



Operation and Maintenance Manual

301.5, 301.6, 301.7 CR, 301.8, 302 CR Mini Hydraulic Excavators

MNH 1-UP (301.5)
JH7 1-UP (301.7 CR)
H8X 1-UP (301.8)
RHM 1-UP (302 CR)
MY6 1-UP (301.6)

Language: Original Instructions



Scan to access the latest service information, purchase additional media, and buy genuine Cat® parts.



Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards, including human factors that can affect safety. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you verify that you are authorized to perform this work, and have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the "Safety Alert Symbol" and followed by a "Signal Word" such as "DANGER", "WARNING" or "CAUTION". The Safety Alert "WARNING" label is shown below.



The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

A non-exhaustive list of operations that may cause product damage are identified by "NOTICE" labels on the product and in this publication.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. You must not use this product in any manner different from that considered by this manual without first satisfying yourself that you have considered all safety rules and precautions applicable to the operation of the product in the location of use, including site-specific rules and precautions applicable to the worksite. If a tool, procedure, work method or operating technique that is not specifically recommended by Caterpillar is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that you are authorized to perform this work, and that the product will not be damaged or become unsafe by the operation, lubrication, maintenance or repair procedures that you intend to use.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Cat dealers have the most current information available.

NOTICE

When replacement parts are required for this product Caterpillar recommends using original Caterpillar® replacement parts.

Other parts may not meet certain original equipment specifications.

When replacement parts are installed, the machine owner/user should ensure that the machine remains in compliance with all applicable requirements.

In the United States, the maintenance, replacement, or repair of the emission control devices and systems may be performed by any repair establishment or individual of the owner's choosing.

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Foreword

California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.



WARNING – This product can expose you to chemicals including ethylene glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to:

www.P65Warnings.ca.gov

Do not ingest this chemical. Wash hands after handling to avoid incidental ingestion.



WARNING – This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to:

www.P65Warnings.ca.gov

Wash hands after handling components that may contain lead.

Literature Information

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

This manual contains safety information, operation instructions, transportation information, lubrication information, and maintenance information.

Some photographs or illustrations in this publication show details or attachments that can be different from your machine. Guards and covers might have been removed for illustrative purposes.

Continuing improvement and advancement of product design might have caused changes to your machine which are not included in this publication. Read, study, and keep this manual with the machine.

Whenever a question arises regarding your machine, or this publication, please consult your Cat dealer for the latest available information.

Safety

The safety section lists basic safety precautions. In addition, this section identifies the text and locations of warning signs and labels used on the machine.

Read and understand the basic precautions listed in the safety section before operating or performing lubrication, maintenance, and repair on this machine.

Operation

The operation section is a reference for the new operator and a refresher for the experienced operator. This section includes a discussion of gauges, switches, machine controls, attachment controls, transportation, and towing information.

Photographs and illustrations guide the operator through correct procedures of checking, starting, operating, and stopping the machine.

Operating techniques outlined in this publication are basic. Skill and techniques develop as the operator gains knowledge of the machine and its capabilities.

Maintenance

The maintenance section is a guide to equipment care. The Maintenance Interval Schedule (MIS) lists the items to be maintained at a specific service interval. Items without specific intervals are listed under the "When Required" service interval. The Maintenance Interval Schedule lists the page number for the step-by-step instructions required to accomplish the scheduled maintenance. Use the Maintenance Interval Schedule as an index or "one safe source" for all maintenance procedures.

Maintenance Intervals

Use the service hour meter to determine servicing intervals. Calendar intervals shown (daily, weekly, monthly, etc.) can be used instead of service hour meter intervals if the calendar intervals provide more convenient servicing schedules and approximate the indicated service hour meter reading. Perform the recommended service at the interval that occurs first.

Under severe, dusty, or wet operating conditions, more frequent lubrication than is specified in the maintenance intervals chart might be necessary.

Perform service on items at multiples of the original requirement. For example, at every 500 service hours or 3 months, also service those items listed under every 250 service hours or monthly and every 10 service hours or daily.

Certified Engine Maintenance

Proper maintenance and repair are essential to keep the engine and machine systems operating correctly. As the heavy-duty off-road diesel engine owner, you are responsible for the performance of the required maintenance listed in the Owner Manual, Operation and Maintenance Manual, and Service Manual.

It is prohibited for any person engaged in the business of repairing, servicing, selling, leasing, or trading engines or machines to remove, alter, or to render inoperative, any emission-related device or element of design installed on or in an engine or machine that is in compliance with all applicable regulations of the intended country to which it has been shipped. Certain elements of the machine and engine such as the exhaust system, fuel system, electrical system, intake air system, and cooling system may be emission-related and should not be altered unless approved by Caterpillar.

Machine Capacity

Additional attachments or modifications may exceed machine design capacity which can adversely affect performance characteristics. Included would be stability and system certifications such as brakes, steering, and rollover protective structures (ROPS). Contact your Cat dealer for further information.

Product Identification Number

Effective First Quarter 2001 the Product Identification Number (PIN) has changed from 8 to 17 characters. To provide uniform equipment identification, construction equipment manufacturers are moving to comply with the latest version of the product identification numbering standard. Non-road machine PINs are defined by ISO 10261. The new PIN format will apply to all machines and generator sets. The PIN plates and frame marking will display the 17 character PIN. The new format will look like the following:

***XXX 0789BG 6SL12345 ***

Illustration 1

g03891925

Where:

1. World Manufacturing Code (characters 1-3)

2. Machine Descriptor (characters 4-8)

3. Check Character (character 9)

4. Machine Indicator Section (MIS) or Product Sequence Number (characters 10-17). These were previously referred to as the Serial Number.

Machines and generator sets produced before First Quarter 2001 will maintain their 8 character PIN format.

Components such as engines, transmissions, axles, and work tools will continue to use an 8 character Serial Number (S/N).

Safety Section

i07929081

Safety Messages

SMCS Code: 7000; 7405

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. Become familiar with all safety messages.

Make sure that all 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 new safety message on the replacement part. Any Cat dealer can provide new safety messages.

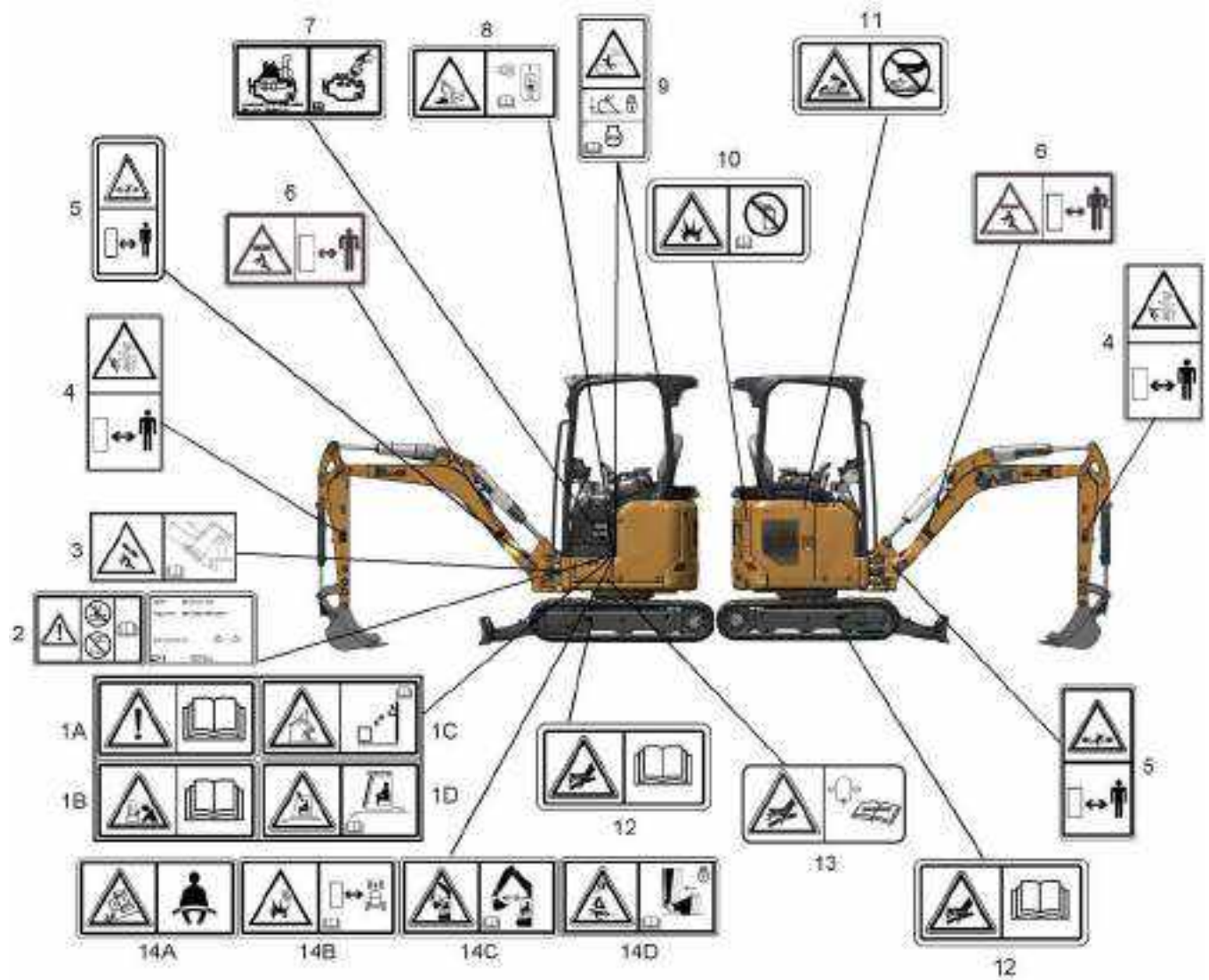


Illustration 2
Warnings for canopy and cab machines

g06275043

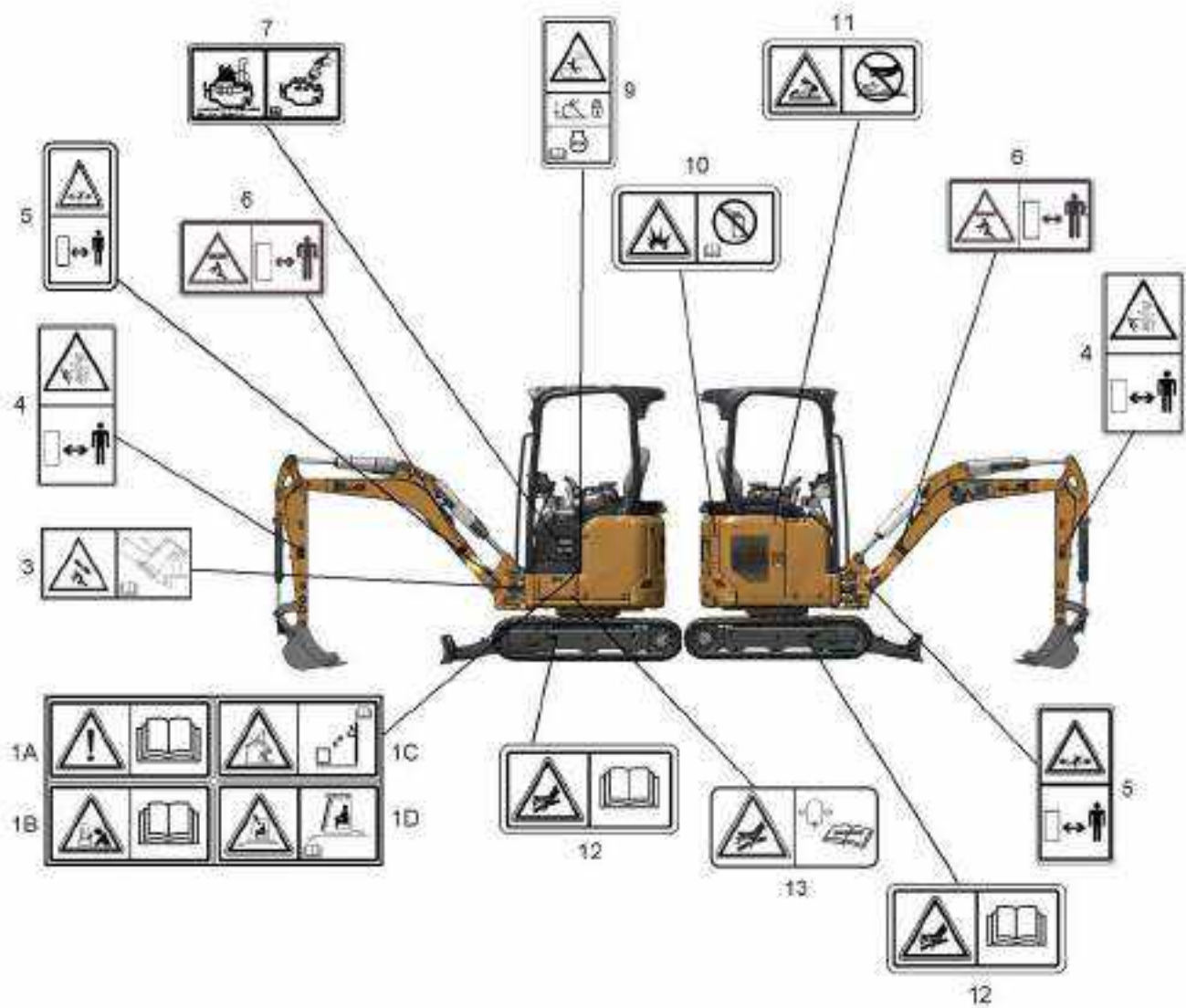


Illustration 3

g06482844

Japan machines

Warnings for canopy and cab machines

Do Not Operate (1A)

This safety message is in the cab below the operator seat.

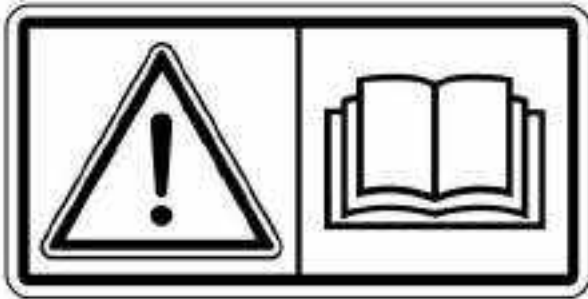


Illustration 4 g01370904

⚠ WARNING

Do not operate or work on this equipment unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Cat dealer for replacement manuals. Proper care is your responsibility.

Improper Connections For Jump-Start Cables (1B)

This safety message is in the cab below the operator seat.

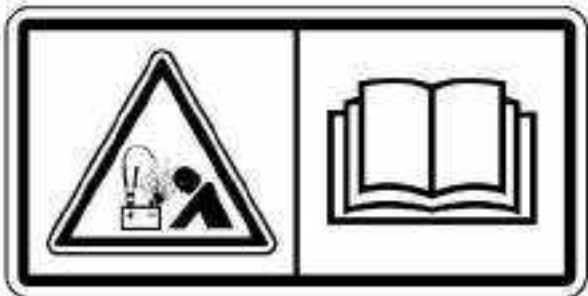


Illustration 5 g01370909

⚠ WARNING

Explosion Hazard! Improper jumper cable connections can cause an explosion resulting in serious injury or death. Batteries may be located in separate compartments. Refer to the Operation and Maintenance Manual for the correct jump starting procedure.

Refer to Operation and Maintenance Manual, "Engine Starting with Jump-Start Cables" for further information.

Electrical Power Lines (1C)

This safety message is in the cab below the operator seat.

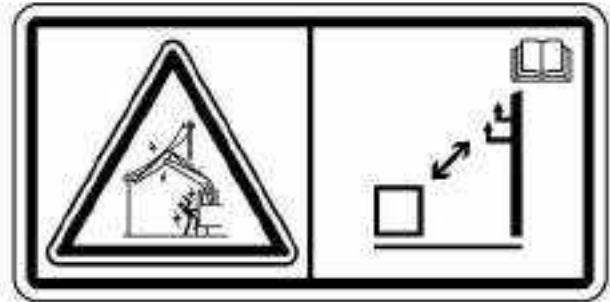


Illustration 6 g01374045

⚠ DANGER

Electrocution Hazard! Keep the machine and attachments a safe distance from electrical power. Stay clear 3 m (10 ft) plus twice the line insulator length. Read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions and warnings will cause serious injury or death

Refer to Operation and Maintenance Manual, "Specifications" for further information.

Crushing Hazard (1D)

This safety message is in the cab below the operator seat.



Illustration 7

g01374048

WARNING

The impact from objects that strike the front of the cab or the top of the cab could result in a crushing hazard with the potential for personal injury or death.

The front guard and the top guard should be installed on the cab for applications where the hazard of falling objects exist. Read the **Operation and Maintenance Manual**.

Refer to Operation and Maintenance Manual, "Guards" for further information.

Do Not Weld or Drill (TOPS/FOPS) (2)

This safety message is in the cab below the operator seat.

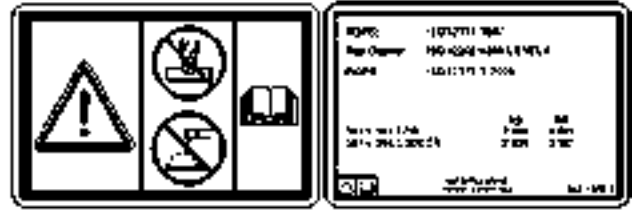


Illustration 8

g06317435

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. This will void the certification. Consult your Cat 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 film. 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.

Refer to Operation and Maintenance Manual, "Plate Locations and Film Locations" for further information.

Crushing Hazard (3)

This safety message is on the front of the machine to the left of the boom swing pin.



Illustration 9

g06275277

⚠ 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.

Crushing Hazard (4)

This safety message is on both sides of the stick.

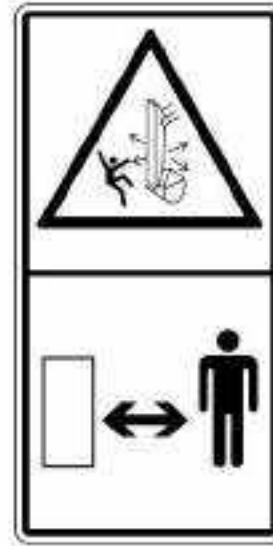


Illustration 10

g01385579

⚠ WARNING

A crushing hazard exists when the stick and boom are in motion and when the machine is being used in object handling applications. Failure to stay clear of the stick and boom when the machine is in operation can result in personal injury or death. Stay clear of the stick and boom when the machine is in operation.

Crushing Hazard (5)

This safety message is on the left side of the boom swing.



Illustration 11

g01958622

⚠ WARNING

Stay clear of this area when machine is operating. You can be crushed by swinging boom.

Crushing Hazard (6)

This safety message is on both sides of the boom.

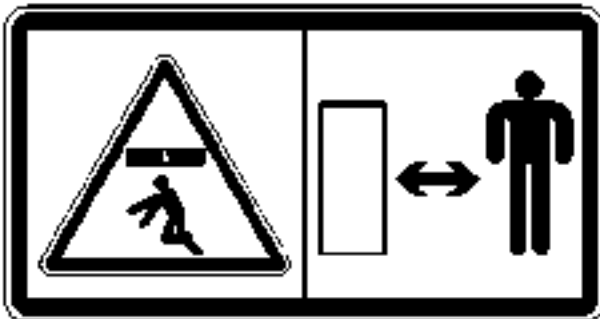


Illustration 12

g02470918

⚠ WARNING

A crushing hazard exists when the stick and boom are in motion and when the machine is being used in object handling applications. Failure to stay clear of the stick and boom when the machine is in operation can result in personal injury or death. Stay clear of the stick and boom when the machine is in operation.

Keep Engine Clean (7)

This safety message is in the cab below the operator seat.

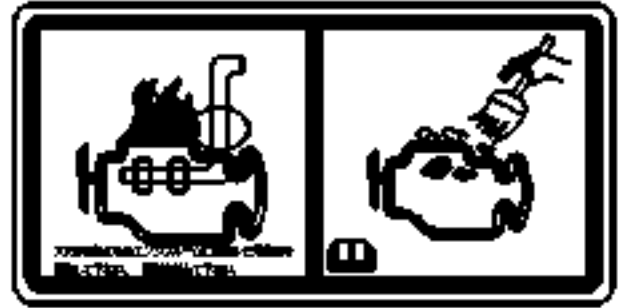


Illustration 13

g03173221

⚠ WARNING

Clean all accumulations of flammable materials such as fuel, oil, and debris from the machine. Failure to do so could cause the materials to ignite, causing a fire which could cause personal injury or death.

Overload Warning Device (8)

This safety message is in the cab below the operator seat.



Illustration 14

g01602013

⚠ WARNING

Overloading the machine could impact the machine's stability which could result in a tipover hazard. A tipover hazard could result in serious injury or death. Always activate the overload warning device before you handle or lift objects.

Refer to Operation and Maintenance Manual, "Operator Controls" for further information.

Crushing Hazard (9)

This safety message is in the cab below the operator seat and on the left rear pillar inside the cab.



Illustration 15

g02282255

WARNING

Crush Hazard! A machine may move unexpectedly and without warning resulting in personal injury or death.

Before leaving the machine lower the work tool to the ground, lock operator controls, shut off the engine and remove the key.

Aerosol Starting Aid (10)

This safety message is on the right rear of the machine.



Illustration 16

g01372254

WARNING

Explosion hazard! Do not use ether! This machine is equipped with an air inlet heater. Using ether can create explosions or fires that can cause personal injury or death. Read and follow the starting procedure in the Operation and Maintenance Manual.

Refer to Operation and Maintenance Manual, "Engine Starting" for further information.

Pressurized System (11)

This safety message is on the right side access door.



Illustration 17

g01371640

WARNING

Pressurized system! Hot coolant can cause serious burns, injury or death. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure. Read and understand the Operation and Maintenance Manual before performing any cooling system maintenance.

Refer to Operation and Maintenance Manual, "Cooling System Coolant Level - Check" for further information.

High-Pressure Cylinder (12)

This safety message is positioned on the track adjusters.



Illustration 18

g06266697

WARNING

High Pressure Cylinder. Do not remove any parts from the cylinder until all of the pressure has been relieved. This will prevent possible personal injury or death.

Refer to Operation and Maintenance Manual, "Track Adjustment - Adjust" for further information.

High-Pressure Gas (13)

This safety message is on the accumulator.

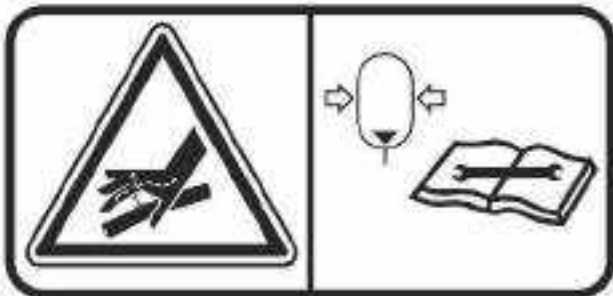


Illustration 19

g06275274

Seat Belt (14a)

This safety message is located in the cab below the operator seat.



Illustration 20

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.

Product Link (14b)

If equipped, this safety message is located in the cab below the operator seat.

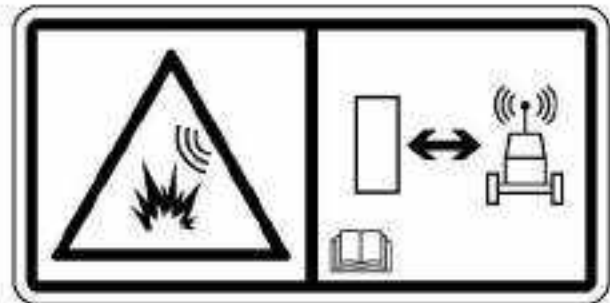


Illustration 21

g01370917

Crushing Hazard (14c)

This safety message is located in the cab below the operator seat.



Illustration 22

g01373971

WARNING

Crushing Hazard! Certain machine front linkage combinations (boom, stick, quick coupler, work tool) may require keeping the work tool away from the cab during operation. Personal injury or death may result if the work tool contacts the cab during operation.

Crushing Injury (14d)

This safety message is located in the cab below the operator seat.



Illustration 23

g01374035

WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged onto the pins. Read the Operator's Manual.

Refer to Operation and Maintenance Manual, "Quick Coupler Operation" for further information.

i08644737

Additional Messages

SMCS Code: 7000; 7405

There are several specific messages on this machine. The exact location of the messages and the description of the information are reviewed in this section. Become familiar with all messages.

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

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

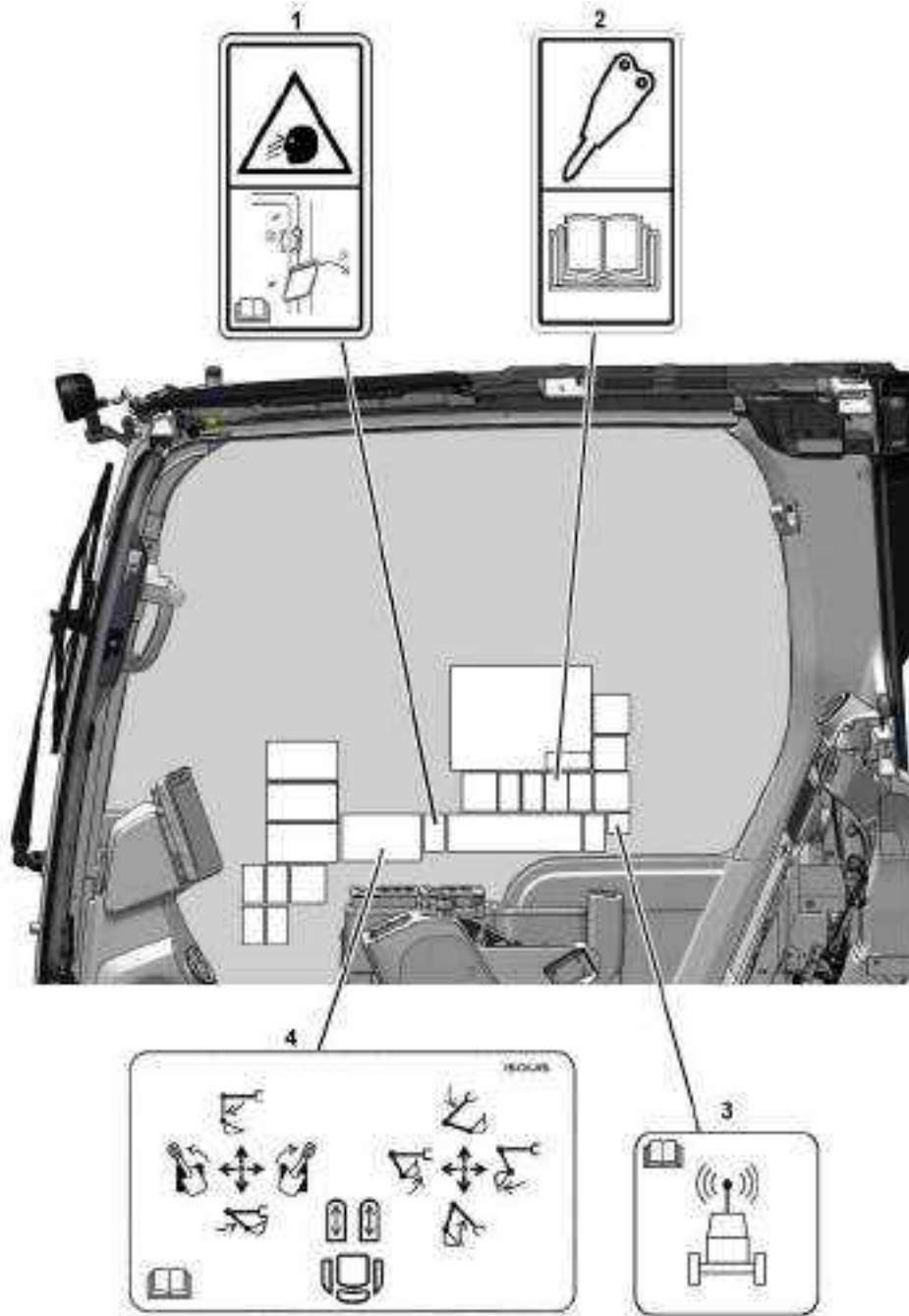


Illustration 24

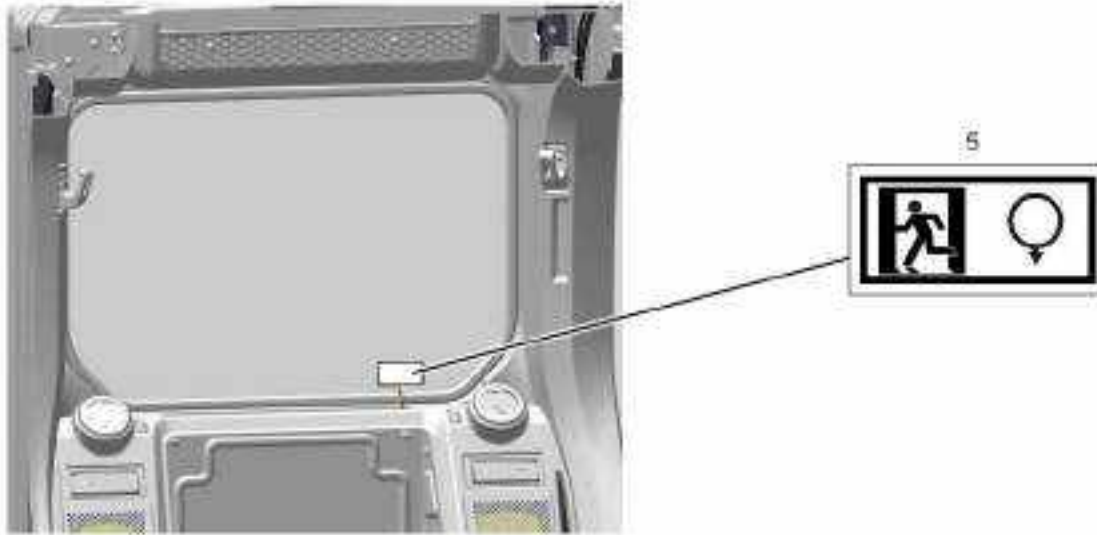


Illustration 25

g06696954

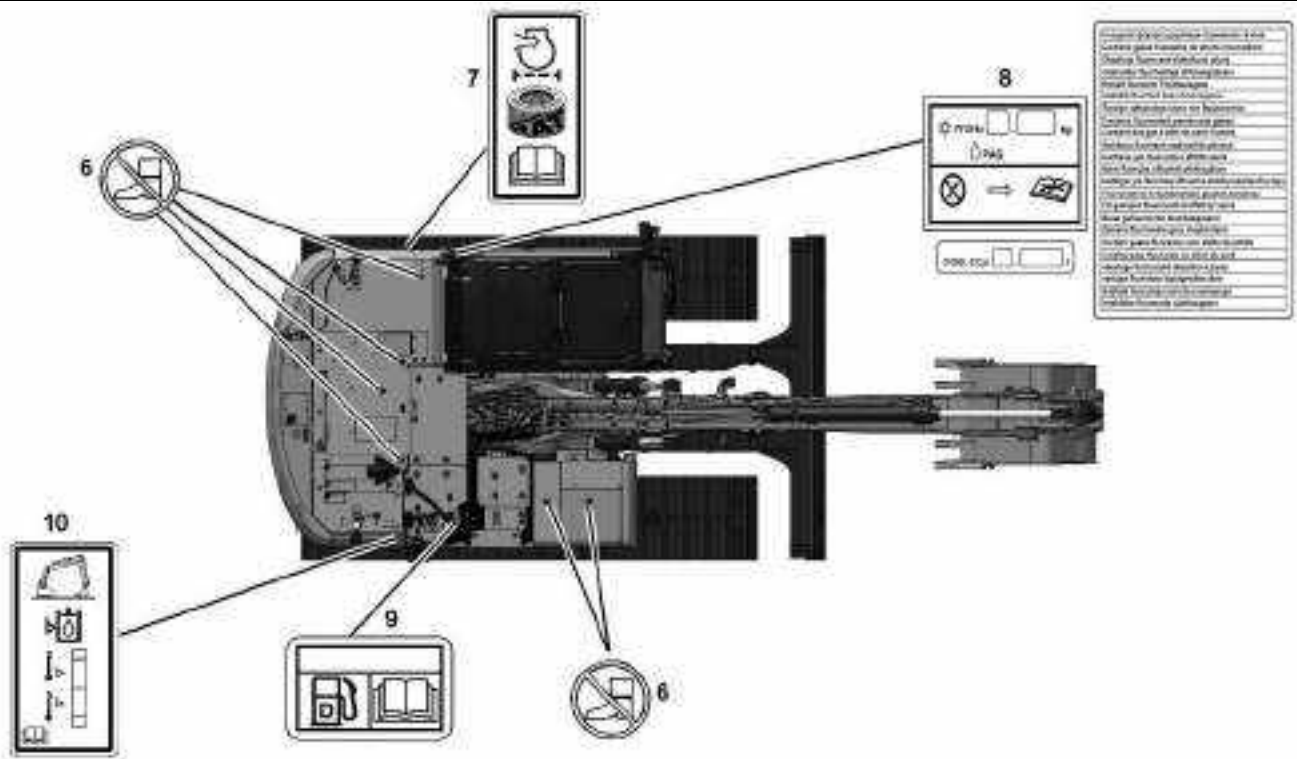


Illustration 26

g06696955

Front Window Usage (1)



Illustration 27

g06214810

This message is located on the window on the right side of the cab.

For machines equipped with the Cat[®] Grade Control monitor, the monitor must be moved downward before lifting or lowering the front window. The monitor is located in the path of the window track in the normal position of the monitor.

Hammer Operation (2)

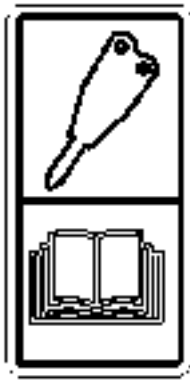


Illustration 28

g06189240

This message is located on the window on the right side of the cab.

Refer to “Work Tool Control” for instructions on hammer operation.

Cat[®]Product Link[™] (3)



Illustration 29

g01418953

This message is located on the window on the right side of the cab.

The Cat[®]Product Link[™] is a satellite communication device that transmits information regarding the machine back to Caterpillar and Cat[®] dealers and customers. All logged events and diagnostic codes that are available to the Cat[®] Electronic Technician (ET) on the Cat[®] data link can be sent to the satellite. Information can also be sent to the Cat[®]Product Link[™]. The information is used to improve Cat[®] products and Cat[®] services.

Refer to “Product Link” for more information.

Joystick Controls Alternate Patterns (4)

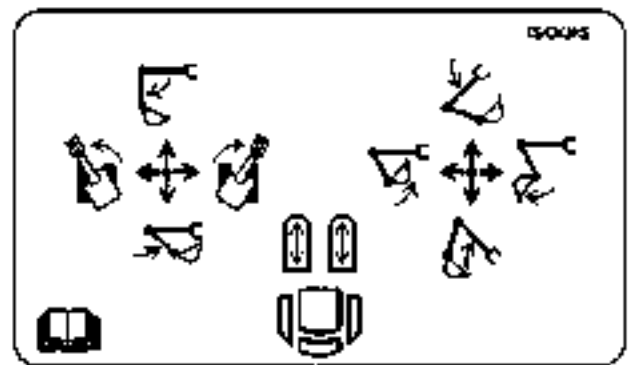


Illustration 30

g06214805

This message is located on the right side window of the cab.

Refer to “Joystick Controls Alternate Patterns” for further information.

Alternate Exit (5)



Illustration 31 g06189112

This message is located on the rear window of the cab in the lower left-hand corner.

Refer to “Alternate Exit” for more information.

No Step (6)

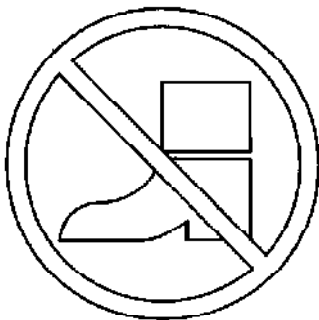


Illustration 32 g00911158

This message is located on various places on the upper structure and covers. The message is also located on the engine valve cover.

Do not step in this area.

Radial Seal Air Filters (7)



Illustration 33 g01134494

This message is located on the air cleaner.

To avoid engine damage, use only Cat® radial seal air filters. Other filters will not seal properly.

Refer to “Engine Air Filter Primary Element - Clean/Replace” for more information.

Air Conditioner (8)

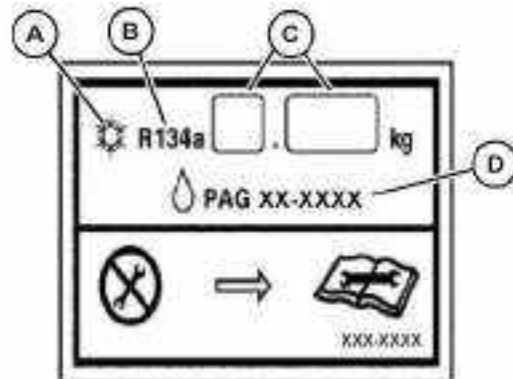


Illustration 34 g06650123

- (A) Air conditioning symbol
- (B) R134a (Refrigerant type common name)
- (C) Refrigerant quantity
- (D) PAG (polyalkylene glycol) lubricating oil part number

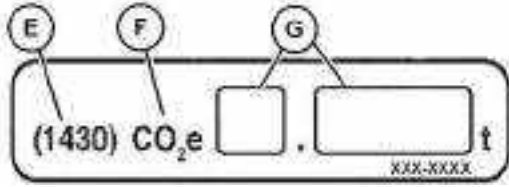


Illustration 35 g06650124

If equipped, this plate provides the below additional greenhouse gas information.

- (E) (1430) - This value is the Global Warming Potential of R134a
- (F) CO₂ equivalent
- (G) CO₂ equivalent in metric tonne based on quantity of charged R134a



Illustration 36 g06685232

(H) If equipped, this film provides the required language translations of the text "Contains fluorinated greenhouse gases"

These messages are located on the left door behind the cab.

These messages for the air conditioner system have the appropriate information for the following services: the air conditioner lubricant, the refrigerant charge, and the refrigerant capacity. Refer to "Air Conditioning and Heating Control" for more information.

Diesel Fuel Requirements (9)

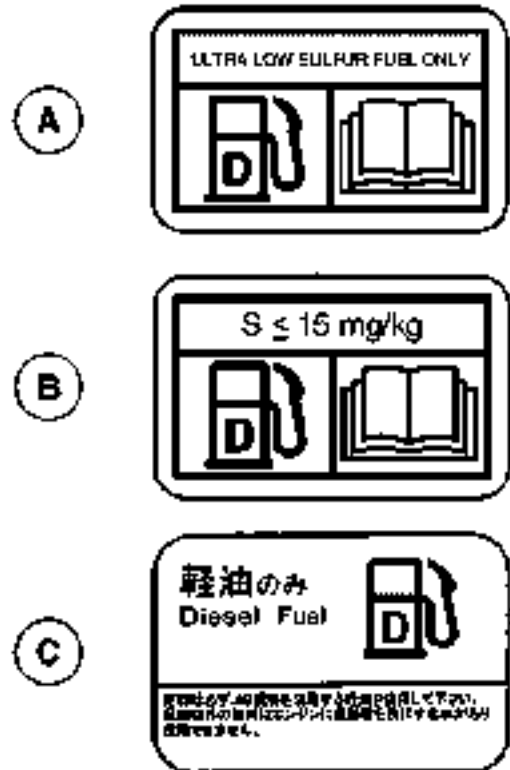


Illustration 37 g03218956

- (A) North America film
- (B) Europe, Africa, Middle East film
- (C) Japan film

This message is located by the fuel tank.

Hydraulic Oil Level Check (10)

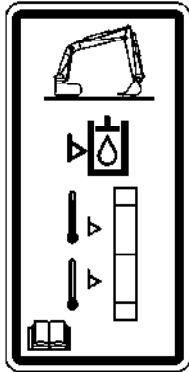


Illustration 38

g01069075

This message is located in the right access compartment next to the sight gauge for the hydraulic oil.

Check hydraulic oil level daily. Refer to "Hydraulic System Oil Level - Check" for more information.

i07920557

General Hazard Information

SMCS Code: 7000

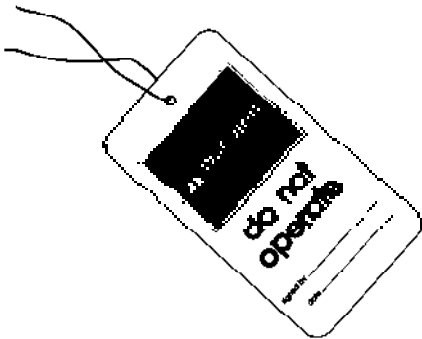


Illustration 39

g00104545

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

WARNING

Operating the machine while distracted can result in the loss of machine control. Use extreme caution when using any device while operating the machine. Operating the machine while distracted can result in personal injury or death.

Know the width of your equipment 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.

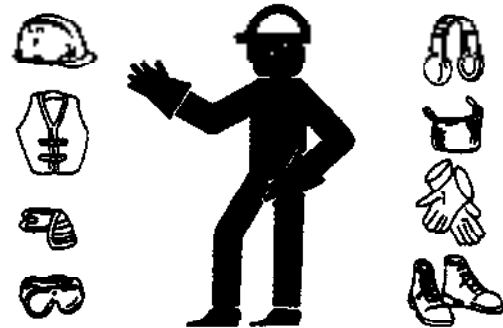


Illustration 40

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 and from the steps.

Remove 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.

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 anchorage points 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. The debris and/or hot water 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.

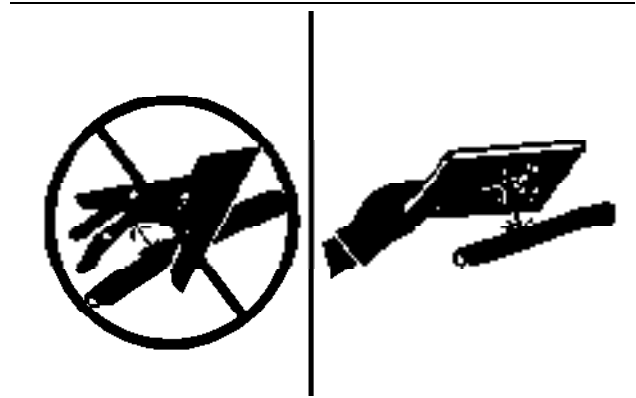


Illustration 41

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 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.

Inhalation



Illustration 42

g02159053

Exhaust

Use caution. Exhaust fumes can be hazardous to your health. If you operate the machine in an enclosed area, adequate ventilation is necessary.

Asbestos Information

Cat equipment and replacement parts that are shipped from Caterpillar are asbestos free. Caterpillar recommends the use of only genuine Cat 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 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 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”. In Japan, use the requirements found in the “Ordinance on Prevention of Health Impairment due to Asbestos” in addition to the requirements of the Industrial Safety and Health Act.
- Obey environmental regulations for the disposal of asbestos.
- Stay away from areas that might have asbestos particles in the air.

Dispose of Waste Properly

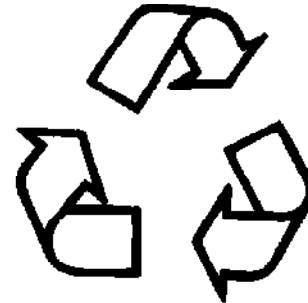


Illustration 43

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.

i05374155

Crushing Prevention and Cutting Prevention

SMCS Code: 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 were to break.

Do not work beneath the canopy of the machine unless the canopy 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 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.

i07746334

Burn Prevention

SMCS Code: 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 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 to remove the hydraulic tank filler cap.

Batteries

The liquid in a battery is an electrolyte. Electrolyte is an acid that can cause personal injury. Do not allow electrolyte to contact the skin or the eyes.

Do not smoke while checking the battery electrolyte levels. Batteries give off flammable fumes which can explode.

Always wear protective glasses when you work with batteries. Wash hands after touching batteries. The use of gloves is recommended.

i07746336

Fire Prevention and Explosion Prevention

SMCS Code: 7000



Illustration 44

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 Cat 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, and so on. 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 45

g03839130

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. Do not use cell phones or other electronic devices while you are refueling. Always stop the engine before fueling. Fill the fuel tank outdoors. Properly clean areas of spillage.

Safety Section
Fire Prevention and Explosion Prevention

Avoid static electricity risk when fueling. Ultra low sulfur diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with a higher sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure that the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

Never store flammable fluids in the operator compartment of the machine.

Battery and Battery Cables



Illustration 46

g03839133

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 Cat 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. Do not use cell phones or other electronic devices in battery charging areas.

Never check the battery charge by placing a metal object across the terminal posts. Use a voltmeter in order to check the battery charge.

Daily inspect battery cables that are in areas that are visible. Inspect cables, clips, straps, and other restraints for damage. Replace any damaged parts. Check 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 Cat 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 Cat 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.

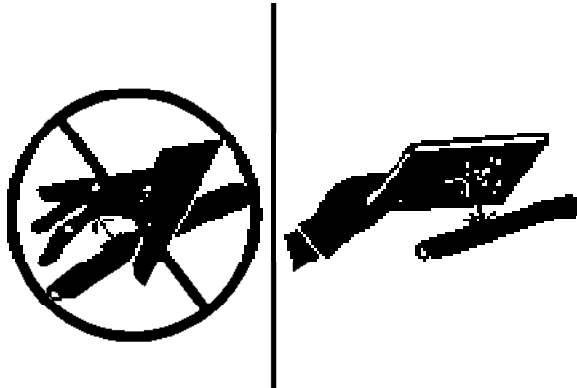


Illustration 47

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 Cat dealer for repair or for replacement parts. Use genuine Cat 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.

Only use approved Ether canisters for the Ether dispensing system fitted to your machine, do not spray Ether manually into an engine, follow the correct cold engine starting procedures. Refer to the section in the Operation and Maintenance Manual with the label "Engine Starting" .

Use ether in ventilated areas. Do not smoke while you are replacing an ether cylinder.

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.

i07374620

Fire Extinguisher Location

SMCS Code: 7000; 7419

Make sure that a fire extinguisher is available. Be familiar with the operation of the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instruction plate.

Install the correct size fire extinguisher to fit the mounting brackets.

A 5 kg (11 lb) fire extinguisher is recommended for this machine.

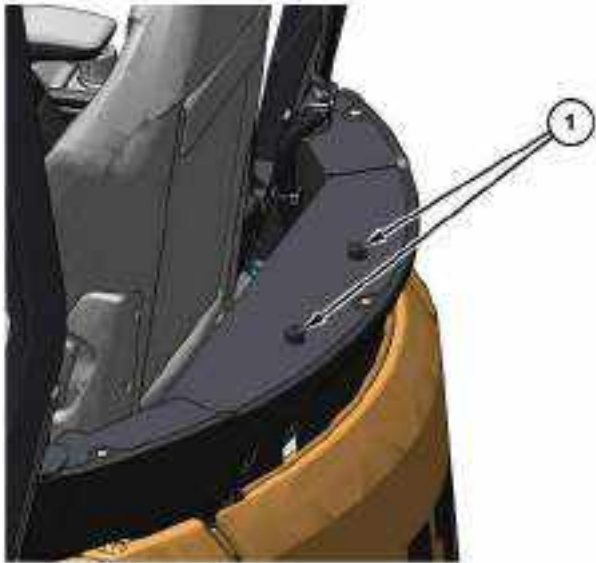


Illustration 48

g06264794

(1) Mounting brackets

A fire extinguisher can be installed at the rear, behind the operator seat, on machines with a canopy.



Illustration 49

g06264969

(1) Mounting brackets



Illustration 50

g06298662

A fire extinguisher can be installed at the rear, left pillar, or behind the operator seat on machines with a cab.

Consult your Cat dealer for the installation of a fire extinguisher according to "DIN-EN 3".

i01329108

Track Information

SMCS Code: 4170; 7000

Track adjusting systems use either grease or oil under high pressure to keep the track under tension.

Grease or oil under high pressure coming out of the relief valve can penetrate the body causing injury or death. Do not watch the relief valve to see if grease or oil is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

The pins and bushings in a dry track pin joint can become very hot. It is possible to burn the fingers if there is more than brief contact with these components.

i04243389

Electrical Storm Injury Prevention

SMCS Code: 7000

When lightning is striking in the vicinity of the machine, stop the work that is being performed. Leave the area, and stay away from the vicinity of the machine.

i04415163

Before Starting Engine

SMCS Code: 1000; 7000

Start the engine only from the operator seat. Do not short across the battery terminals. Bypassing the engine neutral start system can damage the electrical system.

Inspect the condition of the seat belt and the condition of the mounting hardware. Replace any damaged parts or worn parts. Regardless of appearance, replace the seat belt after 3 years of use. Do not use an extension for a seat belt on a retractable seat belt.

Adjust the seat so that full pedal travel can be achieved. Adjust the seat so that full lever travel can be achieved. Make sure that your back is 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 lights are working properly.

Make sure that the hydraulic lockout control is in the RAISED position. When the hydraulic lockout control is in the RAISED position, the controls and drive levers will be deactivated.

WARNING

Deactivation of the hydraulic controls does not prevent the blade, boom swing, or auxiliary circuit functions from moving under gravity or other external forces. Gravity or other external forces can move the blade, boom swing, or auxiliary circuit functions suddenly if a hydraulic control lever is moved.

Personal injury or death may occur from sudden machine movement.

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

i04450732

Visibility Information

SMCS Code: 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. Examples of visual aids are 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.

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 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.

Restricted Area

The restricted area is the area in which persons are in danger due to the movements of the:

- machine
- work equipment
- additional equipment or
- material

This also includes the area affected by falling material, equipment, or by parts which are thrown out.

The danger area must be extended by 0.5 m (20 inch) in the immediate vicinity of:

- buildings
- scaffolds or
- other elements of construction

Seal off the restricted area if not possible to keep a safe distance. Stop work if persons do not leave the restricted area in spite of warning. Keep out of the danger area.

i07404203

Restricted Visibility

SMCS Code: 7000

The size and the configuration of this machine may result in areas that cannot be seen when the operator is seated. For restricted visibility areas, an appropriate job site organization must be utilized to minimize hazards of this restricted visibility. For more information regarding job site organization refer to Operation and Maintenance Manual, "Visibility Information".

Illustrations 52 through 56 provide an approximate visual indication of the areas at ground level inside a radius of 12 m (39 ft) from the operator of significant restricted visibility for various machine configurations. Refer to the correct illustration for your machine configuration. All restricted visibility areas less than 300 mm wide may not be shown. These illustrations do not indicate areas of restricted visibility for distances outside of the shown radius. The areas of restricted visibility shown in the illustrations are with the track and work tool of the machine in the Travel position. Illustration 51 shows the position of the work tool in the travel position. The Caterpillar authorized work tool that resulted in the largest visibility restriction was used.



Illustration 51

g06319431

301.5

Illustration 52 indicates restricted visibility areas at ground level inside the shown radius from the operator.

Note: The shaded areas indicate the approximate location of areas with significant restricted visibility.



Illustration 52 g06321873
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

301.6

Illustration 53 indicates restricted visibility areas at ground level inside the shown radius from the operator.

Note: The shaded areas indicate the approximate location of areas with significant restricted visibility.



Illustration 53 g06321901
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

301.7 CR

Illustration 54 indicates restricted visibility areas at ground level inside the shown radius from the operator.

Note: The shaded areas indicate the approximate location of areas with significant restricted visibility.



Illustration 54 g06321906
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

301.8

Illustration 55 indicates restricted visibility areas at ground level inside the shown radius from the operator.

Note: The shaded areas indicate the approximate location of areas with significant restricted visibility.

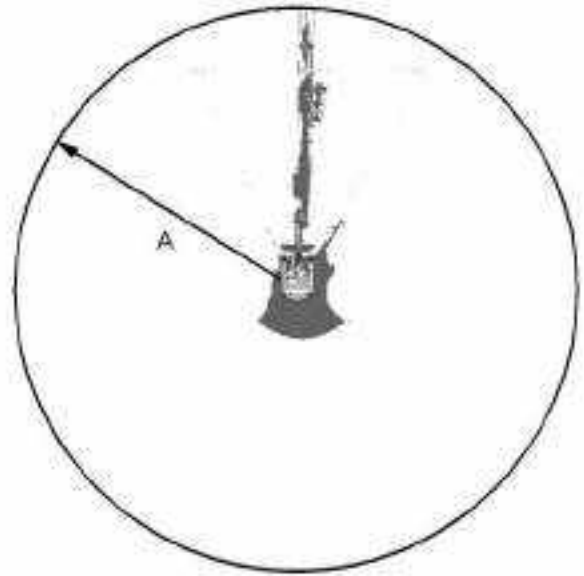


Illustration 55 g06321908
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

302 CR

Illustration 56 indicates restricted visibility areas at ground level inside the shown radius from the operator.

Note: The shaded areas indicate the approximate location of areas with significant restricted visibility.

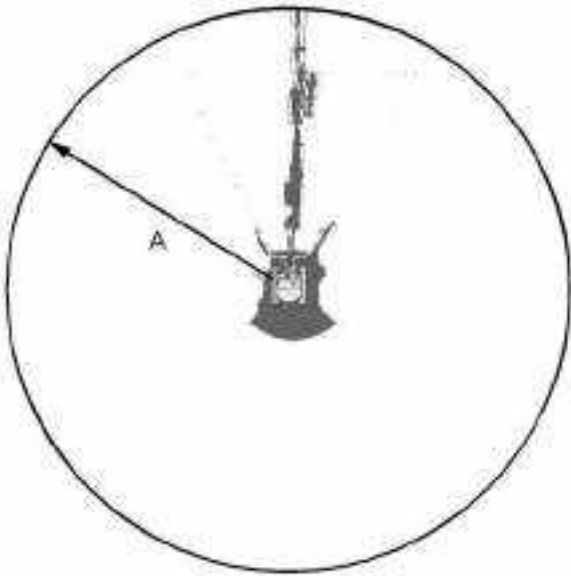


Illustration 56

g06321910

Top view of the machine, ground level visibility, with available left side mirror and right side mirror

(A) 12 m (39 ft)

i07246291

Engine Starting

SMCS Code: 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.

Before you start the engine, make sure that all hydraulic control levers and pedals are at the NEUTRAL position.



Illustration 57

g06264973

Put the hydraulic lockout control in the RAISED position.

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

Briefly sound the horn before you start the engine.

i07246046

Before Operation

SMCS Code: 7000

Clear all personnel from the machine and from the area.

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

On machines with a cab, make sure that all windows are clean. On machines with a canopy, secure the weather protection in the open position or in the closed position (if equipped).

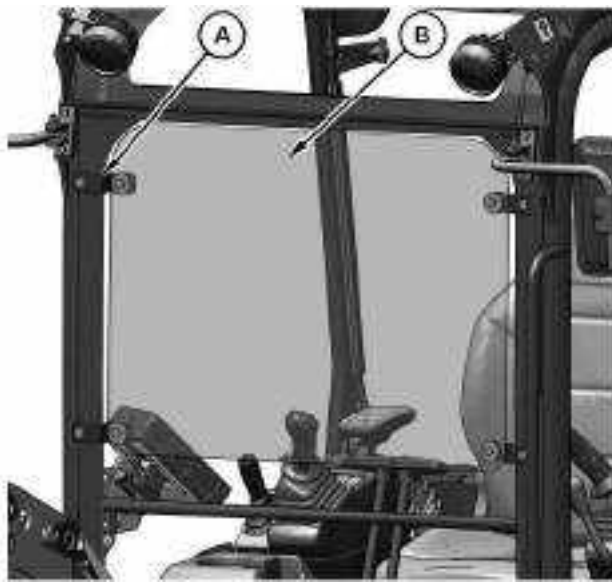


Illustration 58

g06264919

- (A) Bracket
(B) Protection screen

To install the weather protection, install four brackets (A) onto the front pillars of the canopy. Install protection screen (B) onto brackets (A).

To store the weather protection, unbolt protection screen (B) from brackets (A). Unbolt brackets (A) from the front pillars of the canopy.

For the best vision of the area that is close to the machine, adjust the rear view mirrors (if equipped).

Make sure that the machine horn, the travel alarm (if equipped), and all other warning devices are working properly.

Fasten the seat belt securely.

i05333458

Work Tools

SMCS Code: 6700

Only use work tools that are approved by Caterpillar for use on Cat machines.

Use of work tools, including buckets, which are outside of Caterpillar's recommendations or specifications for weight, dimensions, flows, pressures, and so on, may result in less-than-optimal vehicle performance, including but not limited to reductions in production, stability, reliability, and component durability. Caterpillar recommends appropriate work tools for our machines to maximize the value our customers receive from our products. Caterpillar understands that special circumstances may lead a customer to use tools outside of our specifications. In these cases, customers must be aware that such choices can reduce vehicle performance and will affect their ability to claim warranty in the event of what a customer may perceive as a premature failure.

Work tools and work tool control systems, that are compatible with your Cat machine, are required for safe machine operation and/or reliable machine operation. If you are in doubt about the compatibility of a particular work tool with your machine, consult your Cat dealer.

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

A polycarbonate shield must be used when a work tool could throw debris.

Do not exceed the maximum operating weight that is listed on the ROPS certification.

Always wear protective glasses. Always wear the protective equipment that is recommended in the operation manual for the work tool. 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.

Never use the work tool for a work platform.

i08481684

Operation

SMCS Code: 7000

Sound the horn and allow adequate time for bystanders to clear the area before moving the machine into a restricted visibility area. Follow local practices for your machine application. For more information refer to Operation and Maintenance Manual, Restricted Visibility.

Machine Operating Temperature Range

The machine must function satisfactorily in the anticipated ambient temperature limits that are encountered during operation. The standard machine configuration is intended for use within an ambient temperature range of -18°C (0°F) to 43°C (109°F). Special configurations for different ambient temperatures may be available. Consult your Cat dealer for additional information on special configurations of your machine.

Limiting Conditions and Criteria

Limiting conditions are immediate issues with this machine that must be addressed prior to continuing operation.

The Operation and Maintenance Manual, Safety Section describes limiting condition criteria for replacing items such as safety messages, seat belt and mounting hardware, lines, tubes, hoses, battery cables and related parts, electrical wires, and repairing any fluid leak.

The Operation and Maintenance Manual, Maintenance Interval Schedule describes limiting condition criteria that require repair or replacement for items (if equipped) such as alarms, horns, braking system, steering system, and rollover protective structures.

The Operation and Maintenance Manual, Monitoring System (if equipped) provides information on limiting condition criteria, including a Warning Category 3 that requires immediate shutdown of the engine.

Critical Failures

The following table provides summary information on several limiting conditions found in this Operation and Maintenance Manual. The table provides criteria and required action for the limiting conditions listed. Each System or Component in this table, together with the respective limiting condition, describes a potential critical failure that must be addressed. Not addressing limiting conditions with required actions may, in conjunction with other factors or circumstances, result in a risk of personal injury or death. If an accident occurs, notify emergency personnel and provide location and description of accident.

Safety Section
Operation

Table 1

System or Component Name	Limiting Condition	Criteria for Action	Required Action
Line, tubes, and hoses	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.	Visible corrosion, loose, or damaged lines, tubes, or hoses. Visible fluid leaks.	Immediately repair any lines, tubes, or hoses that are corroded, loose, or damaged. Immediately repair any leaks as these may provide fuel for fires.
Electrical Wiring	Signs of fraying, abrasion, cracking, discoloration, cuts on the insulation	Visible damage to electrical wiring	Immediately replace damaged wiring
Battery cable(s)	Signs of fraying, abrasion, cracking, discoloration, cuts on the insulation of the cable, fouling, corroded terminals, damaged terminals, and loose terminals	Visible damage to battery cable(s)	Immediately replace damaged battery cables
Operator Protective Structure	Structures that are bent, cracked, or loose. Loose, missing, or damaged bolts.	Visible damage to structure. Loose, missing, or damaged bolts.	Do not operate machine with damaged structure or loose, missing, or damaged bolts. Contact your Cat dealer for inspection and repair or replacement options.
Seat Belt	Worn or damaged seat belt or mounting hardware	Visible wear or damage	Immediately replace parts that are worn or damaged.
Seat Belt	Age of seat belt	Three years after date of installation	Replace seat belt three years after date of installation
Safety Messages	Appearance of safety message	Damage to safety messages making them illegible	Replace the illustrations if illegible.
Audible Warning Device(s) (if equipped)	Sound level of audible warning	Reduced or no audible warning present	Immediately repair or replace audible warning devices not working properly.
Camera(s) (if equipped)	Dirt or debris on camera lens	Dirt or debris obstructing camera view	Clean camera before operating machine.
Cab Windows (if equipped)	Dirt, debris, or damaged windows	Dirt or debris obstructing operator visibility. Any damaged windows.	Clean windows before operating machine. Repair or replace damaged windows before operating machine.
Mirrors (if equipped)	Dirt, debris, or damaged mirror	Dirt or debris obstructing operator visibility. Any damaged mirrors.	Clean mirrors before operating machine. Repair or replace damaged mirrors before operating machine.
Braking System	Inadequate braking performance	System does not pass Braking System - Test(s) included in Maintenance Section or in the Testing and Adjusting Manual	Contact your Cat dealer to inspect and, if necessary, repair the brake system.
Cooling System	The coolant temperature is too high.	Monitoring System displays Warning Category 3	Stop the engine immediately. Check the coolant level and check the radiator for debris. Refer to Operation and Maintenance Manual, Cooling System Coolant Level - Check. Check the fan drive belts for the water pump. Refer to Operation and Maintenance Manual, Belts - Inspect/Adjust/ Replace. Make any necessary repairs.
Engine Oil System	A problem has been detected with the engine oil pressure.	Monitoring System displays Warning Category 3	If the warning stays on during low idle, stop the engine and check the engine oil level. Perform any necessary repairs as soon as possible.
Engine system	An engine fault has been detected by the engine ECM.	Monitoring System displays Warning Category 3	Stop the engine immediately. Contact your Cat dealer for service.
Fuel System	A problem has been detected with the fuel system.	Monitoring System displays Warning Category 3	Stop the engine. Determine the cause of the fault and perform any necessary repairs.
Hydraulic Oil System	The hydraulic oil temperature is too high.	Monitoring System displays Warning Category 3	Stop the engine immediately. Check the hydraulic oil level and check the hydraulic oil cooler for debris. Perform any necessary repairs as soon as possible.

(continued)

(Table 1, contd)

System or Component Name	Limiting Condition	Criteria for Action	Required Action
Steering System	A problem has been detected with the steering system. (If equipped with steering system monitoring.)	Monitoring System displays Warning Category 3	Move machine to a safe location and stop the engine immediately. Contact your Cat dealer to inspect and, if necessary, repair the steering system.
Overall Machine	Machine service is required.	Monitoring System displays Warning Category 3	Stop the engine immediately. Contact your Cat dealer for service.

Machine Operation

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

Check for proper operation of all controls and of all protective devices while you operate the machine slowly in an open area.

When the machine is moving watch the clearance of the boom. Uneven ground can cause the boom to move in all directions.

Make sure that no personnel will be endangered before you move the machine. Do not allow riders on the machine unless the machine has an additional seat with a seat belt.

Report any machine damage that was noted during machine operation. Make any necessary repairs.

Never use the work tool for a work platform.

Hold attachments approximately 40 cm (15 inches) above ground level while you drive the machine. Do not drive the machine close to an overhang, to the edge of a cliff, or to the edge of an excavation.

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

Be careful to avoid any ground condition which could cause the machine to tip. Tipping can occur when you work on hills, on banks, or on slopes. Tipping can also occur when you cross ditches, ridges, or other unexpected obstructions.

When possible, operate the machine up slopes and down slopes with the final drive sprockets facing down the slope. Avoid operating the machine across the slope. Place the heaviest end of the machine uphill when you are working on an incline.

Keep the machine under control. Do not overload the machine beyond capacity.

Avoid changing the direction of travel on a slope. Changing the direction of travel on a slope could result in tipping or side slipping of the machine.

Bring the load close to the machine before traveling any distances.

Bring the load close to the machine before swinging the load.

Lifting capacity decreases as the load is moved further from the machine.

Make sure that the towing eyes and the towing devices are adequate for your needs.

Only connect trailing equipment to a drawbar or to a hitch.

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

When you maneuver in order to connect the equipment, make sure that no personnel are between the machine and trailing equipment. Block up the hitch of the trailing equipment in order to align the equipment with the drawbar.

Check the local regulations, state codes, and/or directives of the job site for a specific minimum distance from obstacles.

Before you operate the machine, check with local utilities for the locations of underground pipes and for the locations of buried cables.

Know the maximum dimensions of your machine.

Watch the load at all times.

Do not operate the machine without the counterweight. The machine can tip when the boom is over the side.

The clamshell, the grapple, or the magnet can swing in all directions. Move the joysticks in a continuous motion. Failure to move the joysticks in a continuous motion can cause the clamshell, the grapple, or the magnet to swing into the cab or into a person in the work area. This will result in personal injury.

Certain machine front linkage combinations (boom, stick, quick coupler, work tool) can allow the work tool to contact the machine undercarriage, swing frame, boom, boom hydraulic cylinder and or the cab. Be aware of the position of the work tool while you operate the machine.

Shut down the machine until damaged or non-functioning visibility aid(s) is repaired (if applicable) or until appropriate job site organization is used to minimize hazards that are caused by any resulting restricted visibility.

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Machine Operation when the Machine is not Completely Assembled

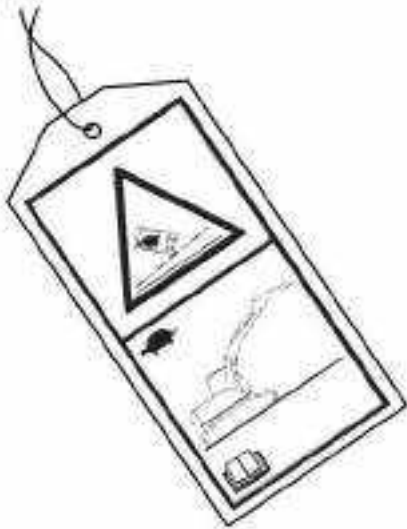


Illustration 59

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Attach the tag to the controls of the machine. When the tag is attached to the controls, operate the machine as described below.

If the machine needs to be operated without the boom, stick, and/or counterweight being installed, the machine should be operated slowly on flat, stable ground or pavement by qualified operators. Avoid any machine operations which could affect machine stability, including the swing function. The ROPS structural certification depends on the support of the boom, stick, and counterweight in the event of a machine tip over or a machine rollover incident.

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Engine Stopping

SMCS Code: 1000; 7000

Do not stop the engine immediately after the machine has been operated under load. This action can cause overheating and accelerated wear of engine components.

After the machine is parked, allow the engine to run for 2 minutes before shutdown. Running the engine for 2 minutes before shutdown allows hot areas of the engine to cool gradually.

Lifting Objects

SMCS Code: 7000

There may be local regulations and/or government regulations that govern the use of machines which lift heavy objects. Obey all local and government regulations.

Regional regulations may require the use of an overload warning device and boom and stick lowering control valves when used to lift objects.

If this machine is used to lift objects within Japan, Japanese regulations require the machine to be equipped with a shovel crane configuration.

Contact your Cat dealer for additional information.

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Demolition

SMCS Code: 6700

There maybe local regulations and/or government regulations that govern the use of machines which are designed and used as demolition machinery.

Note: Obey all local and government regulations.

Demolition machinery is designed for demolishing by pushing or pulling, or fragmenting. Demolition is done by crushing or shearing, buildings and/or other civil engineering structures and component parts and/or separating the resultant debris.

If this machine is used for demolition, regional regulations may require the machine to be equipped with:

- Rollover Protective Structure (ROPS, not required for demolition excavators)
- Boom Lowering Control Valve (BLCV) / Stick Lowering Control Valve (SLCV)
- Top Guard / Front Guard
- Bottom / Motor / Swivel Guard
- EN 356 class P5A front window glass
- If a roof window is used to provide visibility to the working area, then roof window shall be equipped with motorized windscreen wipers and washers.

Demolition applications may generate flying debris. Ensure that there are no personnel in the area around the machine where flying debris may travel.

Demolition applications may generate airborne dust that can be hazardous to your health. If you operate the machine in a dust generating applications, use appropriate safeguarding or adequate ventilation to minimize risk.

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Parking

SMCS Code: 7000

When the engine is turned off, movement of the hydraulic equipment can occur under the following conditions:

- The work tool is not positioned on the ground.
- The work tool drifts when the equipment is not supported.

WARNING

Deactivation of the hydraulic controls does not prevent the blade, boom swing, or auxiliary circuit functions from moving under gravity or other external forces. Gravity or other external forces can move the blade, boom swing, or auxiliary circuit functions suddenly if a hydraulic control lever is moved.

Personal injury or death may occur from sudden machine movement.

1. Park on a level surface. If necessary to park on a grade, chock the tracks.



Illustration 60

g06263720

2. Lower the work tools and the blade to the ground.

3. Move the governor control lever to the LOW idle position and operate the engine at low idle for 2 minutes to allow the engine to cool down.
4. Turn the engine start switch to the OFF position and remove the key.



Illustration 61

g06263724

5. Place the hydraulic lockout control in the RAISED position.

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Slope Operation

SMCS Code: 7000

WARNING

When traveling up or down a slope, travel slowly. The machine can tip at angles that are 15 degrees or more, which could cause serious injury or death. Refer to the Operation and Maintenance Manual for the proper traveling procedure.

WARNING

When traveling across a slope, travel slowly. The machine can tip at angles that are 10 degrees or more, which could cause serious injury or death. Refer to the Operation and Maintenance Manual for the proper traveling procedure.

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 machine traction and machine 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.

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 work tools 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.

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 Code: 7000-II

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 Code: 7000

Sound Level Information

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

Table 2

	Sound Level	Test Method
Operator Sound Pressure Level	68 dB(A)	"ISO 6396:2008" ⁽¹⁾
Exterior Sound Power Level	100 dB (A)	"ISO 6395:2008" ⁽²⁾

(1) The measurement was conducted at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds. The measurement was conducted with the cab doors and the cab windows closed. The cab was properly installed and maintained.

(2) The measurement was conducted at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds.

The sound levels listed above include both measurement uncertainty and uncertainty due to production variation.

Sound Level Information for Machines Required by the Applicable Regional Regulations

- European Union Countries
- United Kingdom
- Eurasian Economic Union Countries
- Ukraine
- Countries that Adopt the “EU Directives”

The information below applies to only the machine configurations that contain regional product marking on or near the Product Identification Plate noted in the “Regional Product Marking” section of this manual.

Table 3

Declared Dynamic Operator Sound Pressure Level		
Region	Sound Level	Test Method
European Union	68 dB(A)	“ISO 6396:2008” ⁽¹⁾
United Kingdom	68 dB(A)	“ISO 6396:2008” ⁽¹⁾
Eurasian Economic Union	68 dB(A)	“ISO 6396:2008” ⁽¹⁾

⁽¹⁾ The measurement was conducted at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds. The measurement was conducted with the cab doors and the cab windows closed. The cab was properly installed and maintained.

Table 4

Declared Exterior Sound Power Level		
Region	Sound Level	Test Method
European Union	100 dB(A)	“ISO 6395:1988” ⁽¹⁾
United Kingdom	100 dB(A)	“ISO 6395:1988” ⁽¹⁾
Eurasian Economic Union	100 dB(A)	“ISO 6395:2008” ⁽¹⁾
Ukraine	100 dB(A)	“ISO 6395:1988” ⁽¹⁾

⁽¹⁾ The measurement was conducted at 70% of the maximum engine cooling fan speed. The sound level may vary at different engine cooling fan speeds.

The declared sound levels listed above include both measurement uncertainty and uncertainty due to production variation.

The machine sound power level meets the criteria that are specified in the applicable regional regulation. For example:

- “European Directive 2000/14 EC” amended by “2005/88/EC”
- “United Kingdom 2001 No. 1701” amended by “2005 No. 3525”
- “Ukraine Technical Regulation of the Noise Emission in the Environment by Equipment for Use Outdoors”

The criteria are specified on the certificate of the conformance and the accompanying labels.

Vibration Information Applicable to Regional Regulations

- “European Union Directive: 2002/44/EC - Physical Agents (Vibration) ”
- “United Kingdom: 2005 No. 1093 - The Control of Vibration at Work Regulation 2005 ”

Vibration Data for Track Type Excavator

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 track type excavators.

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 5 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 to obtain the estimated vibration level. For aggressive operations and severe terrain, add the Scenario Factors to the average vibration level to obtain the estimated vibration level.

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

Table 5

"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
Track Type Excavators	excavating	0.44	0.27	0.30	0.24	0.16	0.17
	hydraulic breaker application	0.53	0.31	0.55	0.30	0.18	0.28
	mining application	0.65	0.42	0.61	0.21	0.15	0.32
	transfer	0.48	0.32	0.79	0.19	0.20	0.23

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.

The Caterpillar suspension seat meets the criteria of "ISO 7096". This represents vertical vibration level under severe operating conditions.

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 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 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 to minimize the vibration level.
 - a. Drive around obstacles and rough terrain.
 - b. Slow down when driving 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 track type excavators.

- c. If no ride control system is available, reduce speed 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 to provide better operator comfort:
- a. Adjust the seat and adjust the controls to achieve good posture.
 - b. Adjust the mirrors to minimize twisted posture.
 - c. Provide breaks 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 the calculation procedure are 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.

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.

Consult your local Cat[®] dealer for more information about machine features that minimize vibration levels. Consult your local Cat[®] dealer about safe machine operation.

Use the following web site to find your local dealer:

Caterpillar, Inc.
www.cat.com

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Operator Station

SMCS Code: 7300; 7301; 7325

Any modifications to the operator station should not project into the operator space. The addition of a fire extinguisher, and other equipment must be installed so that the defined operator space is maintained. Do not bring any items into the operator station. A lunch box or other loose items must be removed. Objects must not pose an impact hazard in rough terrain or in the event of a rollover.

Note: Apart from the operator, no other persons are allowed to ride on the machine.

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Guards (Operator Protection)

SMCS Code: 7000; 7150

There are different types of guards that are used to protect the operator. The machine and the machine application will determine the type of guard that has to be used. The decision regarding the necessary protective structures must be made by the machine owner. The machine owner must observe the national regulations and must inform the operator on the protective structure to be used in a specific work situation.

A daily inspection of the guards is required 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.

Roll Over Protective Structure (ROPS), Falling Object Protective Structure (FOPS), and Tip Over Protection Structure (TOPS)

The ROPS/TOPS structure (canopy) and if equipped, the FOPS structure (roof guard) on your machine is designed, tested, and certified for that machine. Any alteration or any modification to the ROPS/TOPS and 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 ROPS/TOPS and FOPS structure. The protection that is offered by the ROPS/TOPS and FOPS structure will be impaired if the ROPS/TOPS and 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/TOPS and FOPS structure or by drilling holes in the ROPS/TOPS and FOPS structure. Welding brackets or drilling holes in the ROPS/TOPS and FOPS structures can weaken the structures. Consult your Cat dealer for mounting guidelines.

Note: Operating the machine without a ROPS structure is not permitted.

Other Guards (If Equipped)

Protection from flying fragments/objects and/or falling objects is required for special applications. Safety glasses are recommended when flying hazards exist for machines with cabs and machines with open canopies.

Operating the machine in areas with danger of falling objects from above is only permitted with a FOPS structure (roof guard). The protective FOPS structure corresponds to category I and protects the operator against falling material according to "EN ISO 3449:1992".

Note: Only carry out work that does not require any higher-level protection!

Definition of Category I: – Protection against small falling objects (FOPS) or small objects penetrating into the cab from the front (Front Guard), such as bricks, small pieces of concrete, tools, for machines that are used for repairing roads, landscaping work and for working on other construction sites.

Definition of Category II: – Protection against heavy falling objects (FOPS) or heavy objects penetrating into the cab from the front (Front Guard), such as

trees, pieces of rock, for machines that are used for clearance work and forestry work.

When a work tool that creates flying fragments is used, a Polycarbonate shield that is approved by Caterpillar has to be installed (optional equipment). A Polycarbonate shield fulfills the function of a front window but not of a front guard. However, the limited operating range has to be observed, which depends on the used work tool. Graphics 62 and 63 show the limited operating range on the example of a hydraulic hammer.

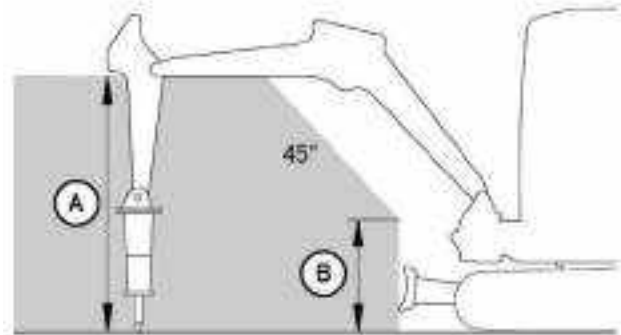


Illustration 62

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(A) 120 cm (47 inch)
(B) 50 cm (20 inch)



Illustration 63

g06276140

When visibility is restricted due to rain, snowfall, dust etc., the work has to be stopped. Resume work only if visibility is no longer restricted.

Note: Operating the machine in areas with danger from objects from the front is NOT permitted.

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 Cat dealer for additional information.

Product Information Section

General Information

i07105852

Regulatory Information (Japan)

SMCS Code: 7000**S/N:** JH71-Up**S/N:** RHM1-Up

Qualifications for Machine Operation

The following qualifications are required for the operation of this machine:

Excavation and Loading

Completion of the construction machines (for land leveling, hauling, loading, and excavation) operation skill training course. (Qualification by the Industrial Safety and Health Act)

Demolition

Completion of the construction machines (for demolition) operation skill training course. (Qualification by the Industrial Safety and Health Act)

Mining Jobs

Certification by the Director General or Deputy Director General of Bureau of Mine Safety after completion of the safety training course. (Qualification by the Mine Safety Act)

Crane Slings for the Bucket with a Hook

Completion of the special slinging training for the crane for loads weighing less than 1 ton. (Qualification by the Industrial Safety and Health Act)

Trailer Transportation

In principle, this machine should be transported by a trailer. Select the appropriate trailer regarding the machine weight and measurements shown in the major specifications in the specification part of this manual. Be aware machine weight and transportation measurements differ depending on the various types of attachments.

- In the event heavy items are to be transported, observe the related laws. These laws include Road Traffic Law, Road Laws, Road Transportation Vehicle Laws, and Vehicle Restriction Laws.
- Conduct prior investigation of the road width, ground clearance of road/railway bridges, weight restrictions etc. of the planned transportation route, to confirm the viability of the transportation execution.

Load

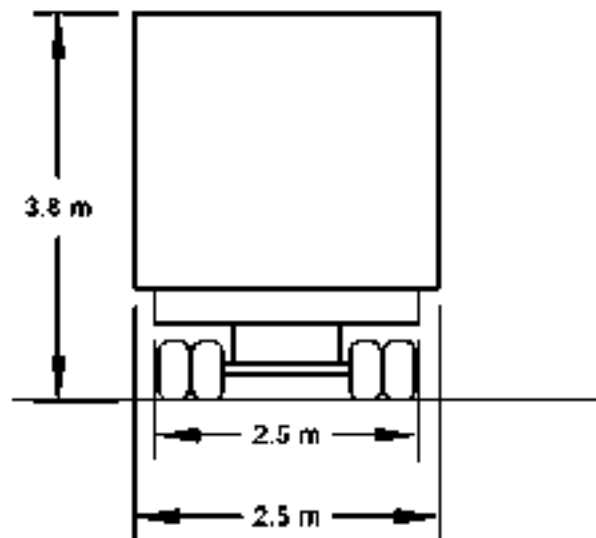


Illustration 64

g02698738

- Not more than 3.8 m (12 ft 6 inch)
- Not more than 2.5 m (8 ft 2 inch)(Safety Standard)
- Not more than 2.5 m (8 ft 2 inch) (Vehicle Restriction Laws)
- Items that protrude out are not allowed. (Government ordinance for Road Traffic Laws)

Transportation weight and measurements are restricted by the Vehicle Restriction Laws. If the actual weight/measurements exceed the limitation figures, you must submit the restriction relaxation request to the pertinent governmental agencies. For details, consult your Cat dealer.

Table 6

Total Length	Not more than 12 m (39 ft 4 inch)
Total Width (A)	Not more than 2.5 m (8 ft 2 inch)

(continued)

(Table 6, contd)

Total Height (B)	Not more than 3.8 m (12 ft 6 inch) when loaded on the trailer.
Total Weight	20 to 25 ton (depending on road, axle, and vehicle length)

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

Various laws and regulations, including Industrial Safety and Health Act, are enforced to ensure prevention of injuries on and around construction equipment and safe and comfortable operation of equipment. Be sure to obey them.

NOTICE

The notices regarding machine operation, inspection, maintenance, and safety contained in this manual are applicable only to cases in which the machine is used for the specified jobs. It is impossible for this kind of manual to cover every kind of operation. Therefore, the content of this manual does not necessarily explain all possible cases. Be sure to pay careful attention also to the items not covered by this manual and confirm the safety before starting jobs to prevent human injury and machine damage accidents.

Qualification of Operators

Operation of construction equipment is limited to persons who have any of the following licenses by law.

Note: Employers will face imprisonment up to a maximum of 6 months or a fine of up to a maximum of five hundred thousand yen if they let unqualified personnel operate equipment. Unqualified operators will also be fined up to a maximum of five hundred thousand yen.

- One who completed an operating skill course for vehicle-type construction equipment at a registered training institution.
- One who passed the construction equipment and technologies license examination (Type 1-3) defined by the Construction Industry Law.
- One who completed an operating training course for construction equipment defined by the Vocational Training Law.

- One who took a special training (rules and skills) at a registered training institution to operate equipment weighing less than 3 tons.
- With an auto-drivers license, an operator does not need to complete an operating skill course for construction equipment to operate equipment on the roads that apply to the rules of the Road Traffic Act. However, the operator needs to complete the course to engage in snow clearing or excavating on the roads.
- The operator must be qualified under the Mine Safety Act to operate construction equipment in a mine.

Acquisition of the Qualifications

The company offers training courses for construction machine operation, in addition to other skills. For details, contact the company's dealer in your area.

Regarding machine operation qualifications, also refer to the laws related to the construction machines shown at the end of this manual.

Subsidy System

Small-to-medium-sized construction business companies are eligible to receive a subsidy for a part of training fees and wages when they have their employees attend a training course to improve skills.

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

Information about operating skill course for vehicle-type construction equipment (for ground leveling, transporting, loading, excavating).

Industrial Safety and Health Act requires operators of construction equipment weight 3 tons and over to acquire a certificate of completion of an operating skill course. Registered with and authorized by the respective directors general of the regional labor bureaus, we offer operating skill courses for vehicle-type construction equipment and special trainings.

Request for Periodical Self-Inspection

Rules of Periodical Self-Inspection

The employer shall, as provided for by the Ordinance of the Ministry of Health, Labor and Welfare, conduct self-inspection periodically. The employer shall keep the records of the results in respect to construction equipment such as tractor shovels and power shovels, etc., specified by Cabinet Order. (from Article 45, Industrial Safe and Health Act)

Ordinance on Industrial Safety and Hygiene

Periodical self-inspections Article 167

(1) The employer shall, as regards a vehicle type construction machine, carry out self-inspections for the following matters periodically once every period within a year. However, this shall not apply to the non-use period of a vehicle type construction machine, which is not used for a period exceeding 1 year.

(2) The employer shall, as regards a vehicle type construction machine set forth in the proviso of the preceding paragraph, carry out self-inspection for abnormalities in each part of a construction machine before resuming the operation.

Periodical self-inspections Article 168

(1) The employer shall, as regards a vehicle type construction machine, carry out self-inspections for the following matters periodically once every period within a month. However, this shall not apply to the non-use period of a vehicle type construction machine, which is not used for a period exceeding one month:

- (i) Abnormalities in a brake, a clutch, a controlling device, and working devices.
- (ii) Damage in a wire, rope, and a chain
- (iii) Damage in a bucket, a dipper, etc.

(2) The employer shall, as regards to the vehicle type construction machine set forth in the proviso of the preceding paragraph, carry out self-inspection for the matters listed in each item of the same paragraph before resuming the operation.

Record of Periodical Self-Inspections Article 169

The employer shall, when having carried out the self-inspections set forth in the preceding two Articles, record the results and retain the records for 3 years.

Specified Self-Inspection Article 169-2

The specified self-inspection pertaining to the vehicle type construction machine shall be the self-inspection (prescribed by Article 167) and carried out by qualified personnel. The employer shall, when having carried out the specified self-inspection pertaining to a vehicle type construction machine, affix an inspection sticker stating the month and year when the said specified self-inspection was carried out at a readily visible location of the said machine.

- Caterpillar Japan has a supporting program for self-inspection as a registered inspection agency. Qualified personnel and inspection equipment are available to help customers who do not conduct internal inspections or do not have time to conduct the specified self-inspections. Contact a Cat dealer near you for details.
- Maintenance and inspection record book for a record-saving purpose can be purchased at Caterpillar Japan.
- Penalty: Employer who fails to carry out self-inspections and to record the results will face a fine of up to five hundred thousand yen.

Checkup before Commencing the Work Article 170

The employer shall, when carrying out the work using a vehicle type construction machine, check functions of a brake and a clutch before commencing the work for the day.

Other Rules

Besides qualification for operating equipment and self inspections, the following obligations are set forth in the Industrial Safety and Health Act:

- To conduct health and safety training for new recruits and shop foremen.
- To appoint the operation leader or supervisor, and establish health and safety management system.
- To inform employees of a chain of command at the worksite, communication and signal rules, traveling route of equipment, speed limits, signs of restricted areas, etc. for securing safety in the workplace.

The Industrial Safety and Health Act further also set obligations related to mechanical structures and rental activities of equipment.

Safety comes before anything else. Establish a workplace where no injuries occur by observing the governing laws and by referring to this manual, specifically the descriptions on safety.

Construction Equipment and Environmental Laws

Prohibition of Emissions and Obligations to Recover Fluorocarbons

Law Concerning the Recovery and Destruction of Fluorocarbons (Enforcement date: April 1, 2015)

Being emitted into the atmosphere, Fluorocarbons, used as refrigerants of air conditioning, destroy the ozone layer and accelerate the global warming as a cause of environmental destruction. Follow the instructions below required by law when handling air conditioners to protect the global environment.

1. 1. Do not arbitrarily emit the encapsulated refrigerant installed on the product into the atmosphere.
2. 2. Recover the encapsulated refrigerant when disposing of the product.

Note: Violators of the law will face a maximum one-year imprisonment or a fine up to a maximum of five hundred thousand yen.

When you need to fill, recover a refrigerant or dispose of a product with an encapsulated refrigerant installed, please ask a filling-recovery operator registered with the government of the local prefecture as "class-1 filling-recovery operator." And carry out the simple inspection of air conditioner and keep the record.

Class-1 Specified products sold after October 1, 2015 shall have the label inside of the cab showing the type and quantity of refrigerant, GWP (Global Warming Potential), and precautions for use. (Refer to the fluorocarbon label in the OMM safety section)

Standard Certificate of Transfer

Dear Customers

Japan Construction Equipment Manufacturers Association

Standard Certificate of Transfer

Issued by the Japan Construction Equipment Manufacturers Association

Standard Certificate of Transfer issued by the Japan Construction Equipment Manufacturers Association proves the ownership of your equipment. Request us to issue the certificate as a proof of transfer of ownership.

Commercial transactions of construction equipment are generally made on a long-term installment plan basis with a special provision of reservation of ownership that the seller retains the ownership of the sold equipment until the buyer completely pays off the installments.

Ownership of some construction equipment can be proved with a vehicle inspection certificate, but the certificate is not issued for most of the equipment. Therefore, the buyer will need to present a third party with a proof of ownership of the sold equipment.

Japan Construction Equipment Manufacturers Association launched a system of standard certificate of transfer in 1971 to normalize trading in construction equipment and establishes a business practice relating to transfer of ownership. Customers are kindly requested to understand the intent of the system and request your seller to issue a certificate of transfer.

1. About the standard certificate of transfer

- a. Japan Construction Equipment Manufacturers Association (hereinafter referred to as CEMA) sets the rules and form of standard certificate of transfer (hereinafter referred to as certificate of transfer), and members of the CEMA issue the certificate of transfer. A certificate of transfer proves the ownership of equipment.

2. Purpose of issuance

- a. A certificate of transfer will be issued for the purpose of clarifying the ownership of equipment and preventing misconduct such as trades of stolen equipment or fraud.

3. Issuer

- a. A certificate of transfer will be issued by a distributor (Primary transferer) who sells new construction equipment and is authorized by the CEMA.

4. Eligibility

- a. A certificate of transfer will be issued for the equipment, which is sold by CEMA-member distributors and defined as construction equipment by the CEMA

5. Issuance

- a. A certificate of transfer will be issued and directly given to a buyer upon the buyer's request when he/she buys eligible equipment from an issuer.
- b. A certificate of transfer may not be issued for the equipment, which was sold as new merchandise more than 10 years ago.
- c. A certificate of transfer is not permitted to substitute a vehicle inspection certificate.

6. Prohibition of reissuance

- a. Certificate of transfer should be safely stored as it will not be reissued under any circumstances.

7. In case a certificate description runs out of space
- a. Discretionary page/s to the certificate will be valid with a tally seal of the issuer at the joint of two pages.

Contact CEMA-member companies or distributors for more details of the system.

Industrial Safety and Health Act

Article 164 (Extracted) of Industrial Safety and Health Act (Restriction on use Other Than Main Application)

Article 164

Business Operator must not use construction machineries of vehicle type for applications other than main application of the applicable construction machineries of vehicle type such as: lifting cargos by hydraulic excavator or lifting/lowering workers using the clamshell.

[2] The previous clause will not be applied for any of the following cases:

1. In performing cargo lifting, any one of the following may be applicable.
 - a. Cannot be avoided due to the nature of the work or necessary in view of performing work in safe.
 - b. When working with attachments installed for metals of hook or shackle etc or other devices for lifting application applicable to any one of the following as implements for boom or bucket etc
 - Enough strength is retained bearable for loads to be applied.
 - Load lifted up is not feared to be dropped from the applicable instrument used, due to provided locking device is in use or etc.
 - Load not feared of disengaging from the implement.
2. In performing work other than cargo lifting, nothing is feared to do harm to the workers.

[3] The business operator must take the following measures, in performing cargo lifting work applicable to Items 1a and 1b of Step 1 above. To prevent any danger of workers from contact with lifted cargo, drop of lifted cargo or turnover or falling down of construction machineries of vehicle type.

1. Designate one person who issues a sign as well as setting up fixed signs related to cargo lifting work, and follow his signs.
2. Perform work on a flat ground.
3. Keep any worker away from any place where is feared to cause any danger to worker due to contact with a cargo or drop of lifted cargo.

[4] Do not perform any work applying load exceeding the allowed rated max load specified according to structure or materials of the applicable construction machineries of the vehicle type.

[5] In using wire rope in slinging device, use wire rope applicable to every item of the followings.

- Safety coefficient is 6 or more. (The safety coefficient here must be the same as specified in Article 213 item 2 in Safety Rules on Crane Works (Article 34 in Ordinance of Ministry of Labor, 1972) etc. Hereinafter called as "Crane Rules")
- Among wire rope 1 strands, numbers of cut strands (other than filler) are less than 10%.
- Reduction of diameter is 7% or less than nominal diameter.
- Free from kinking.
- Free from badly collapse and corrosion.

[6] In using lifting chain as slinging device, the chain is applicable to every item of the followings.

- Safety coefficient is 5 or more.
- Elongation is 5% or less than the length when the applicable lifting chain was fabricated.
- Reduction of diameter of the cross section of link is 10% or less than diameter of cross section of the applicable link when the applicable lifting chain was manufactured.
- Free from cracks.

[7] In using those other than wire rope and lifting chain as slinging device, they must be free from bad damage and corrosion.

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Specifications

SMCS Code: 7000

Intended Use

The intended use of this machine is for excavating with a bucket or working with approved work tools. The machine should be operated with the undercarriage in a stationary position since the upper structure is normally capable of 360 degree swing with mounted equipment. This machine can be used in object handling applications that are within the lift capacity of the machine. When this machine is used in object handling applications, ensure that the machine is properly configured and operated properly. Obey any local governmental regulations and regional governmental regulations. Only lift objects from approved lifting points and with approved lifting devices.

Expected Life

The expected life, defined as total machine hours, of this machine is dependent upon many factors including the machine owner's desire to rebuild the machine back to factory specifications. The expected life interval of this machine is 8,000 service hours. The expected life interval corresponds to the service hours to engine overhaul or replacement. Service hours to engine overhaul or replacement may vary based on overall machine duty cycle. At the expected life interval, remove the machine from operation and consult your Cat® dealer for inspect, repair, rebuild, install remanufactured, install new components, or disposal options and to establish a new expected life interval. If a decision is made to remove this machine from service, refer to "Decommissioning and Disposal". The following items are required to obtain an economical expected life of this machine:

- Perform regular preventive maintenance procedures as described in the Operation and Maintenance Manual.
- Perform machine inspections as described in the Operation and Maintenance Manual and correct any problems discovered.
- Perform system testing as described in the Operation and Maintenance Manual and correct any problems discovered.
- Ensure that machine application conditions comply with Caterpillar recommendations.

- Ensure that the operating weight does not exceed limits set by manufacturer.
- Ensure that all frame cracks are identified, inspected, and repaired to prevent further development.

Carbon Dioxide (CO₂) Emissions Statement

Table 7

European Union (EU) Stage V Engine Emission Compliant CO ₂ Values	
Engine Model	CO ₂ Valve (g/kWh)
C1.7	940.14
C1.1	

(continued)

(Table 7, contd)

European Union (EU) Stage V Engine Emission Compliant CO ₂ Values	
Engine Model	CO ₂ Valve (g/kWh)

Specification Data

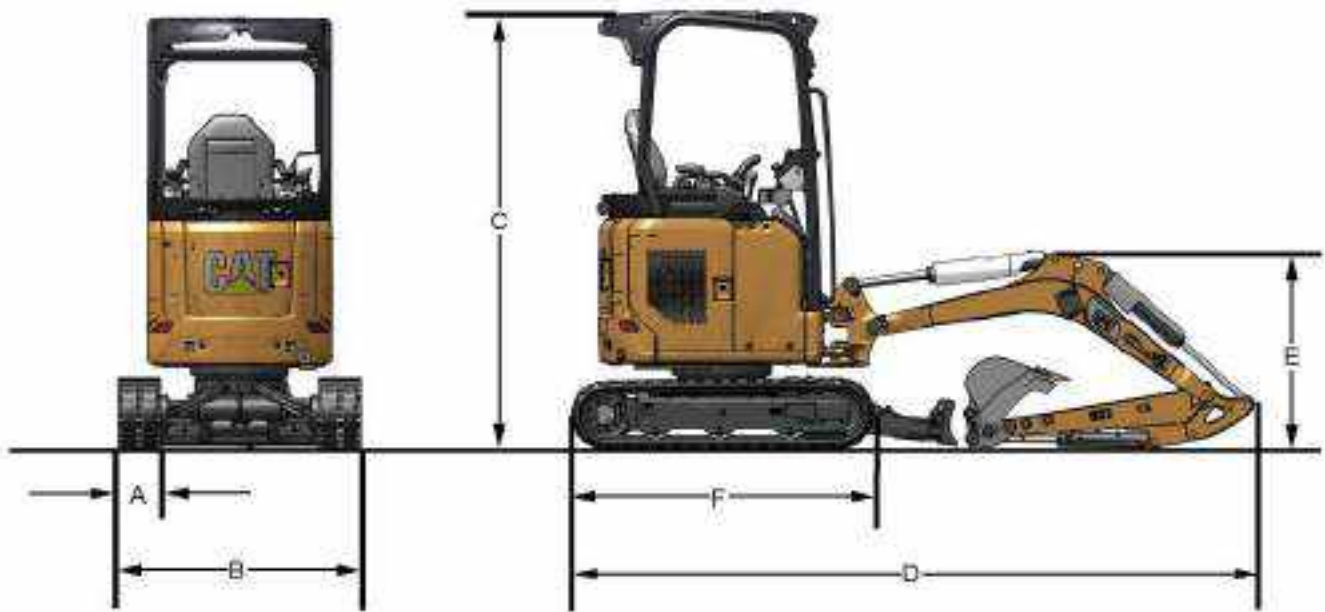


Illustration 65

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301.5

Table 8

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)			
Stick Options	Standard Stick 960 mm (3 ft 2 inch)		Long Stick 1160 mm (3 ft 10 inch)	
Bucket Options	457.0 cubic millimeter (0.04 cubic yard) Bucket			
Machine	Canopy			
Undercarriage Options	Fixed	Expandable	Fixed	Expandable
Operating Weight ⁽¹⁾	1580 kg (3483.3 lb)	1710 kg (3769.9 lb)	1590 kg (3505.3 lb)	1720 kg (3791.9 lb)
Transport Weight ⁽²⁾	1505 kg (3317.9 lb)	1635 kg (3604.6 lb)	1515 kg (3340.0 lb)	1645 kg (3626.6 lb)
Track Width (A)	230 mm (9 inch)			
Machine Width (B) ⁽³⁾	-	990 mm (3 ft 3 inch)	-	990 mm (3 ft 3 inch)
Machine Width (B) ⁽⁴⁾	1300 mm (4 ft 3 inch)			
Machine Height (C)	2310 mm (7 ft 7 inch)			
Transport Length (D)	3470 mm (11 ft 5 inch)		3450 mm (11 ft 4 inch)	
Transport Boom Height (E)	1090 mm (3 ft 7 inch)		1040 mm (3 ft 5 inch)	
Track Length (F)	1460 mm (4 ft 10 inch)			

(1) Includes operator, no bucket, full fuel tank

(2) Does not include operator, no bucket, full fuel tank

(3) Undercarriage retracted

(4) Undercarriage expanded

Product Information Section
Specifications

301.6

Table 9

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)			
Stick Options	Standard Stick 960 mm (3 ft 2 inch)		Long Stick 1160 mm (3 ft 10 inch)	
Bucket Options	457.0 cubic millimeter (0.04 cubic yard) Bucket			
Machine	Cab			
Undercarriage Options	Fixed	Expandable	Fixed	Expandable
Operating Weight ⁽¹⁾	1765 kg (3891.2 lb)	1895 kg (4177.8 lb)	1775 kg (3913.2 lb)	1905 kg (4199.8 lb)
Transport Weight ⁽²⁾	1690 kg (3725.8 lb)	1820 kg (4012.4 lb)	1700 kg (3747.9 lb)	1830 kg (4034.5 lb)
Track Width (A)	230 mm (9.1 inch)			
Machine Width (B) ⁽³⁾	-	990 mm (3 ft 3 inch)	-	990 mm (3 ft 3 inch)
Machine Width (B) ⁽⁴⁾	1300 mm (4 ft 3 inch)			
Machine Height (C)	2310 mm (7 ft 7 inch)			
Transport Length (D)	3650 mm (12 ft 0 inch)		3630 mm (11 ft 11 inch)	
Transport Boom Height (E)	1090 mm (3 ft 7 inch)		1040 mm (3 ft 5 inch)	
Track Length (F)	1460 mm (4 ft 10 inch)			

⁽¹⁾ Includes operator, no bucket, full fuel tank

⁽²⁾ Does not include operator, no bucket, full fuel tank

⁽³⁾ Undercarriage retracted

⁽⁴⁾ Undercarriage expanded

301.7 CR

Table 10

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)	
Stick Options	Standard Stick 960 mm (3 ft 2 inch)	Long Stick 1160 mm (3 ft 10 inch)
Bucket Options	457.0 cubic millimeter (0.04 cubic yard) Bucket	
Machine	Canopy	
Undercarriage Options	Expandable Undercarriage	Expandable Undercarriage
Operating Weight ⁽¹⁾	1790 kg (3946.3 lb)	1800 kg (3968.3 lb)
Operating Weight ⁽²⁾ (³)	1920 kg (4232.9 lb)	1930 kg (4254.9 lb)
Transport Weight ⁽⁴⁾	1715 kg (3780.9 lb)	1725 kg (3802.9 lb)
Transport Weight ⁽²⁾ ⁽⁵⁾	1845 kg (4067.6 lb)	1855 kg (4089.6 lb)
Track Width (A)	230 mm (9.1 inch)	
Machine Width (B) ⁽⁶⁾	990 mm (3 ft 3 inch)	
Machine Width (B) ⁽⁷⁾	1300 mm (4 ft 3 inch)	
Machine Height (C)	2300 mm (7 ft 7 inch)	
Machine Height (C) ⁽²⁾	2350 mm (7 ft 9 inch)	
Transport Length (D)	3620 mm (11 ft 11 inch)	3590 mm (11 ft 9 inch)
Transport Boom Height (E)	1090 mm (3 ft 7 inch)	1040 mm (3 ft 5 inch)
Track Length (F)	1590 mm (5 ft 3 inch)	

⁽¹⁾ Includes operator, no bucket, full fuel tank

⁽²⁾ Japan machines

⁽³⁾ Includes operator, with bucket, full fuel tank

⁽⁴⁾ Does not include operator, no bucket, full fuel tank

⁽⁵⁾ Does not include operator, with bucket, full fuel tank

⁽⁶⁾ Undercarriage retracted

⁽⁷⁾ Undercarriage expanded

Product Information Section
Specifications

301.8

Table 11

Boom Options	Standard Boom 1850 mm (6 ft 1 inch)							
Stick Options	Standard Stick 960 mm (3 ft 2 inch)				Long Stick 1160 mm (3 ft 10 inch)			
Bucket Options	457.0 cubic millimeter (0.04 cubic yard Bucket)							
Machine	Canopy		Cab		Canopy		Cab	
Undercarriage Options	Fixed	Expandable	Fixed	Expandable	Fixed	Expandable	Fixed	Expandable
Operating Weight ⁽¹⁾	1725 kg (3802.9 lb)	1850 kg (4078.6 lb)	1850 kg (4078.6 lb)	1975 kg (4354.1 lb)	1735 kg (3825.0 lb)	1860 kg (4100.6 lb)	1860 kg (4100.6 lb)	1985 kg (4376.2 lb)
Transport Weight ⁽²⁾	1650 kg (3637.6 lb)	1775 kg (3913.2 lb)	1775 kg (3913.2 lb)	1900 kg (4188.8 lb)	1660 kg (3659.7 lb)	1785 kg (3935.6 lb)	1785 kg (3935.6 lb)	1910 kg (4210.8 lb)
Track Width (A)	230 mm (9.1 inch)							
Machine Width (B) ⁽³⁾	-	990 mm (3 ft 3 inch)	-	-	-	-	-	990 mm (3 ft 3 inch)
Machine Width (B) ⁽⁴⁾	1300 mm (4 ft 3 inch)							
Machine Height (C)	2300 mm (7 ft 7 inch)							
Transport Length (D)	3720 mm (12 ft 2 inch)	-	-	-	-	-	3710 mm (12 ft 2 inch)	-
Transport Boom Height (E)	1070 mm (3 ft 6 inch)	-	-	-	-	-	1020 mm (3 ft 4 inch)	-
Track Length (F)	1590 mm (5 ft 3 inch)							

(1) Includes operator, no bucket, full fuel tank

(2) Does not include operator, no bucket, full fuel tank

(3) Undercarriage retracted

(4) Undercarriage expanded

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Table 12

Boom Options	Standard Boom 1850 mm (6 ft 1 inch)							
Stick Options	Standard Stick 960 mm (3 ft 2 inch)				Long Stick 1160 mm (3 ft 10 inch)			
Bucket Options	457.0 cubic millimeter (0.04 cubic yard) Bucket							
Machine	Canopy		Cab		Canopy		Cab	
Undercarriage Options	Fixed	Expandable	Fixed	Expandable	Fixed	Expandable	Fixed	Expandable
Operating Weight ⁽¹⁾	1920 kg (4251 lb)	2015 kg (4462 lb)	2055 kg (4251 lb)-	2150 kg (4740 lb)-	1930 kg (4464 lb)	2025 kg (4464 lb)	2065 kg (4553 lb)	2160 kg (4762 lb)
Operating Weight ⁽²⁾⁽³⁾	2055 kg (4530 lb)	2145 kg (4729 lb)	2180 kg (4806 lb)	2270 kg (5004 lb)	2065 kg (4553 lb)	2155 kg (4751 lb)	2190 kg (4828 lb)	2280 kg (5027 lb)
Transport Weight ⁽⁴⁾	1845 kg (4068 lb)	1940 kg (4277 lb)	1980 kg (4365 lb)	2075 kg (4575 lb)	1855 kg (4090 lb)	1950 kg (4299 lb)	1990 kg (4387 lb)	2085 kg (4597 lb)
Transport Weight ⁽⁵⁾⁽²⁾	1980 kg (4365 lb)	2070 kg (4564 lb)	2105 kg (4641 lb)	2195 kg (4839 lb)	1990 kg (4387 lb)	2080 kg (4586 lb)	2115 kg (4663 lb)	2280 kg (5027 lb)
Track Width (A)	250 mm (10 inch)							
Machine Width (B) ⁽⁶⁾	-	1090 mm (3 ft 7 inch)	-	1090 mm (3 ft 7 inch)	-	-	-	1090 mm (3 ft 7 inch)
Machine Width (B) ⁽⁷⁾	1400 mm (4 ft 7 inch)							
Machine Height (C)	2330 mm (7 ft 8 inch)	2300 mm (7 ft 7 inch)	-	-	-	-	2330 mm (7 ft 8 inch)	2300 mm (7 ft 7 inch)
Machine Height (C) ⁽²⁾			2380 mm (7 ft 10 inch)	2350 mm (7 ft 9 inch)				
Transport Length (D)	3980 mm (13 ft 1 inch)		-	-	-	-	3980 mm (13 ft 1 inch)	
Transport Length (D) ⁽²⁾	3990 mm (13 ft 1 inch)				-	-	-	3980 mm (13 ft 1 inch)
Transport Boom Height (E)	1110 mm (3 ft 8 inch)		-	-	-	-	1110 mm (3 ft 8 inch)	1120 mm (3 ft 8 inch)
Transport Boom Height (E) ⁽²⁾	1170 mm (3 ft 10 inch)		1170 mm (3 ft 10 inch)		-	-	1210 mm (4 ft)	1220 mm (4 ft)
Track Length (F)	1850 mm (6 ft 1 inch)							

(1) Includes operator, no bucket, full fuel tank

(2) Japan machines

(3) Includes operator, with bucket, full fuel tank

(4) Does not include operator, no bucket, full fuel tank

(5) Does not include operator, with bucket, full fuel tank

(6) Undercarriage retracted

(7) Undercarriage expanded

Working Ranges

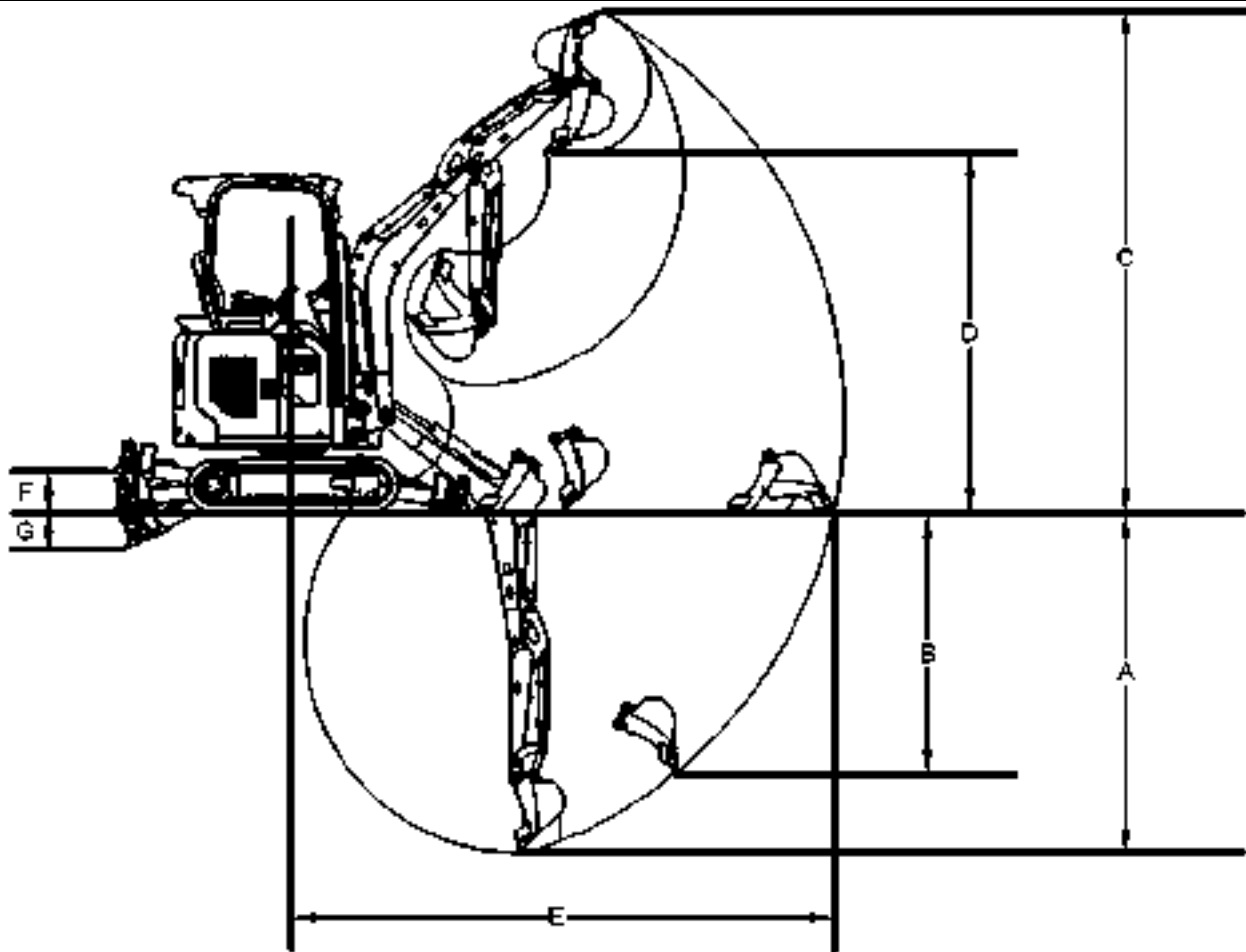


Illustration 66

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Table 13

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)	
Stick Options	Standard Stick 960 mm (3 ft 2 inch)	Long Stick 1160 mm (3 ft 10 inch)
Bucket Options	SAE 457 cubic millimeter (0.04 cubic yard)	
Maximum Digging Depth (A)	2340 mm (7 ft 8 inch)	2540 mm (8 ft 4 inch)
Maximum Vertical Digging Depth (B)	1800 mm (5 ft 11 inch)	1890 mm (6 ft 2 inch)
Maximum Cutting Height (C)	3430 mm (11 ft 3 inch)	3490 mm (11 ft 5 inch)
Maximum Loading Height (D)	2450 mm (8 ft)	2510 mm (8 ft 3 inch)
Maximum Reach at Ground Line (E)	3730 mm (12 ft 3 inch)	3890 mm (12 ft 9 inch)
Blade Raised (F)	275 mm (11 inch)	
Blade Lowered (G)	260 mm (10 inch)	

301.6

Table 14

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)	
Stick Options	Standard Stick 960 mm (3 ft 2 inch)	Long Stick 1160 mm (3 ft 10 inch)
Bucket Options	SAE 457 cubic millimeter (0.04 cubic yard)	
Maximum Digging Depth (A)	2340 mm (7 ft 8 inch)	2540 mm (8 ft 4 inch)
Maximum Vertical Digging Depth (B)	1800 mm (5 ft 11 inch)	1890 mm (6 ft 2 inch)
Maximum Cutting Height (C)	3430 mm (11 ft 3 inch)	3490 mm (11 ft 5 inch)
Maximum Loading Height (D)	2450 mm (8 ft 0 inch)	2510 mm (8 ft 3 inch)
Maximum Reach at Ground Line (E)	3720 mm (12 ft 2 inch)	3890 mm (12 ft 9 inch)
Blade Raised (F)	275 mm (11 inch)	
Blade Lowered (G)	260 mm (10 inch)	

301.7 CR

Table 15

Boom Options	Standard Boom 1780 mm (5 ft 10 inch)	
Stick Options	Standard Stick 960 mm (3 ft 2 inch)	Long Stick 1160 mm (3 ft 10 inch)
Bucket Options	SAE 457 cubic millimeter (0.04 cubic yard)	
Bucket Options⁽¹⁾	SAE 450 cubic meter (0.044 cubic yard)	
Maximum Digging Depth (A)	2350 mm (7 ft 9 inch)	2540 mm (8 ft 4 inch)
Maximum Digging Depth (A) ⁽¹⁾	2390 mm (7 ft 10 inch)	2590 mm (8 ft 6 inch)
Maximum Vertical Digging Depth (B)	1800 mm (5 ft 11 inch)	1890 mm (6 ft 2 inch)
Maximum Vertical Digging Depth (B) ⁽¹⁾	1890 mm (6 ft 2 inch)	1990 mm (6 ft 6 inch)
Maximum Cutting Height (C)	3430 mm (11 ft 3 inch)	3490 mm (11 ft 5 inch)
Maximum Cutting Height (C) ⁽¹⁾	3470 mm (11 ft 4 inch)	3520 mm (11 ft 7 inch)
Maximum Loading Height (D)	2450 mm (8 ft 0 inch)	2510 mm (8 ft 3 inch)
Maximum Loading Height (D) ⁽¹⁾		2470 mm (8 ft 1 inch)
Maximum Reach at Ground Line (E)	3900 mm (12 ft 10 inch)	4060 mm (13 ft 4 inch)
Maximum Reach at Ground Line (E) ⁽¹⁾	3940 mm (12 ft 11 inch)	4110 mm (13 ft 6 inch)
Blade Raised (F)	270 mm (11 inch)	
Blade Lowered (G)	265 mm (10 inch)	

⁽¹⁾ Japan machines

301.8

Table 16

Boom Options	Standard Boom 1850 mm (6 ft 1 inch)	
Stick Options	Standard Stick 960 mm (3 ft 2 inch)	Long Stick 1160 mm (3 ft 10 inch)
Bucket Options	SAE 457 cubic millimeter (0.04 cubic yard)	
Maximum Digging Depth (A)	2370 mm (7 ft 9 inch)	2570 mm (8 ft 5 inch)
Maximum Vertical Digging Depth (B)	1850 mm (6 ft 1 inch)	1940 mm (6 ft 4 inch)
Maximum Cutting Height (C)	3550 mm (11 ft 8 inch)	3620 mm (11 ft 11 inch)
Maximum Loading Height (D)	2560 mm (8 ft 5 inch)	2640 mm (8 ft 8 inch)
Maximum Reach at Ground Line (E)	3800 mm (12 ft 6 inch)	3960 mm (13 ft 0 inch)
Blade Raised (F)	270 mm (11 inch)	
Blade Lowered (G)	265 mm (10 inch)	

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Table 17

Boom Options	Standard Boom 1850 mm (6 ft 1 inch)			
Stick Options	Standard Stick 960 mm (3 ft 2 inch)		Long Stick 1160 mm (3 ft 10 inch)	
Bucket Options	SAE 457 cubic millimeter (0.04 cubic yard)			
Bucket Options ⁽¹⁾	SAE 450 cubic meter (0.044 cubic yard)			
Undercarriage Options	Expandable	Fixed	Expandable	Fixed
Maximum Digging Depth (A)	2250 mm (7 ft 3 inch)	2220 mm (7 ft 8 inch)	2450 mm (8 ft)	2420 mm (7 ft 11 inch)
Maximum Digging Depth (A) ⁽³⁾	2380 mm (7 ft 10 inch)	2350 mm (7 ft 9 inch)	2580 mm (8 ft 6 inch)	2550 mm (8 ft 4 inch)
Maximum Vertical Digging Depth (B)	1920 mm (6 ft 4 inch)	1820 mm (6 ft 0 inch)	2040 mm (6 ft 8 inch)	2010 mm (6 ft 7 inch)
Maximum Vertical Digging Depth (B) ⁽³⁾	1800 mm (5 ft 11 inch)	1770 mm (5 ft 10 inch)	1880 mm (6 ft 2 inch)	1850 mm (6 ft 1 inch)
Maximum Cutting Height (C)	3880 mm (12 ft 9 inch)	3580 mm (11 ft 9 inch)	3960 mm (13 ft)	3990 mm (13 ft 1 inch)
Maximum Cutting Height (C) ⁽³⁾	3970 mm (13 ft)	4000 mm (13 ft 1 inch)	4070 mm (13 ft 4 inch)	4100 mm (13 ft 5 inch)
Maximum Loading Height (D)	2870 mm (9 ft 5 inch)	2590 mm (8 ft 6 inch)	2960 mm (9 ft 9 inch)	2990 mm (9 ft 10 inch)
Maximum Loading Height (D) ⁽³⁾	2710 mm (8 ft 11 inch)	2740 mm (9 ft)	2820 mm (9 ft 3 inch)	2850 mm (9 ft 4 inch)
Maximum Reach at Ground Line (E)	4130 mm (13 ft 7 inch)	4038 mm (13 ft 3 inch)	4310 mm (14 ft 2 inch)	4300 mm (14 ft 1 inch)
Maximum Reach at Ground Line (E) ⁽³⁾	4270 mm (14 ft)	4270 mm (14 ft)	4450 mm (14 ft 7 inch)	4440 mm (14 ft 7 inch)
Blade Raised (F)	375 mm (15 inch)			
Blade Lowered (G)	325 mm (1 ft 1 inch)			

(1) Japan machines

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Boom/Stick/Bucket Combinations**SMCS Code:** 6000; 6700

This machine can be equipped with various boom-stick-bucket combinations to meet the needs of various applications.

As a rule, use a bucket with a smaller capacity when you are using a longer stick. Conversely, use a bucket with a larger capacity when you are using a shorter stick. This rule ensures better machine stability and protection against structural machine damage.

Note: The selection of a compatible boom-stick-bucket combination is a guide. Work tools, uneven ground conditions, soft ground conditions, or poor ground conditions have effects on machine performance. The operator is responsible for being aware of these effects.

Using work tools of other manufactures, or work tools which have been released for other excavators, can reduce the machines output and stability considerably, and can also damage to the machine and injuries to the operator or other personnel.

Consult your Cat dealer for information on selecting the correct boom-stick-bucket combination.

Product Information Section
Lifting Capacities

The following table shows available work tools. Select the most suitable work tool according to the working conditions and according to the type of work that is being done. Always compare the weight of the work tool and its maximum payload with the indications in the lift capacity table. Never exceed the maximum payload stated in the lift capacity table.

Table 18

Buckets for use with Pin-On and Pin Grabber Coupler				
Type	Width	Weight	Capacity	Teeth
Digging	230 mm (9 inch)	29 kg (64 lb)	0.018 m ³ (0.023 yd ³)	3
	300 mm (12 inch)	31 kg (68 lb)	0.022 m ³ (0.029 yd ³)	3
	400 mm (16 inch)	35 kg (78 lb)	0.033 m ³ (0.043 yd ³)	3
	460 mm (18 inch)	38 kg (84 lb)	0.040 m ³ (0.052 yd ³)	3
	500 mm (20 inch)	41 kg (90 lb)	0.045 m ³ (0.059 yd ³)	4
	600 mm (24 inch)	45 kg (100 lb)	0.056 m ³ (0.073 yd ³)	4
Ditch Cleaning	800 mm (32 inch)	41 kg (90 lb)	0.044 m ³ (0.057 yd ³)	0
	1000 mm (39 inch)	43 kg (95 lb)	0.056 m ³ (0.073 yd ³)	0
Angle Bucket	1000 mm (39 inch)	75 kg (165 lb)	0.056 m ³ (0.073 yd ³)	0

Table 19

Buckets for use with CW Coupler Only				
Type	Width	Weight	Capacity	Teeth
Digging	300 mm (12 inch)	31 kg (68 lb)	0.022 m ³ (0.029 yd ³)	3
	400 mm (16 inch)	35 kg (78 lb)	0.033 m ³ (0.043 yd ³)	3
	460 mm (18 inch)	42 kg (92 lb)	0.035 m ³ (0.046 yd ³)	3
	500 mm (20 inch)	41 kg (90 lb)	0.045 m ³ (0.059 yd ³)	4
	600 mm (24 inch)	45 kg (100 lb)	0.056 m ³ (0.073 yd ³)	4
Ditch Cleaning	1000 mm (39 inch)	47 kg (104 lb)	0.056 m ³ (0.073 yd ³)	0
Angle Bucket	1000 mm (39 inch)	84 kg (185 lb)	0.056 m ³ (0.073 yd ³)	0

Table 20

High Capacity Buckets ⁽¹⁾⁽²⁾				
Type	Width	Weight	Capacity	Teeth
Digging	300 mm (120 inch)	39 kg (86 lb)	0.02 m ³ (0.03 yd ³)	2
	450 mm (18 inch)	51 kg (112 lb)	0.038 m ³ (0.05 yd ³)	3
	500 mm (20 inch)	56 kg (124 lb)	0.05 m ³ (0.07 yd ³)	3
	600 mm (24 inch)	66 kg (146 lb)	0.07 m ³ (0.09 yd ³)	4

(1) Japan market only

(2) ESCO teeth required

i08644901

Lifting Capacities

SMCS Code: 7000

WARNING

Failure to comply to the rated load can cause possible personal injury or property damage. This includes the risk of unintended boom lowering. 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.

There may be local regulations and/or government regulations that govern the use of excavators which lift heavy objects. Obey all local and government regulations.

Lifting capacities should be used as a guide. Work tools, uneven ground conditions, soft ground conditions, or poor ground conditions have effects on lifting capacities. The operator is responsible for being aware of these effects.

The lifting capacities are defined by "ISO 10567 2007". The lifting capacities are defined as the lower value of 75% of the static tipping capacity or 87% of the hydraulic lift capacity.

Note: Lifting capacities are based on a standard machine with the following conditions:

- Lift point: Stick nose without bucket
- Lubricants full
- Fuel tank full
- Steel track
- Complete cab with a 75 kg (165.1 lb) operator

Lifting capacities will vary with different work tools and attachments. The weight of a work tool attachment must be subtracted from the lift capacity. Consult your Cat® dealer regarding the lifting capacities for specific work tools and attachments.

This machine may be equipped with various sticks. Lifting capacities may vary between the different sticks. Measure the distance on the stick between the boom hinge pin and the work tool hinge pin. This distance will inform you of the size of the stick that is equipped on the machine.

Use the lifting eye that is provided on the linkage to lift objects. When the lifting eye is used, the connection must be made with a sling or shackle.

Note: Japan regulations require a shovel crane configuration to lift certain objects. A shovel crane has a rated load capacity, therefore, the lift capacities discussed below do not apply to a shovel crane configuration. Consult your Cat® dealer for additional information.

Note: Regional regulations may require the use of an overload warning device and boom and stick lowering control valves during object handling applications.

Contact your Cat® dealer for additional information.

Configuration Identification

Note: Each component has a stamp to identify the configuration affecting lifting capacity.

The owner will need to check the machine configuration to identify the correct lifting capacity.

The configuration identifier will be located with the part number stamped on the component. Refer to the following table for the abbreviation of the configuration.

Table 21

Configuration Identification		
Component	Configuration	Abbreviation
Front	Reach Boom	R
	Mass Boom	M
	Variable Angle Boom	VA
	Super Long Reach Boom	SLR
	Standard	STD
	Heavy Duty	HD
	Extreme Special	ES

(continued)

(Table 21, contd)

Configuration Identification		
Component	Configuration	Abbreviation
	Thumb Ready Stick	TR
Undercarriage	Short Undercarriage (Crawler)	STD
	Long Undercarriage (Crawler)	LC
	Long Narrow Undercarriage (Crawler)	LN
Cylinder	Standard	-
	Heavy Lift	HL
Counterweight	Metric Ton (tonne)	t ⁽¹⁾

(1) Counterweight stamp indicates metric ton. (example 1.0t = 1000 kg)

Symbols Found in the Lifting Capacity Charts

Below are symbols that are commonly found on lifting capacity charts for track excavators.

Note: Depending on the machine configuration, some symbols may not be used.

(mm)
(inch) **Measurements are provided in millimeters and inches**



Lift Capacities are provided in kilograms and pounds



Load is limited by hydraulic lifting capacity rather than by a tipping load



Lift point radius



Lift point height



Lifting capacity over the front of the machine



Lifting capacity over the side of the machine



Heavy Lift ON

With Bucket















[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
													[mm] [inch]	
120												* 499	* 499	90
2500 100							* 244	* 244				* 225	* 225	2760
2000 80							* 559	* 559				* 498	* 498	110
1500 60							* 256	* 256	227	263		217	* 219	3000
1000 40							* 573	* 573				* 483	* 483	320
500 20					* 299	* 299	307	* 320	225	260		191	* 221	3280
0					* 643	* 643	660	* 689	462	593		424	* 487	330
1000 40					419	482	395	341	219	255		176	207	3400
500 20					503	639	635	733	471	547		389	456	140
0					395	458	283	328	210	248		171	201	3420
0					852	987	609	707	457	534		378	443	140
0					383	446	274	320	206	243		175	206	3390
0					825	960	591	688	447	524		388	453	140
-500 20	* 602	* 602	611	713	389	443	271	316	246	241		189	222	3180
-1000 40	* 1349	* 1349	1390	1528	819	953	583	680	443	523		415	491	130
-1500 60			617	719	383	446	272	317				222	260	2680
-2000 80			1324	1542	824	959	588	684				494	577	120
-2500 100			* 604	* 684	392	* 411						* 298	* 298	2380
-3000 120			* 1284	* 1284	845	* 867						* 660	* 660	100

Illustration 67

g06363837

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.


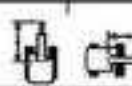
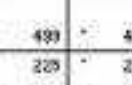
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)						
320							90						
2500 300				* 244 * 359	* 244 * 359		2760 100						
2000 80				* 256 * 573	* 256 * 573	* 399 303	* 219 * 483	2080 120					
1500 60			* 299 * 643	* 299 * 699	* 320 * 699	* 320 703	* 221 * 487	3280 130					
1000 40			* 534 * 1036	482 1038	* 490 * 995	* 341 733	* 348 * 757	258 547	* 225 * 486	207 456	3400 140		
500 20			* 671 * 1438	456 997	* 472 * 1017	328 707	* 369 * 797	248 534	* 239 * 526	201 443	3420 140		
0 0			* 673 * 1451	446 960	* 484 * 1041	320 688	* 366 * 787	249 524	* 265 * 584	206 453	3350 140		
-500 -20	* 602 * 1349	* 402 * 1349	* 698 1874	710 1928	* 617 * 1339	443 963	* 452 * 972	316 680	* 334 * 782	241 520	* 283 * 646	322 491	3180 130
-1000 -40		* 759 * 1633	718 1542	* 533 * 1344	446 958	* 387 * 926	317 684			* 291 * 642	260 577	2980 120	
-1500 -80		* 604 * 1294	* 604 * 1294	* 411 * 867	* 411 * 867					* 298 * 660	* 298 * 660	2380 100	

Illustration 68

g06363840

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
120												* 499	* 499	30
2500							* 244	238				* 225	198	2760
100							* 559	509				* 493	448	110
2000							* 356	225	227	301		217	160	3080
80							* 573	505				* 493	356	120
1500					* 299	* 299	307	228	225	395		191	139	3280
60					* 643	* 643	660	480	482	354		424	308	130
1000					419	386	295	217	218	168		176	127	3400
40					903	660	635	467	471	343		389	280	140
500					395	294	283	205	203	154		171	122	3420
20					952	693	609	443	457	321		379	270	140
0					383	273	274	198	200	149		175	125	3350
0					825	560	591	425	447	321		386	275	140
-500	* 602	* 602	611	422	300	270	271	194	206	147		189	135	3180
-20	* 1349	* 1349	1390	997	819	582	583	419	443	317		418	299	130
-1000			617	428	383	273	272	195				222	160	2880
-40			1324	920	824	667	586	421				494	355	120
-1500			* 884	439	392	281						* 298	220	2380
-80			* 1284	945	845	607						* 660	495	100

Illustration 69

g06363842

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.















[mm] [inch]	1800 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
														
120												* 490	* 490	90
2500 100							* 244	238				* 225	198	2760
							* 559	503				* 488	448	710
2000 80							* 256	235	* 308	181		* 219	160	3080
							* 572	505				* 482	356	520
1500 60					* 290	* 290	* 320	228	* 320	165		* 221	139	3280
					* 843	* 843	* 699	490	* 783	354		* 487	308	100
1000 40					* 534	308	* 410	217	* 349	169		* 225	127	3400
					* 1035	660	* 885	467	* 757	342		* 496	280	740
500 20					* 671	284	* 472	265	* 369	154		* 239	122	3420
					* 1438	613	* 1017	443	* 737	321		* 526	270	740
0 0					* 872	273	* 484	288	* 346	143		* 265	125	3550
					* 1451	568	* 1041	425	* 787	323		* 594	275	740
-500 -20	* 602	* 402	* 358	422	* 617	270	* 452	194	* 334	147		* 230	116	3180
	* 1343	* 1343	* 1074	387	* 1338	582	* 872	438	* 792	317		* 646	299	100
-1000 -40			* 759	428	* 532	272	* 387	195				* 231	160	2680
			* 1523	920	* 1044	587	* 826	421				* 642	355	520
-1500 -60			* 604	428	* 411	281						* 238	220	2380
			* 1284	945	* 867	607						* 660	495	100

Illustration 70

g06364034

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)						
2000								2470						
2500								2960						
100					388	388		120						
2000					181	181		1290						
80					432	432		120						
500					354	354		1460						
60					553	553		140						
3000		674	674	425	431	295	341	288	257	85	194		179	3090
40		1390	1390	914	59	636	734	467	544				140	
500				397	469	292	377	290	245	161	180		183	2990
20				855	890	606	704	452	528	240	409		150	
0													3020	
0													140	
500	578	578	697	699	373	435	295	310	200	235			1360	
20	1293	1293	1282	1499	803	938	579	668	431	567			140	
3000	691	881	693	704	374	437	284	390	301	235			3080	
40	2000	2890	1293	1511	804	939	559	667	434	590			120	
500			818	881	389	443	279	35					3530	
60			1318	1450	679	954	593	660					110	
2000			480	460									1830	
80			945	945									70	

Illustration 71

g06364040

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

(mm) (inch)	1500 60		1501 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
3000															156	156	2470
2500															176	176	2960
300							386	386							394	394	120
2000							181	181	259	259					174	174	3090
00							412	412	582	584					384	384	120
3000							254	254	201	260					276	276	3480
60							553	553	618	558					285	285	140
3000			674	674	431	431	368	341	321	253	268	194			179	179	3580
40			1303	1300	309	319	775	724	650	544					295	295	140
500					626	460	445	327	354	246	231	190			192	163	3090
20					1029	890	953	704	766	628	523	400			422	464	150
0			563	563	675	442	470	38	264	233	244	188			203	186	3520
0			1307	1307	1451	952	1028	680	784	585					471	411	140
500	578	578	861	699	639	436	482	310	346	238					201	189	3280
20	1293	1293	1963	1489	1375	938	932	668	740	567					555	440	140
3000	091	091	028	704	568	477	410	310	294	236					276	229	3090
40	2000	2000	1778	1511	1213	933	877	667	618	503					610	567	120
500			601	601	460	442	320	35							285	285	2630
60			1453	1450	379	354	663	668							631	631	110
2000			460	460											332	332	1830
80			345	345											261	261	70

Illustration 72

g06364041

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60	1501 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000								196 * 196 2470
2500								176 174 2960
2000								134 120 120
1500								174 140 3090
1000								174 120 120
500								174 124 3480
0								182 275 140
0								182 180 3580
0								182 180 140
500								182 180 3590
1000								182 180 150
1500								182 180 3520
2000								182 180 140
2500								182 180 3580
3000								182 180 140
3500								182 180 3580
4000								182 180 140
4500								182 180 3580
5000								182 180 140
5500								182 180 3580
6000								182 180 140
6500								182 180 3580
7000								182 180 140
7500								182 180 3580
8000								182 180 140
8500								182 180 3580
9000								182 180 140
9500								182 180 3580
10000								182 180 140

Illustration 73

g06364043

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000															2470
2500															2160
2000							288	288							120
1500							181	181	259	189					130
1000							412	412	582	358					130
500							254	219	240	165					160
0							550	432	438	252					140
3000			674	488	421	310	360	217	321	158	266	117	179	113	2060
2500			1090	1003	819	693	776	467	636	339			395	250	140
2000					626	395	445	284	354	151	291	114	132	119	2090
1500					1039	614	950	439	766	324	520	244	422	240	150
1000			563	488	875	299	478	314	364	145	244	111	213	110	2020
500			1307	1110	1451	590	1028	417	784	310			471	243	140
0															
3000	578	578	991	489	839	263	462	160	346	142			251	119	2060
2500	1293	1293	1269	1110	1375	957	392	485	749	305			959	262	140
2000	890	827	828	414	968	314	410	311	334	142			274	137	2080
1500	2090	1791	1778	1110	1213	560	1177	464	638	307			649	305	120
1000			681	424	489	270	320	313					285	110	2030
500			1450	313	378	512	660	417					631	404	110
0			460	444									332	329	1030
0			945	915									351	351	70

Illustration 74

g06364047

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														(mm) (inch)
100													90	
2500 90							* 244 * 969	227 486				* 499 * 499	183 427	2760 100
2000 80							* 268 * 973	325 482	290	159		201 447	152 338	3080 120
1500 60					* 299 * 643	* 298 * 643	285 613	218 468	297	157	444 305	176 390	131 291	3280 130
1000 40					398 849	292 630	273 588	206 444	202	151	202 325	161 356	118 264	3480 140
500 20					388 789	270 593	261 562	195 420	195	145	420 312	156 345	115 254	3420 140
0 0					354 782	259 568	253 544	187 402	181	141	400 302	160 352	117 258	3350 140
-500 20	* 502 * 1249	* 502 * 1349	598 1214	402 864	351 755	257 552	249 538	184 396	189	139	406 299	173 387	127 282	3180 130
-1000 40			573 1228	407 876	354 761	259 557	250 539	185 398				204 453	151 335	2880 120
-1500 60			598 1257	418 931	363 782	267 577						280 632	208 470	2780 100

Illustration 75

g06364052

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.




[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)	
320							30	
2500 300				* 244 * 559	227 406		2760 100	
2000 80				* 256 * 573	328 482	* 399 559	2080 120	
1500 60			* 299 * 643	* 299 * 699	* 320 * 468	* 320 * 700	152 130	
1000 40			* 534 * 1036	292 630	* 490 * 895	* 348 * 757	3600 140	
500 20			* 679 * 1438	270 593	* 472 * 1017	* 369 * 797	3420 140	
0 0			* 673 * 1451	259 568	* 484 * 1041	* 366 * 787	3350 140	
-500 -20	* 802 * 1349	* 402 * 1349	* 698 * 1874	402 864	* 617 * 1339	257 562	* 452 * 972	184 385
-1000 -40		* 759 * 1623	407 876	* 533 * 1344	259 557	* 387 * 826	185 398	
-1500 -60		* 604 * 1294	419 911	* 411 * 867	267 577			

Illustration 76

g06364057

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Height (mm) (inch)
2000													196	196	2470
2500													178	166	2960
100							388	388					384	373	120
2000							181	181	211	193			174	165	3290
80							432	432	450	340			384	360	120
500							354	338	207	184			180	17	3450
60							553	488	444	324			250	259	140
1000			603	460	385	295	274	206	200	150	150	110	146	188	3090
40			1366	895	651	639	585	444	450	321			321	235	140
500					367	271	249	193	190	142	147	107	143	162	2990
20					791	594	559	416	434	346	315	220	300	225	150
0			553	399	350	255	249	180	187	137	144	104	143	163	3020
0			1186	837	754	550	536	384	401	292			265	233	140
500	578	578	653	399	344	249	243	178	183	133			154	11	3360
20	1293	1293	1195	837	740	537	523	382	382	295			339	245	140
1000	691	799	698	394	345	250	243	177	184	134			157	129	3080
40	2000	1711	1197	847	741	538	522	381	296	289			280	267	120
500			688	404	351	256	248	180					201	170	3630
60			1222	869	756	552	536	384					538	381	110
2000			480	424									332	312	1830
80			445	38									351	742	70

Illustration 77

g06364061

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.

(mm) (inch)	1500 49	1501 50	2000 66	2500 82	3000 98	3500 114		(mm) (inch)
3000								156 156 2470
2500								176 168 2960
2000					386 386			194 272 120
1500					181 181 259 199			174 135 3090
1000					412 412 582 249			164 200 120
500					254 288 201 184			176 117 3480
0					553 468 618 224			285 289 140
-500		674 460	431 296	363 268	321 150	268 110		179 188 3580
-1000		1283 905	939 639	775 444	650 321			295 235 140
-1500			626 271	445 193	354 143	291 107		192 162 3090
-2000			1029 584	953 416	766 360	523 239		422 225 150
-2500		593 339	675 255	470 183	364 137	244 104		213 163 3520
-3000		1307 837	1451 550	1028 394	784 253			471 229 140
-3500	578 578	861 399	639 249	482 178	346 133			251 111 3280
-4000	1293 1293	1963 837	1375 537	932 382	740 286			555 245 140
-4500	1991 799	1328 394	568 250	410 177	294 114			276 129 3090
-5000	2680 1711	1778 847	1213 539	877 351	618 289			610 287 120
-5500		611 404	460 256	320 113				285 170 2630
-6000		1450 853	970 552	688 294				621 251 110
-6500		450 424						332 312 1630
-7000		945 116						361 742 70

Illustration 78

g06364065

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

Without Bucket














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)		
															
2500 100								335	*	349			* 316 * 703	* 315 * 703	2540 100
2000 80								* 329 722	*	* 329 733			260 580	* 290 * 641	2030 120
1500 60						* 384 * 828	* 384 * 828	329 709	375 807	248 533	283 610	229 507	262 580	262 580	3150 130
1000 40						441 951	504 1087	318 687	364 785	243 524	279 601	213 471	245 541	245 541	3270 130
500 20						420 906	483 1041	308 664	383 761	238 513	273 589	205 460	240 529	240 529	3290 130
0 0				* 625 1362	* 625 * 1446	409 881	471 1016	300 647	345 746	234 505	269 581	213 470	246 542	246 542	3210 130
-500 -20	* 677 * 1510	* 677 * 1510	631 1366	733 1573	406 873	468 1008	297 640	342 738	233	268	230	265	265	265	3030 120
-1000 -40			638 1370	739 1567	406 879	471 1014	299 645	344 743				269	309	309	2720 110
-1500 -60			* 639 * 1366	* 639 * 1366	418 * 896	* 426 * 896						* 359 * 796	* 359 * 796	2200 90	

Illustration 79

g06364078

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.












[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							* 348	* 348			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2030 80
1500 60					* 384	* 384	* 383	375	* 371	283	* 283	262	3150 130
1000 40					* 584	504	* 457	364	* 390	279	* 289	245	3270 130
500 20					* 700	483	* 507	353	* 482	273	* 308	240	3280 130
0 0			* 825	* 625	* 704	471	* 512	345	* 392	268	* 343	246	3210 130
-500 -20	* 577	* 577	* 938	733	* 656	468	* 478	342	* 351	258	* 343	265	3030 120
-1000 -40	* 1510	* 1510	* 2023	1573	* 5400	3008	* 1828	738			* 755	606	2720 110
-1500 -60			* 639	* 639	* 426	* 426					* 359	* 359	2200 90

Illustration 80

g06364085

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities











[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							336	266			* 316	249	2540 100
2000 80							* 329	257			260	198	2030 80
1500 60					* 384	349	329	251	248	189	225	174	3450 60
1000 40					* 828	754	709	540	533	406	507	385	130 40
500 20					441	328	318	241	243	184	213	161	3270 20
0					951	710	687	519	524	397	471	356	130 0
0					420	309	308	230	238	179	209	157	3280 0
-500 -20					906	668	664	498	513	387	460	347	130 -20
0			* 625	442	409	299	300	223	234	175	213	160	3210 0
-500 -20	* 577	* 877	1352	952	601	645	647	482	595	379	470	353	130 -20
-1000 -40	* 1510	* 1510	631	443	405	296	297	220	233	175	230	173	3030 -40
-1500 -60			1356	955	873	638	640	475			508	381	120 -60
			638	449	408	298	299	222			389	201	2720 -40
			1370	958	879	644	645	481			598	446	110 -60
			* 639	461	418	308					* 359	273	2280 -60
			* 1356	955	* 895	666					* 795	617	90 -60

Illustration 81

g06364086

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.












[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							* 340	266			* 315	249	2540 100
2000 80							* 329	257			* 296	198	2030 80
1500 60					* 384	349	* 383	251	* 371	188	* 283	174	3150 60
1000 40					* 828	754	* 835	540	* 813	406	* 625	385	130
500 20					* 584	328	* 457	241	* 390	184	* 268	161	3270 40
0					* 1249	710	* 988	519	* 847	397	* 637	356	130
0					* 700	309	* 507	230	* 482	179	* 308	157	3280 20
0					* 1503	868	* 1194	498	* 868	387	* 678	347	130
-500 -20	* 577	* 877	* 938	443	* 1446	952	* 1516	645	* 1105	482	* 843	378	3030 20
-1000 -40	* 1510	* 1510	* 2023	955	* 625	442	* 704	299	* 512	223	* 382	175	2720 40
-1500 -60			* 812	449	* 1745	988	* 1205	644	* 864	481	* 758	446	110
			* 1745	988	* 639	461	* 426	308			* 359	273	2280 60
			* 1356	995	* 895	686					* 795	617	90

Illustration 82

g06364088

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

[mm] [inch]	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
2000								200 200 200
2500					250 250			245 245 270
3000					580 580			545 545 110
3500					250 250	200 200		200 200 110
4000					570 570	530 530		500 500 130
4500					300 300	240 240		200 200 300
5000					700 700	530 530		480 500 130
5500			450 450	440 440	200 200	260 260	260 260	180 200 340
6000			1480 1480	1540 1540	990 990	1050 1050	680 780	520 590 140
6500			600 600	690 690	400 400	460 460	300 300	200 270 380
7000			1070 1070	1530 1530	900 900	1040 1040	650 750	500 500 140
7500			620 620	710 710	400 400	460 460	290 300	200 200 390
8000			1030 1030	1550 1550	1070 1070	1000 1000	630 730	490 570 140
8500	600 600	610 610	620 620	620 620	600 600	710 710	390 460	290 290 320
9000	1380 1380	1380 1380	1390 1390	1390 1390	1320 1320	1540 1540	890 990	450 530 130
9500	700 700	790 790	890 890	890 890	620 620	710 710	390 460	290 300 290
10000	1240 1240	1240 1240	1260 1260	1260 1260	1020 1020	1550 1550	850 930	520 600 120
10500					600 600	710 710	400 480	300 340 360
11000					1360 1360	1520 1520	870 1000	560 750 130
11500					460 460	460 460		420 420 490
12000								800 800 40

Illustration 83

g06364094

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

[mm] [inch]	588 20		1001 40		1510 60		2000 80		2500 100		3000 120				[mm] [inch]
															
3000													200	280	2190
2500									255	255			245	245	2760
2000									583	583			545	545	180
1500									258	258	320	288	230	230	3110
1000									579	579	635	610	560	560	130
500									322	322	335	280	227	227	3300
0									787	787	735	608	501	501	130
3000					743	743	435	485	432	364	388	277	234	225	3430
2500					1546	1546	1059	1059	834	784	736	597	534	488	180
2000					696	696	888	488	483	351	390	270	248	221	3450
1500					1601	1593	1417	1042	1042	757	644	502	540	488	180
1000					713	713	700	487	508	341	393	285	277	225	3380
500					1546	1551	1514	1067	1055	736	647	571	611	488	180
0	618	418	623	623	947	720	889	461	488	335	389	282	323	240	3210
-500	1264	1264	1332	1332	2148	1545	1448	982	851	725	789	566	713	530	130
-1000	765	795	990	890	676	725	594	481	470	338			327	277	2920
-1500	1745	1745	1997	1997	1878	1556	1275	990	828	725			721	588	120
-2000					717	717	482	468					341	341	3460
-2500					1526	1526	1123	1110					755	755	100
-3000					468	468							425	425	1990
-3500													882	882	60

Illustration 84

g06364099

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000								* 200 * 200 200
2500								* 245 * 218 2760
2000								* 545 * 491 180
1500								* 258 * 208 250 80 * 230 179 310
1000								* 579 * 555 538 408 * 508 388 130
500								* 332 * 251 247 88 209 180 3200
400								* 707 * 541 552 404 463 350 130
300								895 499 445 311 318 240 242 82 194 167 3430
200								1488 1079 859 715 634 517 520 300 422 324 340
150								438 449 420 308 394 228 235 06 191 143 3450
100								1075 571 906 667 658 492 506 379 421 318 340
50								621 433 404 254 285 218 229 171 194 145 3580
40								1334 834 872 625 638 472 496 268 429 319 340
30								608 499 623 623 518 432 398 280 291 214 227 98 208 154 3290
20								1384 1304 1392 1382 1328 830 857 622 627 462 489 363 498 341 130
10								785 755 890 818 623 436 398 288 291 214 227 98 208 154 3290
5								1745 1745 897 803 1333 839 856 623 627 462 525 330 130
0								835 446 408 285 305 225 2480
0								1385 362 675 638 684 567 300
0								488 488 * 425 * 425 580
0								* 902 * 902 60

Illustration 85

g06364100

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.

[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															200	260	200
2500										255	295				245	248	2760
2000										583	596				545	451	170
1500										258	298	300	390		230	179	310
1000										579	595	635	408		508	388	130
500										322	251	205	98		227	152	3250
0										707	541	735	404		501	390	130
1800					743	489	456	311	412	240	366	382			234	187	3430
40					1548	1079	1059	715	834	517	796	500			514	324	140
500					936	449	440	289	493	228	390	09			249	163	3450
25					1601	571	1117	667	1042	492	814	273			589	235	140
1					713	433	700	294	598	219	593	171			277	145	3580
1					1048	334	754	625	1038	472	847	268			611	319	140
1500	698	519	623	623	947	432	669	281	498	214	369	361			323	154	3210
25	1284	1364	1332	1332	2148	950	1440	622	1850	462	789	363			713	341	130
1000	788	706	890	816	978	438	684	299	433	214					327	176	2900
40	1745	1745	2097	1813	1879	829	1275	623	326	460					721	330	120
1500					717	448	482	295							341	238	2460
40					1526	362	1023	628							755	587	100
2000					488	448									429	425	690
60															302	302	60

Illustration 86

g06364101

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities













[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							313	245			304	230	2540 100
2000 80							314	246			247	190	2030 80
1500 60					* 384	335	307	240	231	188	212	166	3450 60
1000 40					* 828	724	662	617	456	387	471	367	130 40
500 20					412	314	297	230	226	176	198	154	3270 20
0					886	680	640	496	487	379	437	339	130 0
0					391	296	286	220	221	171	193	150	3280 0
-500 -20			585	422	843	638	617	475	475	368	426	330	130 -20
-1000 -40			1256	908	379	285	278	213	217	167	197	152	3210 -40
-1500 -60	* 577	* 877	816	615	816	615	600	459	447	368	436	336	130 -60
-2000 -80	* 1510	* 1510	1260	911	376	282	276	210	216	166	195	164	3030 -80
-2500 -100			1260	911	810	608	593	453			471	363	120 -100
-3000 -120			593	429	375	284	277	212			345	191	2720 -120
-3500 -140			1274	924	816	614	598	458			563	425	110 -140
-4000 -160			697	441	389	294					347	261	2280 -160
-4500 -180			1366	962	840	636					773	589	90 -180

Illustration 87

g06364102

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
2500 100							* 348	245				* 315	238	2540
												* 703	539	100
2000 80							* 329	246				* 290	190	2030
							* 733	530				* 641	423	120
1500 60					* 384	335	* 383	240	* 371	189	* 283	166	3150	
					* 828	724	* 835	517	* 813	387	* 625	367	130	
1000 40					* 584	314	* 457	230	* 390	175	* 289	154	3070	
					* 1249	600	* 368	496	* 847	379	* 637	339	130	
500 20					* 706	295	* 507	220	* 482	171	* 305	150	3290	
					* 1503	638	* 1094	475	* 868	368	* 678	330	130	
0 0			* 625	422	* 704	285	* 512	213	* 332	167	* 343	152	3210	
			* 1448	908	* 1518	615	* 1105	459	* 843	368	* 756	336	130	
-500 -20	* 577	* 677	* 938	423	* 650	282	* 478	210	* 351	166	* 343	164	3030	
	* 1510	* 1510	* 2023	911	* 1408	608	* 1028	453			* 755	363	120	
-1000 -40			* 812	428	* 562	284	* 406	212			* 344	191	2720	
			* 1745	924	* 1205	614	* 864	458			* 758	425	110	
-1500 -50			* 639	441	* 425	294					* 359	261	2200	
			* 1356	952	* 895	636					* 795	589	90	

Illustration 88

g06364104

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities






[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															290	290	290
2500																	
2000																	
1500																	
1000																	
500																	
0																	
-500																	
-1000																	
-1500																	
-2000																	
-2500																	
-3000																	

Illustration 89

g06364112

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.

[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															200	200	200
2500																	
2000																	
1500																	
1000																	
500																	
0																	
-500																	
-1000																	
-1500																	
-2000																	
-2500																	
-3000																	

Illustration 90

g06364114

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

301.6

With Bucket















(mm) (inch)	1030 41		1550 60		2000 80		2500 100		3100 122				(mm) (inch)	
														
120												* 602	* 500	90
2500							* 244	* 244				* 225	* 225	2700
100							* 359	* 359				* 498	* 498	110
2000							* 256	* 256	282	* 369		* 219	* 219	3080
80							* 574	* 574				* 483	* 483	120
1500					* 301	* 300	* 321	* 321	279	317		* 221	* 221	3280
60					* 644	* 644	* 700	* 700	600	681		* 487	* 487	130
1000					511	* 534	364	* 410	274	311		224	* 225	3400
40					1102	* 1137	784	* 885	509	669		494	* 495	140
500					488	554	352	399	268	305		218	* 209	3420
20					1051	1194	758	861	576	656		481	* 526	140
0					475	542	343	391	263	300		223	265	3350
0					1024	1167	739	842	565	646		491	562	140
500	* 960	* 602	752	860	473	539	330	387	261	298		241	275	3180
-20	* 1345	* 1345	1612	1843	1017	1160	731	834	560	642		531	607	130
-1000			758	* 760	475	* 533	341	* 398				288	* 291	2880
-40			1626	* 1633	1023	* 1144	734	* 826				621	* 643	120
-1500			* 904	* 634	* 411	* 411						* 299	* 299	2380
-60			* 1284	* 1284	* 867	* 867						* 660	* 660	100

Illustration 91

g06364121

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
100												* 500 * 500	90	
2500 90							* 244 * 244	* 244 * 244				* 225 * 225	* 225 * 225	2760 100
2000 80							* 256 * 256	* 256 * 256	* 309 * 309	* 309 * 309		* 219 * 219	* 219 * 219	3060 120
1500 60					* 309 * 309	* 309 * 309	* 321 * 321	* 321 * 321	* 321 * 321	* 317 * 317		* 221 * 221	* 221 * 221	3280 130
1000 40					* 534 * 534	* 534 * 534	* 410 * 410	* 410 * 410	* 349 * 349	* 311 * 311		* 225 * 225	* 225 * 225	3400 140
500 20					* 872 * 872	* 554 * 554	* 473 * 473	* 399 * 399	* 370 * 370	* 305 * 305		* 239 * 239	* 239 * 239	3420 140
0 0					* 1439 * 1439	* 1094 * 1094	* 1018 * 1018	* 861 * 861	* 797 * 797	* 656 * 656		* 526 * 526	* 526 * 526	3350 140
-500 -20	* 602 * 602	* 602 * 602	* 667 * 667	* 660 * 660	* 617 * 617	* 538 * 538	* 453 * 453	* 387 * 387	* 335 * 335	* 298 * 298		* 293 * 293	* 275 * 275	3180 130
-1000 -40	* 1349 * 1349	* 1349 * 1349	* 1875 * 1875	* 1843 * 1843	* 1331 * 1331	* 1060 * 1060	* 973 * 973	* 834 * 834	* 712 * 712	* 642 * 642		* 644 * 644	* 607 * 607	2800 120
-1500 -60			* 760 * 760	* 760 * 760	* 533 * 533	* 533 * 533	* 388 * 388	* 388 * 388				* 291 * 291	* 291 * 291	2380 100
-2000 -80			* 604 * 604	* 604 * 604	* 411 * 411	* 411 * 411						* 299 * 299	* 299 * 299	2380 100

Illustration 92

g06364124

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities


(mm) (inch)	100E 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
120												* 500 * 500	30	
2500 100							* 244 * 244 * 559 * 559					* 225 * 225 * 498 * 498	2780 110	
2000 80							* 286 * 286 * 574 * 574	262	212			* 219 * 204 * 481 * 453	2000 120	
1500 60					* 308 * 308 * 644 * 644	* 300 * 300 * 644 * 644	* 321 * 321 * 700 * 700	284	279	210		* 221 * 437 * 180 * 388	3280 130	
1000 40					58 1102	379 818	354 784	273 587	274 589	205 440		224 434	156 366	3400 140
500 20					488 1051	357 771	352 758	261 563	268 576	199 428		216 481	161 355	3420 140
0 0					476 1024	346 747	343 739	253 546	263 565	184 418		223 491	164 362	3350 140
-500 -20	* 602 * 1249	* 602 * 1249	752 1612	529 1137	472 1017	344 740	339 731	260 538	261 562	192 415		241 531	177 392	3180 130
-1000 -40			758 1626	534 1180	475 1023	346 748	341 734	251 541				230 521	207 460	2880 120
-1500 -60			* 604 * 1284	545 1175	* 48 * 887	354 765						* 239 * 660	279 628	2380 100

Illustration 93

g06364147

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
120												* 500	* 500	30
2500							* 244	* 244				* 225	* 225	2760
100							* 559	* 559				* 493	* 493	110
2000							* 266	* 266	* 369	212		* 219	204	3000
80							* 574	* 574				* 493	450	120
1500					* 309	* 300	* 321	284	* 321	218		* 221	190	3200
60					* 644	* 644	* 700	611	* 704	651		* 487	398	130
1000					* 534	379	* 410	273	* 348	205		* 225	166	3400
40					* 1037	890	* 1005	867	* 750	443		* 496	366	140
500					* 672	357	* 473	261	* 370	199		* 239	161	3420
20					* 1439	771	* 1018	863	* 757	428		* 526	395	140
0					* 674	346	* 484	253	* 367	194		* 265	164	3350
0					* 1452	747	* 1042	846	* 788	418		* 504	362	140
-500	* 602	* 602	* 667	529	* 617	344	* 453	250	* 335	192		* 293	177	3100
-20	* 1349	* 1349	* 1875	1137	* 1331	740	* 973	538	* 712	415		* 646	392	130
-1000			* 750	534	* 533	346	* 388	251				* 291	207	2880
-40			* 1533	1150	* 1044	745	* 825	541				* 643	460	120
-1500			* 884	545	* 411	354						* 290	279	2300
-80			* 1284	1175	* 867	785						* 660	628	100

Illustration 94

g06364148

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1600 63		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000														186	186	2470
2500														170	170	2900
100							398	398						284	284	120
2000							181	181	259	259				174	174	3250
00							413	413	502	502				304	304	130
1000							295	295	270	291				175	175	3480
60							560	560	588	619				385	385	140
3000			674	674	432	432	360	360	272	300	210	241		179	179	2880
40			1381	1381	920	920	779	778	586	668				395	395	160
500					469	555	390	390	265	302	207	237		182	182	3930
20					1054	1097	754	817	670	659	444	510		422	422	150
0			563	563	472	528	340	387	259	298	205	234		202	210	3520
0			1307	1307	1018	1059	731	834	557	637				447	471	160
-500	570	570	738	846	466	532	334	381	255	232				207	249	3360
-20	1283	1283	1034	1018	1002	1084	719	821	549	629				478	549	160
-1000	091	091	740	028	400	532	333	391	256	293				247	277	3090
-40	2000	2000	1595	1779	1000	1045	718	820	552	619				546	610	120
-600			631	681	460	460	320	320						285	285	2930
-60			1451	1451	978	978	699	688						631	631	110
-2000			460	460										322	322	4030
-60			945	945										751	781	70

Illustration 95

g06364152

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.

(mm) (inch)	1900 40		2500 60		3000 80		3500 100		4000 120		4500 140				(mm) (inch)
															(mm) (inch)
3000													195	195	2470
2500													175	175	2960
100						386	386						384	384	420
2000						601	601	259	259				174	174	3250
60						403	403	562	562				384	384	120
1500						285	285	201	201				175	175	3150
60						500	500	618	618				395	395	140
1800			674	674	432	432	360	360	321	310	266	241	179	179	2660
40			1381	1381	928	928	779	779	638	666			395	395	140
500					627	556	446	388	355	302	291	237	182	182	2990
50					1348	1197	960	847	764	680	520	508	422	422	150
1			563	563	675	530	478	387	364	296	244	228	210	210	3520
1			1307	1307	1452	1199	1028	834	784	637			471	471	140
500	578	578	661	646	639	532	462	381	346	292			251	249	3160
20	1283	1283	1969	1804	1776	1414	1253	1027	940	828			555	549	140
1000	891	891	829	818	868	632	490	381	344	290			277	277	3080
40	2080	2000	1773	1773	1254	1145	870	808	618	618			610	610	120
1500			681	681	868	490	320	318					285	285	2530
60			1451	1451	378	378	663	663					631	631	110
2000			460	460									332	332	1030
40			945	945									241	241	70

Illustration 96

g06364155

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

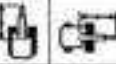
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	
							 (mm) (inch)
3000							* 195 * 195 2470
2500							* 178 * 178 2960
2000				* 266 * 266			* 234 * 234 320
1500				* 413 * 413	* 259 * 213		* 174 * 174 3200
1000				* 266 * 266	* 279 * 209		* 234 * 234 320
500				* 560 * 560	* 599 * 490		* 175 * 182 3460
0		* 674 * 587	* 432 * 383	* 360 * 273	* 272 * 203	* 210 * 155	* 179 * 150 3560
-500		* 1381 * 1283	* 929 * 827	* 779 * 587	* 586 * 437		* 235 * 232 340
-1000			* 499 * 399	* 350 * 258	* 265 * 195	* 207 * 152	* 182 * 146 3580
-1500			* 1054 * 775	* 764 * 589	* 578 * 421	* 444 * 325	* 422 * 321 350
-2000			* 583 * 585	* 472 * 382	* 340 * 249	* 259 * 190	* 203 * 140 3520
-2500		* 1307 * 1111	* 1046 * 739	* 731 * 527	* 557 * 409		* 447 * 326 340
-3000	* 578 * 578	* 739 * 585	* 486 * 336	* 334 * 244	* 255 * 187		* 217 * 158 3360
-3500	* 1293 * 1293	* 894 * 688	* 632 * 425	* 419 * 308	* 249 * 182		* 479 * 349 340
-4000	* 891 * 891	* 743 * 521	* 468 * 337	* 303 * 243	* 256 * 187		* 247 * 181 3560
-4500	* 2090 * 2090	* 1595 * 1129	* 1093 * 728	* 718 * 525	* 552 * 404		* 569 * 402 320
-5000		* 681 * 531	* 469 * 343	* 320 * 249			* 235 * 232 2830
-5500		* 1451 * 1122	* 979 * 739	* 668 * 527			* 621 * 521 180
-6000		* 460 * 460					* 332 * 332 1530
-6500		* 915 * 915					* 351 * 351 70

Illustration 97

g06364156

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
3000															135	135	2470
2500															175	175	2160
2000								288	288						234	234	120
1500								181	181	259	210				174	174	3250
1000								413	413	582	456				384	384	130
500								255	255	361	289				175	182	3160
0								560	560	638	450				385	390	140
1800			674	587	432	383	360	273	321	209	266	155			179	150	3560
1500			1281	1283	928	827	779	587	639	437					395	332	140
1000					627	359	446	259	355	186	291	152			192	146	3590
500					1388	770	900	589	766	421	520	325			422	321	150
0			563	516	875	382	478	249	364	190	244	143			210	149	3520
0			1307	118	1452	738	1029	537	784	409					471	326	140
1500	578	578	891	785	839	336	462	244	346	157				251	158	3360	
1000	1293	1293	1269	118	1375	725	993	526	749	402				399	343	140	
500	890	891	828	625	968	337	430	243	334	157				277	181	3080	
0	2060	2000	1779	100	1214	726	1079	525	638	404				609	402	120	
1500			681	538	488	383	320	249						285	232	2630	
1000			1451	1142	978	739	660	537						631	521	110	
500			460	418										332	332	1530	
0			945	815										351	351	70	

Illustration 98

g06364157

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities


[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)						
100						* 500 * 500	90						
2500 100				* 244 * 244 * 559 * 559		* 225 * 225 * 499 * 499	2760 100						
2000 80				* 256 * 256 * 574 * 574	205 204	* 219 * 219 * 483 * 483	3080 120						
1500 60			* 309 * 309 * 644 * 644	* 321 * 321 * 700 * 700	262 262	* 221 * 221 * 487 * 487	3280 130						
1000 40			482 1040	365 788	342 737	262 565	257 552	186 422	203 461	159 350	3400 140		
500 20			459 889	343 741	330 711	251 540	250 538	190 409	203 443	154 333	3420 140		
0 0			447 961	332 717	322 692	243 523	245 520	166 400	208 458	157 346	3350 140		
-500 -20	* 602 * 1349	* 602 * 1349	707 1517	509 1094	444 955	338 716	318 694	239 516	240 524	164 396	224 498	170 374	3180 130
-1000 -40			713 1531	514 1006	446 963	332 716	319 688	240 519			262 581	198 440	2880 120
-1500 -60		* 604 * 1284	505 1131	* 411 * 887	340 735						* 299 * 660	268 603	2380 100

Illustration 99

g06364160

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
100							* 500 * 500 90
2500 90				* 244 * 244 * 969 * 969			* 225 * 225 2760 * 499 * 499 100
2000 80				* 268 * 268 * 574 * 574	* 309 204		* 219 196 3080 * 483 435 120
1500 60			* 309 * 309 * 644 * 644	* 321 273 * 700 589	* 321 202 * 704 433		* 221 172 3280 * 487 381 130
1000 40			* 534 365 * 1007 788	* 410 262 * 985 565	* 349 186 * 758 422		* 225 158 3400 * 496 350 140
500 20			* 672 343 * 1439 741	* 473 251 * 1018 540	* 370 190 * 797 409		* 239 154 3420 * 526 338 140
0 0			* 674 332 * 1452 717	* 484 243 * 1042 523	* 367 186 * 788 400		* 265 157 3350 * 584 346 140
-500 20	* 502 * 502 * 1349 * 1349	* 667 509 * 1875 1094	* 617 330 * 1331 710	* 453 239 * 973 516	* 335 184 * 712 396		* 292 170 3180 * 646 374 130
-1000 40		* 769 514 * 1633 1006	* 533 332 * 1144 716	* 388 240 * 926 519			* 291 158 2880 * 643 440 120
-1500 60		* 604 505 * 1294 1131	* 411 340 * 887 735				* 299 268 2380 * 660 603 100

Illustration 100

g06364162

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000								2470
2500								2160
2000								1850
1500								1540
1000								1230
500								920
0								610
								300
								0
								-300
								-610
								-920
								-1230
								-1540
								-1850
								-2160
								-2470

Illustration 101

g06364163

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140			(mm) (inch)	
														(mm) (inch)	
3000													136	136	2470
2500													178	178	2160
2000							288	288					234	234	120
1500							181	181	259	204			174	174	3250
1000							413	413	582	437			384	384	130
500							255	255	361	291			175	155	3160
0							560	560	638	431			285	344	340
1800			674	567	432	370	360	262	321	185	266	148	179	183	3560
1500			1281	1225	928	797	779	564	639	418			335	336	140
1000					627	344	446	248	355	180	291	145	182	139	3590
500					1388	710	800	536	766	490	520	378	422	306	150
0			563	495	375	328	478	238	364	182	244	142	210	161	3520
0			1307	1067	1452	700	1029	588	784	330			471	310	340
1500	578	578	881	488	839	323	462	213	346	178			251	151	3360
1000	1293	1293	1869	1067	1375	695	1003	563	748	304			898	323	140
500	880	891	828	500	868	333	410	213	334	179			277	179	3080
0	2060	2000	1779	1077	1214	636	1070	582	638	306			649	383	120
1500			681	590	488	328	320	238					285	222	2630
1000			1451	1089	1378	710	660	588					631	488	170
500			460	488									332	332	1530
0			945	945									751	751	70

Illustration 102

g06364165

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Without Bucket















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							* 349	* 349			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2500 100
1500 60					* 384	* 384	* 381	* 383	383	348	280	* 283	3150 120
1000 40					533	* 584	387	435	451	732	621	* 625	3200 120
500 20					1151	* 1250	835	938	642	723	580	* 637	3280 130
0 0					512	579	376	424	243	338	258	291	3280 130
					1005	1248	812	915	631	71	568	641	3210 130
			* 625	* 625	501	567	369	416	289	325	264	298	3210 130
			* 1446	* 1446	1080	1222	796	898	623	703	582	656	3210 130
500 20	* 677	* 677	772	878	489	564	365	413	216	325	294	321	3000 120
	* 1510	* 1510	1658	1888	1073	1215	789	891			428	709	3000 120
1000 40			778	813	509	562	367	* 407			330	* 344	2720 110
			1672	* 1745	1079	* 1206	794	* 865			733	* 756	110
1500 60			* 639	* 639	* 426	* 426					* 359	* 359	2200 90
			* 1356	* 1356	* 895	* 895					* 795	* 795	90

Illustration 103

g06364168

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
2500 100							2540 100
2000 80				* 329 * 794	* 329 * 794		2500 100
1500 60			* 384 * 929	* 384 * 829	* 383 * 836	* 371 732	3150 120
1000 40			* 584 * 1250	* 584 * 1250	* 457 * 989	* 350 723	3270 130
500 20			* 701 * 1504	* 579 1248	* 507 * 1094	* 462 905	3290 130
0 0		* 625 * 1446	* 625 * 1446	* 705 * 1519	* 567 * 1222	* 496 * 1005	3210 130
-500 -20	* 677 * 1510	* 677 * 1510	* 818 * 2024	* 878 * 1988	* 850 * 1401	* 478 * 1026	3030 120
-1000 -40		* 813 * 1745	* 813 * 1745	* 862 * 1205	* 862 * 1206	* 407 * 865	2720 110
-1500 -60		* 839 * 1358	* 839 * 1358	* 426 * 895	* 426 * 895		2200 80

Illustration 104

g06364170

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
2500 100							2540 100
2000 80							2500 100
1500 60							3500 138
1000 40							3270 129
500 20							3200 126
0 0							3210 126
-500 -20							3000 120
-1000 -40							2720 107
-1500 -60							2200 87

Illustration 105

g06364171

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
2500 100							* 349	311			* 315	303	2540 100
2000 80							* 329	313			* 290	245	2300 120
1500 60					* 384	* 384	* 383	308	* 371	234	* 283	238	2150 130
1000 40					* 594	402	* 457	286	* 380	229	* 289	202	2270 130
500 20					* 701	382	* 507	206	* 402	224	* 308	198	3290 130
0 0			* 625	549	* 705	372	* 513	279	* 393	220	* 343	202	3290 130
-500 -20	* 677	* 677	* 808	550	* 659	368	* 478	276	* 351	218	* 343	217	3030 120
-1000 -40	* 1510	* 1510	* 2024	1095	* 1401	736	* 1028	506			* 756	479	2730 100
-1500 -60			* 813	566	* 562	375	* 407	378			* 344	261	2200 80
			* 1745	1088	* 1206	802	* 865	601			* 753	558	
			* 639	568	* 426	381					* 353	339	
			* 1356	1225	* 895	823					* 795	763	

Illustration 106

g06364172

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

Lift Height (mm) (inch)	590 23		1000 40		1500 60		2000 80		2500 100		3000 120				Lift Height (mm) (inch)
															
2000													261	281	2190
2500									255	255			245	245	2760
3000									580	580			545	545	180
3500									250	250	305	321	230	230	3190
4000									580	580	635	635	568	568	130
4500									320	320	392	395	227	227	3320
5000									707	707	650	731	501	581	130
5500					744	744	435	485	387	413	298	333	234	234	3430
6000					1547	1547	1090	1060	924	894	630	719	514	514	140
6500					696	696	512	519	374	422	290	327	237	243	3450
7000					1070	1081	1105	1240	607	660	628	708	520	540	140
7500					710	710	497	560	365	412	294	321	242	274	3390
8000					1637	1646	1171	1210	787	869	813	893	550	600	140
8500	618	619	623	623	759	857	890	956	359	467			258	292	3210
9000	1264	1264	1332	1332	831	1061	1096	1199	725	879	607	687	570	648	130
9500	768	798	890	890	764	871	881	967	359	467			290	327	2920
10000	1745	1745	1897	1897	1041	1172	1057	1200	775	909			650	721	130
10500					717	717	432	482					241	241	3480
11000					1527	1527	1024	1024					755	755	130
11500					468	468							425	425	3390
12000													882	882	60

Illustration 107

g06364173

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.




[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120			[mm] [inch]		
																
3000													* 267	* 241	2600	
2500													* 245	* 245	2760	
100										* 255	* 255		* 545	* 545	180	
2000										* 258	* 258	* 321	* 321	* 230	* 230	3100
80										* 590	* 590	* 635	* 635	* 598	* 598	130
1500										* 323	* 323	* 295	* 295	* 227	* 227	3080
60										* 707	* 707	* 736	* 731	* 581	* 581	130
1800					* 744	* 744	* 485	* 485	* 413	* 413	* 366	* 363	* 234	* 234	3430	
40					* 1547	* 1547	* 1060	* 1060	* 834	* 834	* 796	* 79	* 514	* 514	140	
500					* 636	* 636	* 661	* 578	* 494	* 422	* 390	* 327	* 249	* 249	3450	
25					* 1681	* 1681	* 1130	* 1248	* 1044	* 890	* 845	* 705	* 549	* 549	140	
1					* 713	* 713	* 704	* 563	* 508	* 42	* 394	* 321	* 277	* 274	3580	
1					* 1646	* 1646	* 758	* 1213	* 1035	* 810	* 848	* 633	* 618	* 603	140	
1000	* 698	* 698	* 623	* 623	* 347	* 357	* 669	* 555	* 488	* 407	* 369	* 318	* 323	* 292	3210	
20	* 1364	* 1364	* 1392	* 1392	* 2198	* 1851	* 1441	* 1188	* 1050	* 878	* 790	* 687	* 713	* 645	150	
1000	* 785	* 785	* 890	* 888	* 378	* 371	* 694	* 667	* 433	* 407			* 327	* 327	2900	
40	* 1745	* 1745	* 1897	* 1897	* 1080	* 1072	* 275	* 268	* 327	* 379			* 721	* 721	120	
1800					* 717	* 717	* 482	* 482					* 341	* 341	3480	
60					* 1527	* 1527	* 1024	* 1024					* 795	* 795	100	
2000					* 488	* 488							* 425	* 425	2880	
80													* 902	* 902	60	

Illustration 108

g06364175

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000								261 261 260
2500 100					255 255 543 530			245 245 260 545 545 190
2000 80					250 250 580 580	305 225 505 505		230 222 310 500 494 130
1500 60					323 307 787 691	302 253 650 501		227 190 320 561 439 130
1000 40			744 695 1547 1333	455 464 1060 874	387 256 834 638	286 227 638 458		234 185 343 514 409 140
500 20			936 856 1879 1201	512 382 1106 828	374 284 887 615	290 221 626 437		237 181 345 521 389 140
0 0			713 540 1837 1185	497 347 1071 784	365 275 797 593	284 216 610 468		242 184 330 523 408 140
-500 -20	838 838 1384 1384	623 623 1332 1332	759 530 1839 1180	480 362 1008 768	359 270 779 583	281 210 607 461		250 186 320 528 433 130
-1000 -40	785 705 1745 1745	690 690 1697 1697	764 542 1841 1169	491 362 1057 781	369 270 725 510			293 232 320 650 493 120
-1500 -60			717 553 1527 1191	482 368 1024 766				241 233 240 755 634 100
-2000 -80			468 418					425 425 190 382 382 60

Illustration 109

g06364176

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.


[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															267	241	260
2500																	
2000																	
1500																	
1000																	
500																	
0																	
-500																	
-1000																	
-1500																	
-2000																	
-2500																	
-3000																	

Illustration 110

g06364178

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120					
													mm inch	
2500 100								* 349	301			* 315	293	2540 100
2000 80								* 329	302			* 299	236	2030 80
1500 60								* 734	650			* 641	526	1500 60
1000 40														1000 40
500 20														500 20
0 0														0 0
-500 -20	* 577	* 577	727	530	465	365	344	256	270	211	267	209	3030 120	
-1000 -40			734	538	471	357	346	267				311	242	2720 110
-1500 -60			* 639	548	* 426	367						* 359	326	2200 90

Illustration 111

g06364185

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
												(mm) (inch)	
2500 100							* 349	301			* 316	293	2540 100
2000 80							* 329	300			* 290	236	2130 120
1500 60					* 384	* 384	* 383	296	* 371	225	* 283	208	3150 130
1000 40					* 829	* 829	* 836	638	* 814	485	* 625	461	3270 130
500 20					* 701	369	* 507	276	* 462	216	* 308	190	3290 130
0 0			* 625	528	* 705	358	* 513	263	* 353	212	* 343	194	3210 130
-500 -20	* 677	* 677	* 938	530	* 650	355	* 478	268	* 351	211	* 343	209	3830 120
-1000 -40	* 1510	* 1510	* 2024	1142	* 1401	767	* 1028	574			* 756	461	2720 110
-1500 -60			* 813	536	* 562	357	* 407	267			* 344	242	2200 90
			* 1745	1154	* 1206	772	* 865	578			* 758	537	
			* 639	548	* 426	367					* 359	325	2200 90
			* 1356	1182	* 895	794					* 795	735	

Illustration 112

g06364187

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000								267 241 260
2500					255 255			245 245 270
2000					530 530			545 545 180
1500					258 258	280 227		230 214 310
1000					590 590	617 457		599 478 130
500					323 294	295 224		227 190 320
0					797 639	613 463		591 421 130
1800			744 585	485 381	345 285	279 219		229 178 3430
1500			547 428	300 244	237 195	161 127		102 78 340
1200			636 506	463 369	353 273	272 212		223 174 3450
900			893 705	543 429	395 311	248 193		191 145 340
600			713 560	468 364	343 264	267 207		227 177 3580
300			1541 1211	1000 784	748 571	576 447		500 390 340
100	608 498	623 493	715 548	451 349	338 259	264 205		242 188 3230
-25	1264 1004	1392 1082	1535 1195	104 79	729 560	570 442		534 415 130
1000	785 755	890 880	719 572	462 348	338 259			274 214 2920
-40	1745 1745	2097 2097	1545 1225	105 79	729 560			611 473 130
1500			717 572	469 355				341 272 3480
-63			1527 1149	1011 756				795 610 300
2000			488 488					425 425 580
-82								902 902 60

Illustration 113

g06364189

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.


[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															267	241	260
2500																	
2000																	
1500																	
1000																	
500																	
0																	
-500																	
-1000																	
-1500																	
-2000																	
-2500																	
-3000																	

Illustration 114

g06364190

Lift Chart Above: 1780 mm (5 ft and 10 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

301.7

With Bucket















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 129																
2500 103																
2000 80																
1500 60																
1000 40																
500 20																
0 0																
-500 -20																
-1000 -40																
-1500 -60																

Illustration 115

g06615559

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage EXTENDED, canopy machine with blade UP.

(mm) (inch)	1000 41		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)			
																		
3000 120																* 691	* 695	100
2500 100								* 345	* 345							* 585	* 585	2930
2000 80								* 563	* 563							* 587	* 587	120
1500 60								* 268	* 268	* 303	261					* 309	236	3250
1000 40								* 604	* 604	* 792	559					* 570	604	130
500 20								* 375	350	* 383	257					* 261	207	3440
0 0								* 616	753	* 838	552					* 576	345	140
-500 -20					* 724	478	* 520	330	* 435	290	* 379	190				* 188	189	3670
-1000 -40					* 1526	1027	* 1117	725	* 941	537						* 168	450	140
-1500 -60					* 825	447	* 619	321	* 473	242	* 381	189				* 202	181	3580
-2000 -80					* 1975	964	* 1325	880	* 1021	521						* 528	398	150
-2500 -100					* 900	457	* 636	312	* 478	238						* 311	184	3520
-3000 -120					* 1938	940	* 1363	871	* 1037	509						* 607	406	140
-3500 -140					* 875	716	* 817	436	* 596	308	* 444	234				* 352	199	3350
-4000 -160	* 1891	* 1681	* 2800	1636	* 1761	957	* 1281	863	* 961	603						* 778	409	140
-4500 -180	* 1174	* 1174	* 1589	725	* 703	439	* 516	308								* 351	231	3050
-5000 -200	* 2638	* 2638	* 2247	1549	* 1520	945	* 1103	666								* 174	513	120
-5500 -220			* 845	737	* 558	449	* 376	318								* 360	310	2550
-6000 -240			* 1703	1579	* 1152	966										* 796	607	100

Illustration 116

g06615561

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage EXTENDED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														601	643	100
2500 100							* 345	327						260	268	2900
2000 80							* 563	486						586	378	120
1500 60							* 358	224	247	158				213	134	3250
1000 40							* 604	481	528	307				475	299	100
500 20								333	315	243	154			188	318	3440
0 0								716	463	521	331			417	257	140
-500 20					454	296	318	302	236	148	180	109		174	306	3570
-1000 40					676	617	685	434	505	317				304	230	140
-1500 60					425	259	304	189	226	140	176	106		169	301	3580
-2000 80					915	551	654	406	490	301				372	222	100
-2500 100					414	250	294	180	222	135				172	303	3620
-3000 120					591	539	633	387	473	290				380	228	140
-3500 140	* 1691	* 1691	1489	900	888	596	624	379	472	285				166	311	3350
-4000 160														411	246	140
-4500 180	* 1174	857	692	406	417	252	290	178						217	332	3040
-5000 200	* 2636	1831	1482	871	895	543	626	382						482	260	120
-5500 220														392	181	2550
-6000 240					1512	897	917	552						658	407	100

Illustration 117

g06615565

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage RETRACTED, canopy machine with blade UP.
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 391	543	100
2500 100							* 248	227						* 365	168	2930
2000 80							* 565	486						* 587	378	120
1500 60							* 268	224	* 350	158				* 258	134	3200
1000 40							* 604	481	* 702	337				* 170	209	130
500 20							* 375	215	* 360	154				* 261	175	3440
0 0							* 898	493	* 838	301				* 576	257	140
-500 -20					* 724	268	* 608	302	* 430	148	* 379	100		* 360	105	3670
-1000 -40					* 1025	617	* 1117	435	* 941	317				* 388	232	140
-1500 -60					* 925	259	* 819	339	* 474	140	* 381	100		* 282	101	3500
-2000 -80					* 1975	561	* 1328	406	* 1021	301				* 420	222	150
-2500 -100					* 900	200	* 608	180	* 478	130				* 311	103	3620
-3000 -120					* 1938	539	* 1388	387	* 1027	290				* 687	225	140
-3500 -140					* 875	401	* 817	249	* 595	178	* 444	132		* 352	111	3300
-4000 -160	* 1801	* 1681	* 2900	868	* 1761	636	* 1281	379	* 961	285				* 776	245	140
-4500 -180	* 1174	857	* 1349	406	* 708	252	* 518	178						* 351	132	3050
-5000 -200	* 2638	1831	* 2347	871	* 1520	543	* 1103	382						* 774	290	120
-5500 -220			* 846	417	* 358	261	* 378	185						* 360	181	2550
-6000 -240			* 1793	897	* 1182	562								* 796	407	100

Illustration 118

g06615567

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage RETRACTED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 233	* 233	2640
2500 100									249	263				* 212	* 212	3130
									835	863				* 478	* 470	130
2000 80									248	262				193	205	3420
									530	561				428	456	140
1500 60								* 262	* 262	243	257	182	194	178	182	3620
								* 920	* 920	521	552	388	414	378	403	150
1000 40					452	485	520	557	595	632	670	708	746	158	169	3730
					898	1044	1190	1336	1482	1628	1774	1920	2066	348	373	150
500 20					428	453	478	503	528	553	578	603	628	153	154	3760
					922	971	1020	1069	1118	1167	1216	1265	1314	337	362	150
0 0			* 488	* 488	410	433	456	479	502	525	548	571	594	155	167	3600
			* 1078	* 1078	882	931	980	1029	1078	1127	1176	1225	1274	342	367	150
-500 -20	* 851	* 851	889	700	405	428	451	474	497	520	543	566	589	164	178	3530
	* 1447	* 1447	1431	1493	878	918	958	998	1038	1078	1118	1158	1198	307	383	140
-1000 -40	* 984	* 984	676	707	407	429	451	473	495	517	539	561	583	198	203	3200
	* 2199	* 2199	1446	1513	873	923	973	1023	1073	1123	1173	1223	1273	421	451	130
-1500 -60	* 1341	* 1341	688	719	414	438	462	486	509	533	557	581	605	244	259	2810
	* 3018	* 3018	1473	1541	890	939	988	1037	1086	1135	1184	1233	1282	548	581	110
-2000 -80			* 663	* 663	* 402	* 402								* 408	* 408	2010
			* 1395	* 1395										* 908	* 908	80

Illustration 119

g06615589

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage EXTENDED, canopy machine with blade UP.

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 120													* 233	* 233	2640
2500 100									* 293	293			* 212	* 212	3130
									* 545	553			* 476	* 476	130
2000 80									* 266	262			* 208	205	3420
									* 645	551			* 455	455	140
1500 60							* 282	* 282	* 329	257	* 341	194	* 209	182	3620
							* 620	* 620	* 725	552	* 623	414	* 460	403	150
1000 40					* 551	485	* 448	337	* 397	249	* 359	190	* 214	169	3730
					* 1183	1044	* 865	726	* 851	535	* 780	407	* 472	373	150
500 20					* 888	458	* 581	300	* 453	240	* 374	185	* 228	164	3780
					* 1645	971	* 1248	600	* 977	518	* 808	398	* 592	362	150
0 0			* 488	* 468	* 317	433	* 630	308	* 474	233	* 371	182	* 253	187	3890
			* 1078	* 1073	* 1568	931	* 1354	663	* 1019	500	* 794	390	* 558	367	150
-500 -20	* 851	* 851	* 834	700	* 856	428	* 610	302	* 458	228	* 339	180	* 297	178	3530
	* 1447	* 1447	* 1392	1493	* 1841	918	* 1310	650	* 977	491			* 656	393	140
-1000 -40	* 864	* 834	* 1181	707	* 757	428	* 588	301	* 430	228			* 334	203	3290
	* 2199	* 2199	* 2493	1513	* 1823	923	* 1167	640	* 850	432			* 736	451	130
-1500 -60	* 1341	* 1341	* 863	718	* 622	438	* 438	307					* 348	209	2810
	* 3038	* 3038	* 2943	1541	* 1323	838	* 824	601					* 753	581	110
-2000 -80			* 603	* 563	* 492	* 492							* 406	* 406	2010
			* 1386	* 1388									* 806	* 806	80

Illustration 120

g06615590

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage EXTENDED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000 120															2640
2500 100									248	160					3130
2300 90									533	340					138
1500 60									248	158					3420
1000 40									530	330					148
500 20									* 282	217	243	154	182	111	3920
0									* 620	468	521	329	388	238	153
-500 -20					467	292	320	203	235	146	178	107	158	93	3730
-1000 -40					904	621	667	426	504	312	391	229	348	205	162
-1500 -60					428	262	303	187	226	138	173	103	153	89	3760
-2000 -80					822	560	650	403	485	260	372	220	337	196	158
-2500 -100			* 486	383	410	245	280	178	218	131	169	98	155	90	3680
-3000 -120			* 1078	822	682	529	625	373	469	261	384	212	342	198	163
-3500 -140	* 651	* 651	660	395	405	241	284	170	214	127	168	98	166	96	3630
-4000 -160	* 1447	* 1447	1431	826	679	578	611	388	480	272			367	213	148
-4500 -180	* 884	828	875	390	407	243	284	170	214	127			190	112	3250
-5000 -200	* 2180	1764	1466	638	673	521	610	365	460	273			421	249	138
-5500 -220	* 1341	842	888	401	414	249	289	175					244	147	2810
-6000 -240	* 3018	1800	1473	862	693	536	623	377					545	330	118
-6500 -260			* 882	421	* 402	265							* 400	284	2010
-7000 -280			* 1305	908									* 308	625	80

Illustration 121

g06615593

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage RETRACTED, canopy machine with blade UP.

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
3000 120														* 233	205	2640	
2500 100									* 203	160				* 212	147	3130	
2000 80									* 303	340				* 470	330	138	
1500 60									* 285	158				* 308	119	3420	
1000 40									* 545	338				* 459	285	145	
500 20									* 382	217	* 329	154	* 341	111	* 209	102	3600
0 0									* 520	485	* 725	329	* 623	235	* 460	227	153
-500 -20					* 551	292	* 448	203	* 397	146	* 359	107	* 314	83	* 214	83	3730
-1000 -40					* 1183	631	* 365	438	* 861	313	* 780	229	* 472	205	* 472	205	156
-1500 -60					* 868	282	* 581	187	* 453	138	* 374	103	* 228	89	* 228	89	3760
-2000 -80					* 1045	565	* 1248	403	* 877	296	* 806	220	* 502	186	* 502	186	153
-2500 -100			* 488	383	* 917	246	* 830	178	* 474	131	* 371	99	* 252	90	* 252	90	3600
-3000 -120			* 1078	822	* 1968	629	* 1354	378	* 1019	261	* 794	212	* 560	188	* 560	188	153
-3500 -140	* 851	* 851	* 834	385	* 858	241	* 810	170	* 455	127	* 330	98	* 297	86	* 297	86	3530
-4000 -160	* 1447	* 1447	* 1692	826	* 1841	519	* 1310	368	* 877	272				* 656	213	148	
-4500 -180	* 984	826	* 1161	390	* 757	243	* 545	170	* 400	127				* 334	112	3280	
-5000 -200	* 2190	1754	* 2483	838	* 1623	521	* 1167	385	* 850	273				* 738	240	138	
-5500 -220	* 1341	842	* 963	401	* 602	249	* 438	175						* 345	147	2810	
-6000 -240	* 3018	1800	* 2043	852	* 1323	536	* 324	377						* 763	330	118	
-6500 -260			* 553	421	* 402	205								* 400	254	2010	
-7000 -280			* 1365	908										* 808	825	80	

Illustration 122

g06615598

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage RETRACTED, canopy machine with blade DOWN.

Without Bucket















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
													(mm) (inch)	
2500 100							* 357 780	* 357 818				317 716	333 752	2730 111
2000 80							* 357 781	* 357 797	269 576	283 607	256 569	269 599	3090 129	
1500 60					* 442 946	* 442 946	354 763	372 801	266 572	280 603	225 499	238 527	3320 131	
1000 40					476 1027	499 1076	341 736	359 774	250 560	274 591	211 465	223 492	3440 143	
500 20					451 973	474 1022	328 708	345 745	253 545	267 577	206 454	218 481	3460 143	
0 0					448 947	463 997	320 689	337 725	248 535	262 586	210 464	223 491	3360 141	
-500 -20	* 768 1699	* 769 1699	704 1507	735 1575	438 942	461 991	316 682	334 720	245 531	261 562	226 499	240 529	3200 131	
-1000 -40	* 1121 2510	* 1121 2510	711 1524	742 1591	441 958	464 999	318 686	336 724			202 582	277 615	2890 129	
-1500 -60	* 1567 3535	* 1567 3535	726 1557	757 1624	451 973	474 1022					354 780	373 840	2370 105	

Illustration 123

g06615545

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage EXTENDED, canopy machine with blade UP.
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
2500 100							* 357 * 830	* 357 * 818				* 366 * 815	333 752	2710 110
2000 80							* 357 * 797	* 357 * 797	* 423 * 854	283 607		* 336 * 744	269 599	3090 120
1500 60					* 442 * 946	* 442 * 946	* 450 * 979	372 801	* 441 * 965	280 603		* 329 * 726	238 527	3320 130
1000 40					* 775 * 1844	499 1076	* 572 * 1232	359 774	* 481 * 1043	274 591		* 336 * 748	223 492	3440 140
500 20					* 945 * 2028	474 1022	* 653 * 1406	346 746	* 508 * 1097	267 577		* 357 * 787	278 481	3460 140
0 0					* 938 * 2018	463 997	* 665 * 1432	337 728	* 505 * 1066	262 566		* 398 * 877	223 491	3380 140
-500 -20	* 766 * 1699	* 766 * 1699	* 852 * 2163	735 1575	* 858 * 1847	461 991	* 622 * 1338	334 720	* 465 * 993	261 562		* 405 * 893	240 529	3200 130
-1000 -40	* 1121 * 2510	* 1121 * 2510	* 1128 * 2412	742 1591	* 744 * 1595	454 999	* 537 * 1147	336 724				* 407 * 898	277 615	2890 120
-1500 -60	* 1567 * 3535	* 1567 * 3535	* 896 * 1834	757 1624	* 578 * 1228	474 1022						* 426 * 943	373 840	2370 100

Illustration 124

g06615549

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage EXTENDED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities
















(mm) (inch)	1030 41		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
2500 100							* 367 780	246 528				317 716	214 483	2710 110
2000 80							* 367 781	246 528	269 576	181 386		266 569	171 381	3090 120
1500 60					* 442 * 946	336 722	354 763	238 512	266 572	178 383		225 499	149 331	3320 130
1000 40					476 1027	309 668	341 738	226 487	260 560	172 371		211 465	138 306	3440 140
500 20					451 973	286 619	328 708	214 462	253 546	166 358		206 454	134 296	3460 140
0 0					440 947	276 590	320 689	206 444	248 536	161 348		210 464	137 302	3380 140
-500 -20	* 766 * 1699	* 766 * 1699	704 1507	420 903	438 942	274 592	316 682	203 437	246 531	159 344		226 499	147 324	3200 130
-1000 -40	* 1121 * 2510	862 1843	711 1524	426 917	441 950	277 598	318 686	204 441				262 582	170 378	2890 120
-1500 -60	* 1567 * 3535	881 1886	726 1557	439 945	451 973	286 619						364 798	229 516	2370 100

Illustration 125

g06615552

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage RETRACTED, canopy machine with blade UP.















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
													(mm) (inch)	
2500 100							* 357 * 836	246 528				* 366 * 815	214 483	2710 110
2000 80							* 357 * 797	246 528	* 423 * 864	181 386		* 336 * 744	171 381	3090 120
1500 60					* 442 * 946	335 722	* 450 * 979	238 512	* 441 * 965	178 383		* 329 * 726	149 331	3320 130
1000 40					* 775 * 1644	309 660	* 572 * 1232	226 487	* 481 * 1043	172 371		* 336 * 740	138 306	3440 140
500 20					* 940 * 2020	286 610	* 653 * 1408	214 462	* 508 * 1097	165 358		* 357 * 787	134 296	3460 140
0 0					* 936 * 2018	276 596	* 665 * 1432	206 444	* 506 * 1086	161 348		* 358 * 877	137 302	3360 140
-500 -20	* 766 * 1699	* 766 * 1699	* 852 * 2163	420 903	* 858 * 1847	274 592	* 622 * 1338	203 437	* 465 * 993	159 344		* 405 * 893	147 324	3200 130
-1000 -40	* 1121 * 2510	862 1843	* 1128 * 2412	426 917	* 744 * 1596	277 598	* 537 * 1147	204 441				* 407 * 898	170 378	2890 120
-1500 -60	* 1567 * 3535	881 1886	* 896 * 1894	435 945	* 578 * 1220	286 615						* 426 * 943	229 516	2370 100

Illustration 126

g06615556

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 960 mm (3 ft 2 inch) standard stick, expandable undercarriage RETRACTED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities

















(mm) (inch)	1200 48		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 305	* 305	2360
2500 100							* 577	* 577						180 630	* 264 * 635	2030 120
2000 80									270 573	264 590				231 515	244 544	3280 130
1500 60								356 767	* 355 * 755	290 571	280 602			206 457	218 483	3490 140
1000 40			1655	1715	452 1010	505 1080	342 737	359 774	288 616	273 607	285 635	215 461	183 427	209 463	2600 100	
500 20					452 975	475 1024	327 705	344 743	250 539	265 570	189 428	211 454	189 416	208 442	208 442	3620 150
0 0			* 613 * 1484	* 613 * 1404	435 937	458 986	316 680	330 719	264 525	258 557	186 208	208	192 423	204 449	204 449	3550 140
-500 -20	* 690 * 1525	* 685 * 1525	638 1474	119 1542	429 924	452 974	310 660	328 706	240 518	255 549			204 451	217 479	217 479	3380 140
1000 -40	* 990 * 2147	* 990 * 2147	694 1488	126 1664	431 927	453 976	310 668	327 716	241 521	255 552			232 514	246 545	246 545	3090 130
-1000 -60	* 1275 * 2858	* 1275 * 2858	707 1517	130 1684	438 944	461 993	316 683	334 721					295 662	312 689	312 689	2630 110
-2000 -80			* 677	* 677									* 505 * 1165	* 505 * 1165	* 505 * 1165	1770 70

Illustration 127

g06615573

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage EXTENDED, canopy machine with blade UP.
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 120													* 305	* 305	2300
2500 100								* 677	* 677				* 286	* 286	2000
2000 80										* 258	284		* 268	344	3200
1500 60										* 592	* 592		* 801	610	130
1000 40										* 365	* 365		* 392	280	3400
										* 709	* 709		* 860	602	140
													* 447	273	3600
													* 400	215	150
													* 785	451	200
													* 971	687	300
													* 290	500	180
													* 648	442	110
													* 323	284	3500
													* 742	449	140
															3300
															140
															3000
															130
															2600
															110
															1770
															70

Illustration 128

g06615578

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage EXTENDED, canopy machine with blade DOWN.

Product Information Section
Lifting Capacities


















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
3000 125															* 305	268	2368
2500 100								* 577	534						280	188	2910
2000 80								* 592	531	270	181				231	154	3288
1500 60								366	238	266	177				206	136	3490
1000 40								767	634	671	381				467	300	3440
500 20					482	313	342	226	258	178	283	102			190	126	3688
0 0			1650	1021	1059	677	737	486	656	347	435	263			427	277	3556
-500 20					452	286	327	212	250	163	196	128			189	122	3620
0 0					575	619	705	457	538	351	428	275			416	268	3550
-500 20	* 606	* 696	693	498	429	266	310	196	240	153					204	131	3388
-1000 40	* 1526	* 1526	1474	872	924	574	668	404	518	331					461	289	3440
-1000 40	* 860	831	831	411	431	267	310	166	241	154					232	149	3088
-1500 60	* 2147	1778	1488	834	927	576	668	423	521	333					514	329	3130
-1500 60	* 1275	850	797	422	438	274	316	202							295	190	2638
-2000 80	* 2888	1821	1517	905	944	592	683	437							662	425	3110
-2000 80			* 677	644											* 505	348	3770
															* 1165	635	78

Illustration 129

g06615579

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage RETRACTED, canopy machine with blade UP.

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 305	260	2360
2500 100							* 677	534						* 285	188	2930
2000 80							* 602	531	* 358	181				* 268	154	3260
1500 60							* 365	238	* 382	177				* 295	135	3490
1000 40					* 438	313	* 608	228	* 447	170	* 480	122		* 273	126	3680
500 20			* 2322	1021	* 1351	677	* 1200	486	* 671	367	* 790	283		* 639	277	150
0 0					* 895	285	* 621	212	* 491	163	* 485	125		* 290	122	3620
-500 -20					* 1912	619	* 1326	467	* 1061	351	* 875	275		* 643	268	150
-1000 -40			* 813	484	* 346	271	* 660	202	* 584	157	* 385	125		* 323	123	3630
-1500 -60			* 1404	871	* 2031	696	* 1421	435	* 1085	338				* 712	271	140
-2000 -80	* 686	* 686	* 984	496	* 891	288	* 637	196	* 480	153				* 381	131	3380
-2500 -100	* 1526	* 1526	* 2053	872	* 1915	574	* 1369	424	* 1029	331				* 842	269	140
-3000 -120	* 360	831	* 1231	411	* 798	267	* 569	196	* 416	134				* 393	149	3080
-3500 -140	* 2147	1776	* 2628	884	* 1694	675	* 1218	423	* 877	333				* 854	329	130
-4000 -160	* 1275	850	* 1612	422	* 647	276	* 451	202						* 405	150	2630
-4500 -180	* 2868	1821	* 2148	939	* 1375	592	* 945	437						* 898	425	110
-5000 -200			* 877	444										* 695	348	1770
-5500 -220														* 1160	635	70

Illustration 130

g06615581

Lift Chart Above : 1780 mm (5 ft 10 inch) standard boom, 1160 mm (3 ft 10 inch) long stick, expandable undercarriage RETRACTED, canopy machine with blade DOWN.

301.8

With Bucket














[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]			
																
3000 120												* 305 * 647	* 305 * 647	2320 90		
2500 100												* 306 * 691	* 306 * 691	2840 110		
2000 80												* 325 * 723	* 325 * 723	3490 130		
1500 60					* 418 * 891	* 418 * 891	* 404 * 878	* 404 * 878				304 674	329 705	299 643	* 295 * 649	3050 120
1000 40					574 1238	585 1280	405 873	422 900	384 854	318 695				240 530	252 557	3470 140
500 20					547 1179	569 1226	392 844	409 881	297 639	311 679				234 517	246 543	3490 140
0 0					535 1182	557 1199	383 824	400 861	292 628	306 659				233 520	252 555	3420 140
-500 -20	* 844 * 1723	* 844 * 1723	671 1365	980 1927	533 1046	556 1194	379 815	396 853	249 523	303 654				259 565	271 597	3280 130
-1000 -40			* 845 * 1820	* 845 * 1820	535 1053	558 1200	380 818	387 856						293 660	312 692	2970 120
-1500 -80			* 680 * 1449	* 680 * 1449	* 476 * 1003	* 476 * 1009								* 324 * 718	* 324 * 718	2490 100

Illustration 131

g06364222

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

















[mm] [inch]	1800 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]											
3000 120							305 647	305 647	2328 90									
2500 100							306 691	306 691	2848 110									
2000 80							325 723	325 723	3169 705	328 705	295 649	295 649	3169 100					
1500 60							416 891	416 891	404 878	404 878	385 842	325 698	297 655	271 599	3350 140			
1000 40							672 1432	595 1283	502 1081	422 900	418 905	318 685	303 668	252 557	3470 140			
500 20							798 1712	569 1226	563 1212	409 881	430 945	311 678	321 706	246 543	3490 140			
0 0							777 1677	557 1199	567 1220	400 881	431 928	304 689	333 746	252 555	3420 140			
500 20							844 1723	844 1723	954 2070	950 1927	705 1521	555 1194	524 1130	384 842	307 654	330 727	271 597	3260 100
1000 40							945 1920	845 1820	809 1307	558 1200	451 964	397 856		324 715	312 582	2570 100		
1500 60							680 1443	680 1443	476 1009	476 1009			324 716	324 716	2480 100			

Illustration 132

g06364223

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120												* 305 * 647	* 305 * 647 2320 90
2500 100												* 306 * 631	* 306 * 631 2640 100
2000 80												* 305 * 723	* 304 * 653 3040 120
1500 60					* 418 * 891	* 418 * 891	* 404 * 878	* 396 * 836	* 381 * 768	* 366 * 732	* 351 * 702	* 259 * 571	* 190 * 398 3350 130
1000 40					574 1238	393 850	405 873	283 609	384 854	212 457	240 530	156 367	3470 140
500 20					547 1179	370 799	392 844	270 583	297 639	201 443	234 517	161 355	3490 140
0 0					535 1182	359 775	363 824	262 564	292 628	201 432	233 520	164 362	3420 140
-500 -20	* 844 * 1723	* 844 * 1723	671 1465	557 1198	533 1146	357 789	379 815	258 557	249 523	191 429	250 565	177 390	3280 130
-1000 -40			* 845 * 1820	583 1280	535 1183	360 775	380 818	260 568			293 660	205 454	2570 100
-1500 -60			* 680 * 1449	574 1238	* 476 * 1003	369 794					* 324 * 718	270 606	2490 100

Illustration 133

g06364224

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.



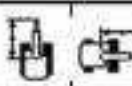
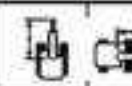
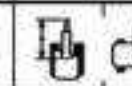
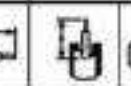
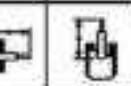
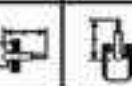
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120							* 305 305 2320 * 647 * 647 90
2500 100				* 306 * 306			* 300 246 2840 * 663 650 110
2000 80				* 325 304	* 349 222		* 295 200 3350 * 723 653 * 895 475 * 643 453 100
1500 60			* 416 * 416	* 404 295	* 385 219	* 297 190	3350 * 891 * 891 * 878 636 * 842 463 * 695 398 140
1000 40			* 672 390	* 502 280	* 418 212	* 303 166	3470 * 1432 850 * 1081 609 * 905 457 * 668 367 140
500 20			* 799 370	* 563 270	* 438 205	* 321 161	3490 * 1712 799 * 1212 580 * 945 443 * 706 355 140
0 0			* 777 359	* 567 262	* 431 201	* 333 164	3420 * 1677 776 * 1228 584 * 928 432 * 746 362 140
500 20	* 844 * 844	* 954 557	* 705 357	* 528 258	* 394 199	* 330 177	3260 * 1723 * 1723 * 2070 1138 * 1521 749 * 1100 557 * 842 428 * 727 390 100
1000 40		* 945 563	* 608 360	* 451 260			2970 * 1820 1210 * 1307 775 * 964 560 * 715 454 100
1500 60		* 680 574	* 476 368				2490 * 1449 1236 * 1103 794 * 716 606 100

Illustration 134

g06364225

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)						
3800 129								2500 100						
2500 100					222 88	232 91	280 110	290 114	242 95	242 95	3040 120			
2000 80					246 97	246 97	315 124	315 124	239 94	239 94	3300 130			
1500 60					284 112	284 112	388 153	388 153	297 117	297 117	3520 140			
1000 40		1862 73	1982 78	2097 83	2217 87	2337 92	2452 96	2572 101	2692 106	2812 111	2932 116	3630 150		
500 20				959 38	971 38	1041 41	1070 42	1139 45	1169 46	1238 49	1268 50	3850 150		
0 0		692 27	682 27	532 21	550 22	379 15	385 15	298 12	302 12	227 9	209 8	3560 140		
-100 -39	762 30	762 30	805 32	884 35	925 36	973 38	990 39	824 32	828 32			233 9	245 10	3430 130
-1000 -40	1792 70	1703 67	1632 64	1695 67	1638 64	1177 46	1203 47	68 3	642 25			514 20	541 21	340
-1500 -60		981 39	886 35	828 33	849 33	372 15	389 15	284 11	288 11			264 10	277 11	360
-1500 -60		767 30	767 30	538 21	538 21	378 15	378 15					314 12	314 12	2740
-2000 -80		636 25	636 25	429 17	429 17	290 11	290 11					693 27	693 27	170
		112 4	132 5	142 6	142 6							342 13	342 13	300
												764 30	764 30	80

Illustration 135

g06364227

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2500 100
2500 100				222 88	222 88	280 110	280 110	3040 120
2000 80				246 97	246 97	315 124	315 124	3300 130
1500 60				284 112	284 112	345 136	345 136	3520 140
1000 40		1862 733	1982 780	887 349	887 349	451 177	451 177	3800 150
500 20				788 309	788 309	571 225	571 225	4000 160
0 0		682 268	682 268	788 309	788 309	571 225	571 225	4200 170
-500 -20	762 300	762 300		735 289	735 289	547 215	547 215	4400 180
-1000 -40				809 318	809 318	588 231	588 231	4600 190
-1500 -60				767 302	767 302	538 211	538 211	4800 200
-2000 -80				636 250	636 250	438 173	438 173	5000 210

Illustration 136

g06364228

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)	
3000 120								2500 100	
2500 100					222 88	232 91	280 110	224 88	3040 120
2000 80					246 97	246 97	315 124	272 107	3320 130
1500 60					284 112	287 113	38 15	38 15	3520 140
1000 40		1862 73	1328 52	987 39	789 31	608 24	482 19	381 15	3630 140
500 20				958 37	771 30	601 24	458 18	357 14	3650 140
0 0		692 27	542 21	395 15	279 11	208 8	156 6	227 9	3560 140
-500 -20	762 30	762 30	605 24	452 18	370 14	273 11	204 8	150 6	3430 140
-1000 -40	1782 70	1703 67	1032 41	787 31	603 24	444 17	308 12	218 9	3360 140
-1500 -60		981 39	648 25	428 17	291 11	212 8	160 6	110 4	3260 130
-2000 -80		767 30	588 23	408 16	278 11	207 8	155 6	100 4	3140 120
-2500 -100		536 21	408 16	282 11	212 8	155 6	100 4	82 3	3000 100

Illustration 137

g06364230

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.

(mm) (inch)	1850 42		1901 50		2000 90		2500 105		3000 120		3500 140				(mm) (inch)
															
3000 120							251	200					251	251	2500 100
2500 100							222	212	280	224			242	219	3040 120
2000 80							246	246	305	222			238	184	3320 130
1500 60							324	287	345	218	284	184	228	163	3520 140
1000 40			1962	1320	567	393	451	283	380	21	343	151	246	150	3630 150
500 20					760	521	538	268	424	253	347	157	262	145	3650 150
0 0					1620	901	1158	579	996	436	746	227	576	222	350
-500 -20	762	762			735	350	533	253	407	193			303	158	3430 140
-1000 -40	1702	1702			1564	753	1159	544	872	415			689	240	3160 130
-1500 -60			929	548	847	391	877	262	581	193			310	180	2920 120
-2000 -80			1996	1179	1391	755	1022	543	742	416			584	289	2740 110
-2500 -100			767	559	520	357	378	257					314	227	2540 100
-3000 -120			1537	1202	1329	749	738	555					630	308	2310 90
-3500 -140			536	526	342	342							342	342	2080 80
			1112	1112									764	764	

Illustration 138

g06364231

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities



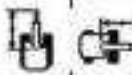
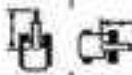


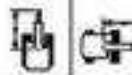
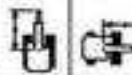
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
							
3000 120							305 120
2500 100				306 120	287 113		300 118
2000 80				325 128	284 112	295 116	205 81
1500 60			416 163	393 155	395 156	275 108	252 99
1000 40			542 213	367 144	382 150	262 103	216 85
500 20			515 203	343 135	368 145	250 98	278 109
0 0			503 198	332 131	359 141	242 95	273 107
500 20	844 332	844 332	920 362	518 204	501 197	330 130	355 139
1000 40			827 326	523 206	504 198	333 131	356 140
1500 60		680 268	534 210	476 187	341 134		324 127

Illustration 139

g06364233

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)		
3000 120													* 305 * 647	* 305 * 647	2320 90
2500 100							* 306 * 634	287 605					* 306 * 663	* 228 544	2840 110
2000 80							* 325 * 723	284 609	* 369 * 805	205 448			* 395 * 645	190 418	3650 140
1500 60					* 418 * 891	390 848	* 404 * 878	275 592	* 365 * 842	202 434			* 297 * 655	165 366	3350 130
1000 40					* 672 * 1432	367 792	* 502 * 1081	262 565	* 418 * 915	196 421			* 303 * 668	152 336	3470 140
500 20					* 799 * 1712	343 741	* 563 * 1212	250 539	* 438 * 945	199 407			* 321 * 706	147 325	3490 140
0 0					* 777 * 1677	332 717	* 567 * 1220	242 520	* 431 * 928	194 396			* 338 * 746	150 331	3420 140
-500 -20	* 844 * 1723	* 844 * 1723	* 954 * 2070	518 1122	* 705 * 1521	330 711	* 526 * 1108	220 503	* 394 * 842	192 392			* 330 * 727	162 357	3260 120
-1000 -40			* 845 * 1820	523 1124	* 609 * 1307	333 717	* 451 * 964	229 516					* 324 * 715	188 417	2970 120
-1500 -60			* 680 * 1449	534 1159	* 476 * 1003	341 738							* 324 * 718	249 560	2490 100

Illustration 140

g06364234

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


(mm) (inch)	1850 42	1901 50	2000 90	2500 105	3000 120	3500 140		(mm) (inch)	
3000 120								2500 100	
2500 100								3040 120	
2000 80								3320 130	
1500 60								3520 140	
1000 40			548 216	372 146	283 111	263 103	284 112	219 86	3630 143
500 20		1904 75	1225 48	780 31	632 25	566 22	611 24	493 19	3660 144
0 0			692 27	502 20	490 19	328 13	395 15	238 9	3590 141
-500 -20	762 30	752 29	805 31	504 20	490 19	323 13	349 14	232 9	3630 143
-1000 -40	1702 67	1703 67	1723 68	1002 39	1060 41	695 27	752 29	560 22	3660 144
-1500 -60			811 32	599 24	494 19	326 13	348 14	232 9	3700 145
-2000 -80			1737 68	1090 42	1062 41	697 27	750 29	488 19	381 15
			767 30	510 20	501 19	330 13	354 14	237 9	3740 146
			1537 60	1196 47	1072 41	711 28	763 30	511 20	382 15
			536 21	516 20	342 13	342 13			3930 154
			1112 43	1112 43					764 30

Illustration 141

g06364238

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.









[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80							251	251					261	261	2500 100
2500 100							222	222	260	267			242	247	3040 120
2000 80							246	246	305	288			238	189	3320 130
2500 100							552	552	703	441			526	378	
3000 120							324	376	345	262	204	150	209	144	3520 140
3500 140							730	885	756	432			528	320	
4000 160					567	372	451	263	380	84	343	147	246	137	3630 150
4500 180			1862	1235	1207	832	373	666	846	498	740	335	541	363	
5000 200					760	344	528	248	424	167	347	143	262	133	3690 155
5500 220					1626	752	1158	518	806	481	746	367	676	297	
6000 240					692	502	789	328	564	238	431	180	305	140	3790 160
6500 260					1561	1000	1638	738	1214	592	928	387	714	391	
7000 280	762	752			735	337	539	232	467	176			382	144	3830 165
7500 300	1702	1703			1584	695	1155	560	872	389			688	237	
8000 320					829	609	647	324	472	232	351	177	390	164	3880 170
8500 340					1836	1092	1291	697	1022	488	742	381	684	364	
9000 360					787	518	530	330	378	237			394	189	3940 175
9500 380					1627	1100	1629	711	738	511			653	467	
10000 400					538	336	342	242					342	342	3990 180
10500 420					1112	1112							764	764	

Illustration 142

g06364240

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities




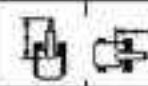
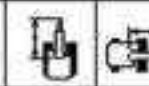
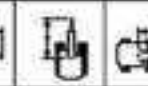

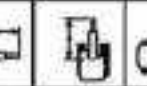


[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
3000 120												* 305 * 305	2320
												* 647 * 647	90
2500 90							* 308 * 308					* 300 * 300	2840
							* 691 * 691					* 603 * 603	100
2000 80							* 325 * 325	349	362			* 295 * 295	3150
							* 723 * 723	750	778			* 649 * 649	130
1500 60				* 415 * 415	* 415 * 415	* 404 * 404	* 404 * 404	346	359			289 * 297	3350
				* 891 * 891	* 891 * 891	* 878 * 878	* 878 * 878	744	772			633 * 655	140
1000 40				534	554	450	466	339	353			270 281	3670
				1386	1409	969	1003	730	759			595 620	140
500 20				609	626	438	452	332	345			264 275	3690
				1309	1353	940	974	705	744			581 606	140
0 0				594	615	427	443	327	340			269 281	3620
				1282	1326	920	955	704	733			594 618	140
-500 20	* 644 * 644	* 844 * 844	* 954 * 954	* 954 * 954	594	614	423	439	324	338		269 302	3260
	* 1723 * 1723	* 1723 * 1723	2068	2070	1274	1320	911	946	699	728		639 666	130
-1000 40			* 845 * 845	* 845 * 845	597	* 608	424	441				* 324 * 324	2970
			* 1820 * 1820	* 1820 * 1820	1283	* 1307	914	949				* 715 * 715	120
-1500 60			* 680 * 680	* 680 * 680	* 476	* 476						* 324 * 324	2490
			* 1449 * 1449	* 1449 * 1449	1009	* 1009						* 718 * 718	100

Illustration 143

g06364250

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							* 305 * 305 * 647 * 647 2320 90
2500 100				* 308 * 308 * 691 * 691			* 300 * 300 * 663 * 663 2840 100
2000 80				* 325 * 325 * 723 * 723	* 369 362 * 895 778		* 295 * 295 * 643 * 643 3150 130
1500 60			* 415 * 415 * 891 * 891	* 404 * 404 * 878 * 878	* 385 359 * 842 772		* 297 * 297 * 655 * 655 3350 140
1000 40			* 572 554 * 1432 1409	* 502 466 * 1081 1003	* 498 353 * 965 759		* 303 281 * 668 620 3670 140
500 20			* 799 628 * 1712 1353	* 563 452 * 1212 974	* 438 345 * 945 744		* 321 275 * 705 606 3690 140
0 0			* 777 615 * 1677 1326	* 567 443 * 1220 955	* 431 340 * 928 733		* 339 281 * 746 613 3820 140
-500 20	* 844 * 844 * 1723 * 1723	* 854 * 854 * 2070 * 2070	* 705 614 * 1521 1326	* 526 439 * 1130 946	* 394 308 * 842 728		* 339 302 * 727 666 3260 130
-1000 40		* 845 * 845 * 1820 * 1820	* 608 * 608 * 1307 * 1307	* 451 441 * 964 949			* 324 * 324 * 715 * 715 2970 120
-1500 60		* 680 * 680 * 1449 * 1449	* 476 * 476 * 1009 * 1009				* 324 * 324 * 718 * 718 2490 100

Illustration 144

g06364251

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities









[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120							* 305 * 305 2320 * 647 * 647 93
2500 100							* 306 * 306 2840 * 631 * 631 110
2000 80							* 325 * 325 349 247 * 295 228 3750 * 723 * 723 750 531 * 643 607 130
1500 60							* 415 * 415 * 404 327 346 244 285 202 3350 * 891 * 891 * 878 705 744 525 633 448 140
1000 40							834 436 450 315 339 238 270 188 3470 1368 341 369 679 710 512 595 415 140
500 20							609 412 436 302 332 238 264 183 3490 1309 830 840 652 715 498 591 403 140
0 0							595 402 427 294 327 225 263 186 3420 1282 860 920 634 704 493 594 411 140
500 20	* 844 * 844	* 954 620	594 400	423 290	324 224	289 200	3260 139
1000 40	* 1723 * 1723	2068 1032	1276 861	911 626	689 483	633 442	2970 120
1500 60		* 845 625	597 402	424 292		* 324 231	2490 100
		* 1820 1045	1283 867	914 629		* 715 512	
		* 680 637	* 476 410			* 324 302	2490 100
		* 1449 1070	* 1103 866			* 716 678	

Illustration 145

g06364259

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.











































[mm] [inch]	100 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120							* 305 * 305 2320 * 647 * 647 95
2500 100							* 306 * 306 2840 * 631 * 631 110
2000 80							* 325 * 325 * 349 247 * 295 228 3350 * 723 * 723 * 895 531 * 645 607 100
1500 60							* 416 * 416 * 404 327 * 385 244 * 297 202 3350 * 891 * 891 * 878 705 * 942 525 * 695 448 140
1000 40							* 472 436 * 502 395 * 418 238 * 303 188 3470 * 1432 941 * 1081 879 * 905 512 * 668 495 140
500 20							* 799 412 * 563 302 * 438 238 * 321 183 3490 * 1712 830 * 1212 852 * 945 498 * 706 403 140
0 0							* 777 402 * 567 294 * 431 225 * 333 186 3420 * 1677 866 * 1228 834 * 928 488 * 746 411 140
500 20							* 844 * 844 * 954 820 * 705 400 * 628 290 * 394 224 * 330 200 3260 * 1723 * 1723 * 2070 1032 * 1521 861 * 1108 626 * 842 483 * 727 442 100
1000 40							* 945 625 * 608 402 * 451 282 * 324 231 2970 * 1820 1045 * 1307 867 * 964 623 * 715 502 100
1500 60							* 880 637 * 476 430 * 324 302 2490 * 1449 1070 * 1103 886 * 716 678 100

Illustration 146

g06364260

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60	1501 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100								3040 120
2000 80								3320 130
1500 60								3520 140
1000 40			567 22.3	567 22.3	451 17.8	451 17.8	338 13.3	351 13.8
500 20		1962 77.2	1962 77.2	1007 39.6	1007 39.6	830 32.7	830 32.7	259 10.2
0 0		692 27.2	692 27.2	592 23.3	592 23.3	423 16.6	440 17.3	235 9.3
-500 -20	762 30.0	752 29.6	950 37.4	978 38.5	588 23.1	588 23.1	417 16.4	413 16.3
-1000 -40	1702 67.0	1702 67.0	2035 80.1	2091 82.3	1260 49.6	1260 49.6	834 32.8	834 32.8
-1500 -60			1996 78.6	1996 78.6	1262 49.7	1262 49.7	837 32.9	837 32.9
-2000 -80			1537 60.5	1537 60.5	1029 40.5	1029 40.5	738 29.0	738 29.0
			535 21.1	535 21.1	342 13.4	342 13.4		

Illustration 147

g06364481

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2500 100
2500 100								3040 120
2000 80								3300 130
1500 60								3520 140
1000 40								3630 150
500 20								3650 150
0 0								3690 150
-500 -20								3430 140
-1000 -40								3360 130
-1500 -60								2740 110
-2000 -80								3000 120

Illustration 148

g06364485

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities






(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100					248			3040 120
2000 80					248			3320 130
1500 60					245	244	204	3520 140
1000 40		1862	1455	987	491	338	237	3630 150
500 20				688	414	338	239	3650 150
0 0				1314	893	648	710	3680 150
1000 40		1591	1388	1274	857	625	638	3700 150
1500 60	762	762	990	688	392	417	285	3740 150
2000 80	1782	1703	2035	1382	1268	945	699	3780 150
2500 100			828	630	687	393	417	3820 150
3000 120			896	1203	1262	846	697	3860 150
3500 140			767	821	538	388	288	3900 150
4000 160			827	1238	1129	880	730	3940 150
4500 180			536	538	342	342		3980 150
5000 200			112	192				4020 150

Illustration 149

g06364489

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.

Lift Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Lift Capacity (mm) (inch)
	Standard	Long	Standard	Long	Standard	Long	Standard	Long	Standard	Long	Standard	Long	Standard	Long	
2000 80							251	251					267	267	2500 100
2500 100							222	222	260	249			242	242	3040 120
2000 80							246	246	305	248			238	237	3320 130
2500 100							552	552	703	532			526	489	3500 140
3000 120							324	319	345	244	204	85	209	184	3500 140
3500 140							730	700	756	524			520	460	3500 140
4000 160			1862	1455	567	441	451	35	380	237	343	182	246	171	3500 140
4500 180					760	414	539	301	424	229	347	170	262	166	3500 140
5000 200					1026	593	1158	640	806	482	740	304	570	367	3500 140
5500 220			692	604	789	393	564	290	431	222	305	175	288	169	3500 140
6000 240			1561	1300	1058	657	1214	625	928	478	714	377	637	372	3500 140
6500 260	762	752			735	392	539	295	467	219			302	180	3400 130
7000 280	1702	1703			1584	848	1855	603	872	471			688	357	3400 130
7500 300			829	611	847	393	472	304	351	219			310	204	3400 130
8000 320			1936	1312	1291	666	1022	603	742	472			684	452	3400 130
8500 340			787	621	530	393	378	288					314	218	2740 110
9000 360			1627	1326	1029	660	798	624					653	522	2010 80
9500 380			538	536	342	282							342	342	2010 80
10000 400			1112	1112									764	764	2010 80

Illustration 150

g06364496

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120	 	 	 	 	 	 	305 * 305 2320 647 * 647 95
2500 100				* 305 * 305 631 604			* 300 255 2840 663 576 110
2000 80				* 325 316 723 679	330 231		* 295 210 3150 643 472 100
1500 60			* 415 * 415 891 * 891	* 404 307 878 661	327 229		272 188 3350 603 457 110
1000 40			802 409 1297 880	428 294 917 635	321 222		254 174 3470 561 384 110
500 20			578 385 1240 832	413 282 888 608	310 215		248 169 3490 463 373 110
0 0			584 375 1213 808	403 274 869 590	308 210		253 172 3420 452 360 110
500 20	* 844 * 844 1723 1723	915 590	561 373	399 270	316 209		272 185 3260 601 408 100
1000 40		* 845 586 1820 1259	564 375	401 271			314 214 2970 697 475 100
1500 60		* 680 597 1449 1295	* 476 384 1109 828				* 324 282 2490 716 633 100

Illustration 151

g06364501

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.




[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							305 647 2320
2500 100				308 691	308 694		300 663 2840
2000 80				325 723	316 679	369 805	231 485 3150
1500 60			416 891	416 891	404 878	307 661	385 842 3350
1000 40			672 1432	409 883	502 1081	284 625	488 905 3470
500 20			799 1712	395 832	563 1212	282 608	438 945 3690
0 0			777 1677	375 803	567 1220	274 590	431 920 3820
-500 -20	844 1723	844 1723	894 2070	500 1247	705 1521	373 803	626 1130 3260
-1000 -40		845 1820	506 1259	603 1307	375 809	451 964	271 585 3470
-1500 -60		680 1448	597 1285	478 1003	384 828		

Illustration 152

g06364503

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

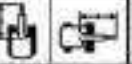
(mm) (inch)	1900 40	1600 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100				222 90	222 90	288 115	230 92	3040 120
2000 80				246 98	246 98	315 125	232 92	3200 125
1500 60				552 218	552 218	763 300	697 275	3500 140
1000 40		962 380	1097 427	894 352	939 370	635 250	687 270	3650 145
500 20			1244 490	935 368	886 348	689 271	657 258	3850 152
1 0		592 233	565 222	569 223	371 146	400 157	278 109	3900 154
-500 -20	742 292	762 300	699 275	586 231	634 250	395 155	384 151	3950 155
1000 40	1793 701	1703 669	1926 758	1297 508	1391 544	757 298	847 333	4100 161
1500 60		905 356	871 341	658 259	368 145	293 115	264 103	4200 165
2000 80		1940 762	1228 481	1193 467	730 287	846 333	583 229	4300 169
2500 100		767 302	581 228	638 251	372 146	378 149	268 105	4400 173
3000 120		1637 645	1251 492	1129 441	892 348	798 312	580 228	4500 177
3500 140		506 199	538 211	342 134	342 134			4600 181
4000 160		112 44	192 75					4700 185

Illustration 153

g06364508

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80							251	251					261	261	2500 100
2500 100							222	222	260	223			242	228	3040 120
2000 80							246	246	305	232			238	182	3320 130
1500 60							552	552	703	437			526	427	3500 140
1000 40							324	309	345	227	204	172	229	170	3500 140
500 20							730	664	756	468			528	379	3500 140
0 0							567	414	451	295	380	220	343	188	3500 140
500 20							1207	894	373	625	846	474	740	362	3500 140
0 0							1626	835	1158	608	806	457	746	364	3500 140
500 20							692	565	789	371	564	270	431	265	3500 140
0 0							1561	1214	1658	733	1214	581	928	442	3500 140
500 20							762	752	735	365	539	264	467	262	3500 140
0 0							1702	1703	1584	787	1155	569	872	425	3500 140
1000 40							829	671	647	396	472	264	351	262	3500 140
500 20							1336	1220	1291	739	1022	568	742	427	3500 140
1000 40							787	581	530	372	378	268			3500 140
500 20							1627	1251	1029	632	738	560			3500 140
1000 40							538	536	342	342					3500 140
500 20							1112	1112							3500 140

Illustration 154

g06364512

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Without Bucket


[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120			* 391 * 391			* 395 * 395	2013 80
2500 100				* 404 * 404 * 322 * 322		* 405 * 405 * 303 * 303	2540 110
2000 80				* 401 * 401 * 387 * 387		338 360 749 779	3000 120
1500 60		* 568 * 568	* 502 * 502 * 1078 * 1078	441 458 850 865	334 343 719 748	299 312 661 680	3230 130
1000 40			596 617 1284 1331	428 446 924 961	328 342 768 738	280 283 619 647	3240 140
500 20			573 594 1234 1281	416 434 898 935	322 335 635 725	275 287 606 634	3360 140
0 0		* 736 * 736 * 1705 * 1705	561 563 1203 1255	408 425 880 919	318 332 665 718	281 284 620 648	3290 130
-500 20	* 878 * 878 * 1857 * 1857	889 888 1906 1969	558 560 1201 1248	405 422 873 910	316 334 683 710	302 318 667 696	3110 130
-1000 40		886 * 888 1822 * 1853	561 563 1207 1255	406 424 877 915		343 354 774 808	2810 110
-1500 60		* 722 * 722 * 1535 * 1535	* 485 * 485 * 1048 * 1046			* 384 * 384 * 843 * 848	2310 90

Illustration 155

g06364531

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)		
															
3000 120					* 391	* 380							* 395	* 395	2000
													* 847	* 847	80
2500 100													* 406	* 406	2640
													* 903	* 903	100
2000 80													* 401	* 401	3000
													* 887	* 887	120
1500 60			* 566	* 566	* 502	* 502	* 466	* 458	* 436	* 348	* 370	* 312	* 370	* 312	3200
					* 1078	* 1078	* 1070	* 1066	* 952	* 749	* 818	* 690	* 818	* 690	130
1000 40					* 718	* 612	* 547	* 446	* 458	* 342	* 379	* 293	* 379	* 293	3340
					* 1538	* 1321	* 1183	* 961	* 994	* 738	* 834	* 647	* 834	* 647	140
500 20					* 825	* 594	* 598	* 434	* 470	* 338	* 399	* 287	* 399	* 287	3360
					* 1774	* 1281	* 1286	* 935	* 1005	* 725	* 879	* 634	* 879	* 634	140
0 0			* 736	* 736	* 811	* 683	* 595	* 429	* 457	* 332	* 389	* 294	* 389	* 294	3280
			* 1705	* 1705	* 1759	* 1255	* 1263	* 918	* 983	* 716	* 857	* 648	* 857	* 648	130
-500 -20	* 878	* 878			* 741	* 690	* 551	* 422	* 482	* 330	* 391	* 296	* 391	* 296	3100
	* 1857	* 1857			* 1598	* 1248	* 1188	* 910	* 876	* 710	* 840	* 698	* 840	* 698	130
-1000 -40			* 908	* 908	* 643	* 583	* 471	* 424			* 378	* 364	* 378	* 364	2900
			* 1853	* 1853	* 1374	* 1255	* 1005	* 945			* 832	* 808	* 832	* 808	100
-1500 -60			* 722	* 722	* 495	* 495					* 384	* 384	* 384	* 384	2300
			* 1535	* 1535	* 1046	* 1046					* 843	* 843	* 843	* 843	80

Illustration 156

g06364533

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120			* 391 * 380			* 395 * 395 * 847 * 847	2000 80
2500 100				* 404 328 * 822 689		* 406 393 * 803 875	2040 100
2000 80				* 401 325 * 887 701		398 244 748 543	3000 120
1500 60		* 566 * 566	* 502 440 * 1078 950	441 318 950 685	334 242 730 521	299 296 661 479	3230 130
1000 40			596 416 1284 900	428 306 924 662	328 237 718 511	280 202 619 447	3340 140
500 20			573 396 1234 855	416 295 988 709	322 231 695 499	275 199 606 436	3360 140
0 0		* 736 575 * 1705 1238	561 385 1209 832	408 289 980 721	318 227 685 490	281 202 620 444	3280 130
-500 -20	* 678 * 678 * 1857 * 1857	699 577 1906 1243	559 392 1201 826	406 286 973 716	316 226 683 487	302 216 667 477	3100 130
-1000 -40		896 504 1922 1256	561 395 1207 831	406 286 977 719		349 248 774 551	2930 100
-1500 -60		* 722 596 * 1535 1284	* 495 394 * 1046 852			* 384 327 * 849 734	2390 90

Illustration 157

g06364534

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.
















[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
 														
3000 120					* 391	* 391						* 395	* 395	2010 80
2500 100							* 404	326				* 406	* 299	2640 110
2000 80							* 401	326				* 377	* 244	3000 120
1500 60			* 568	* 596	* 502	440	* 466	318	* 436	242		* 370	* 216	3230 130
1000 40					* 719	436	* 547	306	* 458	237		* 379	* 202	3240 140
500 20					* 825	386	* 596	295	* 470	231		* 398	* 198	3360 160
0 0			* 726	575	* 811	385	* 599	288	* 457	227		* 383	* 202	3290 130
-500 20	* 878	* 879			* 741	362	* 561	285	* 412	225		* 391	* 216	3110 120
-1000 40	* 1867	* 1857			* 1592	825	* 1885	615	* 876	487		* 840	* 477	2800 110
-1500 60			* 908	594	* 649	385	* 471	285				* 378	* 248	2810 110
-2000 80			* 1953	1258	* 1374	831	* 1805	619				* 832	* 551	2310 90
-2500 100			* 722	596	* 485	394						* 384	* 327	2310 90
-3000 120			* 1535	1214	* 1045	852						* 843	* 704	2010 80

Illustration 158

g06364536

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500			(mm) (inch)
														(mm) (inch)
3800 129													* 348 * 346	2310 90
2500 100							* 311 * 311						* 319 * 319	2050 110
2000 80							* 326 * 326	337 351					* 302 * 302	1790 130
1500 60				* 379 * 379	* 379 * 379	* 405 * 405	* 463 * 463	334 348					* 275 * 287	1400 140
1000 40			863 2052	885 2086	801 1294	822 1340	428 524	448 561	327 394	341 411			* 259 * 271	1000 140
500 20			* 753 * 753	* 753 * 753	573 1235	595 1292	485 594	432 501	348 388	332 378	255 267		* 254 * 266	3520 140
0 0			* 866 * 866	* 886 * 886	558 1198	578 1246	404 571	421 568	333 378	327 370			* 268 * 271	3450 140
-100 -20	* 886 * 886	* 918 * 918	875 2076	894 2118	559 1184	572 1232	399 559	418 557	348 369	324 370			* 275 * 288	3290 130
-1000 -40			881 2090	89 2051	541 1186	570 1233	398 550	418 546	318 378	308 368			* 311 * 325	3010 120
-1500 -60			* 809 * 809	* 889 * 889	553 1178	553 1170	380 540	* 380 * 380					* 378 * 370	2570 100
-2000 -80			* 591 * 591	* 591 * 591									* 421 * 421	1790 70

Illustration 159

g06364539

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500				[mm] [inch]		
																	
3000 120															348	346	2310
															748	748	90
2500 100															311	311	2650
															712	712	110
2000 80															325	325	2390
															728	728	130
1500 60															379	379	2400
															828	828	340
1000 40															827	822	3000
															1342	1340	140
500 20															574	574	3520
															1098	1098	140
1 1															866	866	3450
															1800	1842	340
1500 -20															896	896	3290
															1828	1820	130
1000 -40															895	889	3010
															2114	2051	120
1500 -60															809	809	2570
															1725	1725	300
2000 -80															691	690	1790
															1126	1116	70

Illustration 160

g06364541

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities



[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500				[mm] [inch]	
														[mm] [inch]		
3000 120														345 745	345 745	3310 00
2500 100							311 702	308 767						319 708	288 557	2650 100
2000 80							326 726	324 764	337 725	245 526				302 687	221 493	3190 100
1500 60					379 828	379 820	400 891	398 886	334 718	241 519				275 609	190 428	3100 140
1000 40			853 2052	638 1363	661 1594	420 937	429 924	388 868	327 794	235 506				259 571	188 410	3500 140
500 20			753 1615	578 1249	573 1235	395 854	415 904	292 610	318 698	228 492	255 561	83		254 559	181 400	3620 140
0 0			866 1879	585 1277	556 1198	391 821	404 871	283 612	313 675	222 480				258 563	184 406	3450 140
-500 -20	816 1826	716 1620	875 1916	584 1285	559 1224	375 829	399 869	278 601	318 699	219 473				275 607	195 421	3290 120
-1000 -40			891 1920	589 1225	561 1199	375 820	390 859	278 601	308 681	221				311 689	220 488	3040 120
-1500 -60			803 1725	588 1249	553 1173	382 825	392 864	284						370 818	270 597	2570 100
-2000 -80			591 1126	581 1224										423 945	421 931	1790 70

Illustration 161

g06364543

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.





[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500				[mm] [inch]
															
3000 120															300 120
2500 100							311 702	308 707							250 100
2000 80							326 726	324 734	378 839	245 526					200 80
1500 60					379 828	379 820	400 891	398 886	388 874	241 59					150 60
1000 40					627 1342	420 937	502 1087	386 860	434 943	235 506					100 40
500 20			353 1015	578 1249	791 1699	395 854	574 1229	292 610	459 993	228 492	372 893				500 20
1 1			666 1890	565 1217	818 1762	391 821	583 1279	283 612	468 998	222 480					1 1
-500 -20	616 1826	316 1820			767 1653	375 899	565 1236	278 606	438 922	219 473					-500 -20
-1000 -40			906 2116	589 1225	678 1457	375 840	500 1072	278 606	383 821	221					-1000 -40
-1500 -60			803 1720	580 1249	853 1779	382 825	390	284							-1500 -60
-2000 -80			591 1126	581 1214											-2000 -80

Illustration 162

g06364548

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities








[mm] [inch]	1001 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120							395 15.5
2500 100				404 15.9	306 12.0		391 15.4
2000 80				401 15.8	305 11.9		317 12.5
1500 60		586 23.1	502 19.8	410 16.1	417 16.4	297 11.7	265 10.4
1000 40			584 23.0	389 15.3	405 15.9	288 11.3	310 12.2
500 20			549 21.6	369 14.5	393 15.5	275 10.8	293 11.5
0 0		736 29.0	538 21.2	529 20.8	358 14.1	384 15.1	287 11.3
-500 -20	878 34.5	878 34.5	839 33.0	526 20.7	386 15.2	381 15.0	264 10.4
-1000 -40			846 33.3	544 21.4	523 20.6	358 14.1	303 11.9
-1500 -60		722 28.4	596 23.5	485 19.1	367 14.4		384 15.1

Illustration 163

g06364552

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.










[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)	
3000 120							2000 80	
2500 100				404 160	306 122		2640 100	
2000 80				401 160	308 122		2000 80	
1500 60		568 225	508 200	502 198	413 163	468 185	297 117	3200 126
1000 40			718 283	385 151	547 215	288 113	418 164	3340 131
500 20			825 325	369 145	586 231	275 108	470 185	3360 132
0 0		736 289	508 199	811 319	358 141	595 234	287 113	3290 129
-500 -20	876 345	878 345		741 291	368 145	651 256	284 112	3100 122
-1000 -40		808 317	544 214	649 255	358 141	471 185	268 105	2890 113
-1500 -60		722 284	566 223	495 194	367 144			2300 91

Illustration 164

g06364554

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3800 129								340 134
2500 100				311 712	369 863			319 708
2000 80				326 728	384 868	319 834	238 490	288 642
1500 60			379 828	379 820	405 881	248 642	215 484	359 572
1000 40		803 1943	588 1278	568 1225	383 849	405 873	286 686	288 644
500 20		753 1807	538 1183	541 1186	349 796	391 843	273 589	240 496
0 0		825 1770	525 1162	524 1129	354 783	360 800	263 568	294 626
-500 -20	896 1828	918 1820	824 1768	525 1168	519 1155	348 791	275 608	268 587
-1000 -40			699 1730	518 1140	519 1136	319 752	276 608	258 567
-1500 -60			809 1725	580 1184	526 1133	395 787	381 844	264
-2000 -80			591 1126	569 1106				423 951

Illustration 165

g06364560

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3000 120								340 134
2500 100								310 122
2000 80								285 112
1500 60								260 102
1000 40								235 93
500 20								210 83
1000 40								185 73
1500 60								160 63
2000 80								135 53
2500 100								110 43
3000 120								85 33
3500								60 23
4000								35 13
4500								10 0
5000								0 0

Illustration 166

g06364567

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities














[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
3000 120													2010 80		
2500 100							* 404 * 322	* 404 * 322					* 395 * 847	* 395 * 847	2540 100
2000 80							* 401 * 387	* 401 * 387					371 826	* 377 * 833	3000 120
1500 60			* 568 * 568	* 502 * 502	* 466 * 466	* 466 * 466	369 369	369 369	369 369	369 369	369 369	369 369	301 732	* 343 * 759	3230 126
1000 40				856 1415	676 1028	473 1020	469 1054	363 783	377 812	311 687	323 713	323 713	311 687	323 713	3240 128
500 20				633 1364	653 1400	461 994	477 1029	357 771	371 799	305 673	317 700	317 700	305 673	317 700	3360 132
0 0			* 736 * 1705	* 736 * 1705	621 1338	841 1982	452 976	463 1011	353 761	366 799	313 689	325 716	325 716	325 716	3390 133
500 20	* 878 * 1957	* 878 * 1957			618 1331	638 1375	449 968	465 1004	351 758	365 787	326 742	349 770	349 770	349 770	3410 135
1000 40			* 908 * 1953	* 908 * 1953	621 1338	* 640 * 1374	451 973	467 1005					* 378 * 832	* 378 * 832	2010 80
1500 60			* 722 * 1535	* 722 * 1535	* 485 * 1048	* 485 * 1046							* 384 * 848	* 384 * 848	2310 90

Illustration 167

g06364580

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120			(mm) (inch)	
													
3000 120					* 391	* 380					* 395	* 395	2000 80
2500 100							* 404	* 404			* 406	* 406	2040 100
2000 80							* 401	* 401			* 377	* 377	3000 120
1500 60			* 566	* 566	* 502	* 502	* 466	* 466	* 436	282	* 370	343	3200 130
1000 40					* 718	676	* 647	603	* 488	377	* 379	323	3340 140
500 20					* 825	853	* 598	477	* 470	371	* 399	317	3360 140
0 0			* 736	* 736	* 311	641	* 595	469	* 457	366	* 389	325	3280 130
-500 -20	* 678	* 678			* 741	638	* 551	465	* 432	365	* 391	349	3100 130
-1000 -40	* 1857	* 1857			* 1591	1375	* 1186	1004	* 876	787	* 640	770	2900 100
-1500 -60			* 908	* 908	* 643	640	* 471	457			* 378	* 378	2800 100
-2000 -80			* 722	* 722	* 495	495					* 384	* 384	2300 90

Illustration 168

g06364588

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities








[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120							2010 80
2500 100							2640 110
2000 80							3000 120
1500 60		568	502	466	369	288	3230
1000 40			856	459	473	339	3240
500 20			633	438	461	327	3360
0 0		736	638	621	428	452	3290
-500 20	878	879	994	840	618	426	3110
-1000 40	1957	1957	2109	1378	1331	907	109
-1500 40		908	646	621	427	451	2010
		1953	1380	1338	923	973	110
		722	658	495	436		2310
		1535	1419	1046	944		90

Illustration 169

g06364595

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.


























(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
 	 	 	 	 	 	 	 	 	 	 	 	(mm) (inch)	
3000 120					* 391	* 391					* 395	* 395	2000 80
2500 100							* 404	358			* 406	330	2640 105
2000 80							* 401	267			* 377	270	3000 120
1500 60			* 586	* 586	* 502	482	* 466	350	* 416	288	* 370	240	3220 128
1000 40					* 718	459	* 547	339	* 458	263	* 379	225	3340 132
500 20					* 825	438	* 596	327	* 470	257	* 399	220	3360 133
0 0			* 736	638	* 811	428	* 595	320	* 457	250	* 389	225	3280 130
-500 -20	* 879	* 879			* 741	428	* 581	317	* 442	251	* 381	241	3100 123
-1000 -40	* 1957	* 1957			* 1593	507	* 1886	684	* 876	543	* 840	532	119
-1500 -60			* 938	646	* 649	427	* 471	318			* 378	276	2810 111
-2000 -80			* 722	658	* 495	436					* 384	362	2300 91
			* 1535	1418	* 1248	944					* 848	813	

Illustration 170

g06364606

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60	1501 60	2000 80	2500 100	3000 120	3500	
							(mm) (inch)
3000 120							346 * 346 330 746 * 746 30
2500 100							308 * 308 3950 768 * 768 100
2000 80							328 * 328 378 728 * 728 120 801 823
1500 60							378 * 378 3400 820 * 820 160 400 * 400 348 881 * 881 180 794 823
1000 40							627 * 627 3500 1042 * 1042 160 288 288 3500 825 880 160
500 20							793 * 793 3520 1215 * 1215 160 284 298 820 849 160
0 0							898 * 898 3450 1383 * 1383 160 268 268 3450 638 660 160
-500 -20							969 * 969 3290 1820 * 1820 120 366 366 3290 676 763 120
-1000 -40							995 * 995 3010 2091 * 2114 120 344 380 3010 767 796 120
-1500 -60							803 * 808 2570 1725 * 1725 100 370 * 370 2570 808 * 808 100
-2000 -80							551 * 551 1730 1138 * 1138 70 421 * 421 1730 950 * 951 70

Illustration 171

g06364612

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3000 120								340 134
2500 100								310 122
2000 80								285 112
1500 60								260 102
1000 40								235 93
500 20								210 83
1850 73								205 81
1700 67								190 75
1550 61								175 69
1400 55								160 63
1250 49								145 57
1100 43								130 51
950 37								115 45
800 31								100 39
650 25								85 33
500 20								70 27
350 14								55 21
200 8								40 15
50 2								25 1

Illustration 172

g06364613

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60	1501 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3000 120								346 13.6
2500 100				38 1.5	71 2.8			346 13.6
2000 80				125 4.9	316 12.4	372 14.6	271 10.7	346 13.6
1500 60			378 14.9	379 14.9	403 15.9	360 14.2	349 13.7	346 13.6
1000 40			627 24.7	462 18.2	473 18.6	318 12.5	362 14.2	346 13.6
500 20		793 31.2	840 33.1	624 24.6	439 17.3	459 18.1	325 12.8	346 13.6
0 0		1215 47.7	1305 51.6	1065 41.9	866 33.9	939 36.9	764 30.0	346 13.6
-500 -20	88 3.5	118 4.6	969 37.9	627 24.7	610 24.1	417 16.4	443 17.4	346 13.6
-1000 -40	1620 63.8	1820 71.6	2079 81.6	1250 49.2	1214 47.7	890 34.7	955 37.4	346 13.6
-1500 -60			379 14.9	632 24.9	611 24.1	418 16.4	443 17.4	346 13.6
-2000 -80			2091 82.3	1360 53.5	1316 51.8	992 39.0	955 37.4	346 13.6
			803 31.5	642 25.3	553 21.8	424 16.7	390 15.3	346 13.6
			1725 67.7	1394 54.9	1179 46.3	917 36.1	917 36.1	346 13.6
			591 23.3	591 23.3				346 13.6
			1136 44.7	1136 44.7				346 13.6

Illustration 173

g06364616

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500				(mm) (inch)		
															(mm) (inch)		
3000 120															348 748	345 748	2310 90
2500 100															311 712	308 712	2050 110
2000 80															325 728	328 728	2070 130
1500 60															379 828	379 828	2400 340
1000 40															427 942	432 938	2900 140
500 20															753 1675	649 1383	3520 140
1 1															866 1900	627 1382	3450 340
100 -20	88 1820	98 1520													767 1693	417 930	3290 130
1000 -40															605 2114	612 1380	3010 320
1500 -60															809 1725	642 1384	2570 300
2000 -80															991 1126	660 104	1790 70

Illustration 174

g06364618

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

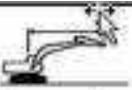






[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							2000 80
2500 100							2840 110
2000 80							3000 120
1500 60							3200 130
1000 40							3340 140
500 20							3360 140
0 0							3280 130
-500 -20							3100 120
-1000 -40							2900 110
-1500 -60							2300 90

Illustration 175

g06364639

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120					* 391	* 391					* 395	* 395	2000 80
2500 100							* 404	338			* 406	* 390	2640 105
2000 80							* 408	327			* 377	259	3000 120
1500 60			* 586	* 586	* 502	455	* 468	329	* 436	252	* 370	225	3220 128
1000 40					* 718	432	* 547	378	* 458	245	* 379	211	3340 132
500 20					* 825	411	* 596	307	* 470	241	* 399	206	3360 133
0 0			* 736	538	* 811	401	* 595	300	* 457	234	* 383	200	3280 130
-500 -20	* 878	* 878			* 741	398	* 581	296	* 432	235	* 391	225	3110 123
-1000 -40	* 1957	* 1957			* 1598	859	* 1886	640	* 876	508	* 840	497	2830 112
-1500 -60			* 938	685	* 640	401	* 471	288			* 378	259	2810 111
-2000 -80			* 722	819	* 495	430					* 384	339	2310 92
			* 1535	934	* 1248	885					* 848	763	

Illustration 176

g06364650

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3800 129								2300 90
2500 100								2650 110
2000 80								2800 100
1500 60								3400 140
1000 40								3900 160
500 20								3500 140
0 0								3450 140
1000 40								3200 130
1500 60								3000 120
2000 80								2800 110
2500 100								2600 100
3000 120								2400 90
3500								2200 80

Illustration 177

g06364669

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500				[mm] [inch]		
2000 80															244 96	246 97	2210 87
2500 100							30 12	31 12							268 105	275 108	2850 112
2000 80							328 129	336 132	378 149	254 100					362 142	330 130	3190 125
1500 60					378 149	379 149	400 157	410 161	438 172	251 99					360 141	360 141	3400 134
1000 40					627 247	435 171	502 197	388 153	434 171	244 96					268 105	184 72	2600 102
500 20			763 300	601 237	791 311	411 161	574 226	365 143	459 180	237 93	372 146	180 71			328 129	189 74	3520 138
0 0			896 353	666 262	818 321	395 155	593 233	295 116	460 181	212 83					264 103	182 71	3450 135
500 20	816 321	416 163			767 301	390 153	565 223	290 114	420 165	223 87					362 141	204 80	3290 129
1000 40			895 352	592 233	878 341	391 154	609 239	290 114	343 135	229 90					362 141	220 87	3010 118
1500 60			1116 435	1275 498	1457 571	644 253	1072 421	626 247							737 288	509 199	320 125
2000 80			808 318	803 315	850 331	398 156	390 153	286 112							370 145	287 113	2570 101
2500 100			591 232	591 232											421 165	421 165	1790 70

Illustration 178

g06364674

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

302

With Bucket












[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
													
3000 120													* 305 * 305 2560 * 647 * 647 100
2500 100					* 566 * 566								* 300 * 300 3080 * 663 * 663 120
2000 80					* 284 * 284 * 633 * 633	* 362 336	* 783 718						* 295 270 3400 * 643 601 140
1500 60			* 419 * 419	* 419 * 419	* 419 * 419	* 419 * 419	389 329	300 254					287 243 3590 636 537 140
1000 40			725 598	598 507	507 426	380 321	298 250	298 250	298 250	298 250	298 250	298 250	269 227 3790 593 500 150
500 20					499 409	371 312	292 246	246 200	246 200	246 200	246 200	246 200	263 221 3740 589 498 150
0 0			695 561	561 483	483 400	364 305	288 242	242 196	242 196	242 196	242 196	242 196	266 226 3670 592 498 150
-500 -20	* 678 * 678	* 678 * 678	696 562	562 476	476 396	361 302							269 242 3600 635 534 140
-1000 -40			690 566	566 478	478 396	362 304							* 324 * 324 3290 * 715 * 715 130
-1500 -60	* 657 * 657	* 657 * 657	662 562	562 481	481 398	396 332							* 324 * 324 2740 * 718 * 718 100

Illustration 179

g06364681

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.




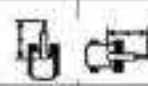



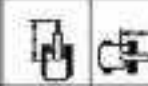
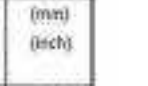

(mm) (inch)	1630 63		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
													(mm) (inch)	
3000 120												* 305 * 647	* 305 * 647	2500 100
2500 100					* 506 * 506							* 300 * 663	* 300 * 663	3000 120
2000 80					* 284 * 833	* 284 * 833	* 362 * 783	335 718				* 295 * 649	270 691	3400 140
1500 60			* 419 * 882	* 419 * 882	* 411 * 888	* 411 * 888	* 395 * 861	329 788	* 374 * 788	254		* 297 * 655	243 537	3500 140
1000 40			* 858 * 1794	588 1291	* 567 * 1213	426 917	* 454 * 980	321 690	* 388 * 834	250 537		* 303 * 668	227 580	3710 150
500 20					* 657 * 1408	409 892	* 491 * 1058	312 671	* 393 * 841	246 528		* 321 * 706	221 498	3740 150
0 0			* 908 * 1964	561 1206	* 658 * 1414	409 861	* 491 * 1055	385 837	* 378 * 823	242 521		* 339 * 745	226 498	3870 150
500 -20	* 878 * 1969	* 878 * 1999	* 318 * 1764	562 1207	* 606 * 1302	398 853	* 466 * 974	382 651				* 330 * 727	242 534	3500 140
-1000 -40			* 708 * 1520	566 1215	* 523 * 1118	398 855	* 383 * 809	384 654				* 324 * 715	275 613	3210 130
-1500 -60	* 857 * 1815	* 857 * 1815	* 362 * 1194	* 552 * 1194	* 398 * 832	* 398 * 832						* 324 * 715	* 324 * 715	2740 110

Illustration 180

g06364693

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities















(mm) (inch)	1590 63		2050 80		2500 100		3000 120		3500 140				(mm) (inch)	
														
3000 120												* 305 * 647	209 647	2580 100
2500 100					* 556 * 566							* 300 * 663	207 466	3090 120
2000 80					* 284 * 633	* 284 * 633	* 352 * 783	217 465				* 295 * 649	172 382	3450 140
1500 60			* 419 * 382	* 413 * 382	* 411 * 888	288 619	389 836	212 455	300	160		287 635	152 335	3590 140
1000 40			725 1562	375 813	507 1092	272 586	380 817	204 438	296 636	156 335		289 593	140 309	3710 150
500 20					498 1055	267 553	371 797	195 420	250 527	152 326		253 509	130 290	3740 150
0 0			386 1470	342 737	484 1032	248 533	364 783	189 407	288 620	149 319		298 582	139 304	3670 150
500 -20	* 878 * 1966	554 1187	686 1471	349 737	476 1024	244 526	361 776	186 401				298 635	146 327	3500 140
-1000 -40			690 1481	346 745	471 1029	246 529	362 780	188 405				* 324 * 715	171 379	3210 130
-1500 -60	* 857 * 1815	566 1217	* 562 * 1194	355 784	* 398 * 832	253 546						* 324 * 716	223 500	2740 110

Illustration 181

g06364694

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.















(mm) (inch)	1590 60		2050 80		2500 100		3000 120		3500 140				(mm) (inch)
													
3000 120												* 305 * 647	2500 100
2500 100					* 594 * 566							* 300 * 663	3000 120
2000 80					* 284 * 633	* 364 * 633	* 362 * 783	217 465				* 296 * 649	3400 140
1500 60			* 419 * 382	413 * 382	* 411 * 888	288 819	* 395 * 861	212 455				* 297 * 655	3500 140
1000 40			* 358 * 1794	375 813	* 587 * 1213	272 506	* 454 * 980	204 438		* 385 * 834	156 335	* 303 * 698	3710 150
500 20					* 657 * 1408	257 553	* 491 * 1056	195 420		* 393 * 841	152 326	* 321 * 706	3740 150
0 0			* 300 * 1964	342 737	* 698 * 1414	245 533	* 491 * 1056	189 407		* 378 * 800	149 319	* 338 * 745	3670 150
500 20	* 878 * 1966	554 1187	* 310 * 1764	343 737	* 696 * 1300	244 526	* 455 * 974	196 401				* 338 * 727	3500 140
-1000 40			* 708 * 1520	345 745	* 523 * 1118	245 529	* 393 * 889	188 405				* 324 * 715	3210 130
-1500 60	* 857 * 1815	566 1217	* 562 * 1194	355 754	* 398 * 832	253 546						* 304 * 716	2740 110

Illustration 182

g06364696

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2020 19
2500 100					277 638	277 630		2080 130
2000 80					288 648	288 648	301 285	2070 140
1500 60				346 680	346 680	343 700	339 642	2060 150
1000 40			888 1438	890 1014	498 1062	438 921	378 815	2050 160
500 20			696 1697	571 1230	490 1054	468 960	368 792	2040 170
0 0			878 1458	595 1394	478 1024	385 852	360 774	2030 180
-500 -20	762 1884	762 1924	877 1988	877 1988	576 1396	552 1311	470 1038	2020 190
-1000 -40			879 1485	595 1392	470 1030	389 838	358 762	2010 200
-1500 -60		898 2007	504 2060	627 1335	562 1299	448 940	385	2000 210
-2000 -80			428 977	428 977	428 977	428 977		2000 220

Illustration 183

g06364699

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500 140				[mm] [inch]	
																
3000 120													261	281	2020	
													560	580	180	
2500 100									277	277			242	242	3280	
									638	630			525	525	120	
2000 80									288	288	386	265	238	238	3570	
									646	646			526	526	140	
1500 60								398	398	343	328	342	280	239	222	3760
								688	688	750	768	760	542	528	432	150
1000 40					888	880	498	428	416	320	368	248	248	288	3880	
					1628	1214	1062	903	906	697	790	503	541	460	160	
500 20					995	871	625	468	472	308	380	242	262	200	2800	
					2053	1230	1009	660	1047	646	605	521	579	440	60	
0 0					995	995	658	386	489	391	360	228	289	205	3500	
					2053	1194	1410	652	1058	648	885	59	627	455	150	
-500 -20	762	762	877	877	871	552	624	390	488	257	352	235	310	219	3680	
	1604	1604	1904	2008	1873	1186	1240	638	939	630	747	507	688	494	150	
-1000 -40					763	595	650	340	410	296			310	240	3430	
					1638	1182	1180	638	873	838			694	546	140	
-1500 -60			906	504	627	562	440	388					314	305	2980	
			2087	2086	1335	1299	940	680					693	682	120	
-2000 -80					428	408							342	342	2250	
					877	877							764	764	90	

Illustration 184

g06364701

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities









(mm) (inch)	1850 40	2500 60	3000 90	3500 100	4000 120	4500 140	
							(mm) (inch)
3000 120							* 261 245 2020 * 553 261 180
2500 100					* 277 218		* 242 184 3280 * 525 418 120
2000 80					* 288 217	301 80	* 238 195 3570 * 526 344 140
1500 60				* 398 288	* 343 271	289 86	* 239 177 3760 * 528 303 150
1000 40		* 688 395	* 498 273	* 458 253	* 379 202	254 754	* 248 128 3880 * 541 279 100
500 20		* 936 350	* 650 255	* 590 268	* 495 195	289 94	* 242 122 3900 * 534 289 80
0 0		* 1037 296	* 756 204	* 676 243	* 568 195	284 94	* 246 123 3930 * 543 272 80
-500 -20	* 762 1604	* 762 1604	* 877 1904	* 514 1195	* 675 717	* 470 811	* 238 355 181 291 142 262 131 3680 * 573 280 150
-1000 -40			* 679 336	* 470 238	* 388 190		* 284 149 3430 * 552 301 140
-1500 -60		* 806 180	* 548 1135	* 343 738	* 448 242		* 314 187 2980 * 593 418 120
-2000 -80			* 428 397	* 377 210			* 342 200 2250 * 764 846 80

Illustration 185

g06364703

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.

Lift Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Lift Height (mm) (inch)
															
2000 80															2000 80
2500 100									277	29					2500 100
2000 80									388	27	318	110			2000 80
1500 60								318	210	343	39	340	58		1500 60
1000 40					668	385	496	273	436	262	368	154	246	128	1000 40
500 20					945	350	625	295	472	312	393	140	262	122	500 20
0 0					2050	756	1338	650	1007	414	625	318	576	269	0 0
1000 40					865	336	658	343	499	305	390	144	288	120	1000 40
500 20					2050	724	1413	524	1050	399	815	309	637	272	500 20
1000 40	762	752	877	534	871	397	624	238	466	311	352	142	302	131	1000 40
500 20	1604	1604	1804	1145	1873	717	1348	502	899	388	747	305	689	230	500 20
1000 40					763	336	653	318	430	293			310	149	1000 40
500 20					1636	723	1183	510	873	388			684	201	500 20
1000 40			888	548	627	383	448	242					354	187	1000 40
500 20			2097	1160	1335	739	948	523					653	419	500 20
2000 80					428	257							342	180	2000 80
					677	373							764	436	

Illustration 186

g06364704

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities









[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
3000 120								300 120
2500 100				563 221	568 223	347 137		289 113
2000 80				643 253	645 254	798 314		640 252
1500 60			445 175	495 195	620 244	689 270	284 112	270 106
1000 40			687 270	582 229	481 189	460 181	280 110	253 100
500 20			980 386	1013 395	861 337	772 303	646 254	588 231
0 0			650 256	527 207	454 179	374 147	285 112	272 107
-500 -20	1504 592	1594 621	2090 818	2290 897	2700 1059	2990 1173	3400 1335	400 157
-1000 -40			655 256	592 231	493 193	373 147	284 112	261 103
-1500 -60		842 331	942 370	552 217	542 213	397 156		325 128

Illustration 187

g06364709

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.









(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								300 120
2500 100				560 22	560 22	347 14	317 13	239 9.4
2000 80				640 25	640 25	785 31	676 27	295 11.6
1500 60		445 17.5	445 17.5	420 16.5	418 16.4	338 13.3	309 12.1	297 11.7
1000 40			334 13.1	334 13.1	807 31.8	858 33.4	885 34.8	817 32.2
500 20			373 14.7	562 22.1	575 22.7	468 18.4	457 18.0	388 15.3
25 1			1025 40.3	1213 47.7	1230 48.4	861 33.9	846 33.3	635 25.0
1 0			932 36.7	527 20.7	656 25.8	374 14.7	438 17.2	285 11.2
-500 -20	1586 62.4	1636 64.4	915 35.8	884 34.8	812 31.9	601 23.7	458 18.0	283 11.1
-1000 -40			2090 82.3	2086 82.1	1751 69.0	1124 44.2	923 36.3	688 27.1
-1500 -60			790 31.1	832 32.8	1504 59.2	1814 71.4	1805 71.1	863 33.9
-2000 -80		842 33.1	842 33.1	532 20.9	542 21.3	387 15.2	381 15.0	225 8.9
		1781 70.1	1765 69.5	1178 46.3	1165 45.8	808 31.8	888 34.9	712 27.9

Illustration 188

g06364710

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1900 40	1600 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2000 80
2500 100					277 10.9	277 10.9		3000 120
2000 80					251 9.9	291 11.4	205 8.1	250 9.8
1500 60					306 12.0	306 12.0	247 9.7	299 11.7
1000 40			700 27.6	870 34.3	480 18.9	462 18.2	350 13.8	280 11.0
500 20			650 25.6	835 32.9	464 18.3	383 15.1	289 11.4	220 8.7
0 0			640 25.2	820 32.3	450 17.7	370 14.6	280 11.0	210 8.3
-500 -20	1726 68	1726 68	904 35.6	880 34.7	641 25.2	580 22.8	335 13.2	277 10.9
-1000 -40		2041 80	1370 54.0	1100 43.3	644 25.3	521 20.5	335 13.2	277 10.9
-1500 -60		971 38.2	882 34.7	610 24.0	520 20.5	440 17.3	300 11.8	250 9.8
-2000 -80		2056 81	1687 66.8	1314 51.7	830 32.7	750 29.5		695 27.3

Illustration 189

g06364712

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
2000 80								2000 80
2500 100					277 10.9	277 10.9		2500 100
2000 80					291 11.4	291 11.4	232 9.1	2000 80
1500 60				326 12.8	326 12.8	326 12.8	232 9.1	1500 60
1000 40			710 27.9	573 22.5	506 19.9	462 18.2	232 9.1	1000 40
500 20			970 38.2	535 21.1	629 24.8	582 22.9	232 9.1	500 20
0 0			951 37.4	521 20.5	657 25.9	370 14.6	232 9.1	0 0
500 20	1726 68	1726 68	904 35.6	863 33.9	865 33.9	821 32.3	232 9.1	500 20
1000 40			756 29.8	621 24.5	647 25.5	365 14.4	232 9.1	1000 40
1500 60		971 38.2	892 35.1	638 25.1	629 24.8	448 17.6	232 9.1	1500 60
2000 80		2096 82.5	1857 73.1	1374 54.1	1337 52.8	830 32.7	232 9.1	2000 80

Illustration 190

g06364713

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities




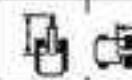



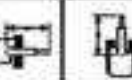
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]	
								
3000 120							* 305 * 305 2560 * 647 * 647 100	
2500 100							* 300 * 300 2080 * 663 * 663 100	
2000 80				* 204 * 204 * 162 * 162 * 633 * 633 * 783 * 783			* 295 * 280 2400 * 645 * 640 140	
1500 60		* 419 * 419 * 882 * 882	* 411 * 411 * 889 * 889	* 395 * 395 * 861 * 861	350 753	320 271	* 297 * 289 2590 * 655 * 574 140	
1000 40		770 1658	635 1349	533 1161	452 974	405 871	341 735	307 267 681 574 635 536 250
500 20				522 1024	436 930	395 851	332 736	302 671 565 621 523 150
0 0		730 1546	597 1284	512 1101	426 938	389 857	326 702	300 664 558 634 533 150
500 20	* 878 * 878 * 1899 * 1899	730 1567	598 1285	508 1093	423 900	386 838	323 696	308 680 572 140
1000 40		* 708 * 708 * 1520 * 1520	682 1434	519 1097	424 913	* 383 * 383 * 809 * 809	324 689	* 324 * 296 3210 * 715 * 655 150
1500 60	* 857 * 857 * 1815 * 1815	* 652 * 652 * 1394 * 1394	* 562 * 562 * 1194 * 1194	* 388 * 388 * 832 * 832				* 324 * 324 2740 * 716 * 716 110

Illustration 191

g06364791

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.


















[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]									
																
3000 120																
2500 100																
2000 80																
1500 60																
1000 40																
500 20																
0 0																
500 20																
1000 40																
1500 60																

Illustration 192

g06364794

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities
















































[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							305 305 2560 647 647 100
2500 100							300 222 3090 663 490 120
2000 80							294 294 352 232 633 633 783 497
1500 60							320 172 295 184 3400 649 410 140
1000 40							320 172 297 164 3590 655 362 140
500 20							307 168 288 151 3730 681 361 635 334 150
0 0							302 164 282 147 3740 671 352 621 324 150
-500 -20							309 160 3600 680 354 140
-1000 -40							324 184 3230 715 403 130
-1500 -60							324 239 2740 718 537 80

Illustration 193

g06364796

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.








(mm) (inch)	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)							
3000 120							2560 100							
2500 100			584 23	566 22			3080 122							
2000 80			294 11	294 11	352 14	232 9	3400 134							
1500 60		419 16	419 16	419 16	308 12	338 13	226 9	3580 141						
1000 40		858 34	400 16	587 23	290 11	454 18	218 9	388 15	368 14	303 12	361 14	369 14	334 13	370 15
500 20				857 34	275 11	431 17	210 8	381 15	164 6	321 13	147 6	3740 150		
0 0		508 20	367 14	858 34	266 10	431 17	204 8	376 15	161 6	333 13	150 6	3670 150		
-500 -20	678 27	588 23	818 32	367 14	805 32	283 11	455 18	201 8		339 13	160 6	3560 140		
-1000 -40			1784 70	790 31	1302 51	566 22	974 39	433 17		727 29	364 14	3230 130		
-1500 -60	857 34	603 24	562 22	379 15	399 16	271 11				324 13	239 9	2740 110		

Illustration 194

g06364798

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500 140				[mm] [inch]
															
3000 120															2620 100
2500 100									277	277					3280 130
2000 80									288	288	316	272			3570 140
1500 60								318	318	343	343	320	278		3760 150
1000 40				838	848	458	454	484	340	315	265				3880 160
500 20				740	897	522	435	393	330	309	260				3900 160
0 0				1554	1272	1090	969	828	690	554	548				4000 160
-500 -20	762	762	877	877	721	598	500	416	380	317	302	252			3680 150
-1000 -40	1604	1604	1904	1904	1546	1264	1090	896	818	683	549	544			3430 140
-1500 -60			906	906	627	530	440	421							2960 120
-2000 -80			2087	2087	1335	1297	940	967							2250 90

Illustration 195

g06364801

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80															2020 80
2500 100									277	277					2280 90
2000 80									288	288	318	272			2570 100
1500 60									316	316	343	343	340	270	2700 100
1000 40									608	608	750	751	750	590	2500 150
500 20									868	868	1062	1062	1062	868	2000 200
0 0									1428	1391	1062	910	901	732	1500 300
1500 60									2050	1997	1338	937	907	711	1000 400
1000 40									2653	2597	1743	960	850	633	500 200
500 20									365	361	498	422	498	322	200 80
0 0									2653	2597	1743	960	850	633	150 60
1500 60									762	752	877	877	871	589	1000 400
1000 40									1304	1284	1304	1304	1273	1254	500 200
500 20									1626	1570	1183	855	810	573	200 80
0 0									2037	2017	1335	940	907		150 60
1500 60									388	386	527	448	448	421	500 200
1000 40									2037	2017	1335	940	907		200 80
500 20									428	428	588	488	488	462	100 40
0 0									2037	2017	1335	940	907		50 20

Illustration 196

g06364803

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2000 80
2500 100					277 11	224 9		3000 120
2000 80					288 11	232 9	315 12	3570 140
1500 60				318 12	260 10	220 9	171 7	3700 150
1000 40			666 26	410 16	496 19	291 11	484 19	3900 160
500 20			740 29	374 15	522 21	274 11	382 15	3900 160
0 0			850 33	499 19	623 25	340 13	446 17	3900 160
-500 -20	762 30	752 30	877 34	670 27	721 28	359 14	502 20	3900 160
-1000 -40	1884 74	1884 74	1384 54	1224 48	1546 61	770 30	1090 43	3900 160
-1500 -60		388 15	586 23	627 25	357 14	448 18	281 11	3900 160
-2000 -80		2087 82	1259 49	1335 53	730 29	948 37	562 22	3900 160

Illustration 197

g06364804

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3000 120															2020 80
2500 100									277	234					2080 82
2000 80									288	232	316	177			2070 82
1500 60								316	268	243	200	342	171		2060 81
1000 40					888	410	498	281	418	217	288	88			2050 81
500 20					985	374	625	274	472	297	380	81			2040 80
0 0					1053	399	700	280	507	346	428	95			2030 80
-500 -20	762	762	877	578	921	358	624	285	486	335	352	84			2020 80
-1000 -40	1884	1884	1904	1224	1973	710	1240	582	888	420	247	111			2010 79
-1500 -60			808	586	827	397	448	289							2000 79
-2000 -80			2007	1259	1335	790	948	562							1990 78

Illustration 198

g06364806

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities










(mm) (inch)	1500 40	1500 50	2000 50	2500 60	3000 70	3500 80			(mm) (inch)
3000 120									300 120
2500 100									250 100
2000 80									200 80
1500 60									150 60
1000 40									100 40
500 20									500 20
0 0									0 0
-500 -20									-500 -20
-1000 -40									-1000 -40
-1500 -60									-1500 -60

Illustration 199

g06364808

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.



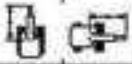
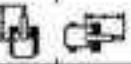
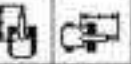
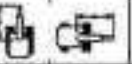


(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)				
3000 120								2000 80				
2500 100				568 223	548 215	347 136		2100 83				
2000 80				645 253	643 252	788 309		2400 94				
1500 60			445 175	445 175	420 165	438 172	274 108	285 112	2900 114			
1000 40			334 131	334 131	307 121	368 145	740 291	817 322	858 336	900 354		
500 20					320 126	308 121	388 153	391 154	538 212	583 230		
0 0					659 259	418 164	433 169	312 123	391 154	244 96		
500 20					1410 555	884 348	1068 416	675 266	840 331	558 219	730 287	
0 0					982 387	583 229	656 258	401 158	438 172	308 121	275 108	
500 20	1500 60	1500 60	2000 80	2002 80	1791 700	1212 477	1430 559	1052 413	699 275	799 313	523 206	745 294
1000 40					1791 700	1212 477	1430 559	1052 413	699 275	799 313	523 206	745 294
1500 60					842 331	842 331	852 334	852 334	387 152	347 136		325 128
					1781 697	1781 697	1778 696	1170 459	808 318	868 340		717 282

Illustration 200

g06364809

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities



(mm) (inch)	1850 40	2500 60	3000 90	3500 100	4000 120	4500 140		(mm) (inch)
3000 120								250 10
2500 100					277 11	277 11		241 10
2000 80					291 11	291 11	308 12	239 9
1500 60				328 13	328 13	347 14	300 12	240 10
1000 40		710 28	699 27	508 20	438 17	384 15	320 13	298 12
500 20		1493 59	1313 52	1003 39	825 33	689 27	641 25	504 20
0 0			699 27	571 22	496 19	449 18	390 15	293 12
-500 -20	1726 68	1726 68	904 36	984 39	885 35	554 22	477 19	391 15
-1000 -40		2041 80	1867 73	1471 58	1191 47	1025 40	842 33	775 30
-1500 -60		321 13	503 20	618 24	669 26	440 17	387 15	315 12
-2000 -80		2056 81	2080 82	1314 52	1245 49	930 37	855 33	595 23
			40 2	41 2				348 14
			336 13	336 13				776 31

Illustration 201

g06364813

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.

(mm) (inch)	1850 40		2500 60		3000 60		3500 80		4000 120		4500 140				(mm) (inch)				
																			
3000 120													259	259	2000 80				
2500 100									277	277			241	241	3100 120				
2000 80									258	231	302	258	239	239	3500 140				
1500 60								326	300	247	300	343	254	249	222	3770 150			
1000 40					713	693	506	428	425	320	367	243	247	208	208	3880 160			
500 20					1693	1313	1063	822	910	688	786	538	543	460	460	3900 160			
0 0					370	521	629	468	474	330	383	243	263	204	204	3900 160			
					2045	1831	1618	142	1022	867	1026	823	679	450	450	3900 160			
					351	557	657	387	488	302	279	228	291	290	3030 120				
-500 -20					2044	1888	1612	854	1058	850	810	513	642	458	450	3900 160			
-1000 -40		1726	1726		504	984	865	554	621	391	464	290	349	208	312	221	3000 120		
-1500 -60					2041	1967	1859	891	1333	842	994	641	741	508	609	488	3500 140		
-2000 -80							758	557	547	391	486	297			310	280	3190 120		
-2500 -100							1628	1197	1172	842	863	641			604	554	340	2950 120	
-3000 -120							971	508	418	565	440	387			315	312	2950 120		
-3500 -140							2096	2010	1314	1215	930	855			635	635	250	280	280
							418	411							346	346	280	280	280
							836	836							775	775	90	90	90

Illustration 202

g06364816

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities

Without Bucket














[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]		
															
3000 120													* 395 * 847	* 395 * 847	2269 90
2500 100					- 346 - 734	- 346 - 734							* 406 * 803	380 856	2680 100
2000 80					* 372 * 823	* 372 * 823	417 896	167 769					366 815	314 700	3250 129
1500 60			* 528 * 894	* 528 * 894	* 482 * 1044	* 482 * 1001	465 887	412 759					328 727	282 623	3470 140
1000 40			749 1612	622 1343	530 1143	449 969	404 870	345 743	321 691	275 592			310 684	285 686	3590 140
500 20			719 1549	595 1283	515 1119	435 930	396 853	337 727	307 683	271 585			304 671	261 574	3600 140
0 0			710 1526	588 1282	506 1089	426 918	380 840	331 714	304 674	269 589			310 688	266 586	3590 140
-500 20			719 1524	588 1280	502 1082	422 910	387 835	329 710					310 736	284 628	3360 140
-1000 40			714 1533	590 1289	504 1086	424 914	390 831	331					* 378 * 832	324 719	3050 120
-1500 60	* 921 * 1945	* 921 * 1945	* 591 * 1251	* 591 * 1251	* 405 * 405	* 405 * 405							* 384 * 848	* 384 * 848	2560 100

Illustration 203

g06364886

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.








[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)					
3000 120						 	* 395 * 395 * 847 * 847	2260 90				
2500 90			* 345 * 345 * 794 * 794			 	* 406 * 406 * 893 * 893	2850 120				
2000 80			* 372 * 372 * 823 * 823	* 499 * 499 * 928 * 928	357 768	 	* 377 * 377 * 833 * 833	314 700	3250 130			
1500 60		* 526 * 526 * 1114 * 1114	* 482 * 482 * 1044 * 1044	* 465 * 465 * 1001 * 1001	* 451 * 451 * 983 * 983		* 379 * 379 * 815 * 815	282 623	3470 140			
1000 40		* 890 * 890 * 1990 * 1990	* 822 * 822 * 1843 * 1843	* 614 * 614 * 1318 * 1318	* 448 * 448 * 969 * 969	* 437 * 437 * 1075 * 1075	* 422 * 422 * 902 * 902	275 592	275 592	* 379 * 379 * 834 * 834	265 596	3580 140
500 20				* 689 * 689 * 1479 * 1479	* 435 * 435 * 938 * 938	* 525 * 525 * 1131 * 1131	* 420 * 420 * 900 * 900	271 585	271 585	* 399 * 399 * 879 * 879	261 574	3600 150
0 0		* 964 * 964 * 2078 * 2078	* 586 * 586 * 1262 * 1262	* 687 * 687 * 1478 * 1478	* 426 * 426 * 918 * 918	* 518 * 518 * 1115 * 1115	* 396 * 396 * 868 * 868	268 857	268 857	* 389 * 389 * 857 * 857	266 806	3730 140
-500 -20		* 870 * 870 * 1873 * 1873	* 806 * 806 * 1760 * 1760	* 634 * 634 * 1364 * 1364	* 422 * 422 * 910 * 910	* 478 * 478 * 1022 * 1022	* 329 * 329 * 710 * 710			* 391 * 391 * 840 * 840	264 628	3750 140
-1000 -40		* 751 * 751 * 1610 * 1610	* 590 * 590 * 1269 * 1269	* 547 * 547 * 1171 * 1171	* 424 * 424 * 914 * 914	* 394 * 394 * 831 * 831				* 378 * 378 * 832 * 832	324 713	3050 120
-1500 -60	* 921 * 921 * 1945 * 1945	* 921 * 921 * 1945 * 1945	* 591 * 591 * 1251 * 1251	* 591 * 591 * 1251 * 1251	* 405 * 405 * 845 * 845					* 384 * 384 * 849 * 849	* 384 * 384 * 849 * 849	2560 100

Illustration 204

g06364893

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


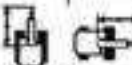
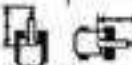
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							385 373 2250
2500 100			346 734	323 603			406 847 2880
2000 80			372 823	320 639	417 896	240 515	366 815 3250
1500 60		528 1114	432 933	482 1044	310 668	412 887	335 727 3470
1000 40		748 1612	400 866	538 1163	236 536	404 870	228 492 321 691
500 20		719 1549	376 810	515 1119	282 605	396 853	221 476 307 663
0 0		710 1528	368 794	508 1083	274 595	390 840	215 465 384 875
-500 -20		708 1524	367 792	502 1082	271 594	387 835	213 460 333 738
-1000 -40		714 1533	371 800	504 1085	272 598	390 840	215 463 378 832
-1500 -60	921 345	587 1263	538 1251	380 820	405 280		386 849 273 610

Illustration 205

g06364900

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.









[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]	
3000 120								395 15.5
2500 100			346 13.6	323 12.7				406 16.0
2000 80			372 14.7	320 12.6	419 16.5	240 9.5		377 14.8
1500 60		528 20.8	432 17.0	482 19.0	390 15.4	451 17.8	235 9.3	370 14.6
1000 40		890 35.1	490 19.3	614 24.2	296 11.7	497 19.6	228 9.0	422 16.6
500 20				689 27.1	282 11.1	525 20.7	221 8.7	420 16.5
0 0		964 37.9	388 15.3	887 34.9	274 10.8	518 20.4	205 8.1	386 15.2
-500 -20								398 15.7
-1000 -40								378 14.9
-1500 -60	821 32.3	587 23.1	591 23.3	380 15.0	405 15.9	280 11.0		384 15.1

Illustration 206

g06364902

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)						
3800 129								2550 100						
2500 100					365 742	358 742		3000 120						
2000 80					398 797	399 799		3430 140						
1500 60				397 664	397 664	403 812	392 790	220 594	277 595	309 600	280 575	3040 150		
1000 40			749 1512	620 1350	532 1145	480 978	483 987	343 740	319 638	273 557	287 524	246 542	3750 150	
500 20			721 1852	596 1216	504 1027	433 874	393 797	334 676	314 637	268 537	262 522	241 501	3770 150	
0 0		567 1338	567 1338	784 1514	590 1250	501 1000	421 868	385 785	327 666	310 643	264 533	247 540	3700 150	
-100 -20	793 1755	793 1755	939 2124	802 1696	709 1440	576 1167	495 996	415 822	361 696	323 656	308 622	262 527	3530 140	
-1000 -40			762 1550	579 1245	495 1007	415 836	381 773	323 657				342 695	291 645	3150 130
-1500 -60			958 1393	596 1262	468 965	421 863						378 810	380 904	2810 110
-2000 -80			433 433	433 433								421 451	421 851	2030 80

Illustration 207

g06364908

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade UP.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)							
3800 129								2550 100							
2500 100					365 742	358 742		3100 120							
2000 80					358 737	358 769		3430 140							
1500 60					307 664	302 628	304 655	277 595	3040 120						
1000 40			749 1582	620 1358	552 1186	488 1016	454 940	408 891	273 567	309 676	248 542	3750 150			
500 20			986 2102	996 1216	660 1430	423 914	589 1297	334 720	446 886	268 577	328 723	241 931	3770 150		
0 0		567 1338	567 1338	992 2128	590 1290	687 1476	421 908	50 108	327 705	406 871	264 569	364 802	245 540	3700 150	
-500 -20	793 1755	793 1755	939 2124	802 1886	90 1862	576 1240	652 1401	416 896	491 1054	323 696	369 814	262 573	362 804	280 110	3530 140
-1000 -40				882 1718	570 1245	679 1498	416 896	438 932	323 697			362 797	281 645	3650 130	
-1500 -60				958 1333	586 1262	466 985	421 883					378 818	280 634	2810 110	
-2000 -80				433 433	433 433							421 451	421 851	2030 80	

Illustration 208

g06364911

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80							326	30					244	303	2500
													246	71	100
2500 100									365	240			208	227	2000
									742	503			208	503	120
2000 80									356	240			302	31	3400
									620	620			667	424	140
2500 100									397	211	400	205	300	80	3040
									664	671	662	565	604	332	150
3000 120					748	497	532	296	400	228	319	178	287	160	3700
					1582	879	1145	610	667	488	606	394	634	350	150
2500 100					721	376	514	280	390	218	314	174	282	156	3770
					1562	914	1107	608	647	469	676	375	622	344	150
2000 80					597	350	704	362	501	269	385	211	310	170	3700
					1338	1101	254	791	1080	501	820	455	603	267	150
2500 100		780	790	939	652	700	359	495	264	381	267	308	169	305	3530
		1755	1795	2124	1816	1503	772	1067	510	822	447			673	363
3000 120					710	390	495	264	391	267				342	3090
					1508	777	1067	510	823	448				759	130
2500 100					658	367	488	268						370	2810
					1350	732	995	502						610	110
2000 80					433	394								421	2030
														951	30

Illustration 209

g06364921

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade UP.

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3000 120							320	38					340	300	2550 100
2500 100									365	240			310	227	3000 120
2000 80									742	50			700	50	3430 140
1500 60							620	620	358	240			302	191	3940 160
1000 40							807	38	403	235	304	80	300	171	3640 150
500 20					749	407	864	671	882	508	855	300	660	370	3750 150
150 6					1582	879	986	376	660	280	589	210	430	174	3770 150
100 4					2102	814	1130	665	1037	400	806	275	723	244	3700 150
50 2			567	550	992	382	687	269	50	211	406	179	364	158	3700 150
25 1			1338	180	2129	701	1476	581	108	458	871	267	802	240	3500 140
10 0.4	790	790	939	552	90	358	652	264	491	207	369	93	362	157	3530 140
5 0.2	1755	1755	2124	186	1862	772	1401	570	1024	447			738	283	3400 130
2.5 0.1					882	360	679	264	438	207			362	188	3150 120
1.25 0.05					1719	777	1339	732	985	582			737	415	2810 110
0.625 0.025					958	397	1399	792					378	232	2500 100
0.3125 0.0125					433	384							818	519	2000 80
0.15625 0.00625													421	277	1500 60
0.078125 0.003125													451	282	1000 40

Illustration 210

g06364923

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities


[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
3000 120													2310 90
2500 100					344 700	344 700					400 862	400 862	2910 100
2000 80					376 832	376 832	397 853	397 725			346 763	294 654	3270 100
1500 60			549 1161	549 1161	491 1051	439 946	392 843	333 735			311 687	264 594	3480 140
1000 40			711 1532	586 1285	504 1088	423 913	384 827	325 700	305 655	258 558	293 648	249 550	3500 100
500 20			683 1471	560 1238	483 1054	409 893	376 810	317 684	301 640	255 549	289 637	245 540	3600 100
0 0			675 1450	552 1188	480 1034	400 863	370 797	311 672	288 622	252 552	286 653	251 553	3500 140
500 20			674 1448	552 1187	477 1027	397 857	367 792	309 667			318 702	249 594	3340 140
1000 40			679 1458	556 1197	479 1032	399 862	370 812	312			366 812	309 685	3030 100
1500 60	903 1907	903 1907	579 1224	567 1220	382 820	352					386 852	386 852	2520 100

Illustration 211

g06364924

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade UP.


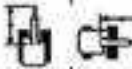


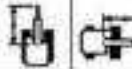











[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
3000 120							* 400 * 400 2318 * 862 * 862 93
2500 100			* 344 * 344 * 708 * 708				* 403 * 354 2918 * 898 * 757 120
2000 80			* 376 * 376 * 832 * 832	* 420 397 * 928 725			* 376 * 294 3270 * 831 * 654 130
1500 60		* 549 * 549 * 1161 * 1161	* 491 439 * 1051 946	* 453 333 * 888 735			* 370 * 264 3480 * 817 * 594 140
1000 40		* 906 586 * 1915 1265	* 820 423 * 1332 393	* 499 325 * 1080 700	* 422 258 * 902 558		* 380 * 249 3580 * 838 * 550 150
500 20		* 1637 560 * 2180 1288	* 691 409 * 1483 883	* 525 317 * 1032 684	* 418 255 * 838 549		* 398 * 245 3600 * 877 * 540 160
0 0		* 959 532 * 2087 1188	* 885 480 * 1474 863	* 517 311 * 1112 672	* 383 252		* 388 * 251 3520 * 858 * 553 140
500 20		* 983 552 * 1959 1187	* 639 397 * 1305 857	* 474 309 * 1014 667			* 391 * 249 3340 * 833 * 554 140
1000 40		* 743 556 * 1592 1157	* 541 389 * 1058 862	* 387 312			* 378 * 309 3030 * 832 * 685 120
1500 60	* 903 * 903 * 1907 * 1907	* 579 587 * 1224 1220	* 382 * 392				* 386 * 386 2520 * 852 * 852 100

Illustration 212

g06364926

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities

[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
2000 80								2000 100
2500 100					362 14.2	338 13.3		3120 123
2000 80				281 11.1	291 11.5	360 14.2	338 13.3	3490 137
2500 100				406 15.9	406 15.9	500 19.7	500 19.7	588 23.1
3000 120			720 28.3	594 23.4	505 19.9	424 16.7	382 15.0	302 11.9
3500 140			865 33.9	749 29.5	639 25.1	547 21.5	481 18.9	402 15.8
4000 160			1073 42.2	920 36.0	781 30.7	673 26.5	582 22.9	500 19.7
4500 180		608 24.0	600 23.6	660 26.0	546 21.5	476 18.7	396 15.6	365 14.4
5000 200	808 31.8	808 31.8	1300 51.2	1037 41.2	876 34.5	734 28.9	622 24.5	534 21.0
5500 220	1008 39.7	1008 39.7	1772 69.8	1428 56.2	1212 47.7	1012 39.8	854 33.6	732 28.8
6000 240			2272 89.5	1867 73.7	1612 63.5	1384 54.5	1184 46.6	1020 40.2
6500 260			2872 113.1	2367 93.3	2062 81.3	1784 70.1	1544 60.8	1340 52.8
7000 280			3572 140.7	2967 117.0	2612 102.8	2284 90.1	1984 78.1	1720 67.7
7500 300			4372 172.1	3667 144.6	3262 128.3	2904 114.6	2564 101.1	2240 88.1
8000 320			5272 207.5	4467 176.2	4012 158.0	3584 141.1	3164 124.6	2780 109.3

Illustration 213

g06364928

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade UP.












[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500 140				[mm] [inch]
															
3000 120							375	385					350	350	2500 100
2500 100									362	338			317	317	2100 80
2000 80									321	281	368	338	281	288	1600 60
1500 60									230	200	227		227	227	1100 40
1000 40									166	146	167	132	131	128	650 25
500 20									82	62	83	75	86	86	350 15
1850 40					771	594	560	424	468	323	407	258	309	230	3750 150
1500 40					1623	1210	1004	804	1013	636	803	552	690	500	3200 130
1000 40					389	561	584	467	518	314	416	251	330	229	2700 110
500 20					215	1210	1426	878	901	677	896	542	726	489	2200 90
1850 40			608	688	938	546	626	386	517	307	405	248	386	230	3000 120
1500 40			1383	1383	2123	1176	1475	854	1114	662	868	524	806	568	2500 100
1000 40		808	908	961	879	907	512	648	391	499	303	368	246	362	2400 90
500 20		1736	1730	2172	1061	1958	1067	1383	842	1048	654		797	541	1900 70
1850 40					795	545	573	391	425	304			362	276	3200 130
1500 40					1793	1172	1227	843	902	695			798	611	2700 110
1000 40					848	553	457	387					371	345	2300 90
500 20					1376	891	965	657					821	771	1800 70
1850 40													431	431	1800 70
1500 40													477	477	1400 50

Illustration 214

g06364934

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Canopy Machine with Blade DOWN.

Product Information Section
Lifting Capacities















(mm) (inch)	1500 60		2100 80		2500 100		3000 120		3500 140				(mm) (inch)	
														
3000 120												* 395 * 847	* 395 * 847	2260 90
2500 100					* 346 * 794	* 346 * 794						* 406 * 903	* 406 * 903	2680 100
2000 80					* 372 * 823	* 372 * 823	* 419 * 928	378 813				* 377 * 820	300 741	3090 120
1500 60			* 526 * 1184	* 526 * 1184	* 482 * 1044	* 482 * 1044	437 940	373 804				349 772	299 662	3470 140
1000 40			793 1708	658 1421	562 1212	476 1026	428 924	365 788	341 735	282 623		030 727	282 623	3590 140
500 20			764 1644	635 1361	547 1179	461 995	421 907	359 772	337 727	289 622		324 714	277 611	3600 150
0 0			764 1622	622 1340	538 1159	452 975	415 894	352 759	335 735	286		301 731	283 624	3530 140
-500 -20			764 1619	622 1338	538 1159	449 967	412 889	350 755				359 783	302 668	3350 140
-1000 -40			* 751 * 1610	626 1347	535 1155	450 971	* 394 852	352				* 378 * 832	345 765	3050 120
-1500 -80	* 921 * 1945	* 921 * 1945	* 591 * 1251	* 591 * 1251	* 405 * 895	* 405 * 895						* 384 * 849	* 384 * 849	2560 100

Illustration 215

g06364822

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.








[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
3000 120							* 395 * 395 2260
2500 100			* 346 * 346				* 847 * 847 2680
2000 80			* 794 * 794				* 406 * 402 2880
1500 60			* 372 * 372	* 419 370			* 803 * 800 320
1000 40		* 526 * 526	* 482 * 482	* 528 483			* 077 333 3250
500 20		* 104 * 104	* 1044 * 1044	* 883 804			* 833 741 100
0 0		* 890 850	* 614 476	* 497 368	* 422 292		* 370 299 3470
-500 -20		* 1880 1421	* 1318 926	* 1075 788	* 902 623		* 896 662 140
-1000 -40			* 689 461	* 525 358	* 420 288		* 378 282 3580
-1500 -60			* 1473 995	* 1131 772	* 960 622		* 873 611 150
-2000 -80		* 364 622	* 687 452	* 518 352	* 386 284		* 383 283 3580
-2500 -100		* 2070 1040	* 1470 976	* 1105 759			* 857 624 140
-3000 -120		* 870 622	* 634 449	* 478 350			* 391 302 3360
-3500 -140		* 1873 1038	* 1364 967	* 1022 755			* 840 668 140
-4000 -160		* 751 626	* 547 450	* 394 352			* 378 345 3050
-4500 -180		* 830 1047	* 1171 871				* 832 765 100
-5000 -200	* 821 * 821	* 591 * 591	* 405 * 405				* 384 * 384 2560
-5500 -220	* 945 * 945	* 1251 * 1251					* 843 * 843 100

Illustration 216

g06364823

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities




[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							395 394 394 394
2500 100			346 734	341 733			406 803
2000 80			372 823	338 729	419 928	254 547	377 833
1500 60		528 1114	457 586	482 1044	326 708	437 940	250 539
1000 40		793 1708	425 938	562 1212	314 678	429 324	243 524
500 20		784 1644	400 886	547 1179	300 649	421 907	236 508
0 0		754 1622	382 847	538 1155	292 631	415 894	230 487
-500 -20		754 1618	382 845	534 1151	285 624	412 889	228 482
-1000 -40		751 1610	385 853	538 1155	281 628	394 884	230
-1500 -60	921 945	623 1341	591 1251	404 873	405 873	295	384 849

Illustration 217

g06364827

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.














(mm) (inch)	1501 60		2100 80		2500 100		3000 120		3500 140				(mm) (inch)	
														
3000 120												* 395 * 847	294 847	2260 90
2500 100					* 346 * 784	341 730						* 406 * 803	271 690	2680 100
2000 80					* 372 * 823	338 729	* 419 * 928	284 547				* 377 * 820	220 497	3090 120
1500 60			* 526 * 754	457 395	* 482 * 1044	328 708	* 451 * 983	250 533				* 370 * 816	199 440	3470 140
1000 40			* 890 * 1080	425 319	* 614 * 1318	394 678	* 697 * 1575	243 524	* 422 * 902	193 418		* 379 * 834	187 412	3590 140
500 20			* 1618 * 2179	490 366	* 689 * 1479	380 849	* 525 * 1131	236 508	* 420 * 880	198 418		* 399 * 879	182 402	3600 150
0 0			* 964 * 2070	332 847	* 687 * 1478	292 631	* 519 * 1115	230 487	* 396 * 868	188		* 383 * 857	186 409	3530 140
-500 -20			* 870 * 1873	332 845	* 634 * 1384	289 624	* 478 * 1022	228 492				* 391 * 840	180 437	3050 140
-1000 -40			* 751 * 1618	335 853	* 547 * 1171	291 628	* 394 * 868	220				* 378 * 832	226 500	3050 120
-1500 -60	* 921 * 1945	623 1341	* 591 * 1251	484 873	* 405 * 873	299						* 384 * 848	291 653	2560 100

Illustration 218

g06364829

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities




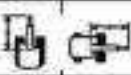


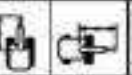

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2550 100
2500 100					365 742	365 742		3000 120
2000 80					398 797	398 797		3430 140
1500 60				397 804	397 804	403 812	379 803	394 720
1000 40			749 1512	646 1436	552 1196	476 1027	427 921	364 730
500 20			784 1649	633 1364	546 1176	459 1001	418 860	355 705
0 0		567 1338	567 1338	745 1610	617 1320	530 1149	448 965	410 854
-500 -20	793 1755	793 1755	939 2124	809 1818	744 1644	642 1436	527 1176	442 965
-1000 -40				747 1644	616 1323	527 1136	442 965	364 742
-1500 -60				958 1333	812 1340	666 965	448 965	
-2000 -80				433 433	433 433			

Illustration 219

g06364831

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade UP.




[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80							326	310					244	246	2500 100
2500 100									365	365			268	268	3000 120
2000 80									742	742			268	768	3400 140
2500 100									356	358			302	302	3800 160
3000 120									620	620			397	397	4200 180
3500 140									397	397	460	272	391	291	4600 200
4000 160									864	864	882	882	855	632	5000 240
4500 180					748	688	552	476	464	364	408	290	268	262	5500 280
5000 200					1582	1436	1196	1027	1006	785	891	624	624	626	6000 320
5500 220					366	633	669	488	509	355	446	295	329	257	6500 360
6000 240					2002	1384	1416	991	1007	205	006	614	723	566	7000 400
6500 260					597	687	662	617	697	448	508	348	406	251	7500 440
7000 280					1338	1338	2029	1328	1476	965	118	380	871	606	8000 480
7500 300	780	790	939	939	910	612	652	442	491	344	369	279	362	277	8500 520
8000 320	1755	1795	2124	2180	1862	1388	1480	953	1094	741			736	611	9000 560
8500 340					800	695	679	442	430	344			362	340	9500 600
9000 360					1719	1323	1238	950	910	742			737	680	10000 640
9500 380					658	622	488	448					370	370	10500 680
10000 400					1350	1340	995	966					610	610	11000 720
10500 420					433	433							421	421	11500 760
11000 440													951	951	12000 800

Illustration 220

g06364834

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage EXTENDED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities




(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
2000 80								244 327 96 129
2500 100					365 295 143 117			208 241 82 95
3000 120					520 420 205 168			302 350 119 138
3500 140					697 560 278 224	940 760 374 304	88 71	360 483 142 190
4000 160			748 431 295 168	852 516 336 207	921 570 366 228	1039 730 411 294	101 81	406 529 160 208
4500 180			940 546 374 218	1076 645 423 258	1200 790 474 314	1320 900 521 354	106 86	463 596 182 235
5000 200		597 338 238 133	686 420 271 165	749 453 297 177	834 507 331 199	904 540 361 216	103 81	506 639 199 252
5500 220	790 575 311 226	790 475 311 170	939 525 371 207	1076 594 423 238	1200 663 474 287	1320 732 521 336	106 86	563 696 221 274
6000 240			1124 640 444 258	1285 719 503 287	1400 780 554 336	1520 850 601 385	111 91	620 757 243 299
6500 260			1350 765 532 307	1520 844 590 336	1650 900 654 385	1700 970 671 434	116 96	677 810 265 318
7000 280			1550 890 619 356	1760 969 696 385	1900 1030 754 434	2000 1040 784 434	121 101	734 863 287 337
7500 300			1750 1015 696 405	2000 1144 792 434	2150 1200 854 483	2250 1110 884 434	126 106	791 916 309 356
8000 320			1950 1140 773 454	2250 1269 898 483	2400 1260 954 532	2400 1180 954 483	131 111	848 969 331 375
8500 340			2150 1265 850 503	2500 1394 1002 532	2650 1320 1054 532	2650 1250 1054 532	136 116	905 1022 353 404

Illustration 221

g06364839

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade UP.




[mm] [inch]	1850 40		2500 60		3000 60		3500 90		4000 120		4500 140				[mm] [inch]
															
3000 120							326	305					346	327	2550 100
2500 100									365	295			319	241	2000 120
2000 80									742	545			708	542	1500 140
1500 60							620	620	358	295			302	203	1000 160
1000 40							387	318	493	248	331	198	308	182	500 180
500 20					748	431	864	710	882	537	855	438	660	404	0 200
					1582	932	1806	1470	1884	1241	1408	711	978	578	
					388	401	588	645	588	298	588	388	328	167	
					2102	910	1640	1045	1097	591	890	402	723	369	
					567	586	932	396	687	288	538	226	406	163	
					1308	1260	2128	834	1476	621	1085	607	871	264	
-500 -20	793	793	939	588	913	393	652	282	451	222	368	181	362	179	3500 140
	1755	1755	2104	1265	1962	825	1401	689	1054	479			798	386	3000 160
-1000 -40					892	395	1719	829	1239	669	863	400	962	281	2500 180
					1719	829	1239	669	863	400			797	445	2000 200
-1500 -60					658	332	1399	545	406	288			378	248	1500 220
					1399	545	985	622					818	554	1000 240
-2000 -80					433	498							423	481	500 260
													951	832	0 280

Illustration 222

g06364841

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Expandable Undercarriage RETRACTED, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities


[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
3000 120												* 400 * 862	400 862 2318 90
2500 100					* 344 * 708	* 344 * 708						* 403 * 895	403 895 2918 100
2000 80					* 376 * 832	* 376 * 832	* 420 * 907	350 770				368 815	310 696 3270 100
1500 60			* 549 * 1161	* 549 * 1161	* 491 * 1061	665 1003	417 897	353 761				301 733	281 623 3489 140
1000 40			756 1628	622 1343	536 1155	450 970	409 880	346 745	325 760	276 594		310 691	266 587 3589 100
500 20			728 1567	596 1286	521 1123	436 940	400 863	338 729	321 692	272 587		309 689	262 577 3609 100
0 0			719 1546	588 1267	512 1103	427 820	398 851	332 717	308 688	278		316 697	268 590 3529 140
-500 -20			719 1544	588 1265	509 1094	424 894	392 846	330 712				340 750	287 634 3349 140
-1000 -40			723 1554	592 1275	511 1101	426 899	387 833	323				* 378 * 832	329 730 3039 100
-1500 -60	* 903 * 1907	* 903 * 1907	* 578 * 1224	* 578 * 1224	* 382 * 832	* 382 * 832						* 386 * 852	386 852 2520 100

Illustration 223

g06364849

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade UP.








(mm) (inch)	1500 60	2100 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							400 16
2500 100			344 13.5	344 13.5			403 15.9
2000 80			376 14.8	376 14.8	420 16.5	358 14.1	376 14.8
1500 60		549 21.6	549 21.6	491 19.3	465 18.3	453 17.8	370 14.6
1000 40		606 23.9	622 24.5	620 24.4	450 17.7	488 19.2	422 16.6
500 20				691 27.2	436 17.2	525 20.7	489 19.3
0 0		859 33.8	888 34.9	885 34.8	427 16.8	517 20.3	382 15.0
-500 -20		960 37.8	988 38.9	985 38.8	424 16.7	474 18.7	391 15.4
-1000 -40		1059 41.7	1085 42.7	1085 42.7	514 20.2	504 19.8	404 15.9
-1500 -60	900 35.4	1003 39.5	979 38.5	982 38.7			386 15.2
	1907 75.1	1907 75.1	1224 48.1	1224 48.1			852 33.5

Illustration 224

g06364853

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 960 mm (3 ft 2 inch) Standard Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Product Information Section
Lifting Capacities









(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								350 792
2500 100					362 828	358 770		317 794
2000 80				281 630	281 630	268 699	259 772	281 685
1500 60				406 902	466 1032	497 1109	392 870	227 597
1000 40			784 1929	620 1598	537 1367	458 1167	467 1181	344 866
500 20			728 1859	597 1500	520 1320	434 1105	398 1012	375 953
0 0		608 1530	688 1753	713 1803	582 1484	508 1290	422 1077	390 997
-500 -20	466 1196	808 2064	961 2452	816 2084	799 2045	579 1468	502 1281	417 1069
-1000 -40			712 1809	591 1500	502 1262	427 1080	387 985	324 825
-1500 -60			848 2166	588 1497	457 1165	423 1074		371 941
-2000 -80								431 1097

Illustration 225

g06364862

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade UP.





(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)		
3800 129								350 792	350 792	3500 100
2500 108								317 794	317 794	3120 130
2000 83								281 685	281 685	3150 140
1500 63								291 696	278 697	3000 150
1000 41								407 693	273 698	3000 150
500 25								436 696	269 679	3120 150
1 1								405 660	265 571	3000 150
100 -29								366 1736	263 1730	3520 140
1000 -49								362 1793	285 653	3120 130
1500 -63								371 1376	388 1269	2780 110
2000 -83								431 1377	431 1377	1960 80

Illustration 226

g06364879

Lift Chart Above: 1850 mm (6 ft 1 inch) Standard Boom, 1160 mm (3 ft 10 inch) Long Stick, Fixed Undercarriage, Cab Machine with Blade DOWN.

Identification Information

i08714229

Plate Locations and Film Locations

SMCS Code: 1000; 7000

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

Serial Numbers will be used to identify engines, transmissions, and major attachments.

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

Product Identification Number (PIN) Plate



Illustration 227

g06276619

PIN plate location

The PIN plate is positioned on the front of the machine, close to the operator compartment.

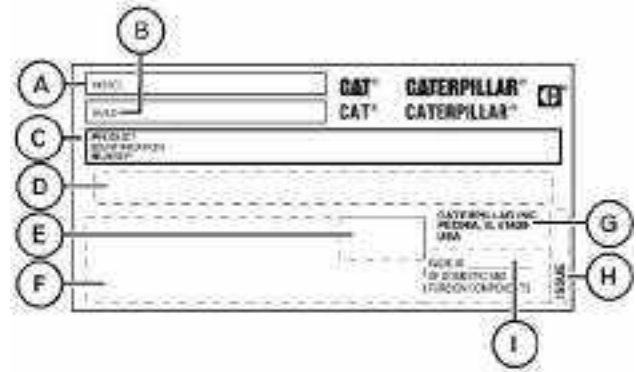


Illustration 228

g06201159

PIN plate

Model (A) _____

Build (B) _____

Product Identification Number (C) _____

Bar Code (D) _____

Month and/or Year of Manufacture Plate (If Required) (E) _____

Regional Certification Plate (If Required) (F) _____

Address of Manufacturer (G) _____

Issue (H) _____

Country of Origin Info Plate (If Required) (I) _____

Local regulation may require documentation of the Month and/or Year of Manufacture in the Operation and Maintenance Manual. Comply with these regulations.

Regional Product Marking (If Equipped)

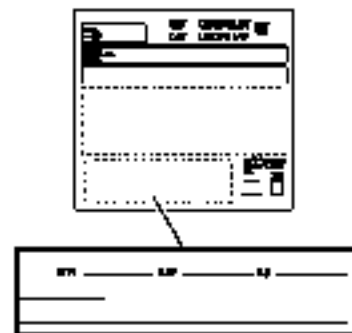


Illustration 229

g06650998

Regional marking plate

This plate is positioned on the bottom left side of the PIN plate or near the PIN plate.

Note: The regional marking plate or plates are installed on machines that meet the applicable requirements that were effective at that time and may differ from the one shown above.

Regional product marking may include one or more of the following:



CE mark



UKCA mark



EAC mark



Gulf Standardization Organization (GSO) mark



Ukraine mark

The following information may be stamped onto the regional product marking plate. For quick reference, record this information in the spaces that are provided below:

- Engine Power Primary Engine (kW)_____
- Engine Power for Additional Engine (If Equipped)_____
- Typical Machine Operating Weight (kg)_____
- Month and/or Year of Manufacture_____
- Machine Type_____

Eurasian Economic Union

Manufacturer Information

Manufacturer:

Caterpillar Inc.,
100 N.E. Adams Street
Peoria, Illinois 61629, USA

Entity authorized by the manufacturer at the territory of Eurasian Economic Union:

Caterpillar Eurasia LLC
75, Sadovnicheskaya Emb.
Moscow 115035, Russia

Machine Specification Film

The machine specification film is on machines that are going into Japan.

The Japanese Industrial Safety and Health Act requires machine specifications to be displayed on a film that can easily be seen by the operator.

If equipped, this film will be on the cab door.

GSI [®]		型式		型式	
総重量	kg	最大出力	kW	作業速度	km/h
仕様		製造会社	特記事項等※他による 取付不可等仕様 ※油圧ポンプ仕様		
機械重量	kg				
平均接地圧	MPa				
バックホウ容量	m ³				
バックホウ質量	kg				
最大傾斜質量(バックホウ)	kg				
バックホウの質量		バックホウの質量		kg	
バックホウの質量		バックホウの質量		kg	
※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。 ※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。 ※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。 ※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。 ※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。 ※バックホウの質量は、バックホウの質量とバックホウの質量の合計を指します。					
キャタピラー・ジャパン合同会社					

Illustration 230

g06178867

Typical example

Electromagnetic Emissions

Note: This label is on machines that are going into Canada.



Illustration 231

g06063443

If equipped, this label is located next to the PIN plate. This label verifies that the product meets the requirements of ICES-002 Issue 6. Compliance to ICES-002 Issue 6 is accomplished by meeting electromagnetic emissions industry standard CISPR-12.

Engine Serial Number

This label is on the engine.

Engine Serial Number _____

Sound Certification

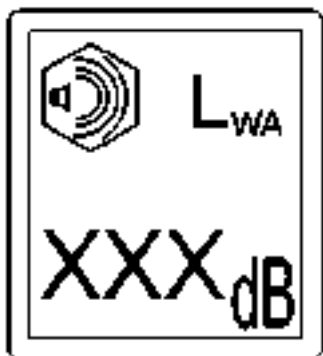


Illustration 232

g06675270

Sound certification film

A typical example of this film is shown.

A certification film is used to verify the environmental sound certification on machines that are certified to the regional requirements. A film installed on your machine will have a value. The value that is listed on the film indicates the guaranteed exterior sound power level (L_{wa}) at the time of manufacture for the conditions that are specified in the following sound test procedures:

- “ISO 6395:1988”

- European Union “2000/14/EC” amended by “2005/88/EC”
- United Kingdom “2001 No. 1701” amended by “2005 No. 3525”



Illustration 233

g03105800

- (A) Low Noise Film
- (B) Super Low Noise Film

If equipped, these certification labels are used to verify the Japan Ministry of Land, Infrastructure, Transportation, and Tourism (MLIT) noise designation according to the Japan “Designation Rule of Low Noise Type Construction Machine”.

Low Noise (A) – Verifies that the Japan “MLIT” designates the machine as a “Low Noise” type construction machine.

Super Low Noise (B) – Verifies that the Japan “MLIT” designates the machine as a “Super Low Noise” type construction machine.

i08085827

Emissions Certification Film

SMCS Code: 1000; 7000; 7405

Consult your Cat dealer for an Emission Control Warranty Statement.

The emission certification film is on the engine.

Declaration of Conformity (European Union)

SMCS Code: 1000; 7000

Table 22

An EU Declaration of Conformity document was provided with the machine if it was manufactured to comply with specific requirements for the European Union. In order to determine the details of the applicable Directives, review the complete EU Declaration of Conformity provided with the machine. The extract shown below from an EU Declaration of Conformity for machines that are declared compliant to "2006/42/EC" applies only to those machines originally "CE" marked by the manufacturer listed and which have not since been modified.

ORIGINAL EU DECLARATION OF CONFORMITY

Manufacturer: Caterpillar Inc., 100 N.E. Adams Street, Peoria, Illinois 61629, USA

Person authorized to compile the Technical File and to communicate relevant part (s) of the Technical File to the Authorities of European Union Member States on request:

Standards & Regulations Manager, Caterpillar France S.A.S 40,
Avenue Leon-Blum, 38000 Grenoble, France

I, the undersigned, _____, hereby certify that the construction equipment specified hereunder

Description:	Generic Denomination:	Earth-moving Equipment
	Function:	Hydraulic Excavator
	Model/Type:	301.5, 301.6, 301.7 CR, 301.8, 302 CR
	Serial Number:	
	Commercial Name:	Caterpillar

Fulfills all the relevant provisions of the following Directives

Directives	Notified Body	Document No.
2000/14/EC amended by 2005/88/EC, Note (1)		
2006/42/EC	N/A	
2014/30/EU	N/A	

Note (1) Guaranteed Sound Power Level - _____ dB (A) Annex VI
Representative Equipment Type Sound Power Level - _____ dB (A)
[Engine Power per ISO 14396 - _____ kW, Rated engine speed - _____ rpm
Technical Documentation accessible through person listed above authorized to compile the Technical File

Done at:

Signature

Date:

Name/Position

Note: The above information was correct as of October 2021, but may be subject to change, please refer to the individual declaration of conformity issued with the machine for exact details.

Declaration of Conformity (Great Britain)

SMCS Code: 1000; 7000

Table 23

A Declaration of Conformity document was provided with the machine if it was manufactured to comply with specific requirements for the Great Britain. In order to determine the details of the applicable legislation, review the complete Declaration of Conformity provided with the machine. The extract shown below from a Great Britain Declaration of Conformity for machines that are declared compliant to 2008 No. 1597 applies only to those machines originally "UKCA" marked by the manufacturer listed and which have not since been modified.

DECLARATION OF CONFORMITY

Manufacturer: Caterpillar Inc., 100 N.E. Adams Street, Peoria, Illinois 61629, USA**Person authorized to compile the Technical File and to communicate relevant part (s) of the Technical File to the Authorities on request:**Standards & Regulations Manager Caterpillar France SAS
40 Avenue Leon-Blum 38000 Grenoble, France**I, the undersigned, _____, hereby certify that the construction equipment specified hereunder**

Description:	Generic Denomination:	Earth - moving Equipment
	Function:	Hydraulic Excavator
	Model/Type:	301.5, 301.6, 301.7 CR, 301.8, 302 CR
	Serial Number:	
	Commercial Name:	Caterpillar

Fulfills all the relevant provisions of these regulations and/or other enactments as listed below:

Legislation	Approved Body	Document No.
2008 No. 1597	N/A	
2016 No. 1091	N/A	
2001 No. 1701 amended by 2005 No. 3525, Note (1)	Note (2)	

Note (1) Schedule - _____ Guaranteed Sound Power Level - _____ dB (A)
 Representative Equipment Type Sound Power Level - _____ dB (A)
 Engine Power per _____ - _____ kW Rated engine speed - _____ rpm
 Technical Documentation accessible through person listed above authorized to compile the Technical File

Note (2) If applicable, information related to Approved Body.

Designated standards taken into consideration: (for 2008 No. 1597 and 2016 No. 1091 Regulations or enactments only)

Done at:**Signature****Date:****Name/Position**

Note: The above information was correct as of October 2021, but may be subject to change, please refer to the individual declaration of conformity issued with the machine for exact details.

Operation Section

Before Operation

i07243772

Mounting and Dismounting

SMCS Code: 6700; 7000



Illustration 234

g06263389



Illustration 235

g06265035

Use handholds whenever you mount the machine.
Use handholds whenever you dismount the machine.

Before you mount the machine, clean the handholds. Inspect the handholds. Make all necessary repairs.

Face the machine whenever you mount the machine and whenever you dismount the machine. Maintain a three-point contact with the ground, track (2) and with the handholds (1).

Note: Do not use any of the operator/control levers as a handhold.

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not try to mount the machine when you carry tools or supplies. Do not try to dismount the machine when you are carrying tools or supplies. Do not use any controls as handholds when you mount or dismount the machine.

Machine Access System Specifications

The machine access system has been designed to meet the intent of the technical requirements in "ISO 2867 Earth-moving Machinery – Access Systems". The access system provides for operator access to the operator station and to conduct the maintenance procedures described in Maintenance section.

i04555675

Daily Inspection

SMCS Code: 1000; 6319; 6700; 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.

Refer to the Maintenance Section for the detailed procedures. Refer to the Maintenance Interval Schedule for a complete list of scheduled maintenance.

Inspect the hydraulic system for leaks. Inspect the hydraulic cylinders and inspect the cylinder rods and seals for damage or for excessive wear. Inspect the linkage and the work tool for damage or for excessive wear. Inspect the linkage for any missing or deformed pins. Make any necessary repairs.

Inspect the following additional components:

- the hydraulic tank
- the hoses
- the tubes
- the plugs

Operation Section
Daily Inspection

- the connecting joints
- the hydraulic fittings

Correct any leaks in the hydraulic system.

Inspect the final drives for leaks. Make any necessary repairs. Check the oil level if you see leakage.

Inspect the tracks for deep cracks, or steel cords that are cut.

Inspect the lights for broken bulbs and for broken lenses. Replace any broken components.

Inspect the films in the machine. Make sure that the films are legible.

Inspect the engine compartment for any trash buildup. Remove any trash buildup from the engine compartment.

Inspect the cooling system for any leaks, for faulty hoses, and for any trash buildup. Correct any leaks, and remove any trash from the radiator.

Inspect the fuel system for any leaks, or faulty hoses. Check the fuel level and refill the tank if necessary.

Inspect all of the belts for the engine attachments. Replace any belts that are worn, frayed, or broken.

Inspect the air filter housing for cracks, loose clamps, or broken tubing. Squeeze the outlet tube slightly into a container in order to purge the dirt from the outlet tube.

Inspect the exhaust system for loose connections or loose clamps.

Make sure that all covers and guards are securely attached. Inspect the covers and the guards for damage.

Inspect the handholds. Clean the handholds. Make any necessary repairs.

Inspect the polycarbonate shield (if equipped) for damage. Tighten any loose bolts on the ROPS and other guards, that might be attached to the ROPS. If repairs are needed, consult your Cat dealer.

Inspect the operator station for trash buildup. Check for trash buildup under the floor mat. Keep these areas clean.

Inspect the foot pedals for proper operation. Remove any dirt buildup in and around the foot pedals. Replace any missing hardware.

Make sure that the Operation and Maintenance Manual is located in the operator station and in good condition.

Inspect the operator station for the following conditions:

- Broken lenses on the gauges
- Broken indicator lights
- Broken switches
- Other broken components

Adjust the rearview mirrors (if equipped) for the best operator vision. Check the mounting bolts for tightness and get broken mirrors replaced immediately.

Machine Operation

i07286539

Alternate Exit

SMCS Code: 7310

WARNING

Warning of personal injury.

Use the front or rear window opening as an exit only in an emergency!

The machine does not have footholds or handles at the alternate exit.

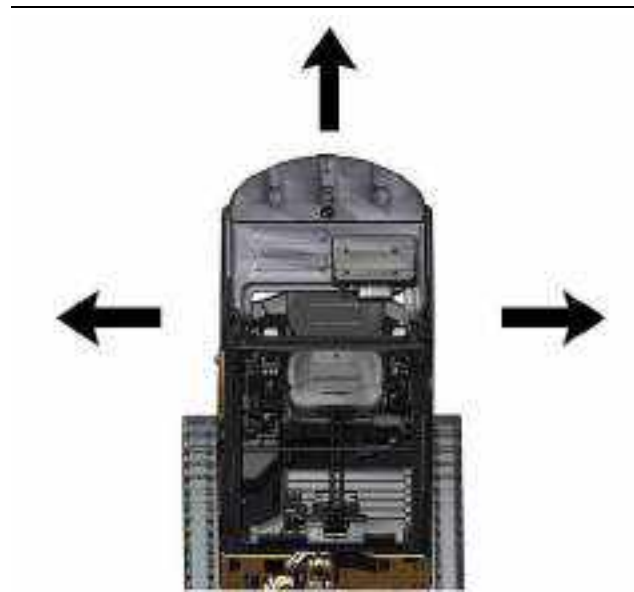


Illustration 236

g06274656



Illustration 237

g06265220



Alternate Exit – The front and rear window openings serve as alternative exits on machines equipped with a cab. If the machine is equipped with a canopy, the rear, left side, and right side all serve as alternate exits.

i07242599

Seat

SMCS Code: 5258-025; 7312-025; 7324; 7327

Note: Check for correct seat adjustment at the beginning of each work period.

Do not adjust the seat while you are operating the machine. Always ensure that the seat has locked into position after any adjustments are made.



Illustration 238

g06263293

To adjust the seat back tilt, turn lever (1) downward.



Illustration 239

g06263299

Pull the fore/aft lever (2) upwards. Hold the lever and slide the seat forward or backward to the desired position. Release the lever and slide the seat forward or backward to lock the seat into position.

The seat should be adjusted so that full travel of the controls and pedals is allowed. Only adjust the seat while the operator is seated against the back of the seat.

i07092308

Seat Belt

SMCS Code: 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. Consult your Cat 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 Retractable Seat Belts

Fastening The Seat Belt



Illustration 240

g06223891

Pull seat belt (2) out of retractor (1) in a continuous motion.

Fasten seat belt catch (3) into buckle (4). 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 241

g06223894

Push the release button on the buckle 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 Cat dealer for longer seat belts and for information on extending the seat belts.

i08709739

Operator Controls

SMCS Code: 7300; 7301; 7451

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

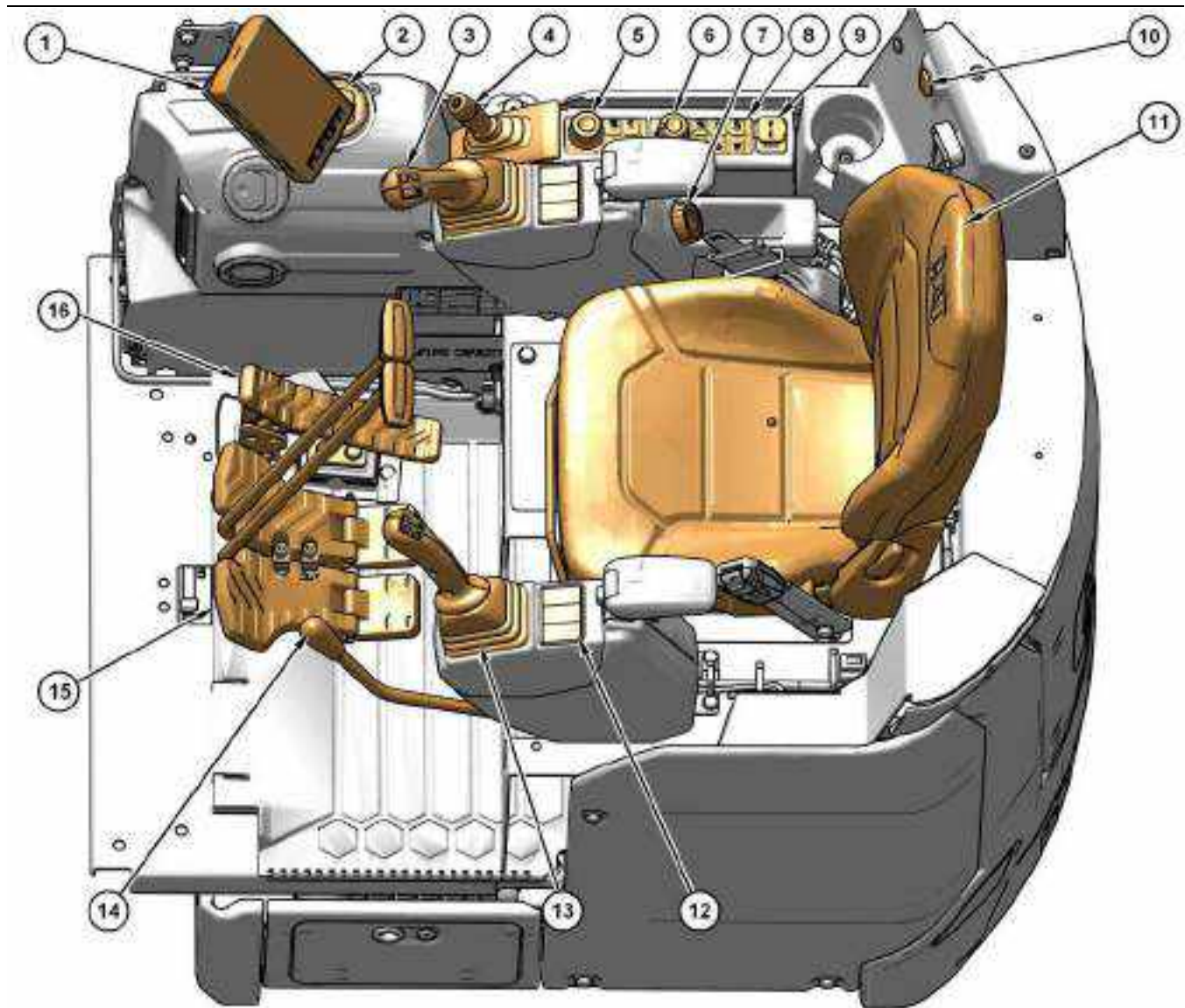


Illustration 242

g06262907

- | | | |
|--|-----------------------------|--------------------------------------|
| (1) Monitoring System | (6) Engine Speed Dial | (12) Adjustable Undercarriage Switch |
| (2) Air Outlet | (7) Engine Start Switch | (13) Left Joystick Controls |
| (3) Right Joystick Controls | (8) Right Side Switch Panel | (14) Hydraulic Lockout Control |
| (4) Dozer Blade Lever / Adjustable Undercarriage Control | (9) USB Port | (15) Travel Lever Controls |
| (5) Jog Dial | (10) Power Outlet (12V) | (16) Primary Auxiliary Control Pedal |
| | (11) Operator Seat | |

Monitoring System (1)

Monitor – Monitor (1) is used to display various operating information of the machine. For more information on the operation of monitor (1), refer to “Monitoring System” for more information.

Air Outlet (2)

Adjust the air outlet direction, if equipped, with air conditioning system.

Right Joystick Controls (3)

The joystick controls are used to control the functions of the machine. For more information on the individual functions of the joysticks, refer to “Joystick Controls”.

Dozer Blade Lever / Adjustable Undercarriage Control (4)



Float – Push the lever fully forward. The blade will lower to the ground. The blade will float with the contour of the ground.

The lever will return to the HOLD position.



Lower – Push lever (4) forward to lower the blade. The lever will return to the HOLD position when you release the lever.

The blade will remain in the selected position.

Hold – Lever (4) will return to the HOLD position when the lever is released from the RAISED or LOWERED position.



Raise – Pull lever (4) backward to raise the blade. The lever will return to the HOLD position when you release the lever.

The blade will remain in the selected position.

Travel Speed Control (4A)



Illustration 243

g06262962

The high-speed travel switch is on the blade control lever. Use the switch to change the travel speed.

Push the switch to the high-speed position to make the machine travel in high speed. The rabbit travel speed icon will illuminate on the monitor when the machine is in the high-speed mode.

Push the switch again to return to low speed.

Always travel at slow speeds on slopes and rough ground.

Jog Dial (5)

Jog Dial – Turn jog dial (4) to choose the desired item in the monitor and depress jog dial (4) to activate the selection. Refer to “Joystick Controls” for more information.

Engine Speed Dial (6)

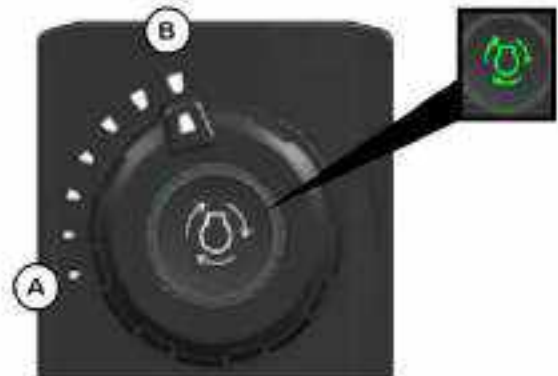


Illustration 244

g06345901

(A) Low engine idle
(B) High engine idle

Turn engine speed dial (5) to control the engine speed (engine rpm). Select desired position from the seven positions that are available. Turn engine speed dial (5) counterclockwise to decrease the engine speed (engine rpm). Turn engine speed dial (5) clockwise to increase the engine speed (engine rpm).

Low Engine Idle (A) – The engine operates in the low rpm range.

High Engine Idle (B) – The engine operates in the high rpm range.

Pressing the center of the engine speed dial can change the engine operation mode from “Power On Demand” mode to “Standard” mode (if equipped). A green illuminator on the center of the throttle dial indicates if the “Power On Demand” mode is active.

In addition to the green illuminator on the dial, a “SMART” Mode indicator, which is the indicator for “Power On Demand”, will illuminate on the monitor. When the machine is in “Standard” Mode, the “Power On Demand” Mode indicator will not be illuminated on the monitor.

The default state of “Power On Demand” at key on can be changed in Cat® Electronic Technician (ET) by changing The Engine Speed Power Mode Power Up Default Configuration. Three settings are available:

ON – Will always default to the ON position when the key is turned on (this is the default state from the factory). Power on demand can be cycled ON or OFF by pressing the center of the engine speed dial.

OFF – Will always default to the OFF position when the key is turned on. Power on demand can be cycled ON or OFF by pressing the center of the engine speed dial.

ALWAYS ON – Forced to ON position all the time, pressing the center of the engine speed dial does nothing.

Note: Some machines may prohibit toggling of the “Power On Demand” mode.

Engine Start Switch (7)

NOTICE

The engine start switch must be in the ON position and the engine must be running in order to maintain electrical functions and hydraulic functions. This procedure must be followed in order to prevent serious machine damage.

Note: Always place the hydraulic lockout lever in the RAISED position while starting the engine. Engine start switch (8) will not function if the left hydraulic control is in the LOWERED position.

Key Switch (If Equipped)

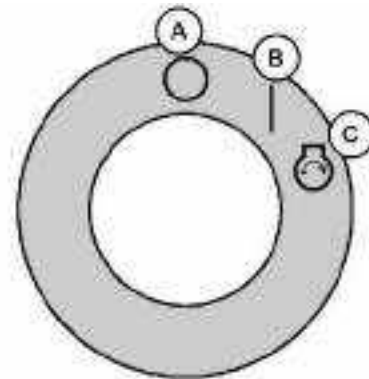


Illustration 245

g06657692

- (A) OFF position
- (B) ON position
- (C) Start position



OFF – Insert the engine start switch key only while engine start switch (8) is in the OFF position (A). Remove the engine start switch key only while engine start switch (8) is in the OFF position (A). Turn engine start switch (8) to the OFF position (A) before the operator attempts to restart the engine. Turn engine start switch (8) to the OFF position to stop the engine (A). Refer to “Stopping the Engine” for more information.



ON – To activate the electrical circuits in the cab, turn the key clockwise to the ON position (B). Refer to “Engine Starting” for more information.



START – To start the tractor engine, turn the key clockwise to the START position (C). After the engine starts, release the key. The key will return to the ON position (B).

Note: If the engine fails to start, return engine start switch key to the OFF position (A). Return the engine start key to the start position before the operator attempts to start the engine again.

Refer to “Engine Starting” for more information.

Push to Start (If Equipped)

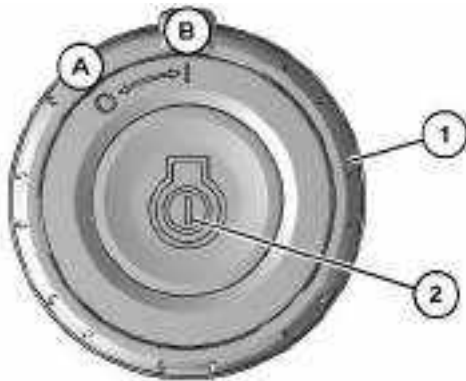


Illustration 246

g06180554

- (A) Off
(B) On
(1) Engine start ring
(2) Start button

Note: The Bluetooth key must be inside the cab to activate the electrical circuits.



OFF – Turn engine start ring (1) to the OFF position (A) to stop the engine. Refer to “Stopping the Engine“ for more information.



ON – To activate the electrical circuits in the cab and enable engine starting, turn the engine start ring (1) clockwise to the ON position (B). Refer to “Engine Starting“ for more information.



START – To start the engine, enter pass code in the monitor (only required if machine security is enabled). Press start button (2). After the engine starts, release the button. Refer to “Engine Starting“ for more information.

Push to Start with Bluetooth Key Fob

If the machine is equipped with push to start and the Bluetooth key fob system, the machine will attempt to detect a Bluetooth key fob when the machine is turned on. If an authorized key fob is detected, the display will immediately proceed to the home screen and the engine will be allowed to start.

Note: the Bluetooth key can be detected when it is outside the cab if it is in close proximity to the machine. Ensure the Bluetooth key is in a sufficient distance from the machine when not in use to prevent unauthorized access to the machine.

Note: The Bluetooth key fob features a sleep mode to preserve battery life. If the key detects no movement for 90 seconds, it will go into sleep mode and stop communicating. While in sleep mode, it cannot be used to access a machine. The Bluetooth key will exit sleep mode and begin communicating after movement of the key is detected. When not in sleep mode, the Bluetooth key communicates every 5 seconds.

Note: If multiple key fobs are present, the first valid key fob detected by the transceiver will be read. If the machine is not able to detect a key fob when it is turned on, the display will prompt the user to enter a 4-digit numerical passcode.

If the voltage of the Bluetooth key fob used to access the machine is low (below 2.5V), a pop-up message will appear on the display indicating the low battery condition and recommend battery replacement. If this message appears, replace the battery within the Bluetooth key fob to ensure proper functionality of the key.



Illustration 247

g06752121

Right Switch Panel (8)



Illustration 248

g06757495

Heating Ventilation Air Conditioning (HVAC) Control Button (8A) (If Equipped)

Pressing this button will navigate the monitor to display the relevant screen for HVAC controls. The air conditioner provides comfort for the operator that is working under various temperature conditions. When the LED is lit, the HVAC is ON.

Display Menu Shortcut Button (8B) (If Equipped)

Press the button to return to the previous menu in the monitor.

Work Light Control Button (8C)



Lights – Push the switch to turn on the work lights. Push the switch again to turn off the work lights.

Window Washer (8D)



Window Washer (12) – Push the button to activate the window washer. The LED will illuminate while window washer control button (8D) is pressed. Two wiper cycles will be completed after releasing window washer control button (8D).

NOTICE

If the wiper does not operate with the switch in the ON position, turn the switch off immediately. Check the cause. If the switch remains on, motor failure can result.

NOTICE

If the washer is used continuously for more than 20 seconds or used when no washer solution comes out, motor failure can result.

Travel Alarm Cancel (8E)



Travel Alarm Cancel – LED will illuminate while travel alarm is canceled. Travel alarm cancel control button (8E) must be pressed every time travel command is initiated to mute the travel alarm.

Note: The travel alarm will sound when the travel levers or the travel pedals are activated.

Radio Button (8F) (If Equipped)

Pressing radio control button (8F) will navigate the monitor to display the relevant screen for radio controls. Refer to Operation and Maintenance Manual, “Radio” for more information.

Home Button (8G) (If Equipped)

Press the button to return back to the home menu on the monitor.

Overload Warning ON and OFF Control Button (8H)



Overload Warning Device – If equipped with Overload Warning, this button (8H) functions as the ON or OFF button for that feature. When ON, the overload warning system activates if the boom pressure exceeds a threshold.

ON – When the LED is illuminated, the overload warning feature is ON.

OFF – When the LED is OFF, the overload warning feature is OFF.

Window Wiper (8J)



Window Wiper – Pressing window wiper control button (8J) once turns the wiper ON with a 6 second delay. Pressing window wiper control button (8J) again changes the delay to 3 seconds. Pressing window wiper control button (8J) again turns on the wiper continuously. Pressing window wiper control button (8J) again turns OFF the wiper.

- No LED : - Wipers are OFF
- 1 LED : 6 second intermittent delay
- 2 LED : 3 second intermittent delay
- 3 LED : Full ON

Radio Mute Switch (8K)



Radio Mute Switch – If equipped, press the switch to mute the radio. The indicator lamp will turn on.

USB Port (9) (If Equipped)

The USB port is available to charge compatible electronic devices.

Note: The port is for charging purposes only.

Power Outlet (10)

A 12V power receptacle is located next to the rear side of the seat. The power receptacle can be used for powering automotive electrical equipment or accessories. Raise the cap to use.

Operators Seat (11)

The operators seat has various adjustments to meet a wide range of operators. For more information, refer to “Seat”.

Adjustable Undercarriage Switch (12)

If equipped, switch (12) determines which function lever (4) controls.

Note: Before operating the dozer blade lever, refer to “Dozer Blade Lever / Adjustable Undercarriage Control (4)”.

When switch (12) is pushed to the bottom position, lever (4) will control the adjustable undercarriage functions.

When switch (12) is pushed to the top position, lever (4) will control the dozer blade functions.

Left Joystick Controls (13)

The joystick controls are used to control the functions of the machine. For more information on the individual functions of the joysticks, refer to “Joystick Controls”.

Hydraulic Lockout Control (14)

WARNING

Deactivation of the hydraulic controls does not prevent the blade, boom swing, or auxiliary circuit functions from moving under gravity or other external forces. Gravity or other external forces can move the blade, boom swing, or auxiliary circuit functions suddenly if a hydraulic control lever is moved.

Personal injury or death may occur from sudden machine movement.



Locked – Place the hydraulic lockout control in the RAISED position to deactivate the hydraulic controls.

Make sure that the hydraulic lockout control is in the RAISED position before you exit the machine.

Note: Always put the left hydraulic lockout control in the RAISED position before starting the engine. The engine start switch will not function if the left hydraulic control is in the LOWERED position.



Unlocked – Place the hydraulic lockout control in the LOWERED position. When the hydraulic lockout control is in the LOWERED position, the hydraulic controls are operable.

Note: The hydraulic controls will only function if the joystick levers are centered when the implements are UNLOCKED. If the joystick levers are not centered when the hydraulic controls are switched from LOCKED to UNLOCKED, the hydraulic circuit associated with the lever out of center will be disabled until the joystick lever is centered.

Travel Lever Controls (If Equipped) (15)

Note: Normal steering occurs when the operator station is facing the blade. The travel lever information given below is for when the blade is in front of the operator station. Reverse steering occurs when the blade is behind the operator station. The directional functions and the steering will be reversed.

When you travel, make sure that the blade is in front of the operator station.

When the travel levers/pedals are moved in the forward direction, the machine will always travel toward the blade. When the travel levers/pedals are moved in the reverse direction, the machine will always travel away from the blade.

If you move a travel lever/pedal farther in the forward direction, the forward travel speed will increase. If you move a travel lever/pedal farther in a backward direction, the reverse travel speed will increase.

Stop – Release the travel levers/pedals to stop the machine. When you release the travel levers/pedals from any position, the travel levers/pedals will return to the CENTER position. The travel brakes will be applied.

Move both of the travel levers equally in the same direction to travel in a straight line.

Note: In steep downhill operation, carefully operate the travel levers.

This machine is also equipped with a joystick steer mode. The left joystick can be used in the same manner as the left and the right travel levers/pedals. Refer to “Joystick Controls” for more information.

Right Travel Lever/Pedal

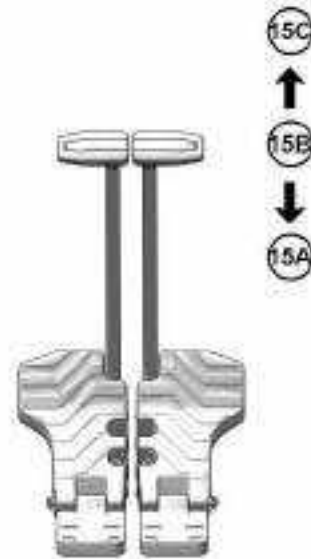


Illustration 249

g06263062

REVERSE (15A) – Move the right travel lever backward to operate the right track in a reverse direction.

STOP (15B) – Release the right travel lever to stop the right track.

FORWARD (15C) – Move the right travel lever forward to operate the right track in a forward direction.

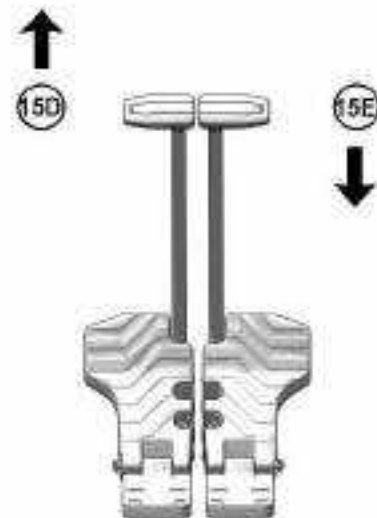


Illustration 250

g06263065

Spot Right Turn – Move the right travel lever (15E) backward. Move the left travel lever (15D) forward at

the same time. This method will turn the machine quickly to the right.

Pivot Right Turn – Move the left travel lever (15E) forward. This method will turn the machine to the right.

Left Travel Lever

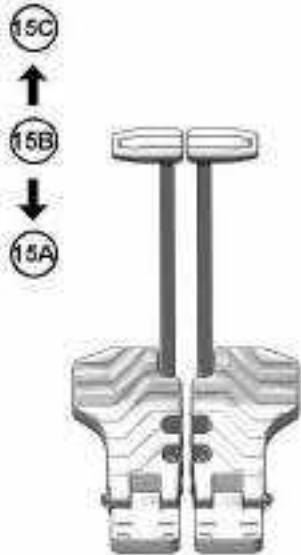


Illustration 251

g06263067

REVERSE (15A) – Move the left travel lever backward to operate the left track in a reverse direction.

STOP (15B) – Release the left travel lever to stop the left track.

FORWARD (15C) – Move the left travel lever forward to operate the left track in a forward direction.

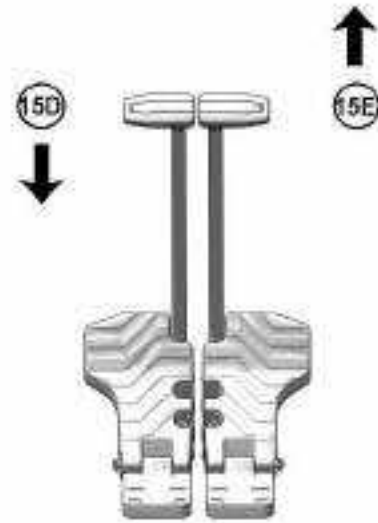


Illustration 252

g06263066

Spot Left Turn – Move the left travel lever (15D) backward. Move the right travel lever (15E) forward at the same time. This method will turn the machine quickly to the left.

Pivot Left Turn – Move the right travel lever (15E) forward. This method will turn the machine to the left.

Auxiliary Control Pedal (If Equipped) (16)

The auxiliary control pedal is used to control the work tools. For more information on the auxiliary controls, refer to "Work Tool Control".

i08265397

Cab Dome Light

SMCS Code: 1433



Illustration 253

g06466796

Dome light in the COURTESY LIGHT position

The cab dome light is located inside the cab above the door.

The lens of the lamp is a three-position switch.



Illustration 254

g06466801

Dome light in the ON position

When the front of the lamp is pressed upward, the lamp will be in the ON position.

When the rear of the lamp is pressed upward, the lamp will be in the OFF position.

When the lamp is in the middle (horizontal position), the lamp will be in the COURTESY LIGHT position.

The courtesy light allows the machine lighting to stay ON for a configurable (0 to 100 seconds) period of time after turning the key switch OFF.



Illustration 255

g06466812

Right switch panel

Note: For the lamp to illuminate in the COURTESY LIGHT position, work light switch (1) must be in an ON position, when the key is switched to OFF.

i08718859

Battery Disconnect Switch

SMCS Code: 1411-B11

NOTICE

Never move the battery disconnect switch to the OFF position while the engine is operating. Serious damage to the electrical system could result.



Illustration 256

g06756719

Some components removed for better clarity

(1) Access cover

Open access cover (1) on left side of the machine. Refer to "Access Door and Cover Locations" for more information.

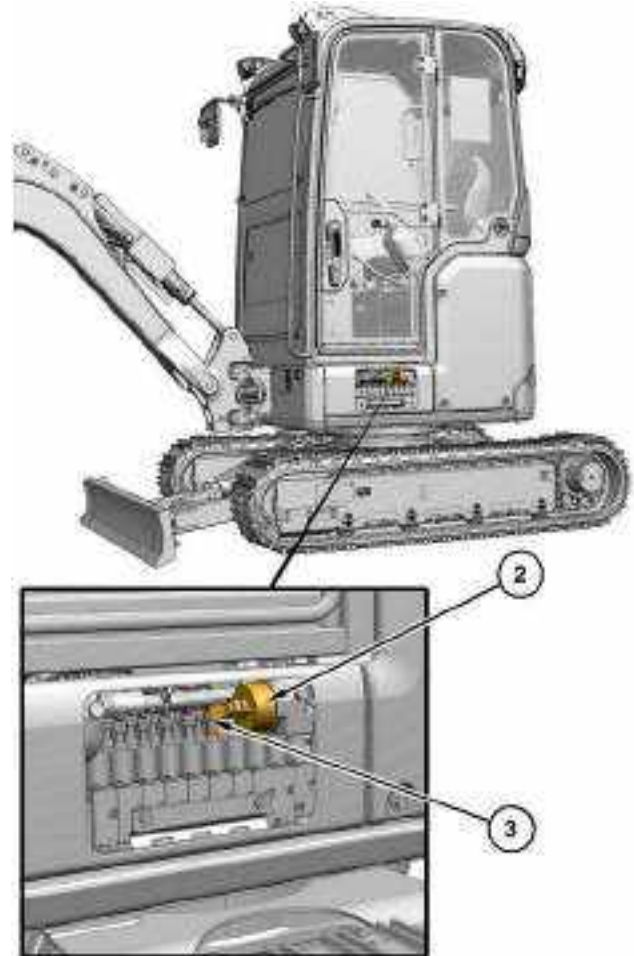


Illustration 257

g06756722

Some components removed for better clarity

(2) Battery disconnect switch

(3) Key

Battery disconnect switch (2) is on the left side of the machine behind access cover (1).



Battery Disconnect Switch – Battery disconnect switch (2) can be used to disconnect the battery from the machine electrical system. Key (3) must be inserted into battery disconnect switch (2) before battery disconnect switch (2) can be turned to ON position.



ON – To activate the electrical system, insert key (3) and turn battery disconnect switch (2) clockwise to ON position. Battery disconnect switch (2) must be turned to ON position to enable battery power to start the engine.



OFF – To deactivate the electrical system, turn battery disconnect switch (2) counterclockwise to OFF position.

Battery disconnect switch (2) and the engine start switch perform different functions. The entire electrical system is disabled when battery disconnect switch (2) turned to OFF position. The battery remains connected to the electrical system when engine start switch is turned to OFF position.

Turn battery disconnect switch (2) to OFF position and remove key (3), when the electrical system or any other machine components are serviced.

Turn battery disconnect switch (2) to OFF position and remove key (3), if the machine is not operated for a month. Turning OFF battery disconnect switch (2) will prevent the battery from being discharged.

The following problems can cause battery to discharge:

- short circuits
- current drawn via some components
- vandalism

Note: If the machine is equipped with Cat[®]Product Link[™], turning battery disconnect switch (2) to OFF position will remove power from the Cat[®] Product Link[™] module. The Cat[®] Product Link[™] module will not be able to communicate due to power unavailability.

Close access cover (1) on left side of the machine. Refer to “Access Door and Cover Locations” for more information.

i08001446

Product Link

SMCS Code: 7490; 7606

Note: Your machine may be equipped with the Cat[®] Product Link[™] system.

The Cat Product Link communication device utilizes cellular and/or satellite technology to communicate equipment information. This information is communicated to Caterpillar, Cat dealers, and Caterpillar customers. The Cat Product Link communication device uses Global Positioning System (GPS) satellite receivers.

The capability of two-way communication between the equipment and a remote user is available with the Cat Product Link communication device. The remote user can be a dealer or a customer.

Data Broadcasts

Data concerning this machine, the condition of the machine, and the operation of the machine is being transmitted by Cat Product Link to Caterpillar and/or Cat dealers. The data is used to serve the customer better and to improve upon Cat products and services. The information transmitted may include: machine serial number, machine location, and operational data, including but not limited to: fault codes, emissions data, fuel usage, service meter hours, software, and hardware version numbers and installed attachments.

Caterpillar and/or Cat dealers may use this information for various purposes. Refer to the following list for possible uses:

- Providing services to the customer and/or the machine
- Checking or maintaining Cat Product Link equipment
- Monitoring the health of the machine or performance
- Helping maintain the machine and/or improve the efficiency of the machine
- Evaluating or improving Cat products and services
- Complying with legal requirements and valid court orders
- Performing market research
- Offering the customer new products and services

Caterpillar may share some or all the collected information with Caterpillar affiliated companies, dealers, and authorized representatives. Caterpillar will not sell or rent collected information to any other third party and will exercise reasonable efforts to keep the information secure. Caterpillar recognizes and respects customer privacy. For more information, please contact your local Cat dealer.

Operation in a Blast Site for Product Link Radios

WARNING

This equipment is equipped with a Cat® Product Link communication device. When electric detonators are being used for blasting operations, radio frequency devices can cause interference with electric detonators for blasting operations which can result in serious injury or death. The Product Link communication device should be deactivated within the distance mandated under all applicable national or local regulatory requirements. In the absence of any regulatory requirements Caterpillar recommends the end user perform their own risk assessment to determine safe operating distance.

Refer to your products Operation and Maintenance Manual Supplement, “Regulatory Compliance Information” for more information.

For information regarding the methods to disable the Cat Product Link communication device, please refer to your specific Cat Product Link manual listed below:

- Operation and Maintenance Manual, SEBU8142, “Product Link - PL121, PL321, PL522, and PL523”
- Operation and Maintenance Manual, SEBU8832, “Product Link PLE702, PLE602, PLE601, PL641, PL631, PL542, PL240, PL241, PL243, PL141, PL131, PL161, PL083 and PL042 Systems”

Note: If no radio disable switch is installed and the equipment will be operating near a blast zone, a Product Link radio disable switch may be installed on the equipment. The switch will allow the Cat Product Link communication device to be shut off by the operator from the equipment control panel. For more details and installation procedures, refer to the following:

- Special Instruction, REHS7339, “Installation Procedure for Product Link PLE640 Systems”
- Special Instruction, REHS8850, “Installation Procedure for the Elite Product Link PLE601, PLE641, and PLE631 Systems”
- Special Instruction, SEHS0377, “Installation Procedure for the Product Link PL131, PL141, and PL161 Systems”

- Special Instruction, REHS9111, “Installation Procedure for the Pro Product Link PL641 and PL631 Systems”
- Special Instruction, M0098124, “Installation Procedure for Pro Product Link PL243 Systems”
- Special Instruction, M0109130, “Installation Procedure for Product Link PL683 and PL783 Systems”

i08258164

Machine Security System (MSS)

SMCS Code: 7631

General Information

NOTICE

This machine is equipped with a Cat® Machine Security System (MSS) that is designed to restrict operation of the machine. The system can be enabled or disabled, unless the machine is equipped with the optional push to start system. If equipped with the push to start system, machine security will always be enabled. Machines equipped with “push to start”, also feature the Cat Bluetooth® key fob entry system.

Any user may start the engine and operate the machine if the security system has been disabled.



Illustration 258

g06223917

Machines that are equipped with Cat MSS can be identified by a decal in the operator station. Read the following information and know your machine settings. Your Cat dealer can identify your machine settings.

The Cat Machine Security System (MSS) discourages unwanted operation of a machine. When armed, the MSS requires operator login to start the engine. The following methods of operator login to disarm the security system are available:

- Cat Bluetooth® key fob
- Cat myEquipment mobile application

- Passcode

Components

The Machine Security System (MSS) consists of the following components:

- Engine start switch
- Electronic Control Module (ECM)
- Machine display
- Optional Cat Bluetooth key fob (CATBTFOB)
- Optional Bluetooth transceiver module (CATBTNT)

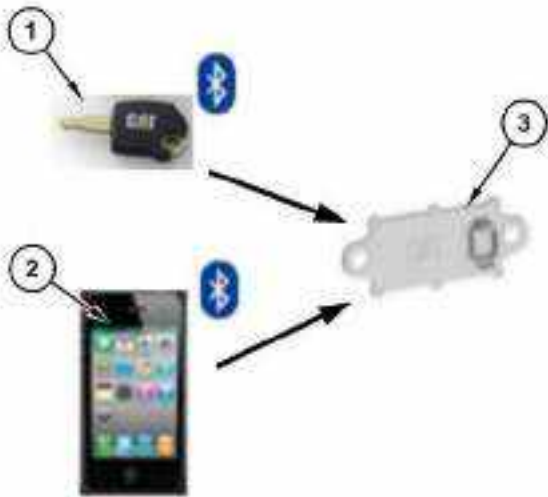


Illustration 259

g06212167

Bluetooth Connections

- (1) Cat Bluetooth key fob (CATBTFOB)
- (2) Smart phone application
- (3) Cat Bluetooth transceiver (CATBTNT)

The Cat Bluetooth key fob (1) contains an electronic chip. The electronic chip has a unique identification number (ID). A Bluetooth transceiver is mounted in the cab to read the ID of the key. The Bluetooth transceiver module translates the information received from the key fob into a J1939 message. This message is sent to the Electronic Control Module (ECM) that is connected to the MSS. The ECM is typically the Machine ECM. The ECM is set up with the ID of the keys of the intended users.

When the MSS is armed, the ECM validates the ID of the key fob. If the key ID is on the list of authorized keys in the ECM and the key is valid, the machine will operate normally. If the key ID is not on the list of authorized keys in the ECM or is not valid, the MSS will keep the critical machine functions disabled.

If the MSS is not enabled, the operator can skip the login and the machine will operate normally.

Standard Key

The machine security can be enabled or disabled using the Cat[®] Electronic Technician (Cat ET) Service Tool or within the display security settings screen (password protected). A master level access passcode must have been used to access the machine security settings in the display. If a standard level passcode was used, the user will be prompted to enter a master level passcode when accessing the machine security passcode screen.

If machine security is enabled, the display will prompt the user to enter a 4-digit numerical passcode when the machine is turned on. Prior to entering an authorized passcode, the engine starter will be disabled and you will not be allowed to proceed to the display home screen. After an authorized passcode has been entered, the display will proceed to the home screen and the engine will be allowed to start.

When turning off the key, the display will prompt the user to select between three options:

- Lock Now – Enables machine security 30 seconds after selected, will have to reenter passcode next time the machine is turned on.
- Wait XX Min – Waits the specified period of time (grace period) to enable machine security, will not have to reenter the passcode if machine is turned back on within the stated time.
- Unlimited – Does not enable machine security, will not have to reenter passcode the next time the machine is turned on.

Note: Selecting unlimited does not permanently disable machine security. The user will be prompted with the same three option above the next time the machine is turned on then back off.

The grace period can be adjusted within the display security settings screen (password protected). The time can be adjusted from 1 to 60 minutes.

Push to Start with Bluetooth Key Fob

If the machine is equipped with push to start and the Bluetooth key fob system, the machine will attempt to detect a Bluetooth key fob when the machine is turned on. If an authorized key fob is detected, the display will immediately proceed to the home screen and the engine will be allowed to start.

Note: The bluetooth key can be detected when it is outside the cab if it is in close proximity to the machine. Ensure the bluetooth key is in a sufficient distance from the machine when not in use to prevent unauthorized access to the machine.

Note: The bluetooth key fob features a sleep mode to preserve battery life. If the key detects no movement for 90 seconds, it will go into sleep mode and stop communicating. While in sleep mode, it cannot be used to access a machine. The bluetooth key will exit sleep mode and begin communicating after movement of the key is detected. When not in sleep mode, the bluetooth key communicates every 5 seconds.

Note: If multiple key fobs are present, the first valid key fob detected by the transceiver will be read. If the machine is not able to detect a key fob when it is turned on, the display will prompt the user to enter a 4-digit numerical passcode.

When the machine is turned off, the display will prompt the user with only the Lock Now and Wait XX Min options. Unlimited option is not available on machine equipped with push to start.

Adding and Removing Passcodes and Bluetooth Key Fobs

Passcodes and Bluetooth key fobs can be added and removed using the Cat® Electronic Technician (Cat ET) Service Tool or within the display security settings screen (password protected). A master level access passcode must have been used to access the machine security settings in the display. If a standard level passcode was used, the user will be prompted to enter a master level passcode when accessing the machine security passcode screen.

When adding a passcode or Bluetooth key fob, the user will be prompted to select the access level. A summary of the access levels is below.

Standard – A standard operator is a registered user of the machine. Operators with this access level can start the engine. This user may save a control configuration for future application.

Master – Master accounts can enable/disable machine security and add/remove passcodes in addition to all standard level functions.

Armed

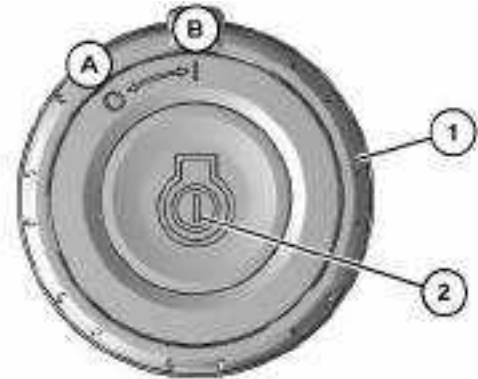


Illustration 260

g06180554

- (A) Off
- (B) On
- (1) Engine start switch ring
- (2) Engine start button

Engine Start Ring Switch Position ON – When the engine start switch ring is first moved to the ON position, the display boots up and the system attempts to detect a Bluetooth key ID or mobile application ID. The ECM will continue reading until a valid key ID is read or a passcode is entered.

Disarmed

MSS can be disabled through the service menu.

i08709746

Monitoring System

SMCS Code: 7451; 7490

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.

The monitoring system alerts the operator of a problem or of an impending problem. The monitoring panel is designed to alert the operator of faulty machine systems. When powering on the panel, there will be an LED test for the first 2 seconds (all LEDs on). The monitoring system consists of the following components:

- Display (with numerous screens and menus)
- Indicators

Two display options are available :

- Performance : Analog gauges and LCD with push-button interface.
- Premium : Full LCD with touchscreen interface.

Most display images in this document are from the performance display. However, the navigation and general functionality is common between two displays for most features. When the functionality is different, supplemental screen images and details are provided.

Reference: For more information on the monitor functions, refer to Systems Operation, M0090757, "Monitoring System" "Performance Display".

Reference: For more information on the monitor functions, refer to Systems Operation, M0091327, "Monitoring System" "Premium Display".

Performance Display



Illustration 261

g06347988

- (1) Action Lamps
- (2) Status Indicator Area
- (3) Gauge Area
- (4) Status Information Area
- (5) Cabin Status Area
- (6) Navigation Buttons

Action Lamps (1)

The action lamps illuminate to show that a problem has occurred with the machine.

Status Indicators (2)

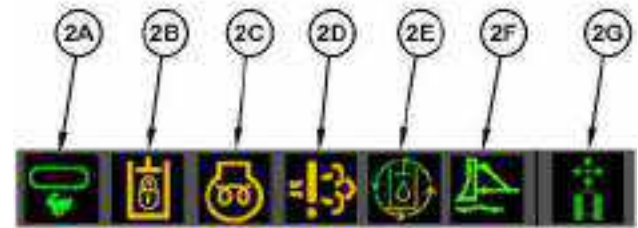


Illustration 262

g06274544

Travel Speed Indicator (2A)



(2A) Travel Speed – If the travel speed switch is moved to the high-speed position, the high-speed travel indicator illuminates.

Hydraulic Pilot Supply Solenoid Status Indicator (2B)



(2B) Hydraulic Pilot Supply Solenoid – Indicator (2B) will illuminate when the hydraulic system is locked out (left arm bar raised).

Glow Plug Indicator (2C)



(2C) Glow Plug – The alert indicator will illuminate when the engine start switch key is turned to the RUN position. After the glow plugs warm up, the LED will go out and the engine can be started. Refer to Operation and Maintenance Manual, "Engine Starting". If the alert indicator does not turn off, consult your Cat® dealer.

Engine Emission System Indicator (2D)



(2D) Engine Emission System Malfunction – Indicator (2D) will illuminate when there is a fault with the engine emission system.

Continuous Flow (2E)



(2E) Continuous Flow – Indicator (2E) will illuminate in amber color when continuous hydraulic oil flow is **ENABLED**. The icon will appear green when continuous flow is active.

Blade Float Indicator (2F)



(2F) Blade Float – Indicator (2F) will illuminate when the blade float feature is **ACTIVE**.

Joystick Steering Indicator (2G)



(2G) Joystick Steering Control – Indicator (2G) will illuminate when joystick steering control status is **ACTIVE**. This indicator is located between the gauges in area (3).

Gauge Area (3)



Illustration 263

g06274545

Fuel Level (3A)



Fuel Level – This gauge indicates the amount of fuel that is remaining in the fuel tank. When the fuel gauge is in the red range, add fuel immediately.

Engine Coolant Temperature (3B)



Engine Coolant Temperature – This gauge indicates the temperature of the engine coolant. The normal operating range is when the indicator is below the red area and not resting in the full left position. Refer to Operation and Maintenance Manual, “Engine and Machine warmup”. If the gauge reaches the red range, stop the machine and investigate the cause of the problem.

Status Information Area (4)

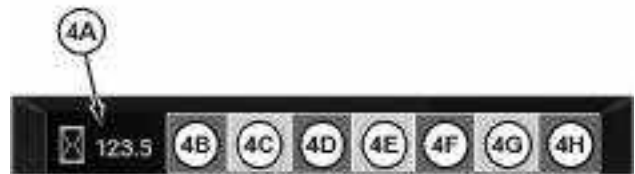


Illustration 264

g06346172

(4A) Service Hour meter

There are seven icon locations to the right of service hour meter (4A). All possible indicators for each location are shown below.

Service Hour Meter (4A)



(4A) Service Hour Meter – Shows the total operating hours of the engine. Use the display to determine the service-hour maintenance intervals.

Location (4B)



(4B) Cruise Control – ON



(4B) Cruise Control – SET

Location (4C)



(4C) Throttle Dial Position – Indicates the engine speed dial setting.



(4C) Auto Idle Control – Auto Idle Control has lowered the engine speed.



(4C) Auto Idle Control – Auto Idle Control is enabled, but not currently active.

Auto Idle Control – Automatically reduce the engine speed to low idle when no active commands are given for 3 seconds. Turn ON or turn OFF this feature using the monitor.

The auto idle control feature allows the operator to reduce the rpm without touching the engine speed dial. Auto idle control is useful when operator wants to reduce the engine speed to talk to someone or while operator is waiting for truck.

Location (4D)



(4D) Security System Immobilizer – This indicator will cover the smart code icon if a security system immobilizer request has been received from product link.



(4D) Smart Mode – This indicator shows that the machine is set to operate in Power On Demand (POD).

Location (4E)



(4E) Thumbwheel Mode – This indicator will illuminate when this feature is ACTIVE.



(4E) Hammer – This indicator will illuminate when this work tool is chosen.



(4E) User Defined – This indicator will illuminate when this work tool is chosen.



(4E) Tilt Bucket – This indicator will illuminate when this work tool is chosen.



(4E) Auger – This indicator will illuminate when this work tool is chosen.



(4E) Thumb – This indicator will illuminate when this work tool is chosen.

Location (4F)



(4F) – In Call



(4F) – Bluetooth Connected



(4F) – Bluetooth Enabled

Location (4G)



(4G) – Boom Swing – This icon appears if this function is controlled with the left thumbwheel.



(4G) – Swing Valve – This icon appears if this function is controlled with the left thumbwheel.



(4G) – Auxiliary Valve 2 – This icon appears if this function is controlled with the left thumbwheel.

Location (4H)



(4H) Joystick Pattern – This icon position combines Pattern Changer and Joystick Steering Pattern. The number on the upper left represents the Pattern Changer. The number in the upper left portion of the icon indicates if an alternate control pattern is selected. The letter in the upper right corner reflects the joystick steer control pattern for the right joystick. Refer to “Joystick Controls” and “Joystick Controls Alternate Patterns” sections for more information.

Cabin Status (5)

Depending upon installed features various information is available in this area. Use of the jog dial can also scroll information between the various available screens.



Illustration 265

g06390246

View of status area

With and without Radio and HVAC installed

Radio Volume (5A)

Radio Volume (5A) – The radio volume function displays the current volume.

Air Conditioning Fan Speed (5B)

Air Conditioning Fan Speed (5B) – The air conditioning fan speed function displays the current fan speed.

Radio Display (5C)

Radio Display (5C) – The radio display area will display radio station, Bluetooth audio, Aux audio input, or DAB information.

Air Temperature (5D)

Air Temperature (5D) – The air temperature function controls the temperature of the air coming out of the vents.

Hydraulic Temperature (5E)

Hydraulic Temperature (5E) – The current temperature of the machine hydraulic oil.

Battery Voltage (5F)

Note: The hydraulic temperature gauge and battery voltage are accessible on the machines with a radio and heat / air conditioning. To access, either highlight the heat / air conditioning on the cabin status screen and use the jog dial to jog to the right. Highlight the radio on the cabin status screen and use the jog dial to jog to the left.

Battery Voltage (5F) – The current voltage of the machine battery.

Clock (5G)

Clock (5G) – If equipped, will display the time of day.

Note: A product link elite system with network manager must be installed on the machine for the clock to be available.

Navigation Buttons (6)

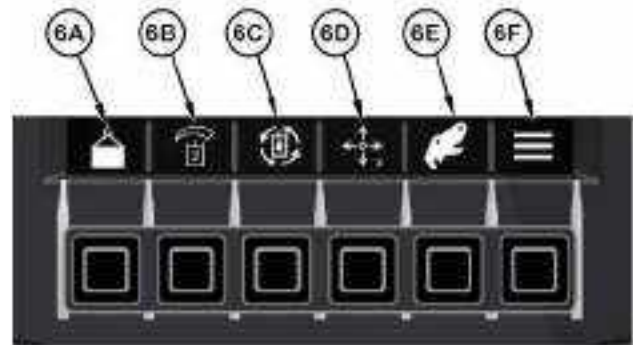


Illustration 266

g06330261

Navigation buttons (6A) through (6E) are programmable shortcuts. The shortcuts will be automatically populated based on how the machine is configured. To view the complete list or change a shortcut, navigate to the “Shortcut Settings” under the “Display Settings” menu on the monitor. Button (6F) accesses the main menu options available in the Monitoring System. The following sections detail the available options.

Main Menu

The following sections detail available options within the menu structure of the display.

Machine Settings

Machine settings adjust various options which control machine functions. Certain settings may require the engine to be OFF for adjustment.

Included in machine settings are the following:

- Control Mode
- Aux/Work Tool
- Auto Idle Control
- Machine Lighting
- Factory Defaults
- Job Clock

Control Mode

Control mode contains several settings that affect machine operation.

Included in this subsection is descriptions of Pattern Changer, Joystick Steering Pattern, Engine Idle Shutdown (if equipped), Implement Speed, Joystick Response, Cruise Control, Forward Travel Trim, and Reverse Travel Trim.

Pattern Changer

The pattern changer allows the selection of various control patterns for the left and right joystick. Refer to “Joystick Controls Alternate Patterns” for details of available patterns.

Joystick Steering Pattern

Joysticks steering Pattern allows for the selection of desired function of the right joystick lever while in Stick-Steer mode. Refer to “Joystick Controls” for more details.

Implement Speed

Implement speed allows the operator to adjust the joystick sensitivity and function maximum speeds. This parameter is adjusting both the joystick sensitivity and speed of the boom, stick, bucket, and swing together. The Advanced settings menu allows for individual adjustment.

To access the Implement Speed options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Implement Speed” .

Select the desired option using the up and down arrows, then press “OK” .

Advanced

To access the Advanced options, press the “Menu” button, select “Machine Settings”, “Control Mode”, “Implement Speed”, then “Advanced” .



Illustration 267

g06333802

Select the desired option using the up and down arrows, then press “OK” .

The following are the options within each:

- Normal
- Fast
- Slow

Joystick Response

Joystick response allows the operator to adjust the implement response to the joystick inputs. This parameter is adjusting the joystick response of the boom, stick, bucket, and swing together. The Advanced settings menu allows for individual adjustment.

Adjusting the implement response rate will change how abrupt the implements start and stop, affecting the smoothness of operation of the machine.

To access the Joystick Response options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Joystick Response” .

Select the desired option using the up and down arrows, then press “OK” .

Advanced

To access the Advanced options, press the “Menu” button, select “Machine Settings”, “Control Mode”, “Joystick Response”, then “Advanced” .



Illustration 268

g06333802

Select the desired option using the up and down arrows, then press “OK” .

The following are the options within each:

- Normal
- Slow
- Fast

Cruise Control

To enable the cruise control feature in the monitor press “Menu” button, select “Machine settings”, “Control mode”, “Cruise control”, then press “OK”. Once enabled, cruise control can be activated as indicated in the “Joystick controls” section.

The cruise control can be added to the shortcut menu in the monitor if desired. Each time the machine is powered ON, the cruise control feature must be enabled.

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.

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.

Forward Travel Trim

Forward travel trim allows operator to make fine adjustments between left and right track speed in FORWARD direction to correct any drift or wandering.

To access the Forward Travel Trim options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Forward Travel Trim”.



Illustration 269

g06333952

To adjust the forward travel trim, use the right and left arrows.

If your machine drifts RIGHT, then move the arrow to the LEFT.

Reverse Travel Trim

Reverse travel trim allows operator to make fine adjustments between left and right track speed in REVERSE direction to correct any drift or wandering.

To access the Reverse Travel Trim options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Reverse Travel Trim”.



Illustration 270

g06333956

To adjust the reverse travel trim, use the right and left arrows.

If your machine drifts RIGHT, then move the arrow to the LEFT.

Engine Idle Shutdown (If Equipped)

Engine Idle Shutdown feature automatically shuts off the engine when the following conditions are met for 3 to 15 minutes :

- Arm bar is raised
- Coolant temperature is above 50° C (122° F)
- Work lights are OFF
- Auto idle control feature is enabled
- Throttle dial position is less than seven

The engine idle shutdown feature must be enabled for the function to be active. To enable, press the "Menu" button, select "Service Mode", "Machine", "Engine Idle Shutdown", then press OK.

Once enabled, the timer can be adjusted by pressing the "Menu" button, "Machine Settings", "Control Mode", then "Engine Idle Shutdown". The idle time is adjustable from 3 to 15 minutes in increment of 1 minute. Press OK to confirm the selection.

Aux/Work Tool

The Aux/Work Tool submenu allows for configuration of the auxiliary hydraulics of the machine.

Included in this subsection is descriptions of Continuous Flow, Quick Coupler, Aux Flow 1 (if equipped), Aux Flow 1 Balance (if equipped), Aux Flow 1 Direction (if equipped), Aux Flow 2 (if equipped), Aux Flow 2 Balance (if equipped), Tiltrotator(if equipped) and Work Tool Select.

Continuous Flow

To enable the continuous flow feature in the monitor press the "Menu" button, select "Machine Settings", "Aux / Work Tool", "Continuous Flow" then "OK". Once enabled, continuous flow can be activated as indicated in the "Continuous Flow" section.

The continuous flow enable can be added to the shortcut menu in the monitor if desired. Each time the machine is powered on, the continuous flow feature must be enabled.

Quick Coupler (If Equipped)

This menu allows for activation of a hydraulic quick coupler. Two types of couplers are supported including dual lock and single lock couplers. Dual lock couplers will show two screens indicating the status of each individual locking mechanism. Single lock couplers have only a single screen allowing for lock and unlock functions of the coupler.

To access the Hydraulic Quick Coupler in the monitor press the "Menu" button, "Machine Settings", "Aux / Work Tool", then "Quick Coupler". The Single Lock or Dual Lock quick coupler screen will be selected automatically based on which quick coupler the machine is configured with.

The quick coupler control screen can be added to the shortcut menu in the monitor if desired.

Tilt rotator (If Equipped)

The Tilt rotator is a specialized worktool that can be purchased for the machine. Refer to the Tiltrotator Operation and Maintenance Manual for more details or contact your dealer for information.

Aux Flow 1 (If Equipped)

Aux 1 Flow allows for metering the flow provided to the auxiliary 1 circuit. To adjust the aux 1 flow press the "Menu" button, select "Machine settings", "Aux / Work Tool", "Aux flow 1" then adjust the flow rate. The flow is adjustable from 10% to 100% in increments of 10 percent.

The aux flow 1 can be added to the shortcut menu in the monitor if desired.

Aux Flow 1 Balance (If Equipped)

Aux Flow 1 Balance allows for reducing flow to aux 1 A port or aux 1 B port. Flow is reduced for work tools that require different flow rates in each direction.

To adjust the aux flow 1 balance press the “Menu” button, select “Machine settings”, “Aux / Work Tool”, “Aux Flow 1 Balance” then adjust the balance as desired. When the slider is in the middle position, the supply flow rate is in the same for both ports.

Adjusting the slider to the LEFT will reduce the flow rate to the right (aux 1 A) port but maintain same flow rate to the left (aux 1 B) port. Adjusting the slider to the RIGHT will reduce the flow rate to the left (aux 1 B) port but maintain the same flow rate to the right (aux 1 A) port.

Aux Flow 1 Direction (If Equipped)

Certain machines may not have one-way flow valves to limit aux flow to one direction. On these machines, Aux 1 Flow Direction is used to allow flow commands to only the B port of the machine.

To access the Aux Flow 1 Direction options, press the “Menu” button, select “Machine Settings”, “Aux / Work Tool”, then “Aux Flow 1 Direction”. To adjust the Aux Flow 1 Direction, use the up and down arrows. Press “OK” to confirm the selection.

Note: Depending upon the work tool one way flow or two way flow can be selected. One way would be selected for a Hammer type work tool.

Aux Flow 2 (If Equipped)

Aux 2 Flow allows for metering the flow provided to the auxiliary 2 circuit. To adjust the aux 2 flow press the “Menu” button, select “Machine settings”, “Aux / Work Tool”, “Aux Flow 2” then adjust the flow rate. The flow is adjustable from 10 percentage to 100 percentage in increments of 10 percent.

The Aux flow 2 can be added to the shortcut menu in the monitor if desired.

Aux Flow 2 Balance (If Equipped)

Aux Flow 2 balance allows for reducing the flow to the aux 2 A port or aux 2 B port. Flow is reduced for work tools that require different flow rates in each direction.

To adjust the aux flow 2 balance press the “Menu” button, select “Machine settings”, “Aux / Work Tool”, “Aux Flow 2 balance” then adjust the balance as desired. When the slider is in the middle position, the supply flow rate is in the same to both ports. Adjusting the slider to the LEFT will reduce the flow rate to the right (aux 2 A) port but maintain same flow rate to the left (aux 2 B) port. Adjusting the slider to the RIGHT will reduce the flow rate to the left (aux 2 B) port but maintain the same flow rate to the right (aux 2 A) port.

Work Tool Select

Toggling the work tool select, various work tools are available. Selecting the work tool attached to the machine will pick default settings for Aux 1 Flow metering.

To select the work tool press the “Menu” button, select “Machine Settings”, “Aux / Work Tool”, “Work Tool Select” then select the desired tool.

The work tool select can be added to the shortcut menu in the monitor if desired.

Auto Idle Control

Auto idle control automatically reduces engine speed to low idle after no implement commands have been issued for 3 seconds. To enable, press the “Menu” button, select “Machine settings”, “Auto idle control”, then press “OK”. Auto idle control can be added to the shortcut menu in the monitor if desired.

Machine Lighting

Courtesy Light – Courtesy light allows the machine lighting to stay ON after turning the key switch OFF. Courtesy lights illuminate if the work lights were ON when the key was switched OFF. Press the “Menu” button, select “Machine Settings”, “Machine Lighting”, “Courtesy Light”. The timer is adjustable from 0 to 100 seconds in increment of 5 seconds. Press OK to confirm the selection.

Job Clock

The job clock displays the number of engine running hours that have been accumulated since the last reset. To reset the job clock back to zero, press the “Menu” button, “Machine Settings”, “Job Clock”, press the RESET button (icon with two parallel lines at a 45 degree angle).

Job Clock can be added to the shortcut menu in the monitor if desired.

Reset Factory Default

Restores factory default settings for the parameters such as joystick response, implement speed, auxiliary flow 1, auxiliary flow 1 balance, auxiliary flow 2, auxiliary flow 2 balance, courtesy light timer, work tool select, automatic engine idle control, cruise control, joystick steering pattern. To reset, press the “Menu” button, select “Machine settings”, “Reset factory default”, then “OK”.

Display Settings

Display settings configure the monitoring system on the machine. To access the display settings press the “Menu” button, select “Display Settings”, then select the desired display setting to be adjusted. Available settings include Show Camera (if equipped), Brightness, Clock Adjust (if equipped), Language, Units, Clock Format (if equipped), and Shortcut Settings

Shortcut Settings – Shortcut settings are configurable allowing for direct access to submenu options on the monitoring system using the Navigation Buttons. The following shortcut settings such as pattern changer, quick coupler, performance, camera, auto idle, continuous flow, work tool select, aux flow 1, aux flow 2, HVAC, radio, audio source, bluetooth, tilt rotator, cruise control, joystick steering pattern, job clock can be selected.

To access the display settings, press the “Menu” button, select “Display settings”, then select the desired display setting to be adjusted.

HVAC (If Equipped)

Accesses the cab climate control system. Refer to the Air Conditioning and Heating Control section for more information.

Radio (If Equipped)

Accesses the radio controls of the machine. Refer to the Radio section for more details on how to operate.

Information

Accesses the performance and ECM summary submenus.

Performance – Displays sensor parameters available on the machine such as engine speed and pump pressure.

ECM Summary – To access the ECM summary press the “Menu” button, select “Information”, then “ECM summary”

Service

Includes submenus showing diagnostics and service mode.

Contact your dealer for more information about menu items not disclosed in this manual.

Diagnostics

Reports fault code information used for troubleshooting.

Maintenance Intervals

The Maintenance feature allows the tracking of machine running hours on various routine service items on the machine. The number of machine running hours since the last reset is accumulated individually for each service item.



Illustration 271

g06711006

To access the Maintenance options, press the “Menu” button, select “Service”, then “Maintenance”.



Illustration 272

g06711007

The Maintenance menu shows the various service items along with the total machine running hours accumulated since last reset on the left and the recommended service interval on the right.

When any of maintenance items are within 20 hours of being due, there will be a "Maintenance Due" popup alerting the operator. The pop up will appear every time the key is turned on. Once cleared, it will not appear again until the key is turned on again.

When any of the maintenance items are past due, there will be a "Maintenance Past Due" popup alerting the operator. The pop up will appear every time the key is turned on. Once cleared, it will not appear again until the key is turned on again.



Illustration 273

g06711008

To reset a maintenance item, highlight the desired item in the menu and press "OK". Within the screen for that item is a reset option (button with two parallel lines). Select the reset button.



Illustration 274

g06711012

Press “OK” to confirm the reset. After pressing “OK” , the number of machine running for that item will be set to 0.

Note: If machine security is enabled, you must be logged in as a Master user to reset a maintenance item. If logged in as a Standard user, a Master Level Access Required message will appear when pressing “OK” and the value will not be reset.

Service Mode

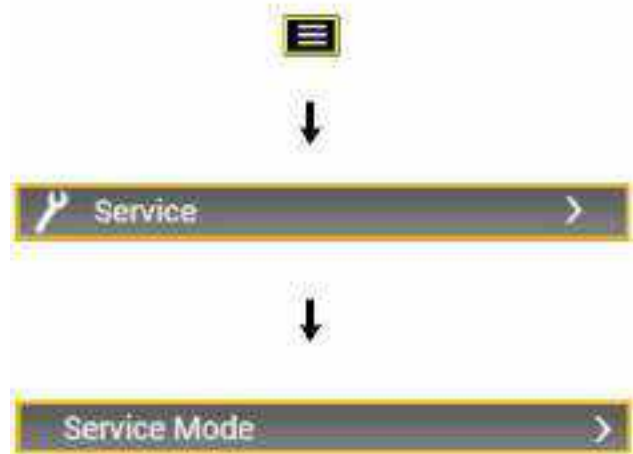


Illustration 275

g06334877

To access the Service Mode Menu options, press the “Menu” button, select “Service” , then “Service Mode” .

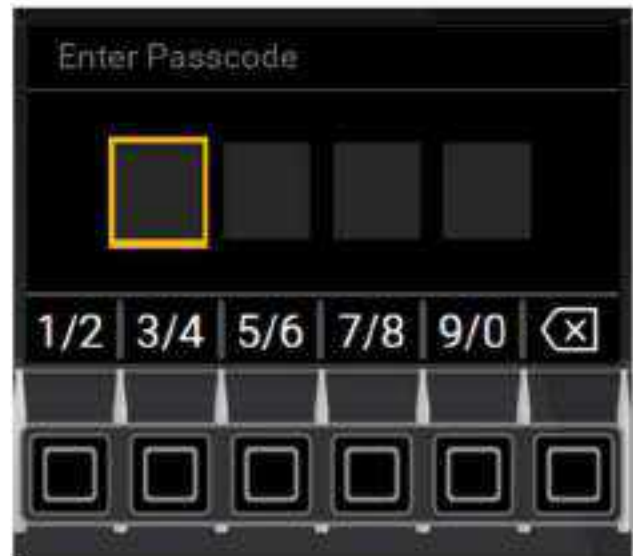


Illustration 276

g06334880

Enter the four-digit service entry password.

Note: Factory set default code is 1234 or 1925.

Thumbwheel Mode

Thumbwheel Mode allows stick to toggle to right thumb roller when in sticks steer mode. Refer to Operation and Maintenance Manual, “Joystick Controls” for more information.

This parameter must be ENABLED for the joystick thumbwheel controls to be used.

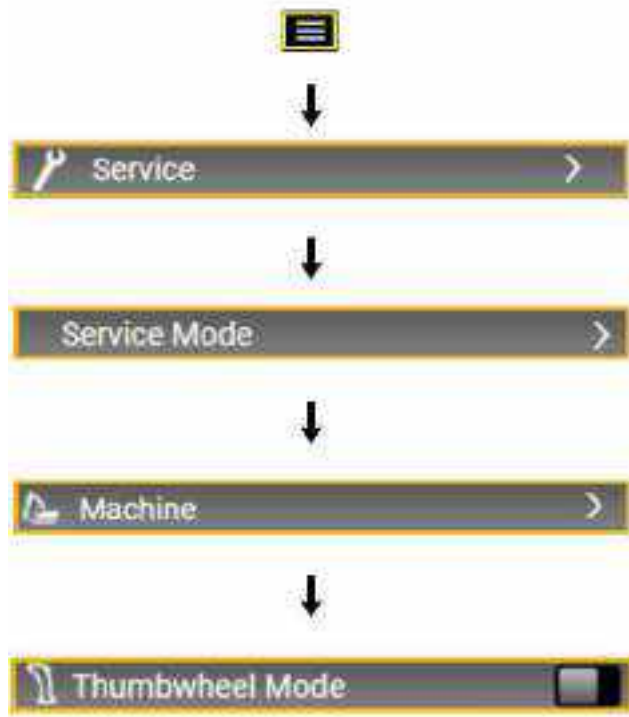


Illustration 277

g06334888

To access the Thumbwheel Mode options, press the "Menu" button, select "Service", "Service Mode", "Machine", then "Thumbwheel Mode".



Illustration 278

g06334998

To enable the Thumbwheel Mode function, select "Thumbwheel Mode" and press "OK".

Note: When the indicator is green and the slide is to the right, the feature is activated.

Auxiliary Flow Command Direction Inversion

Auxiliary Invert allows the Aux 1 and Aux 2 commands to be inverted so that rolling the thumbwheel up will send flow to the A port (right side of stick) and rolling to the thumbwheel down will send flow to the B port (left side of stick).



Illustration 279

g06711017

To access the Auxiliary Invert options, press the "Menu" button, select "Service", "Service Mode", "Machine", then "Aux 1 Invert" or "Aux 2 Invert".



Illustration 280

g06711019

To enable the Auxiliary Inversion, select “Aux 1 Invert” or “Aux 2 Invert” and press “OK” .

Note: When the indicator is green and the slide is to the right, the feature is activated.

Security

Machine security can be configured to prevent unregistered access to your machine. Additional security features can be configured using the Monitoring System. Press the “Menu” button, select “service” , “service mode” , then “security” . If security is disabled or a standard security level passcode or bluetooth key was used to access the machine, you will be prompted to enter a master security level passcode when accessing the security screens. The default master passcode from the factory is “1 1 1 1” . This default passcode can be removed after creating a new master passcode.

If security is enabled and a master security level passcode or bluetooth key was used to access the machine, it will proceed directly to the security screens.

Security Enable

toggling this setting will turn the security system ON or OFF.

Grace Period

This setting is used to set the duration after key off that the registered user stays logged on to the machine. If the machine is turned ON within this time range, the machine will bypass security access without the use of a Bluetooth key or passcode.

Users / Keys

The Users / Keys category from the Security Menu allows the owner / technician to enter unique passcodes (PINs) and/or Bluetooth keys (each with a unique ID) which allow those authorized users to start and operate the machine. Also, the owner or authorized technician can delete passcode PINs and Bluetooth key IDs of authorized keys and users.



Illustration 281

g06334983

To access the User / Keys options, press the “Menu” button, select “Service” , “Service Mode” , “Security” , then “Users / Keys” .



Illustration 282

g06390456

Add PIN



Illustration 283

g06345288

To add new 4-digit PIN to the passcode list of authorized users, select "Add PIN" from the "Users / Keys" menu.



Illustration 284

g06345290

Only a user with a "Master" passcode can enter new "Standard" passcodes.

Note: Standard passcodes are for operators and technicians - Master passcodes are intended for owners or authorized personnel

Multiple Master passcodes can be added to the Master Passcode list. The default master passcode from the factory is "1 1 1 1". This default passcode can be removed after creating a new master passcode.

This same strategy applies to the Bluetooth system, with a Master Bluetooth key used to add or remove Bluetooth keys from respective lists.

Passcode PINs and Bluetooth key IDs can also be added or removed from respective lists using Cat ET.

Note: A maximum total of 25 passcodes and keys can be added to the machine.



Illustration 285

g06345300

From the Add PIN entry screen, use the number buttons to enter a unique 4-digit passcode number.

Note: Each button can enter two numbers. To enter the number two (2), press the left-most “1/2” button twice, then the highlight will move to the next entry field to the right.

Each time a number is entered, the highlight will automatically move to the next space to the right.

Once all four numbers have been entered, the new passcode will be added to the list of authorized PINs. The display will then return to the Keys/Users Menu.

In the example above, when the operator turns the key start switch to ON, the monitor will display the startup passcode entry screen. When the operator enters “1111”, the MSS will allow the engine to be started.

Remove PIN



Illustration 286

g06345316

To remove a 4-digit PIN to the passcode list of authorized users, select “Remove PIN” from the “Users / Keys” menu.

From the “Remove PIN” entry screen, use the number buttons to enter the 4-digit passcode number that you wish to remove if equipped with the Performance display or select the 4-digit passcode number you wish to remove if equipped with the Premium display.

Press the “OK” button or tap the center of the Jog Dial (if equipped) to remove the 4-digit passcode number from the list of authorized passcodes.

Add Bluetooth Key

Illustration 287

g06345355

To add new Bluetooth key ID to the list of authorized Bluetooth keys, select “Add Bluetooth Key” from the “Users / Keys” menu.

From the “Users / Keys” menu, use the arrow buttons to highlight the “Add Bluetooth Key” option, then press the “OK” button. The “Add Bluetooth Key” confirmation screen will appear.



Illustration 288

g06345356

Use the arrow buttons to highlight the “Standard” or “Master” option, then press the “OK” button. The “Add Bluetooth Key” screen will be displayed.



Illustration 289

g06345359

Use a combination of number buttons and Jog Dial Module (if equipped) to enter the unique 12-digit alpha-numeric ID assigned to Bluetooth key chip.

The “Add Bluetooth Key” screen is first displayed with all 12 ID spaces blank and the left-most space highlighted. Use the arrow buttons scroll up and down through the numbers 0-9, then alpha characters A-F, which are displayed in the space. When the desired character is displayed in the highlighted space, move to the next space.

Note: The highlight can also be moved left to change a number previously entered.

Repeat this process for all 12 spaces. When all 12 spaces have been filled with the unique 12-digit Bluetooth key ID, press the “OK” button or tap the center of the Jog Dial (if equipped) to enter the Bluetooth key ID to the list of authorized Bluetooth IDs.

The display will return to the “Users / Keys” Menu.

Remove Bluetooth Key



Illustration 290

g06345381

To remove a 12-digit Bluetooth key ID from the list of authorized Bluetooth key IDs, select “Remove Bluetooth Key” from the “Users / Keys” menu.

Enter the unique 12-digit alpha-numeric ID assigned to the Bluetooth key ID that you wish to remove if equipped with the Performance display or select the Bluetooth Key ID that you wish to remove if equipped with the Premium display.

Press the “OK” button or tap the center of the Jog Dial (if equipped) to remove the Bluetooth key ID from the list of authorized Bluetooth IDs.

The display will return to the “Users / Keys” Menu.

Display System Mode

The Display System Mode can be changed between Normal and Simplified. When the mode is set to Normal, all available display settings are shown and available for adjustment. When the mode is set to Simplified, the display settings below are hidden and not available for adjustment:

- All joystick response settings
- Advanced implement speed settings (overall setting still available)
- Forward travel trim
- Reverse travel trim
- Auxiliary 1 flow balance
- Auxiliary 2 flow balance

- Job clock
- ECM summary
- Machine configurations within service mode

The Simplified Display System Mode is intended for customers who want to limit the adjustability of the machine.

To access the Display System Mode options, press the “Menu” button, select “Service”, “Service Mode”, then “Display System Mode”.

Seat Belt Reminder System (If Equipped)

If the machine is fitted with the operator presence seat belt assembly and the “Operator Seat Belt Monitor Installation Status” configuration is set to “Installed” in Cat® ET, the seat belt reminder system will be active on the machine.

The red seat belt warning symbol is always present on the top status bar when the seat belt is not fastened. Once the seat belt is fastened, the red seat belt warning symbol disappears and there will be no other seat belt notifications while the seat belt remains fastened.



Illustration 291

g06751792

Seat Belt Indicator in Monitor

If the belt is not fastened while the engine is running and the arm bar is lowered, there will be a pulsing audible tone for 10 seconds every minute and a pop-up message stating "Seat Belt Unfastened – Fasten Belt". The audible tone can be configured to be snoozed after 5 minutes by setting the "Operator Seat Belt Audible Alarm Snooze Enable Status" to ENABLED in Cat® ET. If DISABLED, the tone will continue for 10 seconds every minute while the engine is running, arm bar is lowered and seat belt is not fastened.



Illustration 292

g06721427

If the operator seat belt unfastened while machine is not idle event enable status is configured as ENABLED in Cat® ET, the operator seat belt unfastened while machine is not idle event will be logged if the seat belt is not fastened while the engine is running and the arm bar is lowered for 5 minutes. If Disabled, there will not be an event logged.

Monitor Wake-up Feature

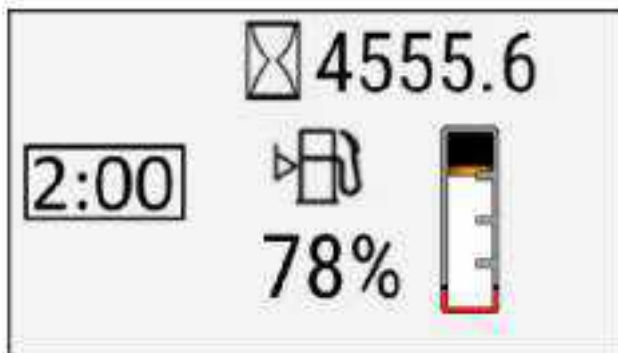


Illustration 293

g06366070

Monitor wake-up screen example

Pressing any navigation button on the monitor will display the service hours of the machine and actual fuel level for 2 minutes. This feature will function when the key is in the OFF position and the battery disconnect switch is in the ON position.

Note: This feature can also be activated by pressing the monitor wake-up button located below the cup holder in the cab (if equipped).

i07256347

Storage and Literature Compartment

SMCS Code: 7268



Illustration 294

g06267099

The compartment on the rear of the operator seat is used to store the literature for the machine.

i07287781

Mirror (If Equipped)

SMCS Code: 7319

WARNING

Adjust all mirrors as specified in the Operation and Maintenance Manual. Failure to heed this warning can lead to personal injury or death.

Note: Your machine may not be equipped with all the mirrors that are described in this topic.



Illustration 295

g06275389

- (1) Right Side Mirror
(2) Left Side Mirror

Mirrors provide additional visibility around your machine. Make sure that the mirrors are in proper working condition and that the mirrors are clean. Adjust all mirrors at the beginning of each work period and adjust the mirrors when you change operators.

The appropriate job site organization is also recommended to minimize visibility hazards. For more information refer to this Operation and Maintenance Manual, "Visibility Information".

Modified machines or machines that have additional equipment or attachments may influence your visibility.

Mirror Adjustment

- Park the machine on a level surface.
- Lower the work tool to the ground.
- Move the hydraulic lockout lever to the LOCKED position. For further details on this procedure, refer to Operation and Maintenance Manual, "Operator Controls"
- Stop the engine.
- Adjust rear view mirrors to provide visibility behind the machine at a maximum distance of 30 m (98 ft) from the rear corners of the machine.

Note: You may need to use hand tools to adjust certain types of mirrors.

Right Side Rear View Mirror (1)



Illustration 296

g06275391

If equipped, adjust the right side rear view mirror (1) so that an area of at least 1 m (3.3 ft) from the side of the machine can be seen from the operator seat. Also, provide as much visibility to the rear as possible.

Left Side Rear View Mirror (2)



Illustration 297

g06275390

If equipped, adjust the left side rear view mirror (2) so that an area of at least 1 m (3.3 ft) from the side of the machine can be seen from the operator seat. Also, provide as much visibility to the rear as possible.

i07255572

Window (Front)

SMCS Code: 7310-FR

Canopy Machines

WARNING

When installing or removing the polycarbonate shield, be extra careful to prevent any personal injury. Also, the hydraulic lockout control must be in the RAISED position to prevent any possibility of sudden movement of the machine due to inadvertent contact with the hydraulic controls.

Do not install/remove the polycarbonate shield until the following items have been done:

- Park the machine on a level surface.
- Lower the work tools and the blade to the ground.
- Cycle the joystick controls. Move the hydraulic lockout control to the RAISED position.
- Remove the engine start switch key.

Perform the following procedure to install the polycarbonate shield.



Illustration 298

g06267035

1. Put polycarbonate shield (1) with the help of another person into position.
2. Secure the polycarbonate shield with the four fasteners attached (2).

Perform the following procedure to remove the polycarbonate shield.

1. Remove four fasteners (2).
2. Remove polycarbonate shield (1) with the help of another person.

Note: Protect the polycarbonate shield from damage while in storage.

Cab Machines

To provide full ventilation inside the cab, the upper window and the lower window can be fully opened.

WARNING

Crushing Hazard! Stay clear (extremities, clothing) of the window run and of the window. Always open and close the front window using both handles. Always make sure the window locks into the recesses as the window is open and closed. Be careful not to hit the front window with your head as the front window is opened and closed.

Stop the engine before opening or closing the front window in order to avoid any unintentional operation or movement of the machine.

Operation Section
Window (Front)

Do not change the position of the front window until the following items have been done:

- Park the machine on a level surface.
- Lower the work tools and the blade to the ground.
- Move the hydraulic lockout control to the RAISED position.

Perform the following procedure to vent the upper window.

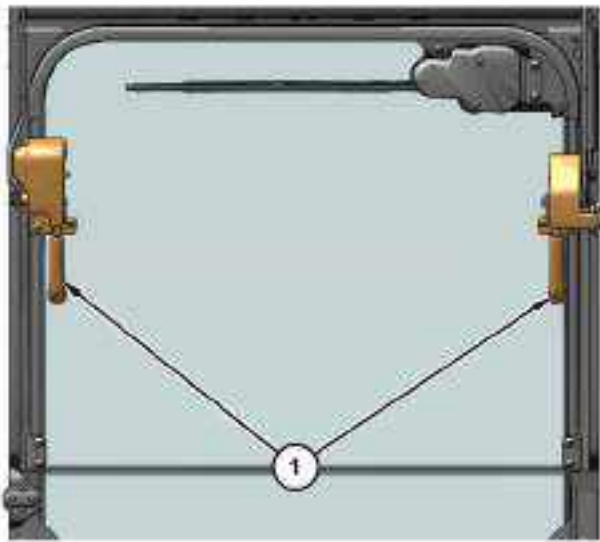


Illustration 299

g06267076

1. Release the auto-lock latches by pulling release levers (1) on the window handles.
2. Holding both handles on the window frame, pull the window upward.
3. Hold both handles and move the window into the storage position until the auto-lock latches near the ceiling are engaged.

Perform the following procedure to close the upper window.

1. Release the auto-lock latches by pulling release levers (1) on the window handles.
2. Holding both handles on the window frame, pull the window downward.
3. Hold both handles and move the window into the closed position until the auto-lock latches near the front of the machine engage.

Perform the following procedure to vent the lower window.

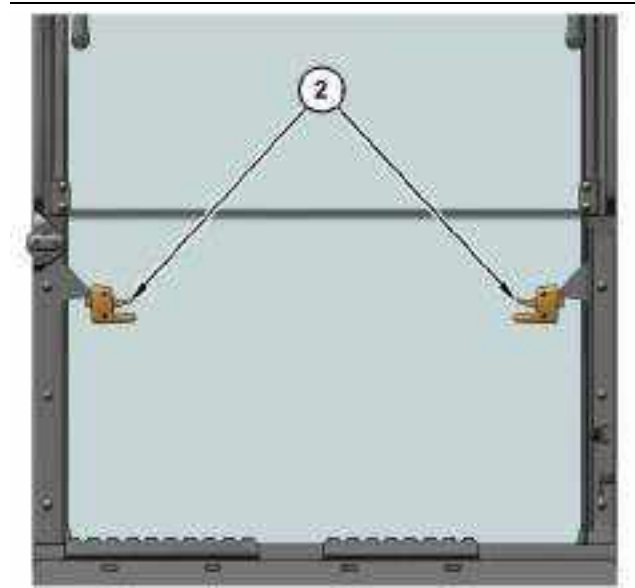


Illustration 300

g06267083

1. Release the auto-lock latches by pushing release levers (2) on the window handles.
2. Holding both handles on the window frame, pull the window upward.
3. Hold both handles and move the window into the storage position until the auto-lock latches near the top window are engaged.

Perform the following procedure to close the upper window.

1. Release the auto-lock latches by pulling release levers (2) on the window handles.
2. Holding both handles on the window frame, pull the window downward.

3. Hold both handles and move the window into the closed position until the auto-lock latches near the front of the machine engage.

i07686363

Joystick Controls

SMCS Code: 5705

Two functions may be performed at the same time by moving the joysticks diagonally.

The machine control pattern is initially set at the factory to the SAE system, as shown. The pattern on the left pertains to the left joystick and the pattern on the right pertains to the right joystick.

The machine control pattern can be varied. Refer to Operation and Maintenance Manual, "Joystick Controls Alternate Patterns" for more information.

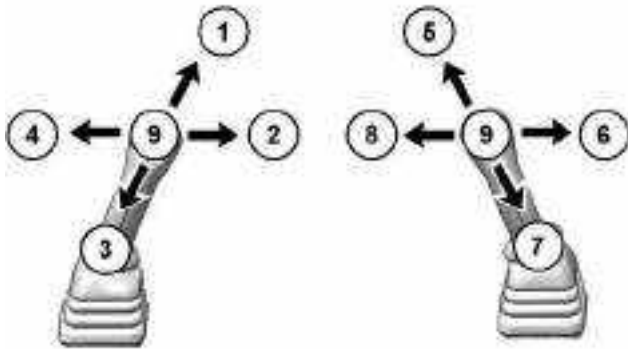


Illustration 301

g06275408



STICK OUT (1) – Move the left joystick to this position to move the stick outward.



SWING RIGHT (2) – Move the left joystick to this position to swing the upper structure to the right.



STICK IN (3) – Move the left joystick to this position to move the stick inward.



SWING LEFT (4) – Move the left joystick to this position to swing the upper structure to the left.



BOOM LOWER (5) – Move the right joystick to this position to lower the boom.



BUCKET DUMP (6) – Move the right joystick to this position to dump the bucket or the work tool.



BOOM RAISE (7) – Move the right joystick to this position to raise the boom.



BUCKET CLOSE (8) – Move the right joystick to this position to close the bucket or the work tool.

HOLD (9) – When you release a joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Joystick Configurations



Illustration 302

g06285624

Vertical Slider Joystick Controls

- (1) Left joystick trigger switch
- (2) Left joystick switch 1
- (3) Left joystick switch 2

- (4) Left joystick thumbwheel
- (5) Right joystick thumbwheel
- (6) Right joystick switch 1

- (7) Right joystick switch 2
- (8) Right joystick trigger switch

Table 24

Joystick Configurations		
Switch Location	Machine Configuration	
	Joystick Steering Mode OFF	Joystick Steering Mode ON
1	Inactive	Cruise Control
2	Boom Swing / Aux 2 Select	House Swing / Aux 2 Select
3	Joystick Steer Mode On/Off	Joystick Steer Mode On/Off
4	Boom Swing / Aux 2 Flow Control	House Swing / Aux 2 Flow Control
5	Aux 1 Flow Control	Aux 1 Flow Control / Stick Control (Configurable)
6	Horn	Horn
7	Travel Speed	Travel Speed
8	Inactive	Inactive / Blade Float / Thumbwheel (5) toggle
Left Joystick	Stick / Swing	Travel
Right Joystick	Boom / Bucket	Boom / Bucket / Blade (Configurable)

Left Joystick Controls

Trigger Switch (1)

Button (1) will only function in joystick steer mode. When in joystick steer mode this button activates cruise control. Cruise control maintains forward or reverse ground speed when the joystick is in the hold position.

Cruise control is available using the Monitor (see "Monitoring System" for details). Cruise control can be enabled using the monitoring system.

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.

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.

Cruise control is disabled by any of the following:

- moving the left joystick forward or reverse after placing the joystick in the hold position.
- pressing button (1).
- moving the travel pedals.
- pressing button (3).
- hydraulic lockout control lever is raised to the lockout position.

Boom Swing / 2nd Auxiliary Button (2)

Button (2) will determine which function thumb wheel (4) controls.

The default setting of thumb wheel (4) is boom swing function.

Joystick Steer Mode Button (3)

Push button (3) to activate joystick steer mode, then press the confirmation button on the monitoring system using the jog dial or touch screen (if equipped). The confirmation process must be completed after every key cycle of the machine.

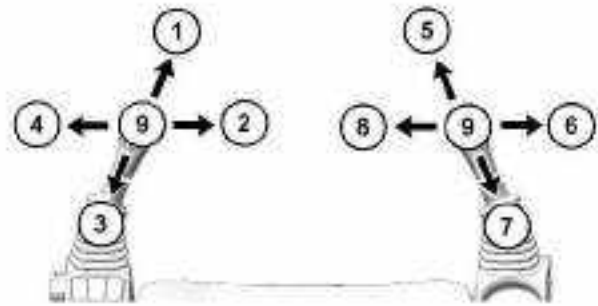


Illustration 303

g06180324

Joystick Steer Pattern A

- (1) TRAVEL FORWARD
- (2) COUNTER-ROTATE CLOCKWISE
- (3) TRAVEL REVERSE
- (4) COUNTER-ROTATE COUNTERCLOCKWISE
- (5) BOOM LOWER
- (6) BUCKET DUMP
- (7) BOOM RAISE
- (8) BUCKET CLOSE
- (9) HOLD

Once activated, the joystick steer light will illuminate as defined in the "Monitor System" section. The left joystick functionality is modified as shown in Illustration 303. This control pattern is identified as joystick steer pattern A.

Note: Refer to Table 24 for additional control changes.

In joystick steer mode, machine swing is available on the left thumb roller in place of boom swing (if equipped). Machine swing and aux 2 (if equipped) can toggle function control on the left thumbwheel while in joystick steer mode.

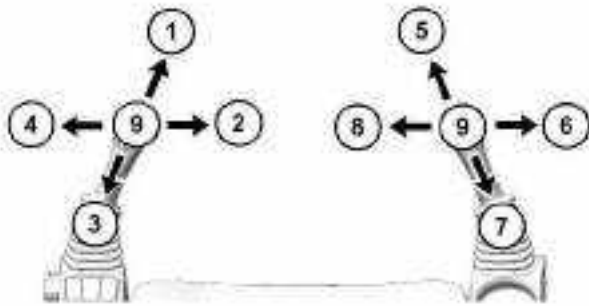


Illustration 304

g06180324

Joystick Steer Pattern B

- (1) TRAVEL FORWARD
- (2) COUNTER-ROTATE CLOCKWISE
- (3) TRAVEL REVERSE
- (4) COUNTER-ROTATE COUNTERCLOCKWISE
- (5) BLADE LOWER
- (6) BLADE TILT CLOCKWISE
- (7) BLADE RAISE
- (8) BLADE TILT COUNTERCLOCKWISE
- (9) HOLD

While in joystick steer mode, changing an alternate control pattern for the right joystick is possible. This pattern is identified as joystick steer pattern B. See the “Monitoring System” section for more details on how to modify the control pattern. The following image details the control of the machine using blade control on the right joystick lever.

Advanced Joystick Steer Mode: An advanced control pattern is available in joystick steer mode using the service mode of the display (see “Monitoring System – Thumbwheel Mode” for setup details). When Thumbwheel Mode is set to enabled and Joystick Steer Pattern A is selected, the trigger on the right joystick can allow for toggling between aux 1 and stick function on the right joystick thumbwheel.

Boom Swing / 2nd Auxiliary Flow Control (4)

If thumb wheel (4) is changed to second auxiliary control, the thumb wheel is used to operate work tools such as a grapple. Refer to Operation and Maintenance Manual, “Work Tool Control” for more information.

If thumb wheel (4) is changed to boom swing function, refer to the information below.

The boom swing control is used to swing the boom to the right or to the left.



Swing Left – Pull downward on the left thumbwheel to swing the boom to the LEFT.



Swing Right – Push upward on the left thumbwheel to swing the boom to the RIGHT.

Note: Operate the boom swing thumbwheel carefully until you become familiar with how boom swing reacts to the controls.

Right Joystick Controls**Primary Auxiliary Control (5)**

The primary auxiliary control thumb wheel is used to control the work tools. For more information on the auxiliary controls, refer to Operation and Maintenance Manual, “Work Tool Control”.

This thumbwheel can be toggled to activate the stick using button (8) while in joystick steer mode if right joystick is configured to Boom/Bucket by using advanced settings in the monitoring system.

Horn (6)

Horn (6) – The horn button is on the right side joystick. Depress the horn button to sound the horn. Use the horn before starting the engine, or for alerting or signaling personnel.

Travel Speed Control (7)

Depress the button to change the travel speed.

Depress the button to the high-speed position to make the machine travel in high speed. The indicator light on the monitor is active when the machine is in the high-speed mode.

Depress the button again to return to low speed.

Always travel at slow speeds on slopes and rough ground.

i08301436

Work Tool Control

SMCS Code: 6700

WARNING

Unexpected operation of the auxiliary control circuit can cause injury or death.

A RAISED hydraulic lock lever does not mean that the auxiliary control function is locked out.

In order to prevent unexpected operation of the auxiliary control circuit, make sure that the foot is not placed on or near the work tool control pedal.

⚠ WARNING

Unexpected operation of the secondary auxiliary control circuit can cause injury or death.

In order to prevent unexpected operation of the secondary auxiliary control circuit, make sure that the thumb is not placed on or near the switch on the left joystick.

⚠ WARNING

Unintended operation of the Auxiliary Control pedal can cause injury or death. A RAISED hydraulic lock lever does not mean that the auxiliary line is locked out.

To Prevent unintended activation of the Auxiliary Control pedal while traveling or whenever the auxiliary line is not being used, make sure the foot is not placed on or near the Auxiliary Control pedal.

⚠ WARNING

Unintended operation of the switch for the Auxiliary Control can cause injury or death.

To prevent unintended activation of the switch for the Auxiliary Control while traveling or whenever the auxiliary line is not being used, make sure that the thumb is not placed on or near the switch for the Auxiliary Control.

Auxiliary lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools. The auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the auxiliary hydraulic lines by performing the following steps:

1. Operate the machine to charge the accumulator.
2. Lower implements to the ground.
3. Turn off the engine and turn the key switch to ON position without starting the engine.
4. Ensure that the Hydraulic Lockout control is in the UNLOCKED position to provide function to the hydraulic circuits.
5. Actuate the auxiliary circuit in both directions several times.

Note: Pressure can build up in the auxiliary lines if the attachment is not coupled/uncoupled immediately after the pressure has been released.

Primary Auxiliary Hydraulic Circuit (AUX I)

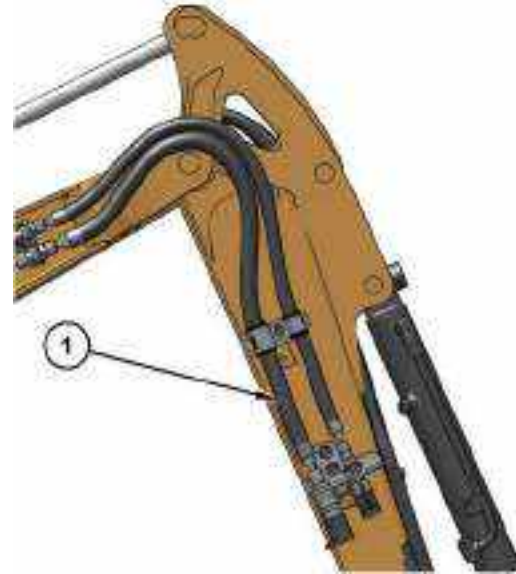


Illustration 305

g06267476

(1) Primary oil feed / return line on right side of stick

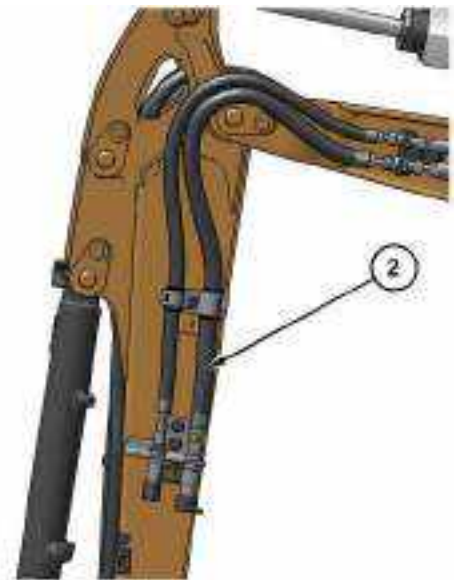


Illustration 306

g06267480

(2) Primary oil feed / return line on left side of stick

There are two primary auxiliary lines that are routed to the stick.

Primary oil feed / return line on right side of stick (1).
Primary oil feed / return line on left side of stick (2).

The primary auxiliary lines can be equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The primary auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the primary auxiliary hydraulic lines by performing the following steps:

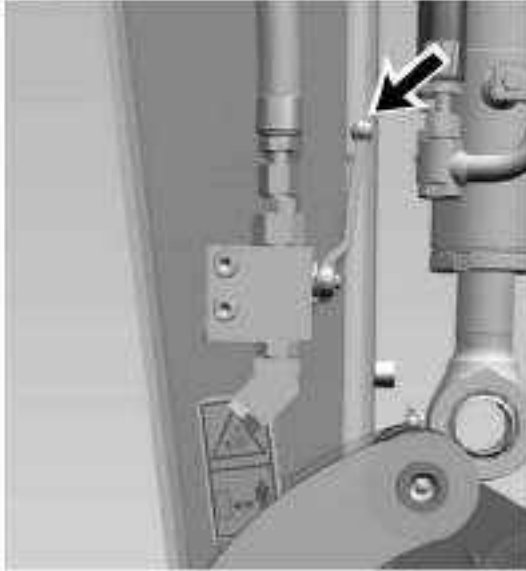


Illustration 307

g06639214

Aux stop valve in ON position

Rotate the aux stop valve to 90 degrees to turn OFF the aux stop valve.

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Secondary Auxiliary Hydraulic Circuit (AUX II) (If Equipped)

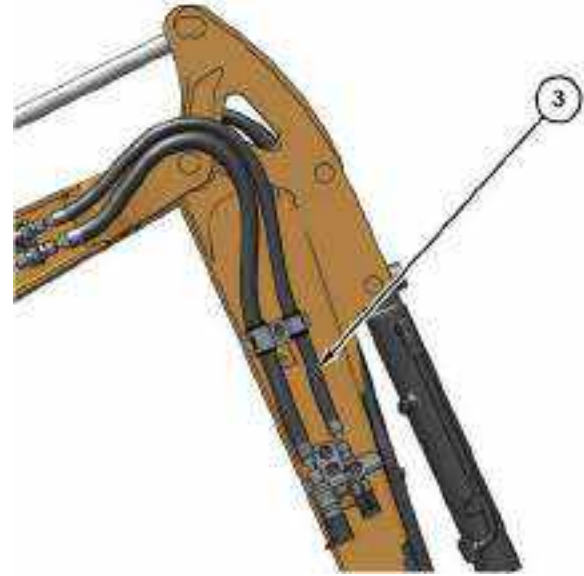


Illustration 308

g06267483

(3) Secondary oil feed / return line on right side of stick

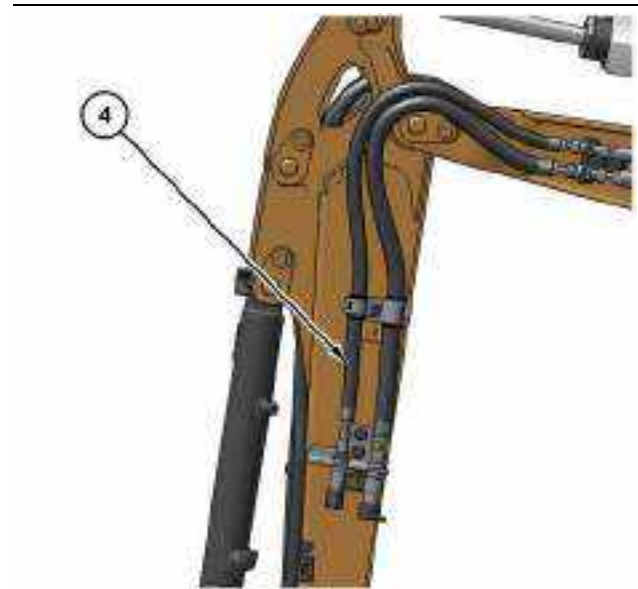


Illustration 309

g06267484

(4) Secondary oil feed / return line on left side of stick

There are two secondary auxiliary lines that are routed to the stick.

Secondary oil feed / return line on right side of stick (3). Secondary oil feed / return line on left side of stick (4).

The secondary auxiliary lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The secondary auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the secondary auxiliary hydraulic lines by performing the following steps:

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Auxiliary Bucket Cylinder Diverter Circuit (AUX V) (If Equipped)

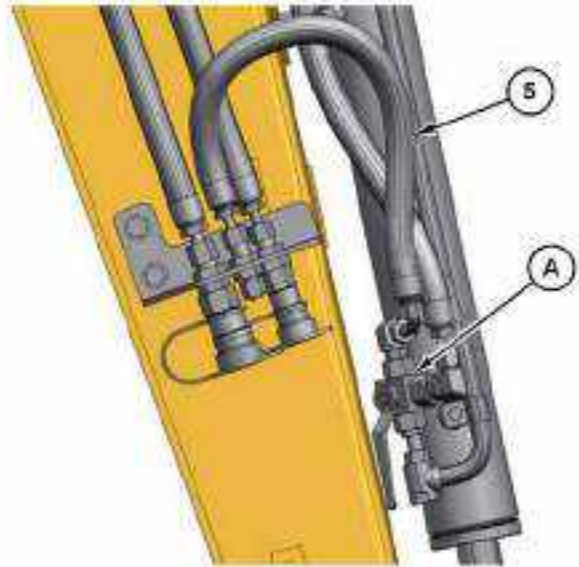


Illustration 310

g06643027

(A) Diverter Valve

(5) Auxiliary oil feed/ return line on right side of stick

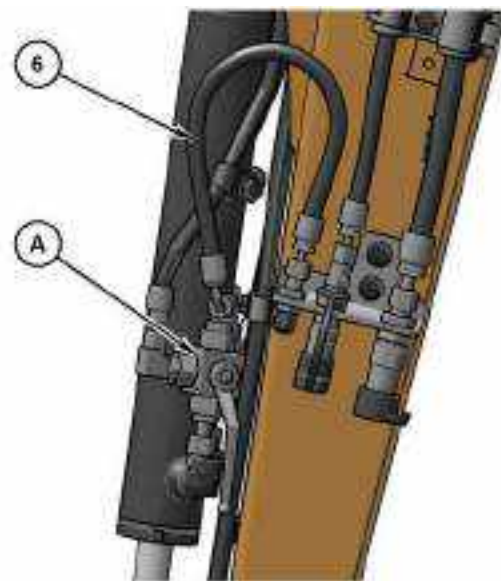


Illustration 311

g06274437

(A) Diverter Valve

(6) Auxiliary oil feed/ return line on left side of stick

Diverter valves are used to divert oil from the bucket cylinder to the auxiliary lines. These valves (A) are attached on the left and right side of the stick. The bucket auxiliary circuit is open when the right ball valve handle has been turned counter-clockwise as far as it will go and the left ball valve handle has been turned clockwise as far as it will go. The bucket auxiliary circuit is closed when the right ball valve handle has been turned clockwise as far as it will go and the left ball valve handle has been turned counter-clockwise as far as it will go.

Auxiliary oil feed/ return line on right side of stick (5).
Auxiliary oil feed/ return line on left side of stick (6).

The bucket auxiliary circuit lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The bucket auxiliary circuit lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the auxiliary hydraulic lines by performing the following steps:

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Continuous Flow

Note: The continuous flow feature must first be enabled in the monitor. Refer to Operation and Maintenance Manual, "Monitoring System" for additional information.



Illustration 312

g06287030

The operator controls the hydraulic flow rate with the thumbwheel on the right-hand joystick. To set continuous flow, first set the continuous flow feature to ON in the monitor. Then use the right thumb wheel to command Aux 1 until the desired hydraulic flow rate is achieved. Hold the thumb wheel at the desired command for 2.5 seconds. After 2.5 seconds, the continuous flow indicator on the monitor will turn green indicating that continuous flow is ACTIVE. Once the continuous flow begins, release the switch. Continuous flow will stop operating when the switch is moved or the hydraulic lockout is lifted or when the machine is turned off.

Work Tool Flow Mode Control



One-Way Flow – Move work tool flow control lever to this position when one-way flow is required.



Two-Way Flow – Move work tool flow control lever to this position when two-way flow is required.

One-Way Flow

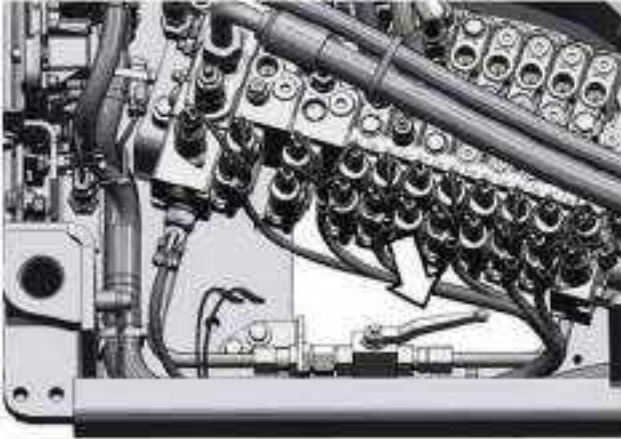


Illustration 313

g06643039

Valve position for one-way flow

The flow control manual valve is located next to the main control valve and can be accessed using the access cover near the cab door.

Two-Way Flow

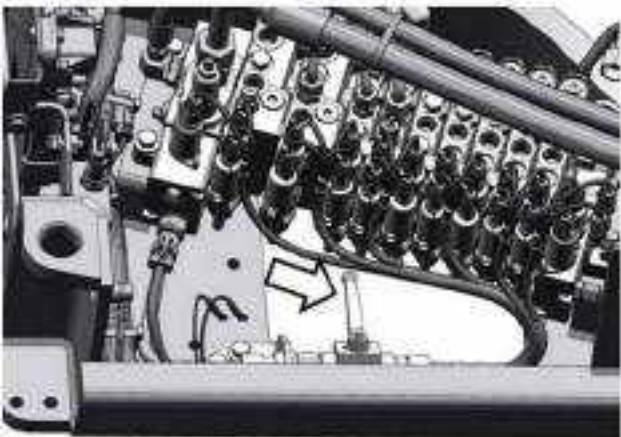


Illustration 314

g06643041

Valve position for two-way flow

The flow control manual valve is located next to the main control valve and can be accessed using the access cover near the cab door.

Auxiliary Control Pedal (AUX 1) (If Equipped)

Note: Operate the Auxiliary Control pedal carefully until you become familiar with how AUX 1 reacts to the controls.

The right Auxiliary Control pedal controls the two-way flow auxiliary line circuit (AUX 1).



Illustration 315

g06274468

(7) Pedal

To pressurize the line that is connected to the left-hand side of the stick, apply pressure to the front of the pedal (7).

To pressurize the line that is connected to the right-hand side of the stick, apply pressure to the back of the pedal (7).

Secondary Auxiliary Control (AUX II) via the Switch on the Joystick (Two-way flow) and Boom Swing Control (If Equipped)

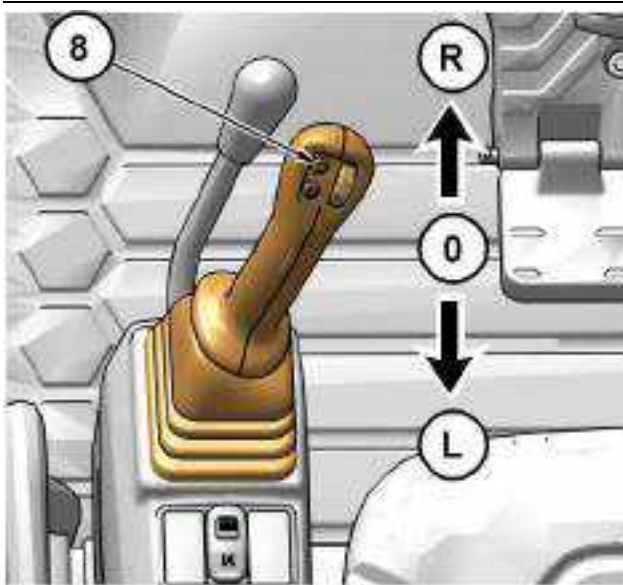


Illustration 316

g06274472

(8) Switch

The switch (8) on the left joystick activates the secondary auxiliary control (AUX II) and the swing boom control. The monitor will display which function is activated.

To swing the boom to the right, slide thumb wheel switch forward.

To swing the boom to the left, slide thumb wheel switch backward.

Note: Operate the switch for the Secondary Auxiliary/ Boom Swing Control carefully until you become familiar with how the AUX II and swing boom react to the controls.

Auxiliary Bucket Cylinder Diverter Circuit Control (If Equipped)

If the diverter valves on the boom are open, the bucket auxiliary circuit can be operated via the right joystick when in excavator pattern.

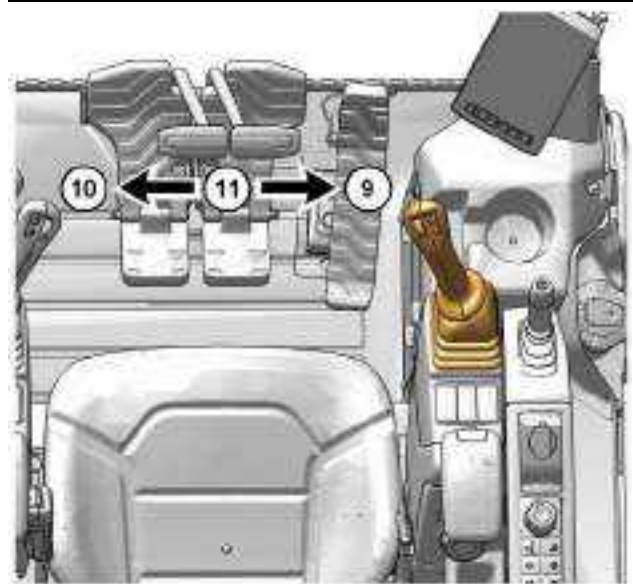


Illustration 317

g06638825

Move the right joystick to position (9) to send flow to left side of stick.

Move the right joystick to position (10) to send flow to the right side of stick.

When you release the joystick from any position, the joystick will return to the HOLD position (11). The functions will stop.

Two functions (bucket auxiliary circuit and boom) may be performed at the same time by moving the joystick diagonally.

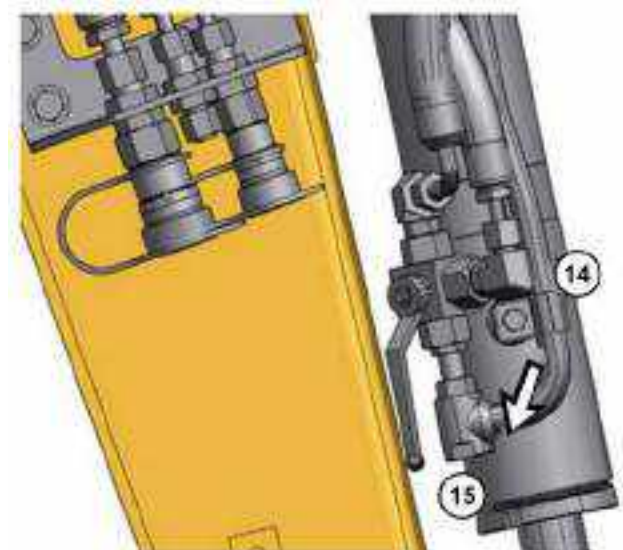


Illustration 318

g06643038

Right Side Diverter Valve

Turn the handle on each diverter valve from position (14) to position (15) to control the bucket.

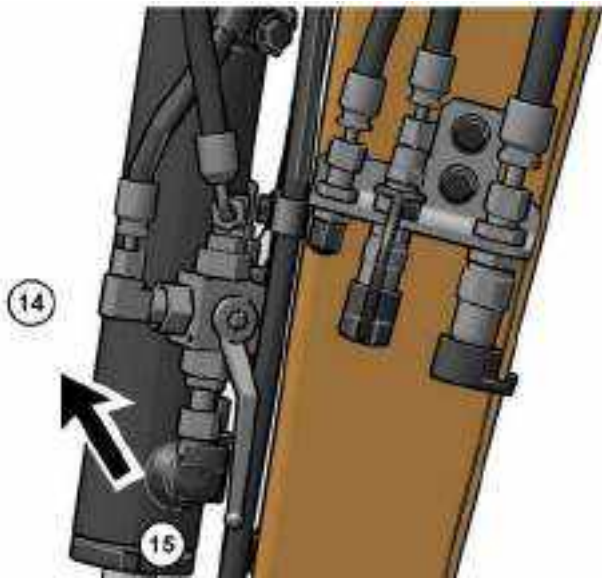


Illustration 319

g06274491

Left Side Diverter Valve

Turn the handle on each diverter valve from position (15) to position (14) to control the auxiliary circuit.

Adjustable Primary Auxiliary Valves

This feature enables the ability to adjust pressure allowing for customized and improved performance of work tools.

Standard Auxiliary



Illustration 320

g06622091

Cab door

1. Open the cab door

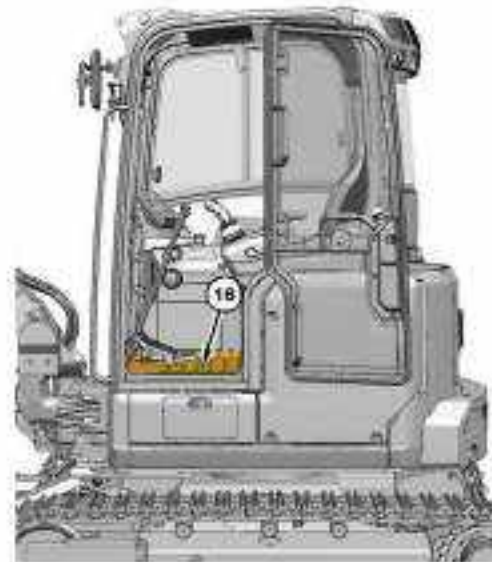


Illustration 321

g06622117

(16) Floor mat

2. Remove the floor mat (16).

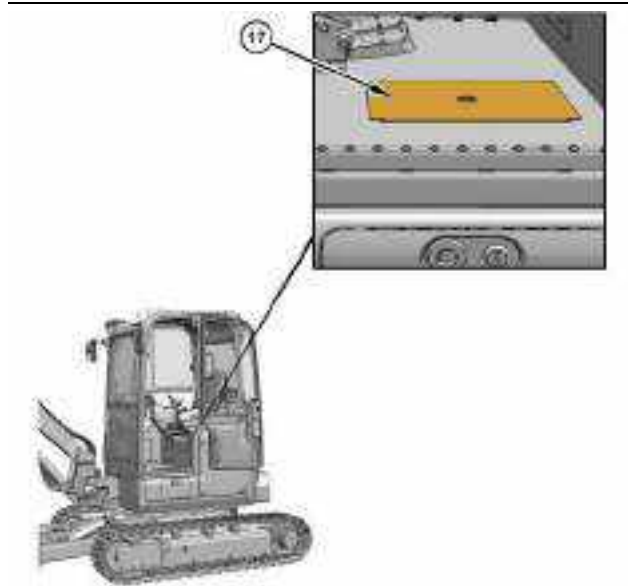


Illustration 322

g06622144

(17) Panel

- Once the floor mat (16) is removed, remove the panel (17) beneath the floor mat (16).

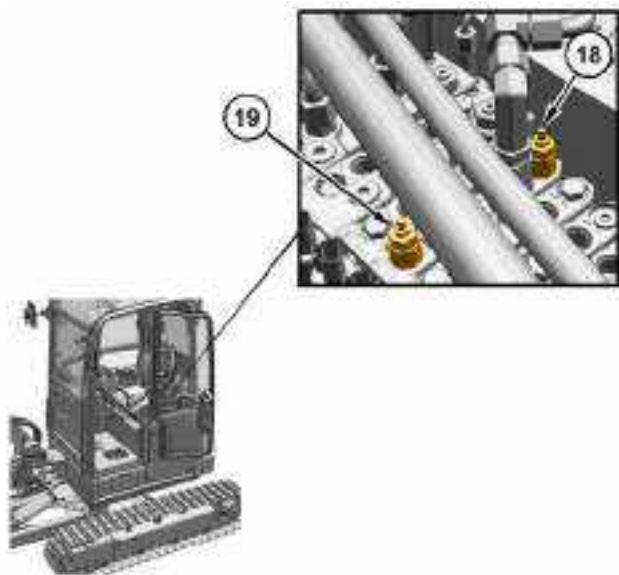


Illustration 323

g06622189

(18) Adjustable relief valve for Aux 4A
(19) Adjustable relief valve for Aux 4B

- The adjustable relief valve for Aux 4A (18) and the adjustable relief valve for Aux 4B (19) are on the main control valve.

Note: On machines equipped with High-Flow Auxiliary, adjusting the above mentioned relief valves will no benefit on the Aux 4 circuit.

i07674806

Joystick Controls Alternate Patterns

SMCS Code: 5059; 5137

WARNING

Check if control pattern 1 (Standard) or control pattern 2 (Alternate) is selected before operating the machine.

Refer to Operation and Maintenance Manual.

Failure to understand control functions could result in injury or death.

Note: Joystick Controls Alternate Patterns are not available when the joystick steer mode is ON.

The machine control pattern can be changed through the monitoring system. Refer to Operation and Maintenance, "Monitoring System" for more information.

The alternate joystick patterns will depend on the language that is selected.

If any language is selected other than Chinese or Japanese, the available alternate pattern is the "Backhoe" Pattern.

If the selected language is Chinese or Japanese, the following three alternate patterns are available:

- "SCM" Pattern
- "Mitsubishi" Pattern
- "Shin-Ko" Pattern

Backhoe Joystick Pattern

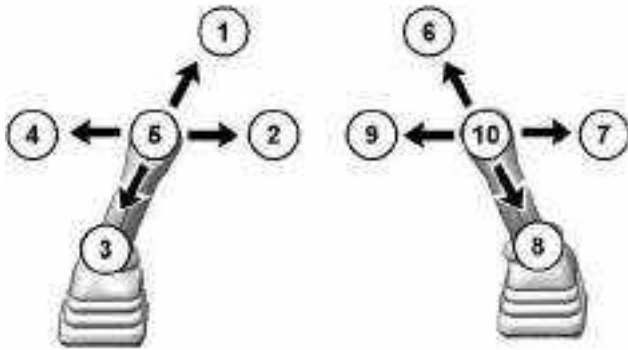


Illustration 324

g06349078



BOOM LOWER (1) – Move the joystick to this position to lower the boom.



SWING RIGHT (2) – Move the joystick to this position to swing the upper structure to the right.



BOOM RAISE (3) – Move the joystick to this position to raise the boom.



SWING LEFT (4) – Move the joystick to this position to swing the upper structure to the left.

HOLD (5) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.



STICK OUT (6) – Move the joystick to this position to move the stick outward.



BUCKET DUMP (7) – Move the joystick to this position to dump the bucket or the work tool.



STICK IN (8) – Move the joystick to this position to move the stick inward.



BUCKET CLOSE (9) – Move the joystick to this position to close the bucket or the work tool.

HOLD (10) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Two functions may be performed at the same time by moving the joysticks diagonally.

SCM Joystick Pattern

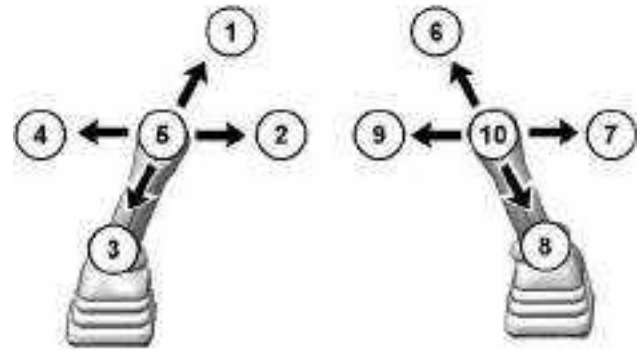


Illustration 325

g06349078



SWING RIGHT (1) – Move the joystick to this position to swing the upper structure to the right.



STICK IN (2) – Move the joystick to this position to move the stick inward.



SWING LEFT (3) – Move the joystick to this position to swing the upper structure to the left.



STICK OUT (4) – Move the joystick to this position to move the stick outward.

HOLD (5) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.



BOOM LOWER (6) – Move the joystick to this position to lower the boom.



BUCKET DUMP (7) – Move the joystick to this position to dump the bucket or the work tool.



BOOM RAISE (8) – Move the joystick to this position to raise the boom.



BUCKET CLOSE (9) – Move the joystick to this position to close the bucket or the work tool.

HOLD (10) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Two functions may be performed at the same time by moving the joysticks diagonally.

Mitsubishi Joystick Pattern

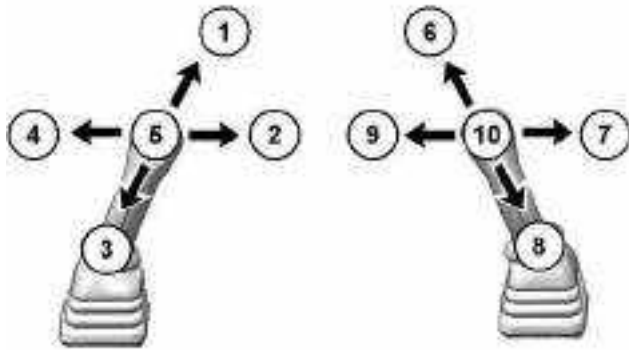










Illustration 326

g06349078

-  **BOOM LOWER (1)** – Move the joystick to this position to lower the boom.
-  **BUCKET CLOSE (2)** – Move the joystick to this position to close the bucket or the work tool.
-  **BOOM RAISE (3)** – Move the joystick to this position to raise the boom.
-  **BUCKET DUMP (4)** – Move the joystick to this position to dump the bucket or the work tool.

HOLD (5) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

-  **STICK IN (6)** – Move the joystick to this position to move the stick inward.
-  **SWING RIGHT (7)** – Move the joystick to this position to swing the upper structure to the right.
-  **STICK OUT (8)** – Move the joystick to this position to move the stick outward.
-  **SWING LEFT (9)** – Move the joystick to this position to swing the upper structure to the left.

HOLD (10) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Two functions may be performed at the same time by moving the joysticks diagonally.

Shin-Ko Joystick Pattern

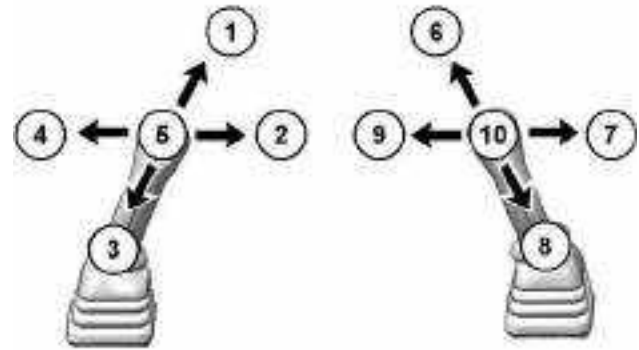










Illustration 327

g06349078

-  **BOOM LOWER (1)** – Move the joystick to this position to lower the boom.
-  **BUCKET CLOSE (2)** – Move the joystick to this position to close the bucket or the work tool.
-  **BOOM RAISE (3)** – Move the joystick to this position to raise the boom.
-  **BUCKET DUMP (4)** – Move the joystick to this position to dump the bucket or the work tool.

HOLD (5) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

-  **STICK OUT (6)** – Move the joystick to this position to move the stick outward.
-  **SWING RIGHT (7)** – Move the joystick to this position to swing the upper structure to the right.
-  **STICK IN (8)** – Move the joystick to this position to move the stick inward.
-  **SWING LEFT (9)** – Move the joystick to this position to swing the upper structure to the left.

HOLD (10) – When you release the joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Two functions may be performed at the same time by moving the joysticks diagonally.

Engine Starting

i08709810

Engine Starting

SMCS Code: 1000; 1090; 1456; 7000

WARNING

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

WARNING

Do not hold the engine start switch in the GLOW PLUG "II" position for longer than 10 seconds. Holding the engine start switch in this position can damage glow plugs and other engine components.

1. Move all hydraulic controls to the HOLD position or to the NEUTRAL position. Refer to "Joystick Controls" for more information.
2. Move the hydraulic lockout control to the RAISED position. Refer to "Operator Controls" for more information.

Note: The engine will not start unless the hydraulic lockout control is in the RAISED position.

3. Enable Auto Idle Control mode. Refer to "Monitoring System" for more information.
4. Move the governor control lever to the low idle position before you start the engine. Refer to "Operator Controls" for more information.
5. Before you start the engine, check for the presence of bystanders or maintenance personnel. Ensure that all personnel are clear of the machine. Briefly sound the horn before you start the engine. Refer to "Operator Controls" for more information.
6. If the engine is cold, turn the engine start switch key to the RUN position. Hold the key in this position until the glow plug lamp turns off, then start the engine by turning the key to the START position. Refer to "Operator Controls" for more information.

NOTICE

Do not crank the engine for more than 10 seconds. If the engine does not start, allow the starter to cool for 2 minutes before cranking again. The engine start switch must be turned to the OFF position before trying to restart.

7. Turn the engine start switch key to the START position. Refer to "Operator Controls" for more information.
8. When the engine starts, release the engine start switch key.
9. If the engine does not start, release the engine start switch key and allow the starter to cool. Then, repeat steps 6 through step 8.
10. After the engine starts, leave the engine in low idle for at least 1 minute. If the engine is cold, refer to "Engine and Machine Warm-Up" for more information.

Note: When the engine has been started at an altitude of 800 m (2625.0 ft) or higher, the engine has slightly less power. However, when working, this reduction is not noticeable.

i07425934

Engine and Machine Warm-Up

SMCS Code: 1000; 7000

NOTICE

Keep the engine speed low until the engine oil pressure registers on the gauge or until the engine oil indicator light goes out.

If it does not register or the light does not go out within ten seconds, stop the engine and investigate the cause before starting again. Failure to do so, can cause engine damage.

Note: The hydraulic lockout control must be in the LOWERED position before the hydraulic controls will function.

1. Allow the engine to warm up at low idle for 5 minutes. Engage the joysticks for the work tool control and disengage the joysticks for the work tool control. This method will speed up the warm-up of the hydraulic components. If the temperature is cold or if hydraulic functions are sluggish, additional time may be required.

Operation Section
Engine and Machine Warm-Up

2. To warm up the hydraulic oil, turn the engine speed dial to the medium engine speed. Run the engine for approximately 3 minutes and move the joystick intermittently from the BUCKET DUMP position to the HOLD position. Do not hold the joystick in the BUCKET DUMP position with the bucket cylinder fully extended for more than 10 seconds.
3. Move the engine speed dial to the maximum engine speed. Repeat Step 2.

This allows the oil to attain relief pressure, which causes the oil to warm up more rapidly.

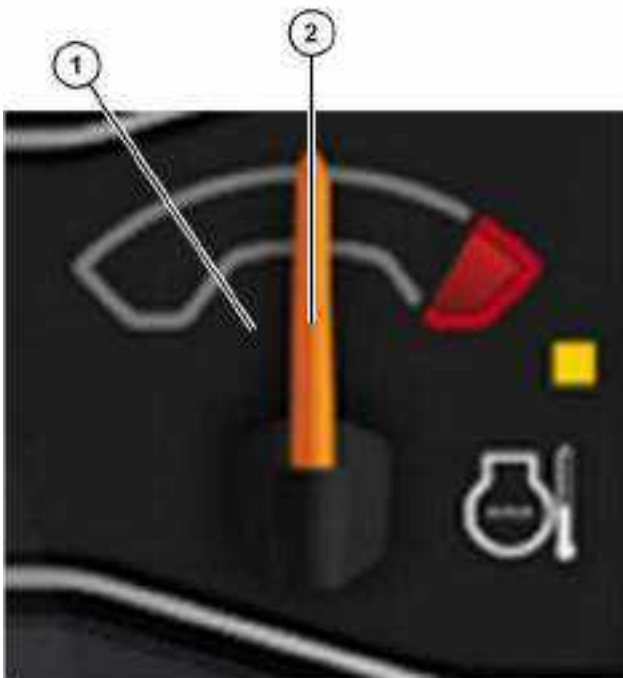


Illustration 328

g06319355

- (1) 40° C (104° F)
(2) 80° C (176° F)

4. Allow the engine to warm up until the coolant temperature dial reaches 40° C (104° F) (1) or, if at higher altitude or cold conditions, 80° C (176° F) (2).
5. Cycle all controls to circulate warm oil through all hydraulic cylinders and through all hydraulic lines.

⚠ WARNING

When you cycle the machine controls, the machine can move suddenly. Contact between the machine and external objects or ground personnel can result in serious injury or death. Before you cycle the machine controls, the machine should be located in an unobstructed, hazard-free work area that is away from external objects and ground personnel.

6. Observe the gauges and the indicators frequently during the operation.

Operation

i08484409

Operation Information

SMCS Code: 7000

Make sure that no personnel are on the machine or near the machine in order to prevent any personal injury. Keep the machine under control at all times in order to prevent injury.

If the boom is in the raised position and if the engine is stopped, refer to Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped" for the procedure to lower the boom.

Reduce the engine speed when you maneuver the machine in tight quarters and when you drive over an incline.

Select the necessary travel speed range before you drive downgrade. Do not change the speed range while you drive downhill.

Use the same travel speed on a downgrade and on an upgrade.

When you travel for any distance, keep the stick inward and carry the boom in a low position. A machine that is equipped with a blade should travel with the blade in the highest position.

When you travel on a steep grade, keep the work tool as close to the ground as possible on the downhill side of the machine.

When you travel on moderate uphill grades, keep the boom on the uphill side of the machine.

Operating Procedure

1. Adjust the operator seat.
2. Fasten the seat belt.
3. Start the machine and refer to Operation and Maintenance Manual, "Engine and Machine Warm-Up" for information about warming the engine and warming the hydraulic oil.
4. Raise the boom enough in order to provide sufficient ground clearance.
5. Make sure that the position of the upper structure and of the undercarriage is known before you move the machine. The dozer blade should be in front of the machine.

Note: The travel levers will operate normally if the dozer blade is in front of the machine. The travel levers will operate backward if the dozer blade is behind the machine.

6. Rotate the engine speed dial clockwise in order to increase the engine speed to the desired speed.
7. Push both travel levers forward at the same time in order to travel forward. If both travel levers are pushed farther, the travel speed at the selected engine speed will be faster.

Note: If the machine does not operate or if the machine does not travel in a straight line, consult your Caterpillar dealer.

8. See Operation and Maintenance Manual, "Operator Controls" for information on "Travel Control". This instruction is about spot turning and about pivot turns.
9. When you make turns in soft material, travel in a forward direction occasionally in order to clear the tracks.
10. Slowly move both of the travel levers to the center position in order to stop the machine.

Lifting Objects

Regional regulations may require the use of an overload warning device and boom and stick lowering control valves when used to lift objects.

The overload warning device (if equipped) must be adjusted for the bucket linkage and bucket size that is installed on the machine. Adjust the overload warning device for proper operation.

The setting for the overload warning device (if equipped) should be checked by an authorized dealer.

Contact your Cat dealer for additional information.

i07287854

Frozen Ground Conditions

SMCS Code: 7000

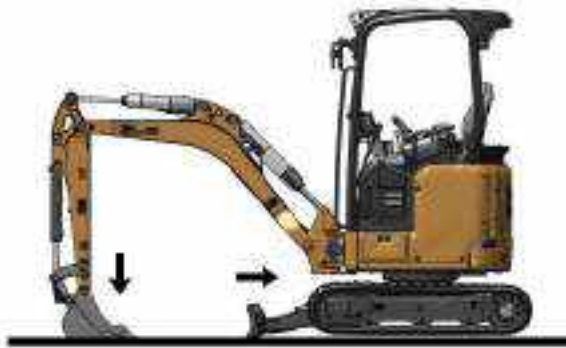


Illustration 329

g06275430

To free the tracks from frozen ground, swing the boom to the front of the machine. Use boom down pressure to free the idler end of the machine.

Swing the boom to the rear of the machine. Use boom down pressure to free the sprocket end of the machine.

i07245364

Equipment Lowering with Engine Stopped

SMCS Code: 7000

To lower the boom, place the hydraulic activation control lever in the UNLOCKED position. Move the joystick to the BOOM LOWER position. If the accumulator is still charged, the boom will lower.

If the boom does not lower, the accumulator is empty. Use the following method to lower the boom.

WARNING

Be sure no one is under or near the work tools before manually lowering the boom. Keep all personnel away from the boom drop area when lowering the boom with the engine stopped in order to avoid possible personal injury.

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.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

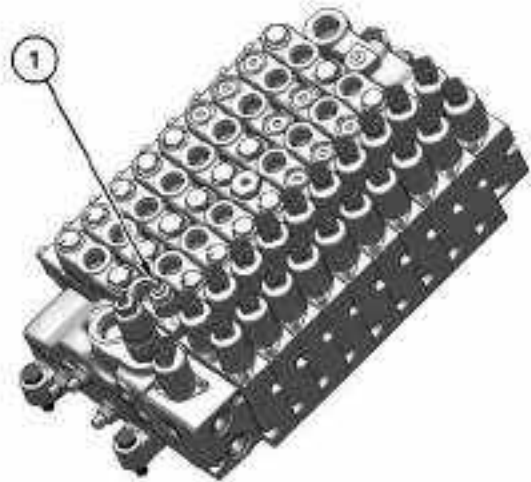


Illustration 330

g06264442

1. Remove plug (1) on end of valve with 5 mm hex wrench.
2. Turn screw clockwise with 4 mm hex wrench until the relief is forced open and the boom begins to lower.
3. Make sure that the work tool has lowered all the way to the ground. Reset the valve by turning the screw counter clockwise until the valve returns to the original position.
4. Replace the plug.
5. Make the necessary repairs before you operate the machine.
6. Check the level of the hydraulic fluid. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level-Check".

Blade (If Equipped)

To lower the blade, place the hydraulic lockout control in the UNLOCKED position. Move the blade control lever to the BLADE LOWER position. If the accumulator is still charged, the blade will lower.

If the blade does not lower, the accumulator is empty. The blade will need to be blocked in the raised position until the engine can be started again.

Additional instructions can be found in the service manual and/or consult your Cat dealer.

Operating Techniques

i07929204

Operating Technique Information

SMCS Code: 7000

WARNING

Know the maximum height and reach of your machine. Serious injury or death by electrocution can occur if machine, work tools, or attachments are not kept a safe distance from electrical power lines. Keep distance at least 3 m (10 ft) Plus additional 10 mm (.4 inch) for each 1,000 volts over 50,000 volts.

For safety, the local codes, the state codes, or the requirements of the job site may require a greater distance.

NOTICE

When swinging into a ditch, do not use the ditch to stop the swinging motion. Inspect the machine for damage if the boom is swung into a bank or an object.

Repeated stopping by an object can cause structural damage if the boom is swung into a bank or an object.

Always swing as slowly as possible. Sudden swing start/stop motion can cause machine instability.

With certain work tool combinations, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

Whenever the tracks of the machine raise off the ground while digging, lower the machine back to the ground smoothly. Do not drop or catch the machine with the hydraulics. Damage to the machine can result.

Do not move hydraulic cylinders to the end of the stroke. This could cause structural damage to the cylinders.

When digging, do not allow the stick cylinder or the bucket cylinder to contact the edge of the excavation.

Do not dig or excavate while the machine is traveling. This could cause damage to the work tool or to the machine.

Do not use the bucket as a pile driver or a hydraulic hammer.

With certain combinations of work tools, the auxiliary hydraulic pedal can have different functions. Always check the function of the auxiliary hydraulic pedal before you use the pedal.

Know the location of any buried cables. Mark the locations clearly before you dig.

Consult your Cat dealer for special bucket tips that are available for use in severe applications.

Move the machine whenever the position for digging is not efficient. The machine can be moved forward or backward at any time during the operating cycle.

When you perform work in close places, utilize the bucket or other work tools in order to perform the following functions:

- Pushing the machine
- Pulling the machine
- Lifting the tracks

Use consistent, comfortable speeds while you operate the machine.

For efficient operation, use more than one control at a time, when possible.

Never swing the bucket or a load over a truck cab or any personnel.

Position a truck so that the machine can load material into the truck from the rear or from the side. Load the truck evenly so that the rear axles are not overloaded.

Do not use oversize buckets or oversize work tools, as this could make the machine unstable.

Machines which are equipped with a canopy, a polycarbonate shield must be installed when a work tool that may create flying objects is used. Always remember to wear your safety glasses even when the polycarbonate shield is in place. Consult your work tool Operation and Maintenance Manual in order to determine if using a work tool will require the polycarbonate shield.

Digging

1. Lower the blade to the ground in order to ensure better machine stability while you are digging.
2. Position the stick at a 90 degree angle to the boom.
3. Position the bucket cutting edge at a 120 degree angle to the ground. Maximum breakout force can now be exerted with the bucket.

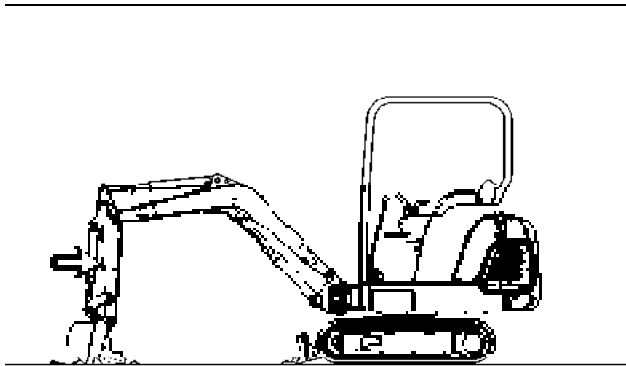


Illustration 331

g00394783

4. Move the stick toward the canopy and keep the bucket parallel to the ground.
5. If the stick stops due to the load, raise the boom and/or perform a curl in order to adjust the depth of the cut.
6. To apply the greatest force at the cutting edge, decrease the down pressure as you move the stick toward the canopy.
7. Maintain a bucket attitude that ensures a continuous flow of material into the bucket.
8. Continue the pass in a horizontal direction so that material peels into the bucket.

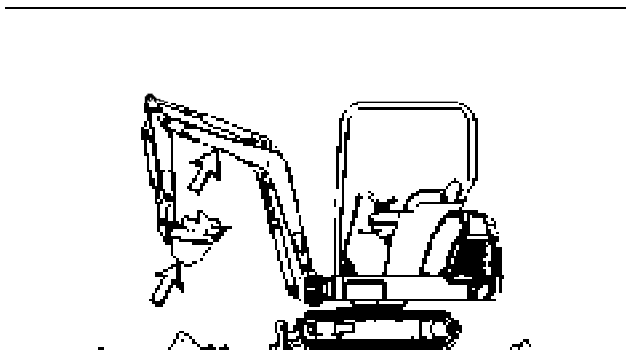


Illustration 332

g00394917

9. Close the bucket and raise the boom when the pass has been completed.
10. Engage the swing control when the bucket is clear of the excavation.

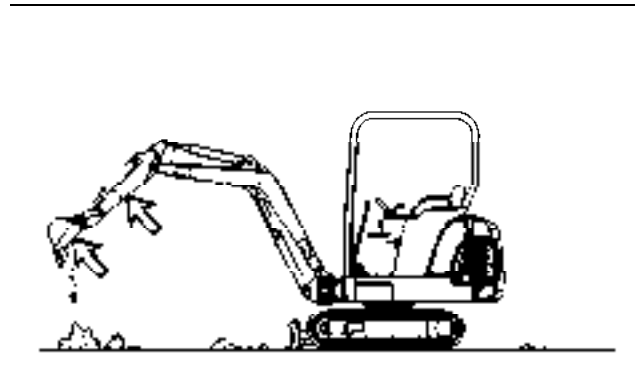


Illustration 333

g00394937

11. To dump a load, move the stick outward and open the bucket in a smooth motion.

Lifting Objects

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Japan regulations require a shovel crane configuration to lift certain objects. Contact your Caterpillar® dealer for more information.

DANGER

Crushing hazard. The excavator may be used for applications with lifting gear only if the prescribed safety devices are in place and functional.

Failure to follow this precautionary measure will lead to serious injury or death.

- Acoustic and optical warning device
- Boom lowering control device
- Suitable equipment for fastening and securing loads
- The lift capacity table must be observed
- Approved bucket linkage with lifting point

WARNING

To prevent injury, do not exceed the rated object handling capacity of the machine. If the machine is not on level ground, the rated object handling capacities will vary.

WARNING

When lifting a load with the blade on the ground, do not raise the blade once the load has been lifted. This action may cause instability and sudden movement of the machine and of the object that is being lifted.

Sudden movement of the machine or the lifted object can cause personal injury.

NOTICE

Damage to bucket cylinder, bucket or linkage could result if slings are placed incorrectly.

Secure the load to prevent the load from falling.

Short slings will prevent excessive load swing. In order to avoid oscillating movements:

- Carry out smooth, slow movements with the machine
- Bear in mind the weather conditions (e.g. wind force, etc.)

Only use the approved lifting point on the Cat bucket linkage in order to lift objects. Lifting capacities are calculated from this point. Adjust to this capacity accordingly. Refer to Operation and Maintenance Manual, "Lifting Capacities" for more information on lifting objects with the machine.

The connection must be made with a sling or with a chain, so that it is not possible to unhook the sling or chain unintentionally.

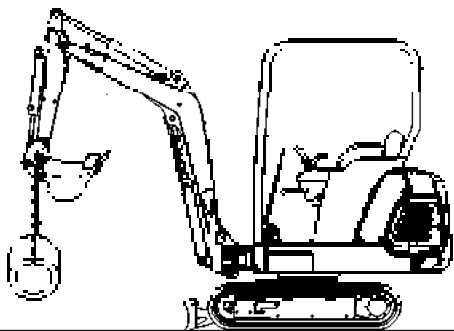


Illustration 334

g00394957

An unstable condition can exist if a load exceeds the machine load rating or if a heavy load is swung over an end or over a side. Lower the blade to the ground in order to increase the stability of the machine.

The most stable lifting position is over a corner of the machine.

For the best stability, carry a load close to the machine and to the ground.

Lift capacity decreases as the distance from the swing centerline is increased. Obey the load charts that are given in Operation and Maintenance Manual, "Boom/Stick/Bucket Combinations".

Position the lifting gear ensuring the sling is not deflected by other parts.

Do not use any lifting gear and slings that are damaged or not sufficiently dimensioned.

The lifting gear must be designed to withstand the loads that can arise in the different positions of the work equipment or parts of the boom. Lateral loads and diagonal tensile forces must also be taken into account.

The sling must be checked regularly by a qualified technician, at least once a year. Replace damaged slings immediately.

Fasten lifting gear and slings to avoid risk, such as rotating parts and crushing or shearing. Furthermore, neither must the work equipment be affected by the lifting gear, nor must the functions of the lifting gear be affected by external influences, such as dirt that cannot be removed by simply cleaning.

Do not place slings over sharp edges.

The persons attaching or securing loads may approach the boom from the side only, and only after the machine operator has given permission. The machine operator may give permission only after the machine is at a standstill and the work attachment no longer moves.

Staying under the suspended loads, in the danger area or under the machine attachment, is forbidden.

Have loads fastened and operators instructed by a qualified person competent in ranging operation and standard hand signals. The person giving instructions to the operator must be in sight of the operator during load attachment and disconnection.

The machine operator must guide the load near the ground and avoid any oscillating or swinging movements.

Machine travel with a raised load must be done carefully on a level surface. Move slowly to avoid sudden motion that can cause swinging or oscillation of the load.

The machine operator must not raise loads over persons.

The machine operator may not leave the seat or stop the engine as long as the load is raised.

i07287891

Travel in Water and Mud

SMCS Code: 7000-V6

NOTICE

When working in or around any body of water, around a stream or river, or in conditions of heavy mud, be careful that the swing bearing, the swing drive gear, and the swivel joint do not dip into water, mud, sand, or gravel. If the swing bearing dips into water, mud, sand, or gravel, immediately grease the swing bearing until the used grease leaks from the outer circle of the swing bearing. Failure to carry out this procedure may cause premature wear in the swing bearing.



Illustration 335

g06275447

Maximum depth of water to the top edge of the idler wheel.

The following guidelines pertain to travel across water and through mud, sand, or gravel.

The machine can travel across a river only under the following conditions:

- The bed of the river is flat.
- The flow of the river is slow.
- The machine dips into the water only to the center of the track carrier roller (dimension A).

While you cross the river, carefully confirm the depth of the water with the bucket. Do not move the machine into an area that has a water depth that is greater than Dimension A.

The machine may sink gradually on soft ground. Therefore, frequently check the height of the undercarriage from ground level and the depth of water on the ground.

If you have any doubts that the water might have been too deep, contact your Cat dealer for the required check.

After you travel through water, carefully clean the machine to remove any salt, sand, or other foreign matter.

Procedure for Removing the Machine from Water or Mud

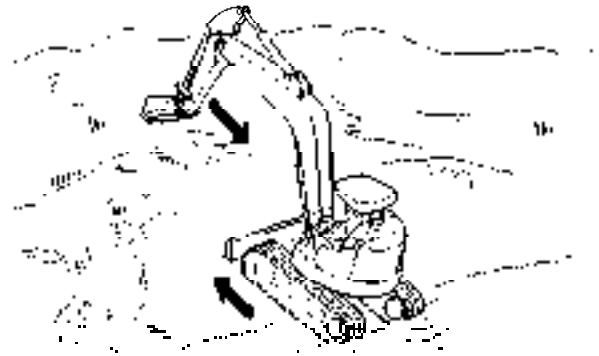


Illustration 336

g00818886

1. You may not be able to move the machine by using the travel controls only. In this case use both the travel control levers/pedals and the stick to pull the machine out of the water or ground.

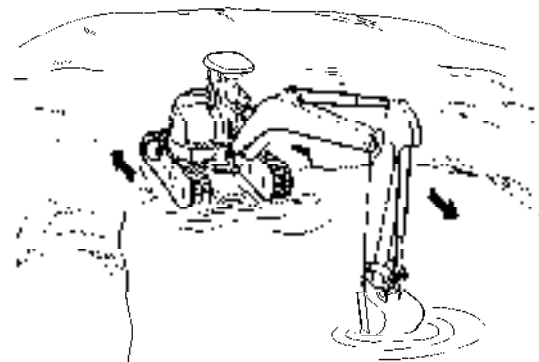


Illustration 337

g00818890

2. The machine may slip because of a steep slope. The procedure in Step 1 may not work. In this case, first rotate the upper structure by 180°. Then use both the travel control levers/pedals and the stick to move the machine up the slope.



Illustration 338

g06275725

3. It may be impossible to travel because the bottom of the frame comes into contact with the ground or the undercarriage is clogged with mud or gravel. In this case, operate the boom and the stick together. Raise the track and rotate the track forward and backward to remove the mud and the gravel.

i05374164

Quick Coupler Operation (Manual Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in injury or death.

Do not operate this machine until you have positive indication that the coupler pins are fully engaged. Check for engagement by:

1. Position the work tool on the ground.
2. Apply slight down pressure on the work tool.
3. Retract and extend the stick cylinder in order to push the work tool against the ground. Visually confirm that there is no movement between the coupler and the work tool.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged onto the pins. Read the Operator's Manual.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Position the work tool on a level surface.

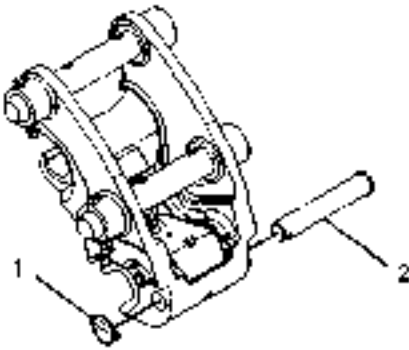


Illustration 339

g02165934

2. Remove lynch pin (1) and the safety pin (2).
3. Retract the work tool cylinder. Position the open hook on the quick coupler over the top pin of the work tool.

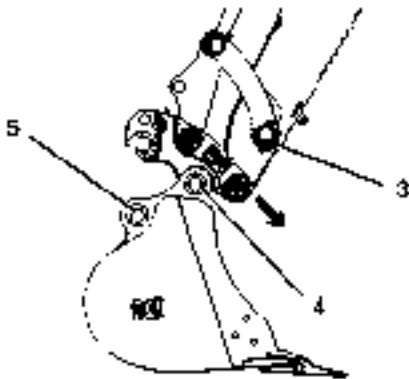


Illustration 340

g02165936

4. Move stick (3) inward and lower the stick until the hook engages the top pivot pin (4) of the work tool.
5. Rotate the quick coupler toward the machine and lift the bucket from the ground.
6. With increased engine speed, extend the work tool cylinder in order to rotate the quick coupler and the bucket toward the stick. When the cylinder is almost at the end of the stroke, reverse the direction of the cylinder. This will cause the bucket to swing. The bucket will drop into the quick coupler and the lower pin (5) of the bucket will engage. Stop the engine.

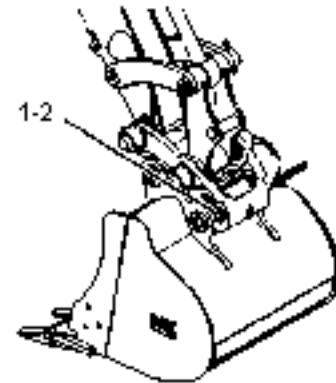


Illustration 341

g02193894

7. Fully insert the safety pin (2) into the bore of the quick coupler. Install the lynch pin (1) in order to secure the safety pin.
8. In order to verify the engagement of the work tool, perform the following procedure.
 - a. Start the engine. Retract and extend the stick cylinder in order to push the work tool against the ground.
 - b. Ensure that there is no movement between the work tool and the quick coupler.
 - c. Visually confirm the engagement of the work tool.

Uncoupling 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 Hydraulic Quick Coupler is disengaged.

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

Operation Section
Manual Pin Grabber Quick Coupler (If Equipped)

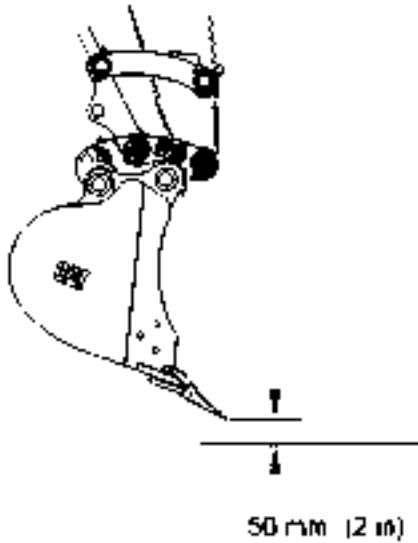


Illustration 342

g01502436

1. Lower the bucket to approximately 50 mm (2 inch) above the ground. The cutting edge should be slightly lower than the rear of the bucket. Other work tools may need to be lowered to the ground.

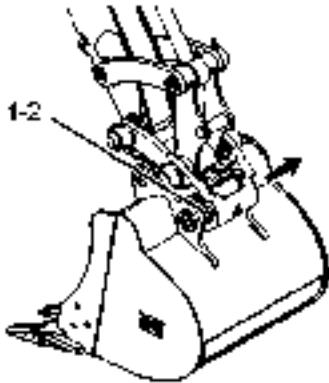


Illustration 343

g02165954

2. Remove lynch pin (1) and safety pin (2) from the quick coupler.

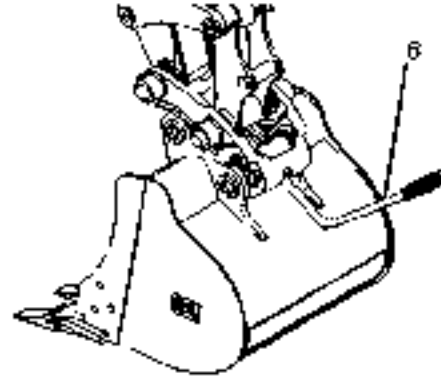


Illustration 344

g02165973

3. Insert the release lever (6). Push down on the release lever (6) in order to open the hook. The work tool will swing away from the coupler.

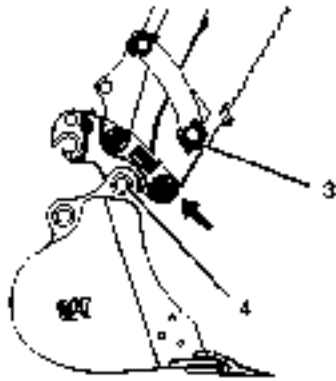


Illustration 345

g02193895

4. Raise stick (3) and move stick (3) away from the work tool in order to release the quick coupler from pivot pin (4) of the work tool.

i05505856

Quick Coupler Operation (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

General Operation

The quick coupler is used to change work tools, with minimal effort on the operators part. The quick coupler can be used with a broad range of buckets and work tools. Each work tool must have a set of pins in order for the quick coupler to work properly.

The work tools are held onto the quick coupler by two independent locking mechanisms. The work tool rear pin locking mechanism consists of a wedge that is actuated by a mechanical threaded actuator. This actuator provides a positive lock and is adjustable to ensure a rigid, tight interface between the work tool and the quick coupler. Additionally, a fully independent locking system exists on the front pin of the work tool. This system is spring applied, ensuring that the work tool is locked immediately after the front pin of the work tool is seated. Always ensure that both locking mechanisms are working properly before using the quick coupler.

Installation

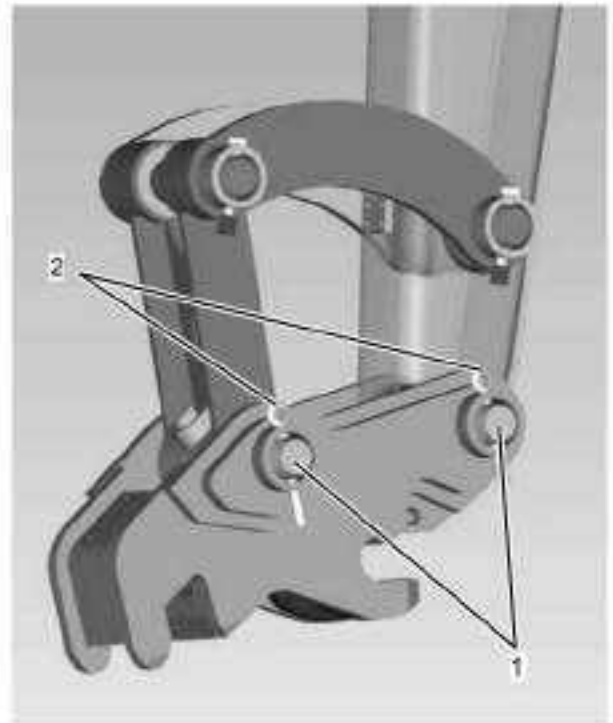


Illustration 346

g02869245

1. The quick coupler comes with two linkage pins (1) for installation on the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.
2. Install the coupler and the linkage pins (1).

3. Install the cotter pins (2).

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that both the front and rear pin locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged onto the pins. Read the Operator's Manual.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Retract the bucket cylinder, positioning the quick coupler front locking mechanism over the front pin of the work tool.

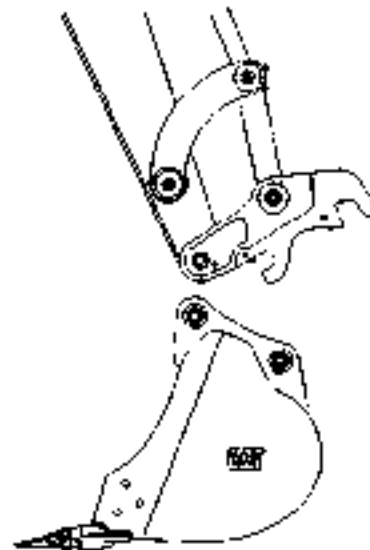


Illustration 347

g02163290

2. Align the quick coupler front locking mechanism over the front pin of the work tool. Extend the stick cylinder until the automatic front locking mechanism of the quick coupler engages and secures the front pin of the work tool.

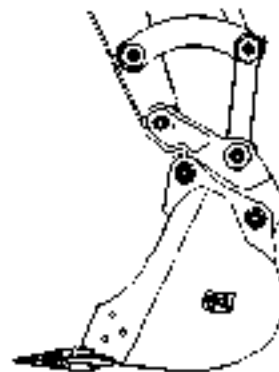


Illustration 348

g02163292

3. Extend the bucket cylinder in order to rotate the quick coupler toward the work tool until the quick coupler contacts the rear pin of the work tool. Position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Stop the engine.

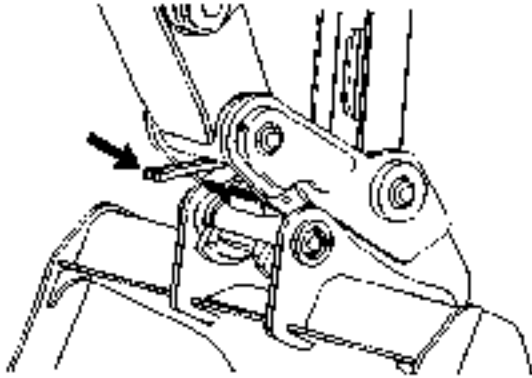


Illustration 349

g02165065

4. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the ratchet in a clockwise direction in order to tighten the rear locking mechanism.
5. In order to verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that both the work tool front and rear pin locking mechanisms are locked and securing the work tool to the coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the quick coupler.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

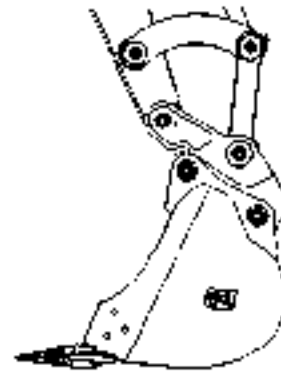


Illustration 350

g02163292

1. In order to unlock the coupler, position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Other work tools may need to be lowered to the ground. Stop the engine.

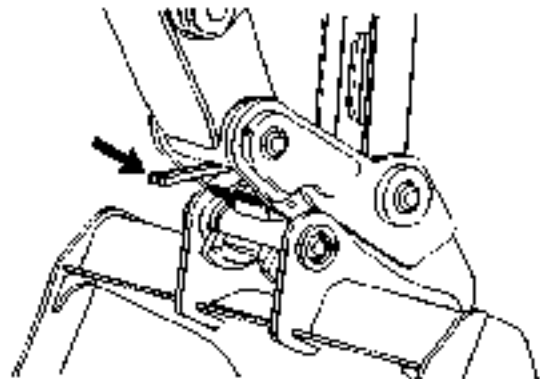


Illustration 351

g02165065

2. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the wrench in a counterclockwise direction in order to release the rear locking mechanism.

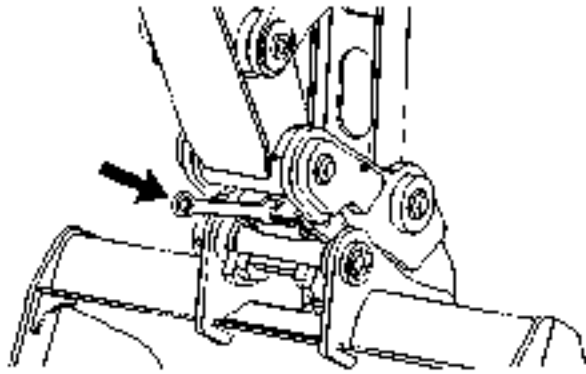


Illustration 352

g02165068

3. Using the supplied wrench, if equipped, and insert the open wrench end onto the front lock actuator. Push down on the wrench to rotate the front lock into an unlocked, detent position.
4. Start the engine. Lower the work tool to the ground.
5. Retract the bucket cylinder in order to rotate the quick coupler away from the work tool until the quick coupler disengages the rear pin of the work tool.
6. Move the stick away from the work tool in order to release the quick coupler from the front pin of the work tool. The front locking mechanism will automatically reset. The quick coupler is now ready to engage the next work tool.

Quick Coupler use with a Bucket that is Reversed

NOTICE

When some Cat buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling. The coupler must be in position between the bucket bosses.

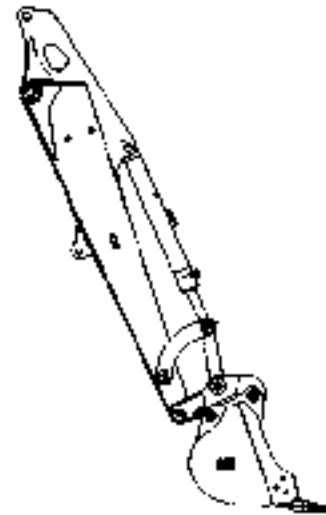


Illustration 353

g02163425

1. Follow the same steps for coupling and uncoupling the work tool in order to operate the coupler with a bucket that is reversed. Refer to "Coupling the Work Tool" and "Uncoupling the Work Tool" for the proper procedure.

i07423159

Quick Coupler Operation (If Equipped)

SMCS Code: 6129; 6522; 7000

Quick Coupler Ready (If Equipped)

Quick Coupler Ready is the definition for the installation of an additional hydraulic control circuit, which is routed to the end of the stick.

If a Hydraulic Quick Coupler is installed, ensure that the machine is equipped with the Quick Coupler Ready System and that the Hydraulic Quick Coupler and the matching work tools are approved for that machine. Caterpillar will not be liable for personal injury and/or damage to property caused by failure to observe the following:

Obey the instructions described in the Operation and Maintenance Manual of the Hydraulic Quick Coupler.

Store the Operation and Maintenance Manual of the Hydraulic Quick Coupler in the machines literature compartment.

The installation of a non-approved Hydraulic Quick Coupler may change the machines original operating functions and its description in the machines Operator and Maintenance Manual.

Furthermore, the following points have to be considered:

- If necessary, modifications and/or supplements have to be carried out at the machine (for example, safety decals), and/or its manuals (for example, changes to the described functionality).
- The Intended Use of the machine might have to be limited.
- The machines EC or EU-Declaration of Conformity might be compromised by fitting a Hydraulic Quick Coupler that does not match with the machine and its interface (for example, provided pressures).
- The Hydraulic Quick Couplers EC or EU-Declaration of Conformity might be compromised by installing the Hydraulic Quick Coupler on a host machine that does not match with the Hydraulic Quick Coupler and its interface (for example, required pressures).

General Operation

The hydraulic quick coupler is used to change work tools while the operator remains in the operator station.

As for how the work tools are held onto the hydraulic quick coupler and how the hydraulic quick coupler is operated, refer to the Hydraulic Quick Coupler Operation and Maintenance Manual. Always ensure that the hydraulic system and the locking mechanisms are working properly before using the hydraulic quick coupler.

If a lifting eye is included on the Hydraulic Quick Coupler, release the work tool from the Hydraulic Quick Coupler to use the lifting eye to pick up loads. To lift a load with the lifting eye, extend the bucket cylinder until the Hydraulic Quick Coupler is in a vertical position. Do not exceed the rated load for the machine.

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Refer to Operation and Maintenance Manual, “Lifting Objects”, for more information on lifting objects with the machine.

Installation

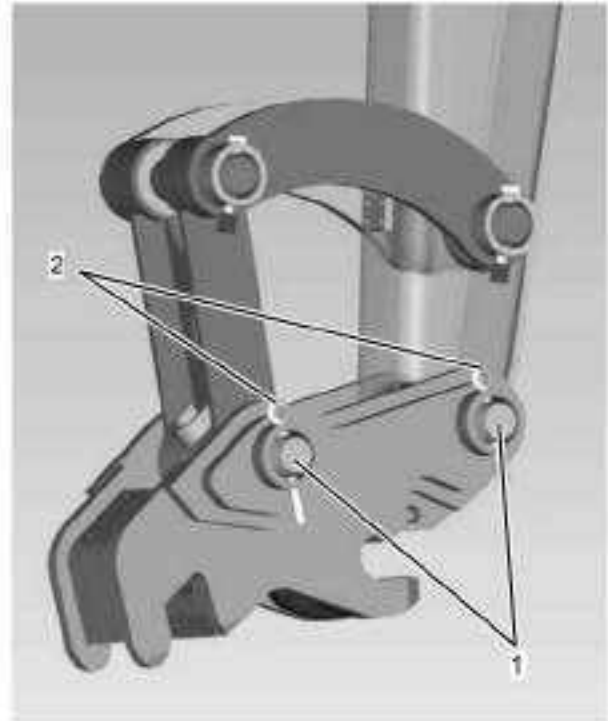


Illustration 354

g02869245

Note: The selection and installation of a Hydraulic Quick Coupler is subject to Cat dealers only.

1. Make sure that the linkage pins (1) fit the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.

Note: If the machine is filled with biodegradable oil, make sure that the Hydraulic Quick Coupler is approved for that type of hydraulic oil. Flush the Hydraulic Quick Couplers hydraulic system with the same biodegradable oil as used in the machine.

2. Install the Hydraulic Quick Coupler and the linkage pins (1).
3. Secure the retaining pins (2) properly.
4. Connect the hydraulic lines following the instructions in the Hydraulic Quick Coupler Operation and Maintenance Manual.
5. Purge the system.

6. Perform a functional test and make sure that everything works properly as described in the Operation and Maintenance Manual of the machine and the Hydraulic Quick Coupler.
7. Check the Hydraulic Quick Coupler and its lines/connectors for any leakage.

Quick Coupler Operation

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that all locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged. Read the Operator's Manuals.

NOTICE

The buzzer will not sound when the switch is in the lock position. The position of the switch does not confirm the Hydraulic Quick Coupler is engaged. A physical test is required by dragging the work tool on the ground to confirm the Hydraulic Quick Coupler is engaged.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab/canopy or the front of the machine. Always check for interference when first operating a new work tool.

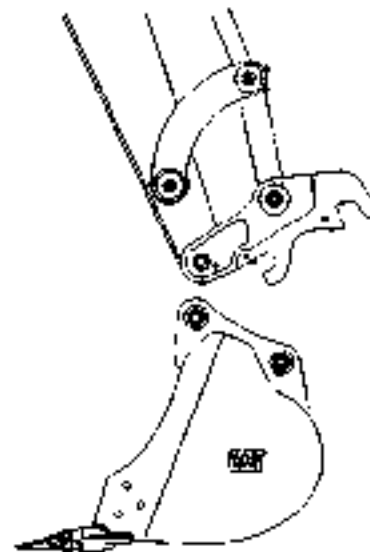


Illustration 355

g02163290

1. Align the Hydraulic Quick Coupler with the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

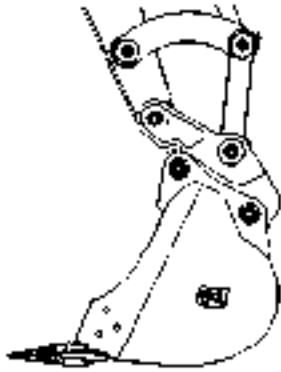


Illustration 356

g02163292

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The Quick Coupler Ready System provides the adjusted pressure to the Hydraulic Quick Coupler. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.
4. Attach the Hydraulic Quick Coupler to the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged. Read the Operator's Manual.

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

5. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.
6. To verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that the locking mechanisms of the work tool are locked and securing the work tool to the Hydraulic Quick Coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the Hydraulic Quick Coupler.

NOTICE

Back drag the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked.

Do not strike the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked. Striking the work tool on the ground may result in damage to the Hydraulic Quick Coupler and the host machine.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

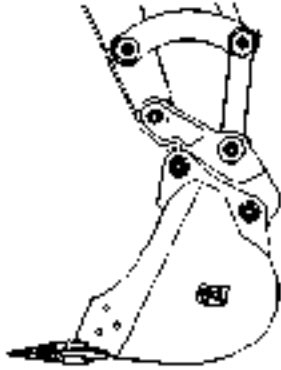


Illustration 357

g02163292

1. To unlock the Hydraulic Quick Coupler, position the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual .

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.

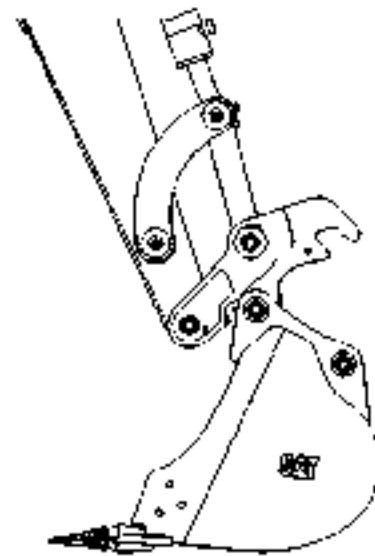


Illustration 358

g02163415

4. Disengage the work tool from the Hydraulic Quick Coupler as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

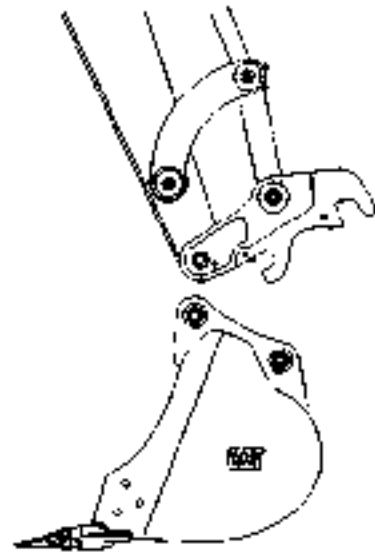


Illustration 359

g02163290

5. Ensure that the work tool is in a stable and safe storage position on the ground.

6. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.

Coupling a Bucket that is Reversed

NOTICE

When some buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling.

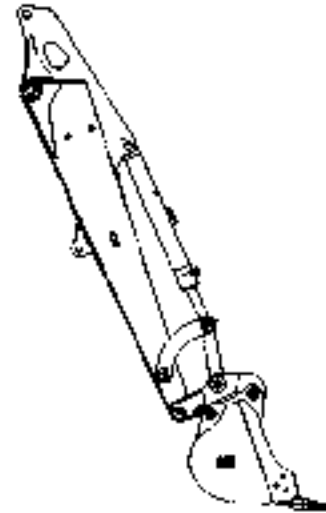


Illustration 360

g02163425

Follow the same steps for coupling and uncoupling the work tool to operate the Hydraulic Quick Coupler with a bucket that is reversed. Refer to “Coupling the Work Tool” and “Uncoupling the Work Tool” for the proper procedure.

i08503640

Quick Coupler Operation (CW (Single Lock) Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer and the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any work tools.

General Operation

The CW coupler is used to change work tools quickly. The quick coupler can be used with a broad range of buckets and work tools.

Installation Procedure

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Hydraulic oil may be trapped in the lines if the hydraulic lines are plugged or if the hydraulic lines are connected. The trapped oil may be under pressure. Use care when you open the hydraulic lines.

Note: The quick coupler must be controlled by the excavator's hydraulic system.

Perform this procedure as described in the following steps:

Ensure that the quick coupler is compatible with the host machine. For more information, consult your Caterpillar dealer.

To provide a stable operating condition, the host machine must be on flat, level ground. The host machine must be blocked to prevent inadvertent movement.

The quick coupler must be supported to prevent inadvertent movement. Position the quick coupler to prevent unnecessary climbing and unnecessary bending.

Optimum alignment of the bores will prevent the use of unnecessary force when you install the pins. Never check the alignment of the bores with your fingers. Use the proper tools to check the alignment of the bores.

A retaining pin can fly out when the retaining pin is struck with force. The area must be clear of people when you drive retaining pins.

When you strike objects, chips and other debris can fly. Before you strike any object, make sure that no one can be injured by the flying debris. Always wear appropriate PPE, including safety glasses.

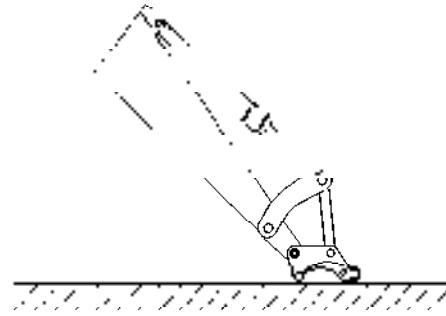


Illustration 361

g00741430

1. Position the quick coupler on the ground in front of the host machine. Make sure that the wedge faces away from the host machine.
2. Install the mounting pins.
3. Lubricate all the mounting points.
4. Connect the hydraulic lines to the quick coupler (if equipped).
5. After mounting the quick coupler on the excavator, or after working on the quick coupler hydraulic system, it is necessary to purge all the air from the cylinder and the control system. Refer to the "Hydraulic System Air Purge" for additional information.

Quick Coupler Removal Procedure

1. Lay the quick coupler flat on the ground.
2. Release the pressure from the hydraulic lines (if equipped).
 - a. Extend the wedge to the UNLOCKED position.
 - b. Stop the engine on the host machine. Turn the ignition to OFF.
 - c. Turn the ignition to the ON position without starting the engine.
 - d. Move the hydraulic control levers repeatedly through the full range of motion. This will release any pressure that may be present in the hydraulic system. Actuate the quick coupler using the machine control monitor. Cycle through locking and unlocking the quick coupler several times to release trapped hydraulic pressure within the quick coupler circuit.
 - e. The wedge should begin to move inward due to the spring force.

- f. Turn the ignition to the OFF position.
- g. Release the pressure in the host machine's hydraulic tank.

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

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, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

3. Place a suitable container below the hydraulic fittings to catch any hydraulic oil that may escape. Slowly disconnect the hydraulic lines. Plug the ends of the hydraulic lines or connect the hydraulic lines.
4. Dispose of the hydraulic oil in a suitable manner.
5. Remove the pins from the quick coupler.

Daily Inspection

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

Accumulated grease and oil on a work tool is a fire hazard.

Remove debris with steam cleaning or high pressure water at any time a significant quantity of oil is spilled on the work tool.

Note: If major repairs to the quick coupler are required, consult your Caterpillar dealer.

1. For the maximum service life of the work tool, make a thorough daily inspection before you mount a work tool to the host machine.
2. Inspect the quick coupler for the following conditions: loose bolts, oil leaks, broken parts, missing parts and cracked components. Check the overall condition of the quick coupler. Check the overall condition of the hydraulic system.
3. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels.
4. If equipped, inspect the condition of the hydraulic lines and the hydraulic fittings.
5. Check the mounting pins for the quick coupler.
6. Inspect the bolts for the wedge when you remove the wedge.
7. Check the lifting device, if equipped. If damage is present, do not use the lifting device. Contact your Caterpillar dealer for repairs.
8. Perform all repairs before you put the quick coupler into service.
9. Perform an UNLOCK and LOCK cycle of the wedge to provide a smooth operation of the wedge. This procedure is for the quick coupler with hydraulic coupling only.

Operation

Coupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

⚠ WARNING

Crush injury. Could cause serious injury or death. Always confirm that the quick coupler is engaged onto the pins. Read the Operator's Manual.

Reference: For more information on connecting the quick coupler to the host machine, contact your dealer for special instructions.

Quick Coupler with Hydraulic Coupling

⚠ WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

NOTICE

The buzzer will not sound when the switch is in the lock position. The position of the switch does not confirm that the quick coupler locking system is properly engaged with the attachment pins. Visually confirm positive engagement of the locking system. A physical test is required by dragging the work tool on the ground to confirm that the coupler is properly engaged with the work tool.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Verify that the wedge is in the unlocked position. If the wedge is not extended, extend the bucket cylinder. Then, extend the wedge.

⚠ WARNING

Ensure that the wedge is extended before coupling the work tool. Severe damage may occur. Failing to extend the wedge before coupling the work tool could result in a poorly coupled work tool or an uncoupled work tool.

Serious injury or death may result from an improperly coupled work tool.

2. Ensure that the mounting bracket of the work tool is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

Coupling a Bucket

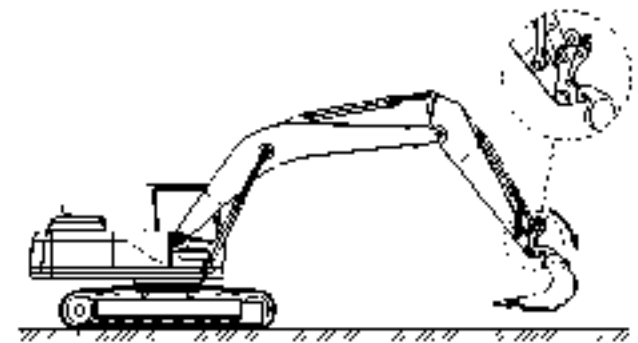


Illustration 362

g01285027

1. Hook the forward pivot of the quick coupler into the hooks of the mounting bracket.

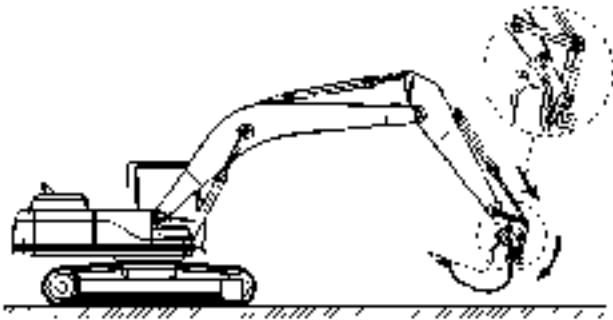


Illustration 363

g01285038

2. Select "UNLOCK" on the monitor display and confirm that the buzzer is sounding with an intermittent pattern of one beep per second. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer. Extend the bucket cylinder until the coupler contacts the work tool.
3. Tilt the quick coupler against the work tool by extending the bucket cylinder.
4. Select "LOCK" on the monitor display and the beep will stop and the rear lock (wedge) will slide back into place. The monitor will return to the home screen.
5. Visually confirm that the wedge has engaged the work tool hook and is properly locked. If this visual confirmation cannot be performed from the machine cab due to obstruction, lighting, etc., place the machine in a safe state, exit the cab, and visually confirm proper engagement at the quick coupler.

WARNING

Inspect the quick coupler engagement before operating the machine.

Serious injury or death may result from improperly engaged coupler.

NOTICE

Visually confirm that the quick coupler engagement system is properly locked to the work tool. Confirm that the wedge has engaged the work tool hook and is properly locked.

6. Verify the engagement of the quick coupler and the work tool.

- a. Place the work tool on the ground.
- b. Apply pressure to the work tool against the ground.
- c. Drag the work tool forward and backward.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

1. Ensure that the work tool mounting bracket is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

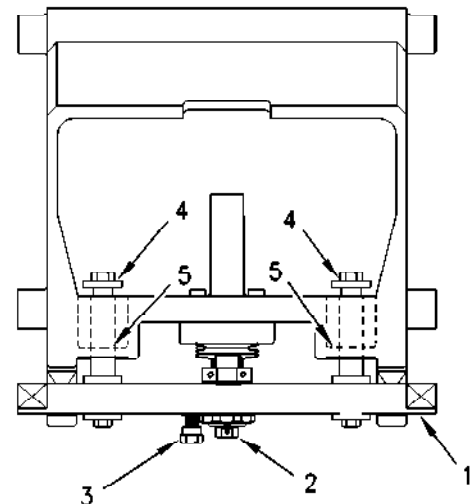


Illustration 364

g00928845

2. To move wedge (1) to the UNLOCKED position, perform the following steps:

Operation Section
CW (Single Lock) Quick Coupler (If Equipped)

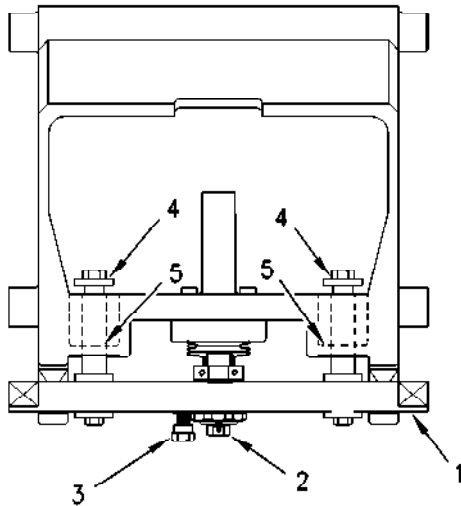


Illustration 365

g00928845

- Loosen lock bolt (3) until you can turn spindle (2).

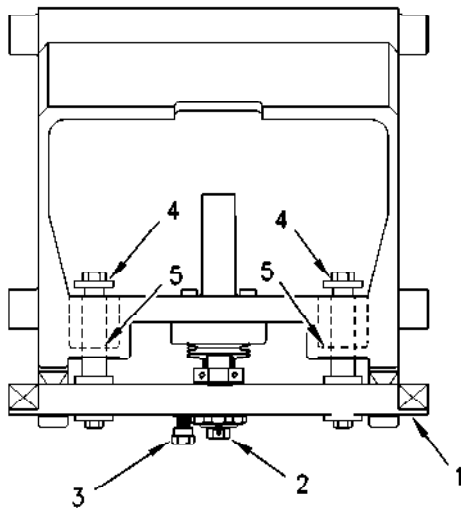


Illustration 366

g00928845

- Turn spindle (2) until the bolts (4) lightly contact the coupler (5).
- Position the coupler with the wedge in an UPWARD position.

Coupling a Bucket

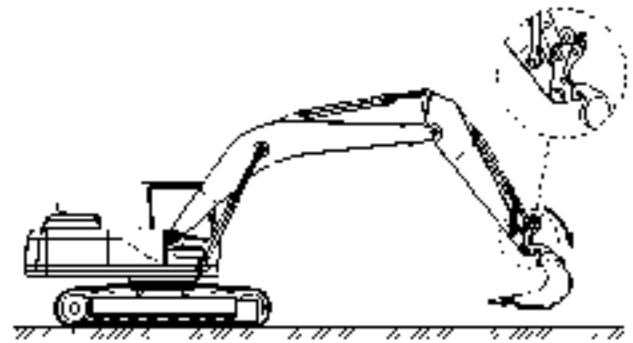


Illustration 367

g01285027

- Hook the front pivots into the hooks of the mounting bracket on the work tool.

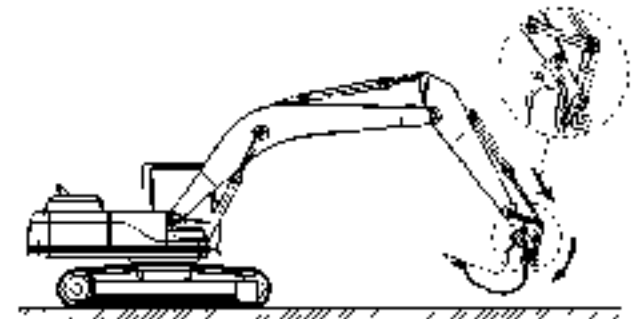


Illustration 368

g01285038

- Tilt the quick coupler against the work tool by extending the bucket cylinder. Stop the engine of the host machine.
 - Turn the spindle inward. Tighten the spindle.
- Note:** If necessary, tighten the spindle until the next notch is aligned with the locking bolt.
- Tighten the locking bolt.

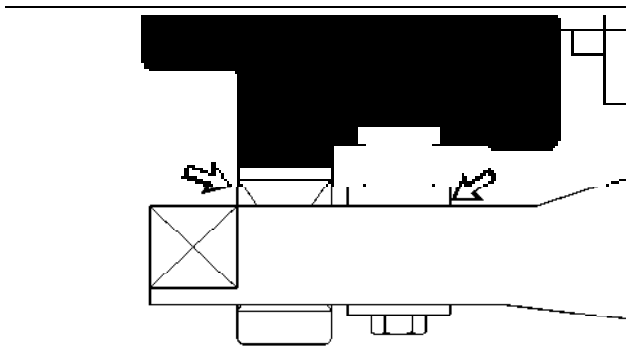


Illustration 369

g00583309

5. Ensure that there is a visible space between the wedge and the quick coupler frame. If there is not a space, the mounting bracket or the quick coupler may be damaged.

WARNING

Inspect the quick coupler engagement before operating the machine.

Serious injury or death may result from improperly engaged coupler.

6. Verify the engagement of the quick coupler and the work tool.
 - a. Place the work tool on the ground.
 - b. Apply pressure to the work tool against the ground.
 - c. Drag the work tool forward and backward.

Uncoupling the Work Tool

Use the following steps to prepare the quick coupler for uncoupling.

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic 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. Disconnect any auxiliary hoses from the work tool (if equipped).
2. Ensure that the work tool is clear of the ground.
3. Fully extend the bucket cylinder. Extend the stick cylinder until the wedge is pointing downward. The load is now released from the wedge.

Quick Coupler with Hydraulic Coupling

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

1. Extend the wedge cylinder.
2. Select UNLOCK on the monitor display and confirm that the buzzer is sounding with an intermittent pattern of one beep per second. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.
3. Retract the bucket cylinder until the coupler is no longer in contact with the work tool. The work tool is now suspended by the front pivot.
4. Place the work tool on the ground.
5. Unhook the quick coupler from the mounting bracket.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

1. Stop the engine of the host machine.
2. Loosen the locking bolt until you can turn the spindle.
3. Turn the spindle outward. If necessary, strike the wedge with a hammer to release the wedge.
4. Retract the bucket cylinder. The work tool will be suspended by the front pivot.
5. Place the work tool on the ground.
6. Unhook the quick coupler from the mounting bracket.

Lifting Loads

WARNING

Lifting loads with the quick coupler is only permitted when there is no work tool attached. Lifting loads when there is a work tool attached may result in serious injury or death.

NOTICE

If used to lift loads, then the excavator must comply with the requirements for lifting machinery. These are given in standard EN 474-5. For more information, consult your Caterpillar dealer.

Note: When you lift loads with the lifting yoke or the lifting hook, the wedge must be retracted or the wedge must be removed from the coupler.

Lifting Hook (If Equipped)

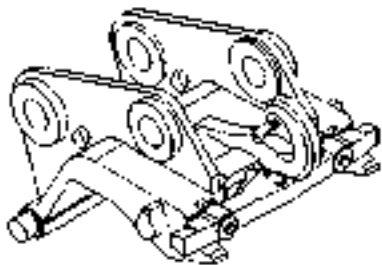


Illustration 370

g03219216

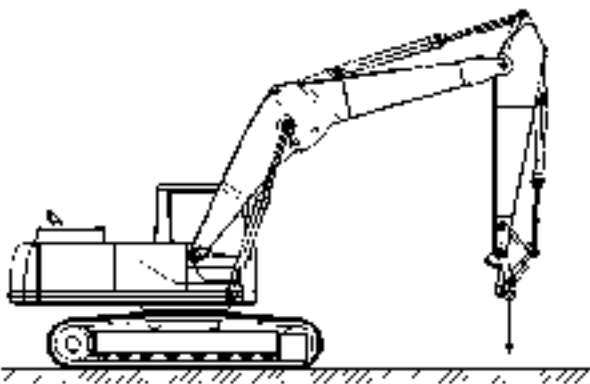


Illustration 371

g01285467

1. Fully extend the bucket cylinder.
2. Make sure that the wedge has been retracted or that the wedge has been removed.

WARNING

Use an appropriate lifting device that is rated for the specific load. Failure to do so can result in serious injury or death.

3. Fasten an appropriate chain, cable, or a lifting strap to the lifting hook. Do not perform any lifting operations if the safety latch is missing. Do not perform any lifting operations if the safety latch is damaged. Contact your supplier.

Lifting Objects

WARNING

To prevent injury, do not exceed the rated load capacity of the machine. If the machine is not on level ground, load capacities will vary.

The quick coupler and attached lifting hook have unique rated load capacities. Each capacity is marked on the corresponding component. Do not exceed the maximum capacity of any component used in a lifting operation. Quick coupler capacities are listed in the table below:

Table 25

Quick Coupler Rated Capacities ⁽¹⁾	
Quick Coupler Model	Rated Capacity
CW05	600 kg (1322 lb)
CW10	1400 kg (3086 lb)

⁽¹⁾ Capacities rated in accordance with EN 474-1:2006+A4:2013 Annex E and ASS 1418.8-2008 standards

Refer to the load charts in the Operation and Maintenance Manual of the host machine. Use the load charts and account for the mass of the work tool. Calculate the load capacity relative to the location of the lifting point on your specific host machine.

Use a sling or a shackle to attach to the lifting point and lift the object. The sling or the shackle must have a rated capacity that is greater than the mass of the load.

Regional regulations may require the use of an overload warning device and boom and stick lowering control valves when used to lift objects.

Contact your Cat dealer for additional information.

The setting for the overload warning device should be checked by an authorized dealer.

i07290597

Bucket - Remove and Install

SMCS Code: 6001; 6001-012; 6001-011; 6101; 6102; 6523

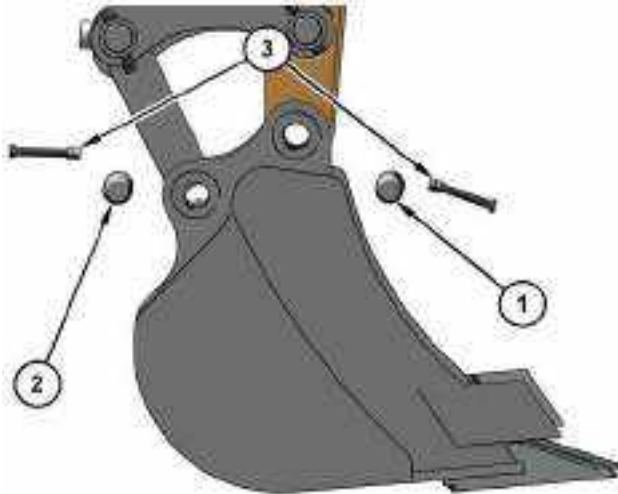


Illustration 372

g06275756

- (1) Pin
- (2) Pin
- (3) Locking Pin

Removal Procedure

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface and lower the bucket to the ground. Shut off the engine.

Note: Make sure that the bottom side of the bucket is facing downward.

2. Remove locking pin (3) from support pin (2) and remove the pin that connects the connecting link to the bucket.
3. Remove locking pin (3) from support pin (1) and remove the pin that connects the stick to the bucket.
4. Start the engine and raise the stick out of the bucket.

Note: After the support pins have been removed, make sure that the support pins do not become contaminated with sand or dirt. Make sure that the stick and the linkage do not become damaged.

Installation Procedure

WARNING

Failure to follow the instruction below for the installation of a work tool may result in personal injury or death. Special care must be taken if more than one person is installing the work tool.

- Confirm the verbal communication and the hand signals that will be used during the installation.
- Be alert for sudden movement of the front linkage and the work tool.
- Do not insert fingers into the bores of the support pins when the support pins and the bores are being aligned.

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface. Position the bucket on a hard, level surface with the bottom side facing downward.
2. Clean each pin and each pin bore. Lubricate each pin bore with molybdenum grease.
3. Start the engine and lower the stick into the bucket until the pin bores are in alignment with each other. Stop the engine and put the hydraulic lockout control in the RAISED position.
4. Install support pin (1) to connect the stick to the bucket. Secure the pin with locking pin (3).
5. Install support pin (2) to connect the connecting link to the bucket. Secure the pin with locking pin (3).
6. To verify a proper work tool installation, perform the following procedure:
 - a. Start the engine. Position the work tool on the ground.
 - b. Apply a slight down pressure on the work tool.
 - c. Retract and extend the stick cylinder to push the work tool against the ground. Visually confirm that there is no movement between the

linkage and the work tool and the locking pins are properly fixed.

i07290678

Hammer Operation (If Equipped)

SMCS Code: 5705-WTL

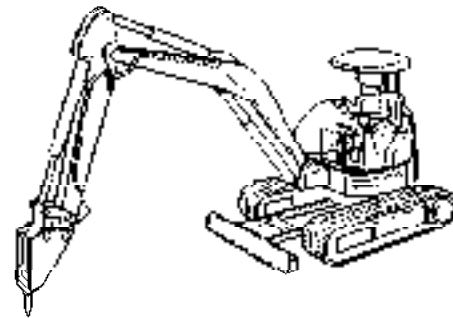


Illustration 373

g00821410

NOTICE

Selection of a hydraulic hammer must be done with extra care. Use of a hydraulic hammer not recommended by Caterpillar could result in structural damage to the machine. Consult your Caterpillar dealer for hydraulic hammer information.

Only use the hydraulic hammer to break rocks, concrete, and other hard objects. Before you start hydraulic hammer operation, place the machine on a level, stable surface. If the machine must be placed on a slope or on a rough surface, be careful during operation.

If the machine is equipped with a canopy, make sure that the machine is equipped with a polycarbonate shield. However, the limited operating range has to be observed, see illustrations 374 and 375. When visibility is restricted due to rain, snowfall, dust etc., the work has to be stopped. Resume work only if visibility is no longer restricted. Wear protective equipment such as a hard hat and protective goggles before you start hydraulic hammer operation.

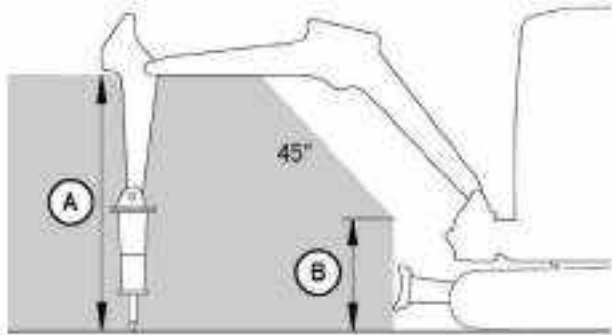


Illustration 374

g03392773

(A) 120 cm (47 inch)
(B) 50 cm (20 inch)



Illustration 375

g06276140

NOTICE

In order to avoid structural damage to the host machine or the hydraulic hammer, comply with the following:

Do not attempt to break rocks or concrete by burying the hammer tool completely into the rocks or concrete.

Do not apply a prying force to the hammer tool in order to remove the hammer tool from the material.

NOTICE

Frequent idle strokes (blank firing) have a deteriorating effect on the hammer. Do not operate the hammer without proper down pressure against the object.

Do not allow the hydraulic hammer to continuously operate at one location and for more than 1 minute. Change the location of the machine and repeat the procedure. Failure to change the location of the machine could cause the hydraulic oil to overheat. Overheated hydraulic oil could damage the accumulator or the cylinder seals.

Stop hydraulic hammer operation immediately if any of the hydraulic hoses are twisting rapidly. This indicates that the accumulator is punctured. Consult your Cat dealer for the necessary repairs.

NOTICE

Do not use the dropping force of the hydraulic hammer to break rocks or other hard objects. This could cause structural damage to the machine.

Do not use the sides or back of the hydraulic hammer to move rocks or other hard objects. Doing this could cause damage not only to the hammer but to stick or boom cylinder.

Do not operate the hydraulic hammer with any of the cylinders fully retracted or extended. Doing this could cause structural damage to the machine, resulting in reduced machine life.

Do not use the hydraulic hammer to lift an object.

Do not operate the hydraulic hammer while the stick is vertical to the ground. This type of operation could allow the stick cylinder to vibrate excessively.

Do not operate the hydraulic hammer on objects in water. This type of operation could cause the chisel to rust and the seal on the sliding section to be damaged.

Operate the attachment control levers carefully to keep the hydraulic hammer's chisel from hitting the boom.

Do not operate the hydraulic hammer with the upper structure sideways to the undercarriage. Before you start hydraulic hammer operation, place the upper structure in the recommended position that is shown in the following illustration. Any other operating positions could make the machine unstable. Any other operating positions could place excessive loads on the undercarriage.

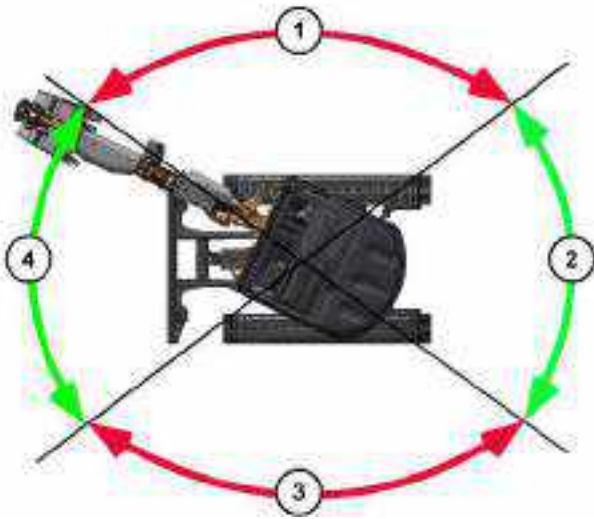


Illustration 376

g06275800

- (1) Incorrect position
- (2) Correct position
- (3) Incorrect position
- (4) Correct position

i07285207

Blade Operation

SMCS Code: 6060

NOTICE

The machine can be damaged if the adjustable gauge undercarriage and the blade are set to different widths (for instance when driving through a door).

Reducing the Width of the Blade

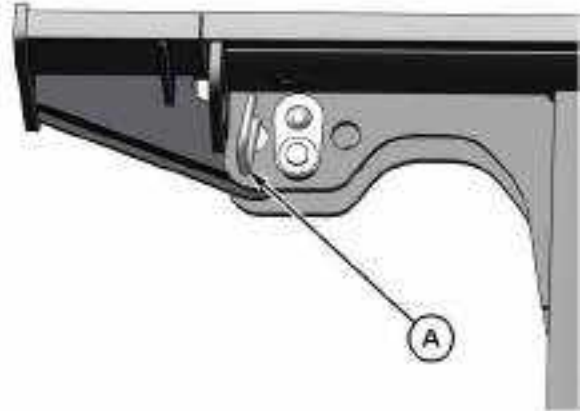


Illustration 377

g06262829

1. Raise the blade to about 1-2 cm (0.39-0.79 inch).
2. Pull out pins (A) on either side.

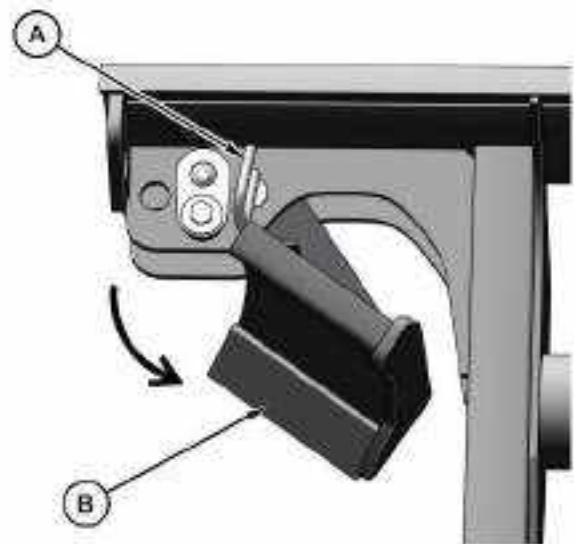


Illustration 378

g06262835

3. Fold in blade extensions (B) on either side.

4. Insert pins (A) on either side.

Increasing the Width of the Blade

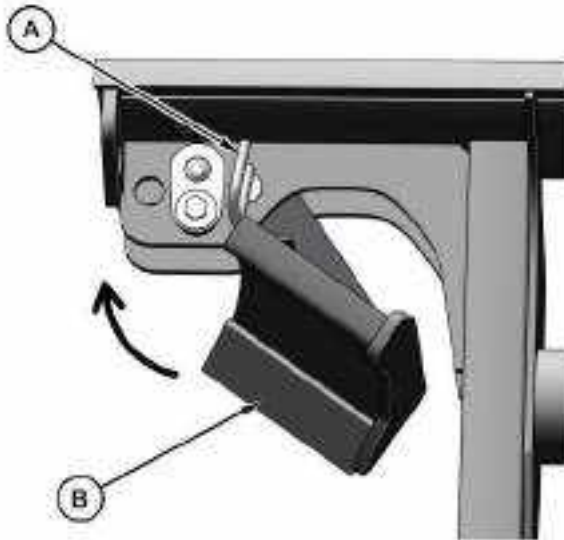


Illustration 379

g06262836

1. Raise the blade to about 1-2 cm (0.39-0.79 inch).
2. Pull out pins (A) on either side.
3. Fold out blade extensions (B) on either side.

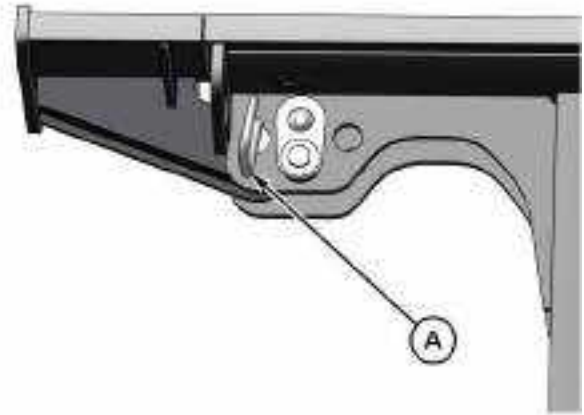


Illustration 380

g06262829

4. Insert pins (A) on either side.

i05334780

Rubber Belt Track Operation

SMCS Code: 4198

The rubber part of the track assembly can easily be damaged during operation. Operate the machine with the rubber belt only if damage to the rubber belt is shallow and the damage is not harmful. However, any harmful damage to the rubber can cause the following serious problems to the entire track assembly:

- Early wear of iron core.
- Early wear of track grousers.
- Fracture of iron core.
- Fracture of track grousers.
- Cuts of steel cords
- Rubber flaking off
- Disengagement of sprocket

Such a failed track assembly needs to be replaced as a unit. In order to minimize the replacement of the track, observe the following items. In order to maximize the performance of the track, observe the following items:

- Avoid Traveling at sites for demolition.

Operation Section
Rubber Belt Track Operation

- Traveling at these sites should be avoided particularly when the machine is being swung at the same time.
- Avoid operation under salty conditions.
- Avoid combined operation of travel and swing with excessive load at rough terrain.
- Avoid operation at rocky sites.
- Avoid suddenly swinging the machine when the machine is Traveling on pavement.
- Use the rubber belt tracks at temperatures within -15°C (5°F) to 45°C (113°F). Avoid operation on hot surfaces.
- Rubber belt tracks are less stable than steel tracks. Side-to-side movement of the machine should be done carefully.
- If the sprockets are badly worn, use a new sprocket for replacement.
- Be sure that the tracks are free of oily materials such as fuel, hydraulic oil, grease, etc.
- Avoid going over sharp obstacles. Decreased life of the track, fracture of the track grousers and cut steel cords can occur.
- Track Tension must be correctly maintained and checked regularly.
- Disengagement of the track could occur if the track gets clear of the track roller. This could happen while the machine travels over an obstacle.

Parking

i07240905

Stopping the Machine

SMCS Code: 7000

WARNING

Deactivation of the controls and drive levers does not prevent the blade, boom swing, or auxiliary circuit functions from moving if the blade lever or a foot pedal is moved.

Personal injury or death may occur from sudden machine movement.

Note: There may be regulations that define the requirements for the operator and/or support personnel to be present when the engine is running.

Park on a level surface. If the machine must be parked on a grade, chock the tracks securely.



Illustration 381

g06268228

1. Turn the engine speed dial counterclockwise to reduce engine speed.



Illustration 382

g06262810

2. Move the left and right travel levers slowly to the STOP position to stop the machine.

Note: Avoid sudden stops. Sudden stops can damage the machine. Slow down and bring the machine to a smooth stop.

3. Lower the work tool and the blade to the ground. Apply a slight downward pressure.



Illustration 383

g06262819

4. Raise the hydraulic lockout control to the RAISED position to deactivate the controls and drive levers.

i07290689

i07291002

Freezing Conditions

SMCS Code: 7000

If freezing temperatures are expected, remove the mud and the dirt from each track roller frame. Park the machine on wood planks. Use the following procedure to clean each track roller frame.

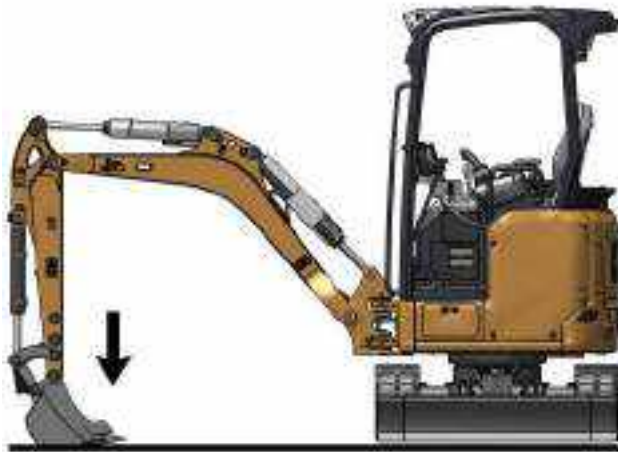


Illustration 384

g06275814

1. Position the boom over one side of the machine.
2. Use boom down pressure to lift the track on one side off the ground. Operate the track in the forward direction. Then operate the track in reverse. Continue this procedure until the maximum amount of material is thrown off the track.
3. Lower the track onto the wood planks.
4. Repeat the procedure for the other track.
5. Clean the area around the skid plate that is on top of the track roller frame and around the track rollers.
6. Lower the attachment onto a wood plank.

Stopping the Engine

SMCS Code: 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.

1. Stop the machine and lower all work tools to the ground.
2. Turn off all auxiliary electrical equipment.
3. Run the engine at low idle for 2 minutes.

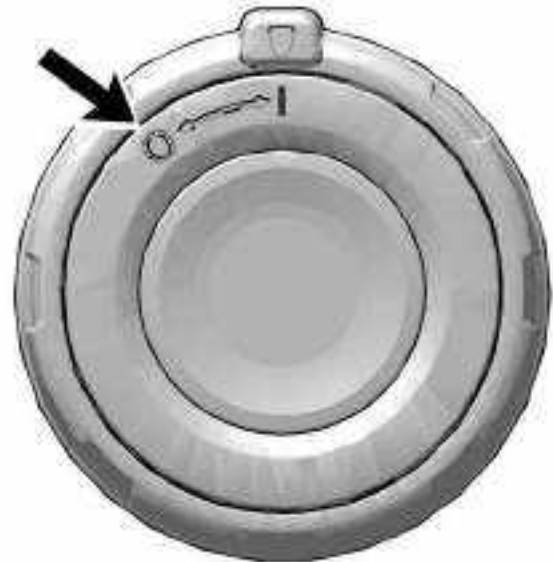


Illustration 385

g06275824

4. Turn the engine start switch key to the OFF position and remove the engine start switch key.



Off – The engine is stopped with the key in this position.

Stop the Engine if an Electrical Malfunction Occurs

Lower all attachments and the blade to the ground. Turn the engine start switch key to the OFF position. If the engine does not stop, perform the following procedure.



Illustration 386

g06268234

1. Remove the cover under the operator seat.

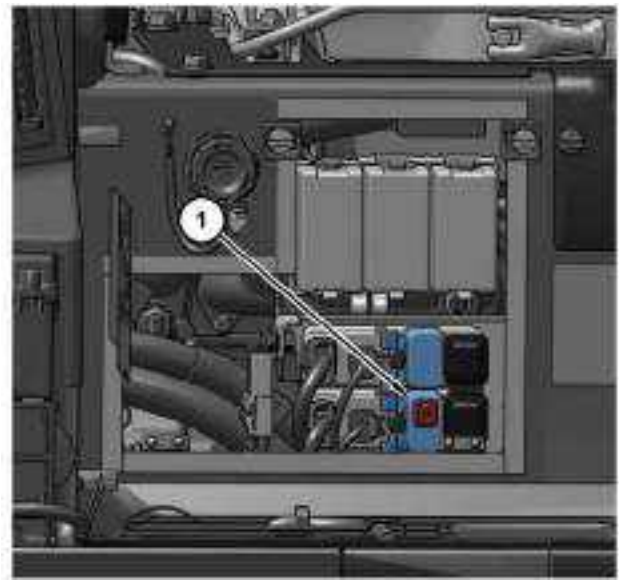


Illustration 388

g06318381

Relay location for sales models 301.6, 301.8, and 302 CR

- (1) Engine stop relay

2. Remove relay (1) marked with the red stop engine film.

Note: Do not operate the machine again until the malfunction has been corrected, and the relay reconnected.

i07508043

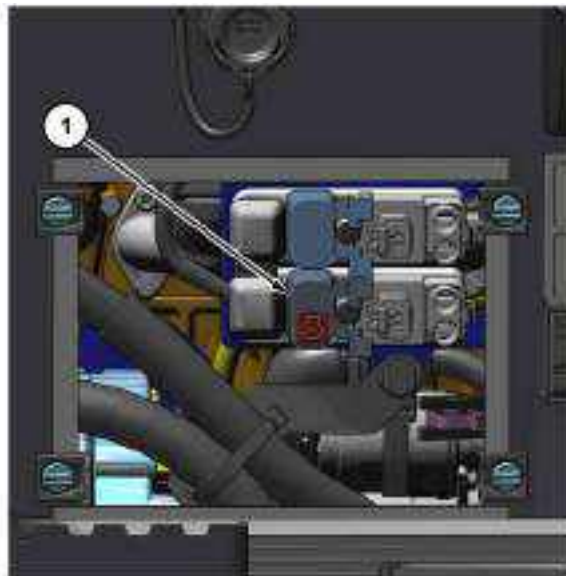


Illustration 387

g06268242

Relay location for sales models 301.5 and 301.7 CR

- (1) Engine stop relay

Leaving the Machine

SMCS Code: 7000

1. Remove the engine start switch key.

Removing the key will prevent unauthorized persons from starting the engine or from turning on the lights.

2. Use the handholds when you exit the machine. Face the machine and use both hands. Step from the operator stand to the ground. Make sure that the rubber mat is clear of debris before you dismount.

3. Inspect the engine compartment for debris. Clean out any debris and any paper to avoid a fire.

4. Lock the engine cover.

The machine is equipped with a courtesy light function. The courtesy light function enables a delay shut down of the lights after the machine has been turned off to allow the operator to exit the machine safely.

i07735116

Machine Storage and Specified Storage Period

SMCS Code: 7000

Machine Storage

The Safety Section of this Operation and Maintenance Manual contains storage information for fuels, lubricants, and ether (if equipped).

The Operation Section of this Operation and Maintenance Manual contains information for short-term storage of this machine, including engine shutdown, parking, and instructions for leaving the machine.

For detailed steps on long-term storage refer to Special Instruction, SEHS9031, "Storage Procedure for Caterpillar Products".

Specified Storage Period

The specified storage period of this machine is 1 year.

After the specified storage period has expired, consult your Cat dealer for inspect, repair, rebuild, install remanufactured, or install new components, and disposal options, and to establish a new specified storage period.

If a decision is made to remove the machine from service, refer to Decommissioning and Disposal for further information.

Transportation Information

i02005176

Shipping the Machine

SMCS Code: 7000; 7500

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

Before you load the machine onto the trailer, remove ice, snow, or other slippery material from the loading dock and from the truck bed. Removal of ice, snow, or other slippery material will prevent the slipping of the machine as you load the machine. Removing ice, snow, or other slippery material will 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.

1. Before you load the machine and before you unload the machine, chock the trailer wheels or chock 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 surfaces 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 machine can drive straight up the loading ramps. Position the machine so that the front linkage and the dozer blade will be the first machine components to travel up the loading ramps. Make sure that the dozer blade is raised up.
2. Extend the front linkage forward over the trailer bed in order to help maintain balance.
3. Use caution when you travel over the areas around the loading ramp joints. Maintain the balance point of the machine.
4. After you load the machine onto the trailer be sure that the machine is properly positioned on the trailer bed.
5. Slowly, swing the upper structure for 180° and carefully move the machine toward the front of the trailer or the rail car.
6. Refer to the Operation and Maintenance Manual, "Lifting and Tying Down the Machine" for information on tying down the machine.

Unloading The Machine

1. Position the machine so that the machine can drive straight down the loading ramps. Position the machine so that the front linkage will be the first machine component to travel down the loading ramps. Position the machine so that the dozer blade will be the last machine component to travel down the loading ramps. Make sure that the dozer blade is raised up.
2. Extend the front linkage forward over the ramps. While you travel down the loading ramps, adjust the front linkage in order to allow the work tool to remain close to the ground. This will prevent the machine from tipping forward.

- Use caution when you travel over the areas around the loading ramp joints in order to maintain the balance point of the machine.

i07423174

Adjustable Gauge Undercarriage Frame

SMCS Code: 4150-VAR

The undercarriage will not expand evenly. When you are expanding the undercarriage, be sure to expand the undercarriage completely. If the undercarriage is not fully expanded, the upper structure can slide when the machine is operated. The machine can overturn if the upper structure slides.

The undercarriage will not retract evenly. When you are retracting the undercarriage, be sure to retract the undercarriage completely. If the undercarriage is not fully retracted, the upper structure can slide when the machine is operated. The machine can overturn if the upper structure slides.

Expand the undercarriage in an open area on flat, solid ground. The undercarriage should always be expanded except when you travel through narrow passages.

Expanding the Undercarriage and Retracting the Undercarriage



Illustration 389

g06268257

- Swing the upper structure to position the dozer blade behind the operator.



Illustration 390

g06268265

- Apply down pressure with the dozer blade to lift the rear of the machine off the ground. Simultaneously hold the joystick controls in the BOOM LOWER position and the STICK OUT position until the tracks are off the ground.

Note: While operating the adjustable undercarriage, be sure not to put the blade in the FLOAT position otherwise a sudden drop may occur.

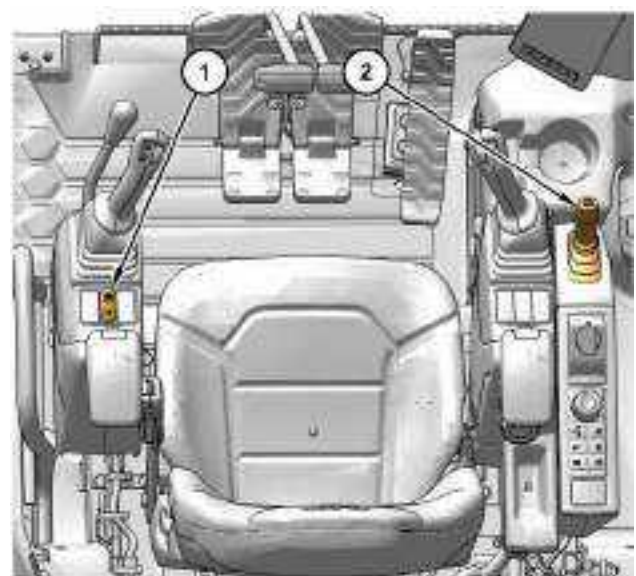


Illustration 391

g06268268

- Lift and hold switch (1) to control the adjustable gauge undercarriage.

4. Move control lever (2) forward to expand the undercarriage. Move control lever (2) backward to retract the undercarriage. Release control lever (2).

Note: While expanding and retracting the undercarriage, the dozer blade may lift slightly and cause the rear of the machine to lift or lower.

5. Release switch (1) to control the blade.
6. Simultaneously hold the joystick controls in the BOOM RAISE position and the STICK IN position to lower the front of the machine to the ground. Carefully lower the rear of the machine to the ground by using the dozer blade control.
7. Swing the upper structure to place the dozer blade in the front of the machine.

i07285192

Lifting and Tying Down the Machine

SMCS Code: 7000; 7500

NOTICE

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

Refer to Operation and Maintenance Manual, "Specifications" for specific weight information.

Use proper rated cables and slings for lifting. The crane should be positioned so that the machine is lifted parallel to the ground.

Positioning the Machine for Lifting

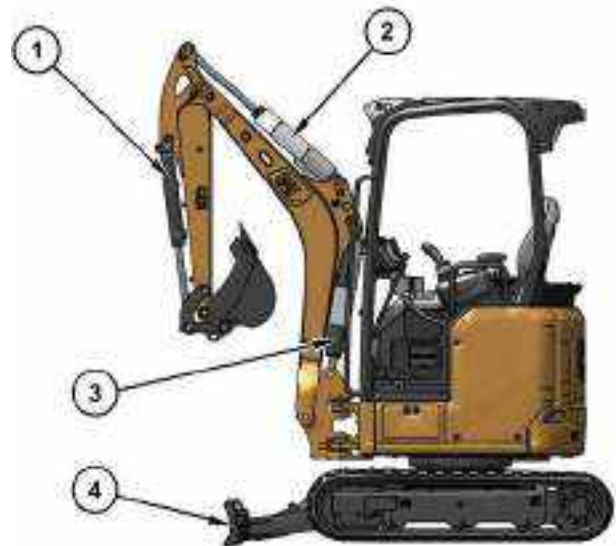


Illustration 392

g06274782

1. Raise blade (4).
2. Position the boom in a straight ahead position.
3. Retract boom cylinder (3), extend stick cylinder (2), and extend work tool cylinder (1) to the end of the stroke.
4. Stop the engine. Raise the hydraulic lockout control and dismount the machine. Lock the door.



Illustration 393

g06274789

5. To obtain the position for the second lifting option, swing the upper structure so blade (4) is to the rear of the machine.

Lifting the Machine

Note: Ensure that the undercarriage is fully expanded before you lift the machine. Ensure that an empty standard bucket is installed on the machine.

Option 1



Illustration 394

g06274811

1. Attach shackles to the lifting eyes on the top of the canopy and fasten slings to the shackles.
2. Use lifting gears that match the required lengths.
3. Raise the machine slowly to make sure that the machine stays in a horizontal position.

Option 2

Illustration 395

g06274836

2. Raise the machine slowly to make sure that the machine stays in a horizontal position.

Tying Down the Machine

Note: Do not allow anyone in the machine during the transport of the machine.

1. Lower the blade to the trailer.
2. Extend the bucket and stick cylinders to the end of the stroke.
3. Lower the boom slowly to rest the bucket control linkage on a block of wood.
4. Stop the engine.
5. Move the hydraulic lockout control to the RAISED position.
6. Ensure that all service doors are closed.
7. Chock the tracks.
8. Install tie-downs on the bucket control linkage to prevent the boom from shifting.



Illustration 396

g06274841

1. Attach shackles to the two lifting eyes on the blade and the two lifting eyes on the middle bracket of the boom. Fasten slings to each shackle.

Note: The shackles should be long enough so that the slings do not contact the cab or canopy.

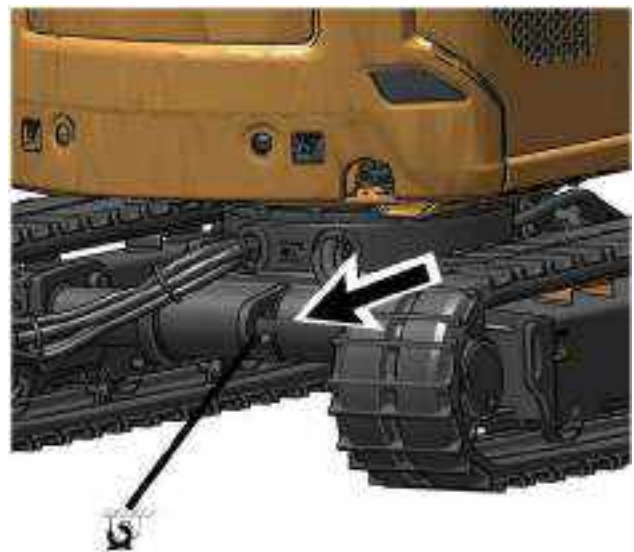


Illustration 397

g06274899

9. Install tie-downs on the rear eye on the lower frame to prevent shifting in transit.

Operation Section
Lifting and Tying Down the Machine



Illustration 398

g06274914

10. Install tie-downs on each side of the tracks.

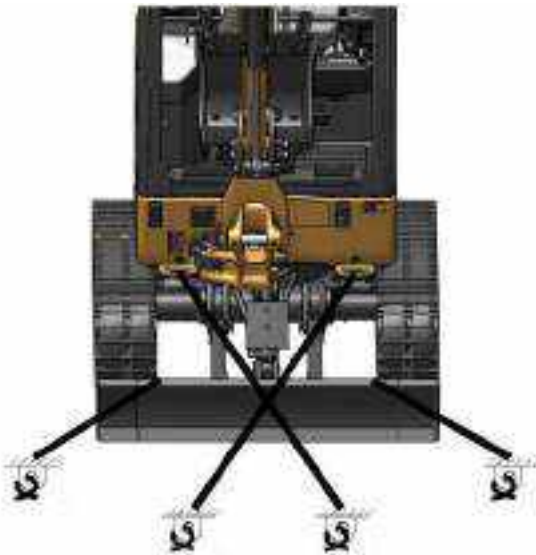


Illustration 399

g06274906

Front of the Machine



Illustration 400

g06274909

Rear of the Machine

11. Install tie-downs on the lower portion of the machine by referring to either Illustration 399 or 400 .

Note: Use protectors between the machine and tie-downs.

Note: To utilize the tie-down points on the rear of the machine, install M30x2 eye bolts. Thread depth is 30 mm (1.2 inch).

12. Separately tie down all work tools that will accompany the machine. Refer to the operation manual for the work tools for instructions on tying down the individual work tools.

Towing Information

i07291036

Towing the Machine

SMCS Code: 7000

Towing the machine:

- Ensure that the excavator can be towed safely
- Use the towing bracket for towing the machine.
- Use the towing bracket only for towing the machine
- Use a shackle pin with a lock pin
- Take off slowly!
- Ensure that there are no persons close to the towing equipment (towing bar, cable)!

WARNING

Personal injury or death could result when towing a disabled machine incorrectly. Keep all personnel clear of the disabled machine until the machine has been towed to a safe place. Follow the towing procedure.

The maximum admissible load of the towing bracket is one and a half times the machine weight.

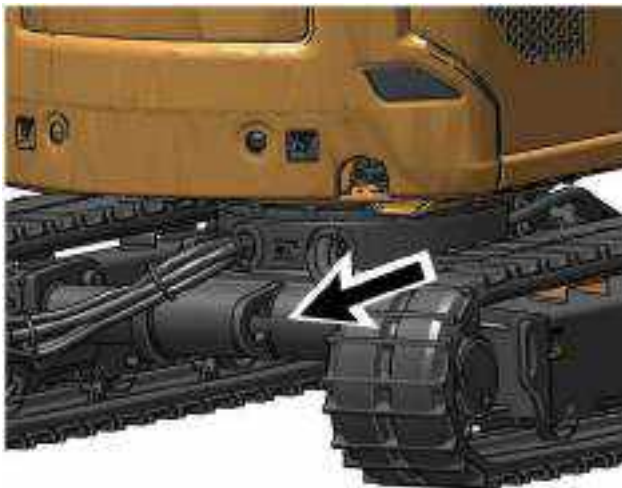


Illustration 401

g06275844

Use the towing bracket on the undercarriage.

Use a shackle and secure the shackle with the shackle pin and a lock pin.

Mount a towing bar or cable of adequate size to the towing eye.

Pull the machine slowly.

NOTICE

Follow the following instructions under all circumstances:

Do not tow the machine if the machine is at a stand-still or broken down, otherwise the final drives of the machine can be damaged.

The manufacturer's warranty shall not apply to accidents or damage caused by towing the excavator.

Do not tow other things (for example, machines, trailers, etc.) with the towing bracket.

Engine Starting (Alternate Methods)

i02016499

Engine Starting with Jump Start Cables

SMCS Code: 1000; 7000

WARNING

Failure to properly service the batteries may cause 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 battery positive (+) to battery positive (+) and the battery negative (-) to battery 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

When jump starting the engine with another machine, make sure that the machines do not touch. This could prevent damage to engine bearings and electrical circuits.

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.

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

1. Lower the equipment to the ground. Move all controls to the HOLD position. Move the hydraulic lockout control (lever) to the LOCKED position.
2. Turn the start switch on the stalled machine to the OFF position. Turn off all accessories.
3. 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.
4. 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.
5. Ensure that battery caps on both machines are tight and correctly placed. Ensure that batteries in the stalled machine are not frozen. Make sure that the batteries have enough electrolyte.

Note: The positive terminal of the 12 volt system of the source and the negative terminal of the 12 volt system of the source must be identified correctly before the jumper cables are connected. The positive terminal of the 12 volt system of the discharged battery must be identified correctly before the jumper cables are connected.

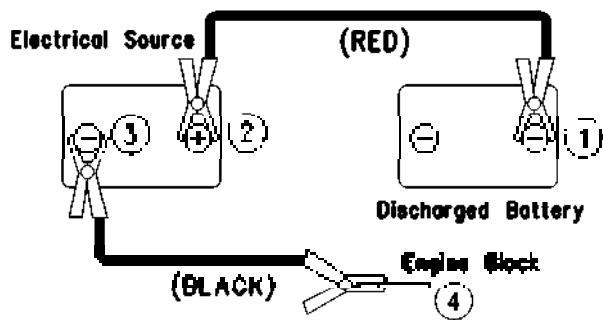


Illustration 402

g00818210

6. The positive ends of the jump start cable are red. Connect one positive end of the jump start cable to positive cable terminal (1) of the discharged battery.
Do not allow the positive cable clamps to contact any metal except for the battery terminals.
7. Connect the other positive end of the jump start cable to positive cable terminal (2) of the electrical source.
8. Connect one negative end of the jump start cable to negative cable terminal (3) of the electrical source.
9. Finally, connect the other negative end of the jump start cable to engine block (4) 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.
10. Start the engine of the machine that is being used as an electrical source or energize the charging system on the auxiliary power source.
11. Wait at least two minutes before you attempt to start the stalled machine. This will allow the batteries in the stalled machine to partially charge.
12. Attempt to start the stalled engine. See Operation and Maintenance Manual, "Engine Starting" for the correct starting procedure.
13. Immediately after you start the stalled engine, disconnect the jump start cables in reverse order.

Maintenance Section

Maintenance Access

i08723449

Access Door and Cover Locations

SMCS Code: 726A-CH

Engine Door

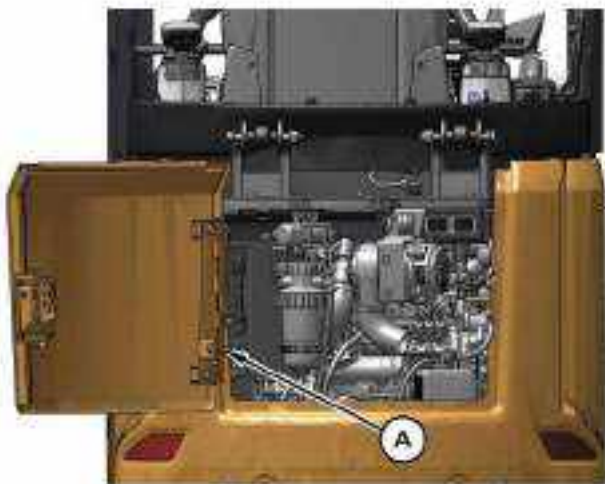


Illustration 403

g06268512

1. Open the engine door by pulling the lever and opening the door towards you. Place lock bar (A) into the bracket to prevent the engine door from closing.

2. To close the engine door, raise lock bar (A) on the left side, close the engine door, and firmly press the door towards the machine.

Left Side Cover



Illustration 404

g06268527

1. To open the left side door, remove three screws (B).



Illustration 405

g06268520

2. Open the left side door towards you, place lock bar (A) into the bracket to prevent the door from closing.

- To close the left side door, raise lock bar (A), and replace three screws (B).

Right Side Cover



Illustration 406

g06268535

- Open the right side door by pulling the lever and opening the door towards you. Place lock bar (A) into the bracket to prevent the door from closing.
- To close the right side door, raise lock bar (A) on the left side, close the door, and firmly press the door towards the machine.

Access Beneath Canopy/Cab

- Park the machine on level ground and lower the implements



Illustration 407

g06268577

- Remove front fender covers (C) on the left and right side.

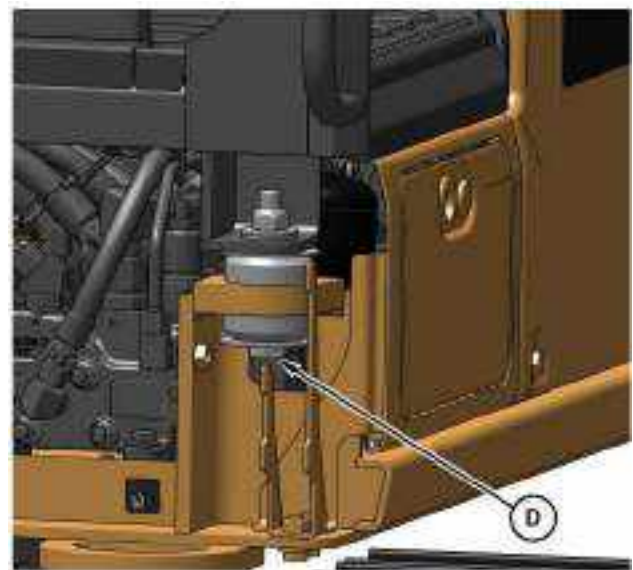


Illustration 408

g06317801

- Remove bolts (D) at the left and right corners of the canopy.



Illustration 409

g06268597

4. Lift the canopy.



Illustration 410

g06268607

5. Secure locks (E) on the left and right side of the canopy.



Illustration 411

g06274240

6. Secure cab brace bar (F). Place one end in the bracket on the cab and other end in the bracket on top of the fuel tank. Adjust bar (F) to the necessary length by turning the center along the threads.

Note: The cab brace bar is stored in front of the fuel tank when not in use.

7. To lower the canopy back into place, perform Steps 2 through 6 in reverse.

Removable Canopy Mounting Area Inspection

Before operation, confirm no loosening or damages to the canopy mounting bolts. If any problems are present, retighten or replace the bolts.

Do not remove the removable canopy. If removal of the canopy is necessary, reinstall the bolts into the mounting brackets. Tighten the bolts to a torque of $100 \pm 20 \text{ N}\cdot\text{m}$ ($74 \pm 15 \text{ lb ft}$).

Note: The removable canopy is designed as a Tip-Over Protective Structure (TOPS) canopy for 302 CR only. The removable canopy for the 301.7 CR is **NOT** a TOPS.

Cab Door Lock (If Equipped)

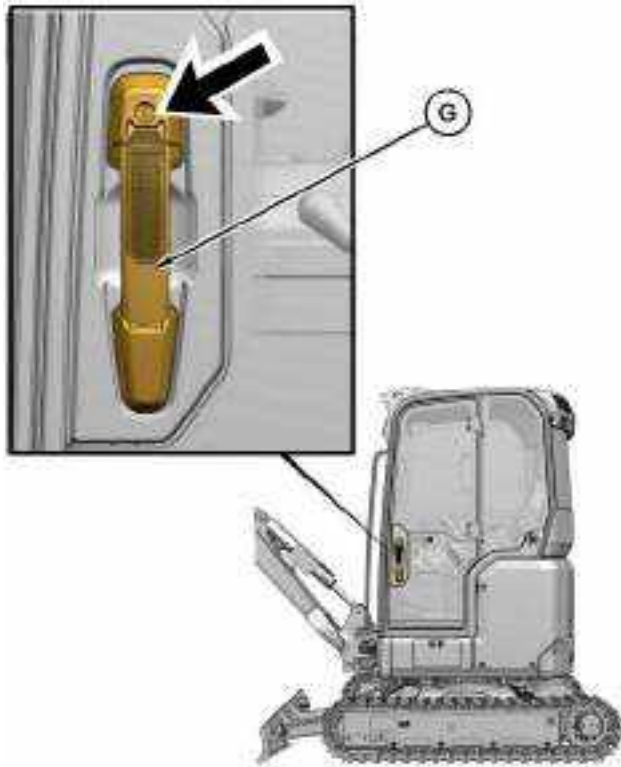


Illustration 412 g06757509
Vertical position of key cylinder on door handle (G).
(G) Cab door



Illustration 413 g06757514
Horizontal position of key cylinder on door handle (G).

When the key cylinder on door handle (G) is in the vertical position as shown in the Illustration 412, the door is locked. To lock the door, insert the key into the cylinder, rotate to the vertical position, and remove the key.

If the door is closed with the key cylinder in the vertical position, the door will remain locked. A key will be required to unlock the door before it can be opened from the outside. The door can always be opened from inside the cab, even if locked. If opened from the inside while locked, the door will remain locked.

When the key cylinder on the door handle is in the horizontal position as shown in the Illustration 413, the door is unlocked. To unlock the door, insert the key into the cylinder, rotate to the horizontal position, and remove the key.

Lubricant Viscosities and Refill Capacities

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Lubricant Viscosities (Fluids Recommendations)

SMCS Code: 7581

General Information for Lubricants

When you are operating the machine in temperatures below -20°C (-4°F), refer to Special Publication, SEBU5898, "Cold Weather Recommendations". This publication is available from your Cat dealer.

Refer to the "Lubricant Information" section in the latest revision of the Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for a list of Cat[®] engine oils and for detailed information. This manual may be found on the following website:

safety.cat.com

The footnotes are a key part of the tables. Read ALL footnotes that pertain to the machine compartment in question.

Selecting the Viscosity

To select the proper oil for each machine compartment, refer to the "Lubricant Viscosity for Ambient Temperature" table. Use the oil type AND oil viscosity for the specific compartment at the proper ambient temperature.

The proper oil viscosity grade is determined by the minimum ambient temperature (the air in the immediate vicinity of the machine). Measure the temperature when the machine is started and while the machine is operated. To determine the proper oil viscosity grade, refer to the "Min" column in the table. This information reflects the coldest ambient temperature condition for starting a cold machine and for operating a cold machine. Refer to the "Max" column in the table for operating the machine at the highest temperature that is anticipated. Unless specified otherwise in the "Lubricant Viscosities for Ambient Temperatures" tables, use the highest oil viscosity that is allowed for the ambient temperature.

Machines that are operated continuously should use oils that have the higher oil viscosity. The oils that have the higher oil viscosity will maintain the highest possible oil film thickness. Refer to "General Information for Lubricants" article, "Lubricant Viscosities" tables, and any associated footnotes. Consult your Cat dealer if additional information is needed.

NOTICE

Not following the recommendations found in this manual can lead to reduced performance and compartment failure.

Engine Oil

Cat oils have been developed and tested in order to provide the full performance and life that has been designed and built into Cat engines.

Cat DEO-ULS multigrade and Cat DEO multigrade oils are formulated with the correct amounts of detergents, dispersants, and alkalinity in order to provide superior performance in Cat diesel engines where recommended for use.

Note: SAE 10W-30 is the preferred viscosity grade for the 3116, 3126, C7, C-9, and C9 diesel engines when the ambient temperature is between -18°C (0°F) and 40°C (104°F).

Table 26

Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosities	°C		°F	
			Min	Max	Min	Max
Engine Crankcase	Cat DEO-ULS Cold Weather	SAE 0W-40	-40	40	-40	104
	Cat DEO-ULS SYN Cat DEO SYN	SAE 5W-40	-30	50	-22	122
	Cat DEO-ULS Cat DEO	SAE 10W-30	-18	40	0	104
	Cat DEO-ULS Cat DEO	SAE 15W-40	-9.5	50	15	122
Pump Coupling (If Equipped)	Cat DEO-ULS Cat DEO	SAE 10W-30	-18	40	0	104

Note: API engine oil categories are backwards compatible. Cat DEO-ULS (API CK-4) oil can be used in all engines with some restrictions related to fuel sulfur level. Cat DEO (API CI-4/API CI-4 PLUS) can be used in engines that are Tier 3 emissions certified and prior, and in engines that do not use aftertreatment devices.

Hydraulic Systems

Refer to the "Lubricant Information" section in the latest revision of the Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for detailed information. This manual may be found on the web on the following website:

safety.cat.com

The following are the preferred oils for use in most Cat machine hydraulic systems:

- Cat HYDO Advanced 10 SAE 10W
- Cat HYDO Advanced 30 SAE 30W
- Cat BIO HYDO Advanced

Cat HYDO Advanced oils allow 6000 hours or higher oil drain intervals for most applications. S·O·S Services oil analysis is recommended when the oil drain interval is increased to 6000 hours or higher. In comparison, non-Cat commercial hydraulic oils (second choice oils) allow 2000 hours oil drain interval. It is recommended to follow the maintenance interval schedule for oil filter changes and for oil sampling that is stated in the Operation and Maintenance Manual for your particular machine. Consult your Cat dealer for details. When switching to Cat HYDO Advanced fluids, cross contamination with the previous oil should be kept to less than 10%.

Second choice oils are listed below.

- Cat MTO
- Cat DEO

- Cat DEO-ULS
- Cat TDTO
- Cat TDTO Cold Weather
- Cat TDTO-TMS
- Cat DEO-ULS SYN
- Cat DEO SYN
- Cat DEO-ULS Cold Weather

Note: Oil drain intervals of the oils listed above are less than those of Cat HYDO Advanced oils. The oil drain interval of these oils is typically 2000 hours and up to a maximum of 4000 hours. An exception is Cat TDTO Cold Weather oil which allows 6000 hours or higher oil drain interval. S·O·S Services oil analysis is required when the oils listed above are used in Cat hydraulic system components and hydrostatic transmissions.

Table 27

Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosities	°C		°F	
			Min	Max	Min	Max
Hydraulic System	Cat HYDO Advanced 10 Cat TDTO	SAE 10W	-20	40	-4	104
	Cat HYDO Advanced 30 Cat TDTO	SAE 30	10	50	50	122
	Cat BIO HYDO Advanced	"ISO 46" Multi-Grade	-30	50	-22	122
	Cat MTO Cat DEO-ULS Cat DEO	SAE10W-30	-20	40	-4	104
	Cat DEO-ULS Cat DEO	SAE15W-40	-15	50	5	122
	Cat TDTO-TMS	Multi-Grade	-15	50	5	122
	Cat DEO-ULS SYN Cat DEO SYN	SAE 5W-40	-30	40	-22	104
	Cat DEO-ULS Cold Weather	SAE0W-40	-40	40	-40	104
	Cat TDTO Cold Weather	SAE 0W-20	-40	40	-40	104

Other Fluid Applications

Table 28

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Final Drives and Swing Drives	Cat TDTO Cat TDTO-TMS Cat TDTO SYN Cold Weather commercial TO-4	SAE 0W-20	-40	0	-40	32
		SAE 0W-30	-40	10	-40	50
		SAE 5W-30	-30	10	-22	50
		SAE 10W	-30	0	-22	32
		SAE 30	-25	25	-13	77
		SAE 50	-15	50	5	122
		Cat TDTO-TMS	-30	25	-22	77
Track Roller Frame Recoil Spring and Pivot Shaft Bearings	Cat TDTO Cat TDTO-TMS Cat TDTO SYN Cold Weather commercial TO-4	SAE 0W-20	-40	0	-40	32
		SAE 0W-30	-40	10	-40	50
		SAE 5W-30	-35	0	-31	32
		SAE 10W	-30	0	-22	32
		SAE 30	-20	25	-4	77
		SAE 40	-10	40	14	104
		SAE 50	0	50	32	122
Cat TDTO-TMS	-25	25	-13	77		

(continued)

(Table 28, contd)

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Track Idlers and Track Rollers	Cat DEO (single grade) Cat DEO SYN	SAE 30	-20	25	-4	77
	Cat DEO-ULS SYN Cat ECF-1-a Cat ECF-2 Cat ECF-3 API CF	SAE 5W-40	-35	40	-31	104

Table 29

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Variable Pitch Flexxaire Fan (If Equipped)	Cat Full Synthetic Multi-grade DEO commercial Full Synthetic Multigrade Diesel Engine Oil meeting either Cat ECF-1 or API CG-4	SAE 0W40 ⁽¹⁾	-40	50	-40	122
		SAE 5W40 ⁽¹⁾	-40	50	-40	122
	Caterpillar Non-Synthetic TO-4	SAE 30 ⁽²⁾	-15	25	-5	77
		SAE 50 ⁽²⁾	-10	50	14	122

(1) This is the first choice. Full synthetic oils are recommended. Synthetic oils may provide longer service life for the fan. Synthetic oils allow for increased service intervals over non-synthetic oils.

(2) This is the second choice. Caterpillar TDTO is acceptable. Commercial oils that meet the TO-4 specification are also acceptable. TDTO is non-synthetic. Commercial TO-4 oils are typically non-synthetic.

Special Lubricants

Grease

To use a non-Cat grease, the supplier must certify that the lubricant is compatible with Cat grease.

Each pin joint should be flushed with the new grease. Ensure that all old grease is removed. Failure to meet this requirement may lead to failure of a pin joint.

Table 30

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
External Lubrication Points	Cat Prime Application Grease	NLGI Grade 2	-20	140	-4	284
	Cat Extreme Application Grease	NLGI Grade 1	-20	140	-4	284
		NLGI Grade 2	-15	140	+5	284

(continued)

(Table 30, contd)

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
	Cat Extreme Application Grease-Artic	NLGI Grade 0.5	-50	130	-58	266
	Cat Extreme Application Grease-Desert	NLGI Grade 2	-10	140	+14	284
	Cat Utility Grease	NLGI Grade 2	-20	140	-4	284
	Cat Ball Bearing Grease	NLGI Grade 2	-20	160	-4	320

Grease for the Autolube System (if Equipped)

The grease used with the automatic lubrication system must not contain any graphite or PTFE.

Note: Pumpability is based on “US Steel Mobility and Lincoln Ventmeter Tests”. Performance may vary depending on lubrication equipment and the length of the lines.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for additional information about grease. This manual may be found on the following website:

safety.cat.com

Table 31

Recommended Grease for the Autolube System						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
Cat Autolube System	Cat Extreme Application Grease	NLGI Grade 1	-35	40	-31	104
		NLGI Grade 2	-30	50	-22	122

Diesel Fuel Recommendations

Diesel fuel must meet “Caterpillar Specification for Distillate Fuel” and the latest versions of “ASTM D975” or “EN 590” to ensure optimum engine performance. Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for the latest fuel information and for Cat fuel specification. This manual may be found on the following website:

safety.cat.com

The preferred fuels are distillate fuels. These fuels are commonly called diesel fuel, furnace oil, gas oil, or kerosene. These fuels must meet the “Caterpillar Specification for Distillate Diesel Fuel for Off-Highway Diesel Engines”. Diesel Fuels that meet the Caterpillar specification will help provide maximum engine service life and performance.

Misfueling with fuels of high sulfur level can have the following negative effects:

- Reduce engine efficiency and durability
- Increase the wear
- Increase the corrosion
- Increase the deposits
- Lower fuel economy
- Shorten the time period between oil drain intervals (more frequent oil drain intervals)
- Increase overall operating costs
- Negatively impact engine emissions

Failures that result from the use of improper fuels are not Caterpillar factory defects. Therefore the cost of repairs would not be covered by a Caterpillar warranty.

Caterpillar does not require the use of ULSD in off road and machine applications that are not Tier 4/ Stage IIIB certified engines. ULSD is not required in engines that are not equipped with after treatment devices.

Follow operating instructions and fuel tank inlet labels, if available, to ensure that the correct fuels are used.

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more details about fuels and lubricants. This manual may be found on the following website:

safety.cat.com

Fuel Additives

Cat Diesel Fuel Conditioner and Cat Fuel System Cleaner are available for use when needed. These products are applicable to diesel and biodiesel fuels. Consult your Cat dealer for availability.

Biodiesel Fuel Recommendations

NOTICE

Never use raw vegetable or plant-based oils in place of esterified biodiesel.

The use of oils that are not esterified can lead to engine damage, up to and including engine failure.

Biodiesel is a fuel that can be made from various renewable resources that include vegetable oils, animal fat, and waste cooking oil. These oils and fats are chemically processed (esterified), and filtered to remove water and contaminants.

For biodiesel storage requirements, consult your fuel supplier.

Note: In some regions, biodiesel blends are known as Fatty Acid Methyl Ester (FAME).

Use biodiesel blends that meet national, regional, and local standards.

For more information on biodiesel standards, and to reduce the risks associated with biodiesel usage, refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Biodiesel Blend Limits

NOTICE

The use of biofuel blends above the acceptable limit can lead to higher engine downtime.

Biodiesel blend levels up to B20 are acceptable to use in this product.

The use of higher biodiesel blend levels are acceptable in regions where mandated. Consult your Cat dealer.

Note: The energy density of biodiesel blends above B20 are noticeably lower than diesel fuel.

Note: For engines equipped with emission aftertreatment devices, biodiesel blends must be blended with U.S. Ultra Low Sulfur Diesel, or European Sulfur Free Diesel.

Coolant Information

The information provided in this "Coolant Recommendation" section should be used with the "Lubricants Information" provided in the latest revision of Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations". This manual may be found on the web on the following website:

safety.cat.com

The following two types of coolants may be used in Cat diesel engines:

Preferred – Cat ELC (Extended Life Coolant)

Acceptable – Cat DEAC (Diesel Engine Antifreeze/Coolant)

NOTICE

Never use water alone as a coolant. Water alone is corrosive at engine operating temperatures. In addition, water alone does not provide adequate protection against boiling or freezing.

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Capacities (Refill)

SMCS Code: 1000; 7000

Table 32

Approximate Refill Capacities				
Component or System		Liters	US gal	Recommended Type
Fuel Tank	S/N: MNH1–Up; JH71–Up	22	5.80	Diesel Fuel
	S/N: H8X1–Up; RHM1–Up; MY61–Up	26	6.87	
Cooling System		3.5	0.90	"ASTM D4985"
				Caterpillar Extended Life Coolant (ELC)
Engine Crankcase with Filter		3.5	0.90	Refer to Operation and Maintenance Manual, "Lubricant Viscosities".
Final Drive		0.6	0.16	
Hydraulic System ⁽¹⁾		18	4.76	
		kg	lbs	
Refrigerant ⁽²⁾		0.8	1.8	R-134a

(1) The amount of hydraulic fluid that is needed to refill the hydraulic system after performing Operation and Maintenance Manual, "Hydraulic System Oil - Change"

(2) Refer to Service Manual, "Air Conditioning and Heating R-134a for All Caterpillar Machines" for additional information

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S·O·S Information

SMCS Code: 1000; 1348; 3080; 4050; 5050; 7000; 7542-008

S·O·S Services is a highly recommended process for Cat 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.

The effectiveness of S·O·S Services is dependent on timely submission of the sample to the laboratory at recommended intervals.

Refer to the Operation and Maintenance Manual, "Maintenance Interval Schedule" for a specific sampling location and a service hour maintenance interval.

Consult your Cat dealer for complete information and assistance in establishing an S·O·S program for your equipment.

Maintenance Support

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Prepare the Machine for Maintenance

SMCS Code: 1000; 7000

Refer to the following procedure before you perform any maintenance to the machine.

WARNING

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

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

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

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, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Note: Permit only one operator on the machine. Keep all other personnel away from the machine or in view of the operator.

1. Park the machine on a dry, level, solid surface that is free of any debris.

Note: The surface must be solid enough to support the weight of the machine and any tooling that is used to support the machine.

2. Engage the parking brake. Place wheel blocks in front and behind the wheels or tracks.
3. Lower all work tools to the ground.
4. Stop the engine.

5. Release the pressure in the hydraulic system. Refer to Operation and Maintenance Manual, "System Pressure Release" for more information.

Perform a visual inspection first. If the visual checks are completed but the problem has not been identified, perform operational checks. If the problem has not been identified, perform instrument tests. This procedure will help to identify system problems.

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Service Interval Chart

SMCS Code: 7000

The service interval chart is on the roof.

Refer to this Operation and Maintenance Manual, "Maintenance Interval Schedule" for the correct maintenance intervals and procedures that are specific to your machine.

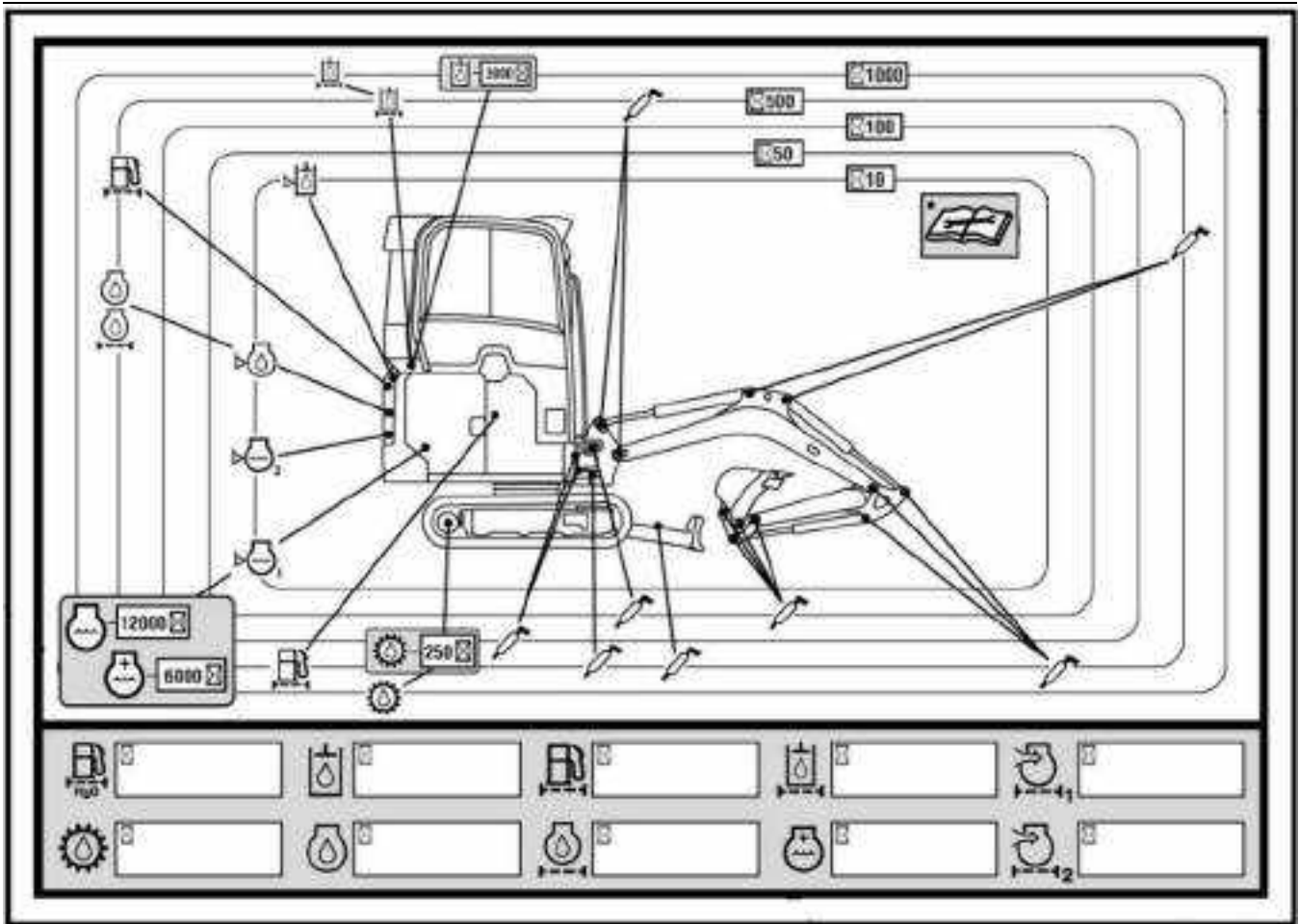















Illustration 414

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-  **Service hour interval** – Hourly interval in which a maintenance procedure should be performed.
-  **Coolant level** – Check the coolant level.
-  **Cooling system coolant** – Add ELC (Extended Left Coolant).
-  **Cooling system coolant** – Change the ELC (Extended Life Coolant).
-  **Engine oil level** – Check the engine oil level.
-  **Engine oil** – Change the engine oil.
-  **Engine oil filter** – Change the engine oil filter.

-  **Final Drive Oil** – Change the final drive oil.
-  **Fuel system filter** – Replace the fuel system filters.
-  **Grease zerk** – Lubricate the designated locations.
-  **Hydraulic oil level** – Check the hydraulic oil level.
-  **Hydraulic oil** – Change the hydraulic oil.
-  **Hydraulic oil filter** – Change the hydraulic oil filter.

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System Pressure Release

SMCS Code: 1250-553-PX; 1300-553-PX; 1350-553-PX; 5050-553-PX; 6700-553-PX; 7540-553-PX

WARNING

Personal injury or death can result from sudden machine movement.

Sudden movement of the machine can cause injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

Coolant System

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.

To relieve the pressure from the coolant system, turn off the machine. Allow the cooling system pressure cap to cool. Remove the cooling system pressure cap slowly to relieve pressure.

Hydraulic System

WARNING

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

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

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

1. Position the machine on level ground.
2. Lower the work tools to the ground.
3. Shut off the engine.
4. Turn the key to the ON position before moving the joysticks.

Note: Ensure that the hydraulic activation control lever in the UNLOCKED position.

5. Move the joysticks through the full range of travel. This action will relieve any pressure that may be present in the hydraulic system.
6. Slowly loosen the filler cap to release the pressure in the hydraulic tank.
7. Tighten the filler cap.
8. The pressure in the hydraulic system has been released. Lines and components can be removed.

Release Hydraulic System Pressure in the Auxiliary Circuits

1. Start the engine to charge pilot accumulator.
2. Shut off the engine.

Note: Perform Step 3 through Step 5 immediately after the engine is shut off to insure adequate pilot system pressure is available to release the pressure in the hydraulic circuits.

3. Turn the engine start switch to the ON position without starting the engine.
4. Place the hydraulic activation control lever in the UNLOCKED position.
5. Actuate the auxiliary circuit in both directions several times.
6. Place the hydraulic activation control lever in the LOCKED position.
7. Start the engine to recharge pilot accumulator.

Note: Do not activate any controls when recharging pilot accumulator.

8. Shut off the engine.
9. Repeat Step 3 through Step 6 for each auxiliary circuit.
10. After releasing the hydraulic pressure in each of the desired hydraulic circuits, place the hydraulic activation control lever in the LOCKED position.
11. Turn the engine start switch to the OFF position.
12. Remove the hydraulic oil tank filler cap.
13. The pressure in the multiple hydraulic circuits that require service is now released and lines and components can be disconnected or removed from those hydraulic circuits.

Note: Pressure can build up in the auxiliary lines if the attachment is not coupled/uncoupled immediately after the pressure has been released.

Note: Refer to the Operation and Maintenance Manual, Equipment Lowering with Engine Stopped for information on lowering the work tool with the engine off.

5. Use standard welding procedures to weld the materials together.

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Welding on Machines and Engines with Electronic Controls

SMCS Code: 1000; 7000

Do not weld on any protective structure. If it is necessary to repair a protective structure, contact your Cat dealer.

Proper welding procedures are necessary 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 to prevent heat related damage. The following steps should be followed 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 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 to reduce the possibility of damage to the following components:
 - Bearings of the drive train
 - Hydraulic components
 - Electrical components
 - Other components of the machine
4. Protect any wiring harnesses and components from the debris and the spatter which is created from welding.

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Maintenance Interval Schedule

SMCS Code: 7000

Ensure that all safety information, warnings, and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance. All adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging are included. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, **WHICH EVER OCCURS FIRST**, to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance. Refer to the maintenance procedure for any other exceptions that may change the maintenance intervals.

Note: The aftertreatment system can be expected to function properly for the useful life of the engine (emissions durability period), as defined by regulation. All prescribed maintenance requirements must be followed.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

The following guidelines should be followed if the service hours are not met:

Items listed between 10 and 100 service hours should be performed at least every 3 months.

Items listed between 250 and 500 service hours should be performed at least every 6 months.

Items listed between 1000 service hours and 2500 service hours should be performed at least every year.

When Required

“ Air Cleaner Dust Valve - Clean/Inspect“	349
“ Air Conditioner/Cab Heater Filter (Recirculation) - Inspect/Replace“	349
“ Battery - Recycle“	351
“ Battery or Battery Cable - Inspect/Replace“	352
“ Bucket Tips - Inspect/Replace“	358
“ Condenser (Refrigerant) - Clean“	358

“ Engine Air Filter Primary Element - Clean/Replace“	363
“ Engine Air Filter Secondary Element - Replace“	366
“ Film (Product Identification) - Clean“	372
“ Fuel System - Prime“	374
“ Fuel Tank Cap - Clean“	376
“ Fuel Tank Water and Sediment - Drain“	377
“ Fuses - Replace“	377
“ Oil Filter - Inspect“	386
“ Quick Coupler - Clean/Inspect“	387
“ Radiator Core - Clean“	389
“ Track Adjustment - Adjust“	392
“ Window Washer Reservoir - Fill“	395
“ Window Wiper - Inspect/Replace“	395
“ Windows - Clean“	395

Every 10 Service Hours or Daily for First 100 Hours

“ Blade Linkage - Lubricate“	354
“ Boom and Stick Linkage - Lubricate“	354
“ Bucket Linkage - Lubricate“	357
“ Swing Frame Pin - Lubricate“	390
“ Swing Gear and Bearing - Lubricate“	391

Every 10 Service Hours or Daily

“ Cooling System Coolant Level - Check“	361
“ Engine Air Filter Service Indicator - Inspect“	366
“ Engine Oil Level - Check“	367
“ Fuel System Water Separator - Drain“	376
“ Horn - Test“	379
“ Hydraulic System Oil Level - Check“	383
“ Light - Test“	385
“ Quick Coupler - Lubricate“	389
“ Seat Belt - Inspect“	389
“ Travel Alarm - Test“	394

“ Undercarriage - Check“ 395

Every 10 Service Hours or Daily for Machines Used in Severe Applications

“ Blade Linkage - Lubricate“ 354

Every 50 Service Hours

“ Bucket Linkage - Lubricate“ 357

“ Quick Coupler - Clean“ 387

“ Swing Frame Pin - Lubricate“ 390

“ Track Adjustment - Inspect“ 393

Every 100 Service Hours

“ Swing Gear and Bearing - Lubricate“ 391

Every 250 Service Hours

“ Belt - Inspect/Adjust/Replace“ 352

“ Engine Oil Sample - Obtain“ 368

“ Quick Coupler - Check“ 386

“ Quick Coupler - Lubricate“ 389

Initial 500 Service Hours

“ Final Drive Oil - Change“ 372

“ Hydraulic System Oil Filter (Return) - Replace“ 382

Every 500 Service Hours

“ Blade Linkage - Lubricate“ 354

“ Boom and Stick Linkage - Lubricate“ 354

“ Boom, Stick, and Frame - Inspect“ 355

“ Cooling System Coolant Sample (Level 1) - Obtain“ 362

“ Engine Air Filter Primary Element - Clean/ Replace“ 363

“ Engine Oil and Filter - Change“ 368

“ Final Drive Oil Sample - Obtain“ 373

“ Fuel Lift Pump Strainer - Replace“ 374

“ Fuel System Primary Filter (Water Separator) Element - Replace“ 375

“ Hydraulic System Oil Sample - Obtain“ 384

Every 750 Service Hours

“ Lifting Hook - Inspect“ 384

Every 1000 Service Hours

“ Battery Hold-Down - Tighten“ 351

“ Engine Valve Lash - Check/Adjust“ 371

“ Final Drive Oil - Change“ 372

“ Hydraulic System Oil Filter (Return) - Replace“ 382

Every 3000 Service Hours

“ Hydraulic System Oil - Change“ 379

Every 3 Years

“ Seat Belt - Replace“ 390

Every 6000 Service Hours

“ Cooling System Coolant Extender (ELC) - Add“ 361

Every 12 000 Service Hours

“ Cooling System Coolant (ELC) - Change“ 359

i07291066

Air Cleaner Dust Valve - Clean/Inspect

SMCS Code: 1051-571-VL

1. Open the rear access door.
2. The air filter housing is in the engine compartment.

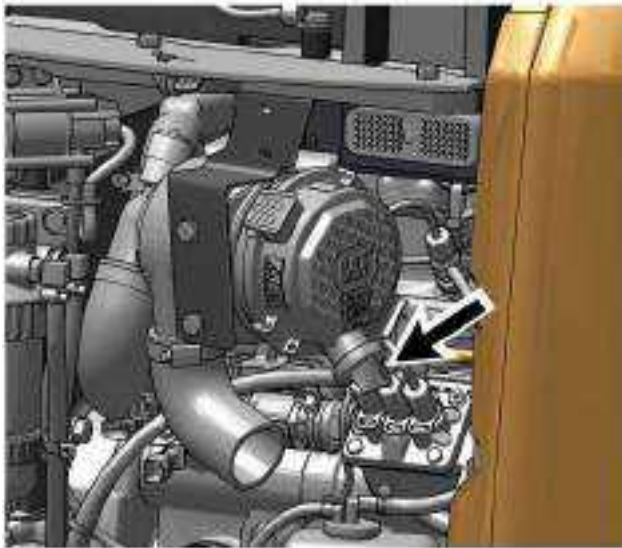


Illustration 415

g06275872

3. Check the dust valve after every 10 service hours or at the end of each day. Actuate the valve by squeezing the lips of the valve to remove any accumulated debris.
4. Close the rear access door.

i08468077

Air Conditioner/Cab Heater Filter (Recirculation) - Inspect/Replace

SMCS Code: 1054-040-A/C; 1054-510-A/C

NOTICE

An air recirculation filter element plugged with dust will result in decreased performance and service life to the air conditioner or cab heater.

To prevent decreased performance, clean the filter element, as required.

NOTICE

Failure to reinstall the filter element for the air conditioning system will contaminate and damage the system components.

Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".

Cab Intake Air Filter

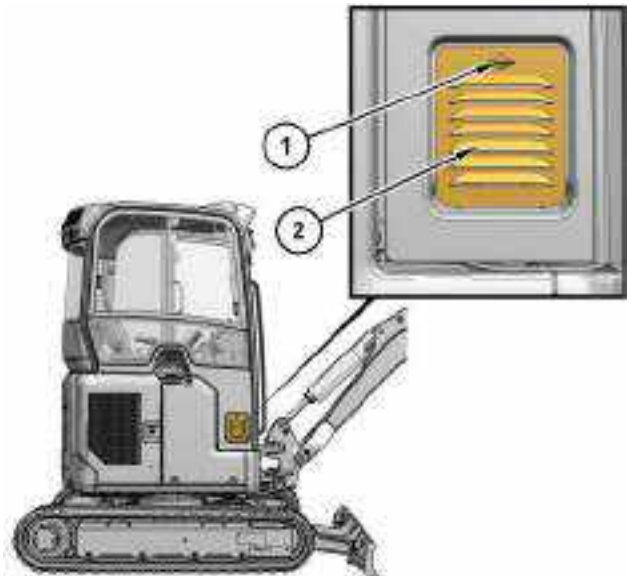


Illustration 416

g06675025

- (1) Knob
(2) Cab intake air filter cover

1. Open cab intake air filter cover (2) using knob (1) provided.

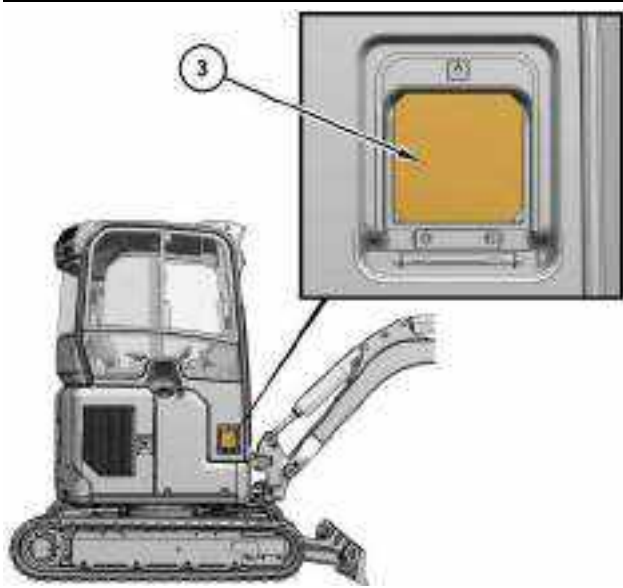


Illustration 417

g06675032

(3) Cab intake air filter

2. Remove cab intake air filter (3).
3. Tap cab intake air filter (3) to remove the dirt. Do not use compressed air to clean cab intake air filter (3).
4. After cleaning cab intake air filter (3), inspect cab intake air filter (3). If cab intake air filter (3) is damaged or badly contaminated, use new cab intake air filter (3). Make sure that cab intake air filter (3) is dry.
5. Install cab intake air filter (3).

6. Close cab intake air filter cover (2) using knob (1) provided.

Air Conditioner Filter

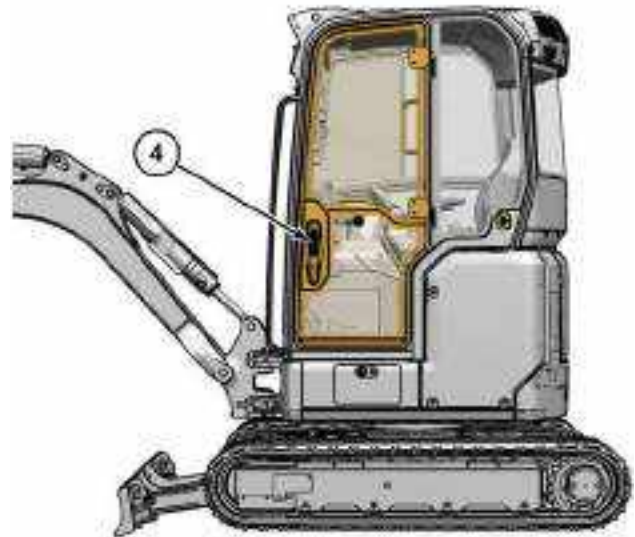


Illustration 418

g06675035

(4) Cab door

1. Open cab door (4). Refer to "Access Door and Cover Locations" for more information.

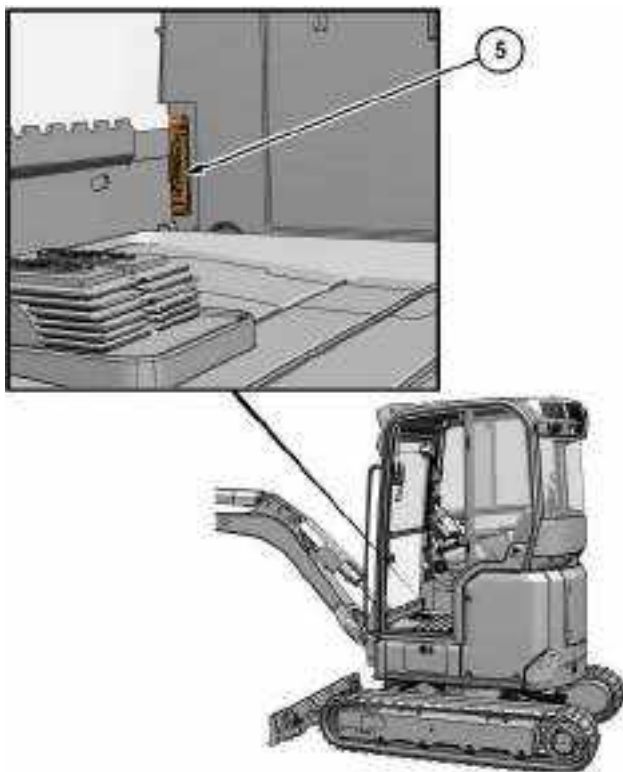


Illustration 419

g06675047

Some components removed for better clarity
Location of air conditioner filter element
(5) Air conditioner filter element

2. Air conditioner filter element (5) is on the lower right side of the cab and to the front of Heating Ventilation and Air Conditioning (HVAC) unit.
3. Remove air conditioner filter element (5) by sliding air conditioner filter element (5) outward.
Refer to Illustration 420 for the direction in which air conditioner filter element (5) to be removed.
4. Tap air conditioner filter element (5) to remove the dirt. Do not use compressed air to clean air conditioner filter element (5).
5. After cleaning air conditioner filter element (5), inspect air conditioner filter element (5). If air conditioner filter element (5) is damaged or badly contaminated, use new air conditioner filter element (5). Make sure that air conditioner filter element (5) is dry.
6. Install air conditioner filter element (5).
7. Close cab door (4). Refer to "Access Door and Cover Locations" for more information.

i08316356

Battery - Recycle

SMCS Code: 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

i00934872

Battery Hold-Down - Tighten

SMCS Code: 7257

Tighten the hold-downs for the battery in order to prevent the batteries from moving during machine operation.

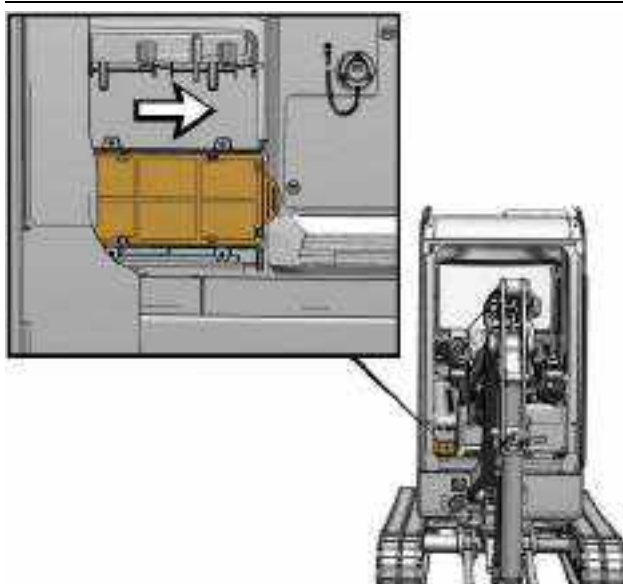


Illustration 420

g06675072

Some components removed for better clarity
Direction to remove air conditioner filter element

i07279888

Battery or Battery Cable - Inspect/Replace

SMCS Code: 1401-040; 1401-510; 1401-561; 1401; 1402-510; 1402-040

WARNING

Personal injury may occur from failure to properly service the batteries.

Batteries give off flammable fumes that can explode. Electrolyte is an acid and can cause personal injury if it contacts the skin or eyes.

Prevent sparks near the batteries. Sparks could cause vapors to explode. Do not allow jumper cable ends to contact each other or the engine. Improper jumper cable connections can cause an explosion.

Always wear protective glasses when working with batteries.

1. Turn the engine start switch to the OFF position. Remove the engine start switch key from the switch. Turn all switches to the OFF position.
2. To access the battery, tilt the canopy up. Refer to Operation and Maintenance Manual, "Access Door and Cover Locations" for more information on how to tilt the canopy up.
3. Disconnect the negative battery cable at the battery.
4. Disconnect the positive battery cable at the battery.
5. For necessary repairs, consult your Cat dealer. Replace the cable or the battery, as needed.
6. Connect the positive battery cable at the battery.
7. Connect the negative battery cable at the battery.
8. Install the engine start switch key.

Battery Recycle

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

i08130170

Belt - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510; 1397-025; 1397-040; 1397-510

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

For maximum engine performance and maximum utilization of your engine, inspect the belts for wear and for cracking. Check the belt tension. Adjust the belt tension to minimize belt slippage. Belt slippage will decrease the belt life. Belt slippage will also cause poor performance of the alternator and of any driven equipment.

If new belts are installed, recheck the belt adjustment after 30 minutes of operation.

Water Pump Belt, Fan Drive Belt, and Alternator Belt



Illustration 421

g06558770

- (1) Bracket bolt
- (2) Alternator mounting bolt
- (3) Alternator mounting bolt

1. Open the engine access door.
2. Remove the fan guard.
3. Check the belt tension.

Table 33

Belt Tension Chart	
Gauge Reading	
Initial Belt Tension ⁽¹⁾	Used Belt Tension ⁽²⁾
400 to 489 N (90 to 110 lb)	267 to 356 N (60 to 80 lb)

- (1) Initial Belt Tension refers to a new belt.
- (2) Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 33 for proper belt tension adjustment.

4. If the tension is not correct, loosen bolt (1), and alternator mounting bolts (2) and (3). Adjust alternator position.
5. When the adjustment is correct, tighten bolt (1), and alternator mounting bolts (2) and (3) securely.
6. Check the tension of the belt again.
7. Close the engine access door.

Air Conditioner Belt (If Equipped)

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

1. Open the engine access door.
2. Remove the bottom access guard.
3. Remove the fan guard.

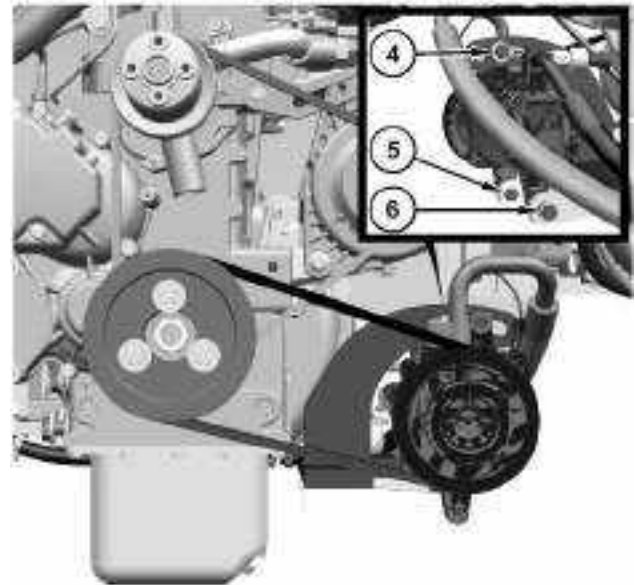


Illustration 422

g06558782

- (4) Compressor mounting bolt
- (5) Compressor mounting bolt
- (6) Compressor mounting bolt

4. Check the belt tension.

Table 34

Belt Tension Chart	
Gauge Reading	
Initial Belt Tension ⁽¹⁾	Used Belt Tension ⁽²⁾
423 to 467 N (95 to 105 lb)	378 to 422 N (85 to 95 lb)

- (1) Initial Belt Tension refers to a new belt.
- (2) Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 34 for proper belt tension adjustment.

5. If the tension is not correct, loosen bolts (4), (5), and (6). Adjust compressor position.
6. When the adjustment is correct, tighten bolts (4), (5), and (6).
7. Check the tension again.

8. Close the engine access door.

i07291617

Blade Linkage - Lubricate

SMCS Code: 6060-086

Dozer

Lower all the work tools and the blade to the ground.

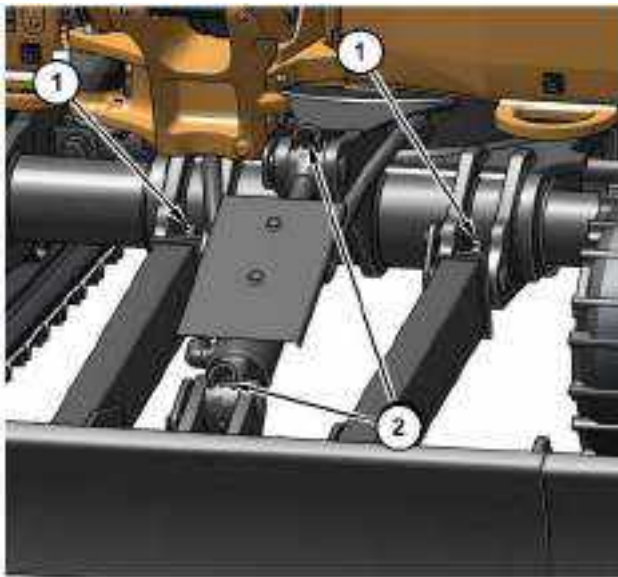


Illustration 423

g06276254

Wipe all fittings before lubricating.

1. Apply lubricant to the fittings for the arms (1) that support the blade.
2. Apply lubricant to the fittings of the blade cylinder (2).

i07284739

Boom and Stick Linkage - Lubricate

SMCS Code: 6501-086; 6502-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the boom and stick linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on grease.

1. Position the machine into the service position.
2. Wipe all fittings before you apply lubricant.



Illustration 424

g06273896

3. Apply lubricant to grease fittings (1) at each cylinder end.



Illustration 425

g06273754

4. Apply lubricant to grease fittings (2) at the boom cylinder pin joint.

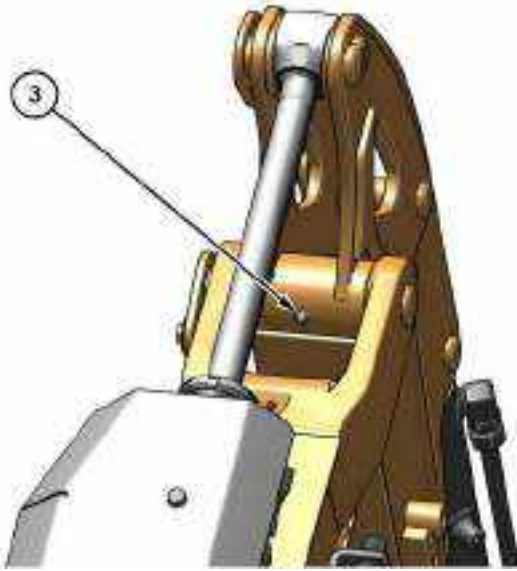


Illustration 426

g06273898

5. Apply lubricant to grease fitting (3) at the stick cylinder pin joint.

i07291711

Boom, Stick, and Frame - Inspect

SMCS Code: 6501; 6502; 6506

All earthmoving equipment is prone to a high degree of wear. Regular inspections for structural damage are necessary.

The interval between these inspections depends on the factors that follow.

- The age of the machine
- The severity of the application
- The loads that have been carried on the machine
- The amount of routine servicing that has been carried out

If the machine has been involved in any accident, the machine must be inspected thoroughly. Inspect the machine regardless of the date of the last inspection.

The machine must be clean before the machine is inspected.

Proper repair of frames and structures requires specific knowledge of the following subjects.

- Materials that have been used to manufacture the frame members
- Frame member construction

- Repair techniques that are recommended by the manufacturer.

Consult your Cat dealer if repairs are necessary. Your Cat dealer is qualified to carry out repairs on your behalf.

All repairs should be carried out by a Cat dealer. If you carry out your own repairs, contact your Cat dealer for advice about proper repair techniques.

Particular attention should be given to all welded structures. Inspect the following items thoroughly for cracks and for defects:

- Boom
- Stick
- Blade
- Lifting points
- Upper frame
- Lower frame

NOTICE

The areas highlighted are of particular importance but other areas must not be neglected. The entire structure must be carefully examined.

Boom

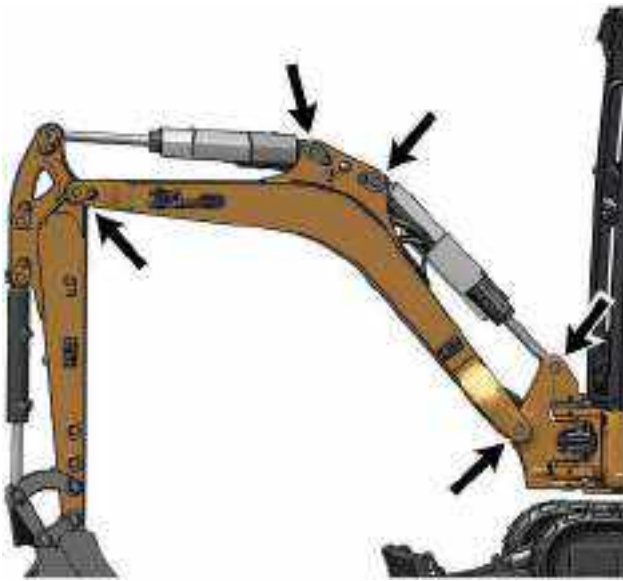


Illustration 427

g06276285

Check all welded joints and check the mounting points for the cylinder.

Blade

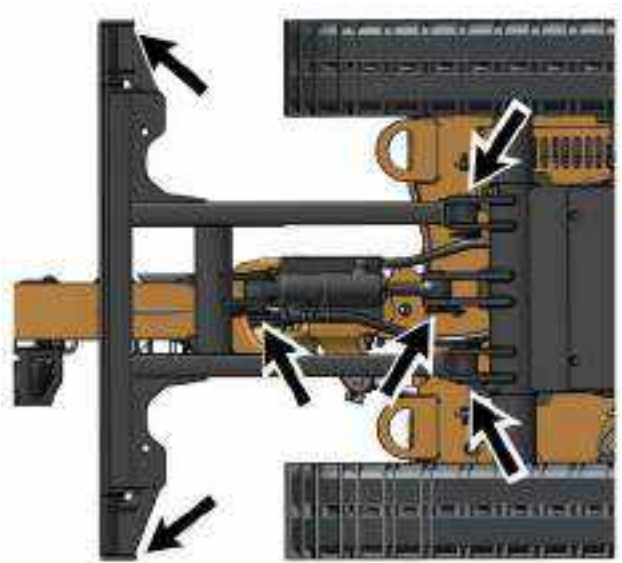


Illustration 429

g06276301

Check all welded joints and check the mounting points for the cylinder.

Stick

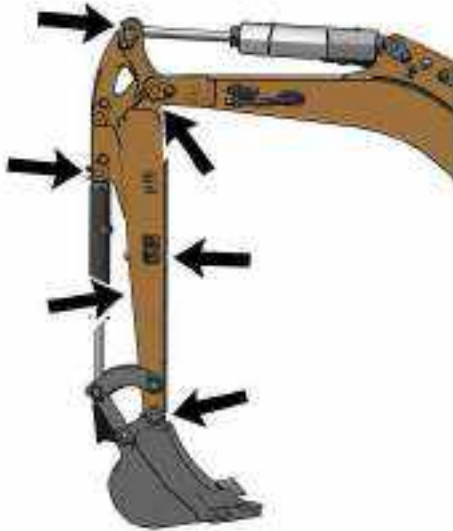


Illustration 428

g06276291

Check all welded joints and check the mounting points for the cylinder.

Lifting Points



Illustration 430

g06276305

Check the approved lifting points carefully. Check the welds. Check that the plates are not excessively bent. Check that the lifting holes are not deformed.

Upper Frame



Illustration 431

g06276321

Check for damaged panels. Specifically look for any damage to the canopy that might invalidate the certification. The canopy is a safety device that must be maintained in good condition. Check for loose hardware or missing hardware.

Note: Replace any hardware that is loose, damaged, or missing with original replacement parts only.

Lower Frame



Illustration 432

g06276531

Check the weld joints in the lower structure. Check for loose hardware or missing hardware. Check the ring of bolts that secure the swing gear.

i07293069

Bucket Linkage - Lubricate

SMCS Code: 6513-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the bucket linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on molybdenum grease.

Apply lubricant through all fittings after operation under water.

Wipe all fittings before you apply lubricant.

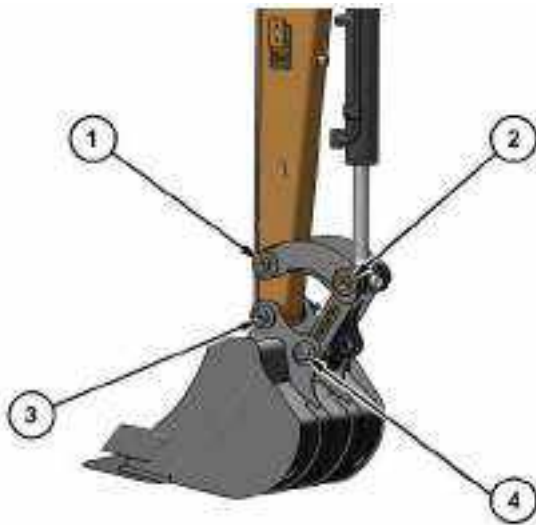


Illustration 433

g06276574

Note: Completely fill all cavities of the bucket control linkage with grease when you initially install a bucket.

1. Apply lubricant through fittings for the linkages (1) and (2).
2. Apply lubricant through fittings for the bucket (3) and (4).

Note: Service the above fittings after you operate the bucket under water.

i07294704

Bucket Tips - Inspect/Replace

SMCS Code: 6805-510; 6805-040

WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket tips or side cutters.

Bucket Tips

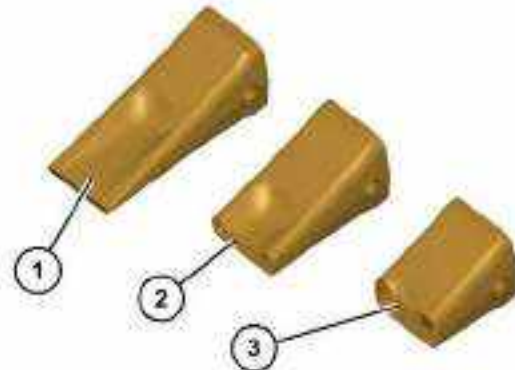


Illustration 434

g06214790

- (1) Usable
 (2) Replace this bucket tip.
 (3) Overworn

Check the bucket tips for wear. Consult your Cat dealer if the bucket tips need to be replaced. Your Cat dealer is qualified to carry out repairs on your behalf.

i07295040

Condenser (Refrigerant) - Clean

SMCS Code: 1805-070

NOTICE

If excessively dirty, clean condenser with a brush. To prevent damage or bending of the fins, do not use a stiff brush.

Repair the fins if found defective.

1. Remove the right side console inside the cab.



Illustration 435

g06276629

2. Inspect the condenser for debris. Clean the condenser, if necessary.
3. You can use compressed air, high-pressure water, or steam to remove dust and other debris from the condenser. However, the use of compressed air is preferred.
4. Reinstall the right side console.

i07279114

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

NOTICE

Do not change the coolant until you read and understand the cooling system information in Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Failure to do so could result in damage to the cooling system components.

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: If cooling system samples Level 1 and Level 2 are not performed, and ELC not added, The coolant should be changed every 2 years.

Note: This machine was filled at the factory with Caterpillar Extended Life Coolant.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

1. Open the right side access door.

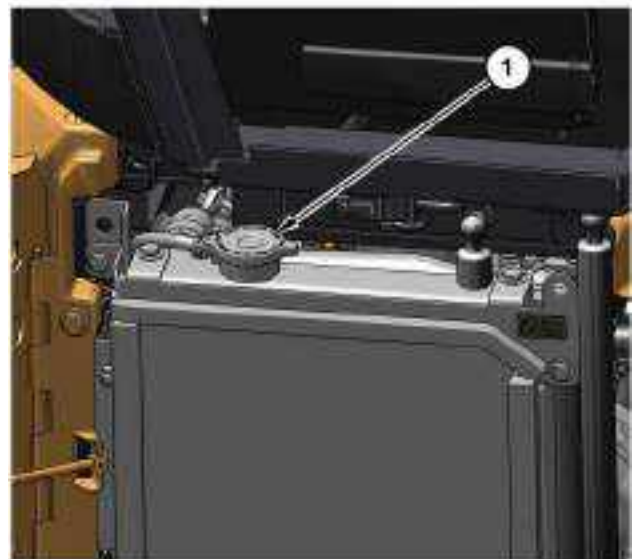


Illustration 436

g06268850

2. Loosen radiator cap (1) slowly to release pressure. Remove the radiator cap.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

Maintenance Section
Cooling System Coolant (ELC) - Change



Illustration 437

g06268860

3. Remove guard (2) under the fuel tank to access the coolant drain hose.

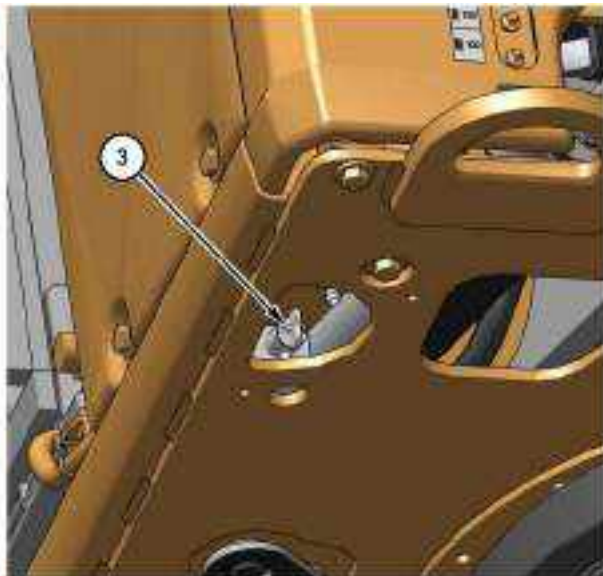


Illustration 438

g06268866

4. Remove coolant drain hose cap (3) and allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

5. Flush the cooling system with water until the draining water is transparent.
6. Install coolant drain hose cap (3).

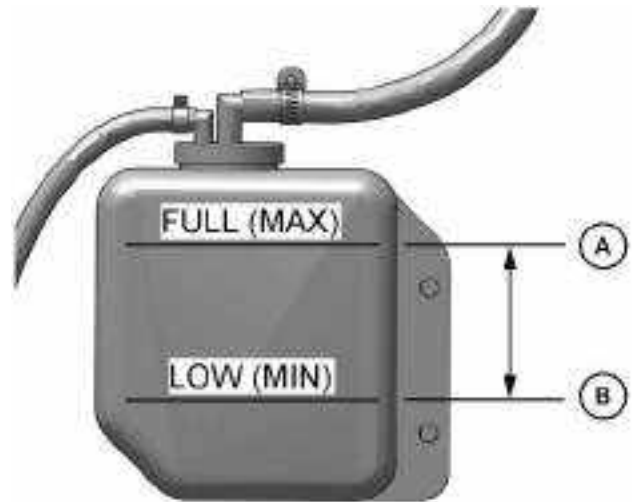


Illustration 439

g06268911

7. Add the Extended Life Coolant to the proper level as shown on the coolant reservoir. Refer to the following topics:
 - Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations"
 - Operation and Maintenance Manual, "Capacities (Refill)"
8. Start the engine. Leave the radiator cap off. Run the engine to expel any air from the system.
9. Maintain the coolant level within 13 mm (0.5 inch) of the bottom of the filler pipe.
10. Install the cooling system pressure cap after the thermostat and the coolant level stabilizes.
11. Stop the engine.
12. If more coolant is necessary, add the appropriate coolant solution.
13. Install guard (2).
14. Install radiator cap (1).
15. Close the right side access door.

Note: Dispose of drained fluids according to local regulations.

i03967772

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

WARNING

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

When a Caterpillar Extended Life Coolant is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, "Maintenance Interval Schedule" for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 35

RECOMMENDED AMOUNT OF EXTENDER BY COOLING SYSTEM CAPACITY	
Cooling System Capacity	Recommended Amount of Extender
6 to 11 L (1.6 to 3 US gal)	.2 L (0.21 qt)

For additional information on the addition of extender, see Operation and Maintenance Manual, SEBU6250, "Caterpillar Coolant Recommendations" or consult your Caterpillar dealer.

i07305734

Cooling System Coolant Level - Check

SMCS Code: 1350-040; 1350-535-FLV; 1395-535-FLV

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 rear access door.

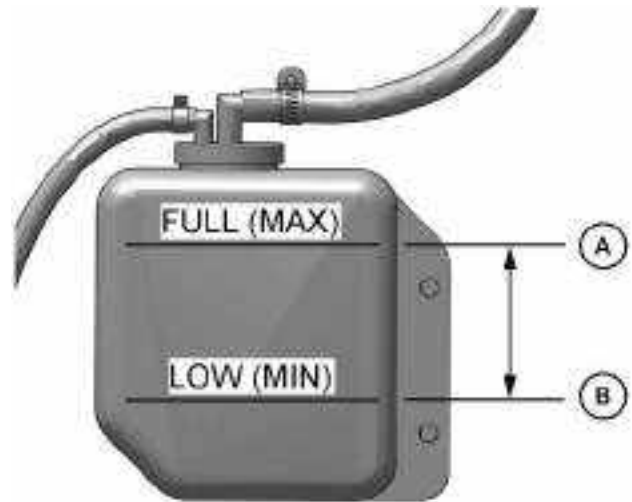


Illustration 440

g06268911

2. Maintain the coolant level between "FULL" mark (A) on the coolant reservoir and "LOW" mark (B) on the coolant reservoir.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. If additional coolant is necessary, remove the filler cap for the coolant reservoir and add the appropriate coolant mixture. Install the filler cap.

i07296023

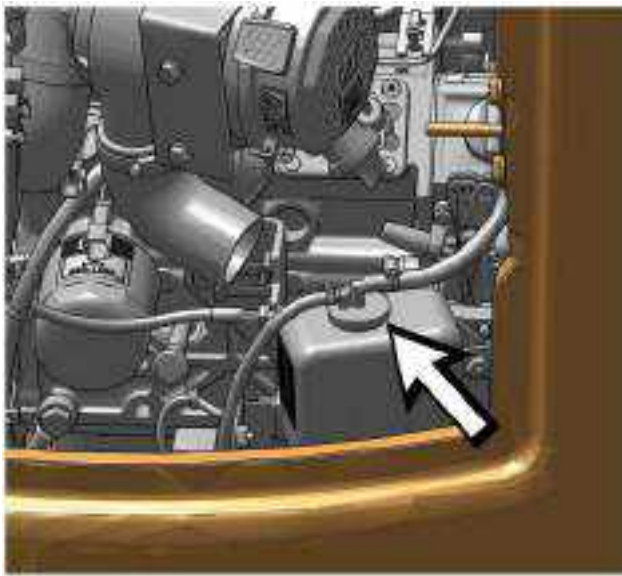


Illustration 441

g06268892

4. If the coolant reservoir is empty, remove the cooling system pressure cap slowly to relieve pressure. Add coolant to the radiator.

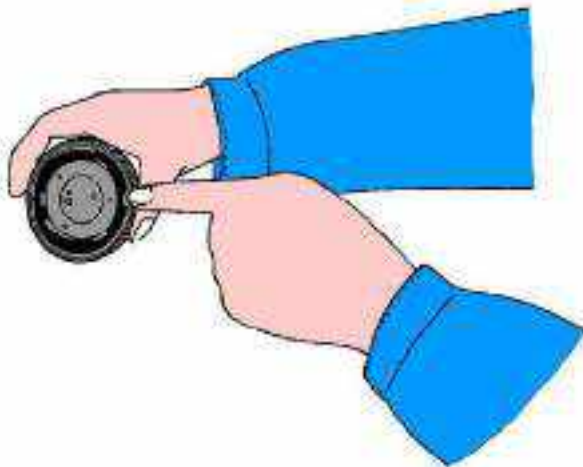


Illustration 442

g06277320

5. Inspect the condition of the cap gasket. If necessary, replace the cap.
6. Install the cooling system pressure cap.
7. Close the rear access door.

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 1395-554; 1395-008; 7542

Note: It is not necessary to obtain a Coolant Sample (Level 1) if the cooling system is filled with Cat ELC (Extended Life Coolant). Cooling systems that are filled with Cat ELC should have a Coolant Sample (Level 2) that is obtained at the recommended interval that is stated in the Maintenance Interval Schedule.

Note: Obtain a Coolant Sample (Level 1) if the cooling system is filled with any other coolant instead of Cat ELC. This includes the following types of coolants.

- Commercial long life coolants that meet the Caterpillar Engine Coolant Specification -1 (Caterpillar EC-1)
- Cat Diesel Engine Antifreeze/Coolant (DEAC)
- Commercial heavy-duty antifreeze/coolant solution

NOTICE

Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contaminate may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

Note: Level 1 results may indicate a need for Level 2 Analysis.

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, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the coolant as close as possible to the recommended sampling interval. The recommended sampling interval for Level 1 Coolant Analysis is every 250 service hours. To receive the full effect of S·O·S analysis, you must establish a consistent trend of data. To establish a pertinent history of data, perform consistent samplings that are evenly spaced. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Use the following guidelines for proper sampling of the coolant:

- Complete the information on the label for the sampling bottle before you begin to take the samples.
- Keep the unused sampling bottles stored in plastic bags.
- Keep the lids on empty sampling bottles until you are ready to collect the sample.
- Place the sample in the mailing tube immediately after obtaining the sample to avoid contamination.
- Never collect samples from expansion bottles.
- Never collect samples from the drain for a system.

1. Operate the machine to circulate the coolant. Collect the sample after a normal workday. Collect the samples from one to two hours after the engine has been shut off.
2. Start the engine momentarily to circulate the coolant again.
3. Shut off the engine.
4. Carefully remove the radiator cap.
5. Use a vacuum pump and draw the sample. Do not allow dirt or other contaminants to enter the sampling bottle. Fill the sampling bottle three-fourths from the top. Do not fill the bottle completely.
6. Place the sampling bottle with the completed label into the mailing tube.
7. Install the radiator cap.

i07296888

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070; 1054-510

Cleaning Primary Air Filter Elements

NOTICE

Caterpillar recommends certified air filter cleaning services available at participating Caterpillar dealers. The Caterpillar cleaning process uses proven procedures to assure consistent quality and sufficient filter life.

Observe the following guidelines if you attempt to clean the filter element:

Do not tap or strike the filter element in order to remove dust.

Do not wash the filter element.

Use low pressure compressed air in order to remove the dust from the filter element. Air pressure must not exceed 207 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 damage to the pleats.

Do not use air filters with damaged pleats, gaskets, or seals. Dirt entering the engine will cause damage to engine components.

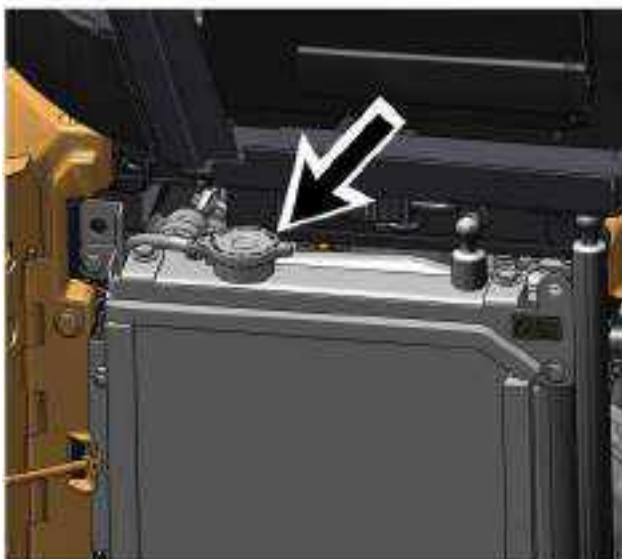


Illustration 443

g06276640

WARNING

Pressurized System: Hot coolant can cause serious burns. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure.

Maintenance Section
Engine Air Filter Primary Element - Clean/Replace

The primary air filter element can be used up to six times if the element is properly cleaned and if the element is properly inspected. When the primary air filter element is cleaned, check for rips or tears in the filter material. The primary air filter element should be replaced at least one time per year. This replacement should be performed regardless of the number of cleanings.

NOTICE

Do not clean the air filter elements by bumping or tapping. This could damage the seals. Do not use elements with damaged pleats, gaskets, or seals. Damaged elements will allow dirt to pass through. Engine damage could result.

Visually inspect the primary air filter elements before cleaning. Inspect the air filter elements for damage to the seal, the gaskets, and the outer cover. Discard any damaged air filter elements.

There are two common methods that are used to clean primary air filter elements:

- Pressurized air
- Vacuum cleaning

Pressurized Air

Pressurized air can be used to clean primary air filter elements that have not been cleaned more than two times. Pressurized air will not remove deposits of carbon and oil. Use filtered, dry air with a maximum pressure of 207 kPa (30 psi).

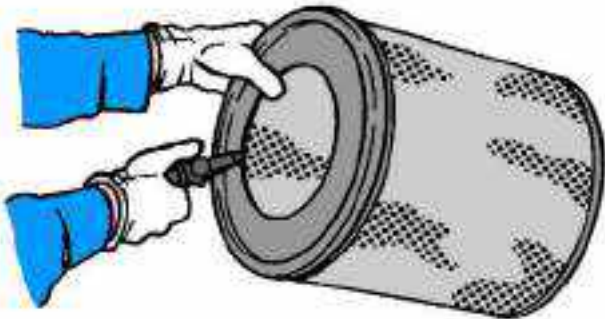


Illustration 444

g06276726

Note: When the primary air filter elements are cleaned, always begin with the clean side (inside) to force dirt particles toward the dirty side (outside).

Aim the hose so that the air flows inside the element along the length of the filter to help prevent damage to the paper pleats. Do not aim the stream of air directly at the primary air filter element. Dirt could be forced further into the pleats.

Vacuum Cleaning

Vacuum cleaning is another method for cleaning primary air filter elements which require daily cleaning because of a dry, dusty environment. Cleaning with pressurized air is recommended prior to vacuum cleaning. Vacuum cleaning will not remove deposits of carbon and oil.

Inspecting the Primary Air Filter Elements



Illustration 445

g06276739

Inspect the clean, dry primary air filter element. Use a 60 watt blue light in a dark room or in a similar facility. Place the blue light in the primary air filter element. Rotate the primary air filter element. Inspect the primary air filter element for tears and/or holes. Inspect the primary air filter element for light that may show through the filter material. If it is necessary to confirm the result, compare the primary air filter element to a new primary air filter element that has the same part number.

Do not use a primary air filter element that has any tears and/or holes in the filter material. Do not use a primary air filter element with damaged pleats, gaskets, or seals. Discard damaged primary air filter elements.

Storing Primary Air Filter Elements

If a primary air filter element that passes inspection will not be used, the primary air filter element can be stored for future use.



Illustration 446

g06276742

Do not use paint, a waterproof cover, or plastic as a protective covering for storage. An airflow restriction may result. To protect against dirt and damage, wrap the primary air filter elements in volatile corrosion inhibitor (VCI) paper.

Place the primary air filter element into a box for storage. For identification, mark the outside of the box and mark the primary air filter element. Include the following information:

- Date of cleaning
- Number of cleanings

Store the box in a dry location.

Replacing the Air Filter Element

The air filter element should be replaced immediately if the element is damaged.

1. Open the rear access door.

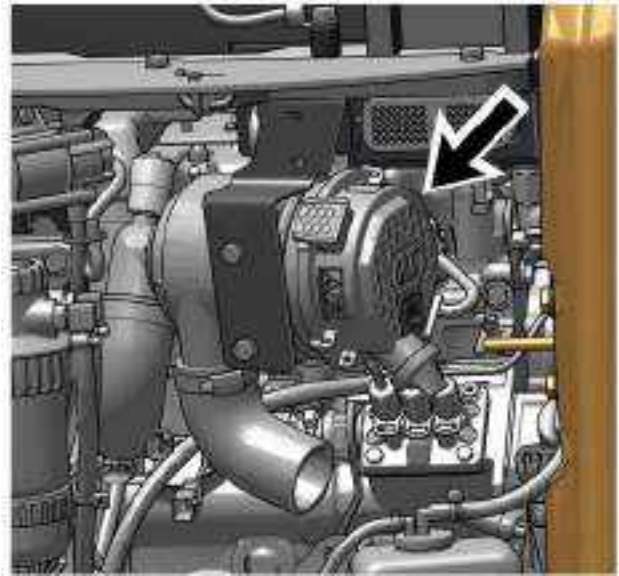


Illustration 447

g06276763

2. Unclamp the access cover and remove the access cover to the air cleaner.

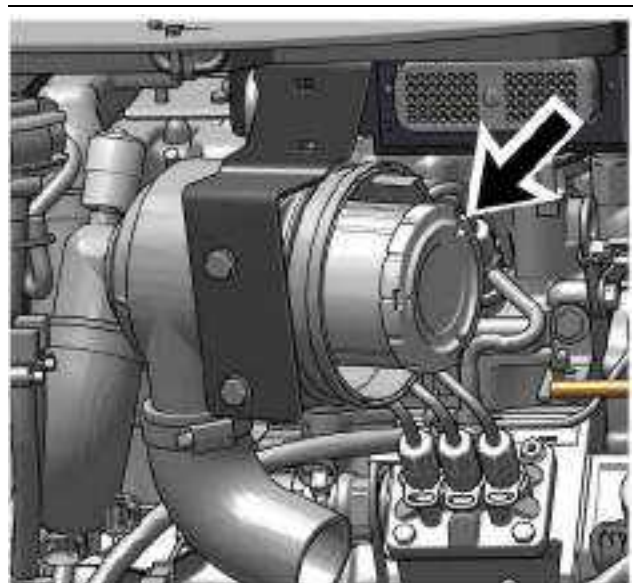


Illustration 448

g06276765

3. Remove the primary filter element from the air cleaner housing.
4. Inspect the filter element. If the pleats, the gaskets or the seals are damaged, discard the filter element. Replace damaged filter elements with new filter elements.

Maintenance Section
Engine Air Filter Secondary Element - Replace

5. Wipe dust from the interior of the air cleaner housing. Remove the cover from the air inlet port. Leave the secondary filter element in place while you clean the air cleaner housing.
6. Put the clean air filter element into the air cleaner housing and push the air filter element into position.
7. Install the access cover.
8. Close the rear access door.

i07297257

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510

NOTICE

Always replace the secondary filter element. Never attempt to reuse the element by cleaning.

The secondary filter element should be replaced at the time the primary element is serviced for the third time.

NOTICE

The filter should be kept in service for no longer than one year.

NOTICE

Always leave the secondary filter element in place while you clean the air cleaner housing.

1. Open the rear access door.
2. Remove the air cleaner housing cover.
3. Remove the primary filter element. Refer to Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace".

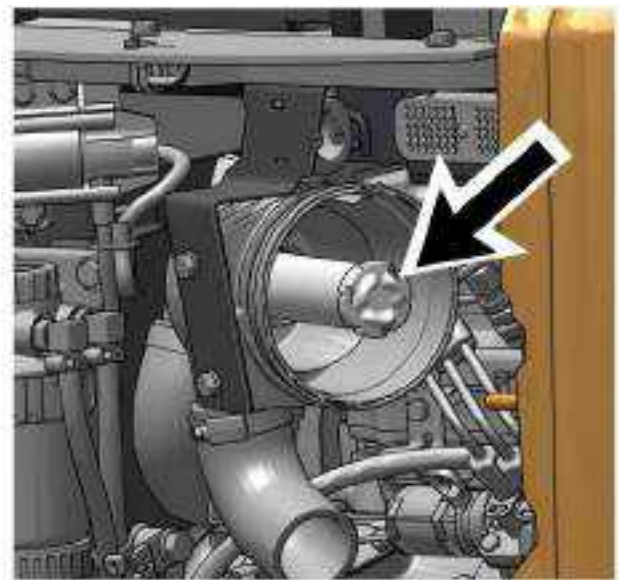


Illustration 449

g06276771

4. Remove the secondary filter element. Pull out to remove the element.
5. Cover the air inlet opening. Clean the inside of the air cleaner housing.
6. Install a new secondary filter element. Push the element firmly to properly seat the element. Write the date on the element.
7. Install the primary filter element and the air cleaner housing cover.
8. Close the rear access door.

i07280036

Engine Air Filter Service Indicator - Inspect

SMCS Code: 7452-040-DJ

NOTICE

Service the air cleaner only with the engine stopped. Engine damage could result if the air cleaner is serviced while the engine is running.

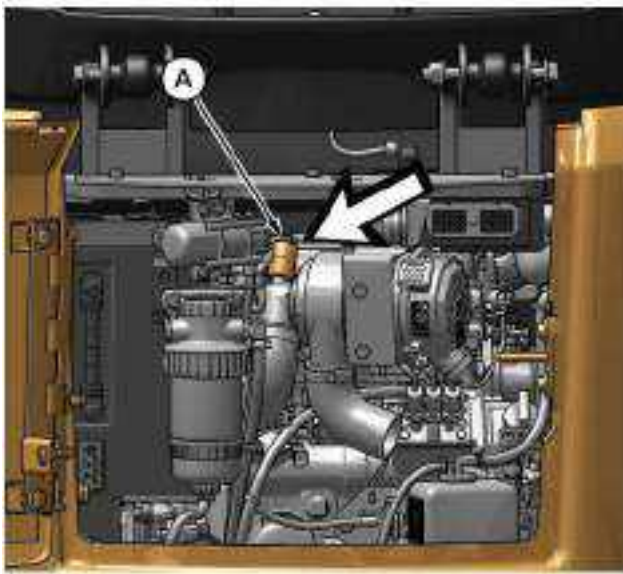


Illustration 450

g06272398

1. Open the rear access door.
2. If the piston in the engine air filter service indicator is in the red zone, push button (A) to reset. Service the air cleaner.

Note: See the Operation and Maintenance Manual, "Engine Air Filter Element - Replace".

3. Close the rear access door.

i07281033

Engine Oil Level - Check

SMCS Code: 1000-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Do not overfill the crankcase. Engine damage can result.

1. Open the rear access door.

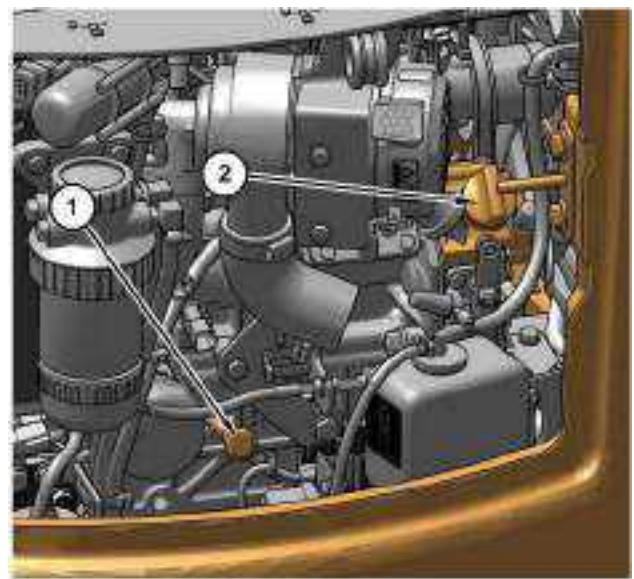


Illustration 451

g06272736

2. While the engine is stopped, maintain the oil level in the crosshatched area on the dipstick (1).
3. If necessary, remove the oil filler cap (2) and add oil. Allow the oil to drain into the crankcase before you check the oil level.
4. Close the rear access door.

i07297308

Engine Oil Sample - Obtain

SMCS Code: 1000-008; 1000; 1348-008; 1348-554-SM; 7542-554-SM; 7542-554-OC; 7542-008

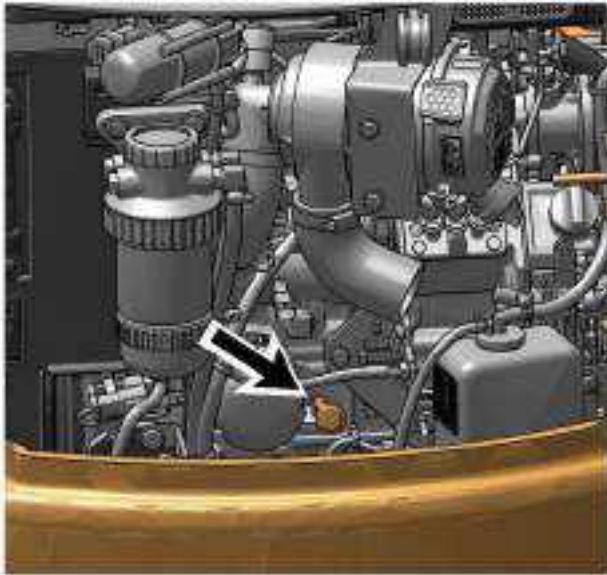


Illustration 452

g06276791

Obtain a sample of the engine oil through the dipstick tube. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, "How To Take A Good Oil Sample" for more information about obtaining a sample of the engine oil.

i08424452

Engine Oil and Filter - Change

SMCS Code: 1318-510

Selection of the Oil and Filter Change Interval

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

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.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

The engine oil and filter change interval for standard service application is every 500 hours or every year when the following requirements are met:

- Utilize Cat Recommended Fluids
- Utilize Cat Filters
- Utilize S·O·S Services at recommended interval
- Altitude does not exceed 2300 m (7545 ft)

When these requirements are not met, the oil and filter change interval should be every 250 hours, or use S·O·S Services oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

NOTICE

When operating in any of the conditions or environments outlined in this Operation and Maintenance Manual, Severe Service Application, use S·O·S Services oil analysis to determine the best oil and filter change interval.

When S·O·S Services are not used in severe service applications, the oil and filter change interval should be every 250 hours..

If you select an interval for oil and filter change that is too long, you may damage the engine.

Note: If the sulfur content in the fuel is greater than 1.5% by weight, use an oil that has a TBN of 30 and reduce the oil change interval by one-half.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

Reference: “Lubricant Viscosities“

Reference: Operation and Maintenance Manual, “Maintenance Interval Schedule”

Reference: Operation and Maintenance Manual, “S·O·S Information”

Use the table below to determine the appropriate oil and filter change interval.

Table 36

Selection of Oil and Filter Change Interval					
	Altitude Exceeds 2300 m (7545 ft)	Conditions			Interval
		Cat Recommended Fluids	Cat Filters	S·O·S Services	
Standard Service Application	NO	YES	YES	YES	500 hours or every year
		YES	YES	NO	500 hours or every year
		YES	NO	YES	500 hours or every year
		NO	YES	YES	500 hours or every year
		NO	NO	NO	250 hours
Severe Service Application	YES	NO	NO	NO	250 hours
		YES	YES	NO	250 hours
		YES	YES	YES	Use S·O·S ⁽¹⁾
		YES	NO	YES	Use S·O·S ⁽¹⁾
		NO	YES	YES	Use S·O·S ⁽¹⁾

⁽¹⁾ If operating in any of the conditions or environments outlined in the Severe Service Application, use S·O·S Services oil analysis to determine the best oil change interval.

Engine Oil and Filter Change

1. Park the machine on a level surface. Prepare the machine for maintenance. Refer to “Prepare the Machine for Maintenance“.

Maintenance Section
Engine Oil and Filter - Change



Illustration 453

g06660612

2. Open the access door at the rear of the machine.
Refer to "Access Door and Cover Locations".

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

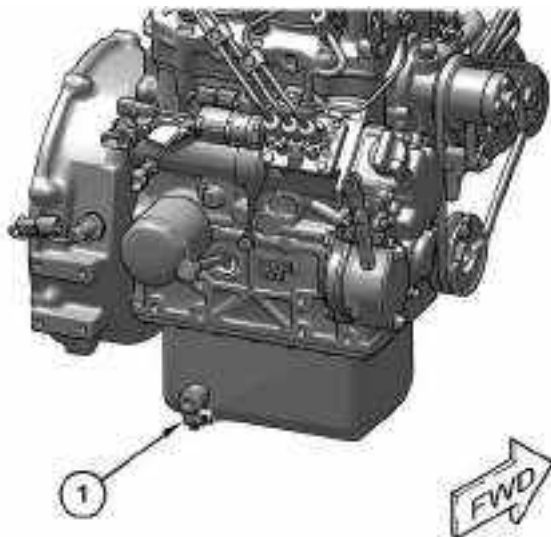


Illustration 454

g06660613

Some components removed for better clarity

- (1) Crankcase drain plug

3. Remove crankcase drain plug (1) and allow the oil to drain into a suitable container.

Note: Discard any drained fluids according to local regulations.

4. Clean crankcase drain plug (1). Inspect the seal for damage. If damaged, replace the seal.

5. Install crankcase drain plug (1).

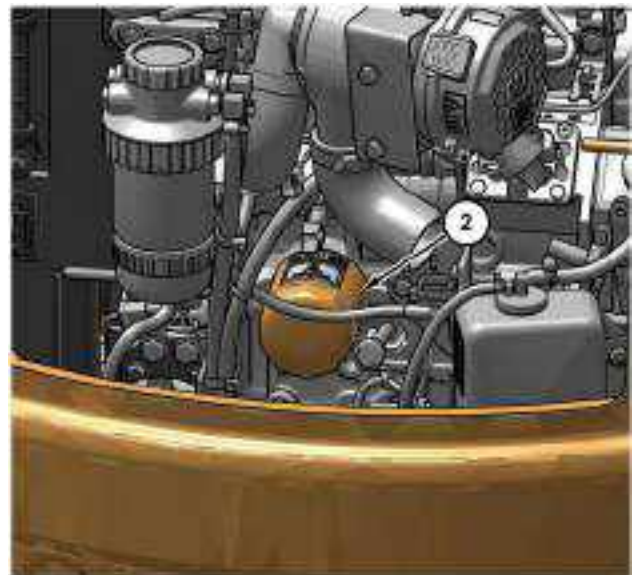


Illustration 455

g06660605

- (2) Filter

6. Remove filter (2) with a filter wrench. Discard filter (2).

Note: Used filters should always be disposed according to local regulations.

7. Install new filter (2) by hand. When the gasket contacts the filter base, tighten the filter for an additional three quarters of a turn.

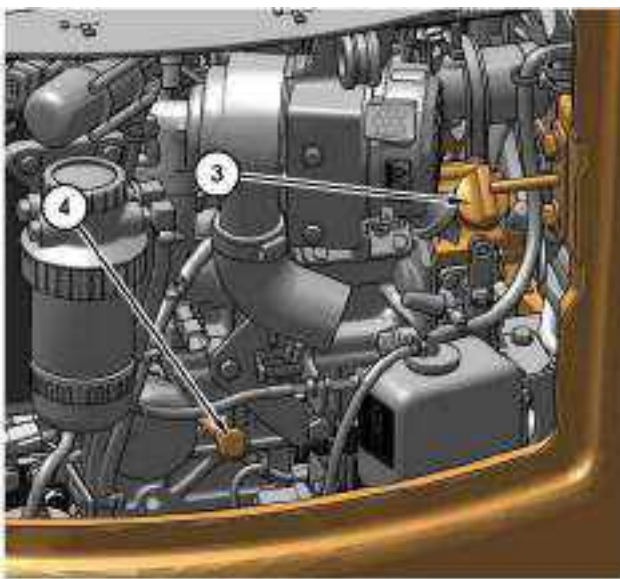


Illustration 456

g06660606

- (3) Oil filler cap
(4) Oil level gauge

8. Remove oil filler cap (3). Fill the crankcase with new oil. Refer to "Capacities (Refill)". Clean oil filler cap (3) and install oil filler cap (3).

NOTICE

Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

9. Start the engine and allow the oil to warm. Refer to "Engine Starting". Check the engine for leaks.
10. Stop the engine. Refer to "Stopping the Engine".



Illustration 457

g06183475

11. Wait for 30 minutes to allow the oil to drain back into the crankcase. Check the oil level with oil level gauge (4). Maintain the oil between the "L" and "H" marks on the oil level gauge (4).

If necessary, add oil. Refer to "Lubricant Viscosities".

12. Start the engine and operate the engine at low idle for several minutes. Refer to "Engine Starting". While the engine is running, check the filter base for oil leaks.
13. Stop the engine and allow the oil to drain back into the crankcase. Refer to "Stopping the Engine".
14. Close the access door at the rear of the machine. Refer to "Access Door and Cover Locations".

i08423522

Engine Valve Lash - Check/Adjust

SMCS Code: 1105-535; 1105-025

WARNING

Ensure that the engine cannot be started while this maintenance is being performed. To help prevent possible injury, do not use the starting motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting valve lash clearance.

NOTICE

Only qualified service personnel should perform this maintenance. Refer to the Systems Operation/Testing and Adjusting Manual, "Valve Lash and Valve Bridge Adjustment" article or consult your Caterpillar dealer for the complete valve lash adjustment procedure.

Operation of Caterpillar engines with improper valve adjustments can reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

Note: For procedures on adjusting the valve lash and adjusting the valve bridge, refer to Systems Operation/Testing and Adjusting, "Valve Lash and Valve Bridge Adjustment". Consult your Cat® dealer for assistance.

i07284921

Film (Product Identification) - Clean

SMCS Code: 7405-070; 7557-070



Illustration 458

g06184074



Illustration 459

g06274059

Typical example of the Product Identification Films.

Cleaning of the Films

Make sure that all the product identification films are legible. Make sure that the recommended procedures are used to clean the product identification films. Ensure that all the product identification films are not damaged or missing. Clean the product identification films or replace the films.

Hand Washing

Use a wet solution with no abrasive material that contains no solvents and no alcohol. Use a wet solution with a "pH" value between 3 and 11. Use a soft brush, a rag, or a sponge to clean the product identification films. Avoid wearing down the surface of the product identification films with unnecessary scrubbing. Ensure that the surface of the product identification films is flushed with clean water and allow the product identification films to air dry.

Power Washing

Power washing or washing with pressure may be used to clean product identification films. However, aggressive washing can damage the product identification films.

Excessive pressure during power washing can damage the product identification films by forcing water underneath the product identification films. Water lessens the adhesion of the product identification film to the product, allowing the product identification film to lift or curl. These problems are magnified by wind. These problems are critical for the perforated film on windows.

To avoid lifting of the edge or other damage to the product identification films, follow these important steps:

- Use a spray nozzle with a wide spray pattern.
- A maximum pressure of 83 bar (1200 psi)
- A maximum water temperature of 50° C (120° F)
- Hold the nozzle perpendicular to the product identification film at a minimum distance of 305 mm (12 inch).
- Do not direct a stream of water at a sharp angle to the edge of the product identification film.

i07281445

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

Note: At the time of changing oil, observe the oil for presence of metallic particles or other foreign matters. If you find something that needs attention, consult your Cat dealer.

1. Warm up the oil by roading the tracks. Draining the oil should be done when the oil is hot. Draining the oil when hot will help to prevent sludge.
2. Move the machine to level ground.

i07281532



Illustration 460

g06272783

3. Position one of the final drives as shown in illustration 460 .

Note: Refer to Operation and Maintenance Manual, “General Hazard Information” for information on Containing Fluid Spillage.

4. Remove the oil level plug (1).
5. Remove the oil drain plug (2). Allow the oil to drain into a suitable container.
6. Clean the drain plug (2). Apply pipe sealant to the threads of the drain plug to prevent leakage. Reinstall the drain plug.
7. Add oil to the final drive through the opening for the oil level plug (1) until the oil is level with the plug threads (1). See Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Capacities (Refill)”.
8. Clean the oil level plug (1). Apply pipe sealant to the threads of the oil level plug to prevent leakage. Reinstall the oil level plug.
9. Repeat the procedure for the other final drive.
10. Start the engine and allow the final drives to run through several cycles.
11. Stop the engine. Check the oil level in both final drives.
12. Apply pipe sealant on the threads of the oil level plug. Reinstall the oil level plug.
13. Properly dispose of the drained material. Obey local regulations for the disposal of the material.

Final Drive Oil Sample - Obtain

SMCS Code: 4011-008; 4050-008; 4050-SM; 7542-008



Illustration 461

g06272797

1. Position the final drive as shown in illustration 461 .
2. Remove oil level plug (1).
3. Obtain a sample of the final drive oil through the hole for the oil level plug.
4. Clean the oil level plug. Apply pipe sealant on the threads to prevent leakage. Reinstall the plug.

Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for more information on obtaining a sample of the final drive oil. For additional information about taking an oil sample, refer to Special Publication, PEGJ0047, “How To Take A Good Oil Sample”.

i07297388

Fuel Lift Pump Strainer - Replace

(If equipped)

SMCS Code: 1256-510-STR; 1256

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

The fuel lift pump strainer is located below the fuel system primary filter.



Illustration 462

g06276835

1. Open the rear access door.
2. Disconnect clamps (2) from both the side of the strainer (1) and remove the strainer.
3. Replace the strainer.

4. Reconnect the hoses.
5. Close the rear access door.

i05372885

Fuel System - Prime

SMCS Code: 1250-548

WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn off the start switch and let the engine cool down when changing fuel filters or water separator elements. Clean up fuel spills immediately.

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, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not loosen the fuel lines at the fuel manifold. The fittings may be damaged and/or a loss of priming pressure may occur when the fuel lines are loosened.

Prime the fuel system in order to fill the fuel filter, and prime the fuel system in order to purge trapped air. The fuel system should be primed under the following conditions:

- The fuel tank is running low.
- The machine has been stored.
- The fuel filter is being replaced.
- The fuel lines have been replaced.

1. Fill the fuel tank. Move the hydraulic lockout lever to the RAISED position. Turn the ignition key to the first position.
2. Wait 5 minutes while the fuel system primes automatically.

NOTICE

Do not crank the engine continuously for more than 10 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

3. Start the engine.
4. Check the fuel system for leaks.
5. Run the engine at low idle for 5 minutes.

Note: If the engine runs smoothly, and then stops, or the engine runs rough, more priming may be necessary.

6. If more priming is necessary, turn off the engine.
7. Move the hydraulic lockout lever to the RAISED position.
8. Turn the engine start switch key to the first position.
9. Prime the fuel system again.

Note: If the fuel system does not prime correctly, consult your Cat dealer.

i07281585

Fuel System Primary Filter (Water Separator) Element - Replace

SMCS Code: 1263-510-FQ

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

1. Open the rear access door.

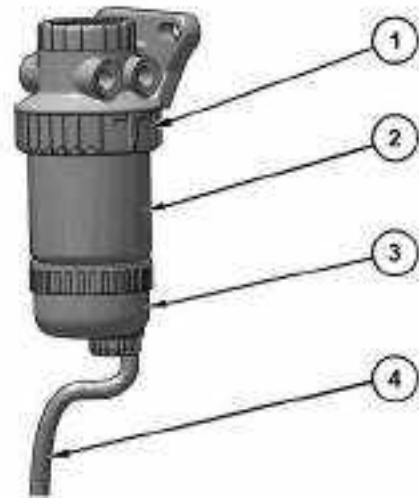


Illustration 463

g06272834

- (1) Locking ring
- (2) Primary fuel filter/water separator element
- (3) Water separator bowl
- (4) Drain hose

2. Open the drain on the water separator bowl (3). Allow the water and fuel to drain into a suitable container.
 3. Support the fuel filter/water separator element (2) and rotate the locking ring (1) counterclockwise. Remove the locking ring.
 4. Remove the water separator bowl (3) from the bottom of the fuel filter/water separator element (2).
- Note:** The water separator bowl is reusable. Do not discard the water separator bowl.
5. Inspect the O-ring seal of the water separator bowl (3) for damage. Replace the O-ring seal, if necessary.
 6. Lubricate the O-ring seal with clean diesel fuel or lubricate the O-ring seal with motor oil. Place the seal in the water separator bowl.
 7. Spin the water separator bowl (3) onto the new fuel filter/water separator element (2) by hand until the fuel filter/water separator is snug. Do not use tools to tighten the fuel filter/water separator element to the bowl.

8. Clean the filter mounting base.
9. Install the new element. Rotate the locking ring (1) clockwise to fasten the filter to the mounting base.

10. Prime the fuel system. See Operation and Maintenance Manual, "Fuel System - Prime" for instructions.

11. Close the access door.

i07281590

Fuel System Water Separator - Drain

SMCS Code: 1263

1. Open the rear access door.

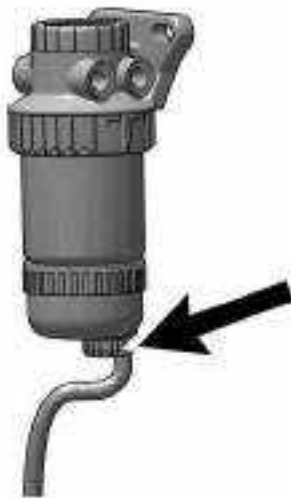


Illustration 464

g06272847

2. Turn the drain valve counterclockwise to open the drain valve.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Drain the water and drain the sediment into a suitable container.

Note: Dispose of drained fluids according to local regulations.

4. Close the drain valve.

5. Close the rear access door.

i07305678

Fuel Tank Cap - Clean

SMCS Code: 1273-070-Z2; 1273



Illustration 465

g06277309

1. Remove fuel cap (1).

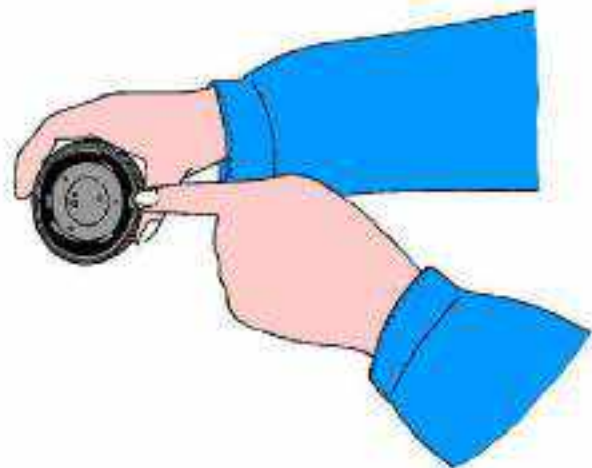


Illustration 466

g06277320

2. Inspect the cap and gasket for damage. Replace the fuel tank cap if the cap is damaged.

3. Use a clean, nonflammable solvent to wash the fuel tank cap.

4. Put a light coating of fuel oil on the cap gasket.

5. Install the fuel cap.

i07282145

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543

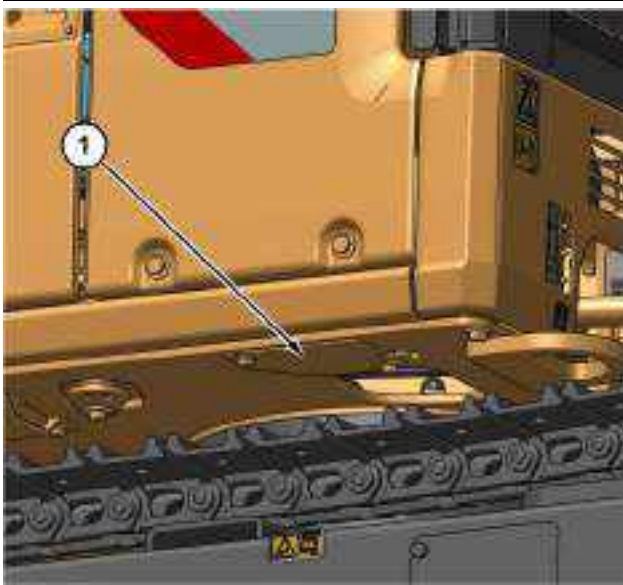


Illustration 467

g06317865

1. Remove guard (1) under the fuel tank to access the drain hose.

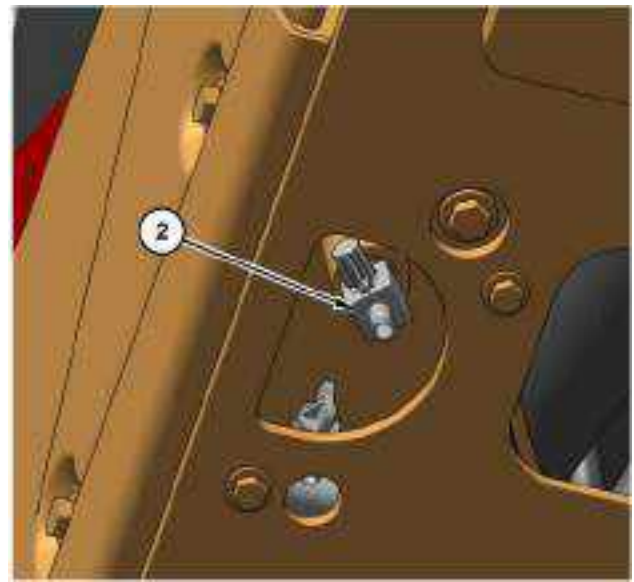


Illustration 468

g06317875

2. Open fuel tank valve (2). Allow the water and sediment to drain into a suitable container.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

3. Close fuel tank valve (2).

Note: Discard the drained fluids according to local regulations.

4. Reinstall guard (1).

i07282454

Fuses - Replace

SMCS Code: 1417-510

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. If necessary, consult your Cat dealer.

NOTICE

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE

If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Cat dealer.

Maintenance Section
Fuses - Replace

The fuses are located below the seat or on the lower right console.

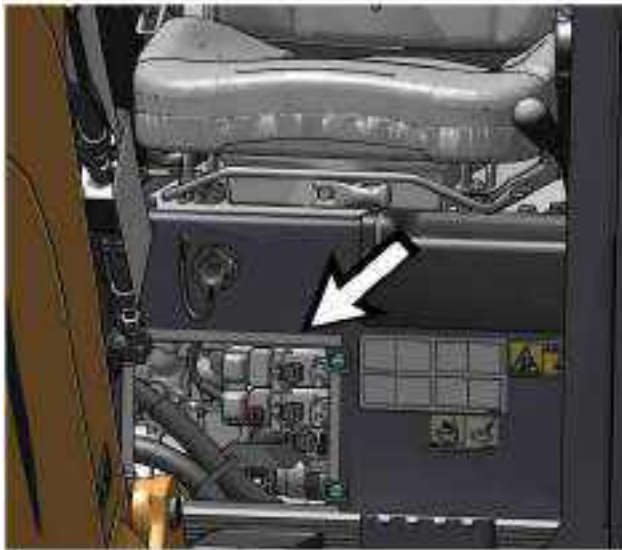


Illustration 469 g06273207
Fuse and relay locations for 301.5 and 301.7 CR

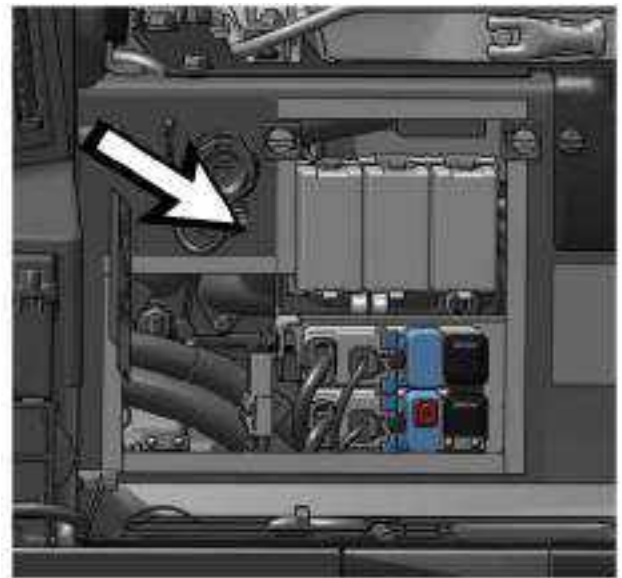


Illustration 471 g06318395
Fuse and relay locations for 301.6, 301.8, and 302 CR

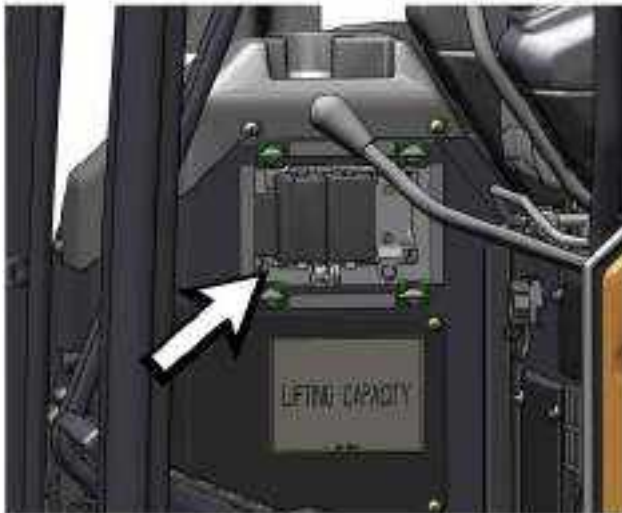


Illustration 470 g06273205
Fuse and relay locations for 301.5 and 301.7 CR

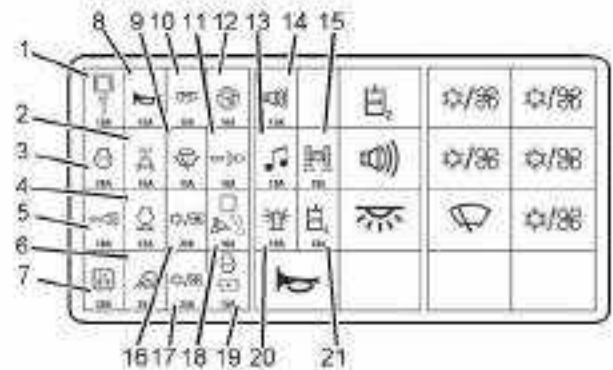


Illustration 472 g06318200

- (1) Monitor and Service Connector – 10 amp
- (2) Product Link – 15 amp
- (3) Engine Start – 20 amp
- (4) Governor – 15 amp
- (5) Key Switch – 10 amp
- (6) Working Lamp – 25 amp
- (7) Machine ECM – 30 amp
- (8) Horn – 10 amp
- (9) Wiper Washer – 15 amp
- (10) Courtesy Lamp – 10 amp
- (11) Power Socket – 10 amp

- (12) Fuel Pump – 10 amp
- (13) Radio – 10 amp
- (14) Fault Alarm – 10 amp
- (15) Undercarriage Expansion – 10 amp
- (16) Heat Ventilation and Air Conditioner – 20 amp
- (17) Heat Ventilation and Air Conditioner – 25 amp
- (18) Engine ECM and Blade Control – 10 amp
- (19) Engine Stop and Alternator IG Term – 15 amp
- (20) Beacon – 10 amp
- (21) Second Auxiliary – 10 amp

i02054663

Horn - Test

SMCS Code: 7402-081

Test the horn on a daily basis. Press downward on the horn button in order to sound the horn. If the horn does not sound, make the necessary repairs before you operate the machine.

i08423525

Hydraulic System Oil - Change

SMCS Code: 5056-044

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

If the machine is filled with non-biodegradable hydraulic oil and biodegradable hydraulic oil is wanting to be used, consult a Cat dealer. Biodegradable hydraulic oil can NOT be added to the system by performing an ordinary hydraulic oil change. Damage to the hydraulic system can occur.

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, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on level ground. Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".

Relays

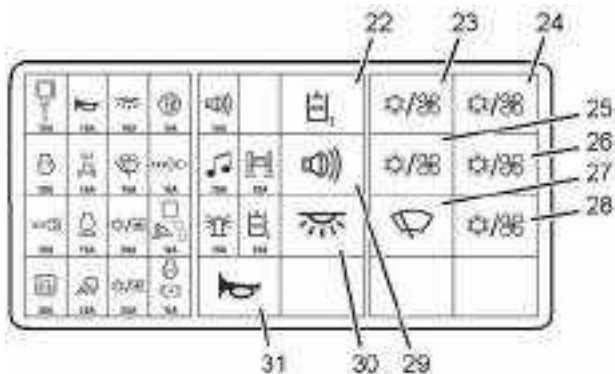


Illustration 473

g06318247

- (22) Second Auxiliary – Relay
- (23) Heat Ventilation and Air Conditioner – Relay
- (24) Heat Ventilation and Air Conditioner – Relay
- (25) Heat Ventilation and Air Conditioner – Relay
- (26) Heat Ventilation and Air Conditioner – Relay
- (26) Heat Ventilation and Air Conditioner – Relay
- (27) Front Wiper – Relay
- (28) Heat Ventilation and Air Conditioner – Relay
- (29) Fault Alarm – Relay
- (30) Courtesy Lamp – Relay
- (31) Horn – Relay



Illustration 474

g06400477

2. Extend the stick and the bucket fully. Lower the boom so that the bucket is rested on the ground. Lower the blade to the ground. Refer to Illustration 474 .
3. Turn the engine switch to the OFF position. Refer to "Engine Starting".
4. Cycle the joysticks to relieve any pressure remaining in the hydraulic lines. Refer to "System Pressure Release".
5. Move the hydraulic lockout control lever to the RAISED position. Refer to "Operator Controls".



Illustration 475

g06273625

(1) Oil filler cap

6. Open left side access door. Refer to "Access Door and Cover Locations".

WARNING

Pressurized system!

The hydraulic tank contains hot oil under pressure. To prevent burns from the sudden release of hot oil, relieve the tank pressure with the engine off. Relieve pressure by slowly turning the cap until the cap reaches the secondary stop.

7. Relieve the internal pressure in the hydraulic tank by slowly loosening oil filler cap (1).

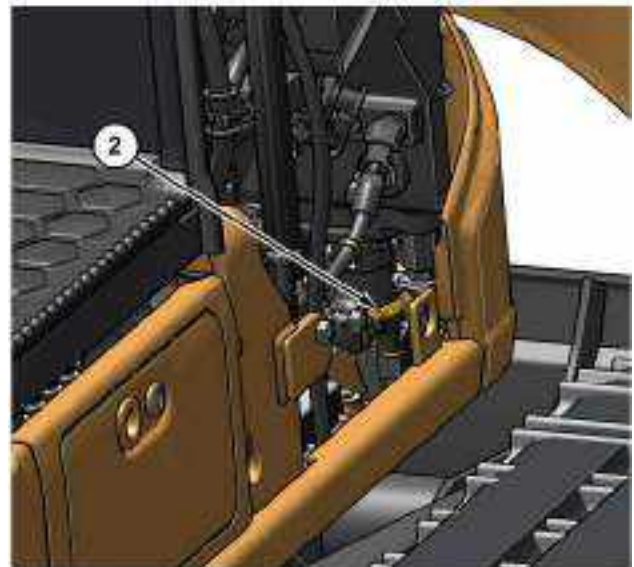


Illustration 476

g06273640

(2) Drain valve

8. Hydraulic oil drain valve (2) is on the bottom side of the hydraulic oil tank.

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

9. Open drain valve (2) and attach a drain hose. Allow the oil to drain into a suitable container.

Note: Discard the drained fluids according to local regulations.

10. Check the hydraulic tank for contamination and clean if necessary.
11. Inspect the hydraulic suction screen and clean with a nonflammable solvent. Replace the screen if the screen is damaged.
12. Close drain valve (2) and remove the drain hose.

13. Open hydraulic oil filler cap (1) and fill the hydraulic system oil tank with the same type of oil that was in it before. Refer to "Lubricant Viscosities" and "Capacities (Refill)".
14. Inspect the O-ring on oil filler cap (1) for damage. Replace the O-ring, if necessary.
15. Tighten oil filler cap (1).

Note: Do not start the machine until all of the following steps have been completed.

16. Ensure that the hydraulic tank has the correct amount of fluid. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level - Check".

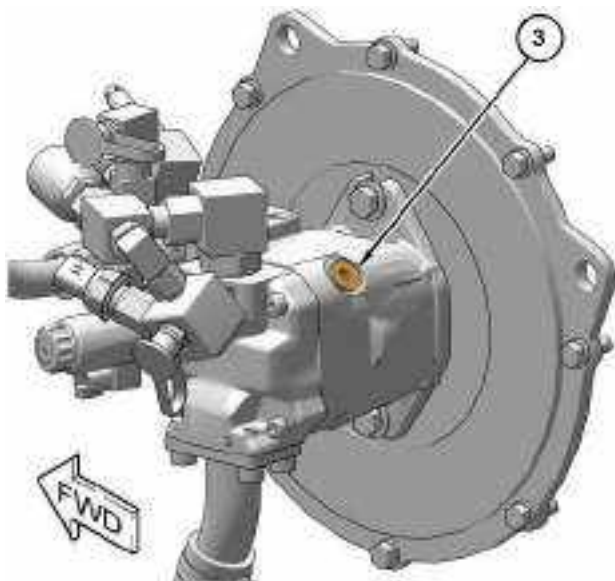


Illustration 477

g06661621

Main hydraulic pump

Some components removed for better clarity

(3) Vent plug

17. Main hydraulic pump is located near the hydraulic tank. Slowly loosen vent plug (3) on the top of the hydraulic pump to allow air to escape from the system.

Note: Cavitation and pump damage can occur if air is trapped in the pump.

18. Once hydraulic oil starts coming out of the vent port, tighten vent plug (3) to a torque of $80 \pm 12 \text{ N}\cdot\text{m}$ ($59 \pm 9 \text{ lb}\cdot\text{ft}$).
19. Close left side access door. Refer to "Access Door and Cover Locations".

20. Start the engine and run the engine for a few minutes. Refer to "Engine Starting".
21. Operate the joysticks to cause the hydraulic oil to flow through the circuits. Refer to "Joystick Controls".
22. Open the access door on the rear of the machine. Refer to "Access Door and Cover Locations".

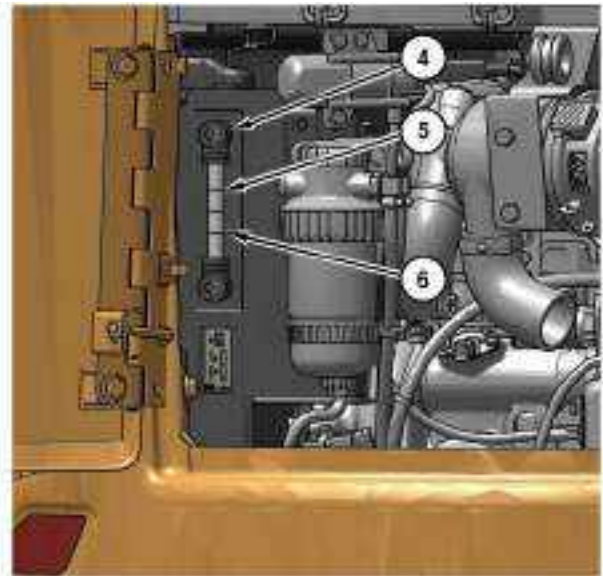


Illustration 478

g06400503

- (4) Sight gauge
- (5) High range
- (6) Low range

23. Maintain the hydraulic oil level in the middle of the sight gauge (4), which is behind the rear access door.

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, the hose clamps, and the hydraulic oil filter.

CAUTION

Bleed the hydraulic pump after performing a hydraulic oil change and using a vacuum pump - otherwise severe damage to the pump can occur.

24. Stop the engine. Refer to "Stopping the Engine".
25. If necessary, tighten any loose clamps and any loose connections. Replace any damaged hoses.
26. Close the rear access door. Refer to "Access Door and Cover Locations".

i08423603

Hydraulic System Oil Filter (Return) - Replace

SMCS Code: 5068-510-RJ

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Never remove the fill/vent plug from the hydraulic tank if the oil is hot.

Air can enter the system and cause pump damage.

1. Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".
2. Open the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

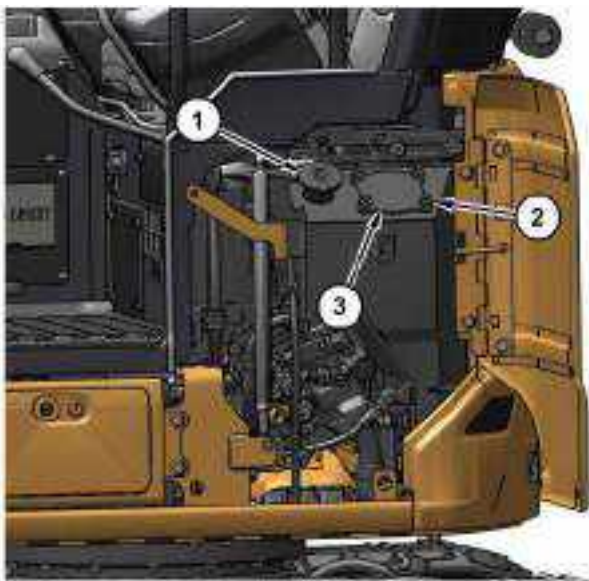


Illustration 479

g06660588

- (1) Oil filler cap
- (2) Bolt
- (3) Cover

WARNING

Pressurized system!

The hydraulic tank contains hot oil under pressure. To prevent burns from the sudden release of hot oil, relieve the tank pressure with the engine off. Relieve pressure by slowly turning the cap until the cap reaches the secondary stop.

3. Clean the area around oil filler cap (1) and cover (3).
4. Slowly loosen oil filler cap (1) to relieve the pressure in the hydraulic oil tank. Refer to "System Pressure Release". Clean oil filler cap (1).
5. Place a suitable container under the filter.

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

6. Remove four bolts (2). Remove cover (3) and collect the hydraulic oil as the oil drains.

Note: Discard any drained fluids according to local regulations.

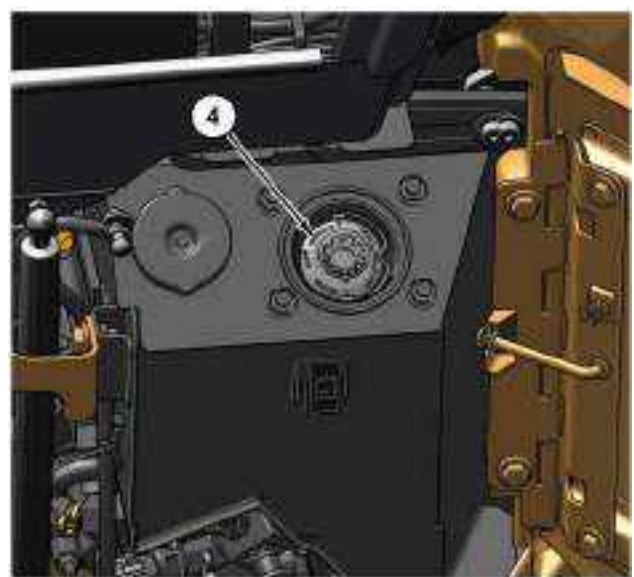


Illustration 480

g06660589

- Hydraulic tank
- (4) Filter element

7. Remove and discard filter element (4).

Note: Used filters should always be disposed according to local regulations.

8. Remove any dirt from the housing and the sealing surface of cover (3). Check the surface of the removed filter element (4) for dirt residue and coarse particles. If dirt residue and/or coarse particles are found, consult your Cat[®] dealer.
9. Install new filter element (4).
10. Position cover (3) in place on top of the hydraulic tank. Tighten four bolts (2).
Refer to Specifications, SENR3130, "Torque Specifications" for the recommended torque.
11. Install oil filler cap (1).
12. Close the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

i07475362

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

Note: Check the hydraulic system oil level with the machine on a level surface.



Illustration 481

g06273670

1. Park the machine on level ground. Lower the work tool to the ground with the stick in the vertical position.

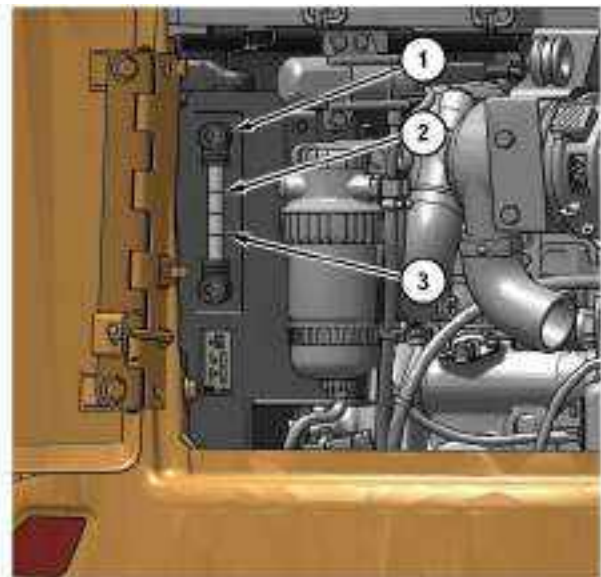


Illustration 482

g06273684

- (2) High
- (3) Low

2. The sight gauge (1) is behind the rear access door.
3. Maintain the hydraulic system oil level in the middle of the sight gauge.
4. Open left side access door.

i07284652



Illustration 483

g06273689

5. Slowly loosen hydraulic oil tank cap (4) to relieve any pressure and add hydraulic oil, if necessary.
6. Close left side access door.

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008-OC; 5095-SM; 5095-008; 7542-008; 7542



Illustration 484

g06273696

Obtain a sample of the hydraulic oil by removing the floor mat and cover to expose SOS sampling port (1) under the cab floor.

Refer to Special Publication, SEBU6250, "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the hydraulic oil. Refer to Special Publication, PEGJ0047, "How To Take A Good Oil Sample" for more information about obtaining a sample of the hydraulic oil.

i07203750

Lifting Hook - Inspect

SMCS Code: 6459-040

Note: Designate a person to inspect the hook frequently. The designated person should inspect the hook prior to operation and during operation. The designated person will determine if the conditions that are found are a hazard. The designated person will determine if a more detailed inspection is required.

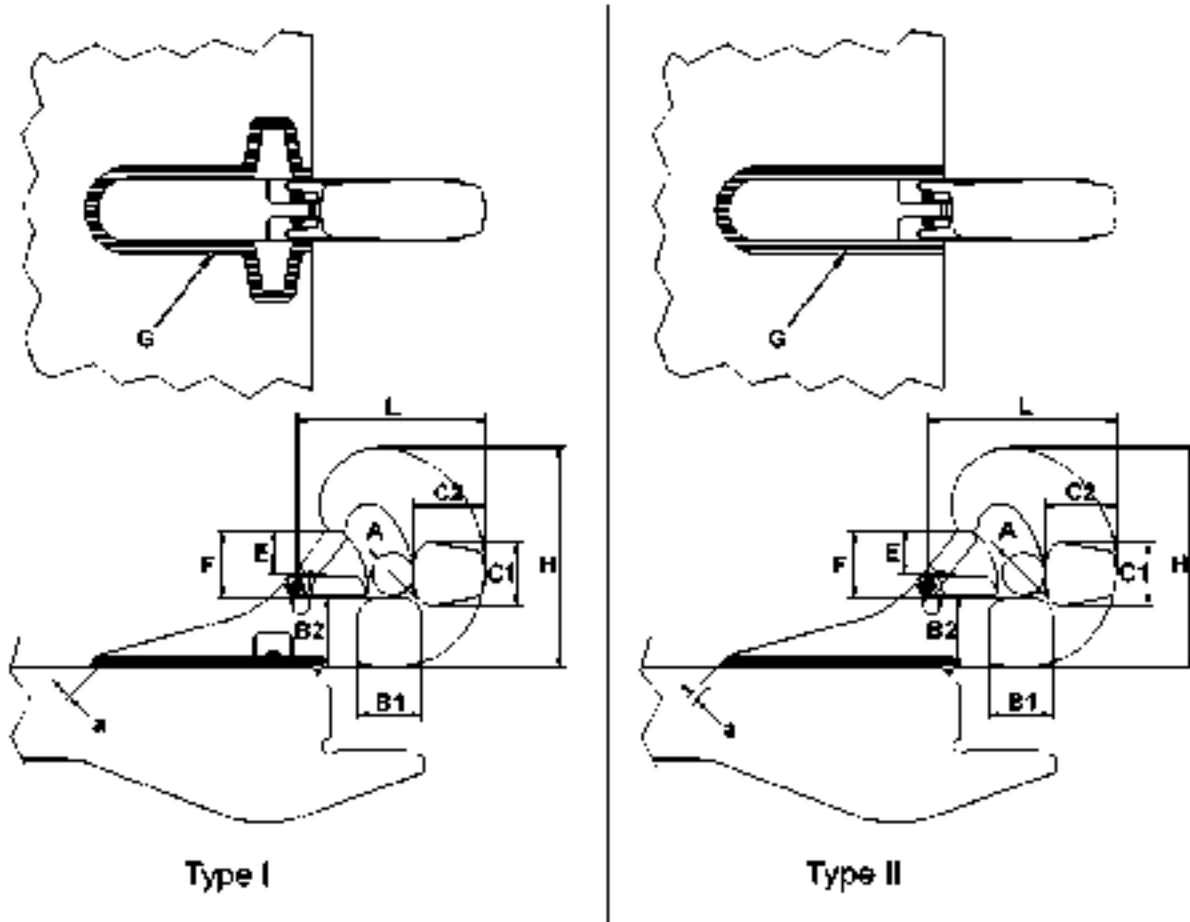


Illustration 485

g01540013

(A) Maximum diameter of bar
(B1) Nominal width of bottom
(B2) Nominal height of bottom
(C1) Nominal width of front

(C2) Nominal height of front
(E) Actual throat clearance
(F) Full throat clearance
(G) Required height of weld (a)

(H) Nominal height of hook
(L) Nominal length of hook

1. Inspect the hook for any distortion such as bends in the hook or twists in the hook.
2. Inspect the dimensions of the throat (E) and (F). An increase in the dimensions of the throat must not exceed 5% of the original dimensions of the throat. Refer to Illustration 485 for the dimensions of the throat.
3. Inspect the hook for wear. An increase in the nominal dimensions (B1), (B2), (C1), (C2), (H), and (L) of the hook must not exceed 10% of the original nominal dimensions of the hook. Refer to Illustration 485 for the nominal dimensions of the hook.
4. Inspect the hook for cracks, nicks, or gouges.
5. Ensure that the latch properly engages. Inspect the latch for any damage. Ensure that the latch is not malfunctioning.

Note: Before continuing to operate the hook, the hook must be repaired or replaced if any of the above conditions exist. Refer to Special Instruction, REHS3357, "Procedure for Installation or Replacement of a Lifting Hook or a Lifting Yoke on Certain Quick Couplers" for additional information.

i04432083

Light - Test

SMCS Code: 1429-081

Turn on the switch. Observe the lights and replace any that are not working.

i07349186

Oil Filter - Inspect

SMCS Code: 1308-507; 5068-507

Inspect a Used Filter for Debris



Illustration 486

g06224663

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 from steel parts and on cast iron parts.

Nonferrous metals can indicate wear from 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 debris could be caused by friction and by normal wear. Consult your Cat dealer 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.

i01819738

Quick Coupler - Check

SMCS Code: 6129-535; 6700-535

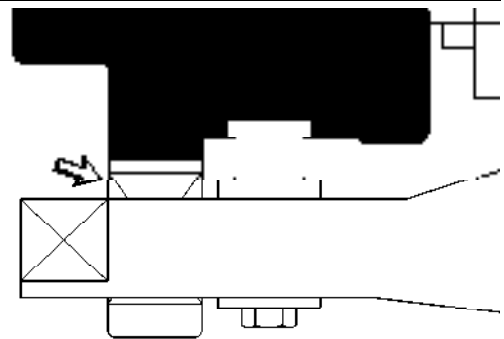


Illustration 487

g00584367

1. Ensure that there is a visible space between the wedge and the quick coupler frame. If there is no space, the mounting bracket or the quick coupler may be damaged or worn. Contact your Caterpillar dealer.

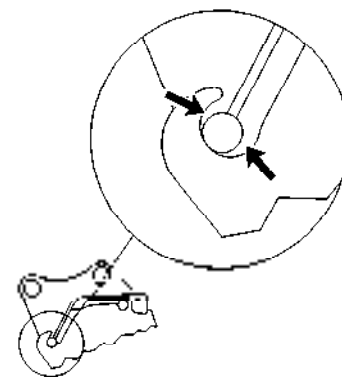


Illustration 488

g00584389

2. Check if there is play between the quick coupler and the mounting bracket. Contact your Caterpillar dealer.

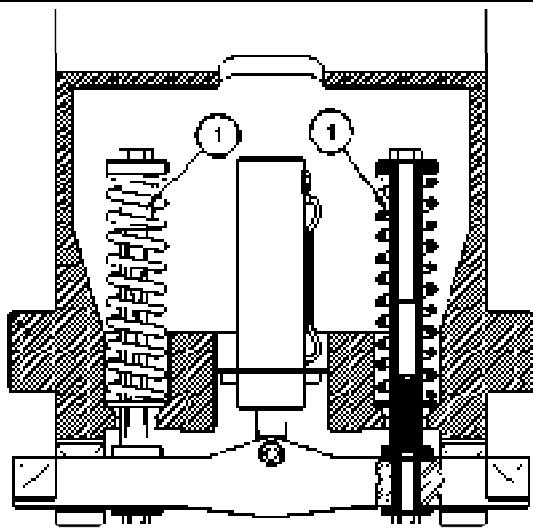


Illustration 489

g00584390

3. Visually inspect the shafts (1). The shafts (1) must be straight. Replace the shafts (1) if the shafts are bent.

i04673589

Quick Coupler - Clean

SMCS Code: 6129-070

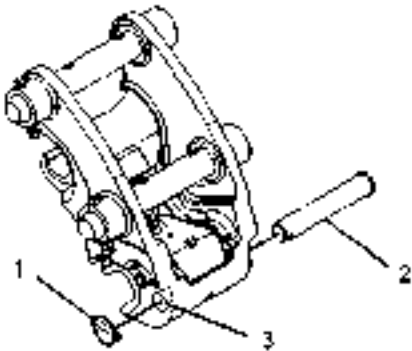


Illustration 490

g01155173

Typical example

1. Remove pin (1).
2. Remove safety pin (2) from the quick coupler. The pin may be located on the right side or located on the rear of the quick coupler.
3. Clean safety pin (2).
4. Clean out bore (3) on either side of the coupler.

5. Remove any trash or buildup from the quick coupler.

6. Apply grease to safety pin (2).

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for more information about the selection of grease.

7. Insert safety pin (2) into bore (3) on the right side.

8. Insert pin (1) into safety pin (2) on the left side of the quick coupler.

i02166325

Quick Coupler - Clean/Inspect

SMCS Code: 6129-040; 6129-070

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Do not weld on the quick coupler without consulting your Caterpillar dealer.

Note: Clean the quick coupler prior to inspection in order to properly inspect the quick coupler.

Note: Refer to Operation and Maintenance Manual, "Daily Inspection" for additional information.

1. Inspect the hydraulic lines and the hydraulic fittings for damage or for wear. Repair any worn components or replace any worn components. Repair any leaking components.
2. Inspect the locking pins that secure the quick coupler to the host machine.
3. Inspect the steel material of the quick coupler for cracks.
4. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels. Refer to Operation and Maintenance Manual, "Safety Messages" for additional information.

i02973110

i05815772

Quick Coupler - Lubricate (If Equipped)

SMCS Code: 6129-086

1. Lower all work tools to the ground.
2. Wipe off the fittings before you lubricate the fitting.

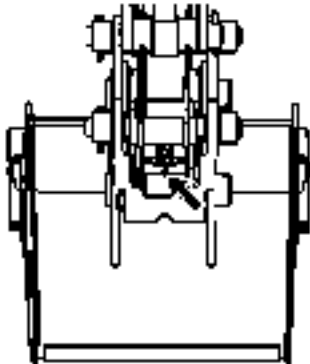


Illustration 491

g01167510

Typical example

3. Apply grease to the fittings of the quick coupler.

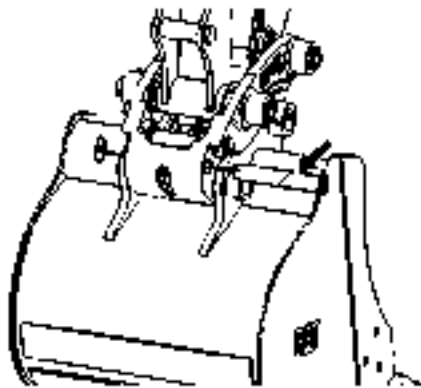


Illustration 492

g01167518

Typical example

4. Apply grease to the external surface of the pin in the lock assembly.

Note: The lock assembly may be located on the side of the coupler or located on the rear of the coupler.

5. Check the overall condition of the quick coupler. Look for the following conditions: loose bolts, worn parts, broken parts, missing parts and damaged parts. Make any necessary repairs.

Quick Coupler - Lubricate (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129-086

1. Release the work tool from the quick coupler. Ensure that the work tool is in a stable and safe storage position on the ground. Refer to Operation and Maintenance Manual, "Quick Coupler Operation - Mechanical Pin Grabber Quick Coupler" for the proper procedure.

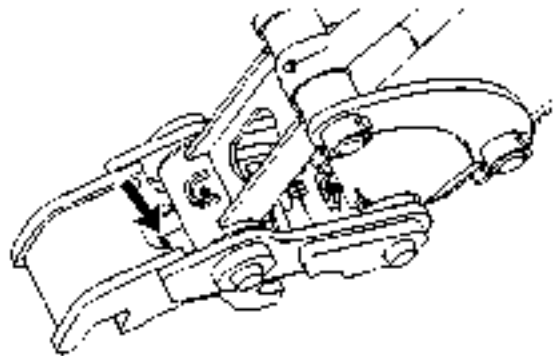


Illustration 493

g03681390

2. Wipe off the fitting before you lubricate the fitting.
3. Apply grease to the fitting of the quick coupler.
4. Check that all pin retainers are in place and that all bolts and nuts are tight.
5. Check the full operation of all the moving parts within the quick coupler. Repair or replace immediately if required.
6. Check that there is no material buildup around the rear locking mechanism, threaded actuator, or wedge plate. Check that there is no material buildup around the front locking mechanism.
7. Check the quick coupler for cracks, bent components, or wear.

i06514107

Quick Coupler - Lubricate

SMCS Code: 6129-086

Spindle Lubricate

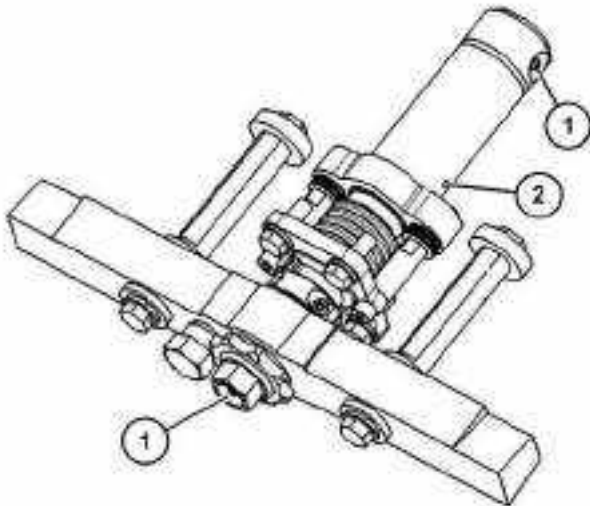


Illustration 494

g06005591

Note: On quick couplers with spindle coupling, the spindle must be lubricated.

1. Uncouple the work tool to lubricate the spindle housing. Refer to Uncoupling the Work Tool - Quick Coupler with Spindle Coupling for information.
2. Turn the spindle inward completely, in a CLOCKWISE direction. Grease the spindle at both grease points (1) until the grease becomes visible at the grease release hole (2).
3. Turn the spindle outward completely, in a COUNTER-CLOCKWISE direction. Remove any excess grease from the spindle.
4. Couple the work tool.

i07284663

Radiator Core - Clean

SMCS Code: 1353-070

1. Open the right side access door.

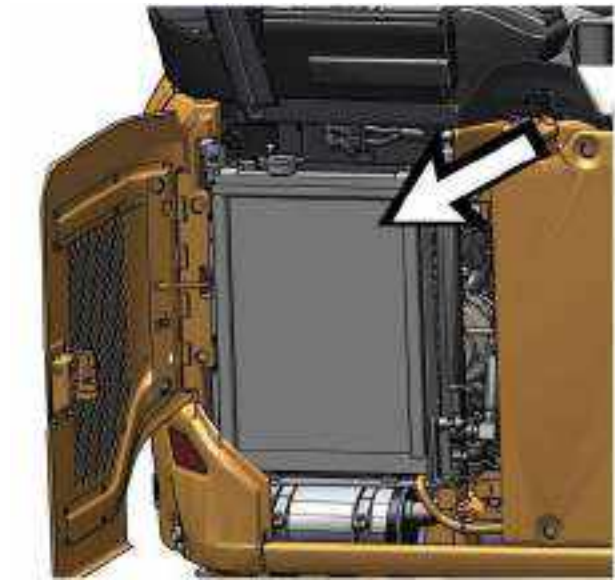


Illustration 495

g06273709

2. You can use compressed air or water to remove dust and other debris from the radiator fins. The compressed air should be oil free and 200 kPa (29 psi) maximum.
3. Close the right side access door.

i07285015

Seat Belt - Inspect

SMCS Code: 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.

Maintenance Section

Seat Belt - Replace



Illustration 496

g06224278

Typical example

Check the seat belt mounting hardware 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 seat belt (1) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

i06970675

Seat Belt - Replace

SMCS Code: 7327-510

The seat belt should be replaced within 3 years of the date of installation. A date of installation label is attached to the seat belt retractor and buckle. If the date of installation label is missing, replace the belt within 3 years from the year of manufacture as indicated on the belt webbing label, buckle housing, or installation tags (non-retractable belts).

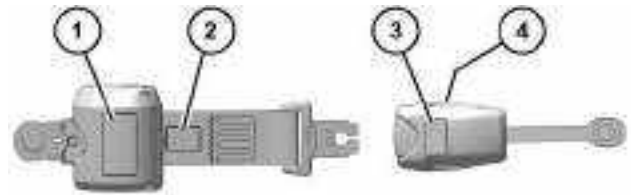


Illustration 497

g06183390

- (1) Date of installation (retractor)
- (2) Year of manufacture (tag) (fully extended web)
- (3) Date of installation (buckle)
- (4) Year of manufacture (underside) (buckle)

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

Determine the age of a new seat belt before installing on seat. A manufacture label is on the belt webbing and imprinted on the belt buckle. Do not exceed the install by date on the label.

A complete seat belt system should be installed with new mounting hardware.

Date of installation labels should be marked and affixed to the seat belt retractor and buckle.

Note: Date of installation labels should be permanently marked by punch (retractable belt) or stamp (non-retractable belt).

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i07284881

Swing Frame Pin - Lubricate

SMCS Code: 6506-086; 6507-086

1. Lower all work tools to the ground.
2. Wipe all grease fittings before you lubricate the grease fittings.

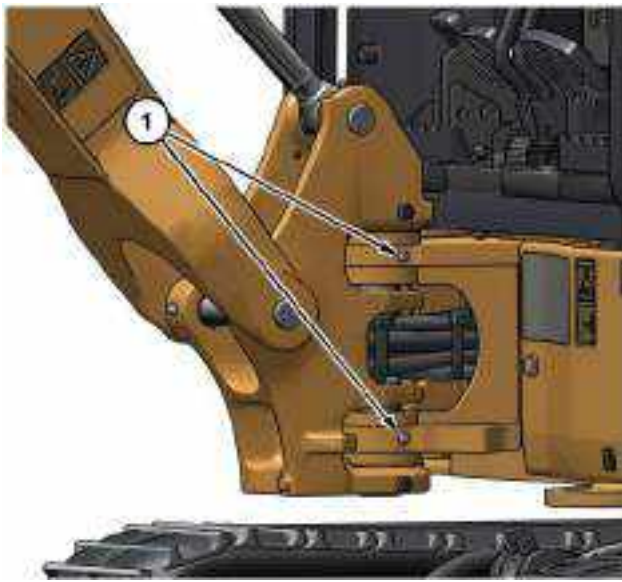


Illustration 498

g06273916

3. Apply lubricant to grease fittings (1) for the swing frame.

i07284699

Swing Gear and Bearing - Lubricate

SMCS Code: 7063-086

WARNING

Do not rotate the machine during lubrication. Danger of severe crushing that can cause severe injury or death.

1. Park the machine on a level surface. Lower all work tools to the ground. Place the hydraulic lockout control in the RAISED position.

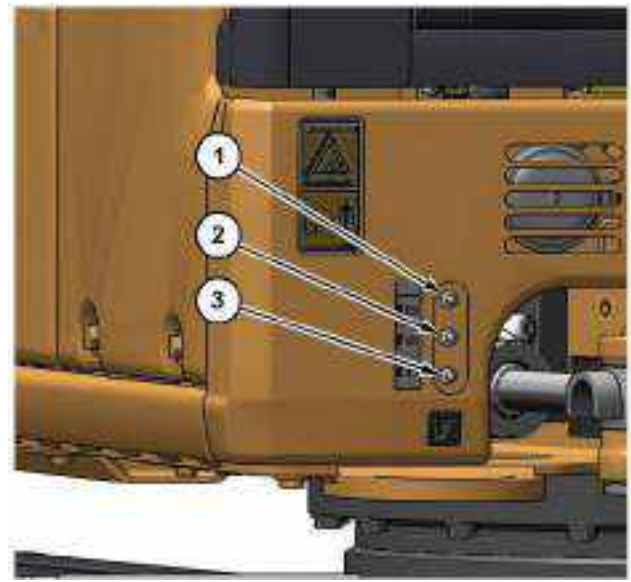


Illustration 499

g06273727

- (1) Swing cylinder (head)
- (2) Swing bearing (inner)
- (3) Swing gear (outer)

2. Fittings (1), (2), and (3) for the swing cylinder, bearing, and gear are on the right side of the machine on the upper carriage.
3. Wipe the fittings and lubricate.



Illustration 500

g06273733

4. Rotate the upper structure for 90°.
5. Apply grease to the fitting for the swing bearing.
6. Repeat Step 4 and Step 5 until the upper structure has rotated 360°.

7. Rotate the upper structure 360° twice.

i07284885

Track Adjustment - Adjust

SMCS Code: 4170-025

Tightening the Tracks



Illustration 501

g06273924

1. Remove cover (1).



Illustration 502

g06273930

2. Wipe fitting (2) before you add grease.

3. Add grease through fitting (2) until the correct tension is reached.
4. Operate the track back and forth to equalize the pressure.
5. Check the amount of sag. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
6. Repeat the same procedure for the other track.

Loosening the Track

WARNING

Personal injury or death can result from grease under pressure.

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.

Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

Loosen the relief valve one turn only.

If track does not loosen, close the relief valve and contact your Caterpillar dealer.



Illustration 503

g06273930

1. Loosen fitting (2) carefully until the track begins to loosen. One turn should be the maximum.
2. Tighten fitting (2) when the desired track tension is reached.

3. Operate the track back and forth to equalize pressure.
4. Check the amount of sag in the track. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
5. Repeat the same procedure for the other track.

If the correct adjustment cannot be achieved, consult your Cat dealer.

i07284912

Track Adjustment - Inspect

SMCS Code: 4170-040

Note: Keeping the track properly adjusted will increase the service life of the track components and the drive components.

Check the rubber tracks for the following conditions:

- Steel cords that are cut
- Core irons that are fractured
- Rubber flaking off to the point of showing steel cords or core irons
- Loss of traction or grousers are worn down to approximately 5 mm (0.2 inch) in height.

If any of the above conditions or a combination of the above conditions are observed, replace the belt.

Measuring Rubber Track Tension

1. Park the machine on a level surface.



Illustration 504

g06273981

2. Position the upper frame over the tracks at a 90° angle.
3. Lower the bucket to the ground with the stick in a vertical position.
4. Chock the track that is not being lifted off the ground.
5. Apply boom down pressure until the track that is on the same side as the bucket has cleared the ground.
6. Chock the lower frame of the machine in this position.
7. Clean the track rollers and the area around the skid plate.

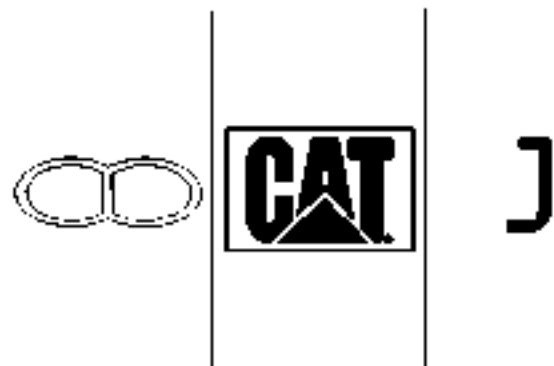


Illustration 505

g03731778

Various track joint marks

8. For a machine that is equipped with the rubber tracks, locate the track joint mark on the inside flat of the track.

Note: The track joint mark varies by supplier.

9. Position the track joint mark under the center track roller.

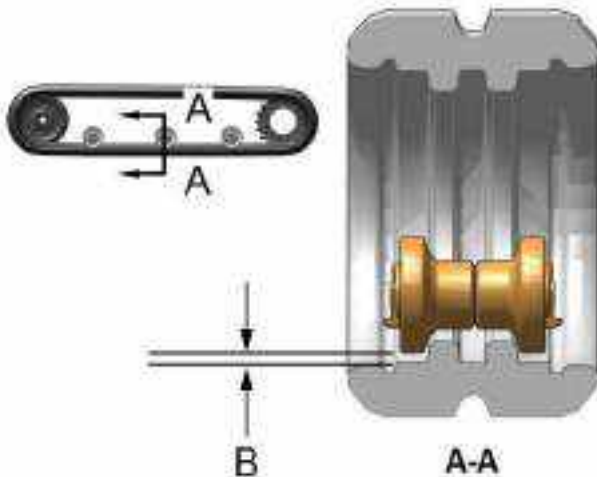


Illustration 506

g06274031

The distance (B) is the amount of track sag.

10. Measure the sag in the track. The sag is measured from the bottom of the center roller to the surface on the top of the track.

Measuring Steel Track Tension

Note: The track tension must be set according to the current operating conditions. Keep the track as slack as possible if the soil is heavy.

Follow the same procedures for measuring rubber track tension. There is not an “omega” mark on the steel tracks. You do not need to align the steel tracks.

If the correct adjustment cannot be achieved, consult your Cat dealer.

Table 37

Track Sag	
Rubber Tracks	5 to 10 mm (0.20 to 0.40 inch)
Steel Tracks	10 to 20 mm (0.40 to 0.80 inch)

i07285023

Travel Alarm - Test

SMCS Code: 7429-081

Move the machine to test the travel alarm.

1. Start the engine. Lower the hydraulic lockout control to the UNLOCKED position.
2. Raise the work tool. Make sure that there is adequate overhead clearance.

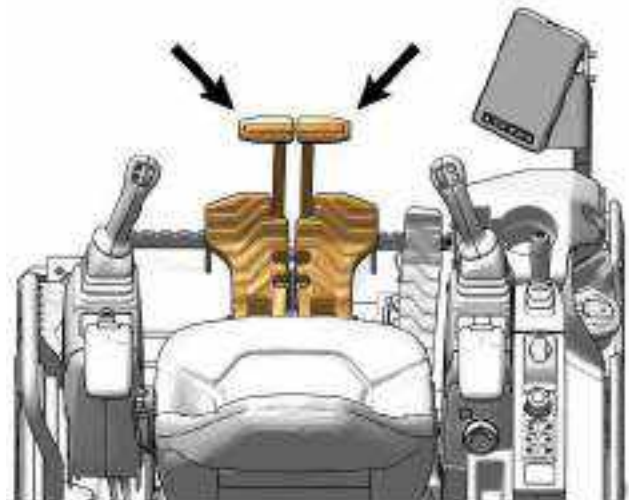


Illustration 507

g06274089

3. Use the travel levers to move the machine forward. The travel alarm should sound.
4. Release the travel levers to stop the machine.
5. Use the travel levers to move the machine backward. The travel alarm should sound.
6. Release the travel levers to stop the machine. Lower the work tool to the ground. Deactivate the hydraulic control and drive levers by placing the hydraulic lockout control in the RAISED position. Stop the engine.

i04288151

Undercarriage - Check

SMCS Code: 4150-535

1. Check the track rollers and the idler wheels for possible leakage.
2. Check the surface of the track, the track rollers, the idler wheels, and the drive sprockets. Look for signs of wear and loose mounting bolts.
3. Listen for any abnormal noises while you are moving slowly in an open area.
4. If abnormal wear exists or abnormal noises or leaks are found, consult your Cat dealer.

i07305486

Window Washer Reservoir - Fill

SMCS Code: 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

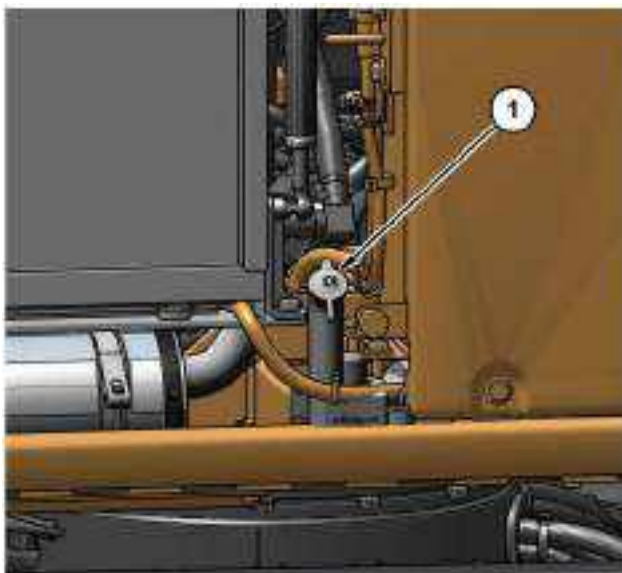


Illustration 508

g06277138

The washer fluid bottle is inside the right side access door.

1. Remove the filler cap (1).
2. Fill the washer fluid bottle with washer fluid through the filler opening.

3. Close the filler cap (1).

i01048717

Window Wiper - Inspect/Replace

SMCS Code: 7305-510; 7305-040

Inspect the wiper blade on the front window. Replace the window wiper blade if the window wiper blade is worn or damaged. Replace the front window wiper blade if the front window is streaked after use.

i07305526

Windows - Clean

SMCS Code: 7310-070; 7340-070

Clean the outside of the windows from the ground, unless handholds are available.



Illustration 509

g06277176

Typical example

Cleaning Methods

Aircraft Window Cleaner

Apply the cleaner with a soft cloth. Rub the window with moderate pressure until all the dirt is removed. Allow the cleaner to dry. Wipe off the cleaner with a clean soft cloth.

Soap and Water

Use a clean sponge or a soft cloth. Wash the windows with a mild soap or with a mild detergent. Also use plenty of lukewarm water. Rinse the windows thoroughly. Dry the windows with a moist chamois or with a moist cellulose sponge.

Stubborn Dirt and Grease

Wash the windows with a good grade of naphtha, of isopropyl alcohol, or of Butyl Cellosolve. Then, wash the windows with soap and with water.

Polycarbonate Windows (If equipped)

Special care is needed to clean polycarbonate windows.

Wash polycarbonate windows with mild soap and warm water that does not exceed 50° C (122° F). Use a soft sponge, or damp cloth. Never use a dry cloth or paper towels on polycarbonate windows. Rinse the windows with a sufficient amount of clean cold water.

Note: Naphtha or kerosene can be used to remove labels, films, paint, or marking pen from polycarbonate windows.

Note: Do not use abrasive, or highly alkaline cleaners. Do not use sharp instruments, such as squeegees or razor blades on polycarbonate windows. Do not clean polycarbonate windows in the hot sun or at elevated temperatures.

Warranty Section

Warranty Information

i08375716

Emissions Warranty Information

SMCS Code: 1000

The certifying engine manufacturer warrants to the ultimate purchaser and each subsequent purchaser that:

1. New non-road diesel engines and stationary diesel engines less than 10 liters per cylinder (including Tier 1 and Tier 2 marine engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the United States and Canada, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed by the United States Environmental Protection Agency (EPA) by way of regulation.
 - b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.
2. New non-road diesel engines (including Tier 1 and Tier 2 marine propulsion engines < 37 kW and Tier 1 through Tier 4 marine auxiliary engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the state of California, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, to all applicable regulations adopted by the California Air Resources Board (ARB).
 - b. Free from defects in materials and workmanship which cause the failure of an emission-related component to be identical in all material respects to the component as described in the engine manufacturer's application for certification for the warranty period.

3. New non-road diesel engines installed in construction machines conforming to the South Korean regulations for construction machines manufactured after January 1, 2015, and operated and serviced in South Korea, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed in the Enforcement Rule of the Clean Air Conservation Act promulgated by South Korea MOE.
 - b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.

The aftertreatment system can be expected to function properly for the lifetime of the engine (emissions durability period) subject to prescribed maintenance and operating environment requirements being followed.

A detailed explanation of the Emission Control Warranty that is applicable to new non-road and stationary diesel engines, including the components covered and the warranty period, is found in a supplemental Special Publication. Consult your authorized Cat dealer to determine if your engine is subject to an Emission Control Warranty and to obtain a copy of the applicable Special Publication.

Reference Information Section

Reference Materials

i08292374

Reference Material

SMCS Code: 1000; 7000

Additional literature regarding your product may be purchased from your local Cat dealer or by visiting publications.cat.com. Use the product name, sales model, and serial number to obtain the correct information for your product.

publications.cat.com

i08292382

Decommissioning and Disposal

SMCS Code: 1000; 7000

When the product is removed from service, local regulations for the product decommissioning will vary. Disposal of the product will vary with local regulations.

Improperly disposing of waste can threaten the environment. Obey all local regulations for the decommissioning and disposal of materials.

Utilize appropriate personal protective equipment when decommissioning and disposing product.

Consult the nearest Cat dealer for additional information. Including information for component remanufacturing and recycling options.

i08467615

Caterpillar Approved Work Tools

SMCS Code: 6700; 7007

NOTICE

Use only work tools that are recommended by Caterpillar. The use of work tools that are not recommended by Caterpillar could damage your machine. Consult your Cat dealer for information on recommended work tools.

The following work tools have been approved by Caterpillar. Refer to Operation and Maintenance Manual for each work tool for proper operation, maintenance, and servicing of the work tools.

Using work tools of other manufactures, or work tools which have been released for other excavators, can reduce the machines output and stability considerably, and can also damage the machine and cause injuries to the operator or other personnel.

Always compare the weight of the work tool and maximum payload of work tool with the indications in the lift capacity table. Never exceed the maximum payload stated in the lift capacity table.

Table 38

Caterpillar Approved Work Tools for Mini Hydraulic Excavators					
Work Tool	Machine Model				
	301.5	301.6	301.7 CR	301.8	302 CR
Quick Coupler	Manual Pin Grabber Quick Coupler				
	ManualCW05Quick Coupler				
	ManualCW05Hook Quick Coupler				
	HydraulicCW05Quick Coupler				
	HydraulicCW05Hook Quick Coupler				
Thumb	Hydraulic Thumb				
Hammer	H45DHammer				
	B1Hammer	B1Hammer	B1Hammer	B1Hammer	-
	-	-	B2Hammer	B2Hammer	B2Hammer
Mud Bucket	Mud Bucket with cubic capacity of 8.5 m ³ (11.12 yd ³)				
General Purpose Bucket	General Purpose Bucket with cubic capacity of 0.02 m ³ (0.034 yd ³)				
Ditch Cleaning Bucket	-				Ditch Cleaning Bucket with cubic capacity of 0.03 m ³ (0.046 yd ³)
Compaction Wheel	DC-12 SKHCompaction Wheel				
	DC-18 SKHCompaction Wheel				
	DC-24 SKHCompaction Wheel				
Other Buckets	(1)				

(1) Refer to "Boom/Stick/Bucket Combinations" for more information.

Refer to Operation and Maintenance Manual, "Maintenance Interval Schedule" for more information.

This list was completed at the time of publication. There may be additional work tools that have been approved since that time. Consult your Cat[®] dealer for an updated list of approved work tools.

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Product and Dealer Information

Note: For product identification plate locations, see the section "Product Identification Information" in the Operation and Maintenance Manual.

Delivery Date: _____

Product Information

Model: _____

Product Identification Number: _____

Engine Serial Number: _____

Transmission Serial Number: _____

Generator Serial Number: _____

Attachment Serial Numbers: _____

Attachment Information: _____

Customer Equipment Number: _____

Dealer Equipment Number: _____

Dealer Information

Name: _____ Branch: _____

Address: _____

Dealer Contact

Phone Number

Hours

Sales: _____

Parts: _____

Service: _____

M0088895
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