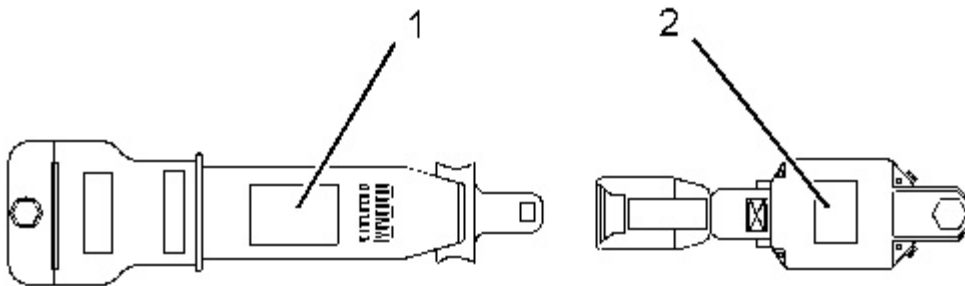


Illustration 1

g01022746

(1) Date of Manufacture

(2) Date of Installation

Contact your Caterpillar dealer for the replacement of the seat belt.



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i01878236

Tilt Cylinder Bearings and Bucket Linkage Bearings - Lubricate

SMCS - 5104-086-BD; 6107-086-BD

Wipe all of the grease fittings before you apply lubricant.

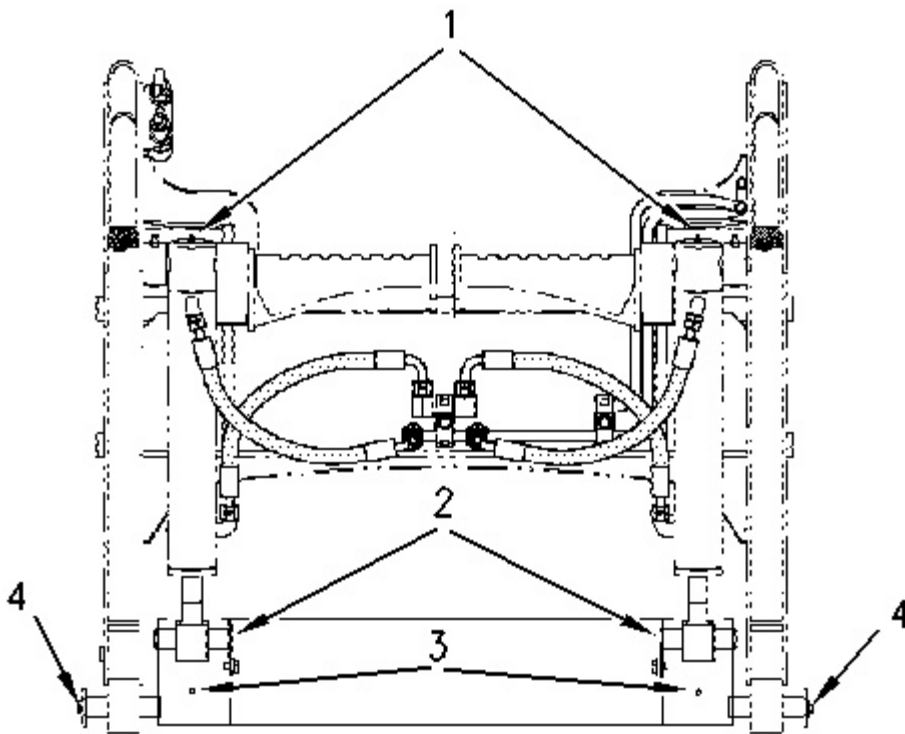


Illustration 1

g00955895

Note: Lubricate the fittings with the loader lift arms in the fully lowered position.

Apply lubricant to the grease fittings (1) for the upper bearings for the tilt cylinders.

Apply lubricant to the grease fittings (2) for the lower bearings for the tilt cylinders.

Apply lubricant to the grease fittings (3) for the coupler engagement pins.

Apply lubricant to the grease fitting (4) for the pivot pin of the quick coupler assembly.

There are a total of 8 grease fittings.



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i02124717

Tire Inflation - Check

SMCS - 4203-535-AI

Measure the tire pressure on each tire. Consult your Caterpillar dealer for the correct load rating and for the correct operating pressures. These correct load ratings and correct operating pressures can also be obtained from your tire dealer.

Inflate the tires, if necessary.

Tire Inflation with Air



WARNING

Use a self-attaching inflation chuck and stand behind the tread when inflating a tire.

Proper inflation equipment, and training in using the equipment, are necessary to avoid overinflation. A tire blowout or rim failure can result from improper or misused equipment.

Before inflating tire, install on the machine or put tire in restraining device.

NOTICE

Set the tire inflation equipment regulator at no more than 140 kPa (20 psi) over the recommended tire pressure.

Tire Inflation with Nitrogen

Caterpillar recommends the use of dry nitrogen gas for tire inflation and for tire pressure adjustments. This includes all machines with rubber tires. Nitrogen is an inert gas that will not aid combustion inside the tire.


WARNING

Proper nitrogen inflation equipment, and training in using the equipment, are necessary to avoid over inflation. A tire blowout or rim failure can result from improper or misused equipment and personal injury or death can occur.

A tire blowout and/or rim failure can occur if the inflation equipment is not used correctly, due to the fact that a fully charged nitrogen cylinder's pressure is approximately 15000 kPa (2200 psi).

There are other benefits to using nitrogen in addition to reducing the risk of an explosion. The use of nitrogen for tire inflation lessens the slow oxidation of the rubber. Use of nitrogen also slows gradual tire deterioration. This is especially important for tires that are expected to have a long service life of at least four years. Nitrogen reduces the corrosion of rim components. Nitrogen also reduces problems that result from disassembly.


WARNING

A tire blowout or a rim failure can cause personal injury.

Use a self-attaching inflation chuck and stand behind the tread when inflating a tire, to prevent personal injury.

NOTICE

Set the tire inflation equipment regulator at no more than 140 kPa (20 psi) over the recommended tire pressure.

Use **6V-4040** Inflation Group or an equivalent inflation group to inflate tires with a nitrogen gas cylinder.

Reference: For tire inflation instructions, refer to Special Instruction, SMHS7867, "Nitrogen Tire Inflation Group".

For nitrogen inflation, use the same tire pressures that are used for air inflation. Consult your tire dealer for operating pressures.



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i01445212

Tire Segment - Replace - Removal

SMCS - 4203-510-SEG

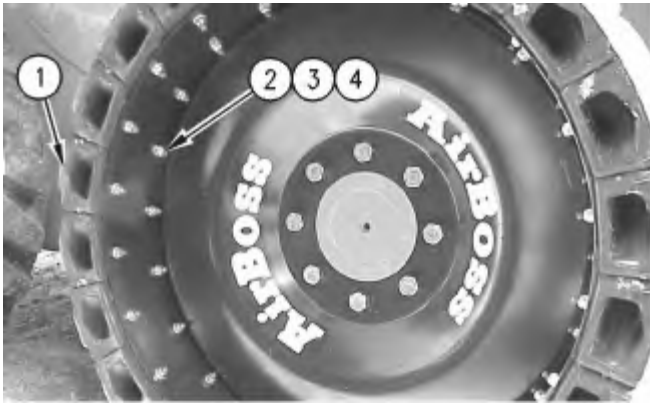


Illustration 1

g00756820

1. Remove any dirt buildup from the segment (1). Remove any dirt buildup from the stud threads (2) .
2. Remove the locknuts (3) and washers (4). There are four locknuts and washers per segment.
3. Remove the segment from the rim.

Installation

1. Clean the inner surface of the rim. Clean the outer surface of the rim.
2. Align the studs in the segment with the holes in the rim. Install the segment, the washers and the locknuts.

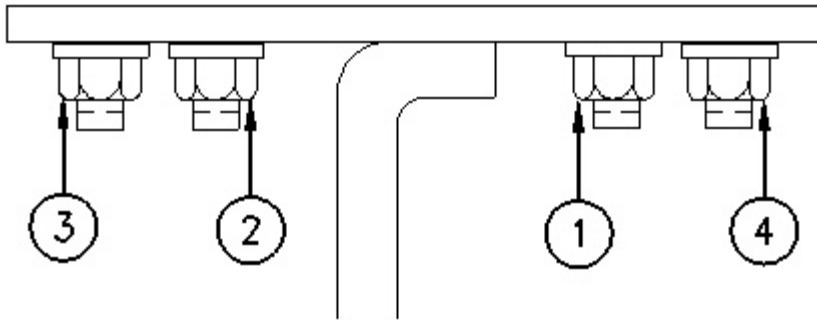


Illustration 2

g00756806

3. Tighten the locknuts (1), (2), (3) and (4) in order. Refer to the table below for the correct torque.

Table 1

The Recommended Torques for the Locknuts	
All Sizes Except 19.5L-24 & 17.5-25	19.5L-24 & 17.5-25
15 ± 1 N·m (11 ± 1 lb ft)	35 ± 1 N·m (26 ± 1 lb ft)



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i01203574

Wheel Nuts - Tighten

SMCS - 4210-527

Check the torque on new wheels or reinstalled wheels after every one service hour until the specified torque is maintained. After the specified torque is maintained, check the torque on the nuts after every ten service hours or every day.

Check the nuts on all four wheels. Use a star pattern when you are tightening the nuts.

The torque specifications are given in the following table.

Table 1

Tightening Torque for Wheels	
Airboss and Solid Tires	163 ± 7 N·m (120 ± 5 lb ft)
Pneumatic Tires	149 ± 7 N·m (110 ± 5 lb ft)



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i01982402

Window Washer Reservoir - Fill - If Equipped

SMCS - 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar nonfreezing window washer solvent or equivalent. System damage can result from freezing.

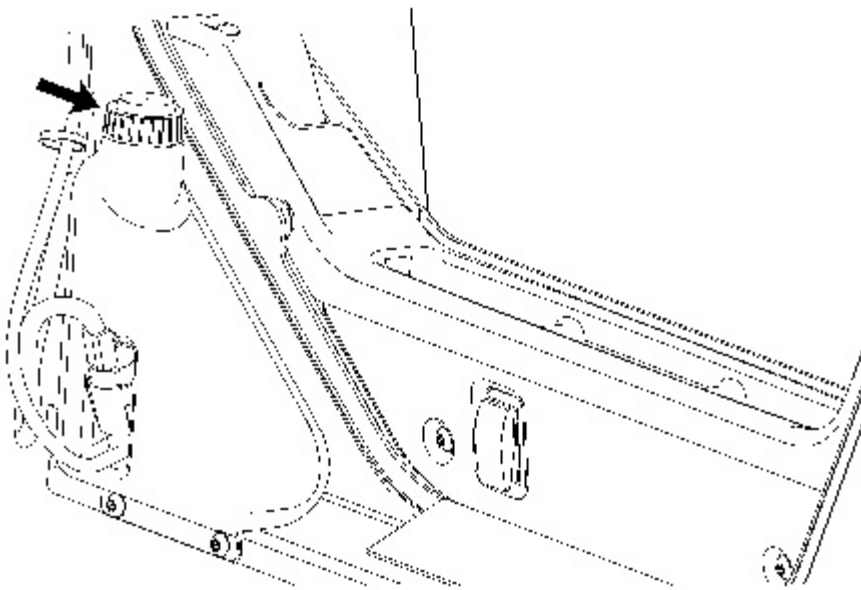


Illustration 1

g01027404

The reservoir for the window washer solvent is located inside the cab on the left side.

Fill the reservoir with window washer solvent.



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i02810705

Window Wiper - Inspect/Replace - If Equipped

SMCS - 7305-040; 7305-510

Inspect the condition of the front window wiper blade. Replace the window wiper blade if the window wiper blade is worn or damaged. If the window wiper blade streaks the window, replace the window wiper blade.

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i01981264

Windows - Clean

SMCS - 7310-070

Use commercially available window cleaning solutions in order to clean the windows. The side windows of the cab can be removed for cleaning. Refer to the following procedure in order to remove the side windows.

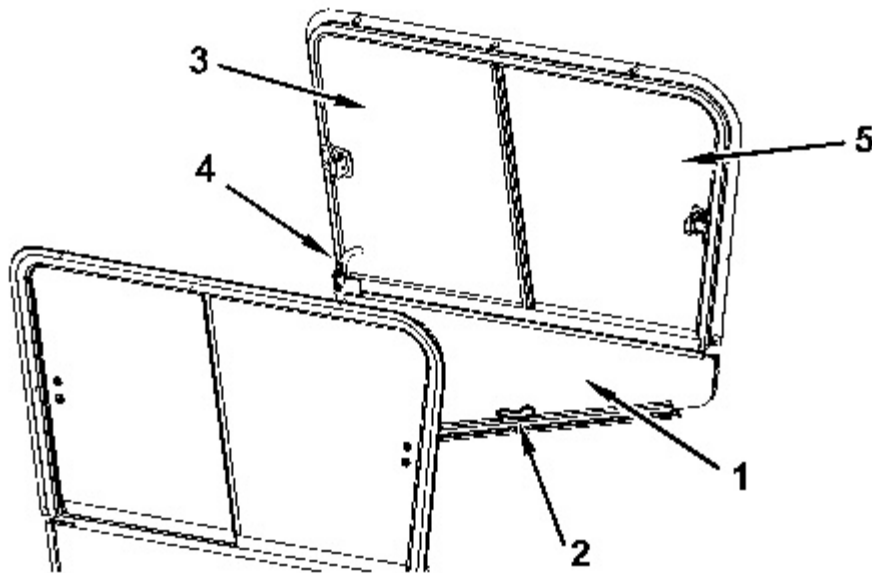


Illustration 1

g01026875

1. Release the latch (2) in order to remove the window (1). Pull downward on the window in order to remove the window. Pull outward on the window in order to remove the window.
2. Release the latch (4) in order to remove the window (3). Pivot the channel for the window downward. Pull the window outward in order to remove the window.
3. Slide the window (5) forward. Pull the window outward in order to remove the window.



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i02728710

Work Tool - Lubricate

SMCS - 6700-086

Multipurpose Bucket

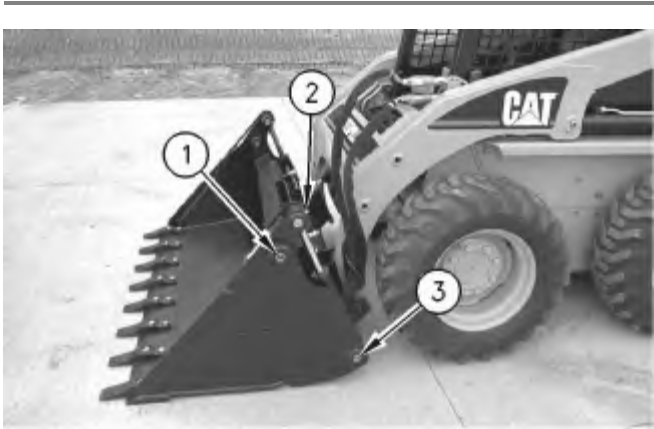


Illustration 1

g00534457

Apply lubricant to the grease fitting (1) for the pivot pin of the apron.

Apply lubricant to the grease fitting (2) for the rod end of the multipurpose bucket cylinder.

Apply lubricant to the grease fitting (3) for the head end of the multipurpose bucket cylinder.

Repeat for the other side of the bucket.

There are six grease fittings.

Utility Grapple Tools



Illustration 2

g00647980

Apply lubricant to the four grease fittings for the grapples.

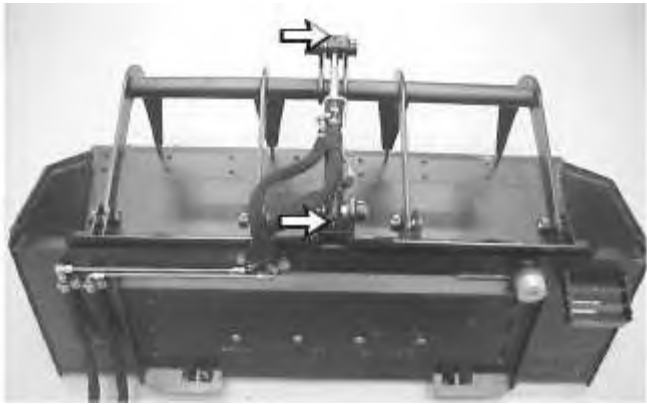


Illustration 3

g00647988

Apply lubricant to the two fittings for the grapple cylinder.

There are six grease fittings.

Industrial Grapple Tools



Illustration 4

g00645995

Apply lubricant to the four grease fittings for the fork cylinders.



Illustration 5

g00646004

Apply lubricant to the four grease fittings for the two forks.

There are eight grease fittings.

Grapple Rake

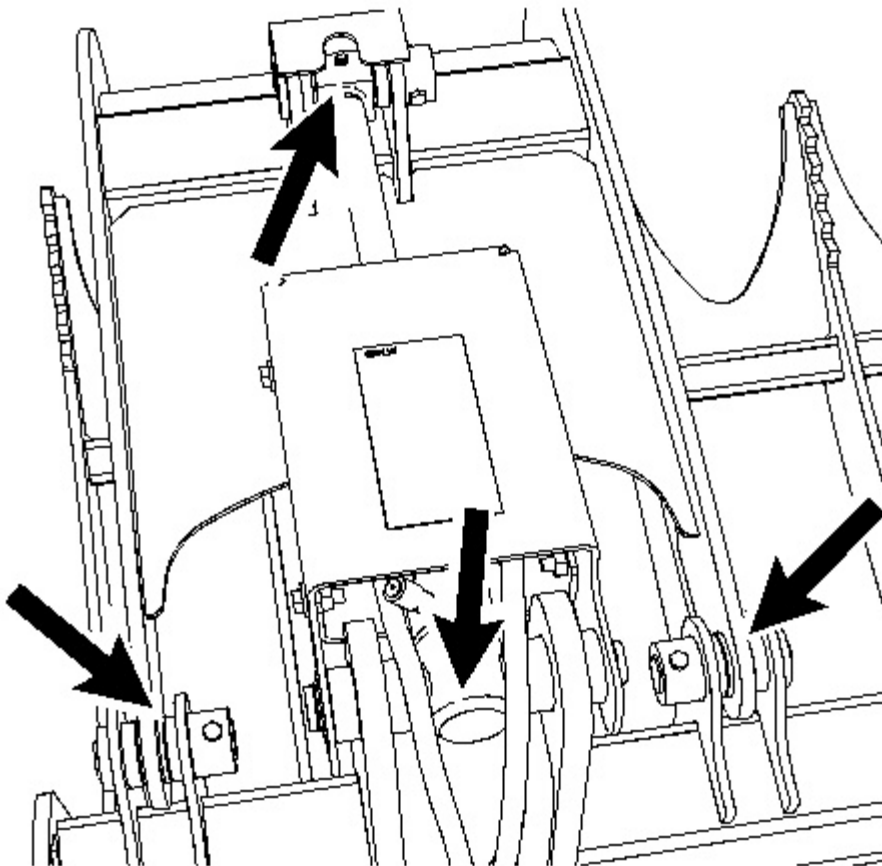


Illustration 6

g01368386

Apply lubricant to the four grease fittings for the grapple cylinders.

Apply lubricant to the four grease fittings for the two grapples.

There are eight grease fittings.

Angle Blade



Illustration 7

g00648033

Apply lubricant to the grease fitting on the rod end of the angle cylinder.

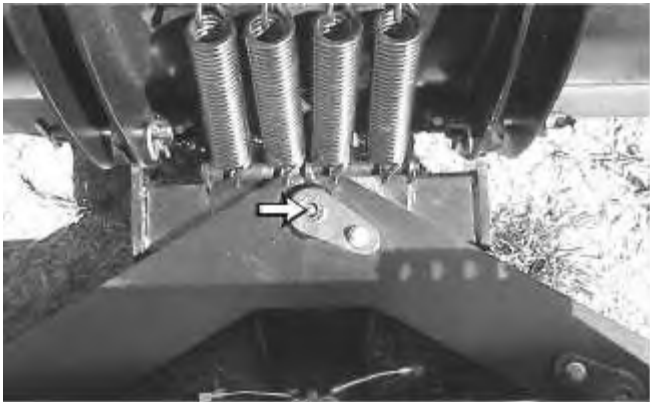


Illustration 8

g00648037

Apply lubricant to the grease fitting on the horizontal pivot point of the blade.

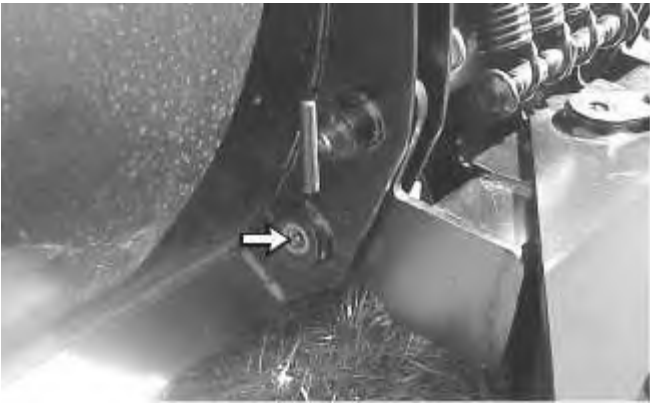


Illustration 9

g00648038

Apply lubricant to the grease fitting on the vertical pivot point of the blade. Repeat for opposite side of the blade.

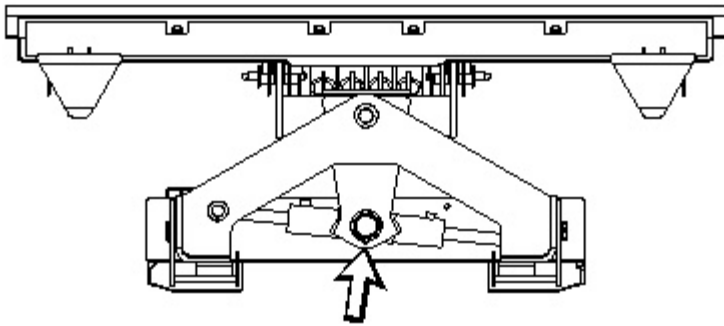


Illustration 10

g00677570

This is a bottom view of the angle blade.

Apply lubricant to the grease fitting on the pivot point of the cylinder.

There are five grease fittings.

Dozer Blade

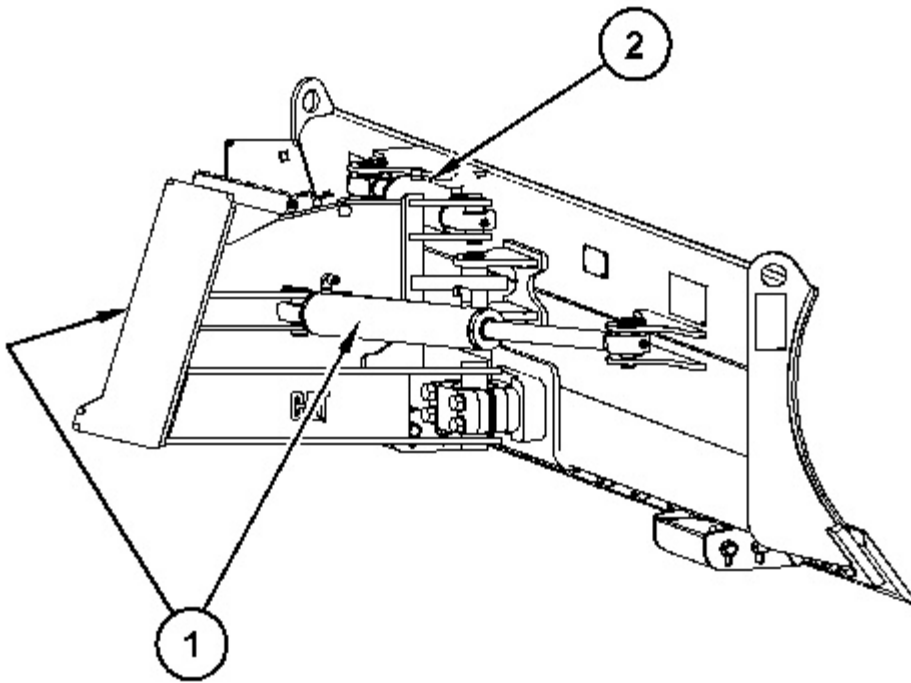


Illustration 11

g01073259

Apply lubricant to the grease fitting on both ends of the right hand angle cylinder (1) . Repeat for opposite side of the blade.

Apply lubricant to the grease fitting on the pivot points on each end of the tilt cylinder (2) .

There are six grease fittings.



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i01809997

Work Tool Mounting Bracket - Inspect

SMCS - 6700-040-BK

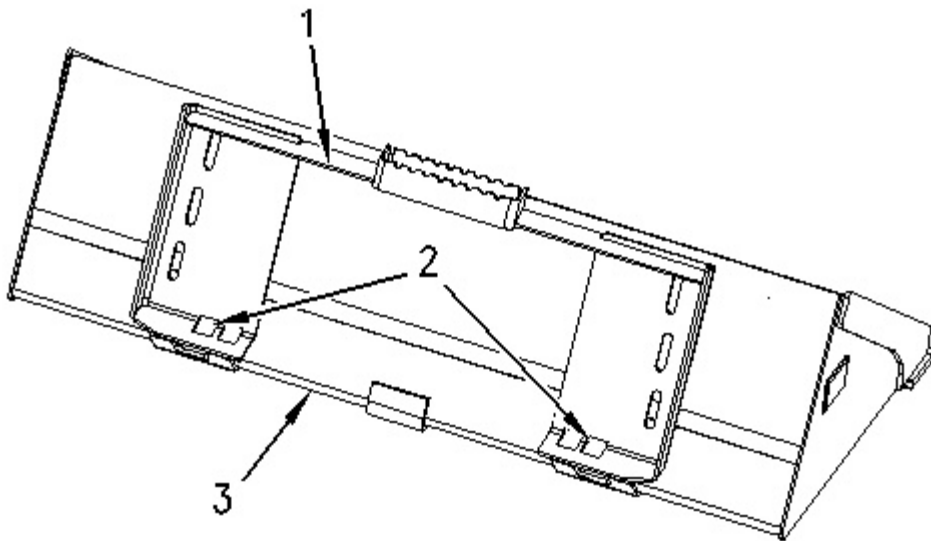


Illustration 1

g00925058

Inspect upper angled plate (1) and ensure that the plate is not bent or otherwise damaged. Inspect holes (2) for wear and for damage. Inspect lower angled plate (3) and ensure that the plate is not bent or otherwise damaged. If any wear is suspected or any damage is suspected, consult your Caterpillar dealer before you use the work tool.



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i02702100

Reference Material

SMCS - 1000; 7000

Cooling System

Special Publication, PEEP5027, "Label - ELC Radiator Label"

Special Publication, PEHP4036, "Product Data Sheet for Caterpillar ELC"

Special Publication, SEBD0518, "Know Your Cooling System"

Special Publication, SEBD0970, "Coolant and Your Engine"

Grease

Special Publication, NEDG6022, "Product Data Sheet for Multipurpose Lithium Complex Grease with Molybdenum (MPGM)"

Special Publication, NEHP5621, "How To Select The Right Grease For Any Job". This publication lists the typical characteristics for eleven of Caterpillar's greases.

Special Publication, PEHP0003, "Product Data Sheet for Multipurpose Lithium Complex Grease (MPG)"

Special Publication, PEHP0017, "Product Data Sheet for Special Purpose Grease (SPG) Bearing Lubricant"

Hydraulic Oil

Special Publication, PEHP0005, "Product Data Sheet for Caterpillar Hydraulic Oil (HYDO)"

Special Publication, PEHP6047, "Product Data Sheet for Caterpillar Biodegradable Hydraulic Oil (HEES)"

Miscellaneous Publications

Special Publication, PECP6026, "One Safe Source" English language for use in NACD

Special Publication, PECP6027, "One Safe Source" English language for use in COSA

Special Publication, PECP6028, "One Safe Source" English language for use outside NACD and COSA

Special Publication, PEHP8035, "Product Data Sheet for TDTO Transmission Multi-Season (TMS)"

Special Publication, SEBD0717, "Diesel Fuels and Your Engine"

Special Publication, SEBU6250, "Caterpillar Machine Lubricant Recommendations"

Special Publication, SEBU5898, "Cold Weather Recommendations"

Special Publication, SENR5664, "Air Conditioning and Heater R-134a for All Caterpillar Machines"

Special Publication, SMBU6981, "Emissions Control Warranty Information"

Oil

Special Publication, LEDQ7315, "CG-4 Oil The Preferred Oil for Caterpillar Engines"

Special Publication, PEHP3050, "Product Data Sheet for Caterpillar Multipurpose Tractor Oil (MTO)"

Special Publication, PEHP6001, "How to Take a Good Oil Sample"

Special Publication, PEHP7041, "Product Data Sheet for Caterpillar Diesel Engine Oils (DEO)" CG-4 engine oils (International markets)

Special Publication, PEHP7508, "Product Data Sheet for Caterpillar Gear Oil (GO)"

Special Publication, PEHP8038, "Product Data Sheet for Caterpillar Diesel Engine Oils (DEO)", CH-4 engine oils (North America and Australia)

Special Publication, SEBD0640, "Oil and Your Engine"

Operation and Maintenance Manuals

Operation and Maintenance Manual, SEBU5898, "Cold Weather Recommendations"

Operation and Maintenance Manual, SMBU6981, "Emissions Control Warranty Information"

Parts Manuals

Parts Manual, SEBP3770 216B RLL1-UP, 226B MJH1-UP, 232B SCH1-UP, and 242B BXM1-UP

Parts Manual, SEBP3928 248B SCL1-UP and 268B LBA1-UP

Parts Manual, SEBP3769 236B HEN1-UP, 246B PAT1-UP, 252B SCP1-UP, and 262B PDT1-UP

ROPS/FOPS Structure

Special Publication, SEBD1587, "What ROPS/FOPS Certification Means"

Special Publication, SEHS6929, "Inspection, Maintenance and Repair of ROPS and Attachment Installation Guidelines"

Safety Manuals

Safety Manual, SEBU7224

S·O·S Information

Special Publication, PEHP7057, "S·O·S Coolant Analysis"

Special Publication, TEJB1015, "Understanding the S·O·S Report"

Specifications Manuals

Specifications Manual, SENR3130, "Torque Specifications"

Additional Reference Material

ASTM D2896 "TBN Measurements" This can normally be obtained from your local technological society, from your local library, or from your local college. SAE J732 "SPECIFICATIONS DEFINITIONS FRONT END LOADER"

SAE J183 "Classification" This can normally be found in the SAE handbook.

SAE J313 "Diesel Fuels" This can be found in the SAE handbook. Also, this publication can be obtained from your local technological society, from your local library, or from your local college.

SAE J754 "Nomenclature" This can normally be found in the SAE handbook.

Engine Manufacturers Association Lubricating Oils Data Book

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Product: SKID STEER LOADER
 Model: 226B SKID STEER LOADER MJH
 Configuration: 216B 226B 232B 242B Skid Steer Loader MJH00001-10574
 (MACHINE) POWERED BY 3024C Engine

Operation and Maintenance Manual

216B, 226B, 232B, 236B, 242B, 246B, 248B, 252B, 262B and 268B Skid Steer Loaders

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Caterpillar Approved Work Tools

SMCS - 6700

Only use Caterpillar approved work tools on this machine.

Note: Do not use a Caterpillar work tool on a machine that is not approved by Caterpillar.

Table 1

Caterpillar Approved Work Tools for Skid Steer Loaders

Work Tool	216B	226B	226B HF	232B	242B	242B HF	236B	246B	248B	268B	252B 262B
General Purpose Bucket 1524 mm (60 inch)	O	O	O	A	A	A	A	A	A	A	NR
General Purpose Bucket 1676 mm (66 inch)	A	A	A	O	O	O	O	O	O	O	O
General Purpose Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
General Purpose Bucket 1981 mm (78 inch)	NR	NR	NR	NR	NR	NR	A	A	A	A	A
Multipurpose Bucket	O	O	O	A	A	A	A	A	A	A	NR

1524 mm (60 inch)											
Multipurpose Bucket 1676 mm (66 inch)	A	A	A	O	O	O	O	O	O	O	O
Multipurpose Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
Multipurpose Bucket 1981 mm (78 inch)	NR	NR	NR	NR	NR	NR	A	A	A	A	A
Dirt Bucket 1372 mm (54 inch)	A	A	A	A	A	A	NR	NR	NR	NR	NR
Dirt Bucket 1524 mm (60 inch)	O	O	O	A	A	A	A	A	A	A	NR
Dirt Bucket 1676 mm (66 inch)	A	A	A	O	O	O	O	O	O	O	O
Dirt Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
Light Material Bucket 1829 mm (72 inch)	O	O	O	O	O	O	O	O	O	O	O
Light Material Bucket 1981 mm (78 inch)	NR	NR	NR	A	A	A	A	A	A	A	O
Light Material Bucket 2134 mm (84 inch)	NR	NR	NR	NR	A	A	NR	A	A	A	O
Utility Bucket											

1524 mm (60 inch)	O	O	O	A	A	A	A	A	A	A	NR
Utility Bucket 1676 mm (66 inch)	A	A	A	O	O	O	O	O	O	O	O
Utility Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
A14B Auger	O	O	O	O	O	O	O	O	O	O	O
A19B Auger	A	A	O	A	A	O	O	O	O	O	O
A26B Auger	!	!	A	!	!	A	!	!	O	O	!
BH30 Backhoe	A	O	O	O	O	O	!	!	!	!	!
BH30 w Backhoe	!	!	!	!	!	!	O	O	O	O	O
Angle Blade 1829 mm (72 inch)	O	O	O	O	O	O	A	A	A	A	A
Angle Blade 2134 mm (84 inch)	A	A	A	A	A	A	O	O	O	O	O
Dozer Blade 2007 mm (79 inch)	O	O	O	O	O	O	A	A	A	A	A
Dozer Blade 2337 mm (92 inch)	A	A	A	A	A	A	O	O	O	O	O
BA18 Angle Broom	O	O	O	O	O	O	O	O	O	O	O
BP15B Pickup Broom	O _*	O	O	O	O	O	O	O	O	A	O
BP18B Pickup Broom	!	!	!	O	O	O	O	O	O	O	O
PC203 Cold Planer	O	O	O	O	O	O	O	O	O	O	O
PC204 Cold Planer	!	A	A	A	O	A	O	O	O	O	O

PC205 Cold Planer	!	!	O	!	!	O	!	!	O	O	!
PC206 Cold Planer	!	!	A	!	!	A	!	!	O	O	!
PC210 Cold Planer	!	!	!	!	!	!	!	!	O	O	!
Carriage and Fork Tines	O	O	O	O	O	O	O	O	O	O	O
Utility Fork 1676 mm (66 inch)	O	O	O	O	O	O	O	O	O	O	O
Utility Fork 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
Industrial Grapple Bucket 1524 mm (60 inch)	O	O	O	A	A	A	A	A	A	A	NR
Industrial Grapple Bucket 1676 mm (66 inch)	A	A	A	O	O	O	O	O	O	O	O
Industrial Grapple Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
Industrial Grapple Bucket 1981 mm (78 inch)	NR	NR	NR	NR	NR	NR	A	A	A	A	A
Industrial Grapple Fork 1676 mm (66 inch)	O	O	O	O	O	O	O	O	O	O	O
Industrial Grapple Fork 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O
Utility Grapple											

Bucket 1676 mm (66 inch)	O	O	O	O	O	O	O	O	O	O	O	O
Utility Grapple Bucket 1676 mm (66 inch)	O	O	O	O	O	O	O	O	O	O	O	O
Utility Grapple Bucket 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O	O
Utility Grapple Fork 1676 mm (66 inch)	O	O	O	O	O	O	O	O	O	O	O	O
Utility Grapple Fork 1829 mm (72 inch)	NR	NR	NR	A	A	A	O	O	O	O	O	O
Grapple Rake 1829 mm (72 inch)	O	O	O	O	O	O	O	O	O	O	O	O
Grapple Rake 2134 mm (84 inch)	A	A	A	O	O	O	O	O	O	O	O	O
Material Handling Arm	O	O	O	O	O	O	O	O	O	O	O	O
SR17 Snowblower	O	O	O	O	O	O	NR	NR	NR	NR	NR	NR
SR18 Snowblower	NR	NR	NR	NR	NR	NR	O	O	O	O	O	O
SR21 Snowblower	NR	NR	NR	NR	NR	NR	A	A	A	A	A	A
SR318 Snowblower	NR	NR	A	NR	NR	A	NR	NR	O	O	NR	NR
SR321 Snowblower	NR	NR	A	NR	NR	A	NR	NR	O	O	NR	NR
LR15B Landscape Rake	O *	O *	O *	O *	O *	O *	O *	O *	O *	O *	O *	O *

LR18B Landscape Rake	!	!	!	!	!	!	O*	O*	O*	O*	O*
PR172 Power Rake	O	O	NR	O	O	NR	A	A	A	A	A
PR184 Power Rake	A	O	NR	A	O	NR	O	O	O	O	O
PR190 Power Rake	A	A	NR	A	A	NR	O	O	O	O	O
LT13B Landscape Tiller	O	O	O	O	O	O	O	O	O	O	O
LT18B Landscape Tiller	!	!	!	!	!	!	O	O	O	O	O
SG16B Stump Grinder	O	O	O	O	O	O	O	O	O	O	O
SG18B Stump Grinder	!	!	O	!	!	O	!	!	O	O	!
T9B Trencher	O	O	O	O	O	O	O	O	O	O	O
T15B Trencher	!	!	A	!	!	A	!	!	O	O	!
CV16B Vibratory Compactor	O*	O*	O*	O	O	O	O	O	O	O	O
CV18B Vibratory Compactor	!	!	!	!	!	!	O	O	O	O	O
SW45 Wheel Saw 3 inch	!	!	A*	!	!	A*	!	!	O	O	!
SW45 Wheel Saw 6 inch	!	!	A*	!	!	A*	!	!	O	O	!
SW45 Wheel Saw 8 inch	!	!	A*	!	!	A*	!	!	O	O	!
SW60 Wheel Saw 6 inch	!	!	!	!	!	!	!	!	O*	O*	!
SW60 Wheel Saw 8 inch	!	!	!	!	!	!	!	!	O*	O*	!
H50 H50S Hammer	O	O	!	O	O	!	!	!	!	!	!
H63 H63S Hammer	O	O	!	O	O	!	O	O	O	O	O

O - The machine performance is optimum with this work tool.

A - The machine performance is acceptable with this work tool.

HF - The machine is equipped with high flow hydraulics.

NR - This work tool is not recommended for use on this machine.

! - This work tool is not approved for use on this machine.

***** - This work tool has a lift restriction on this machine. Do not raise the lower pivot pin higher than 1 m (3 ft) above the ground.

Many of the work tools in the table have an Operation and Maintenance Manual. Please refer to the Operation and Maintenance Manual that is provided with the work tool for the proper use of the work tool.

Contact your Caterpillar dealer concerning specific work tools that are approved by Caterpillar for this machine. This list was complete at the time of publication. There may be additional work tools that have been approved since that time. Consult your Caterpillar dealer for an updated list of approved work tools.

INTENDED USE STATEMENT FOR THE GRAPPLE RAKE

This Work Tool has the intended functions of raking, loading, carrying, and moving bulky material. The material may be encountered in the following applications:

- Landscape cleanup
- Storm debris cleanup
- Demolition
- Industrial
- Construction



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Decommissioning and Disposal

SMCS - 1000; 7000

Decommissioning and disposal will vary with local regulations. Consult the nearest Caterpillar dealer for additional information.

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