

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



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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.

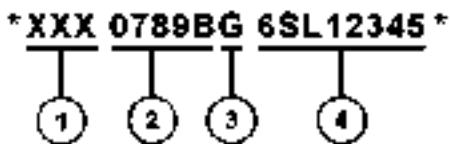
It is prohibited for any person engaged in the business of repairing, servicing, selling, leasing, or trading engines or machines to remove, alter, or to render inoperative, any emission-related device or element of design installed on or in an engine or machine that is in compliance with all applicable 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:



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.

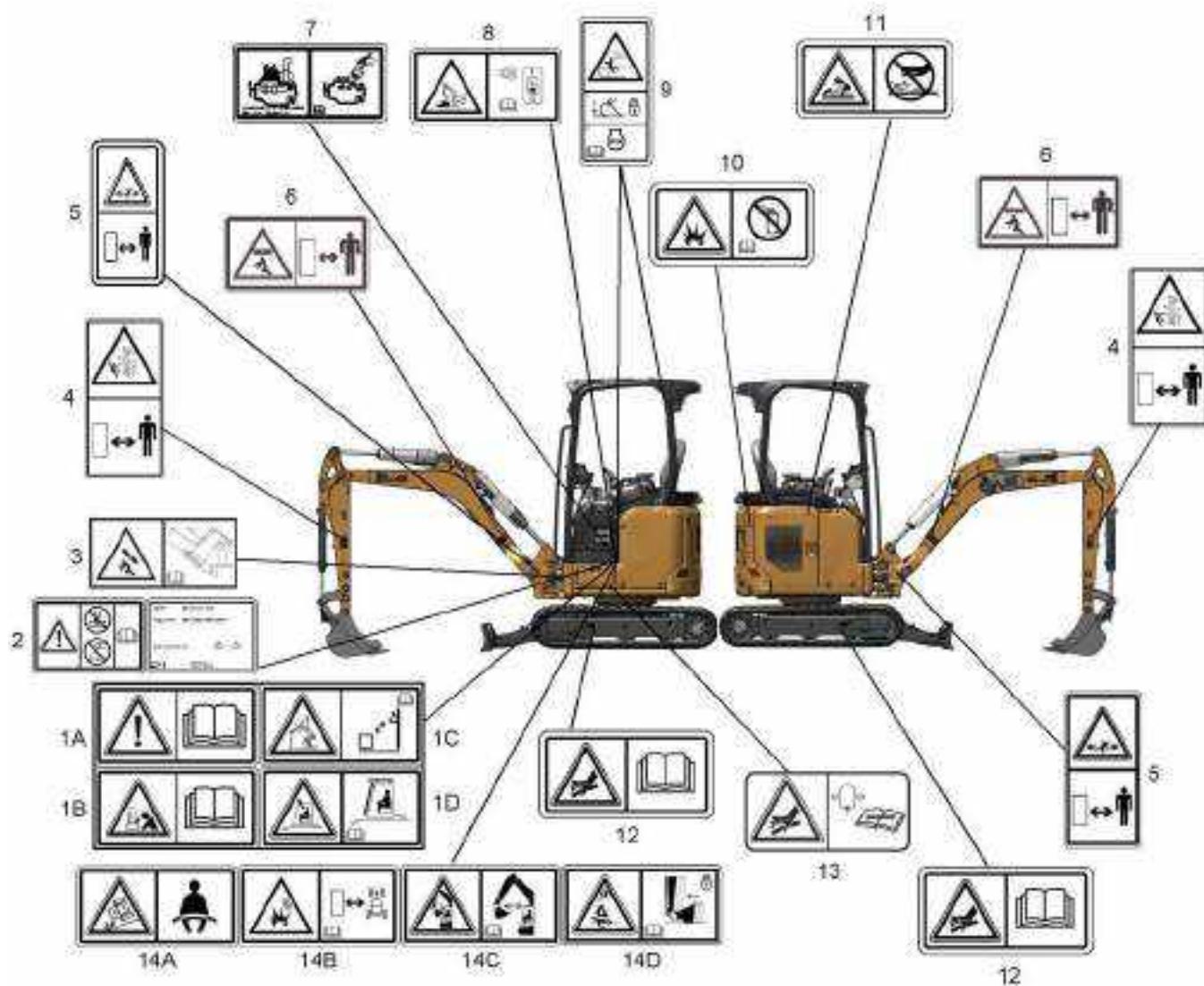


Illustration 2
Warnings for canopy and cab machines

g06275043

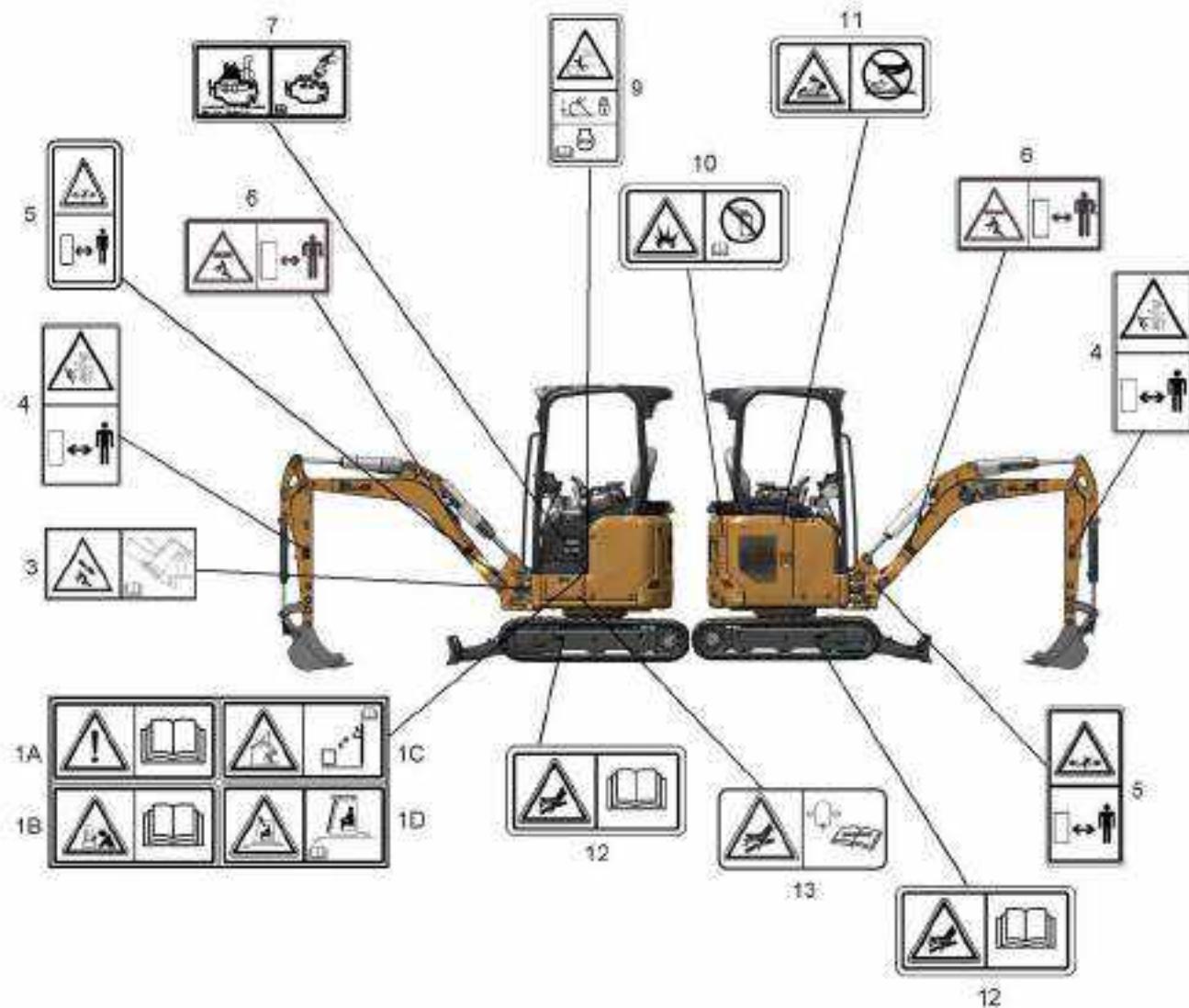


Illustration 3
Japan machines
Warnings for canopy and cab machines

g06482844

Do Not Operate (1A)

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

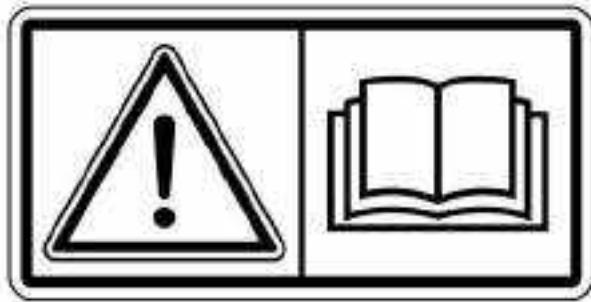


Illustration 4

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.

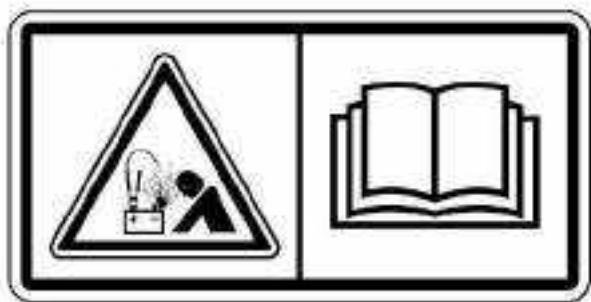


Illustration 5

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.

Safety Section
Safety Messages



Illustration 7

g01374048



Illustration 8

g06317435

⚠️ 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.

⚠️ 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.

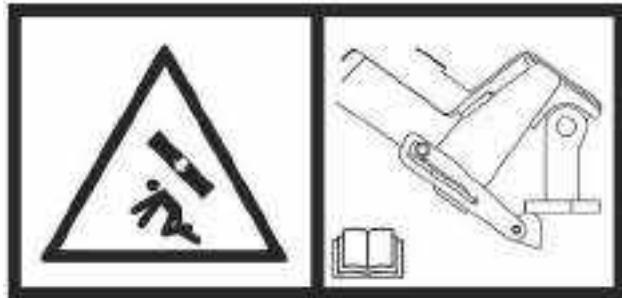


Illustration 9

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.

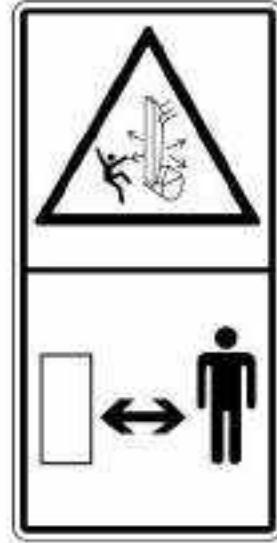


Illustration 10

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.

Safety Section
Safety Messages



Illustration 11

g01958622

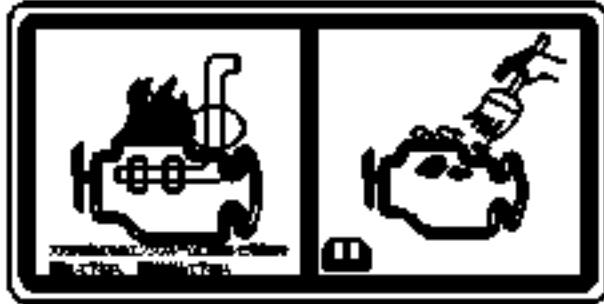


Illustration 13

g03173221

⚠️ 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.

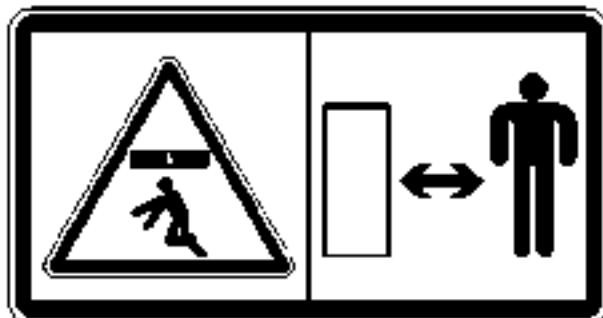


Illustration 12

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.

⚠️ 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.

Safety Section
Safety Messages

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.

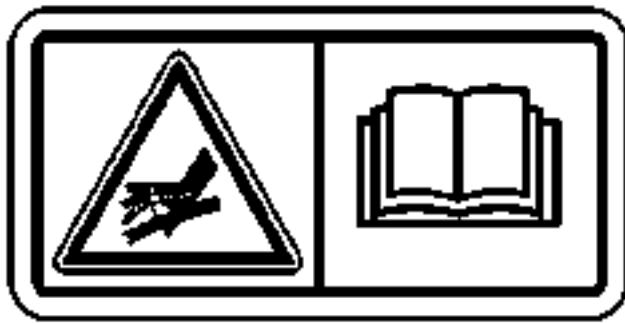


Illustration 18

g06266697



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.

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.

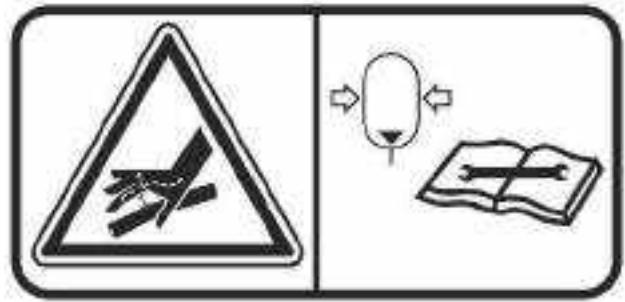


Illustration 19

g06275274

Seat Belt (14a)

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

Product Link (14b)

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

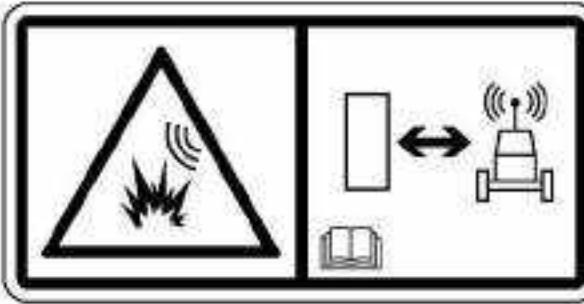


Illustration 21

g01370917

Crushing Hazard (14c)

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

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

i08644737



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.

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.

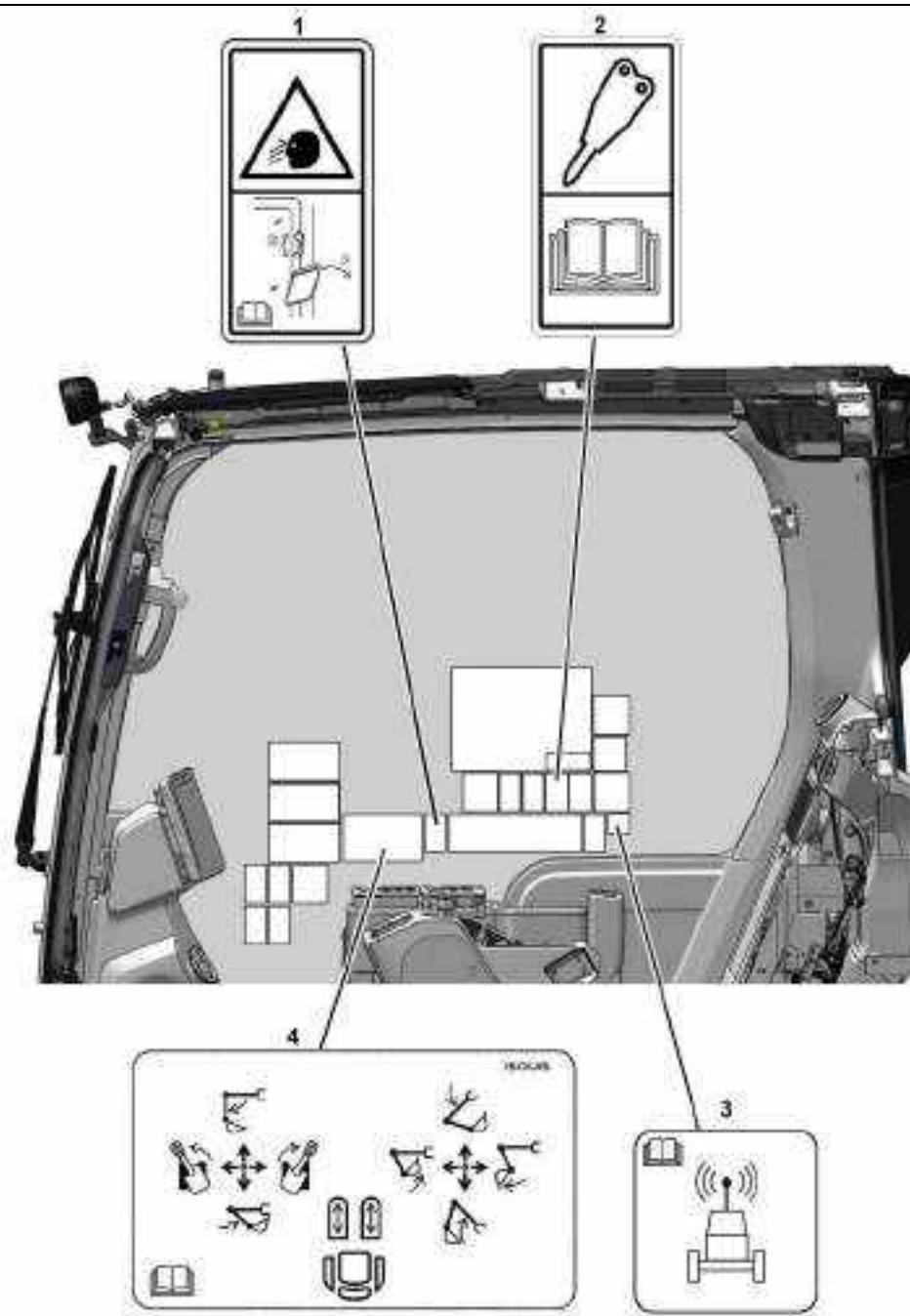


Illustration 24

g06696953

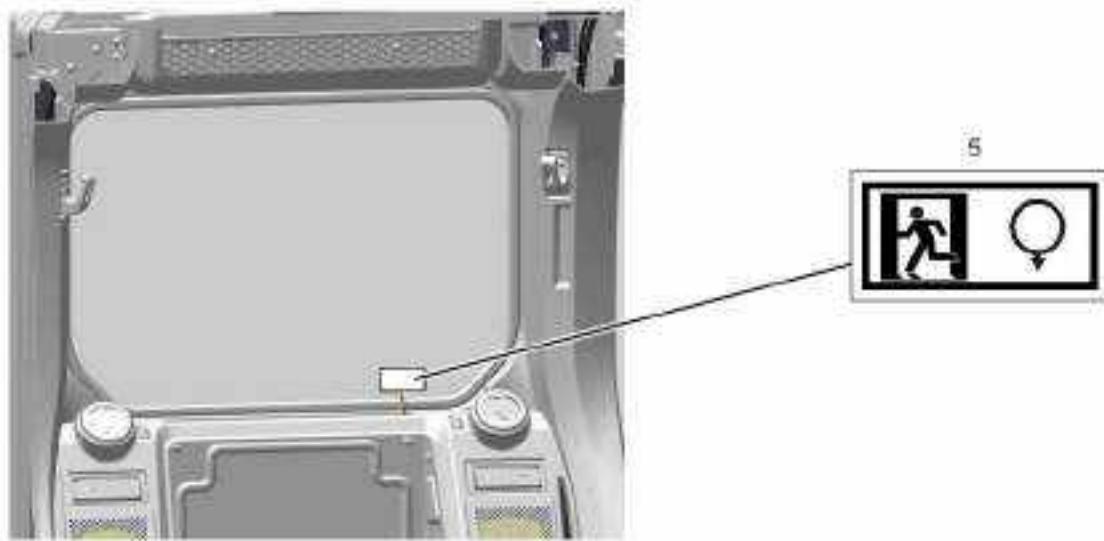


Illustration 25

g06696954

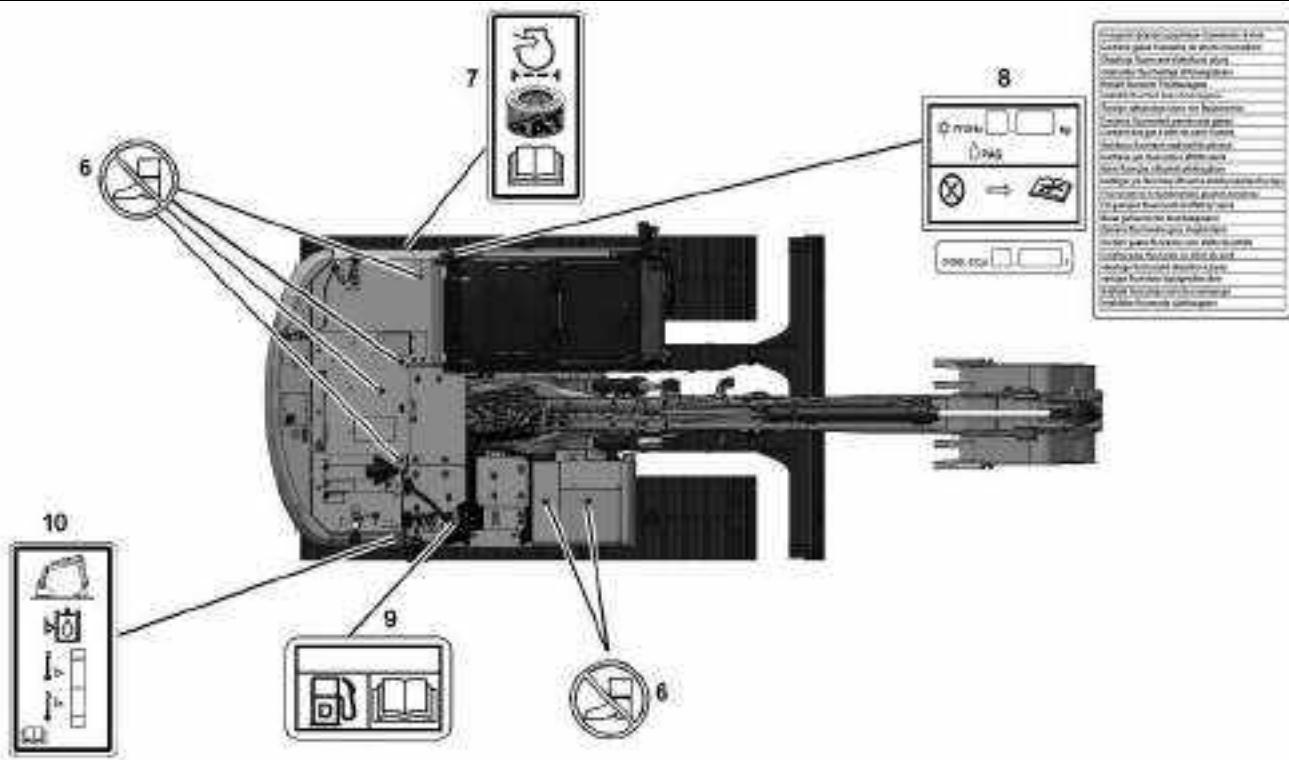


Illustration 26

g06696955

Front Window Usage (1)

Safety Section
Additional Messages



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)

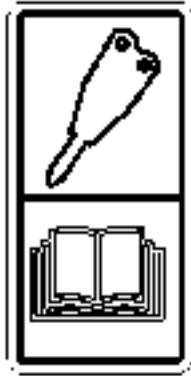


Illustration 28

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)

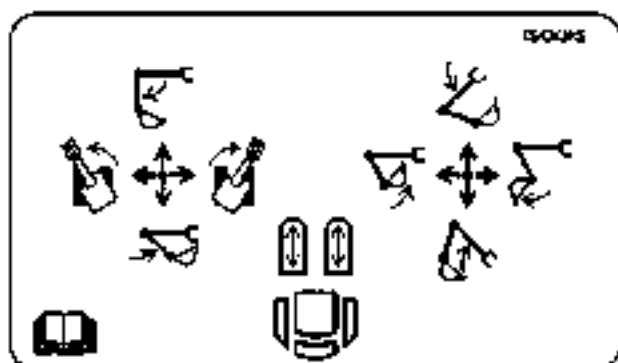


Illustration 30

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)

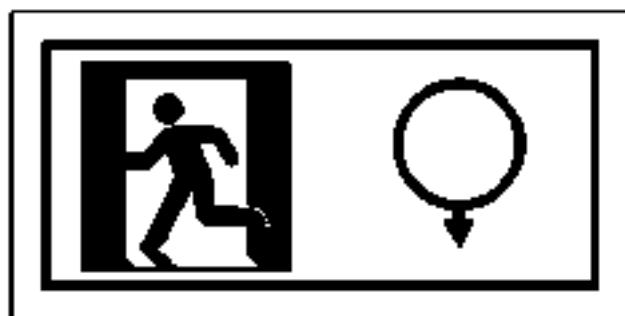


Illustration 31

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)

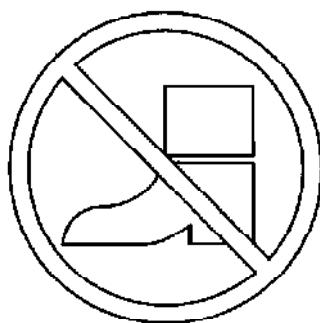


Illustration 32

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)

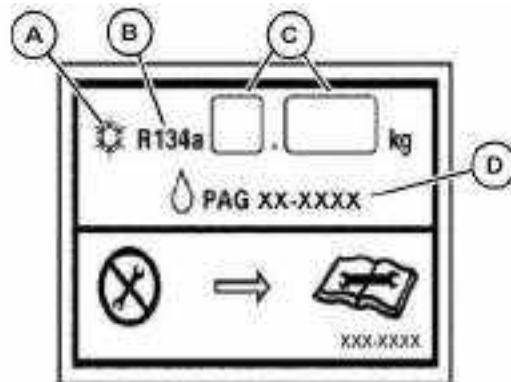


Illustration 34

g06650123

(A) Air conditioning symbol

(B) R134a (Refrigerant type common name)

(C) Refrigerant quantity

(D) PAG (polyalkylene glycol) lubricating oil part number

Safety Section
Additional Messages

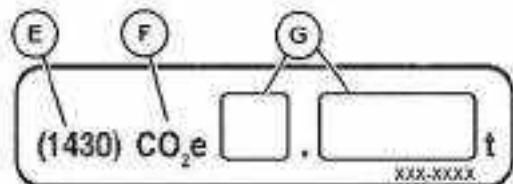


Illustration 35

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)

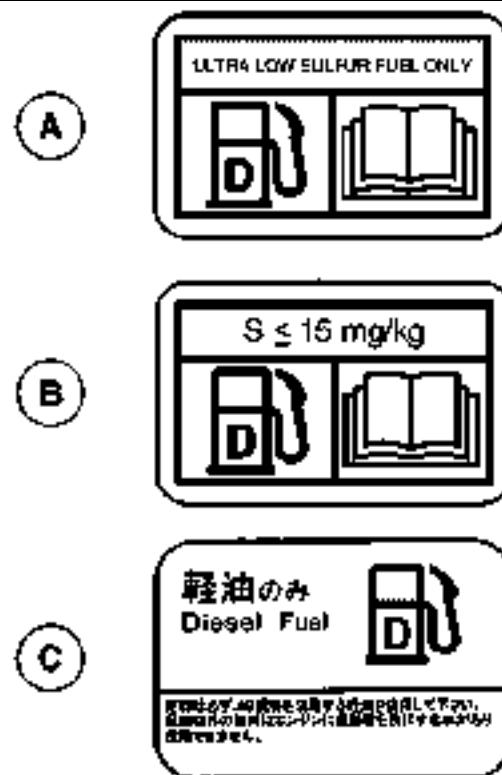


Illustration 37

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)

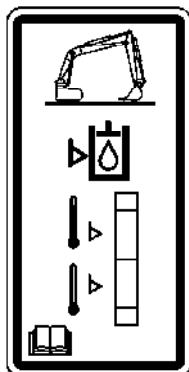


Illustration 38

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

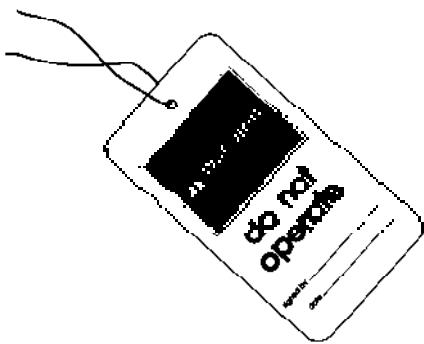


Illustration 39

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.

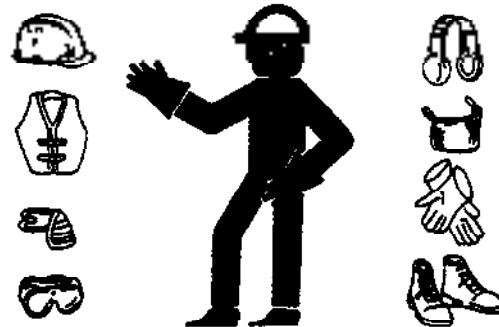


Illustration 40

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.

Safety Section
General Hazard Information

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.

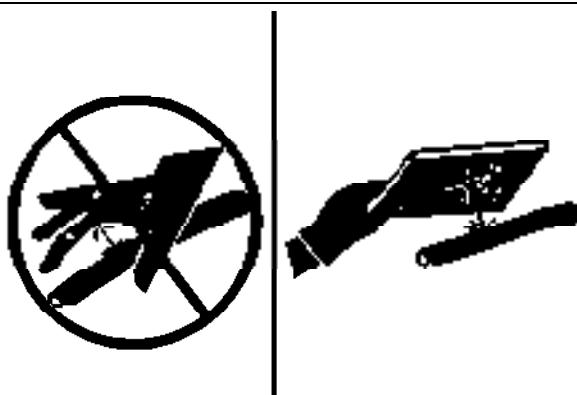


Illustration 41

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

- 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.

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.

Dispose of Waste Properly

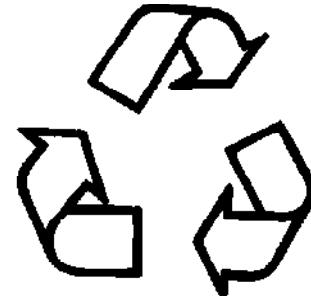


Illustration 43

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.

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.

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.

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.

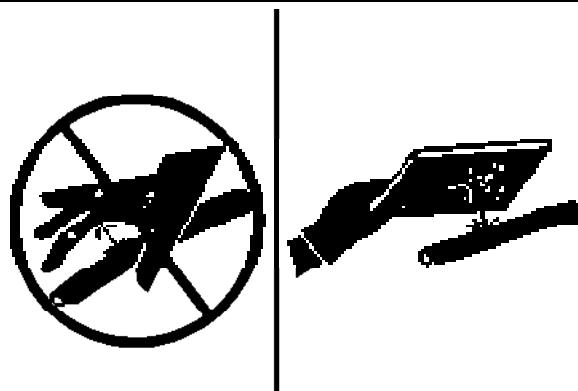


Illustration 47

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.

Safety Section

Fire Extinguisher Location

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.

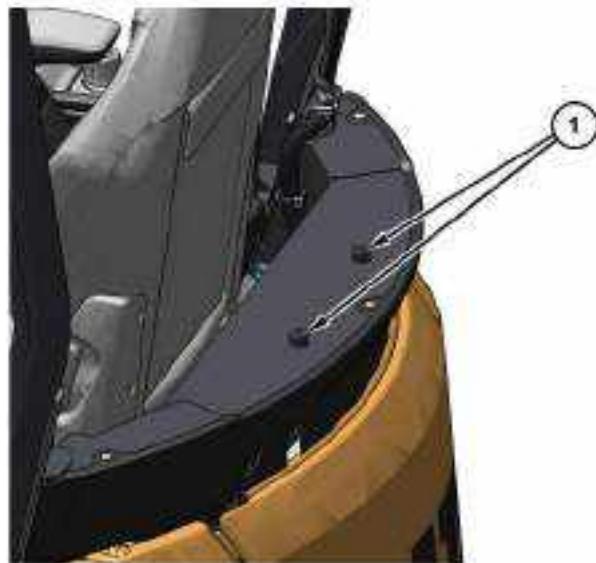


Illustration 48

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

Safety Section

Restricted Visibility

- 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.

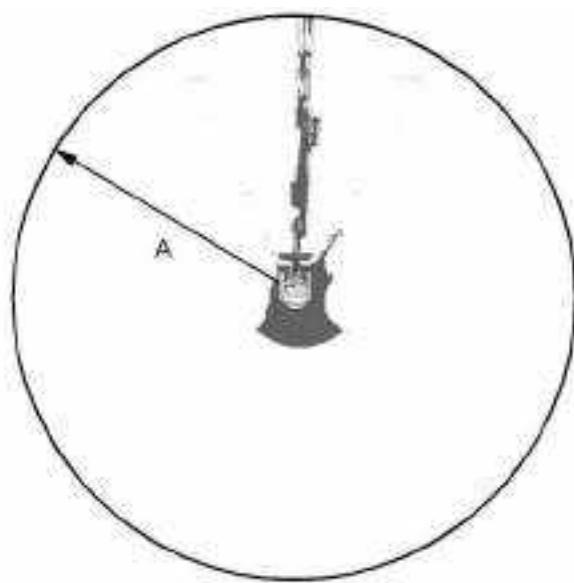


Illustration 53

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.

Safety Section
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.

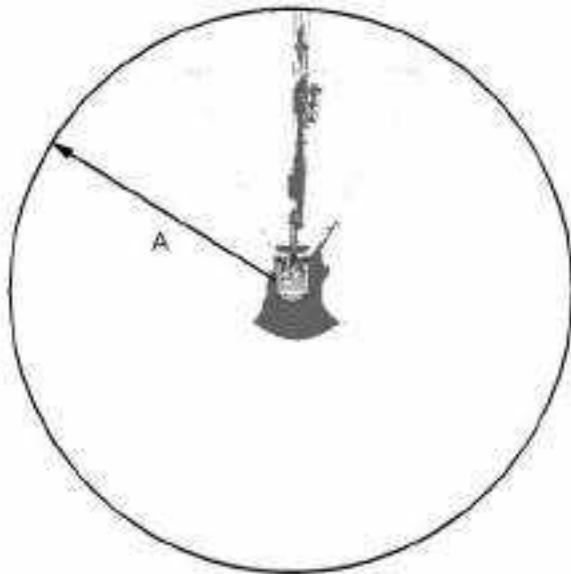


Illustration 55

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.

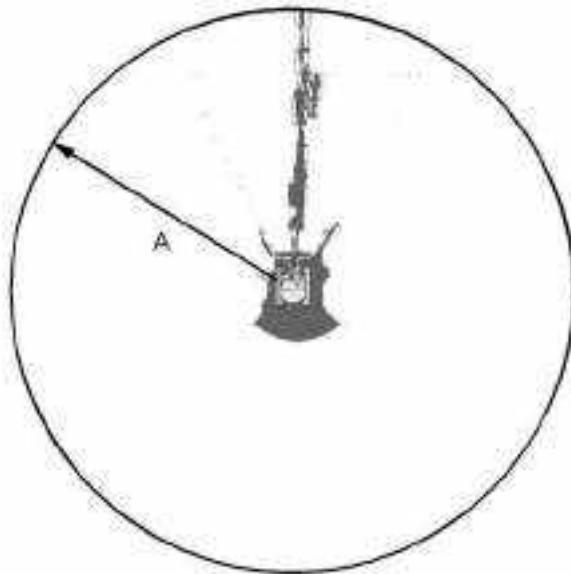


Illustration 56

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).

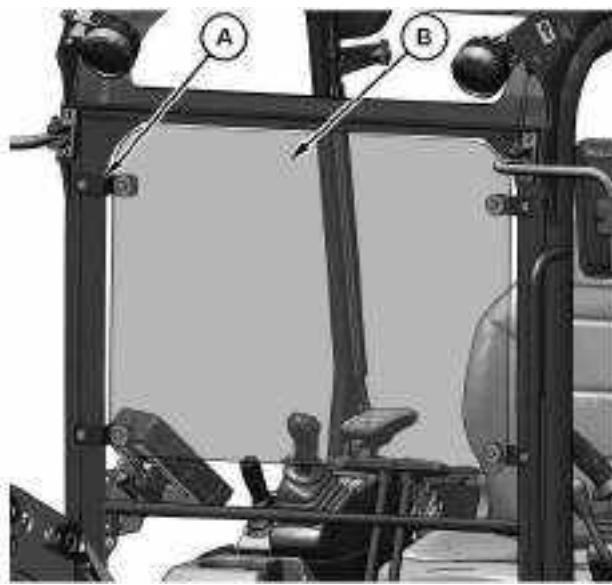


Illustration 58

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

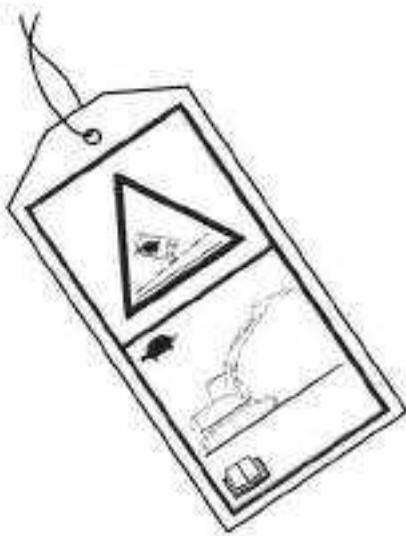


Illustration 59

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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.

i08482613

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 windscreens 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.

i07243924

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.

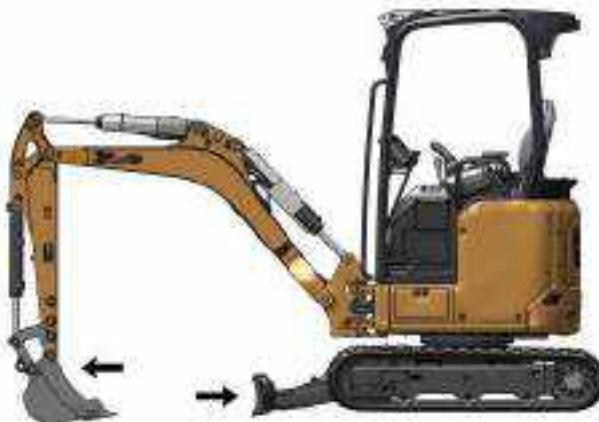


Illustration 60

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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.

Safety Section

Equipment Lowering with Engine Stopped

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.

Safety Section
Sound Information and Vibration Information

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.

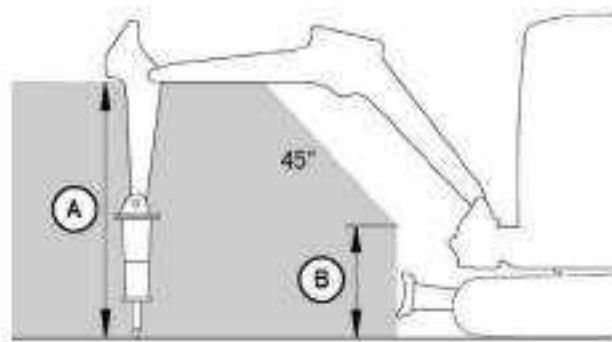


Illustration 62
(A) 120 cm (47 inch)
(B) 50 cm (20 inch)

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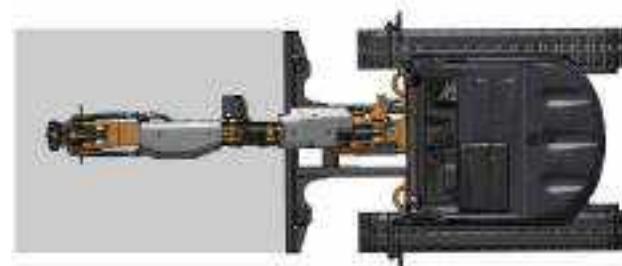


Illustration 63
g06276140

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 Slinging 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

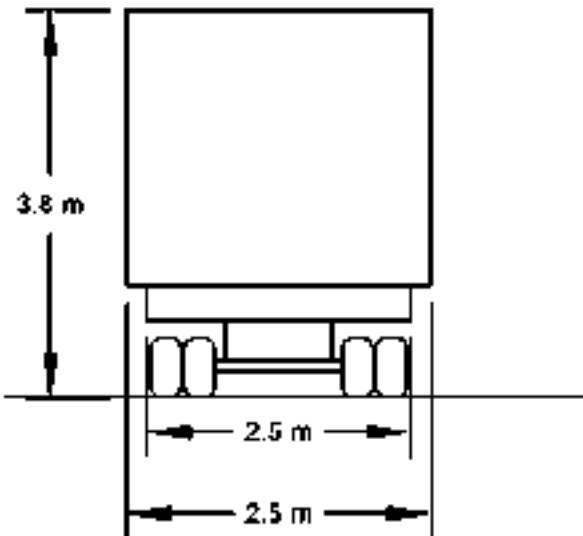


Illustration 64

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 proceeding 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.

- 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 Value (g/kWh)
C1.7	940.14
C1.1	

(continued)

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.

(Table 7, contd)

European Union (EU) Stage V Engine Emission Compliant CO₂ Values	
Engine Model	CO₂ Valve (g/kWh)

Specification Data

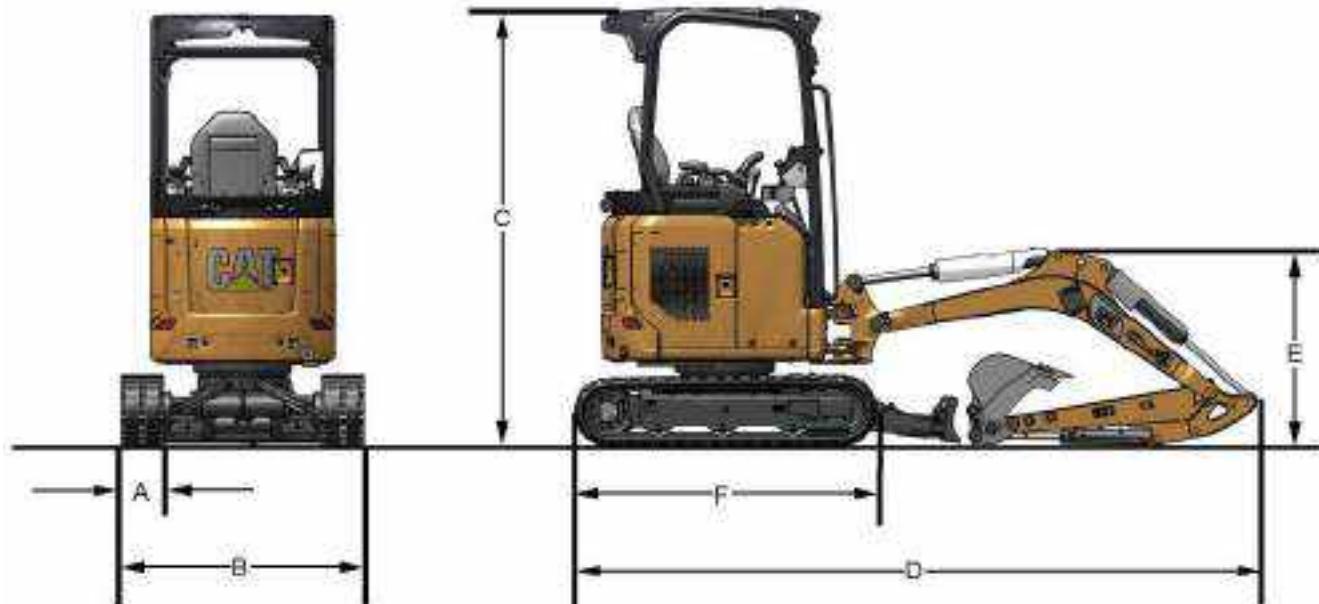


Illustration 65

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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

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 7inch)		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

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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

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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	Expanda-ble	Fixed	Expanda-ble	Fixed	Expand-able	Fixed	Expand-able
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	Expanda-ble	Fixed	Expanda-ble	Fixed	Expanda-ble	Fixed	Expanda-ble	
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

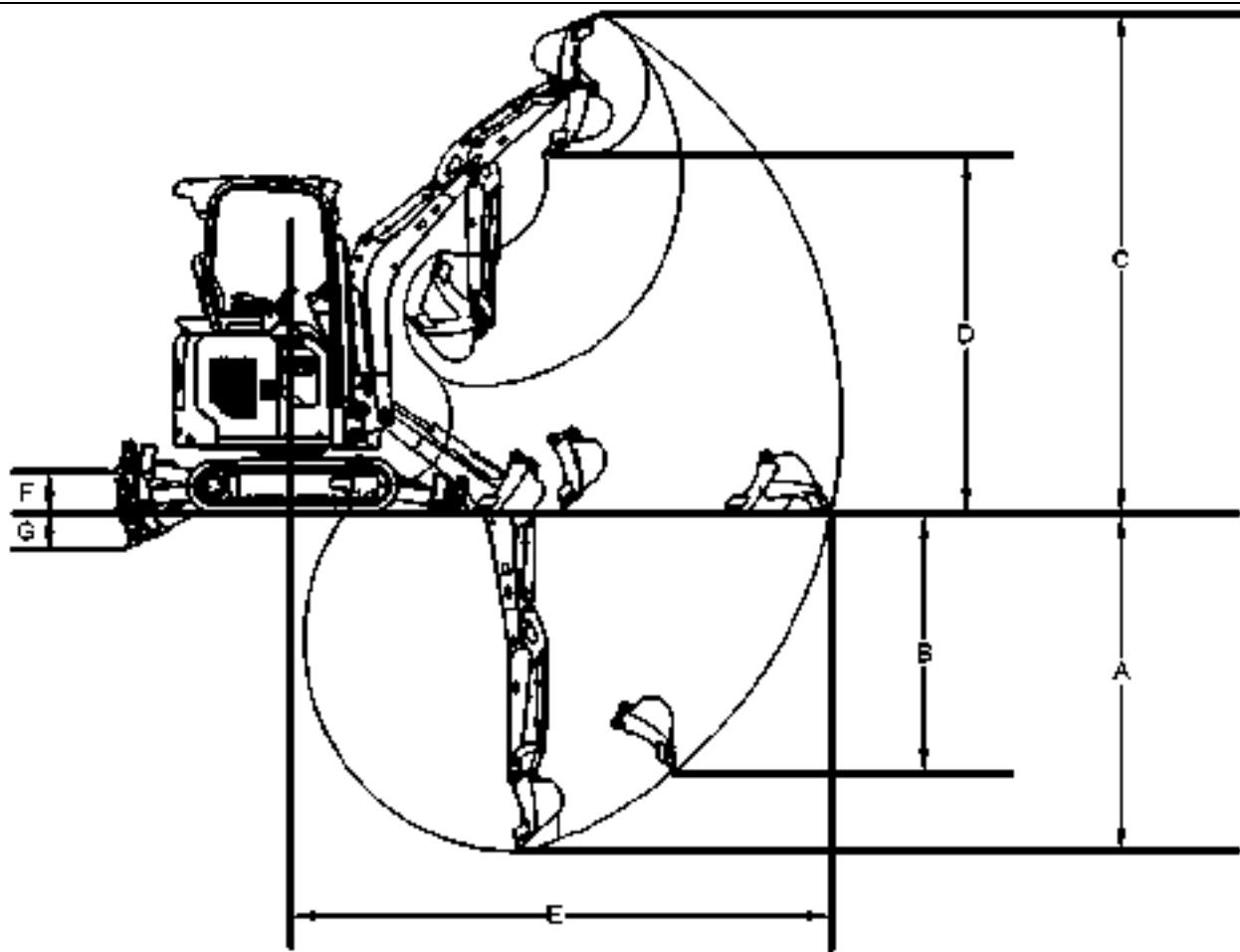


Illustration 66

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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)	

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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)	

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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

i07929290

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 manufacturers, or work tools which have been released for other excavators, can reduce the machine's output and stability considerably, and can also damage the machine and injure 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

(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
Counter-weight	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

(continued)

Product Information Section
Lifting Capacities

With Bucket

[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120						[mm] [inch]
A											
-120										489	489
2500				244	244				225	225	2789
100				559	559				488	488	19
2000				256	256	227	283	217	219	3009	
80				573	573			483	483	120	
1500			299	299	307	320	225	280	191	221	3289
60		643	643	660	683	412	589	424	497	139	
1000			419	482	295	341	219	255	178	297	3409
40		503	939	635	733	471	547	385	496	149	
900			395	458	283	328	210	248	171	201	3429
20		852	987	109	707	457	534	379	443	140	
0			383	446	274	320	206	243	105	286	3359
0			825	980	591	686	417	524	388	453	140
-500	* 602	* 602	611	713	389	443	271	316	241	189	232
-20	* 1349	* 1349	1310	1528	818	953	583	680	443	418	139
-1000			617	719	383	446	272	317		222	260
-40			124	1542	824	959	586	684		494	577
-1500			* 604	* 604	392	* 481				* 288	* 288
-60			* 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)
120														90
2500						- 244	- 244			- 229	- 229			2760
300						- 559	- 559			- 493	- 493			90
2000						- 256	- 256	- 369	- 363	- 219	- 219			3080
10						- 573	- 573			- 483	- 483			120
1500				- 293	- 293	- 320	- 320	- 320	- 260	- 221	- 221			3380
60				- 643	- 643	- 699	- 699	- 703	- 559	- 487	- 487			130
1000				- 534	- 482	- 410	- 341	- 348	- 258	- 225	- 207			3400
40				- 1035	- 1035	- 895	- 733	- 757	- 547	- 486	- 456			140
500				- 671	- 499	- 472	- 328	- 369	- 248	- 239	- 201			3420
20				- 1431	- 997	- 1017	- 707	- 797	- 534	- 528	- 443			140
0				- 673	- 446	- 484	- 320	- 366	- 243	- 265	- 208			3550
0				- 1451	- 960	- 1041	- 688	- 787	- 534	- 584	- 453			140
500	- 602	- 602	- 698	- 710	- 617	- 443	- 452	- 316	- 334	- 241	- 293	- 222		3180
-20	- 1049	- 1049	- 1874	- 1628	- 1339	- 953	- 972	- 680	- 782	- 520	- 646	- 491		130
1000			- 759	- 719	- 533	- 446	- 387	- 317			- 231	- 260		2880
-40			- 1633	- 1542	- 1364	- 863	- 826	- 684			- 642	- 577		120
-1500			- 604	- 604	- 418	- 411					- 238	- 298		2380
-60			- 1204	- 1204	- 867	- 867					- 660	- 660		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

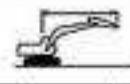
[mm] (inch)	1300 40	1500 50	2000 60	2500 80	3000 100		[mm] (inch)
 A							
120							* 499 * 499 99
2500				* 244 238			* 225 198 2760
100				* 559 509			* 408 448 110
2000				* 256 256	227	198	* 217 160 3060
80				* 573 505			* 493 356 100
1500			* 299 * 299	307 228	225	185	191 139 3289
60			* 643 * 643	680 480	482	354	424 308 139
1000			419	306 295	237	219	168 176 127 3400
40			903	660 635	467	471	243 309 280 140
500			395	294 283	205	213	154 171 122 3420
20			852	613 609	443	457	331 373 270 140
0			383	273 274	198	248	149 175 125 3350
0			825	568 551	425	447	321 366 275 140
500	* 602	* 602	611	422 393	270 271	194	266 187 169 135 3160
-20	* 1049	* 1049	1050	987 818	582 583	418	443 317 418 299 139
-1000			417	428 383	273	272	195
-40			1324	920 824	587	586	421
-1500			* 604	439 392	281		
-80			* 1284	945 845	607		
							* 298 220 2160
							* 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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 120							+ 439 * 439 90
2500				+ 244 238			+ 229 198 2760
150				+ 509 509			+ 488 445 110
2000				+ 266 255	+ 318 188	+ 218 150 1080	+ 483 356 120
80				+ 573 505			
1500			+ 239 * 239	+ 320 220	+ 320 165	+ 221 139 3280	
60			+ 643 * 643	+ 699 490	+ 703 354	+ 487 308 130	
1000			+ 534 308	+ 410 217	+ 349 182	+ 225 127 3400	
40			+ 1138 660	+ 885 467	+ 757 343	+ 486 280 160	
500			+ 671 284	+ 472 265	+ 369 154	+ 239 122 3420	
20			+ 1438 613	+ 1017 443	+ 757 331	+ 526 270 140	
0			+ 673 273	+ 484 188	+ 346 149	+ 269 125 3500	
0			+ 1451 569	+ 1041 425	+ 787 321	+ 594 275 140	
500	+ 602 * 602	+ 966 422	+ 617 270	+ 452 184	+ 334 167	+ 292 136 3180	
-20	+ 1049 * 1049	+ 1874 917	+ 1333 582	+ 872 493	+ 712 317	+ 646 239 130	
-1000		+ 759 428	+ 533 273	+ 387 185		+ 291 160 2680	
-40		+ 1633 920	+ 1044 587	+ 826 421		+ 642 355 120	
-1500		+ 604 439	+ 411 281			+ 298 220 2380	
-60		+ 1264 945	+ 867 607			+ 680 495 100	

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	4000 160		(mm) (inch)
									(mm) (inch)
2000									196 * 196 2670
2500				398 * 396					376 * 376 2960
100				161 * 161	228 * 239				394 * 394 120
2000				412 * 412	487 544				394 * 394 130
80				354 * 354	284 298				378 * 378 125
1500				593 * 585	461 558				383 * 385 160
4000		674 * 674	425 * 431	295 341	298 353	185 194	160 * 179	3560	
40		1380 * 1380	514 * 519	636 714	467 544		353 * 355	140	
500				287 460	292 377	299 246	161 180	355 383	2590
25				895 990	606 704	452 528	346 409	341 384	150
0		563 * 563	380 442	271 316	204 219	153 188	157 186	3520	
0		1262 * 1307	817 582	593 610	428 515		347 411	140	
500	579 * 579	597 639	373 435	295 310	200 238		168 189	3360	
-20	1292 * 1293	1282 1499	803 598	579 668	431 517		373 440	140	
-1000	595 * 591	603 704	374 437	284 310	201 238		184 229	3080	
-40	2000 * 2800	1293 1511	804 593	563 657	434 510		431 587	120	
-700		518 * 581	380 440	279 315			261 * 285	3530	
-40		1318 * 1450	819 554	593 668			564 * 631	110	
-2000		460 * 460					342 * 332	1830	
-80		945 * 945					351 * 381	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)	1000 40	1500 59	2000 80	2500 100	3000 120	3500 140	4000 160		(mm) (inch)
3000									196 160 2470
2600									178 139 2960
300				386 316					354 334 120
2000				181 181	266 259				174 174 3250
00				412 412	582 584				384 384 130
1500				254 254	291 283				195 179 3450
60				593 593	638 553				285 325 160
1000	674 674	431 431	368 341	321 253	286 194	179 129	3580		
40	1293 1293	1290 1290	919 919	778 734	650 544	395 335	140		
500			628 499	495 327	354 295	231 180	192 163	3590	
20			1229 990	993 704	766 523	409 422	404 404	150	
0		563 563	675 442	478 388	364 239	244 188	210 185	3520	
0		1307 1307	1401 952	1028 680	784 555	471 411	411 360		
500	578 578	961 699	639 436	482 310	346 218	251 189	189 1360		
20	1293 1293	1293 1293	1099 1275	938 932	649 740	567 555	443 443	140	
3000	691 691	931 704	565 437	419 310	294 236	216 188	216 188	3390	
40	2600 2600	1778 1511	1213 939	877 667	618 503	503 409	503 367	120	
-2000		691 691	460 440	320 315				285 285	2630
60		1693 1693	1470 954	998 688				631 631	110
2000		460 460						332 332	1830
60		365 365	916					761 761	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)	1000 40	1500 59	2000 79	2500 100	3000 120	3500 140		
								(mm) (inch)
3000								156 180 2470
2600								178 194 2960
300				386 386				384 382 120
2000				181 181	226 93			174 163 3250
00				412 412	457 359			384 316 130
1500				251 251	218 224	185		179 154 3450
60				553 553	481 382			383 375 160
1000		674 1293	480 1029	425 394	280 634	217 636	165 467	160 153 3580
40					297 297	252 204	200 161	203 178 140
500					614 614	606 499	452 324	540 244 150
0		563 1282	409 880	380 817	283 580	221 583	204 428	195 312 2520
0		578 1293	578 1292	597 880	283 803	285 567	116 465	147 421 160
500		578 1293	578 1292	597 880	283 803	285 567	116 465	169 159 3360
-20							200 431	203 265 140
-3000		591 1291	837 1293	603 890	373 804	284 588	116 464	194 137 3380
-40		2000 1291	1791 1293	890 890	604 588	688 464	424 387	431 385 120
-5000				614 1218	424 913	280 809	270 582	251 180 2630
60							110 467	564 486 110
-2000				450 915	444 916			332 325 1830
60								261 261 70

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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 3000								* 135 * 135 2470
 2500				* 286 * 286				* 178 174 2960
2000				* 181 * 181	* 259 169			* 234 232 120
18				* 412 * 412	* 592 358			* 384 38 130
1600				* 254 239	* 266 165			* 175 124 3160
13				* 559 432	* 618 352			* 385 275 340
1800		* 674 488	* 426 360	* 217 * 321	158 * 266	107		* 179 113 3560
45		* 1380 1009	* 819 669	* 776 467	* 696 339			* 395 250 140
500				* 626 315	* 445 264	* 254 151	* 291 178	* 192 149 3580
25				* 1339 614	* 959 439	* 766 324	* 530 244	* 422 240 150
8		* 580 488	* 375 289	* 473 384	* 364 165	* 244 89		* 219 99 3520
1		* 1307 1009	* 1451 590	* 1028 407	* 784 312			* 471 243 140
500	* 578 * 578	* 981 488	* 639 260	* 462 366	* 346 162			* 259 119 3560
-28	- 1293 - 1293	- 1263 1263	- 1010 1010	- 1375 567	- 392 405	- 740 305		- 355 242 140
-1000	- 896 897	- 629 414	- 568 284	- 410 388	- 394 162			- 278 137 3680
-40	- 2060 1291	- 1778 1213	- 1010 568	- 877 464	- 618 307			- 619 305 120
-1500		- 881 424	- 489 270	- 320 193				- 285 110 2830
-43		- 1450 923	- 378 512	- 668 417				- 631 434 110
-2000		- 460 444						- 332 329 1830
-48		- 945 785						- 251 * 781 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

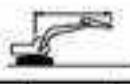
[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3600 120			(mm) (inch)	
													
100											499	499	90
2500							244	227			225	183	2760
900							569	486			493	427	110
2000							268	225	200	169	201	152	3080
80							573	482			447	338	120
1500					299	299	285	218	207	187	176	131	3280
60					643	643	613	469	444	326	390	231	130
1000					393	292	273	206	202	161	161	113	3400
40					849	630	593	444	433	325	356	264	140
500					368	270	261	195	186	145	158	115	3420
20					783	583	562	420	420	312	345	254	140
0					358	269	253	187	181	141	160	117	3380
0					762	568	544	402	400	302	352	259	140
-500	502	502	505	402	354	257	249	184	189	123	123	127	3180
-20	1048	1049	1214	864	795	552	538	395	406	299	381	282	130
-1000			673	407	356	259	250	185			204	161	2880
-40			1228	876	761	557	539	398			451	335	120
-1500			598	419	363	267					280	209	2380
-60			1257	931	782	577					632	470	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.

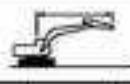
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 120							- 430 - 430 90
2500				- 244 227			- 229 189 2760
300				- 559 406			- 493 427 90
2000				- 256 226	- 369 169	- 219 152	3080
10				- 573 482		- 403 338	120
1500			- 293 * 293	- 320 218	- 320 157	- 221 181	3280
60			- 643 * 643	- 699 463	- 703 326	- 487 391	130
1000			- 534 282	- 410 206	- 348 161	- 225 188	3400
40			- 1035 630	- 895 446	- 757 325	- 486 364	140
500			- 671 270	- 472 195	- 369 145	- 239 195	3420
20			- 1431 583	- 1017 420	- 797 312	- 528 254	140
0			- 673 259	- 484 187	- 366 141	- 269 187	3550
0			- 1451 558	- 1041 462	- 787 302	- 584 259	140
500	* 602 * 602	* 668 402	* 617 257	* 452 184	* 334 159	* 293 127	3180
-20	* 1049 * 1049	* 1874 864	* 1339 562	* 972 385	* 792 299	* 646 282	130
1000			* 759 407	* 533 269	* 387 185		231 151 2880
-40			* 1633 876	* 1041 557	* 826 198		* 642 335 120
-1500			* 604 419	* 418 267			* 238 209 2380
-60			* 1284 901	* 867 571			* 660 470 100

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 	 	 	 	 	 	 	 	 
2000								1500 150 2470
2500				398 396				178 166 2960
100				161 161	211 209			294 293 120
2000				412 412	450 449			174 175 3290
80				354 353	398 397			384 380 130
1500				593 483	444 394			180 97 3450
60								250 259 160
3000		630 460	385 295	274 206	200 99	180 100	146 108	3560
40	1366 866	655 639	598 598	444 450	321		321 235	140
500			367 271	269 193	193 92	167 107	943 562	2990
25		701 594	589 496	414	365 318	220 220	300 225	150
0		593 389	360 259	249 183	187 127	144 101	143 103	3520
0		1186 837	754 590	536 394	401 293		215 238	140
500	579 579	653 533	344 219	243 178	183 133		154 81	3360
-20	1292 1293	1066 837	740 537	523 392	292 266		328 249	140
-1000	591 799	658 534	345 259	243 177	184 134		157 129	3380
-40	2000 1711	187 741	539 522	391 296	283		280 287	120
-1000		688 404	351 256	248 183			231 170	3530
-40		1222 603	756 532	536 394			516 381	110
-2000		485 424					332 312	1830
-80		945 896					751 742	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)	1000 40	1500 59	2000 79	2500 100	3000 120	3500 140		(mm) (inch)
 3000								196 180 2470
 2600								178 168 2960
 300				386 316				234 273 120
 2000				181 181	269	99		174 135 3250
 00				412 412	582	249		264 280 130
 1500				251 251	261	198		255 257 3650
 60				553 468	618	234		285 289 160
 1000	674 460	431 295	368 268	321 150	268	110	179 188	3580
 40	1293 905	399 639	778 444	550 201			295 325	140
 500		628 271	495 153	354 143	231	107	192 162	3590
 20		529 584	959 496	766 266	523 220	120	429 425	150
0	563 329	675 255	478 183	264 102	244	94	210 160	3520
0	1307 937	937 1461	559 328	394 784	243		471 229	160
500	578 578	961 389	639 289	482 178	346 133		251 81	3360
20	1293 1293	1293 937	1275 537	932 382	740 285		558 245	140
3000	091 799	928 394	568 250	419 177	254 134		276 139	3390
40	2000 971	1778 947	1213 539	877 381	618 289		619 287	120
2500		691 404	460 256	320 163			285 150	2630
60		1693 959	979 552	668 394			621 381	110
2000		450 424					332 392	1830
60		365 896					765 742	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

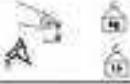
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 2500 100				-335 * 349		* 316 * 395	2540
2000 80				* 329 * 329 722 * 733		260 * 290 580 * 641	2930 120
1500 50			* 384 * 384 828 * 828	329 375 709 607	248 283 533 610	229 262 580 607	3150 130
1000 40			441 951	504 1087	318 364 587 785	279 243 601 524	3270 130
500 20			420 906	493 1041	308 353 664 761	218 273 513 589	3290 130
0 0		* 625 * 625 1362 * 1446	409 881	471 1016	300 345 647 746	234 269 565 581	3210 130
-500 -20	* 677 * 677 1510 * 1510	631 1366	733 1513	406 873	468 297 1008 640	342 233 738	230 265 508 586
-1000 -40		658 1370	739 1567	406 879	471 299 1014 645	344	269 309 596 606
-1500 -60		* 639 * 639 1366 * 1366	418 * 426 896 * 896				* 359 * 359 796 * 796
							2200

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.

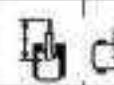
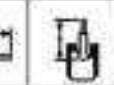
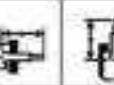
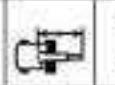
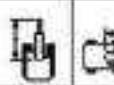
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
							
2500 100				* 348 * 348			* 315 * 315 2540
2000 80				* 329 * 329			* 290 * 290 2930
				* 133 * 133			* 641 * 641 120
1900 76				* 384 * 384	375 * 371	283 * 283	262 3150
				* 828 * 828	* 897 * 813	510 * 625	589 130
1000 40				* 584 504	* 457 364	* 390 279	* 289 245 3270
				* 1249 1087	* 998 785	* 847 601	* 637 541 130
500 20				* 700 483	* 507 353	* 462 273	* 308 240 3280
				* 1503 1041	* 1194 761	* 868 588	* 678 529 130
0 0			* 625 * 625	* 704 471	* 512 345	* 392 269	* 343 246 3210
			* 1446 * 1446	* 1516 1016	* 1105 745	* 843 581	* 756 542 130
-500 -20	* 577 * 577	* 677 * 677	938 733	* 650 468	* 478 342	* 351 268	* 343 266 3030
	* 1510 * 1510	* 1510 * 1510	2023 1573	* 1400 1008	* 1028 738		* 755 686 120
-1000 -40			* 812 739	* 592 471	* 406 344		* 344 309 2720
			* 1745 1587	* 1205 1054	* 864 743		* 708 606 110
-1500 -40			* 639 * 639	* 426 * 426			* 359 * 359 2200
			* 1306 * 1306	* 996 * 995			* 795 * 795 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

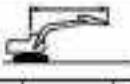
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120			(mm) (inch)		
														
2600 100							335	266			*	315	249	2640
2000 80							*	329	257			260	198	2930
1900 76							*	324	251	248	185	225	174	3150
							*	828	754	709	540	503	406	385
1000 40							441	328	318	241	243	184	213	3270
530 20							951	710	687	519	524	397	471	356
530 20							420	309	308	230	238	179	289	3280
0 0							906	668	664	488	513	387	460	347
0 0							*	635	442	405	299	300	223	234
							*	1352	952	891	645	647	492	595
-500 -20	*	577	*	E77	631	443	405	296	297	220	233	175	230	173
-1000 -40	*	1510	*	5510	1356	955	873	638	640	476			508	381
-1500 -50					638	449	408	298	299	222			369	201
					1370	958	879	644	646	451			596	446
					*	629	461	418	308				*	355
					*	1356	955	*	895	666			*	795
														-90

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)								
2600 100							*	340	266			*	316	249	2640					
2000 80							*	329	257			*	295	198	2030					
1900 76							*	333	253			*	641	442	120					
1900 76					*	384	349	*	383	251	*	371	185	*	293	174	3150			
1000 40					*	584	328	*	457	241	*	390	184	*	289	161	3270			
530 20					*	1249	710	*	988	519	*	847	397	*	637	356	130			
530 20					*	700	309	*	507	230	*	462	179	*	305	157	3280			
0 0			*	635	442	*	704	299	*	512	223	*	392	175	*	343	160	3210		
0 0			*	1446	952	*	1518	645	*	1106	452	*	843	379	*	756	353	130		
-500 -20	*	577	*	E77	*	978	443	*	650	296	*	478	220	*	351	175	*	343	173	3030
-1000 -40		*	1510	*	5510	*	2023	955	*	1400	638	*	1128	476			*	756	381	120
-1500 -50			*	812	449	*	582	298	*	406	222				*	344	201	2720		
-1500 -50			*	1745	958	*	1206	664	*	864	451				*	756	446	110		
-1500 -50			*	629	461	*	426	309						*	355	273	2280			
-1500 -50			*	1356	995	*	895	666						*	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

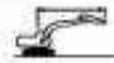
(mm) (inch)	500 20	1000 40		1500 60		2000 80		1500 60		3000 120			(mm) (inch)					
															(mm) (inch)			
2000															200	200	200	200
2000								255	255						245	245	245	245
100								583	583						545	545	545	545
2000								258	258	258	258	258	258	258	230	230	230	230
80								528	528	528	528	528	528	528	508	508	508	508
1500								322	322	247	247	247	247	247	227	227	227	227
60								267	267	532	532	532	532	532	501	501	501	501
1000						636	763	445	445	298	298	298	298	298	227	196	225	3430
40						1488	1546	953	1059	686	754	830	957	957	432	432	432	140
500						638	638	420	463	366	366	235	235	235	210	210	210	3690
20						1075	1533	906	1042	659	737	809	903	903	421	421	421	140
0						621	713	404	487	296	341	223	223	223	194	194	194	3380
0						1034	1281	872	1007	638	736	495	571	571	429	429	429	140
500	618	619	620	623	623	618	720	398	451	291	325	227	262	262	249	249	249	3210
-20	1364	1364	1392	1392	1392	1329	1549	897	952	627	725	493	566	566	456	530	530	130
-1000	766	795	890	890	890	423	716	398	481	291	318				237	237	237	2900
-40	1745	1745	1937	1937	1937	1029	1556	858	933	627	725				525	606	606	120
-1500						655	717	405	488						305	341	341	2460
-60						1365	1526	875	1010						664	755	755	100
-2000						1458	1458								929	949	949	1380
-80															982	882	882	80

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)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	
								(mm) (inch)
3000								260 260 2190
2600					255 255			245 245 2760
300					583 583			545 545 180
2000					256 256	320 320	296 296	310 310
00					579 579	635 635	610 610	566 566 130
1000					322 322	335 335	285 285	227 227 3320
60					267 267	735 735	609 609	501 501 130
1000			743 743	783 783	495 495	412 412	384 384	277 277 3430
40			1546 1546	1546 1546	1059 1059	919 919	754 754	597 597 140
500			1596 1596	1596 1596	1093 1093	1417 1417	942 942	770 770 248 248
20			1601 1601	1601 1601	1093 1093	1417 1417	942 942	549 549 400 400 160
0			713 713	713 713	703 703	483 483	506 506	391 391 265 265 225 225 3380
0			1546 1546	1546 1546	1514 1514	1067 1067	856 856	736 736 947 947 571 571 671 671 486 486 140
500	618 618	619 619	620 620	623 623	947 947	720 720	693 693	461 461 466 466 398 398 369 369 262 262 323 323 240 240 3210
20	1364 1364	1364 1364	1392 1392	1392 1392	2146 2146	1545 1545	1440 1440	992 992 951 951 725 725 799 799 546 546 712 712 530 530 130
3000	116 116	205 205	299 299	390 390	676 676	725 725	594 594	403 403 410 410 398 398 327 327 272 272 2320
40	5745 5745	1245 1245	1937 1937	1937 1937	1878 1878	1558 1558	1275 1275	993 993 826 826 725 725 721 721 606 606 120
-2000					717 717	717 717	482 482	468 468
60					1526 1526	1526 1526	1023 1023	990 990
-2000					456 456	456 456		
60								425 425 425 425 341 341 341 341 2460
								755 755 755 755 755 755 755 755 100
								425 425 425 425 341 341 341 341 100
								982 982 982 982 60 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	900 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 A	 B	 C	 D	 E	 F	 G	 H	 I
3000								* 280 * 280 280
2500					255 255			* 245 245 2760
2000					255 255	250 250		* 230 230 310
1800					255 255	250 250		* 220 220 300
1600					222 222	247 247	209 209	189 209 2360
1400					207 207	241 241	183 183	150 183 200
1200				835 499	445 335	240 240	192 192	147 147 3430
1000				1499 1019	559 715	636 636	507 520	324 324 340
800				630 449	420 369	386 386	235 235	181 181 3450
600				1375 971	906 667	658 658	506 506	315 315 340
400				621 433	404 294	298 298	219 219	145 145 3380
200				1334 934	872 635	628 628	473 473	319 319 340
-500	* 646 * 518	* 623 * 623	619 432	398 288	296 296	214 214	227 227	168 208 3210
-200	- 1364 - 1364	- 1362 - 1362	1323 930	857 622	627 627	452 452	469 469	341 488 341 320
-1000	- 785 - 785	- 890 - 890	846 623	436 398	298 298	214 214		237 237 320 320
-400	- 1745 - 1745	- 897 - 897	1333 829	856 623	627 627	460 460		525 525 330 320
-1500				835 646	408 295			305 225 2460
-400				1385 962	675 678			694 587 300
-2000				- 488 - 488				- 425 - 425 330
-600								1 932 1 932 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								300 20
2500					255 10 295			245 10 260
2000					250 10 290	300 10 320	230 10 270	210 10 260
1800					250 10 290	300 10 320	230 10 270	210 10 260
1600					220 10 250	250 10 280	220 10 250	200 10 250
1500					200 10 230	230 10 260	200 10 230	190 10 230
1400					190 10 220	220 10 250	190 10 220	180 10 220
1300					180 10 210	210 10 240	180 10 210	170 10 210
1200					170 10 200	200 10 230	170 10 200	160 10 200
1100					160 10 190	190 10 220	160 10 190	150 10 190
1000					150 10 180	180 10 210	150 10 180	140 10 180
900					140 10 170	170 10 200	140 10 170	130 10 170
800					130 10 160	160 10 190	130 10 160	120 10 160
700					120 10 150	150 10 180	120 10 150	110 10 150
600					110 10 140	140 10 170	110 10 140	100 10 140
500					100 10 130	130 10 160	100 10 130	90 10 130
400					90 10 120	120 10 150	90 10 120	80 10 120
300					80 10 110	110 10 140	80 10 110	70 10 110
200					70 10 100	100 10 130	70 10 100	60 10 100
100					60 10 90	90 10 120	60 10 90	50 10 90
0					50 10 80	80 10 110	50 10 80	40 10 80

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}
2600 100							313	246				364 140 688 539
2000 80							314	246				242 190 546 423
1900 76							384 828	335 724	307 562	240 517	231 456	189 387 212 471
1000 40							412	314	297	230	226	176 198 154 3270
500 20							686	680	640	496	487	379 437 339 130
0 0				585	422	379	285	279	213	217	167	197 152 3210
0 0				1256	908	818	615	600	459	467	369	435 336 130
-500 -20	* 577 * 1510	* 677 * 5510		587	423	376	282	275	210	216	166	213 164 3030
-1000 -40				593	429	375	284	277	212			245 563 425 110
-1500 -50				697	441	389	294					343 773 261 580 -50
				1366	952	840	636					

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.

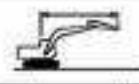
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120			(mm) (inch)	
													
2500							* 348	245			* 315	238	2540
100							* 329	246			* 703	539	100
2000							* 733	530			* 290	190	2930
80											* 641	423	120
1900							* 384	335	* 383	240	* 371	190	3160
60							* 828	724	* 835	517	* 813	387	130
1000							* 584	314	* 457	230	* 390	175	3270
40							* 1249	600	* 388	496	* 847	379	130
500							* 700	295	* 507	220	* 402	171	3230
20							* 1503	638	* 1094	475	* 868	368	130
0							* 625	422	* 704	285	* 512	213	3210
0							* 1448	908	* 1518	615	* 1105	459	130
-500	* 577	* 677					* 938	423	* 650	282	* 478	210	3030
-20	* 1510	* 1510					* 2023	911	* 1400	608	* 1028	453	120
-1000							* 812	429	* 563	284	* 406	212	2720
-40							* 1745	924	* 1205	614	* 864	458	110
-1500							* 639	441	* 425	294			2200
-60							* 1356	952	* 895	636			90
											* 359	261	
											* 795	569	

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													
2500													
2000													
1800													
1600													
1400													
1200													
1000													
800													
600													
400													
200													
0													

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	900 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
          								
3000								* 280 * 280 280
2500					255 248			* 245 239 230
2000					* 593 533			* 545 470 410
1800					* 258 247	* 220 182	* 239 170 130	
1600					* 579 532	* 636 580	* 598 380 330	
1500					* 322 290	* 355 318	* 227 150 120	2320
1400					* 282 250	* 325 304	* 301 223 180	
1300				743 678	412 377	386 346	334 160 3430	
1200				* 1546 1395	* 1059 995	* 954 895	* 914 393 340	
1100				* 636 429	660 525	* 483 428	* 290 168	249 136 2450
1000				* 1681 927	* 1417 677	* 1042 720	* 644 361	* 549 299 140
900				* 713 413	* 703 288	* 598 398	* 393 162	* 277 137 3380
800				* 1646 891	* 1514 665	* 1035 490	* 847 358	* 618 303 340
700	* 646 * 598	* 623 * 623	* 547 411	* 668 275	* 498 204	* 369 168	* 323 148	3210
600	- 1364 - 1364	- 1392 - 1392	- 2148 896	- 1440 892	- 1056 440	- 709 345	- 713 323	130
500	- 785 - 785	- 795 - 795	- 890 888	- 878 495	- 694 236	- 433 294	- 337 167	2320
400	- 1745 - 1745	- 1747 - 1747	- 1713 895	- 1673 895	- 1275 883	- 326 440	- 721 371	120
300				* 717 426	* 482 281			* 341 175 2460
200				* 1526 910	* 1023 668			* 795 433 300
100				* 498 413				* 425 413 330
								* 932 * 932 60

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

Product Information Section
Lifting Capacities

With Bucket

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120			(mm) (inch)				
A																
120																
2500							*	244	*	244						
100							*	159	*	159						
2000							*	256	*	256	282	*	309			
80							*	574	*	574		*	483			
1500					*	300	*	300	*	321	279	317	*	231		
60					*	644	*	644	*	700	600	681	*	487		
1000						511	*	534	364	*	410	274	311	224		
40						1162	*	1137	184	*	885	589	684	*	493	
500						488	554	352	399	268	305	218	*	239		
20						1051	1194	758	861	576	656	481	*	526		
0						479	542	343	391	263	300	223	265	3350		
0						1024	1167	739	842	565	646	491	502	140		
500	*	602	*	602	752	880	473	539	339	387	261	298	261	275		
-20	*	1349	*	1349	1812	1843	1017	1160	731	834	582	642	531	607		
-1000					758	*	760	475	*	533	381	*	388	288		
-40					1526	*	1613	1023	*	1144	734	*	826	621	*	643
-1500					*	904	*	684	*	411	*	411		*	299	
-60					*	1284	*	1234	*	867	*	867		*	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 90
2500				244 244			225 225 2760
100				559 559			493 493 190
2000				256 256	309 309		219 219 3060
80				574 574			483 483 120
1500			309 309	321 321	321 317	221 221	3280
50			644 644	700 700	704 631	487 487	130
1000			534 534	410 410	349 311	225 225	3460
40			1037 1037	985 985	758 629	496 496	140
500			672 672	554 554	399 370	239 239	3420
20			1439 1439	1094 1094	861 737	526 526	140
0			679 679	542 542	391 367	269 256	3380
0			1452 1452	1042 1042	788 646	562 562	140
-500	+ 602 + 602	+ 602 + 602	+ 967 + 967	660 617	535 453	299 293	275 275 3180
-20	+ 1049 + 1049	+ 1049 + 1049	+ 1076 + 1076	1843 1331	1160 973	712 642	607 607 120
-1000			+ 760 + 760	+ 533 + 533	+ 388 + 388		+ 291 + 291 2880
-40			+ 1633 + 1633	+ 1044 + 1044	+ 926 + 926		+ 643 + 643 120
-1500			+ 604 + 604	+ 411 + 411			+ 299 + 299 2380
-80			+ 1284 + 1284	+ 887 + 887			+ 660 + 660 100

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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
A	   	   	   	 			
120							* 500 * 500 30
2500				* 244 * 244			* 225 * 225 2780
100				* 539 * 539			* 438 * 438 110
2800				* 284 * 284	282	282	* 219 294 3080
80				* 574 * 574			* 483 453 120
1500			* 308 * 300	* 321 324	279	210	* 221 180 3280
60			* 644 * 644	* 700 611	600	455	* 487 398 130
1600			58	279 364	274	205	224 186 3400
40			1002 618	784 587	589	440	484 366 140
500			438 357	352 261	268	199	218 161 3420
20			1059 771	758 563	578	428	481 355 140
0			476 346	343 253	263	194	222 164 3280
0			1024 747	730 546	545	415	491 362 140
-500	* 602 * 602	752 529	472 344	339 289	281	192	241 177 3180
-20	* 1249 * 1249	1612 1037	1017 740	731 538	562	415	521 392 130
-1000		258 534	475 346	341 251			280 207 2880
-40		1028 1160	1023 745	734 541			621 460 120
-1500		* 604 545	* 45 354				* 298 279 2380
-80		* 1284 1075	* 857 765				* 680 628 100

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.

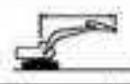
[mm] [inch]	1300 40		1500 50		2000 60		2500 80		3000 100			[mm] [inch]	
													
120											500	500	90
2500							244	244			225	225	2760
100							559	559			498	498	110
2000							256	256	369	210	219	284	3060
80							574	574			493	453	100
1500					309	300	321	284	321	210	221	180	3280
60					644	644	700	611	704	451	487	398	130
1000					534	379	410	273	348	205	225	166	3400
40					107	89	105	567	750	443	496	366	140
900					672	357	473	261	370	199	239	161	3420
20					1439	771	1018	563	787	428	528	385	160
0					674	346	184	253	367	194	265	164	3350
0					1452	747	1042	546	718	410	504	362	140
500	602	602	987	629	617	344	453	250	315	192	293	127	3160
-20	1049	1049	1825	107	1031	740	973	538	712	415	648	392	139
-1000			750	534	533	346	388	251			291	287	2880
-40			1533	1150	1044	745	826	541			643	660	120
-1500			604	545	411	354					293	279	2100
-80			1284	1175	987	765					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)	1000 40	1500 59	2000 79	2500 99	3000 119	3500 140		(mm) (inch)
A	          							
3000								156 " 186 2470
2500								178 " 178 2960
100				398 " 396				284 " 284 120
2000				181 " 181	259 " 259			374 " 374 3250
00				413 " 413	582 " 582			384 " 384 130
1000				285 " 285	270 " 270	281		375 " 375 3450
60				560 " 560	686 " 686	643		385 " 385 160
1000		674 " 674	432 " 432	363 " 363	360 " 360	272	303	241 " 179 3560
40		1381 " 1381	920 " 920	778 " 778	718 " 718	566	608	395 " 395 160
500			469 " 556	399 " 396	316 " 316	265	382	207 " 192 3930
20			1664 " 1972	764 " 957	670 " 670	659	444	422 " 422 150
0		563 " 563	472 " 538	349 " 349	297 " 297	259	298	204 " 203 3520
0		1307 " 1307	3018 " 3559	731 " 814	657 " 657	617		447 " 431 160
-500	- 578 " 578	738 " 946	466 " 532	334 " 381	285 " 285	232		237 " 249 3360
-20	- 1283 " 1283	1534 " 1618	9002 " 984	719 " 821	649	629		478 " 543 160
-1000	- 091 " 091	240 " 2620	400 " 532	322 " 391	256 " 256	232		247 " 277 3000
-40	- 2600 " 2600	1595 " 1779	1003 " 949	719 " 810	582 " 618			546 " 610 120
-2000		631 " 681	460 " 460	328 " 328	320 " 320			285 " 285 2030
-60		1951 " 1951	1651 " 978	570 " 668	688 " 688			631 " 631 110
-2000		460 " 460						322 " 322 1830
-60		945 " 945						761 " 761 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	2000 49	2000 49	2500 100	2500 100	3000 118	3000 118	3500 140	3500 140		(mm) (inch)
 3000											195 * 195 2470
2500 109				386 * 386							178 * 178 2360
2000 69				181 * 181	259 * 259						174 * 174 3150
1500 69				413 * 413	562 * 562						384 * 384 130
1000 40				285 * 285	201 * 201						175 * 175 3150
500 20				500 * 500	618 * 618						395 * 395 140
0 0				674 * 674	432 * 432	300 * 300	368 * 321	310 * 266	241 * 179		179 * 179 3560
-500 -20				1301 * 1301	929 * 929	729 * 719	939 * 939	866 * 866	595 * 595		395 * 395 140
-1000 -40				627 * 556	446 * 388	355 * 355	392 * 291	237 * 237	192 * 192		392 * 392 2390
-1500 -50				1346 * 1167	860 * 867	786 * 786	880 * 820	610 * 610	422 * 422		422 * 422 150
-2000 -69				563 * 563	475 * 519	478 * 519	564 * 564	244 * 244	213 * 213		213 * 213 3520
-2500 -89				1307 * 1307	1452 * 1452	959 * 959	1029 * 854	784 * 837	471 * 471		471 * 471 140
-3000 -109	578 * 578	661 * 646	639 * 522	462 * 388	346 * 346	232 * 232					258 * 249 3360
-3500 -1293	1293 * 1293	1369 * 1369	1376 * 1144	953 * 823	748 * 748	528 * 528					395 * 343 140
-4000 -2000	891 * 891	929 * 928	588 * 552	410 * 388	294 * 294	293 * 293					377 * 377 3060
-4500 -2600	2600 * 2600	2779 * 2779	1254 * 1145	870 * 838	618 * 618	618 * 618					610 * 610 120
-5000 -3500			681 * 681	490 * 490	320 * 320						285 * 285 2530
-5500 -4000			460 * 460	378 * 378	668 * 668						631 * 631 110
-6000 -4500			345 * 345								332 * 332 100
-6500 -5000			241 * 241								281 * 281 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)	1388 46	2000 66	2000 66	2598 100	3000 120	3598 140		(mm) (inch)
 A	 C	 C	 C	 C	 C	 C	 C	 C
3000								135 135 2470
2500								128 128 2360
2000				181 181 259 213				234 234 320
1800				413 413 582 498				234 234 320
1600				255 255 379 309				175 182 3469
1400				560 560 599 490				285 360 340
1388	674 674	587 587	432 432	383 383 273 272 203 210 155				179 190 3580
45	1281 1281	1269 1269	929 929	927 779 597 596 427				325 332 340
500				498 398 350 258 265 195 207 152 192 146				3580
28				1054 770 764 699 576 421 444 326 422 321 150				
8			580 580	588 472 342 340 249 259 190 204 345 203 149 3520				
3			1207 1207	1086 739 731 577 557 603 447 326 340 340 340				
-500	578 578	738 738	598 486 336 334 244 255 197					3360
-125	1293 1293	1293 1293	1884 1322 725 719 526 549 402					340 340 340
-1000	690 690	691 691	743 521 466 337 233 243 256 197					247 181 3690
-45	2866 2866	2860 1595	1629 1093 728 718 525 562 404					568 402 320
-1500			691 501 469 343 320 249					285 232 2650
-45			1451 842 378 729 668 577					621 521 110
-2500			460 460					332 332 1830
-88			945 945					751 751 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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000								135 135 2470
2500				386 386				178 178 2960
2000				181 181 259 313				234 234 320
1800				413 413 592 456				274 274 350
1600				285 285 361 309				315 315 390
1400				560 560 619 480				355 355 440
1200		674 674 729 627	587 587 629 627	283 283 359 446	321 321 355 355	293 293 321 321	266 266 291 325	179 179 190 222
45		1361	1289	729 697	697 697	621	621	332 332
500				1348 1348	770 770	800 800	766 766	192 192
25				1452 1452	738 738	1029 1029	784 784	146 146
8			580 580	518 518	312 312	478 478	248 248	219 219
1			1307 1307	1181 1181	738 738	1029 1029	784 784	326 326
-500	578 578	578 578	981 981	936 936	462 462	244 244	396 396	193 193
-25	1293 1293	1293 1293	1263 1263	1181 1181	1375 1375	725 725	526 526	249 249
-1000	896 896	896 896	891 891	828 828	566 566	397 397	410 410	277 277
-45	2060 2060	2060 2060	2000 2000	1779 1779	1020 1020	1214 1214	726 726	492 492
-1500				881 881	738 738	910 910	520 520	232 232
-45				1451 1451	742 742	739 739	668 668	521 521
-2000				460 460	460 460	507 507		332 332
-45				945 945	945 945			70 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

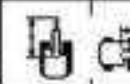
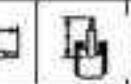
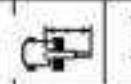
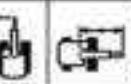
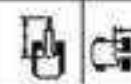
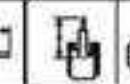
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
100							
2500				244 559	244 559		225 493
100				256 574	256 574	204	195 483
2000				309 644	321 644	262 563	221 487
80				1049	768 737	565 552	381 422
1500				482	365 737	262 565	172 350
40				453	342 741	251 540	159 338
500				383	332 717	250 523	154 346
20				447	322 692	245 520	157 346
0				361	717 692	203 400	140 346
-500	+ 602	+ 602	707	509 851	445 710	239 584	224 516
-20	+ 1049	+ 1049		1094	955	516 524	374 356
-1000			713	514	445	240	262 501
-40			1503	1006	332 716	186 683	198 440
-1500			604	525	418 387	240 735	2380 100
-80			+ 1284	1131			+ 680 603

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															
2500				- 244	- 244								- 225	- 225	2760
900				- 569	- 569								- 493	- 493	110
2000				- 268	- 268	- 309	- 204	- 219	- 195	- 308					
80				- 574	- 574			- 483	- 435	- 120					
1500			- 309	- 300	- 321	- 273	- 321	- 202	- 221	- 172	- 3280				
60			- 644	- 644	- 700	- 588	- 704	- 433	- 487	- 381	- 130				
1000			- 538	- 365	- 410	- 262	- 349	- 186	- 225	- 153	- 3400				
40			- 1037	- 788	- 985	- 565	- 758	- 422	- 496	- 350	- 140				
500			- 672	- 343	- 473	- 251	- 370	- 190	- 239	- 154	- 3420				
20			- 1439	- 741	- 1018	- 540	- 797	- 409	- 528	- 338	- 140				
0			- 678	- 332	- 484	- 243	- 367	- 186	- 269	- 157	- 3380				
0			- 1452	- 717	- 1042	- 523	- 788	- 400	- 584	- 346	- 140				
-500	- 502	- 502	- 967	- 509	- 617	- 330	- 453	- 239	- 335	- 194	- 293	- 170	- 3180		
-20	- 1048	- 1049	- 1875	- 1084	- 1331	- 710	- 973	- 516	- 712	- 386	- 646	- 374	- 130		
-1000			- 769	- 514	- 533	- 332	- 389	- 240			- 291	- 198	- 2880		
-40			- 1633	- 906	- 1044	- 716	- 926	- 513			- 643	- 440	- 120		
-1500			- 604	- 525	- 411	- 340					- 299	- 268	- 2380		
-60			- 1284	- 1131	- 887	- 735					- 680	- 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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 A	 	 	 	 	 	 	 	
3000								135 135 2470
2500				386 386				178 178 2960
2000				181 181	259 204			334 334 120
1800				413 413	589 627			384 384 130
1600				285 285	362 391			375 375 3160
1400				560 560	562 421			385 344 340
1200	674 674	567 567	432 432	370 370	243 262	255 195	196 148	179 143 3560
45	1361 1361	1228 1228	939 939	797 797	720 664	548 419		395 395 140
500				469 469	344 329	249 249	166 166	145 145 3590
25				991 991	710 709	516 513	403 413	370 370 350
1			580 580	486 486	443 328	318 218	192 192	189 189 3520
1			1307 1307	1067 1067	952 799	604 515	310	415 310 340
500	578 578	578 578	694 694	486 486	436 323	312 213	238 178	281 181 3560
-25	1223 1223	1223 1223	1400 1400	1067 1067	938 695	672 563	512 394	645 333 140
-1000	896 896	896 896	699 699	608 608	437 323	311 213	238 178	238 178 3080
-40	2060 2060	2060 2060	1500 1500	1077 1077	948 696	671 562	514 396	510 333 320
-1500				681 681	700 547	317 217	238	285 222 2830
-43				1451 1451	1089 935	710 660	515	631 493 70
-2000				460 460				332 332 1800
-48				945 945	815 815			251 781 70

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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
         								
3000								135 135 2470
2500								178 178 2960
2000					388 388			334 334 120
1800					181 181	259 204		174 174 3250
1600					413 413	592 627		384 384 130
1500					285 285	285 281		175 185 3160
1400					560 560	619 421		385 344 140
1300				674 674	657 632	370 360	262 321	179 163 3560
1200				1361 1361	1228 1228	739 737	729 664	335 335 140
1100					627 627	344 344	446 249	291 445 139
1000					1348 1348	710 710	900 516	766 493 380
900					580 580	486 486	478 238	384 192 3520
800					1307 1307	3067 3067	1452 709	1029 585 340
700					578 578	981 981	486 939	323 462 3360
600					1293 1293	1293 1293	1275 635	393 563 233
500					2060 2060	2000 1779	1077 1074	896 670 140
400								277 179 3080
300								619 383 320
200								285 222 2830
100								631 493 70
0								332 332 1800
-100								251 781 70
-200								
-300								

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.

Product Information Section
Lifting Capacities

Without Bucket

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 A							
2500				349	349		315
100							703
2000				329	329		290
80				734	734		641
1500			384	384	383	343	280
60		829	829	836	836	732	625
1000		533	584	587	455	395	263
40		1151	1250	835	838	723	580
600		612	573	375	424	283	281
20		1105	1240	912	915	631	568
0	625	625	501	567	369	289	264
0	1448	1448	1089	1222	796	623	582
900	677	677	772	979	564	413	321
30	1510	1510	1858	1888	1073	1225	628
-1000			778	813	503	367	330
-40			1672	1745	1673	1206	756
-1000			619	629	428	426	399
-60		1356	1356	985	985		785

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 100		
							(mm) (inch)
2500 100				349 138	349 138		315 121
2500 80				329 129	329 129		290 114
1900 60			384 129	384 129	383 126	371 141	283 109
1900 40			584 259	584 259	457 189	425 169	380 147
900 30			701 304	579 248	507 194	424 155	335 129
0 0		625 1446	625 1446	705 319	567 222	513 205	393 168
900 30	677 1510	677 1510	938 2024	879 1918	659 1401	564 1295	476 1028
-1000 -40			813 1745	813 1745	562 1205	562 1205	407 865
-1500 -60			639 1356	639 1356	428 895	428 895	359 795
							315 121

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 100		(mm) (inch)
 A	 	 	 	 	 	 	
2500 100				348 311			315 303 2540 703 685 109
2000 80				323 313 794 673			290 245 641 545 129
1500 60			384 384 823 823	383 308 836 836	363 234 661 651 503 621	280 216 479 479 139	359 359 139
1000 40			533 402 181 869	387 286 135 640	286 229 642 495	263 202 580 446	3279 139
500 20			512 382 1105 827	376 288 812 618	293 224 631 484	259 198 563 436	3299 139
0 0		625 1446	549 1182 1889 803	501 372 1899 796	369 279 653 623	289 229 623 476 562 446	264 202 139
-500 -20	677 1510	677 1510	772 1858 1185 1073	590 499 1073 798	369 365 799 799	276 219 598 598	284 217 479 129
-1000 -40			778 1672 1198 1073	595 509 802 794	371 367 601		330 251 733 556 109
-1500 -60			839 1256 1225	568 426 895	391 381 823		359 339 795 763 89

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							349	311			315	303	2540
100											703	685	100
2000							329	313			290	245	2390
80							734	673			641	545	120
1500					384	384	383	306	371	294	283	218	3150
60					829	829	826	661	844	503	625	479	130
1000					594	402	457	286	380	223	289	202	3270
40					1259	868	969	640	847	485	637	446	130
500					701	382	507	266	402	224	369	188	3290
20					1504	927	1094	618	889	484	679	436	130
0			625	549	705	372	513	279	393	220	343	202	3210
0			1448	1382	1519	803	1005	603	843	478	706	445	130
-500	677	677	938	599	659	369	479	276	351	219	343	217	3030
-10	1510	1510	2024	1885	1401	798	1029	596			756	473	120
-1000			813	556	562	371	407	279			344	261	2720
-40			1745	1388	1205	802	865	601			753	558	100
-1500			609	568	425	391					359	338	2300
-60			1058	1225	895	823					795	763	90

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

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 A	 2000	 2500	 3000	 3500	 4000	 4500	 5000	 5500
2000								260 * 281 289
2500					255 * 255			245 * 245 2760
3000					258 * 258	305 * 321	230 * 230	310
3500					258 * 258	305 * 321	230 * 230	310
4000					328 * 323	302 * 316	227 * 227	3220
4500					328 * 323	302 * 316	227 * 227	3220
5000			714 * 714	485 * 485	387 * 413	298 * 302	234 * 234	3430
5500			1547 * 1547	1060 * 1060	924 * 934	639 * 718	514 * 514	140
6000			1696 * 1696	1105 * 1105	519 * 574	422 * 429	327 * 327	3490
6500			1670 * 1670	1081 * 1081	1248 * 1248	607 * 603	529 * 549	140
7000			710 * 710	697 * 693	385 * 412	284 * 321	242 * 242	3380
7500			1637 * 1637	1046 * 1031	1210 * 1210	783 * 813	593 * 603	140
8000	618 * 618	1294 * 1294	623 * 623	759 * 757	493 * 506	359 * 417	236 * 258	2920
8500	1064 * 1064	1292 * 1292	1292 * 1292	1061 * 1056	1099 * 1096	725 * 803	607 * 670	140
9000	266 * 266	1245 * 1245	899 * 899	764 * 751	495 * 507	359 * 417		293 * 327
9500	1745 * 1745	1297 * 1297	1297 * 1297	1041 * 1032	1057 * 1057	1200 * 1200	775 * 879	120
10000				717 * 717	492 * 492			341 * 341
10500				1527 * 1527	1024 * 1024	1034 * 1034		755 * 755
11000				468 * 468	453 * 453			425 * 425
11500								982 * 982
12000								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	900 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
         								
3000								261 * 261 280
2500					255 * 255			245 * 245 2760
2000					253 * 253			545 * 545 110
1800					258 * 258	321 * 321	239 * 239	310
1600					590 * 590	635 * 635	598 * 598	130
1500					323 * 323	325 * 325	227 * 227	280
1400					282 * 282	707 * 736	581 * 581	100
1300				744 * 744	485 * 485	413 * 413	386 * 386	3430
1200				1547 * 1547	3060 * 3060	534 * 534	796 * 796	514 * 514
1100				636 * 636	661 * 661	484 * 484	422 * 422	3450
1000				1601 * 1601	1410 * 1410	1044 * 1044	910 * 910	549 * 549
900				713 * 713	704 * 704	563 * 563	412 * 412	3580
800				1646 * 1646	1515 * 1515	1213 * 1213	1035 * 1035	610 * 610
700	646 * 646	618 * 618	623 * 623	623 * 623	947 * 947	663 * 663	556 * 556	488 * 488
600	1364 * 1364	1304 * 1304	1292 * 1292	1292 * 1292	2190 * 2190	1861 * 1861	1441 * 1441	1119 * 1119
500	785 * 785	765 * 765	890 * 890	888 * 888	978 * 978	821 * 821	694 * 694	657 * 657
400	1745 * 1745	1745 * 1745	897 * 897	897 * 897	1890 * 1890	1872 * 1872	1275 * 1275	926 * 926
300	1500 * 1500	1500 * 1500	1500 * 1500	1500 * 1500	717 * 717	482 * 482	482 * 482	341 * 341
200	1527 * 1527	1527 * 1527	1527 * 1527	1527 * 1527	904 * 904	904 * 904	904 * 904	795 * 795
100	498 * 498	498 * 498	498 * 498	498 * 498				425 * 425
0								932 * 932 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

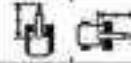
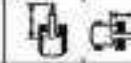
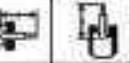
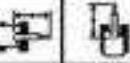
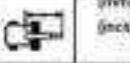
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 A	 	 	 	 				
3000								281 * 281 280
2500					255 * 255			245 * 245 240
100					593 * 593			545 * 545 50
2000					258 * 258	305 238	239 222	310
60					598 * 598	636 509	599 494	590
1500					323 307	302 237	237 190	320
60					789 681	650 561	561 438	180
1100			744 695	435 464	387 236	236 227	234 185	340
40			1547 1399	1060 874	934 638	638 499	516 409	340
300			696 636	512 382	374 234	230 221	237 181	3450
20			1673 1291	1106 826	987 613	626 437	521 389	340
3			713 510	487 387	365 275	284 216	242 184	3300
3			1837 1655	1071 784	797 593	610 468	533 408	340
400	110 * 870	620 * 620	759 538	490 362	359 270	281 20	258 180	2210
10	1364 * 1364	1364 * 1362	1382 1030	833 606	766 575	563 461	570 433	180
1000	795 * 705	705 * 590	744 542	491 362	369 270		293 222	2920
40	1245 * 1245	1245 * 1097	1241 889	1057 781	725 510		650 430	180
1500			717 553	482 386			241 233	2460
40			1527 1081	924 796			755 634	500
2000			468 * 468				425 * 425	1500
40							392 * 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	900 40	1500 60	2000 80	2500 100	3000 120		
								(mm) (inch)
3000								261 261 280
2500					255 255			245 245 2760
2000					253 253			545 545 110
1800					258 258	321 321	239 239	310 310
1600					250 250	305 305	228 227	280 280
1500					223 223	297 297	219 217	189 189
1400					202 202	261 261	191 188	130 130
1300			744 744	805 805	413 413	296 296	227 227	3430 3430
40			1547 1547	1309 1309	3060 3060	614 614	796 796	439 439 340
300			636 636	596 596	661 661	382 382	434 434	249 249 3450
25			1601 1601	1201 1201	3430 3430	625 625	1944 1944	613 613 310
8			713 713	510 510	704 704	387 387	568 568	275 275 3380
1			1646 1646	1385 1385	1515 1515	794 794	1035 1035	530 530 400
500	646 646	518 518	623 623	623 623	947 947	518 518	669 669	362 362 3210
-28	1364 1364	1304 1304	1292 1292	1292 1292	2199 2199	1660 1660	1441 1441	788 788 196 196
-1000	-	785 785	706 706	690 690	888 888	978 978	512 512	694 694 270 270
-40	-	1745 1745	1745 1745	897 897	1297 1297	1880 1880	1659 1659	1275 1275 466 466
-1500	-				717 717	553 553	482 482	388 388 341 341
-43	-				1527 1527	1311 1311	1024 1024	796 796 283 283
-2000	-				498 498	466 466		
-60	-							425 425 300 300
								932 932 60 60

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

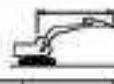
[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120			[mm] [inch]			
															
2500 100							*	349	301			*	315	293	2540
2000 80							*	329	302			*	290	236	2930
1900 76					*	384	*	384	376	296	285	225	264	208	3150
1000 40					*	828	*	825	811	638	614	485	585	461	130
900 36					504	388	385	385	286	281	221	247	194	3270	
800 32					1088	838	788	617	605	475	546	429	130		
0 0			*	625	628	472	368	347	289	271	212	248	194	3210	
0 0		*	1446	1138	1017	774	749	580	586	458	547	428	130		
-500 -20	*	577	*	577	727	539	465	355	344	256	270	-211	267	209	3030
-1000 -48		*	1510	*	1510	1562	1142	1010	767	742	574		590	461	120
-1500 -40					734	538	471	357	346	297			311	242	2720
					1577	1154	1016	772	747	578			690	537	110
			*	639	548	*	426	367				*	359	326	2200
			*	1306	1182	*	936	794				*	795	736	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]	1050 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]	
 2500 100				- 349	301		+ 316 + 703 293 2640	
 2500 80				+ 329	302		+ 290 + 641 236 2330	
 1500 50			- 384 + 829	+ 384 + 829	+ 383 + 136	+ 296 + 538 + 814	+ 225 + 485 + 625 208 3150	
 1000 40			+ 584 + 1250	+ 398 + 838	+ 457 + 889	+ 286 + 617 + 847	+ 350 + 476 + 476 194 3270	
 500 20			+ 701 + 1504	+ 369 + 797	+ 107 + 1194	+ 276 + 596 + 869	+ 462 + 466 + 578 190 3280	
 0 0	+ 625 + 1446	+ 528 + 1139	+ 705 + 1519	+ 358 + 774	+ 513 + 1105	+ 269 + 580 + 843	+ 353 + 458 + 766 194 3210	
 -500 -20	+ 677 + 1510	+ 577 + 1510	+ 938 + 2024	+ 630 + 1142	+ 650 + 1401	+ 355 + 767 + 1028	+ 476 + 574	+ 351 + 211 + 756 209 3030
 -1000 -40			+ 813 + 1745	+ 536 + 1154	+ 582 + 1256	+ 357 + 772 + 865	+ 407 + 570	+ 267 + 344 + 756 242 2720
 -1500 -60			+ 639 + 1366	+ 548 + 1182	+ 426 + 895	+ 367 + 794		+ 325 + 369 + 795 2200

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	900 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
 A	 	 	 	 	 	 	 	
3000								280
2500					255	255		245
2000					255	255		245
18					255	255	227	214
1600					223	223	227	190
13					223	223	227	190
1800				744	595	485	385	228
45				1547	1296	1060	844	173
500				636	536	463	389	340
25				1593	1350	1043	785	390
18				713	520	468	384	340
1				1547	121	3000	264	173
500	648	518	623	623	715	598	461	242
-28	1364	1364	1392	1392	1336	1096	894	173
-1000	785	705	890	888	719	522	462	340
-48	1745	1745	1897	1897	1546	1225	995	173
-1500					717	512	469	385
-43					1527	1148	1011	785
-2000					498	498		
-48					498	498		

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	900 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
         								
3000								* 261 * 261 280
2500					255 * 255			* 245 * 245 2760
2000					* 253 * 253			* 245 * 245 2760
1800					* 258 * 258	321 327		* 239 244 310
1600					* 250 * 250	325 326		* 227 237 280
1400					* 223 * 223	326 327		* 227 237 280
1200					* 202 * 202	326 403		* 201 421 120
1000				744 595	413 385	386 278		* 234 178 3430
45				* 1547 1296	* 3060 2644	* 65 796		* 514 393 340
500				* 636 536	* 661 589	* 484 273		* 249 174 3450
25				* 1601 1350	* 3430 2955	* 1944 580		* 549 383 110
8				* 713 520	* 704 584	* 568 264		* 277 177 3380
1				* 1646 1221	* 1515 1264	* 1035 571		* 618 380 140
-500	* 646 * 598	* 623 * 623	* 947 598	* 669 549	* 488 259	* 389 208		* 323 188 3210
-25	* 1364 * 1364	* 1392 * 1392	* 2199 196	* 1441 1251	* 1951 560	* 790 442		* 713 45 120
-1000	* 785 * 765	* 890 * 880	* 978 592	* 694 548	* 433 259			* 327 24 3260
-45	* 1745 * 1745	* 897 * 897	* 1880 1825	* 1275 788	* 327 560			* 721 479 120
-1500				* 717 512	* 482 385			* 341 272 2460
-43				* 1527 848	* 804 786			* 795 410 300
-2000				* 498 * 488				* 425 * 425 1580
-40								* 932 * 932 60

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

Product Information Section
Lifting Capacities

With Bucket

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140			(mm) (inch)
A														
3000														
-129														
2500							4 245	4 283						
-108							4 569	4 583						
2000							1 268	1 268	247	261				
-80							1 604	1 604	526	589				
1500							333	350	243	267				
-60							716	763	321	562				
1000							454	470	316	336	238	250	100	174
-40							979	1027	686	723	606	637	192	3570
500							425	447	304	321	226	242	176	189
-20							915	964	654	682	460	521		181
0							414	437	294	312	222	236		372
0							891	940	633	671	478	509		346
-500							887	718	413	438	280	308		164
-20	1 1631	1 1661	1 169	1 530	650	937	624	663	472	503				3580
-1000	1 1174	1 1174	600	723	417	439	282	309						188
-40	1 2638	1 2638	1 482	1 549	895	945	626	666						411
-1500			706	737	426	449	360	318						438
-60			1 512	1 579	917	966								140

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.

(m) (inch)	1000 40		1500 59		2000 66		2500 104		3000 120		3500 140		4000 157		(m) (inch)			
2000 100															691 265	695 265	100 3900	
2500 103							+ 243 + 563	+ 243 + 563							+ 587 + 587	+ 587 + 587	120 120	
2000 80							+ 266 + 604	+ 266 + 604	+ 353 + 792	261 559					+ 370 + 570	+ 235 + 564	3250 130	
1500 60							+ 375 + 816	+ 375 + 750	+ 383 + 639	257 552					+ 281 + 576	+ 201 + 445	3440 140	
1000 40					+ 724 + 1525	476 1027	+ 620 + 1117	+ 336 + 323	+ 495 + 943	250 533	+ 379 + 533	100			+ 268 + 588	+ 189 + 450	3870 140	
500 20					+ 925 + 1975	447 964	+ 619 + 1325	321 600	+ 474 + 1021	242 521	+ 381 + 521	169			+ 202 + 520	+ 181 + 399	3890 150	
0 0					+ 900 + 1938	407 940	+ 636 + 1368	312 671	+ 478 + 1017	236 509					+ 311 + 687	+ 184 + 466	3920 140	
-500 -20					+ 875 + 1681	716 1681	+ 817 + 2800	436 1636	+ 596 + 1761	308 957	+ 444 + 1281	234 663				+ 352 + 718	+ 199 + 439	3310 140
-1000 -40					+ 1174 + 2638	725 2247	+ 708 + 1549	438 1520	+ 516 + 1103	304 666					+ 355 + 774	+ 231 + 513	3650 120	
-1500 -60					+ 845 + 1703	737 1579	+ 558 + 1152	449 966	+ 376 + 1103	318 666					+ 360 + 796	+ 310 + 697	2500 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 59		2000 79		2500 106		3000 120		3500 140				(mm) (inch)
														
2000 120														601 100
2500 100					+ 243 + 563	227 486								260 586 376 120
2000 90					+ 258 + 604	224 481	247 528	158 307						213 475 299 100
1500 60						333 716	215 463	243 521	154 331					188 417 257 140
1000 40				454 979	296 617	318 625	292 426	298 506	148 317	180 317	109 317			174 384 230 140
500 20					425 915	239 591	304 654	189 406	228 490	145 301	176 301	104 301		169 372 222 100
0 0					414 591	250 539	294 633	150 387	222 473	135 260				172 380 226 140
-500 -20	+ 1081 + 1081		687 1400	401 860	413 868	349 636	290 624	176 379	219 472	132 285				166 411 246 140
-1000 -40	+ 1174 + 2636		682 1482	406 871	417 895	352 643	292 626	178 382						217 482 132 120
-1000 -60			706 1512	417 897	426 917	251 662	300 622	196 382						292 658 181 100

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		1300 50		2000 60		2500 100		3000 100		3500 140				
															(mm) (inch)
2000 120															+ 395 543 100
2500 100							+ 243 565	227 486							+ 366 163 2900
2000 80							+ 268 504	224 481	+ 353 792	158 337					+ 259 134 3200
1500 60							+ 375 898	215 483	+ 363 638	154 331					+ 361 170 3440
1000 40					+ 724 1625	260 517	+ 626 1117	208 435	+ 436 943	148 312	+ 379 700				+ 366 105 3570
500 20					+ 925 1975	259 561	+ 819 1326	189 406	+ 474 1021	140 301	+ 381 706				+ 362 101 3590
0 0					+ 900 1938	200 539	+ 606 1383	180 387	+ 478 1027	130 290					+ 311 103 3520
-500 -20	+ 1601	+ 1681	+ 875 2950	801 968	+ 317 1761	249 536	+ 595 1281	178 379	+ 444 951	132 265					+ 362 111 3320
-1000 -40	+ 1174	+ 857	+ 1049 2247	406 871	+ 706 1520	252 543	+ 516 1103	178 332							+ 351 132 3050
-1500 -60			+ 646 + 793	417 897	+ 556 1182	261 562	+ 378 106								+ 360 161 2550
															+ 386 407 100

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 50		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															(mm) (inch)
3000															233
120															233
2500									249	263					212
100									322	363					212
2000									248	262					193
80									339	361					428
1500									* 262	* 282	243	257	182	194	178
60									* 320	* 320	521	552	388	414	378
1000							462	485	320	337	235	249	178	199	158
40							936	1044	987	725	504	539	361	407	348
500							428	453	303	320	225	240	173	195	153
20							922	971	652	690	485	516	372	398	337
0							* 466	* 486	410	433	290	308	218	233	189
0							* 1078	* 1078	982	931	625	663	489	500	364
-500	* 651	* 551	689	700	405	428	284	302	214	228	158	158	166	179	2530
-20	* 1447	* 1447	1431	1493	678	919	611	650	400	491			367	393	140
-1000	* 984	* 684	676	707	407	429	284	301	214	228			198	203	3260
-40	* 2199	* 2199	1446	1513	673	923	610	649	400	492			421	451	139
-1500	* 1343	* 1341	688	719	414	433	289	307					244	259	2810
-60	* 3018	* 3018	1473	1541	890	939	623	661					541	581	119
-2000							* 663	* 663	* 402	* 402					* 400
-60							* 1366	* 1366							* 106

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		1500		2000		2500		3000		3500		4000	
	40	60	60	80	90	100	100	120	120	140	140	160	160	(mm) (inch)
1000 120														* 233 233 2640
2500 100														* 212 212 3130
2000 80														* 206 205 3420
1500 60														* 206 182 3620
1000 40														* 190 169 3730
500 20														* 228 164 3780
0 0														* 253 157 3890
-500 -20														* 297 178 3500
-1000 -40														* 334 203 3210
-1500 -60														* 376 251 3130
-2000 -80														* 346 259 2810
														* 383 281 110
														* 406 305 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 59		2000 80		2500 100		3000 120		3500 140				
															(mm) (inch)
3000															233
-120															305
2500									249	160					2640
-100									533	340					212
2000									248	158					147
-80									530	330					470
1500									232	154	182	111	170	102	3820
-60									* 520	329	388	235	378	227	153
1000					462	292	320	293	235	146	178	107	159	83	3730
-40					504	331	597	436	504	312	291	229	349	205	152
500					428	262	363	187	226	138	173	103	153	89	3760
-20					522	360	550	403	485	260	372	220	337	196	158
0			*	466	383	410	245	290	179	218	131	169	99	155	80
-0			*	1078	822	882	529	525	373	469	281	384	212	342	198
-500	*	651	*	651	669	385	405	241	284	179	214	127	168	98	165
-20	*	1447	*	1447	1431	826	679	519	511	385	400	212			213
-1000	*	984	*	828	875	390	407	243	284	173	214	127			148
-40	*	2190	*	1784	1446	838	873	521	510	385	460	273			112
-1500	*	1341	*	842	888	401	414	249	289	175					3250
-60	*	3010	*	1830	1473	862	890	536	523	377					138
-2000			*	183	421	*	402	265							2810
-80			*	1305	900										118
															2010
															80
															2010
															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 59		2000 80		2500 100		3000 120		3500 140					
															(mm) (inch)	
3000																
-120																
2500									* 203	160						
-100									* 163	140						
2000									* 288	158						
-80									* 140	138						
1500									* 292	217	* 329	154	* 341	111	* 209	102
-60									* 220	165	* 275	329	* 623	235	* 460	227
1000									* 561	292	* 448	203	* 397	146	* 359	107
-40									* 1183	631	* 315	438	* 861	313	* 780	229
500									* 984	282	* 581	187	* 453	118	* 374	103
-20									* 1045	565	* 1243	433	* 877	286	* 636	230
0									+ 486	383	+ 917	245	+ 830	179	+ 474	131
0									+ 1078	622	+ 1958	629	+ 1354	379	+ 1019	261
-500	* 651	* 651	* 834	385	* 656	261	* 910	170	* 455	127	* 338	38	* 297	86	* 3530	
-20	* 1447	* 1447	* 1892	826	* 1841	519	* 1310	385	* 877	272					* 654	213
-1000	* 984	809	* 1561	390	* 767	243	* 545	173	* 403	127					* 384	112
-40	* 2199	1754	* 2483	838	* 1623	521	* 1167	385	* 859	273					* 738	249
-1500	* 1341	942	* 263	491	* 622	249	* 438	175							* 345	147
-40	* 3018	1800	* 2043	862	* 1323	536	* 324	377							* 763	330
-2000			* 653	421	* 402	265									* 400	264
-40			* 1366	908											* 809	325

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.

Product Information Section
Lifting Capacities

Without Bucket

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120						
													(mm) (inch)		
2500							* 367	* 367			317	333	2710		
-100							780	818			716	752	118		
2000							* 367	* 367	269	263	266	269	3090		
-80							781	* 797	576	607	569	599	129		
1500					*	442	* 442	354	372	266	280	225	238	3320	
-60					*	846	* 846	763	801	572	603	499	527	130	
1000						476	499	341	359	260	274	211	223	3440	
-40						1027	1076	736	774	560	591	465	492	140	
500						451	474	328	346	253	267	206	218	3460	
-20						973	1022	708	746	546	577	454	481	140	
0						446	463	320	337	246	262	210	223	3360	
0						947	997	689	726	535	566	464	491	140	
-500	*	766	*	766	794	736	438	461	316	334	246	261	226	240	3200
-20	*	1699	*	1699	1607	1575	942	991	682	720	531	562	499	529	130
-1000	*	1121	*	1121	711	742	441	464	318	336			262	277	2890
-40	*	2510	*	2510	1524	1581	956	999	686	724			582	615	120
-1500	*	1567	*	1567	726	757	451	474					364	373	2370
-60	*	3635	*	3535	1557	1624	973	1022					790	840	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				" 367	" 367			" 366
100				" 630	" 618			" 615
2000				" 367	" 367	" 423	283	" 336
60				" 797	" 797	" 854	507	" 744
1500			" 442	" 442	" 450	372	" 441	280
60			" 946	" 946	" 979	801	" 965	603
1000			" 775	499	" 572	359	" 481	274
40			" 1644	1076	" 1232	774	" 1043	591
500			" 945	474	" 653	346	" 508	267
20			" 2021	1022	" 1406	746	" 1097	577
0			" 938	463	" 665	337	" 505	262
0			" 2018	997	" 1432	728	" 1066	566
-500	" 766	" 766	" 952	735	" 858	461	" 622	334
-20	" 1699	" 1699	" 2163	1575	" 1847	991	" 1308	720
-1000	" 1121	" 1121	" 1128	742	" 744	464	" 537	336
-40	" 2510	" 2510	" 2412	1591	" 1595	999	" 1147	724
-1500	" 1567	" 1567	" 896	757	" 578	474		
-60	" 3635	" 3635	" 1094	1624	" 1221	1022		

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)	1000 40		1500 60		2000 80		2500 100		3000 120						
	A	B	C	D	E	F	G	H	I	J	K	L			
2500							* 367	246			317	214	2710		
100							* 780	528			716	483	110		
2000							* 367	246	269	181	265	171	3090		
60							* 781	528	576	386	569	381	120		
1500					*	442	336	364	238	266	178	225	149	3320	
60					*	945	722	763	512	572	383	499	331	130	
1000						476	309	341	226	269	172	211	138	3440	
40						1027	668	736	487	560	371	465	306	140	
500						451	286	328	214	253	166	206	134	3460	
20						973	619	708	462	546	358	454	296	140	
0						440	278	320	206	248	161	210	137	3380	
0						947	596	689	444	535	348	464	302	140	
-500	*	766	*	796	704	420	438	274	316	203	246	159	226	147	3200
-20	*	1699	*	1699	1507	903	942	592	682	437	531	344	499	324	130
-1000	*	1121	862	711	426	441	277	318	204			262	170	2890	
-40	*	2510	1843	1524	917	950	598	686	441			582	378	120	
-1500	*	1567	881	726	439	451	286					364	229	2370	
-60	*	3535	1885	1557	945	973	619					798	516	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)
2500							" 357	246			" 366	214	2710
100							" 836	528			" 815	483	110
2000							" 357	246	" 423	181	" 336	171	3090
80							" 797	528	" 864	386	" 744	381	120
1500					" 442	335	" 450	238	" 441	178	" 329	149	3320
60					" 946	722	" 979	512	" 965	383	" 726	331	130
1000					" 775	309	" 572	228	" 483	172	" 336	138	3440
40					" 1644	660	" 1232	487	" 1043	371	" 740	306	140
500					" 940	280	" 653	214	" 508	166	" 357	134	3460
20					" 2020	610	" 1408	462	" 1097	368	" 767	296	140
0					" 336	276	" 665	206	" 505	161	" 398	157	3360
0					" 2018	596	" 1432	444	" 1086	348	" 677	302	140
-500	" 766	" 766	" 852	420	" 658	274	" 622	203	" 465	159	" 405	147	3200
-20	" 1699	" 1699	" 2163	903	" 1847	592	" 1338	437	" 993	344	" 893	324	130
-1000	" 1121	962	" 1128	426	" 744	277	" 537	204			" 407	170	2890
-40	" 2510	1843	" 2412	917	" 1596	598	" 1147	441			" 898	378	120
-1500	" 1967	981	" 896	439	" 578	286					" 426	229	2370
-60	" 3535	1885	" 1894	945	" 1220	619					" 943	516	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)	1000 48		1500 59		2000 90		2500 104		3000 129		3500 140					
														(mm) (inch)		
3000 120														* 305	* 305	2360
2500 100														200	* 204	2930
2000 91														630	* 638	128
1500 69														231	244	3280
1000 43														515	544	138
500 23														206	218	3450
0 0														457	463	140
-500 -20														131	259	3980
-1000 -40														427	453	160
-1500 -60														416	442	150
-2000 -80														192	204	3550
-2500 -100														423	449	160
-3000 -120														204	217	3380
-3500 -140														451	479	140
-4000 -160														232	248	3030
-4500 -180														514	545	130
-5000 -200														295	312	2630
-5500 -220														682	699	110
-6000 -240														* 505	* 505	1770
-6500 -260														* 1165	* 1165	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)	500 40		1500 120		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
															(mm) (inch)	
3000 120															* 305 * 305 2360	
2500 100							* 577	* 577							* 286 * 286 2900 * 636 * 636 128	
2000 80							* 592	* 592	* 358 284						* 268 344 3280 * 593 544 139	
1500 60							* 365	* 365	* 392 280						* 265 218 3490 * 685 493 149	
1000 40							* 436	665	* 508 369	* 447	273	* 400	215	* 273 206	3600	
							* 436	665	* 508 369	* 447	273	* 400	215	* 273 206	3600	
							* 436	665	* 508 369	* 447	273	* 400	215	* 273 206	3600	
500 20							* 1912	1024	* 1336	743	* 1061	670	* 876	454	* 641 442 111	
0							* 613	* 613	* 548	458	* 560	333	* 604	258	* 395 293	3550
0							* 1404	* 1404	* 2031	986	* 1421	719	* 1985	657	* 742 449 149	
-500 -20	* 696	* 686	* 904	719	* 891	452	* 637	328	* 480	255					* 381 217 3380	
-500 -20	* 1526	* 1526	* 2083	1542	* 1915	974	* 1369	708	* 1028	549					* 842 479 148	
-1000 -40	* 960	* 860	* 1235	725	* 700	452	* 609	327	* 415	216					* 393 246 3090	
-1000 -40	* 2147	* 2147	* 2528	1566	* 1094	976	* 1218	706	* 877	552					* 856 545 133	
-1500 -60	* 1275	* 1275	* 1912	738	* 647	461	* 451	334							* 406 312 2600	
-1500 -60	* 2868	* 2868	* 2146	1584	* 1975	993	* 945	721							* 898 698 111	
-2000 -80							* 677	* 677							* 605 * 605 1770	
-2000 -80															* 1166 * 1166 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 59		2000 83		2500 100		3000 120		3500 140						
A m ft																	
3000 120													* 305	368	338		
2500 100							* 577	534						280	188	291	
2000 80							* 592	531	270	181				231	154	329	
1500 60							566	538	266	177				205	135	349	
1000 40			1650	1001	482	313	342	226	258	179	293	132	199	129	364		
500 20					452	205	327	212	250	163	195	128	169	122	362		
0 0					575	619	705	457	538	351	428	276	416	268	160		
-500 -20	*	613	404	405	271	318	309	244	157	198	125		190	123	358		
-1000 -40	*	1404	871	937	536	680	455	525	338				423	271	140		
-1500 -60	*	1526	1474	872	924	574	668	434	518	331				204	131	338	
-2000 -60	*	1526	1474	872	924	574	668	434	518	331				451	289	146	
-1000 -40	*	831	611	431	267	310	166	341	154					230	149	388	
-1500 -60	*	1778	1489	934	527	576	668	423	521	333				514	329	138	
-2000 -60	*	1821	1517	935	544	592	683	437						295	190	253	
			*	677	644									* 505	348	179	
														*	1165	835	79

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 50		2000 60		2500 80		3000 120		3500 140		4000 160		inch inch		
kg lb															inch inch		
3000 120															* 305 120	260 100	2360 900
2500 100							- 677 232	534 212							* 285 108	188 78	2530 1000
2000 80							- 592 222	531 202	* 358 138	181 76					* 263 154	154 64	3260 1300
1500 60							- 395 142	239 91	* 392 177	177 71					* 265 135	135 56	3410 1400
1000 40					- 638 232	313 1031	- 609 1361	228 677	- 447 1200	170 406	- 480 271	122 367	- 780 283	* 273 120	120 50	3680 1600	
500 20					- 895 1912	285 619	- 621 1336	212 457	- 491 1061	163 361	- 486 876	125 276	- 895 276	* 293 122	122 50	3620 1600	
0 0			- 813 504	404 371	- 346 2031	271 606	- 660 1421	202 436	- 594 1045	157 308	- 386 208	125 208	- 712 271	* 323 129	129 50	3580 1500	
-500 -20	- 666 1526	- 666 1526	- 984 2453	- 406 872	- 891 1915	285 574	- 637 1369	156 424	- 480 1029	153 311					* 361 842	131 289	3360 1400
-1000 -40	- 960 2147	- 831 1776	- 1231 2626	- 411 884	- 798 1694	267 676	- 669 1218	156 423	- 416 877	154 313					* 393 856	149 329	3800 1500
-1500 -60	- 1275 2688	- 850 1821	- 1012 2146	- 422 939	- 847 1375	274 592	- 451 945	202 437							* 405 898	150 425	3630 1500
-2000 -80			- 677 1354												* 505 1160	348 836	1770 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

Product Information Section
Lifting Capacities

With Bucket

(mm) (inch)	1300 40	1500 50	2000 60	2500 80	3000 100	3000 100		(mm) (inch)	
3000								305 * 385 2320	
120								647 * 847 90	
2500					308 * 308			306 * 300 2840	
100					691 * 691			663 * 663 10	
2000					325 * 325	34	329	293 * 295 269	
80					723 * 723	674	705	643 * 643 10	
1500				418 * 418	404 * 404	311	325	258 271 3350	
60				891 * 891	878 * 878	668	638	571 593 140	
1000				574	585	405	422	384 311 240 252 3470	
40				1236	1283	873	910	654 605 530 557 140	
500				547	563	392	409	297 21 234 246 3490	
20				1079	1226	844	881	629 679 517 543 140	
0				505	557	383	400	292 306 233 252 3420	
0				1052	1199	624	661	628 655 520 555 140	
500	* 844	* 844	871	900	533	556	379	396 289 503 250 271 3260	
-20	* 1723	* 1723	1885	1927	1848	1194	815	853 823 654 569 597 130	
-1000			* 845	* 845	538	558	380	387	298 312 2970
-40			* 1820	* 1820	1853	1200	818	856	660 692 120
-1500			* 680	* 680	476	476			* 324 * 324 2480
-80			* 1449	* 1448	1003	1009			* 718 * 716 100

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.

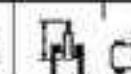
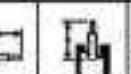
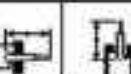
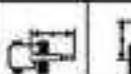
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000							- 305
120							- 647
2500				- 306	- 306		- 300
100				- 631	- 631		- 663
2000				- 725	- 725	- 969	- 295
80				- 723	- 723	- 815	- 649
1500			- 416	- 416	- 404	- 404	- 315
60			- 891	- 891	- 878	- 878	- 842
1000			- 672	- 595	- 502	- 422	- 418
40			- 1432	- 1283	- 1081	- 910	- 865
500			- 798	- 569	- 563	- 469	- 418
20			- 1712	- 1226	- 912	- 881	- 945
0			- 777	- 567	- 400	- 431	- 359
0			- 1677	- 1189	- 620	- 661	- 746
500	- 844	- 844	- 954	- 959	- 705	- 524	- 394
-20	- 1723	- 1723	- 2870	- 1927	- 1521	- 1194	- 842
-1000			- 945	- 845	- 803	- 558	- 451
-40			- 1820	- 1820	- 1307	- 1200	- 964
-1500			- 680	- 680	- 476	- 476	
-60			- 1443	- 1443	- 1003	- 1003	

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

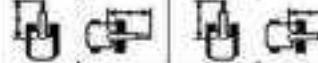
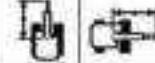
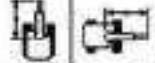
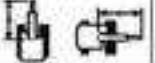
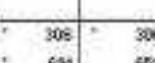
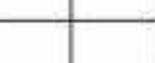
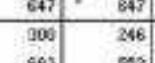
[mm] (inch)	1300 40	1500 50	2000 60	2500 80	3000 100							
A												
3000											" 305	" 305
120											" 647	" 647
2500				" 308	" 308					" 300	246	2840
100				" 634	" 659					" 663	593	116
2000				" 325	304	34	222	289	209	349		
80				" 723	653	674	475	643	453	100		
1500			" 418	" 418	" 404	295	311	219	258	180	3359	
60			" 891	" 891	" 878	636	668	489	571	398	140	
1000			574	383	405	283	304	212	240	166	3470	
40			1236	850	873	609	654	457	530	387	140	
900			547	370	392	270	297	206	234	161	3490	
20			1073	789	844	583	619	440	517	385	140	
0			535	359	383	262	292	201	233	164	3420	
0			1052	775	824	564	628	432	503	362	140	
800	" 844	" 844	671	557	533	357	379	258	289	193	259	127
-20	" 1723	" 1723	1865	1198	1046	789	815	557	823	429	569	290
-1000			" 845	583	538	360	380	260			298	205
-40			" 1820	1210	1053	775	816	580			660	454
-1500			" 680	574	" 476	368				" 324	270	2490
-80			" 1449	1236	" 1003	794				" 716	606	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.

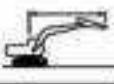
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
	 	 	 	 	 		
3000							305
120							647
2500				306	306		300
100				631	650		663
2000				325	304	369	295
80				723	653	815	649
1500			416	416	404	385	297
60			891	891	878	836	685
1000			672	393	502	410	303
40			1432	850	1001	609	668
900			793	370	563	418	321
30			1712	799	1212	580	706
0			777	359	567	431	339
0			1877	776	1220	664	746
500	844	844	954	657	705	357	528
-20	1723	1723	2070	1138	1521	769	100
-1000			945	563	603	360	451
-40			1820	1210	1307	775	584
-1000			680	574	476	368	
-60			1449	1236	1103	794	

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

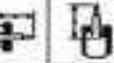
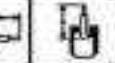
(mm) (inch)	1000 40	1500 59	2000 80	2500 100	3000 120	3500 140					
 A	 A	 B	 C	 D	 E	 F	 G	 H	(mm) (inch)		
3000 120				251 100	251 100			251 100	251 100	2500 100	
2500 100				222 90	222 90	280 110		242 95	242 95	3040 120	
2000 80				246 98	246 98	315 125		239 92	239 92	3320 130	
1500 60				254 102	254 102	318 125	237 93	249 98	249 98	2520 100	
1000 40				250 100	250 100	325 125	249 102	252 102	252 102	2640 100	
1800 70		1502 59	1502 59	587 230	587 230	406 160	423 167	397 155	234 92	229 92	3530 130
500 20				598 230	598 230	468 181	468 181	395 155	652 262	593 232	499 192
1000 40				593 230	593 230	411 161	678 268	634 248	404 164	529 219	499 190
1000 40				682 268	682 268	532 212	593 230	379 149	398 158	302 120	227 87
1000 40				681 268	681 268	544 214	591 230	396 158	653 263	650 230	481 190
1000 40	762 300	762 300	665 265	894 355	526 195	547 199	373 147	396 158	294 120	238 100	233 90
1000 40	1792 700	1792 700	1502 592	1025 405	1029 409	1077 427	803 327	848 338	630 248	642 252	514 214
1000 40				981 398	888 368	928 362	872 342	399 159	284 112	318 120	284 110
1000 40				981 398	888 368	919 362	872 342	399 159	318 112	585 235	685 230
1000 40				787 312	787 312	918 368	580 228	378 150			318 110
1000 40				827 342	827 342	1029 392	756 312	798 312			633 233
1000 40				836 342	836 342	942 392	312 120			342 132	800 320
1000 40				812 342	812 342					764 304	764 304

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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 3000 120				251 100	251 100			251 100
 2500 100				222 90	222 90	280 110		242 95
 2000 80				246 102	246 102	315 125		239 98
 1500 60				254 120	254 120	345 135	249 105	239 98
 1000 40				250 110	250 110	335 130	249 105	239 98
 500 20				250 110	250 110	350 140	250 110	250 110
 000 00				250 110	250 110	350 140	250 110	250 110
 1000 40				250 110	250 110	350 140	250 110	250 110
 500 20				250 110	250 110	350 140	250 110	250 110
 000 00				250 110	250 110	350 140	250 110	250 110
 500 20				250 110	250 110	350 140	250 110	250 110
 000 00				250 110	250 110	350 140	250 110	250 110

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 59	2000 80	2500 100	3000 120	3500 140	
        							(mm) (inch)
3000 120				251 100	251 100		261 100
2500 100				222 90	222 90	224 90	242 90
2000 80				246 98	246 98	235 90	235 90
1500 60				562 220	562 220	476 180	528 180
1000 40				730 300	730 300	668 260	522 200
1800 70			587 130	399 100	406 100	263 90	234 90
1500 59		1502 130	1307 100	674 300	674 300	652 260	503 200
1200 48			596 100	371 90	391 90	268 90	230 90
900 36			682 165	542 144	532 144	395 120	379 110
700 28	762 170	762 170	665 160	543 147	526 139	390 120	373 110
500 20			651 165	544 147	528 139	372 120	372 110
400 16			645 170	545 132	528 132	361 100	361 100
300 12			787 130	658 120	598 120	378 100	377 100
200 8			627 130	532 120	517 120	750 100	585 100
100 4			636 130	538 120	542 120	362 100	342 100
0 0			712 130				764 100

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)	1000 40		1500 50		2000 80		2500 100		3000 120		3500 160					
															[mm] (inch)	
3000							254	259					261	261	2580	
228													563	563	100	
2600							232	212	280	234			242	219	3040	
300							518	510					535	431	120	
2000							248	246	245	222			238	184	3320	
98							592	552	702	476			526	409	130	
1500							324	297	345	218	284	164	228	163	3520	
68							739	638	756	468			528	369	160	
1000							567	399	451	283	380	29	343	361	3830	
40			1962	1200	1007	560	573	610	646	483	743	345	541	323	150	
500							260	321	538	268	424	263	347	157	3650	
28							1620	691	1654	579	956	426	746	327	322	150
0			632	542	789	395	564	258	431	198	305	154	289	143	2530	
0			1581	165	1698	796	1214	586	928	423	716	306	827	325	150	
-500			762	762			735	390	639	253	407	183		343	158	3430
-28			1202	1203			1504	753	1159	544	923	415		619	349	140
-1000					929	840	847	381	477	282	361	180		290	180	2190
-40					1936	1079	1291	258	1022	543	742	418		684	389	130
-1500					797	559	520	357	373	257				394	227	2740
-60					637	1202	1029	789	738	555				533	508	110
-2000					536	536	342	342						342	342	2010
-80					812	812								764	764	30

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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000							305
120							647
2500				306	287		300
100				631	615		663
2000				325	284	205	272
80				723	699	634	604
1500			416	380	395	275	202
60			891	818	851	682	438
1000			542	367	382	262	196
40			1867	782	822	585	421
900			515	343	368	250	278
30			119	741	793	539	407
0			503	332	359	242	273
0			1863	717	773	520	567
500	* 844	* 844	920	518	501	330	255
20	* 1723	* 1723	1758	1112	1077	711	764
-1000			827	523	504	333	286
-40			1771	1124	1083	717	787
-1000			680	534	476	341	
-60			1449	1150	1003	736	

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)	1300 40	1500 50	2000 60	2500 80	3000 100							[mm] (inch)	
													
3000												" 305 "	
120												" 647 "	
2500						" 305 "	" 287 "					" 306 "	
100						" 634 "	" 615 "					" 663 "	
2000						" 325 "	" 284 "	" 319 "	" 205 "	" 295 "	" 199 "	" 309 "	
80						" 723 "	" 609 "	" 615 "	" 448 "	" 649 "	" 419 "	" 100 "	
1500				" 418 "	" 383 "	" 404 "	" 375 "	" 365 "	" 202 "	" 297 "	" 185 "	" 359 "	
60				" 891 "	" 848 "	" 878 "	" 582 "	" 842 "	" 434 "	" 655 "	" 366 "	" 140 "	
1000				" 672 "	" 567 "	" 502 "	" 262 "	" 418 "	" 196 "	" 303 "	" 152 "	" 3470 "	
40				" 1432 "	" 792 "	" 1081 "	" 565 "	" 365 "	" 421 "	" 669 "	" 336 "	" 40 "	
900				" 793 "	" 343 "	" 583 "	" 250 "	" 418 "	" 199 "	" 321 "	" 147 "	" 3490 "	
20				" 1712 "	" 741 "	" 1212 "	" 539 "	" 345 "	" 407 "	" 706 "	" 325 "	" 100 "	
0				" 2777 "	" 332 "	" 567 "	" 242 "	" 431 "	" 194 "	" 333 "	" 150 "	" 3420 "	
0				" 1877 "	" 717 "	" 1220 "	" 520 "	" 328 "	" 296 "	" 746 "	" 331 "	" 140 "	
500	" 844 "	" 844 "	" 954 "	" 510 "	" 705 "	" 350 "	" 526 "	" 239 "	" 394 "	" 182 "	" 330 "	" 162 "	" 3269 "
-20	" 1723 "	" 1723 "	" 2070 "	" 192 "	" 1521 "	" 711 "	" 830 "	" 593 "	" 842 "	" 392 "	" 727 "	" 357 "	" 139 "
-1000				" 845 "	" 523 "	" 503 "	" 333 "	" 451 "	" 239 "		" 324 "	" 188 "	" 2970 "
-40				" 1820 "	" 1124 "	" 1307 "	" 717 "	" 164 "	" 516 "		" 715 "	" 457 "	" 129 "
-1500				" 680 "	" 534 "	" 476 "	" 341 "				" 324 "	" 249 "	" 2490 "
-80				" 1449 "	" 1050 "	" 1003 "	" 736 "				" 716 "	" 560 "	" 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)	1000 40	1500 59	2000 79	2500 100	3000 120	3500 140	Diagram
3000					254	259	
2500					222	212	
2000					248	246	
1500					582	552	
1000					324	276	
500					739	695	
0					548	372	
-500					517	344	
-1000					114	743	
-1500					632	502	
-2000					1581	1090	
-2500					1203	1203	
-3000					1762	762	
-3500					1723	905	
-4000					1062	504	
-4500					1060	499	
-5000					1074	798	
-5500					1069	765	
-6000					1062	697	
-6500					1057	697	
-7000					1057	599	
-7500					1056	501	
-8000					1079	399	
-8500					7H	294	
-9000					7H	217	
-9500					7H	197	
-10000					7H	177	
-10500					7H	157	
-11000					7H	137	
-11500					7H	117	
-12000					7H	97	
-12500					7H	77	
-13000					7H	57	
-13500					7H	37	
-14000					7H	17	
-14500					7H	7	
-15000					7H	0	

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				250	250						260	260	2900
120											560	560	100
2500				222	222	260	267				242	242	3040
100				510	510						535	455	120
2000				246	246	245	245				238	189	2320
80				652	552	703	441				526	326	150
1500				234	276	345	262	204	150		229	149	2520
60				730	585	756	423				526	320	180
1000				567	372	451	380	343	147		246	137	3530
40		1862	1235	1007	892	973	846	493	740		541	363	155
500				760	544	538	449	424	162	247	143	252	130
25				1626	793	1788	618	606	481	246	307	576	295
0		682	502	789	528	664	238	431	90	335	140	289	155
0		1561	1000	1656	738	1214	52	926	387	714	391	637	297
500	262	762		735	523	539	232	407	106		213	144	3430
-20	1702	1203		1844	635	1855	560	872	289		635	207	140
-1000			829	609	647	524	422	232	350	97		310	164
-40		1936	1003	1291	697	1022	488	742	381		684	384	130
-1000			787	519	530	330	379	217			314	219	2760
-40		1627	1110	1229	711	738	511				653	467	110
-2000			638	508	242	242					242	342	2010
-80		812	812								764	758	30

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							" 305 " 305 2320
120							" 647 " 647 90
2500				" 306 " 306			" 303 " 300 2840
90				" 691 " 691			" 663 " 663 110
2000				" 325 " 325	" 349 " 349	" 362 " 362	" 295 " 295 3150
80				" 723 " 723	" 750 " 750	" 779 " 779	" 649 " 649 130
1500			" 416 " 416	" 404 " 404	" 346 " 346	" 359 " 359	" 289 " 289 3350
60			" 891 " 891	" 891 " 891	" 778 " 778	" 744 " 744	" 639 " 639 140
1000			636 654	650 666	339 353	353 370	281 3470
40			1366 1409	1409 1463	730 759	759 595	620 140
500			608 628	628 640	332 345	345 284	275 3480
20			1309 1353	1353 1376	716 744	744 581	606 140
0			598 616	616 632	327 340	340 269	281 3420
0			1282 1326	1326 1355	704 733	733 634	613 140
-500	" 644 " 644	" 644 " 644	" 594 " 594	" 614 " 614	" 420 " 420	" 439 " 439	" 324 " 324 3260
-20	" 923 " 923	" 1023 " 1023	" 2063 " 2070	" 1274 " 1274	" 911 " 911	" 546 " 546	" 728 " 728 635
-1000			" 845 " 845	" 597 " 597	" 606 " 606	" 424 " 424	" 324 " 324 2370
-40			" 1020 " 1020	" 1280 " 1307	" 914 " 914	" 543 " 543	" 715 " 715 120
-1500			" 680 " 680	" 479 " 479	" 476 " 476		" 324 " 324 2490
-60			" 1443 " 1443	" 1009 " 1009			" 716 " 716 100

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							305
120							647
2500				306	306		300
900				691	691		663
2000			325	325	319	295	295
80			723	723	815	649	849
1500		416	416	404	385	297	297
60		891	891	878	878	655	655
1000	872	654	502	466	416	303	281
40	1432	1409	1081	1003	905	668	620
500	793	628	563	452	438	321	275
20	1712	1353	1212	974	845	708	606
0	777	615	587	443	431	339	281
0	1677	1326	1220	995	868	746	613
-500	844	614	526	439	394	339	302
-20	923	723	570	420	346	227	166
-1000	845	615	608	451	441	324	324
-40	1620	1620	1307	1307	943	715	715
-1500	680	680	479	476		324	324
-60	1449	1449	1009	1009		718	718

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

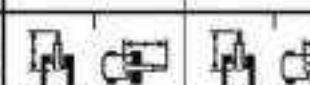
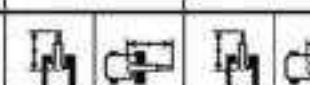
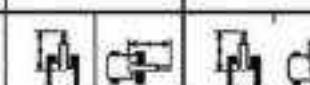
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000							305
120							647
2500				306	306		305
100				631	631		647
2000				325	325	349	325
80				723	723	750	531
1500			416	416	404	327	289
60			891	891	878	705	625
1000			634	436	450	325	270
40			1368	941	969	730	595
900			608	412	436	302	264
20			1309	890	840	652	501
0			595	402	427	294	263
0			1282	866	820	634	504
500	844	844	954	620	591	480	224
-20	1723	1723	2068	1312	1276	911	628
-1000			945	625	597	402	324
-40			1820	1045	1283	867	715
-1000			680	637	476	430	324
-60			1449	1370	1103	866	716

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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000							305
120							647
2500				306	306		300
100				631	631		615
2000				325	325	369	295
80				723	723	815	649
1500			416	416	404	327	297
60			891	891	878	705	655
1000			672	436	502	315	303
40			1432	941	1001	673	512
900			793	412	563	302	321
30			1712	890	1212	652	706
0			777	402	567	294	431
0			1877	866	1220	634	433
500	844	844	954	620	705	400	528
-20	1723	1723	2070	1312	1521	861	130
-1000			945	625	603	402	451
-40			1820	1045	1307	867	984
-1000			680	637	476	410	629
-60			1449	1370	1103	866	

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)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	4000 160		(mm) (inch)
 A	 A	 A	 A	 A	 A	 A	 A	 A	 A
3000 118				250 95					260 100
2600 100				222 88	212 86	260 100	230 93		242 96
2000 78				248 98	246 96	245 95	235 92		238 93
1500 60				252 100	252 100	262 103	264 103		256 98
1000 40				234 92	234 92	245 98	264 103		238 93
4000 160				230 91	230 91	243 98	264 103		236 92
4000 160		1562 612	1562 612	567 221	567 221	451 177	283 110	275 106	246 96
500 20				630 250	630 250	405 157	330 127	727 277	563 217
0 0				1214 482	1214 482	937 382	912 372	710 277	592 227
-500 -20				1274 482	1274 482	912 382	947 397	656 277	543 217
-1000 -40				2091 762	2091 762	1260 500	1294 500	833 347	607 257
-1500 -60				2025 762	2025 762	1282 500	1288 500	834 347	716 316
-2000 -80				1936 762	1936 762	1282 500	1288 500	837 347	688 288
-2500 -100				1977 827	1977 827	530 200	373 140	319 119	594 214
-3000 -120				1929 827	1929 827	342 140	738 288	736 286	680 210
-4000 -160				192 827	192 827				764 286

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 59	2000 80	2500 100	3000 120	3500 140	Diagram
	     	     	     	     	     	     	(mm) (inch)
3000 120				251 100	251 120		
2500 100				222 90	222 90	280 110	242 95
2000 80				246 100	246 100	315 120	239 98
1500 60				562 220	562 220	703 270	528 210
1000 40				730 290	730 290	756 290	528 210
1800 70			587 230	587 230	451 180	380 150	249 100
1500 60	1502 59	1502 59	1297 50	1297 50	973 40	946 38	740 30
1200 48			768 30	768 30	520 22	424 17	347 15
900 36			1626 65	1357 54	912 38	916 38	746 30
600 24	682 27	682 27	798 32	612 25	564 23	440 17	336 14
300 12	1581 62	1581 62	1638 65	1319 54	1214 48	947 40	828 35
-300 -12	762 30	762 30	735 30	696 29	539 23	433 17	302 14
-600 -24	1792 72	1792 72	1564 58	1394 54	894 38	973 38	736 30
-900 -36			829 35	928 38	847 38	697 30	472 20
-1200 -48			896 38	1086 45	1288 54	1022 42	932 38
-1500 -60			787 32	767 30	910 38	580 25	279 14
-1800 -70			827 35	807 32	1029 42	756 30	798 30
-2000 -80			836 35	598 25	942 38	312 14	
-2500 -100			812 32	782 30			
-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 59	2000 80	2500 100	3000 120	3500 140	
 A	 	 	 	 	 	 	 
3000				251	251		
-120				-222	-222	-260	-240
2500				-510	-510		-535
-100				-246	-246	-315	-239
2000				-562	-562	-793	-528
-80				-354	-354	-345	-459
1500				-730	-730	-743	-524
-60							-528
1000							-400
-40							-340
500							
-25							
0							
-0							
-500	-762	-762	-900	-686	-686	-392	-262
-25	-1792	-1792	-1703	-1205	-1202	-1260	-973
-1000				-829	-829	-617	-417
-40				-896	-896	-646	-597
-1500				-787	-787	-510	-379
-40				-827	-827	-629	-590
-2000				-636	-636	-342	-312
-40				-112	-112		

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.

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)														
																													
2000							250	250											260	260	2900								
120																			560	560	100								
2500							222	222	260	240								242	242	3040									
100							510	510										535	535	120									
2000							246	246	246	246								238	238	3320									
80							552	552	700	512								526	489	150									
1500							234	234	345	244	204	106						229	184	3520									
60							730	700	750	524								520	400	180									
1000							567	461	450	390	237	192						246	211	3530									
40				1962	1455	1007	562	573	679	846	569	740	391					541	339	150									
500							760	414	528	301	424	229	247	179				252	186	3550									
25							1626	993	1788	616	606	482	246	304				570	367	150									
0				682	604	789	398	564	286	431	232	335	175	289	169			210	169	3590									
0				1561	1300	1656	857	1214	625	528	478	714	377	637	372			322	257	150									
500				762	762		735	392	539	295	407	219						210	180	3430									
-20				1702	1203		1844	845	1855	603	672	471						635	357	140									
-1000							829	611	647	383	472	284	361	219				310	284	3169									
-40							1336	1312	1291	866	1022	602	742	472				684	452	150									
-1000							787	621	530	389	379	269						314	256	2760									
-40							1627	1316	1295	860	798	624						653	572	110									
-2000							638	636	242	242								242	242	2010									
-60							812	812										764	764	30									

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

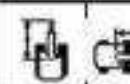
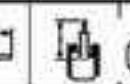
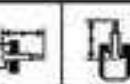
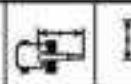
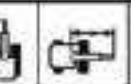
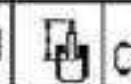
[mm] (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] (inch)
							
3000							305
120							647
2500				305	305		305
100				631	604		647
2000			325	316	310	251	295
80			723	679	709	495	649
1500		418	416	404	307	327	272
60	831	831	831	878	661	713	603
1000	602	469	426	294	221	222	254
40	1297	883	917	635	890	477	561
900	578	385	413	262	313	215	248
20	1240	832	888	600	675	463	547
0	584	375	403	274	366	219	253
0	1213	808	889	580	813	452	569
900	844	844	561	373	799	220	272
20	1723	1723	1953	1247	803	560	601
-1000	845	586	564	375	401	271	314
-40	1220	1259	1216	809	183	585	697
-1000	680	587	476	384			475
-60	1413	1205	1103	828			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											305 120
120											647 80
2500							305 691	305 694			300 660
100							325 723	316 673	389 685	231 485	256 576
2000							416 891	416 891	404 878	307 681	328 490
80							672 1432	409 883	602 1081	294 625	498 477
1500							793 1712	385 832	563 1212	282 608	438 463
60							777 1677	375 803	567 1220	274 590	431 452
1000							705 1521	375 803	526 1130	270 582	394 449
40							845 1820	596 1259	602 1307	451 809	271 585
1500							690 1449	597 1285	475 1003	384 828	
60											
-500	+ 644	+ 644	+ 964		500	+ 705	375	+ 526	270	+ 394	200
-20	+ 923	+ 1723	+ 2070		1247	+ 1521	803	+ 1130	582	+ 449	727
-1000											409
-40											120
-1500											
-60											

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	2000 49	2000 49	2500 90	2500 90	3000 118	3000 118	3500 140	3500 140		(mm) (inch)
 A										 B	
3000 118				250 98	250 98					281 110	281 110
2500 109				222 83	222 83	288 113	239 93			242 95	229 90
2000 89				246 97	246 97	315 124	232 92			238 93	192 75
1500 68				304 119	269 106	327 128	227 88	261 102	172 68	229 92	170 68
1000 41		1862 730	1989 777	367 145	416 164	427 165	235 93	219 83	240 92	159 62	213 84
500 22				578 244	397 175	410 176	281 116	219 89	244 102	305 124	228 93
0 0				592 1581	585 1214	560 1205	271 120	400 161	364 154	206 86	240 103
-500 -23	762 1293	762 1293	699 1293	566 1293	554 1293	315 129	354 137	264 127	380 169	202 88	
-1000 -48			905 1940	871 1228	658 1193	368 736	293 846	264 648	308 127		279 119
-1500 -63			767 1637	681 1256	910 1129	372 802	279 788	268 580			216 693
-2000 -88			526 1112	516 1162	342 942	342 942					242 764
											237 764
											2740 80
											110 80

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				250 100	250 100		
-80							
2500				222 90	222 90	260 100	
-100							
3000				246 98	246 98	246 98	
-80							
3500				234 90	234 90	234 90	
-60							
4000				567 230	494 210	390 160	246 100
-40		1962 790	1389 550		471 200	363 150	149 60
5000				760 330	597 250	528 220	262 110
-28					424 180	424 180	262 110
-0		682 280	565 220	594 230	210 90	205 90	289 110
-0		1561 620	1214 480	1214 500	501 220	443 180	343 130
6000	762 310	762 310		735 300	595 250	467 200	210 100
-20				1844 780	1855 780	569 250	685 280
7000				472 190	472 190	472 190	310 130
-40		829 330	671 250	799 320	364 160	361 160	684 280
8000				1023 420	568 240	742 320	310 130
-60		787 320	581 240	798 320	379 160	369 160	684 280
9000				827 350	725 300	827 350	310 130
-40		1251 500	1251 500	798 320	568 240	742 320	684 280
10000				912 380	912 380	912 380	310 130
-60							

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.

Product Information Section
Lifting Capacities

Without Bucket

[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
 A							
3000			391	391			395
-120							847
2500				404	404		406
-100				322	322		303
2000				401	401		396
-80				887	887		743
1500		568	568	502	502	441	399
-60		1078	1078	1078	1078	569	661
1000			596	617	428	320	290
-40			1284	1331	924	761	619
500			573	594	416	322	275
-20			1234	1281	898	635	606
0	726	726	561	563	408	318	281
0	1795	1795	1203	1255	895	665	620
-500	878	879	989	988	569	405	302
-20	1857	1857	1956	1989	1201	1243	883
-1000			886	908	561	563	343
-40			1922	1953	1207	1255	774
-1000			722	722	495	495	384
-60		1535	1535	1545	1546		843

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	3600 120		(mm) (inch)	
3000 120				- 391 * 380			- 395 * 395	2800 90	
2500 100				- 404 * 404			- 405 * 406	2840 100	
2000 80				- 422 * 422			- 403 * 403	3000 100	
1500 60		- 566 * 566	- 502 * 502	- 465 * 458	- 436 * 436	348 * 379	312 * 3230	3230 130	
1000 40			- 710 * 617	- 547 * 446	- 458 * 458	342 * 379	293 * 3340	3340 140	
500 20			- 825 * 594	- 598 * 434	- 470 * 470	328 * 393	287 * 3280	3280 140	
0 0		- 735 * 736	- 811 * 583	- 595 * 425	- 457 * 457	322 * 389	294 * 3280	3280 130	
-500 -20	- 878 * 829	- 1592 * 1245	- 551 * 423	- 452 * 452	339 * 370	291 * 340	216 * 2880	2880 120	
-1000 -40	- 1857 * 1567	- 1953 * 1374	- 643 * 583	- 471 * 424			379 * 832	364 * 808	2800 100
-1500 -60		- 722 * 722	- 495 * 495	- 1005 * 915			- 384 * 849	384 * 343	2300 90
		- 1535 * 1535	- 1045 * 1045						

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

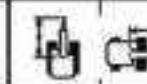
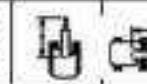
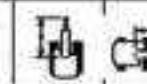
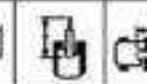
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120			(mm) (inch)
								
3000 120				391 * 380				395 * 385
2500 100					404 * 393	328		405 * 393
2000 80					401 * 387	325		393 * 347
1500 60		* 566 * 566	* 502 * 478	480 * 450	441 * 420	318 * 306	242 * 238	216 * 210
1000 40				596 * 524	416 * 324	420 * 324	328 * 227	202 * 147
500 20				573 * 424	396 * 355	416 * 388	322 * 221	198 * 140
0 0			* 735 * 1705	576 * 1238	385 * 1209	408 * 900	388 * 621	328 * 438
-500 -20	* 678 * 1857	* 629 * 1857	933 * 1906	577 * 1243	553 * 1201	405 * 825	396 * 615	216 * 427
-1000 -40			896 * 1922	564 * 1256	561 * 1207	385 * 931	286 * 613	246 * 551
-1500 -60			* 722 * 1535	596 * 1284	495 * 1045	394 * 852		239 * 50

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)	1000 40	1500 60	2000 80	2500 100	3000 120		
3000 120				391	391		395 847
2500 100				404	326		406 503
2000 80				401	325		377 833
1500 60		568 1878	599 1978	502 1538	640 900	466 547	426 685 952 521 816 479
1000 40			719 1774	416 925	386 955	547 596	450 295 470 516 834 447
500 0	726 1795	575 1238	811 1259	385 832	595 1283	283 621	457 457 227 963 857 444
-500 -20	878 1857	879 1857		741 1593	382 825	591 885	412 615 376 437 840 427
-1000 -40			900 1953	594 1296	640 1574	471 831	286 619
-1500 -60			722 1505	595 1214	495 1045	384 852	
							394 843 734 99

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

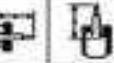
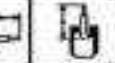
(mm) (inch)	1000 40	1500 59	2000 80	2500 100	3000 120	3500 130		(mm) (inch)
 A	 A	 B	 C	 D	 E	 F	 G	 H
3000 120								346 136
2500 100				318 122	318 122			319 122
2000 80				326 126	326 126	337 132		302 119
1500 60				329 128	319 120	326 126		297 117
1000 40				329 128	403 160	463 183	334 132	308 125
500 20				329 128	403 160	463 183	348 140	340 134
1000 40		963 380	965 380	966 380	922 362	423 166	446 174	327 127
40 16		2062 800	2062 800	2062 800	1244 490	1240 490	961 361	794 310
500 20		753 300	753 300	753 300	573 225	995 390	415 160	422 166
25 10		1975 775	1975 775	1975 775	1235 490	1232 490	604 238	686 267
10 4		866 340	866 340	866 340	578 225	404 160	425 166	333 127
10 4		1879 740	1879 740	1879 740	1242 490	1246 490	871 340	968 360
500 20	816 320	816 320	875 340	904 360	559 225	572 225	399 160	416 166
-25 -10	1620 640	1620 640	1676 660	1919 720	1184 460	1232 490	853 340	697 270
-1000 -40			881 340	881 340	561 225	579 225	398 160	416 166
-1500 -60			889 340	889 340	559 225	579 225	398 160	416 166
-2000 -80			899 340	899 340	552 225	559 225	390 150	378 146
-2500 -100			909 340	909 340	550 225	552 225	380 140	370 140
-3000 -120			919 340	919 340	550 225	552 225	370 136	368 136
-3500 -130			929 340	929 340	550 225	552 225	360 132	360 130

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 59	2000 80	2500 100	3000 120	3500 130		
								(mm) (inch)
3000 120								* 346 * 346 2310
2500 100				* 311 * 311				* 319 * 319 2060
2000 80				* 326 * 326	* 328 350			* 302 * 302 2090
1500 60				* 379 * 379	* 403 * 403	* 398 348		* 309 * 309 2400
1000 40				- 928 - 928	- 820 - 820	- 881 - 881	- 874 748	- 689 635 340
1800 71				- 827 - 827	- 812 - 812	- 802 - 802	- 846 - 846	- 308 - 271 3500
1400 55				- 1042 - 1042	- 1140 - 1140	- 987 - 987	- 943 - 943	- 878 593 140
900 35				- 753 - 753	- 753 - 753	- 791 - 791	- 905 - 905	- 574 - 422
8 1				- 1075 - 1075	- 1075 - 1075	- 1099 - 1099	- 1202 - 1202	- 929 - 933
8 1				- 866 - 866	- 866 - 866	- 818 - 818	- 578 - 578	- 593 - 425
700 28	- 816 - 816	- 916 - 916		- 757 - 757	- 572 - 572	- 565 - 565	- 416 - 416	- 438 - 324
700 28	- 1020 - 1020	- 1020 - 1020		- 1093 - 1093	- 1232 - 1232	- 1216 - 1216	- 697 - 697	- 922 - 700
1000 40				- 1065 - 1065	- 818 - 818	- 879 - 879	- 679 - 679	- 600 - 428
1000 40				- 214 - 214	- 1851 - 1851	- 1487 - 1487	- 1233 - 1233	- 1072 - 836
1500 43				- 809 - 809	- 819 - 819	- 952 - 952	- 553 - 553	- 280 - 280
1500 43				- 1725 - 1725	- 1725 - 1725	- 1179 - 1179	- 870 - 870	
2000 48				- 651 - 651	- 650 - 650			
2000 48				- 1029 - 1029	- 1016 - 1016			
								- 423 - 423
								- 351 - 351
								- 70 - 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)	1300 40	2000 60	2000 60	2500 80	3000 100	3000 100	3000 100	3500 118	3500 118	(mm) (inch)
3000 100										3000 100
2500 80				311 102	318 107					2500 80
2000 60				326 126	326 124	337 125	345 126			2000 60
1600 52				379 128	379 120	403 131	394 128	411 131		1600 52
1300 43				393 133	393 130	401 131	394 128	401 129		1300 43
1000 39		953 323	638 213	868 304	420 137	429 137	386 136	327 125		1000 39
800 29		753 285	676 248	573 225	395 134	415 134	289 104	319 110	238 105	800 29
600 21		586 217	565 217	556 198	381 181	404 181	283 102	313 110	232 105	600 21
400 13		479 182	427 182	418 182	321 125	371 125	602 218	675 238	460 190	400 13
-500 -19	516 1826	318 1820	575 1826	564 1826	559 1826	375 1826	399 1826	278 1826	218 1826	-500 -19
-1000 -40		691 1828	563 1828	551 1828	375 1828	299 1828	278 1828	318 1828	221 1828	-1000 -40
-1500 -49		803 1725	580 1725	553 1725	312 1725	290 1725	284 1725			-1500 -49
-2000 -58		951 1726	650 1726	550 1726						-2000 -58

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)	1300 40	1500 50	2000 60	2500 80	3000 100	3500 120	4000 140	4500 160	(mm) (inch)
3000 100									300 100
2500 80				311 102	310 107				319 108
2000 60			326 126	326 126	328 128	245 83			302 98
1500 50		379 128	379 128	403 130	398 135	391 134			300 98
1000 40	327 107	420 142	502 167	502 167	434 143	235 96	308 108	308 108	3500 140
500 20	750 295	676 248	751 299	676 294	574 229	459 193	228 92	328 123	328 123
0 0	886 330	565 217	818 321	583 221	468 179	232 98	384 160	384 160	3450 140
-500 -19	816 326	816 320	787 315	566 216	438 166	219 92	362 142	362 142	3290 130
-1000 -40	946 346	563 216	678 226	500 167	362 162	221 90	362 143	362 143	3010 120
-1500 -49	809 325	580 218	593 178	312 115	280 105	234 96	370 148	370 148	2570 100
-2000 -58	951 356	550 206					421 163	421 163	1750 70

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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)							
	              													
3000														
120														
2500														
100														
2000														
80														
1500														
60														
1000														
40														
500														
20														
0														
0														
500	878	878	929	928	928	956	981	264	287	209	284	289	319	
-20	1057	1057	1057	1057	1057	1101	1167	622	571	642	452	628	442	130
-1000												328	231	2810
-40												723	512	110
-1500												1044	384	2310
-60												843	684	90
1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850

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				- 381	- 381		- 385 - 395
120							- 847 - 847
2500				- 404	306		- 406 - 280
100				- 322	658		- 303 - 632
2000				- 401	305		- 377 - 227
80				- 387	657		- 393 - 507
1500		- 568	- 568	- 502	413	- 466	- 379 - 201
60				- 1678	892	- 1015	- 818 - 445
1000			- 718	389	- 547	- 286	- 379 - 183
40			- 1535	842	- 1183	- 618	- 534 - 415
500			- 825	369	- 596	- 275	- 338 - 183
20			- 1774	792	- 1268	- 584	- 305 - 404
0		- 798	596	- 818	359	- 595	- 389 - 187
0		- 1795	1053	- 1793	773	- 1283	- 578 - 454
500	- 876	- 876		- 741	356	- 551	- 381 - 200
-20	- 1867	- 1867		- 1598	767	- 1088	- 571 - 452
1000		- 808	544	- 849	358	- 471	- 328 - 231
-40		- 1953	1171	- 1374	773	- 1005	- 575
-1500		- 722	556	- 495	367		- 384 - 304
-60		- 1535	1099	- 1046	794		- 849 - 604

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 59	2000 80	2500 100	3000 120	3500 130		(mm) (inch)
 A	 	 	 	 	 	 	 	 
3000 120								345 13.6 746 29.4 746 29.4 345 13.6 345 13.6
2500 100				311 12.2 712 28.0	368 14.5 663 26.1			319 12.5 708 27.9 558 22.0
2000 80				326 12.8 726 28.8	386 15.2 688 27.4	319 12.6 730 28.7		289 11.3 662 26.3 459 18.0
1500 60			379 14.9 828 32.6	379 14.9 820 32.0	403 15.8 831 32.4	298 11.7 678 28.4		359 14.1 572 22.7 407 16.0
1000 40		903 35.5 1943 76.8	588 23.1 1225 48.1	393 15.5 849 33.5	405 15.8 873 34.1	266 10.5 684 26.4		243 9.2 537 21.0 380 14.9
500 20		753 30.0 1607 62.9	538 21.1 1163 45.3	541 21.4 1166 45.6	369 14.2 643 26.9	233 9.9 648 26.6	240 9.8	239 9.9 528 21.0 3520 14.0
0 0		825 32.5 1770 69.2	625 25.1 1129 44.9	628 25.4 820 32.0	360 14.5 568 26.8	263 10.8 625 26.5		243 10.0 525 22.5 3450 14.0
-500 -20	816 32.1 1620 64.0	916 35.8 1520 59.8	624 25.0 1110 44.5	625 25.1 751 30.1	368 14.6 800 33.7	268 10.9 628 27.0		258 10.1 520 22.9 3290 13.0
-1000 -40		639 25.3 1130 44.6	618 24.9 1160 44.6	619 24.9 752 30.7	376 14.8 808 33.7	288 11.4 597 27.4	294 11.4	292 10.4 649 25.2 3010 12.0
-1500 -60		809 32.1 1125 44.4	510 20.5 1133 44.7	526 21.5 767 30.7	395 15.1 881 34.4	264 10.6 597 27.4		369 14.6 818 33.7 573 20.0
-2000 -80		651 25.4 1129 44.6	650 25.4 1046 41.4					421 16.5 953 38.5 70

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 59	2000 80	2500 100	3000 120	3500 130	4000 150	(mm) (inch)
3000								345 345 2310
120								748 748 30
2500				311 712 663				319 249 2560
100				326 726 669	328 839 490			708 558 10
2000				326 726 669	328 839 490			302 306 2390
80				326 726 669	328 839 490			867 459 130
1500				379 928 820	403 881 642	398 874 684		309 194 2109
59				379 928 820	403 881 642	398 874 684		689 407 340
1800				327 842 842	393 849 849	502 867 686	434 943 471	308 172 3500
40				327 842 842	393 849 849	502 867 686	434 943 471	876 380 140
3000				753 1975 183	538 163 163	791 1699 796	574 1239 589	459 933 486
25				753 1975 183	538 163 163	791 1699 796	574 1239 589	328 923 140
8				866 1900	925 1032	818 1762	356 763	593 568 596
1				866 1900	925 1032	818 1762	356 763	263 568 444
500	816 1620	916 1620		757 1693	310 751	565 1216	268 587	438 922 470
-20	816 1620	916 1620		757 1693	310 751	565 1216	268 587	362 738 339
-1000				805 214	610 1487	878 752	919 1072	600 597
-40				805 214	610 1487	878 752	919 1072	362 737 452
-1500				809 1725	510 184	952 1179	395 767	600 597
-43				809 1725	510 184	952 1179	395 767	378 818 300
-2000				651 104	650 104			421 573
-60				651 104	650 104			421 573 70
								851

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)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000 120				391	391		
2500 100				404	404		
2000 80				422	522		
1500 60		568	596	502	502	466	468
1000 40				1078	1078	1015	1015
900 30				1415	1459	1020	1054
0 0				1364	1408	1044	1029
500 -20	878	879		613	639	449	455
-1000 -40	-1857	-1857		1331	1375	568	1004
-1000 -60			300	300	621	640	451
			-1953	-1953	1338	1374	573
						1005	
			722	722	495	495	
			-1505	-1525	1045	1046	

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 * 395 280 + 847 * 847 90
2500 100				- 404 * 404 + 922 * 922				- 406 * 406 2840 + 903 * 903 100
2000 80				- 401 * 401 + 887 * 887				- 377 * 377 3000 + 833 * 833 120
1500 60		- 566 * 566	- 502 * 502 + 1078 * 1078	- 466 * 466 + 1078 * 1078	- 436 * 436 + 1075 * 1075	382	- 379 * 379 + 816 * 816	343 3230 759 130
1000 40			- 710 * 676 + 1538 * 1458	- 547 * 547 + 1163 * 1154	- 493 * 493 + 1163 * 1154	377	- 379 * 379 + 812 * 834	323 3340 710 140
500 20			- 825 * 653 + 1774 * 1408	- 598 * 598 + 1286 * 1129	- 477 * 477 + 1286 * 1129	371	- 393 * 393 + 805 * 799	317 3360 700 140
0 0		- 735 * 736 + 1705 * 1705	- 841 * 841 + 1759 * 1362	- 595 * 595 + 1263 * 1011	- 457 * 457 + 1263 * 1011	366	- 389 * 389 + 803 * 790	320 3280 716 130
-500 -20	+ 678 * 629 + 1957 * 1957		- 741 * 636 + 1591 * 1275	- 551 * 551 + 1186 * 1004	- 465 * 465 + 1186 * 1004	368	+ 391 * 391 + 806 * 787	343 3800 770 120
-1000 -40		- 908 * 908 + 1953 * 1953	- 643 * 643 + 1374 * 1374	- 471 * 471 + 1005 * 1005	- 467 * 467 + 1005 * 1005		+ 379 * 379 + 832 * 832	328 2800 832 100
-1500 -60		- 722 * 722 + 1535 * 1535	- 495 * 495 + 1045 * 1045				+ 384 * 384 + 849 * 849	384 2300 849 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

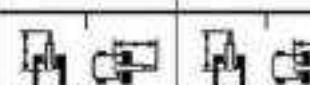
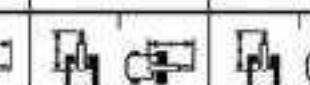
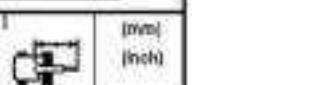
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000 120			391	391			395 847
2500 100				404 322	358 763		406 503
2000 80				401 387	357 770		371 826
1500 60		568 1078	599 1041	502 1015	482 795	369 795	283 577
1000 40				656 1415	459 991	473 1020	339 731
900 30				633 1364	438 947	461 1044	327 707
0 0		726 1795	638 1373	621 1339	428 823	452 876	320 691
500 -20	878 1857	879 1857	994 2109	840 1328	613 1331	425 907	317 868
-1000 -40			900 1953	646 1391	621 1338	427 923	451 873
-1000 -60			722 1505	658 1419	495 1045	438 944	

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)	1300 40	1500 50	2000 60	2500 80	3000 100							
												(mm) (inch)
3000 120				" 391	" 391					" 395	" 395	200
2500 100				" 404	398					" 406	330	2640
2000 80				" 401	257					" 377	270	3000
1500 60		" 568	" 568	" 502	482	" 486	350	" 416	283	" 370	240	3200
1000 40				" 718	459	" 547	339	" 458	263	" 373	226	3340
500 20				" 825	438	" 596	327	" 470	257	" 393	220	3560
0 0		" 736	638	" 911	428	" 585	320	" 457	250	" 369	225	3280
-500 -20	" 879	" 879		" 741	428	" 551	317	" 412	251	" 381	241	3160
-1000 -40	" 957	" 957		" 1593	917	" 886	684	" 876	543	" 840	532	299
-1500 -80			" 908	646	" 640	427	" 471	318		" 378	276	2810
			" 1553	1385	" 1374	923	" 1005	689		" 832	613	19
			" 722	656	" 495	436				" 304	262	2010
			" 1505	1415	" 1246	944				" 843	813	90

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)	1000 40	1500 59		2000 79		2500 100		3000 120		3500 139		
		L	H	L	H	L	H	L	H	L	H	(mm) (inch)
3000												2110
328												240
2600						38	31					246
300						712	712					246
2000						326	306	322	303			262
99						726	726	801	829			267
1500						576	479	602	569			300
68						820	820	881	881	754	823	300
1000						627	627	473	465	582	375	288
40						1042	1242	1019	1054	780	619	615
500						762	762	654	654	475	354	292
26						1215	1215	1065	1499	909	1025	764
0						886	886	637	637	448	348	362
0						1983	1983	1329	1372	967	1002	751
-500						816	816	999	999	631	443	459
-26						1820	1820	2079	2125	1214	1258	955
-1000						375	375	611	631	443	458	247
-46						2891	2891	2116	1380	955	910	363
-2500						903	903	553	553	390	310	
-60						1725	1725	1579	1579	973		
-2000						951	951					421
-60						1136	1136					561
												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 59	2000 80	2500 100	3000 120	3500 130		(mm) (inch)
 3000 120								* 346 * 346 2310 + 746 + 746 30
 2500 100				* 311 * 311 2560 + 712 + 712 10				* 319 * 319 2560 + 718 + 718 10
 2000 80				* 326 * 326 2390 + 726 + 726 130	* 328 * 328 2390 + 728 + 728 130			* 302 * 302 2390 + 687 + 687 130
 1500 60			* 379 * 379 2400 + 928 + 928 140	* 403 * 403 2400 + 881 + 881 140	* 398 * 398 2400 + 874 + 874 140			* 309 * 309 2400 + 689 + 689 140
 1000 40			* 827 * 827 3500 + 1342 + 1342 140	* 502 * 502 3500 + 967 + 967 140	* 434 * 434 3500 + 943 + 943 140			* 308 * 308 3500 + 678 + 678 140
 500 20		* 753 * 753 3520 + 1075 + 1075 140	* 791 * 791 3520 + 1099 + 1099 140	* 574 * 574 3520 + 1029 + 1029 140	* 459 * 459 3520 + 933 + 933 140	* 348 * 348 3520 + 723 + 723 140		* 328 * 328 3520 + 649 + 649 140
 0 0		* 866 * 866 3450 + 1000 + 1000 140	* 818 * 818 3450 + 1062 + 1062 140	* 637 * 637 3450 + 1279 + 1279 140	* 465 * 465 3450 + 992 + 992 140			* 384 * 384 3450 + 802 + 802 140
 -500 -20	* 816 * 816 3280 + 1020 + 1020 140		* 757 * 757 3280 + 1053 + 1053 140	* 631 * 631 3280 + 1286 + 1286 140	* 458 * 458 3280 + 922 + 922 140			* 362 * 362 3280 + 738 + 738 140
 -1000 -40		* 865 * 865 3010 + 2114 + 2114 140	* 816 * 816 3010 + 1057 + 1057 140	* 631 * 631 3010 + 1072 + 1072 140	* 468 * 468 3010 + 990 + 990 140			* 362 * 362 3010 + 737 + 737 140
 -1500 -40		* 819 * 819 2570 + 1025 + 1025 140	* 819 * 819 2570 + 1078 + 1078 140	* 552 * 552 2570 + 980 + 980 140				* 378 * 378 2570 + 818 + 818 140
 -2000 -40		* 651 * 651 1790 + 1029 + 1029 140						* 421 * 421 1790 + 951 + 951 70

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)	1000 40	1500 59	2000 79	2500 100	3000 120	3500 140	4000 160	4500 180	(mm) (inch)
3000									346 136
325									346 140
2500				38 710	311 715				318 708
300									280 650
2000				326 726	306 726	322 801	271 562		262 567
360				376 820	379 820	403 881	369 786	287 794	300 680
400									288 635
1000				627 1042	462 599	473 1019	318 710	362 780	207 450
40									3500 140
500			762 1215	840 1303	634 1065	439 946	459 909	325 762	292 620
20									3520 160
0			886 1383	827 1352	617 1029	423 843	448 967	388 901	268 635
-500			816 1820	818 1820	627 2079	610 1250	417 1214	443 993	345 955
-20									245 523
-1000				375 2091	632 1360	611 1316	419 882	443 955	247 870
-400									246 523
-2500				803 1725	642 1394	553 1079	424 97	390 97	
-600									370 818
-2000				951 1136	351 1156				307 687
-400									100 70

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 59	2000 80	2500 100	3000 120	3500 130		(mm) (inch)
 3000 120								* 346 * 346 2310
 2500 100				* 311 * 311 2360				* 319 * 283 2360
 2000 80				* 312 * 312 2360				* 318 * 658 110
 1500 60				* 326 * 326 2360	* 328 * 271 2360			* 302 * 345 2360
 1000 40				* 326 * 326 2360	* 328 * 271 2360			* 287 * 546 130
 1500 60				* 379 * 379 2400				* 309 * 320 2400
 1000 40				- 928 - 820	* 403 * 368 2400			- 689 * 489 140
 1000 40				- 927 - 822	* 502 * 398 2400			- 678 * 493 140
 1000 40				- 942 - 842	* 502 * 398 2400			- 678 * 493 140
 1000 40				- 753 - 649	* 519 * 419 2420			- 628 * 392 1320
 1000 40				- 1075 - 1013	- 646 - 529			- 723 * 447 110
 1000 40				- 866 - 827	- 618 - 423			- 584 * 296 1000
 1000 40				- 890 - 852	- 612 - 427			- 502 * 454 140
 1000 40	- 816 - 816			- 757 - 617	- 565 - 318			- 362 * 219 1000
 1000 40	- 1020 - 1020			- 693 - 590	- 526 - 318			- 738 * 482 130
 1000 40				- 805 - 632	- 678 - 468			- 562 * 246 1000
 1000 40				- 214 - 1380	- 1457 - 932			- 737 * 545 130
 1000 40				- 809 - 642	- 552 - 424			- 378 * 207 1000
 1000 40				- 1725 - 1384	- 1179 - 917			- 818 * 687 1000
 1000 40				- 651 - 559				- 421 * 421 1000
 1000 40				- 1029 - 1016				- 951 * 851 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

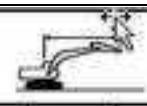
[mm] [inch]	1000 40	1500 60		2000 80		2500 100		3000 120				
											(mm) (inch)	
3000 120					" 391	" 380				" 395	" 395	2800
2500 100							" 404	338		" 406	310	2840
2000 80							" 422	725		" 403	700	190
1500 60		" 566	" 566	" 502	455	461	323	350	252	310	225	3230
1000 40				" 624	492	449	318	345	246	295	211	3340
500 20				" 1345	903	968	687	743	531	659	465	140
0 0		" 735	588	601	491	437	307	339	241	289	206	3360
-500 -20	" 878	" 829	903	600	599	398	425	396	332	326	210	3280
-1000 -40	" 1857	" 1857	2008	1252	1262	859	917	840	788	808	702	497
-1500 -60			" 908	606	589	401	427	389			810	573
			" 1053	1306	1263	865	922	844			" 384	339
			" 1535	1394	" 1045	885					" 849	763
												80

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)	1300 40	1500 50	2000 60	2500 80	3000 100		
							(mm) (inch)
3000 120				" 391	" 391		" 395 " 395 200
2500 100				" 404	338		" 406 390 2640
2000 80				" 401	237		" 377 253 3000
1500 60		" 568 "	" 568	" 502 465	" 466 329	" 416 252	" 370 225 3200
1000 40				" 1678 983	" 105 711	" 362 582	" 816 498 130
500 20				" 718 432	" 547 318	" 458 246	" 373 211 3340
0 0		" 736 598	" 911 401	" 525 411	" 596 307	" 470 241	" 393 206 3360
-500 -20	" 1295 1238	" 1759 865	" 1593 859	" 741 398	" 551 286	" 412 235	" 381 225 3160
-1000 -40		" 1553 1395	" 1374 865	" 640 401	" 471 298	" 376 508	" 340 240 297 130
-1500 -80		" 722 619	" 495 410	" 1505 1334	" 1005 644		" 378 259 2810
		" 1505 1334	" 1046 865				" 384 239 2310
							" 343 763 90

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

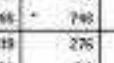
(mm) (inch)	1000 40	1500 59	2000 80	2500 100	3000 120	3500 130		(mm) (inch)
 A	 	 	 	 	 	 	 	 B
3000 120								346 136 346 136
2500 100				318 122 318 122	318 122			319 122 276 108
2000 80				326 126 326 126	326 126 280 110	324 124 280 110		302 118 230 90
1500 60				379 148 379 148	403 158 403 158	358 140 358 140		393 153 393 153
1000 40				497 196 497 196	527 206 527 206	510 198 510 198		633 248 633 248
4000 160		897 350 142	653 260 910	425 166 425 166	449 168 739 293	318 118 527 212		272 104 601 237
5000 200		1753 675 257	606 238 1259	410 156 910	425 165 724 291	336 127 512 212	327 127 389 147	367 141 437 160
6000 240		1866 700 267	518 197 1259	395 146 915	425 165 724 291	336 127 512 212		372 132 600 243
7000 280	816 320 1620	1116 410 1871	517 194 1264	579 214 1245	390 142 804	298 118 626 218	326 128 484 218	390 144 633 240
8000 320		1026 390 1860	515 192 1255	579 212 1246	391 141 804	298 118 626 218	326 128 484 218	397 149 725 320
9000 360		1039 399 1869	513 191 1259	572 211 1249	395 140 809	298 117 626 218		378 147 633 241
10000 400		1039 399 1869	511 190 1259	572 210 1249	395 140 809	298 117 626 218		378 147 633 240

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 140	4000 160	(mm) (inch)
2000								246 246
120								246 246
2500				28 311				268 275
100				712 712				266 269
2000				328 326	326 254			302 330
80				726 726	838 548			862 592
1500			279 279	403 399	250 251			360 360
60			800 800	800 801	712 874			860 456
3000			627 435	602 424	244 244			306 194
40			1242 949	1097 949	916 943	527		876 427
500		753 601	790 48	574 459	395 372	190		329 189
25		1315 1296	1315 1090	1239 989	989 892	512		723 417
0		896 896	898 396	593 285	460 212			364 182
0		1333 1267	1362 1095	1279 995	990 890			862 423
600	816 1620	818 1820		767 595	290 430	223		362 284
-20				1653 942	1236 626	522 484		736 459
-1000			895 895	898 591	609 363	220		362 239
-40		2116 1275	2116 1457	844 1072	626			737 509
-1500			895 893	893 593	399 246			329 287
-40		1725 1295	1725 1375	859 859				616 843
-2000			591 591	591 591				421 421
-60		1136 1136						961 961
								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.

Product Information Section
Lifting Capacities

With Bucket

[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140			
A								(mm) (inch)
3000 120								* 305 * 305 2560
2500 100								* 647 * 647 100
2000 80								* 300 * 300 3090
1500 60								* 663 * 663 120
1000 40								* 295 270 3400
500 20								* 643 601 140
0 0								287 243 3590
-500 -20								636 537 140
-1000 -40								289 227 3710
-1500 -60								536 500 150
-2000 -80								263 221 3740
-2500 -100								268 226 3670
-3000 -120								269 242 3600
-3500 -140								626 534 140
-4000 -160								324 276 3230
-4500 -180								716 613 130
-5000 -200								324 324 2740
-5500 -220								716 716 110

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)	1600 61		2000 80		2500 100		3000 120		3500 140			(mm) (inch)
												
3000											* 305	* 305
120											* 647	* 647
2500					*	566	*	566			*	300
100					*	284	*	284	*	362	*	663
2000					*	633	*	633	*	718	*	295
80					*	633	*	633	*	718	*	649
1500					*	419	*	419	*	411	*	395
60					*	382	*	382	*	388	*	388
1000					*	185	*	588	*	557	*	426
40					*	1794	*	1291	*	1213	*	917
500					*	103	*	581	*	658	*	409
20					*	1364	*	1206	*	1414	*	861
-3					*	878	*	878	*	318	*	582
-20					*	1999	*	1990	*	1764	*	1207
-1000					*	708	*	586	*	523	*	398
-40					*	1520	*	1216	*	1118	*	856
-1500					*	857	*	857	*	562	*	562
-60					*	1815	*	1815	*	1194	*	832

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)	1500 63	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							* 305 * 647
2500 100			* 566 * 566				* 300 * 663
2000 80			* 281 * 633	* 286 * 633	* 352 * 783	217 465	* 295 * 619
1500 60		* 419 * 882	* 413 * 882	* 411 * 888	288 619	369 636	212 455
1000 40		725 1562	376 813	507 1092	272 506	380 617	204 438
500 20			498 1055	257 553	371 797	195 420	252 627
0 0		386 1470	342 737	483 1032	243 533	364 783	189 407
500 -20	* 878 * 1969	554 1187	343 1471	478 737	244 1024	361 526	188 776
-1000 -40			690 1481	346 745	471 1029	246 529	362 780
-1500 -60	* 857 * 1815	566 1217	* 562 * 1194	355 764	* 398 * 832	253 546	
							* 324 * 715
							* 324 * 716
							223 500
							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)	1500 60		2000 80		2500 100		3000 120		3500 140			(mm) (inch)					
3800 120											*	305 647	289 647	2560 100			
2500 100					*	564 888	*	566 888			*	300 663	297 465	3090 120			
2600 80					*	283 633	*	284 633	*	352 783	217 465	*	296 649	172 302	3400 140		
1500 60			*	419 882	413 882	*	411 888	288 619	*	395 951	212 455	*	374 655	162 336	3590 140		
1000 40			*	158 1794	376 813	*	587 1213	272 586	*	454 980	204 438	*	386 834	156 335	3710 150		
500 20					*	657 1408	257 653	*	491 1056	195 420	*	391 841	152 326	3740 150			
0 0			*	300 1964	342 737	*	658 1414	243 633	*	491 1056	189 407	*	376 800	149 319	3670 150		
600 -20	*	976 1969	564 1187	*	310 1764	343 737	*	636 1300	244 526	*	455 974	100 401		*	338 727	140 327	3600 140
-1000 -40			*	708 1520	346 745	*	623 1112	246 529	*	393 809	188 405			*	324 715	171 373	3210 130
-1500 -60	*	857 1815	566 1217	*	562 1194	355 754	*	398 832	253 546				*	324 716	223 500	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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 A  B  C  D  E  F  G  H  I  J								
3000 120								261 893
2500 100					277 638	277 630		242 535
2000 80					288 648	288 646	301 709	239 642
1500 60				316 600	316 600	343 751	329 742	239 542
1000 40			386 1014	510 1062	428 921	379 915	320 697	248 632
500 20		536 1497	571 1230	490 1064	469 999	368 792	308 666	242 620
0 0		578 1458	595 1394	476 1024	386 852	368 774	301 648	236 610
-500 -20	762 1884	762 1684	877 1584	877 1388	976 1499	470 1011	398 818	355 764
-1000 -40					879 1486	470 1000	398 808	356 763
-1500 -60					986 1387	504 1288	448 946	395 868
-2000 -80					1000 1335	527 1209		
					1028 977	428 877		

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)	1300 40	2000 60	2000 60	2500 80	3000 100	3000 100	3500 110		(mm) (inch)	
									(mm) (inch)	
3000 100									251 * 251 2820	
2500 80					277 * 277				242 * 242 3280	
2000 60				636 * 636	636 * 636				535 * 535 300	
2000 60				646 * 646	646 * 646				526 * 526 240	
1600 52			316 * 316	316 * 316	316 * 316	316 * 316	250 * 250	239 * 239	222 3760	
1600 52			658 * 658	658 * 658	708 * 708	750 * 750	542 * 542	528 * 528	492 350	
1600 52			636 * 636	636 * 636	620 * 620	616 * 616	248 * 248	246 * 246	288 3880	
1600 52			1024 * 1024	1062 * 1062	921 * 921	906 * 906	503 * 503	541 * 541	460 300	
1600 52			1053 * 1053	1210 * 1210	1049 * 1049	1047 * 1047	500 * 500	521 * 521	449 290	
1600 52			1053 * 1053	1194 * 1194	1010 * 1010	1056 * 1056	648 * 648	815 * 815	937 * 937 350	
1600 52	762 * 762	762 * 762	877 * 877	877 * 877	871 * 871	952 * 952	624 * 624	496 * 496	257 * 257 3880	
1600 52	1604 * 1604	1604 * 1604	1604 * 1604	1608 * 1608	1673 * 1673	1816 * 1816	1340 * 1340	618 * 618	939 * 939 494 350	
1600 52					763 * 763	915 * 915	653 * 653	298 * 298	410 * 410 3410	
1600 52					1638 * 1638	1882 * 1882	1883 * 1883	618 * 618	873 * 873 546 140	
1600 52			906 * 906	904 * 904	827 * 827	912 * 912	448 * 448	395 * 395		318 * 318 305 2860
1600 52			1087 * 1087	2086 * 2086	1335 * 1335	1299 * 1299	948 * 948	988 * 988		933 * 933 682 120
2500 80					928 * 928	977 * 977				342 * 342 2250
2500 80										766 * 766 264 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)	1300 40	2000 60	2000 60	2500 80	3000 100	3000 100	3500 110	
3000 100								
2500 80					277 900	219 469		242 535
2000 60					289 646	217 465	301 600	239 526
1600 52					318 658	248 624	211 454	239 528
1300 43					335 686	273 702	202 435	246 541
1000 39					355 739	293 732	224 432	246 541
500 19				598 1637	350 750	450 654	368 732	242 534
0 0				673 1658	336 726	478 524	368 774	244 543
-500 -19	762 1604	762 1604	877 1604	514 1659	676 717	470 1011	355 562	242 528
-1000 -43					679 658	336 722	470 1010	355 562
-1500 -43					806 1087	548 738	627 948	340 523
-2000 -58					928 877	337 712		

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.

(mm) (inch)	1000 40	1500 60		2000 80		2500 100		3000 120		3500 140			(mm) (inch)			
2000													261 865 245 661 189			
120													242 535 186 416 130			
2500								277 620 29	29				238 526 185 344 140			
100								620 463					238 526 185 344 140			
3000								289 646 316	317 465	316 462	258 526 329	229 526 383 383 150	2570 3570 2769 3569 150			
80								646 638 624	345 454	316 454	258 329	229 329 383 383 150	246 541 229 160			
1500								688 1428 832	495 1062 801	495 1062 801	368 793 300	154 341 160	246 541 229 160			
60								965 2052 795	359 1328 690	625 1328 690	472 1017 414	262 625 316	252 576 269 160	2369 3909 262 160		
0								965 2052 724	338 1412 524	698 1412 524	498 1050 398	185 380 316	188 316 272 150	1800 3900 180 150		
-600	762 -1624	762 -1624	377 -1624	534 -1624	871 -1623	393 -1342	624 592	218 592	466 593	311 410	262 180	162 305 685	162 230 150	3889 150		
-1200								763 1626	336 722	693 1182	218 592	180 388			316 684 301	149 160
-1800					398 -2037	618 -1616	827 1335	343 738	443 523	242 523				316 653 419	187 120	
-2400						428 -927	597 773						312 764	389 490	2259 30	

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] (in)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] (in)
2000 72								211 834
2500 100				563 203 663 268 347 317				259 861 288 311 100 130
3000 120				643 289 649 269 354 305 795 676				285 849 252 249 140 160
3500 140				445 334 445 334 420 307 466 309 365 369 284 207 270 226 3600 150				270 508 508 508 21 3720
4000 160				667 340 582 323 663 333 772 646 360 290 294 276 218 248 166 3760				502 502 466 150
4500 180				650 355 527 303 454 377 374 366 740 64 595 408 560 405 150				254 211 3880
5000 200	1850 71	1850 71	1850 71	601 596 503 534 451 470 371 341 283				273 403 227 161 160
5500 220				655 546 532 594 453 374 373 343 284				316 636 281 190 130
6000 240				642 1781 842 1291 552 370 542 357 391				325 717 325 2700 110

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)	1900 40	1500 40	2000 40	2500 100	3000 120	3500 40		(mm) (inch)
3600								311 121 3610
325								554 554 300
2500								239 239 310
100				560 + 560	347 317			661 661 120
2140				269 + 269	554 315			295 295 240
93				642 + 642	785 676			943 939 140
1500				445 + 445	420 418	338 309	374 374 237	226 226 3600
43				334 + 334	807 807	838 838	817 817 509	555 555 500
1100				379 + 562	576 1230	466 + 457	300 300	324 324 21
48				1039 + 1039	881 881	386 646	636 636 502	693 693 350
500					659 1113	492 817	391 1066	322 628 450
28					1113 1113	1066 840	710 450	495 495 150
1				932 + 932	527 1110	436 866	375 1052	338 745 211
8				1953 + 1953	833 1110	614 866	799 614	685 745 150
-500				910 + 910	884 1250	528 621	420 371	330 330 227
-25	- 1500	- 1000	- 2000	1000 + 1250	1000 1000	528 1000	420 371	581 581 140
-1000					790 1000	532 814	377 1005	324 324 280
-48					1000 1000	814 814	377 813	716 716 150
-1500					842 1781	532 1781	367 808	325 712
-68					1781 1781	542 808	367 808	325 712

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

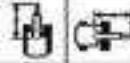
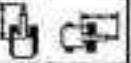
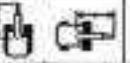
(mm) (inch)	1900 40	2000 49	2000 49	2500 100	2500 100	3000 120	3000 120	3500 140	3500 140		(mm) (inch)
 A											
3000 118										- 253	- 253
2500 100						- 277	- 277			- 241	- 241
2000 80						- 638	- 630			- 534	- 534
1500 60						- 296	- 291	- 285	- 285	- 239	- 239
						- 649	- 648			- 526	- 526
1500 60				- 326	- 326	- 347	- 309	- 290	- 290	- 249	- 249
				- 709	- 709	- 759	- 664	- 607	- 607	- 528	- 528
1500 60			- 708	- 573	- 483	- 462	- 359	- 299	- 278	- 232	- 232
			- 1693	- 1205	- 1040	- 965	- 771	- 644	- 597	- 514	- 427
500 20			- 659	- 525	- 464	- 383	- 248	- 219	- 232	- 228	- 189
			- 1417	- 1083	- 957	- 826	- 749	- 622	- 586	- 488	- 403
300 12			- 643	- 521	- 450	- 318	- 348	- 281	- 267	- 231	- 192
			- 1392	- 1020	- 969	- 787	- 738	- 695	- 576	- 479	- 424
-500 -20	- 1726	- 1726	- 304	- 663	- 641	- 59	- 445	- 365	- 326	- 29	- 248
-1000 -40			- 371	- 882	- 819	- 529	- 440	- 378	- 321	- 271	- 242
-1500 -60			- 2056	- 1617	- 1314	- 837	- 830	- 798			- 215
-2000 -80				- 48	- 48					- 895	- 650
				- 936	- 836					- 775	- 775

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	4000 160	4500 180	(mm) (inch)
         									
2000 80									250 100
2500 100					277 108	277 108			243 98
3000 120					630 250	630 250			534 220
3500 140					291 110	291 110	332 130	239 98	239 98
4000 160					649 260	649 260	643 250	207 85	526 215
4500 180					226 85	226 85	347 140	240 100	3770 150
40 16				710 280	573 225	606 243	462 190	421 170	239 100
500 20				970 385	535 220	629 240	503 190	474 170	367 150
600 24				2065 800	983 380	1369 530	1028 400	1022 400	226 100
700 28				961 380	521 220	657 240	370 140	488 170	379 150
800 32				2044 800	929 380	1412 530	797 300	850 350	417 170
900 36				904 360	863 340	865 340	621 230	385 150	312 130
1000 40				1026 400	2041 800	1845 380	1860 380	1333 530	464 170
1100 44				1226 440	2056 800	1957 380	1766 300	1647 300	316 130
1200 48				1326 480	2058 800	1957 380	1768 300	1755 300	316 130
1300 52				1426 520	2058 800	1957 380	1770 300	1755 300	316 130
1400 56				1526 560	2058 800	1957 380	1772 300	1755 300	316 130
1500 60				1626 600	2058 800	1957 380	1774 300	1755 300	316 130
1600 64				1726 640	2058 800	1957 380	1776 300	1755 300	316 130
1700 68				1826 680	2058 800	1957 380	1778 300	1755 300	316 130
1800 72				1926 720	2058 800	1957 380	1780 300	1755 300	316 130
1900 76				2026 760	2058 800	1957 380	1782 300	1755 300	316 130
2000 80				2126 800	2058 800	1957 380	1784 300	1755 300	316 130

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)
 A	 	 	 	 			
3000 120							* 305 * 305 250
2500 100			- 565 - 565				* 647 * 647 100
2000 80			- 604 - 604	- 352 - 352			* 300 * 300 300
			- 633 - 633	- 783 - 783			* 663 * 663 120
1500 60			- 419 - 419	- 411 - 411	- 395 - 395	320	271 * 297 259 359
			- 882 - 882	- 883 - 883	- 888 - 888	753	* 655 574 140
1000 40		770 1858	635 1089	633 1061	452 974	405 871	341 735
						307 681	267 574
500 20				522 1024	436 939	395 851	332 796
						312 671	263 565
0 0			730 1886	597 1284	512 1101	426 919	389 697
						326 702	306 664
500 20	* 878 * 879	730	598	503	423	386	323
	* 1859 * 1860	1857	1085	1083	993	830	696
-1000 -40			- 700 - 1520	- 682 - 1294	- 591 - 1097	- 424 - 913	- 383 - 809
							- 324 - 699
-1500 -60	* 857 * 857	- 682 - 1115	- 662 - 1104	- 583 - 1104	- 432 - 832		
							* 324 * 324 2740
							* 716 * 716 10

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							305 120
2500 100			565 22	566 22			647 100
2000 80			204 80	204 80	352 140		663 100
1500 60			419 16	419 16	411 16	395 15	295 11
1000 40		858 33	635 25	567 22	452 18	454 18	384 15
900 36		1754 68	1089 42	1210 48	974 39	980 39	574 22
800 32		998 38	597 24	657 27	436 18	431 18	536 20
700 28		1924 75	1284 52	1411 59	919 40	1055 40	593 22
600 24	878 34	1879 72	818 38	598 25	608 25	423 17	330 13
-1000 -40	-1859 -72	-1859 -72	-1754 -68	-1285 -52	-1302 -52	-990 -40	-574 -22
-1000 -40	-	-	-700 -28	-682 -28	-523 -22	-424 -17	-383 -13
-1000 -40	-857 -34	-857 -34	-562 -22	-562 -22	-388 -17	-398 -17	-324 -13
-600 -24	-1815 -72	-1815 -72	-1194 -52	-1194 -52	-832 -35	-832 -35	-716 -28

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

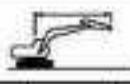
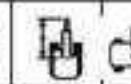
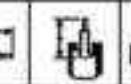
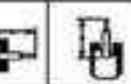
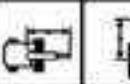
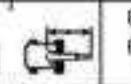
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 160		(mm) (inch)
							
3000							- 305 - 305 2560
120							- 647 - 647 100
2500							- 300 222 3090
100			- 565 - 565				- 663 490 120
2000			- 204 - 204	- 352 232			- 295 164 3460
80			- 633 - 633	- 783 497			- 649 410 140
1500			- 419 - 419	- 419 306	- 395 236	- 320 172	- 297 164 3590
60			- 882 - 882	- 882 659	- 661 487		- 655 362 140
1000		770	400	539 290	405 218	317 168	289 161 3770
40	1659	865	1661	625 871	470 681	361 635	334 150
500			522	275 395	219 212	164 164	282 147 3740
20			1024	593 651	452 671	352 621	324 150
0		739	387	512 286	389 204	308 181	289 150 3870
0		1568	783	1001 573	937 453	584 346	634 330 150
500	- 876	590	730	567 508	263 308	201	160 3500
-20	- 1899	1265	1667	790 1093	564 930	433	680 354 140
1000			- 708	371 519	264 383	202	- 324 184 3290
-40			- 1520	738 1087	566 509	436	- 715 403 130
1500	- 857	603	- 562	379 - 398	271		- 324 239 2740
-60	- 1815	1296	- 1194	917 - 932	505		- 716 537 90

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										" 305	" 2960
120										" 647	" 100
2500				" 566	" 566					" 300	" 3050
100				" 284	" 284	" 352	" 232			" 660	" 120
2000				" 433	" 433	" 783	" 497			" 295	" 3400
80				" 419	" 419	" 411	" 306	" 395	" 374	" 102	" 164
1500				" 832	" 832	" 833	" 659	" 661	" 487	" 655	" 140
60				" 858	" 400	" 587	" 290	" 454	" 218	" 386	" 168
1000				" 1794	" 868	" 1213	" 625	" 980	" 470	" 834	" 303
40				" 1408	" 583	" 1053	" 452	" 641	" 352	" 706	" 150
500				" 908	" 367	" 857	" 275	" 491	" 210	" 391	" 321
20				" 1964	" 783	" 1416	" 573	" 1055	" 433	" 803	" 324
0				" 678	" 560	" 612	" 367	" 605	" 263	" 491	" 160
0				" 1999	" 1265	" 1764	" 790	" 1302	" 566	" 374	" 360
-500				" 708	" 371	" 523	" 264	" 363	" 201		" 339
-20				" 1520	" 798	" 1118	" 569	" 809	" 436		" 727
-1000				" 857	" 603	" 562	" 379	" 395	" 271		" 324
-40				" 1815	" 1295	" 1194	" 817	" 832	" 585		" 409
-1500											" 130
-60											" 716

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)	1300 40	2000 60	2000 60	2500 80	3000 100	3500 110	3500 110	
3000 110								
2500 80					277 900	277 900		
2000 60					636 646	636 646		
1600 52					316 658	316 751	272 686	238 568
1300 43					496 1021	496 1021	343 751	239 528
1000 39					686 1439	686 1439	340 732	223 519
500 19				700 1593	697 1593	425 946	380 714	280 658
0 0			724 1554	591 1272	508 1093	432 968	385 828	255 654
-500 -19	762 1604	762 1604	877 1564	877 1564	721 1546	598 1264	416 880	317 818
-1000 -43					723 1552	591 1210	502 1079	379 817
-1500 -43					527 1335	530 1287	440 948	421 967
-2000 -58					428 977	426 977		

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	4000 160							
													(mm) (inch)	
2000														2820
120														110
2500														3280
100														130
3000														3570
80														160
1500														2760
60														150
3500														3890
40														160
500														3900
25														160
0														160
0														160
600	762	762	877	877	871	589	624	416	466	317	392	252	313	3890
-20	-1684	-1684	-1684	-1684	-1684	1673	1254	1340	836	590	613	747	544	590
-1000						763	591	693	436	410	512			310
-40						1626	1270	1182	885	873	683			684
-2000						986	827	589	443	421				314
-60						2037	1335	1237	940	907				653
-2000						927	827							312
-60						428	428							764
						927	827							30

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

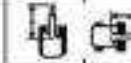
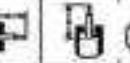
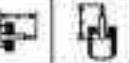
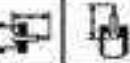
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 160		(mm) (inch)
 A								
2000 150								261 863 + 563 180
2000 100					277 630 581	234		242 535 443 130
2000 80					286 646 637	232	316 173	238 526 311 140
1500 60				318 633 603	390 603 581	245 415	320 636	229 529 328 150
1000 40			686 1438 885	410 1062 885	496 827 889	281 468 466	315 616 516	246 541 363 160
500 20			740 1590 999	374 1123 910	522 1093 914	214 380 416	287 393 384	250 345 374 293 160
0 0			724 1554 777	380 1093 777	508 914 775	282 428 429	385 428 429	285 383 386 150
-500 -20	762 1684	762 1684	877 1594	670 1224	721 1546	393 770 1093	296 552 518	390 420 420
-1000 -40					723 1552 775	389 1073 951	379 417	394 420
-1500 -60			398 2087	596 1259	827 1035 790	287 948 962		
-2000 -80					428 977	382 625		
								398 653 453 120
								342 764 744 30

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 59	2000 80	2500 100	3000 120	3500 140												
																	(mm) (inch)	
3000 120																261 100	261 100	2020 100
2500 100									277 110	234 90						242 95	183 75	2580 130
2000 80									288 115	232 95	316 130	173 70	239 105	167 70	2570 130			
1500 60									316 125	268 110	343 145	250 110	342 145	211 90	239 105	169 75	2760 140	
1000 40									600 240	603 240	750 300	485 190	750 300	265 110	528 220	320 120	2850 150	
1800 70									886 340	410 160	496 195	284 110	416 160	217 80	386 150	386 150	3880 160	
1300 52									1439 560	915 360	3062 1200	637 250	560 220	488 190	793 300	594 220	303 120	3900 170
900 35									395 150	374 140	625 250	234 90	472 180	297 110	383 140	382 140	3900 170	
600 24									395 150	360 140	608 250	262 100	459 180	200 80	380 140	380 140	3820 150	
400 16									2050 80	777 300	3410 1400	564 220	1050 420	429 180	818 300	637 220	295 120	3950 170
-500 -20	762 1884	762 1884	877 1884	578 1884	871 1884	358 1884	624 270	286 140	466 220	155 80	352 200	154 100	313 140	163 100	3880 160			
-1000 -40							763 1884	360 1884	693 1884	286 1884	419 1884	195 1884			310 140	162 100	3910 160	
-1500 -40							1626 1884	775 1884	783 1884	581 1884	673 1884	420 1884			304 140	359 120	3940 160	
-2000 -40							986 1884	606 1884	827 1884	387 1884	448 1884	265 1884			318 140	292 120	3980 160	
-2500 -40							1335 1884	790 1884	946 1884	562 1884					312 140	453 120	3950 160	
-3000 -40							877 1884	825 1884							342 140	321 120	3950 160	
															768 140	744 120		

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)	1600 -40	1600 -50	2000 -60	2500 -100	3000 -100	3500 -100	4000 -100	4500 -100	5000 -100	5500 -100	6000 -100	6500 -100	7000 -100	7500 -100	8000 -100	8500 -100	9000 -100	9500 -100	10000 -100
A (mm) (inch)	1600 -40	1600 -50	2000 -60	2500 -100	3000 -100	3500 -100	4000 -100	4500 -100	5000 -100	5500 -100	6000 -100	6500 -100	7000 -100	7500 -100	8000 -100	8500 -100	9000 -100	9500 -100	10000 -100
2000 -50																	311 -64	311 -64	310 -60
2500 -60																	239 -60	239 -60	239 -60
3000 -60																	661 -130	661 -130	661 -130
3500 -60																	255 -50	255 -50	255 -50
4000 -60																	549 -100	549 -100	549 -100
4500 -60																	242 -48	242 -48	242 -48
5000 -60																	536 -100	536 -100	536 -100
5500 -60																	227 -45	227 -45	227 -45
6000 -60																	501 -100	501 -100	501 -100
6500 -60																	267 -53	267 -53	267 -53
7000 -60																	586 -115	586 -115	586 -115
7500 -60																	273 -55	273 -55	273 -55
8000 -60																	560 -110	560 -110	560 -110
8500 -60																	254 -50	254 -50	254 -50
9000 -60																	244 -48	244 -48	244 -48
9500 -60																	439 -87	439 -87	439 -87
10000 -60																	324 -62	324 -62	324 -62
10500 -60																	314 -59	314 -59	314 -59
11000 -60																	326 -62	326 -62	326 -62
11500 -60																	317 -59	317 -59	317 -59

Illustration 199

q06364808

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 49	2000 80	2500 100	3000 120	3500 140	4000 160	(mm) (inch)
3000								200 * 201 164 * 164 300
2500				568 * 568 347 320				239 * 239 161 * 161 190
2000			289 * 289 643 * 643 254 236 721					235 * 235 169 * 169 180
1500			445 * 445 334 * 334 420 * 420 388 320 374 288 237 242 3600					535 * 535 536 * 536 537 537 3720
1000			579 * 579 1539 1291 496 * 496 457 321 394 286 324 237 3740					589 * 589 581 * 581 560 * 560 530 * 530 430 * 430 150
500			659 * 659 443 384 488 * 488 432 312 391 286 322 232 3740					338 * 338 227 * 227 360
0			992 * 992 1953 1211 656 * 656 488 * 488 430 308 275 243 327 227 360					244 * 244 3490
-500			910 * 910 1506 2090 612 * 612 564 501 450 303					539 * 539 340
-1000			798 * 798 1504 1222 568 * 568 517 460 377 305					324 * 324 281 * 281 380
-1500			642 * 642 1781 1783 552 * 552 592 387 387 325 2700					714 * 714 622 * 622 130
-2000			517 * 517 1779 1870 468 * 468 388 325 325 2700					717 * 717 717 * 717 110

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)	1986 40	2000 45	2000 60	2000 100	2000 120	2000 140		(mm) (inch)
 A B C D	                							
3009 120								1 259 + 579
2509 100					1 277 + 636	277 + 630		1 241 + 534
2409 88					1 296 + 649	291 + 649	306 + 651	1 239 + 526
1909 68				1 326 + 709	326 + 708	317 + 709	320 + 708	1 290 + 544
1609 48				1 373 + 103	373 + 103	384 + 103	320 + 993	1 247 + 543
509 28			703 103	521 103	496 103	493 103	373 925	243 641
1 3			888 1677	557 936	482 936	397 884	365 795	230 639
-509 -28	1226 1226	1226 2041	904 1471	904 1471	885 1471	554 925	477 642	381 775
-1009 -48			909 1677	557 936	477 936	398 884	366 795	230 639
-1509 -48			971 2056	509 2056	419 1314	515 1215	440 930	387 885
-2009 -68					406 336	411 336		
								1 315 + 535
								1 302 + 535
								1 290 + 526
								1 275 + 525
								1 260 + 520

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)	1338 40	1500 59	2000 60	2500 100	3000 120	3500 140	
(mm) (inch)	259 10	259 10	259 10	259 10	259 10	259 10	
3009							259
123							579
2500				277	277		241
100				638	630		534
2500				256	251	252	239
83				649	649		526
1500			326	326	320	342	299
69			703	703	759	752	529
1000		713	639	506	428	320	247
43		1633	1333	983	822	916	543
500		379	571	629	485	474	283
28		2045	1831	1249	958	1022	679
3		581	657	657	297	438	291
8		2044	1888	1412	854	1059	610
-500		504	584	621	381	464	312
-23	-1226	-1726	-2041	-1867	-1899	-181	-741
-1000				756	652	547	406
-43				1626	1627	1072	942
-1500		-971	939	-418	595	440	367
-63		-2098	2088	-1314	1295	930	855
-2000			-418	-418			-346
-89			-936	-936			-775

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

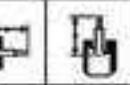
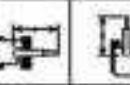
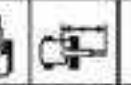
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
 A							
3000							395 395 2269
-120							- 947 - 947 39
2500			346 346				406 380 2689
-100			- 794 - 794				- 903 956 120
2000			- 372 - 372	417 417	357 357		966 384 3289
-80			- 923 - 923	896 896	769 769		815 700 130
1500		- 526 - 526	482 482	465 465	412 412	352 352	328 282 3470
-60		- 194 - 194	1044 1044	1001 1001	987 987	789 789	727 623 140
1000		749 622	539 443	404 345	321 275	310 285	3599
-40		1612 1343	943 969	870 743	691 592	684 586	140
500		719 595	515 435	395 337	307 271	304 261	3600
-20		1549 1283	1119 938	853 727	683 595	671 574	159
0		730 598	505 426	390 331	304 285	311 286	3539
0		1526 1262	1069 919	840 716		688 586	140
-500		799 666	502 422	387 329		393 284	3389
-20		1524 1260	1082 900	835 710		736 628	140
-1000		714 590	504 424	390 331		378 324	3050
-40		1533 1289	1093 919	854		832 719	130
-1500	- 921 - 921	- 591 - 591	- 405 - 405			- 384 - 384	2589
-60	- 1845 - 1845	- 1251 - 1251	- 1251			- 843 - 843	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.

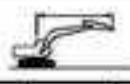
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							* 395 * 395 2380
2500 100			* 345 * 345				* 847 * 847 90
2000 80			* 794 * 794				* 405 380 2380
1500 60			* 526 * 526	* 482 465	* 451 352		* 803 858 120
1000 40			* 899 622	* 614 445	* 437 345	* 422 275	* 377 314 3250
500 20			* 1000 1343	* 1018 965	* 1075 743	* 592 592	* 833 700 130
0 0			* 964 586	* 687 426	* 519 337	* 420 271	* 393 261 3800
-500 -20			* 1073 1262	* 1473 910	* 1115 710	* 386 268	* 389 268 3530
-1000 -40			* 751 580	* 547 424	* 394 331		* 840 628 140
-1500 -60	* 921 * 921	* 591 * 591	* 405 * 405				* 384 * 384 2560
	* 1845 * 1845	* 1251 * 1251					* 849 * 849 100

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 160		
							(mm) (inch)
3000							- 385 373 2350
120							- 847 847 90
2500			- 345 323				- 406 288 2880
100			- 734 693				- 803 575 120
2000			- 372 320	417 240			- 366 210 3250
80			- 823 629	896 515			- 815 467 120
1500		- 526 432	- 482 318	412 235			328 187 2420
60		- 114 933	- 1044 668	887 507			727 413 140
1000		743 400	539 296	404 228	321 181	319 175	3580
40		1512 866	1043 638	870 492	691 350	684 386	140
500		719 376	515 282	396 221	307 178	304 171	3600
20		1543 813	1119 605	953 476	683 383	671 376	150
0		719 388	508 274	390 215	304 175	311 174	3530
0		1526 794	1083 591	940 465		688 383	140
500		708 367	502 271	387 213		333 165	3350
-20		1524 792	1082 584	935 460		736 408	140
1000		714 371	504 272	390 215		- 378 211	3050
-40		1533 800	1085 588			- 832 463	120
-1500	- 921 587	- 591 380	- 405 280			- 384 273	2560
-60	- 1845 1063	- 1251 820				- 849 613	100

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								* 385 373 2260 * 847 847 90
2500 100			- 346 323					* 406 355 2060 * 903 975 120
2000 80			- 372 320 * 419 240					* 377 290 1550 * 833 467 130
1500 60		- 528 432 * 482 310	- 451 235					* 370 187 3470 * 816 413 140
1000 40		- 880 490 * 614 296	- 497 230 * 422 181					* 379 175 3580 * 834 396 140
500 20		- 1880 868 * 1318 638	- 675 452 * 502 398					* 393 171 3600 * 879 376 150
0 0		- 964 388 * 687 274	- 519 215 * 396 175					* 383 174 3580 * 857 383 140
500 20		- 870 387 * 631 271	- 478 213					* 381 185 3580 * 840 409 140
-1000 -40		- 1873 792 * 1364 584	- 1022 460					* 378 211 3600 * 832 489 120
-1500 -60	- 321 587 * 581 380	- 405 280						* 384 273 2060 * 843 613 100

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 59	2000 80	2500 100	3000 120	3500 140										
											(mm) (inch)					
3000 120					326 128	326 128						346 136				
2500 100						325 128	358 142	358 142				319 125				
2000 80						320 120	358 142	359 142	359 142			302 119				
1500 60						327 127	347 134	403 159	352 139	277 109	309 120	340 138				
1000 40						364 144	364 144	382 151	758 300	586 230	589 235	575 225				
1800 71					749 300	532 210	490 195	493 195	343 138	319 125	273 108	287 113	3750 1480			
1500 59					1562 598	1259 500	1045 400	987 380	740 300	686 280	581 220	542 210	150 59			
1200 48					721 282	536 216	514 197	423 167	383 147	324 120	268 107	282 115	3770 1470			
900 35					1592 592	1296 502	1007 402	914 362	676 272	676 272	677 277	622 242	571 215			
600 24					587 230	587 230	794 308	580 218	501 200	425 165	385 145	327 127	264 104	287 111	3700 1400	
300 12					1238 493	1238 493	1514 550	1250 500	1000 400	968 380	765 300	686 280	583 223	543 203	150 59	
-500 -20	793 1255	793 1255	939 2024	939 2024	799 1240	576 367	495 366	416 366	384 322	323 222	308 227	262 177	305 123	280 110	3530 1430	
-1000 -40						792 1245	619 1067	495 836	416 823	385 827	323 827			342 753	291 645	3550 1450
-1500 -43						598 1262	596 1262	468 969	421 969					378 818	360 834	3810 1410
-2000 -48						633 1262	633 1262							421 953	421 951	2030 800

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 59	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
3000 120				326 128	326 128			346 140
2500 100					325 128	328 128		345 140
2000 80					320 120	320 120		340 140
1500 60				307 117	307 117	303 117	303 117	330 130
1000 40				297 114	297 114	291 114	291 114	304 120
500 20				284 108	282 108	285 108	285 108	275 100
1800 70			749 294	830 326	652 268	464 186	408 166	308 120
1300 51			1562 598	1598 616	1596 616	1596 616	1591 611	542 210
900 35			2102 798	2196 796	1610 610	423 193	559 193	328 120
500 20			587 213	587 213	587 213	423 179	518 179	245 90
1000 40			1338 512	1338 512	1329 512	1476 576	918 576	543 210
500 20	793 312	793 312	939 392	939 392	913 376	652 376	498 376	362 140
1000 40	1255 495	1255 495	2024 796	2024 796	1962 1240	1401 1240	1054 1239	738 290
1500 59					912 1245	679 1245	436 936	323 937
1000 40					912 1245	679 1245	436 936	323 937
1500 59					912 1245	679 1245	436 936	323 937
2000 80					912 1245	679 1245	436 936	323 937
2500 100					912 1245	679 1245	436 936	323 937
3000 120					912 1245	679 1245	436 936	323 937
3500 140					912 1245	679 1245	436 936	323 937

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	4000 160	
2000 80				326 128	338			
2500 100					385 142	249 93		
3000 120					256 95	249 95		
3500 140					362 140	311 124		
4000 160					360 130	311 120		
4500 180					360 130	311 120		
5000 200				748 292	497 195	532 195	296 195	403 195
5500 220				1562 592	879 314	1145 314	610 314	667 314
6000 240				721 192	376 192	514 192	269 192	328 192
6500 260				1562 592	814 314	1137 314	605 314	647 314
7000 280				587 1338	550 1338	704 1338	362 1338	501 1338
7500 300				1295 3124	2124 3124	1032 3124	700 3124	495 3124
8000 320						1067 277	995 277	995 277
8500 340						570 277	570 277	570 277
9000 360						923 277	446 277	446 277
9500 380								
10000 400								

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 59	2000 80	2500 100	3000 120	3500 140	
 3000 120				326 128	328		348 140 348 141 300
2500 100					325 125 742 303	240 50	319 119 227 90 300 120
2000 80					320 120 620 257 604	240 50 757 303 505 282	302 101 340 867 424 140
1500 60					325 125 620 325 604	403 225 505 305	309 101 340 869 370 150
1000 40				749 1502 1502 996 2102	407 196 196 326 814	464 196 196 500 1937	408 179 191 406 406
500 20				587 1338 1338 1339 1755	550 1219 1219 1339 2024	587 1219 1219 1339 1866	510 515 495 571 1954
0 0				992 1866 1866 1866 1866	992 1866 1866 1866 1866	268 264 496 510 510	211 496 496 447 447
-500 -20				1719 1719 1719 1719	1719 1719 1719 1719	244 323 323 510	207 307 307 440
-1000 -40				1339 1339 1339 1339	1339 1339 1339 1339	438 502 502 502	
-1500 -40				992 992 992 992	992 992 992 992	268 268 268 268	
-2000 -40				603 603 603 603	603 603 603 603		

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										* 400 862	* 400 862	2318 90
2500 100				* 344 709	* 344 708					* 403 858	354 757	2310 100
2000 80				* 376 832	* 376 832	397 853	397 725			346 763	294 654	2270 100
1500 60			* 549 1061	* 549 1061	* 491 1051	439 946	392 843	392 716		311 687	264 584	3489 140
1000 40			711 1512	596 1285	504 1088	423 913	384 827	325 700	315 855	259 655	293 643	249 550
500 20			683 1471	569 1288	489 1054	409 983	376 810	317 684	301 648	295 549	289 637	245 540
0 0			679 1450	552 1185	483 1034	400 863	370 797	310 672	296 522	296 553	251 553	3529 140
-500 -20			674 1448	552 1187	477 1027	397 857	367 792	309 667		319 702	289 594	3340 140
-1000 -40			679 1458	556 1197	479 1032	389 862	370 702	302 667		366 812	309 685	3030 120
-1500 -60	* 803 * 1807	* 803 * 1807	* 873 * 1234	* 667 * 1220	* 382 * 392					* 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
2500 100			344 * 344				* 362 * 362 2318
2000 80			376 * 376	420 327			* 376 * 376 2318
1500 60			549 * 549	491 439	453 333		* 581 * 581 2318
1000 40			596 * 596	620 423	499 325	422 258	* 638 * 638 2318
500 20			1855 * 1855	1285 1332	913 680	700 502	558 * 558 2318
0 0			1857 * 1857	1288 1483	691 409	525 317	419 295
-500 -20			1959 * 1959	1887 1385	1014 857	684 482	549 * 549 2318
-1000 -40			1943 * 1943	1592 1197	541 389	474 309	391 269
-1500 -60	* 803 * 803	* 807 * 807	573 1224	667 1220	382 * 392	387 302	333 * 333 2318
							* 385 * 385 2318
							* 382 * 382 100

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	4000 160		(mm) (inch)
									(mm) (inch)
2000									2000
-125									-100
2500									2500
-100									-100
3000									3000
-80									-60
3500									3500
-60									-50
4000									4000
-40									-30
4500									4500
-20									-15
5000									5000
-10									-8
5500									5500
-5									-4
6000									6000
-25									-20
6500									6500
-20									-15
7000									7000
-15									-10
7500									7500
-10									-8
8000									8000
-5									-4
8500									8500
-5									-4
9000									9000
-10									-8
9500									9500
-10									-8
10000									10000
-10									-8

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)	1388 46	2500 85	2000 60	2598 100	1000 32	2598 100	2598 100							
												(mm) (inch)		
3009 120					315 120	315 120				359 137	359 137	2500 100		
2508 98						362 138	338 132			317 124	317 124	3120 120		
2408 93					281 100	281 100	368 140	338 127		308 120	288 110	3450 140		
1160 45					405 157	405 157	417 159	332 127	391 155	268 103	309 121	3659 140		
					882 320	882 320	929 323	715 275	856 313	563 221	631 239	850 330		
5008 19				771 280	591 210	560 204	424 162	488 184	323 112	407 152	256 96	309 120	3750 150	
5009 19				381 140	581 210	584 206	467 166	519 186	314 116	416 156	251 96	339 126	3760 150	
1			608 236	688 262	546 197	606 212	596 197	517 184	307 114	405 152	248 94	388 136	3880 150	
1			1383 520	1383 520	2123 776	1475 520	1844 572	1184 427	862 362	588 227	524 194	805 311	888 330	
-508 -19	808 1730	908 1230	961 2072	879 1681	907 1959	912 1867	648 1283	381 642	489 1948	303 654	286 1948	362 1237	245 541	3520 140
-1009 -48					735 1722	645 1722	573 1227	398 843	428 362	394 655		362 798	226 611	3230 130
-1509 -49					848 1376	553 981	457 965	387 957				371 821	345 721	2780 110
-2509 -88												431 877	431 877	1860 -80

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	2000 80	2500 100	3000 120	3500 140		[mm] (inch)
 A							
3000 120							" 395 " 395 220
2500 100			" 348 " 348				" 347 " 347 90
2000 80			" 372 " 372	" 419 279			" 406 " 402 280
1500 60		" 526 " 526	" 482 " 482	" 437 373			" 393 " 393 120
1000 40		" 754 " 754	" 784 " 784	" 844 " 844	" 840 804		" 772 882 140
500 20		733 658	662 476	428 366	341 282	330 282	3590 3590
0 0		764 635	547 461	421 359	327 299	324 277	3600 3600
-500 -20		754 622	533 452	415 352	325 286	321 283	3530 3530
-1000 -40		751 626	538 450	412 350		355 382	3550 3550
-1500 -60	" 921 " 921	" 591 " 591	" 405 " 405	" 394 352		" 378 345	3600 3600
	" 1945 " 1945	" 1345 " 1345	" 1251 " 1251			" 832 765	120 120
						" 394 " 394	2500 2500
						" 843 " 843	100 100

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 * 847 * 847 90
 2500 100			- 346 - 346				* 406 * 402 2660 * 903 * 903 120
 2000 80			- 372 - 372	- 419 - 379			* 377 393 3250 * 823 823 130
 1500 60	- 526 - 526	- 482 - 482	- 482 - 482	- 451 - 273			* 370 239 3470 * 104 * 104 160
 1000 40	- 650 - 650	- 614 - 614	- 614 - 614	- 497 - 368	- 422 - 292	- 379 - 282	3580 * 1080 1080 140
 900 30	- 689 - 689	- 641 - 641	- 641 - 641	- 525 - 368	- 420 - 288	- 393 - 277	3600 * 1479 1479 150
 0 0	- 622 - 622	- 587 - 587	- 587 - 587	- 519 - 382	- 396 - 286	- 383 - 283	3580 * 1070 1070 160
 500 20	- 622 - 622	- 639 - 639	- 639 - 639	- 478 - 350			* 381 302 3380 * 1073 1073 160
 1000 40	- 626 - 626	- 547 - 547	- 547 - 547	- 450 - 384	- 382 -		* 378 345 3080 * 1047 1047 120
 1000 60	- 585 - 585	- 405 - 405	- 405 - 405				* 384 * 384 2680 * 1251 * 1251 100
60 60	- 585 - 585	- 405 - 405	- 405 - 405				* 384 * 384 2680 * 1251 * 1251 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

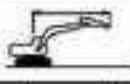
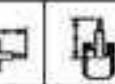
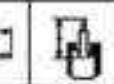
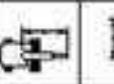
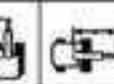
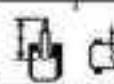
[mm] [inch]	1500 60	2000 60	2500 100	3000 120	3500 160		(mm) (inch)
							
3000 120							* 385 * 847
2500 100			- 345 - 734	- 341 - 733			- 406 - 803
2000 80			- 372 - 823	- 338 - 729	- 419 - 828	- 254 - 547	- 377 - 833
1500 60		- 526 - 114	467 586	482 1044	328 708	437 340	280 533
1000 40		733 1703	425 93	562 1212	314 678	429 324	243 524
500 20		764 1644	400 86	547 979	300 648	421 307	236 509
0 0		754 1622	382 847	538 1058	292 631	415 394	230 487
-500 -20		754 1619	382 845	534 1055	285 624	412 389	228 482
-1000 -40		- 751 - 1610	385 863	538 1055	280 628	- 384 - 380	226 500
-1500 -60	* 921 * 1845	623 1341	- 591 - 1251	404 873	298		- 291 - 653
							100

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)	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] (inch)
 3000 120							* 395 * 847
2500 100			* 348 * 784	341 730			* 408 * 903
2000 80			* 372 * 923	328 725	* 419 * 928	254 547	* 377 * 820
1500 60		* 526 * 754	457 395	482 1044	328 708	* 451 * 983	260 533
1000 40		* 880 * 1880	425 919	616 1018	394 678	* 497 * 1075	243 524
500 20		* 1618 * 2173	480 886	689 1473	380 849	* 525 * 1131	236 568
0 0		* 964 * 2076	392 647	687 1473	519 631	* 230 * 1115	* 396 * 487
-500 -20		* 870 * 1873	352 845	634 1384	289 624	* 479 * 1022	228 492
-1000 -40		* 751 * 1618	395 853	547 1171	281 628	* 394 * 230	
-1500 -80	* 921 * 1945	623 1341	* 591 * 1251	484 823	405 299		
							* 394 * 843
							291 653
							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 59	2000 80	2500 100	3000 120	3500 140	
 A	 	 	 	 	 	 	 
3000				326	365	395	(mm) (inch)
-120				-306	-345	-375	300
2500				325	355	385	2800
-100				-342	-342	-398	120
2000				358	378	392	3400
-80				-320	-320	-387	140
1500				397	427	463	3040
-60				-364	-364	-403	80
1000				426	476	504	2850
-40				-392	-427	-476	50
500				466	513	546	3770
-25				-449	-464	-506	150
0				507	567	617	3700
-0				-438	-438	-488	150
-500	793	793	939	939	744	612	3530
-25	1255	1255	2024	2024	-1595	1030	718
-1000					747	615	610
-40					-1094	1323	611
-1500					998	622	350
-40					-1339	1240	100
-2000					933	433	2810
-40					-933	-933	421
							2030
							80

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	4000 160								
													(mm) (inch)		
2000														2500	
-120														100	
2500														3000	
-100														120	
3000														3400	
-80														140	
3500														3840	
-60														160	
4000														4000	
-40				748	686	652	476	464	364	408	290	308	262	3700	
5000				-1562	-1436	-1198	-1027	-866	-715	-611	-624	-876	-577	150	
-28				-366	633	699	489	509	395	416	295	329	257	3770	
6000				-2102	-1384	-1419	-990	-1087	-715	-694	-614	-723	-665	150	
-9				-587	-587	-592	-617	-697	-448	-518	-408	-281	-364	261	3700
-9				-1338	-1338	-2109	-1228	-1476	-965	-715	-871	-608	-882	-526	150
6000	-780	-793	-939	-939	-913	-612	-652	-412	-491	-348	-369	-279	-362	-277	3500
-20	-1058	-1295	-2124	-2130	-1962	-1388	-1484	-953	-954	-741		-736	-611	-140	
6000					-800	-685	-678	-442	-430	-348			-362	-310	3500
-40					-1719	-1223	-1238	-953	-913	-742			-737	-689	150
7000					-698	-622	-488	-448					-279	-370	2810
-40					-1389	-1340	-995	-916					-616	-810	150
8000					-433	-432							-421	-421	2030
-60													-561	-561	150

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	4000 160	
2000 80				326	316			
2500 100				385	355			
3000 120				742	545			
3500 140				256	255			
4000 160				629	629	750	647	
1500 60				397	250	405	343	305
1000 40				864	710	862	733	470
500 20				748	431	652	314	427
4000 160				1562	912	1188	816	921
500 20				766	401	546	210	410
4000 160				1640	896	1176	645	900
0 0				587	586	749	398	593
0 0				1338	1260	1610	834	1143
500 20	780	793	939	988	744	393	627	282
4000 160	1058	1295	2124	1275	1889	625	1136	699
500 20				747	395	627	232	406
4000 160				1604	929	1136	608	876
500 20				698	392	488	218	
4000 160				1389	845	995	622	
2000 80				433	433			

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)	1388 40		2000 66		2000 66		2598 100		3000 120		3598 140					
														(mm) (inch)		
3009 120							326	326					326	327	2550	
2508 100									365	355			319	341	3000	
2408 88									742	545			708	542	320	
2108 73							620	620	737	547			302	203	3130	
1808 63							397	318	453	248	391	108	393	182	3640	
1608 49							664	718	932	937	855	418	663	404	160	
1508 45							749	431	552	314	484	241	408	171	3750	
1508 43							1512	932	1866	676	1036	510	931	418	378	378
1508 38							398	401	660	238	509	232	476	328	167	3770
1508 31							2102	910	1619	645	1037	591	694	402	723	369
1508 30							567	506	395	687	288	518	236	406	170	3700
1508 28							1328	1266	2129	834	1476	621	985	487	371	374
1508 25	730	730	939	598	513	380	652	282	456	222	269	181	362	179	3530	
1508 23	1255	1255	2124	1265	1962	625	1401	669	1054	479			298	396	140	
1508 19							992	316	579	282	436	222			362	281
1508 18							1718	829	1239	668	863	480			797	445
1508 17							658	302	406	288					370	243
1508 16							1399	545	985	622					818	554
1508 15							403	935							423	481
1508 14															963	933

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

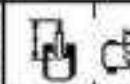
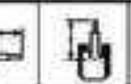
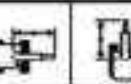
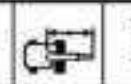
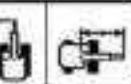
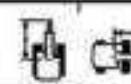
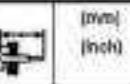
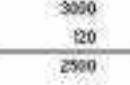
(mm) (inch)	1500 60	2000 80		2500 100		3000 120		3500 140			(mm) (inch)	
												
3000 120										400 962	400 962	230 90
2500 100				344 709	344 708					403 898	376 846	290 120
2000 80				376 832	376 832	420 807	359 770			368 819	313 696	3270 130
1500 60			549 1061	549 1061	491 1061	465 1063	417 897	353 761		301 733	281 623	3480 140
1000 40		756 1528	622 1343	538 1055	450 970	409 880	346 745	325 760	276 594	313 691	286 587	3580 150
500 20		728 1567	596 1286	521 1023	436 940	400 863	338 729	321 692	272 597	309 689	262 577	3600 150
0 0		719 1546	588 1267	512 1103	427 820	395 851	332 717	309 712	270 702	316 687	288 580	3520 140
-500 -20		719 1544	588 1265	509 1093	424 904	392 846	330 712			340 750	287 634	3340 140
-1000 -40		723 1554	592 1275	511 1101	428 919	387 846	333 712			378 832	329 730	3030 120
-1500 -60	803 1307	803 1307	873 1234	679 1224	392 892	392 892				385 852	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.

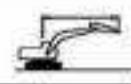
[mm] (inch)	1500 60	2000 80	2500 100	2000 120	3000 140		[mm] (inch)
 3000 120							* 400 * 400 230 * 862 * 862 90
2500 100			* 344 * 344				* 403 * 378 290 * 836 * 816 120
2000 80			* 376 * 376	* 420 368			* 376 * 363 3270 * 832 * 832 100
1500 60		* 549 * 549	* 491 465	* 453 363			* 370 281 3480 * 861 * 1061 1003 * 886 761
1000 40		* 906 622	* 629 450	* 498 346	* 422 276	* 380 266 3580	* 185 1343 1332 970 * 1080 745 * 962 594 * 836 587 150
500 20			* 691 436	* 525 339	* 419 272	* 393 262 3600	* 1483 940 * 1132 723 * 888 587 * 877 577 150
0 0		* 559 598	* 685 427	* 517 332	* 383 273	* 388 268 3520	* 2067 1247 * 1474 920 * 1112 717
-500 -20		* 963 598	* 639 424	* 474 330		* 381 287 3540	* 1859 1245 * 1355 914 * 1014 712
-1000 -40		* 743 592	* 541 428	* 387 333		* 378 329 3030	* 1532 1275 * 1053 933
-1500 -80	* 903 * 1003	* 579 * 579	* 392 * 392			* 396 * 386 2520	* 1907 * 1807 * 1224 * 1224

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 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 A	 B	 C	 D	 E	 F	 G	 H	 I
3000 120				318 * 38				350 * 350
2500 100					362 * 358			347 * 347
2000 80				381 * 381	368 * 359			364 * 364
1500 60				420 * 430	389 * 372			385 * 377
1000 40				466 * 466	407 * 392	327 * 318	309 * 309	3650 * 3560
				502 * 502	429 * 403	303 * 293	281 * 281	375 * 360
1800 70			784 * 630	537 * 450	457 * 344	323 * 273	298 * 246	3750 * 3750
1500 60		1629 * 1259	1671 * 1259	911 * 711	927 * 741	655 * 569	641 * 543	350 * 350
1200 48		1528 * 1200	1537 * 1200	520 * 424	398 * 319	249 * 219	295 * 242	3760 * 3760
900 36		1569 * 1200	1620 * 1200	638 * 557	722 * 606	618 * 531	631 * 533	350 * 350
600 24	608 * 608	688 * 688	713 * 682	508 * 432	396 * 328	318 * 266	292 * 247	3680 * 3680
400 16	1203 * 1203	1383 * 1383	1533 * 1254	1093 * 988	945 * 797	677 * 511	644 * 544	350 * 350
3000 120	1750 * 1750	2172 * 2084	1523 * 1245	1081 * 899	933 * 699	695 * 539	695 * 579	3720 * 3720
2000 80			212 * 181	691 * 602	477 * 397	324 * 263	350 * 285	3700 * 3700
1500 60			1523 * 1250	1062 * 868	926 * 700		777 * 633	350 * 350
1000 40			948 * 948	519 * 457	427 * 324		375 * 365	2780 * 2780
700 28		1376 * 1269	1269 * 965	565 * 564			621 * 521	310 * 310
500 20							431 * 431	1860 * 1860
300 12							977 * 977	80 * 80

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.

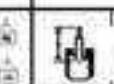
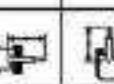
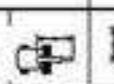
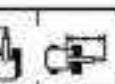
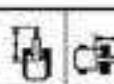
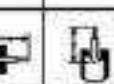
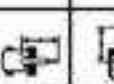
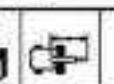
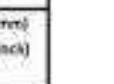
(mm) (inch)	1000 40	1500 59	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
 3000 120				315 125	315 125			350 137 792 300
 2500 100					362 138 826 320	350 137 792 300	317 127 784 290	280 110 704 280
 2000 80				281 108 620 262	368 140 630 262	350 137 792 300	301 126 685 275	280 110 687 280
 1500 60				406 156 882 352	407 156 882 352	350 137 792 300	309 129 656 261	280 110 657 280
 1000 40			771 300 1204 450	560 190 800 350	458 170 800 350	344 137 693 273	407 147 741 309	246 100 543 270
 500 20		391 155 1206 205	597 2123 1254	664 2123 1254	424 127 918 350	510 190 906 350	375 140 678 315	242 100 533 270
 0 0	608 1303	688 1303	598 2123	582 1254	606 1475	517 38 984	328 707 666	265 511 544
 -500 -20	806 1750	908 1750	961 2172	906 2084	907 1950 1245	648 1280 699	417 1045 619	455 324 603
 -1000 -40					798 1703 1250	673 1227 860	425 324 700	362 285 738
 -1500 -40					948 1376 1250	959 1250 965	427 324 964	371 285 621
 -2000 -40								431 377 800

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.

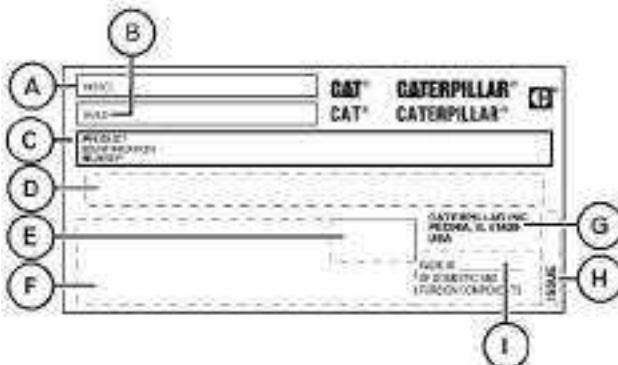


Illustration 228

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)

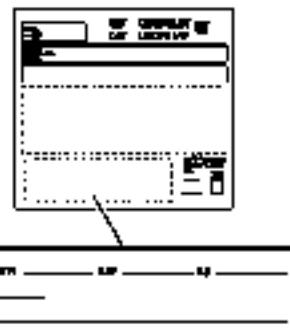


Illustration 229

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.



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

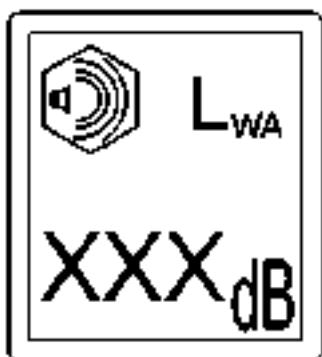


Illustration 232

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

Fulfils 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	

Fulfils 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.

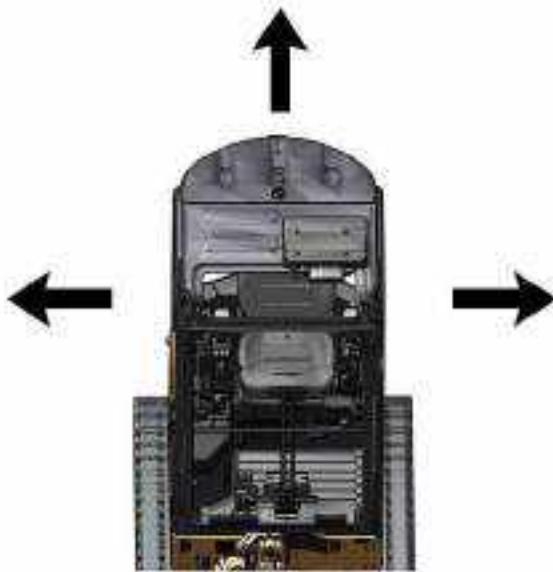


Illustration 236

g06274656

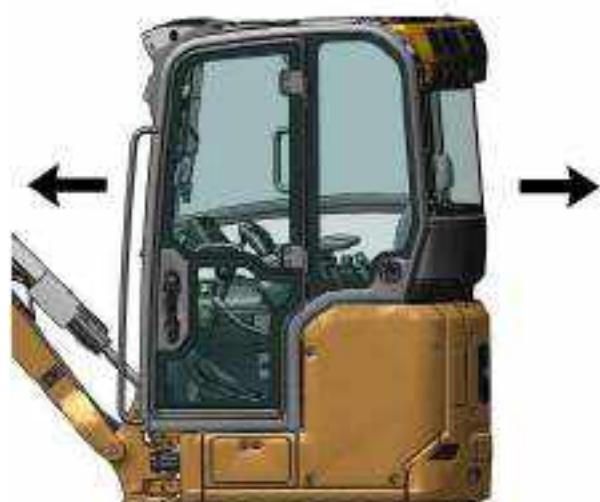


Illustration 237

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.

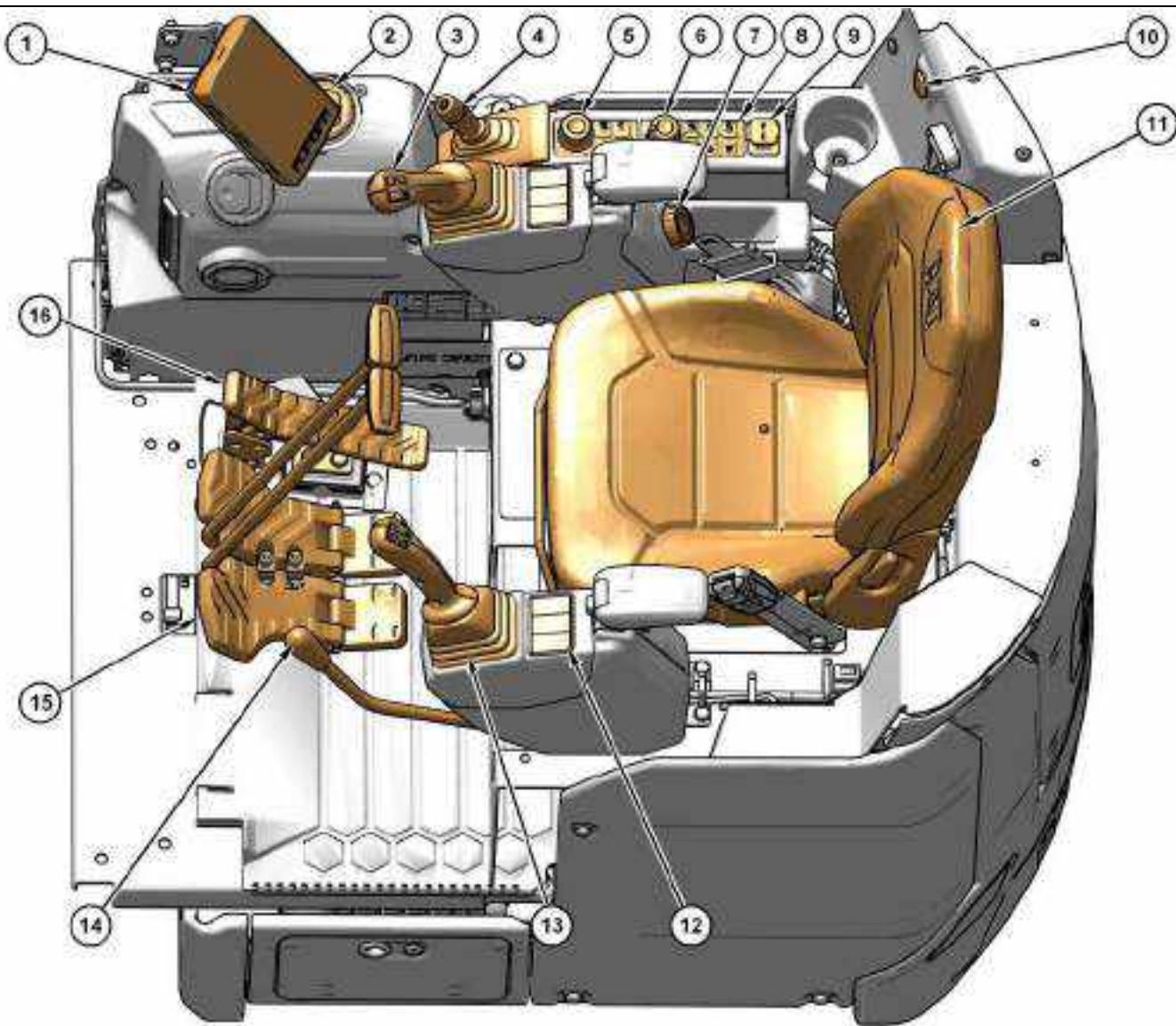


Illustration 242

g06262907

- (1) Monitoring System
- (2) Air Outlet
- (3) Right Joystick Controls
- (4) Dozer Blade Lever / Adjustable Undercarriage Control
- (5) Jog Dial
- (6) Engine Speed Dial
- (7) Engine Start Switch
- (8) Right Side Switch Panel
- (9) USB Port
- (10) Power Outlet (12V)
- (11) Operator Seat
- (12) Adjustable Undercarriage Switch
- (13) Left Joystick Controls
- (14) Hydraulic Lockout Control
- (15) Travel Lever Controls
- (16) Primary Auxiliary Control Pedal

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)

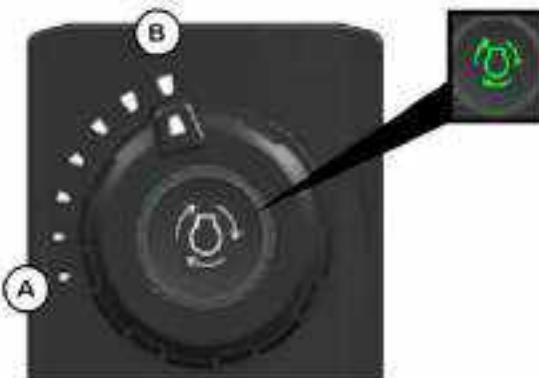


Illustration 244

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)

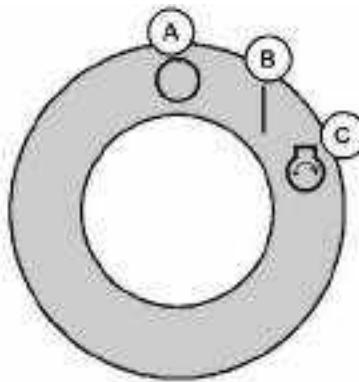


Illustration 245

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)

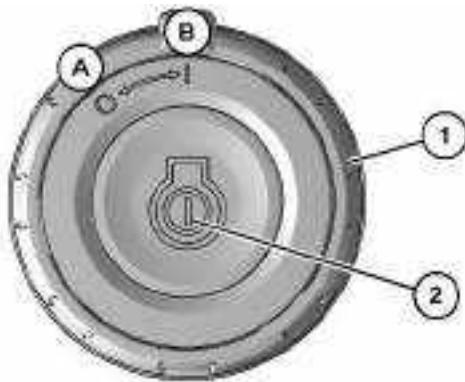


Illustration 246

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.

Operation Section

Operator Controls

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

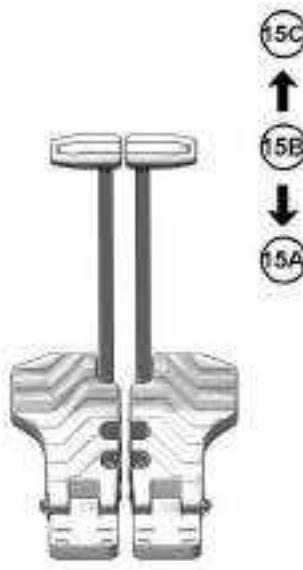


Illustration 249

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.

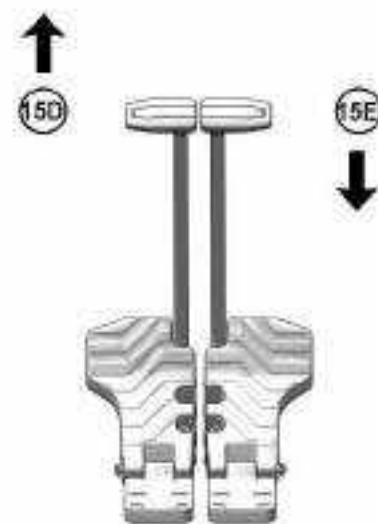


Illustration 250

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

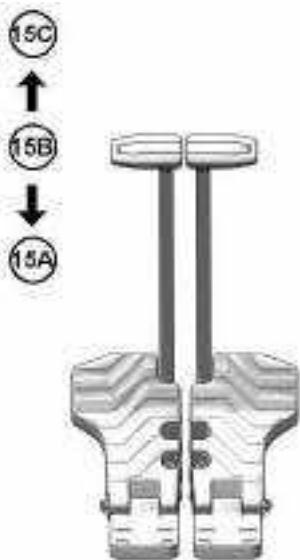


Illustration 251

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.

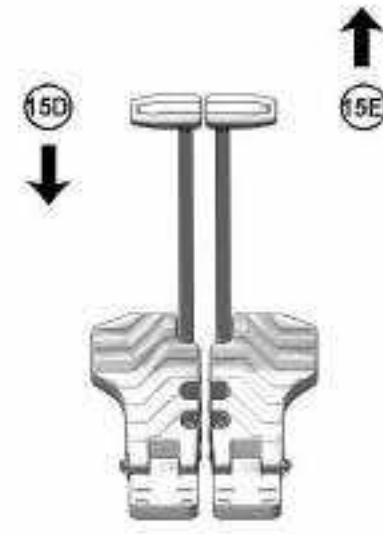


Illustration 252

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.

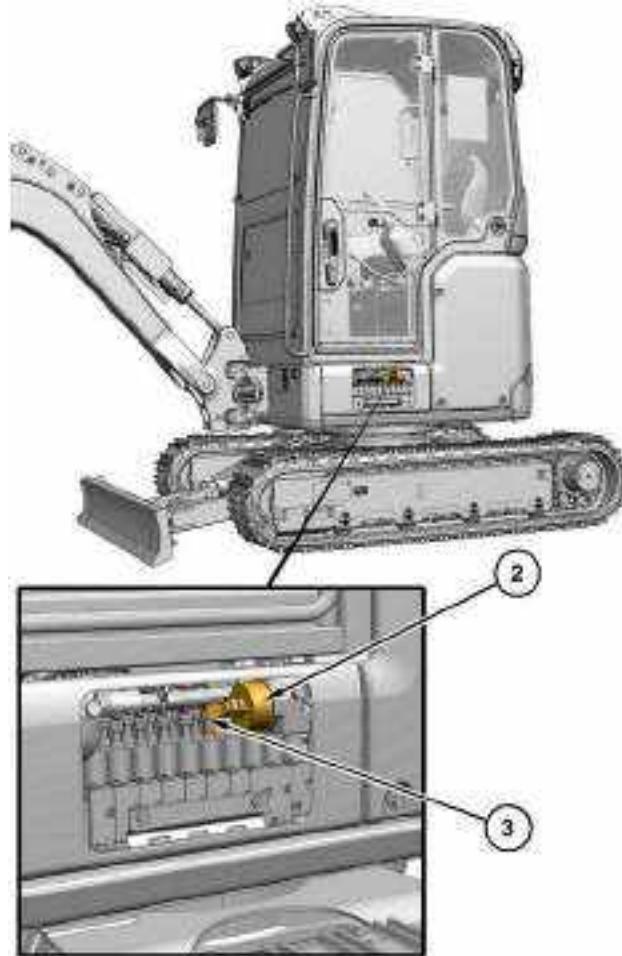


Illustration 257

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 machines 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)

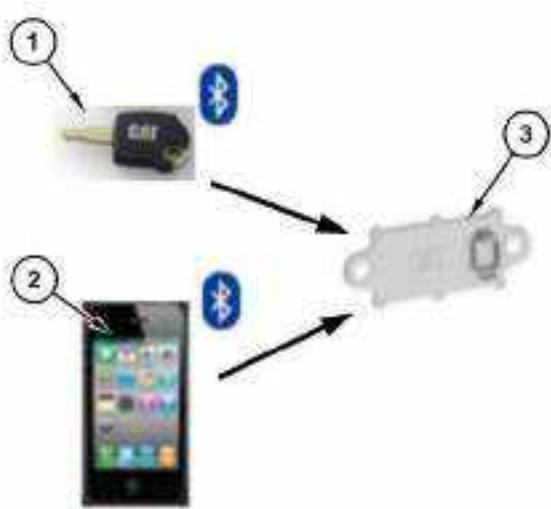


Illustration 259

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

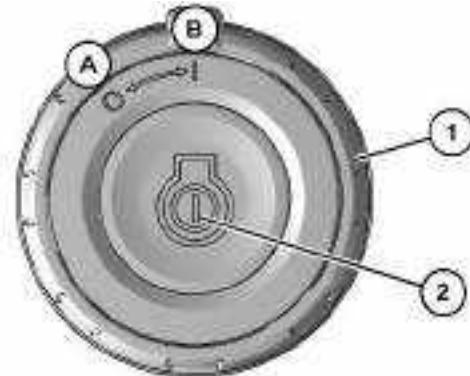


Illustration 260

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)

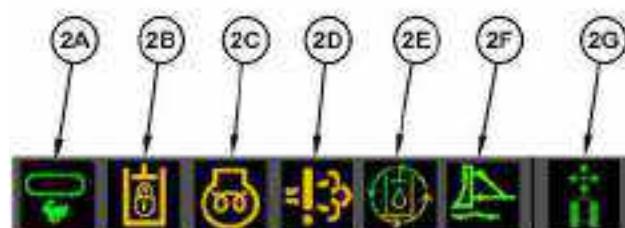


Illustration 262

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).

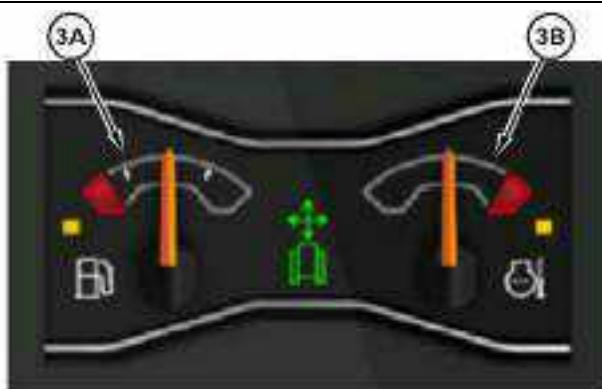
Gauge Area (3)

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)

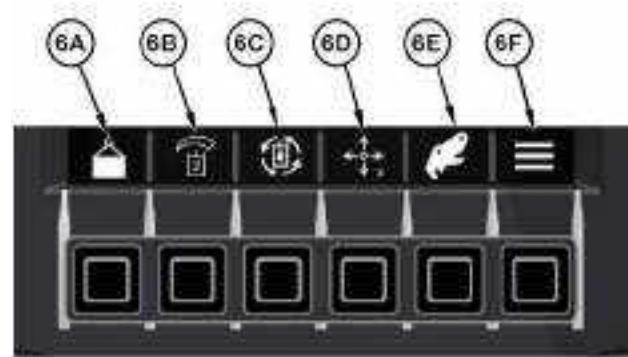


Illustration 266

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".

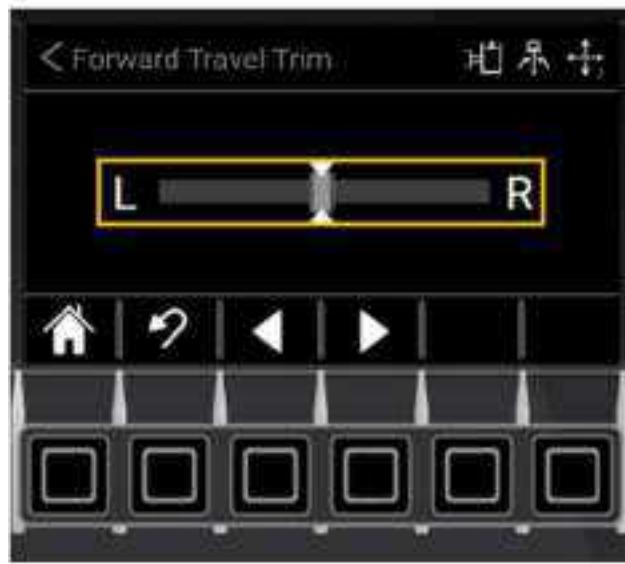


Illustration 269

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

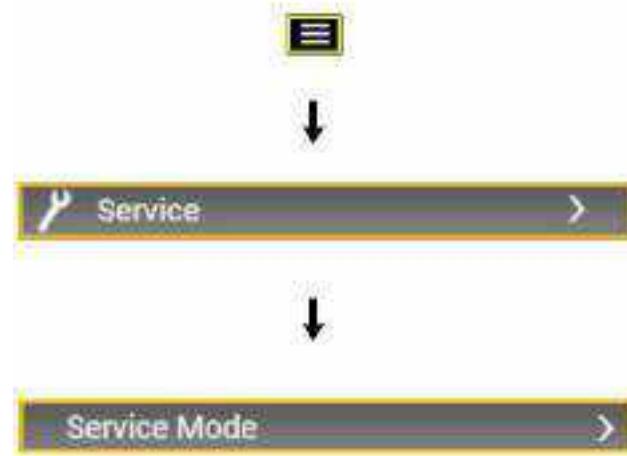


Illustration 275

g06334877

To access the Service Mode Menu options, press the "Menu" button, select "Service" , then "Service Mode"

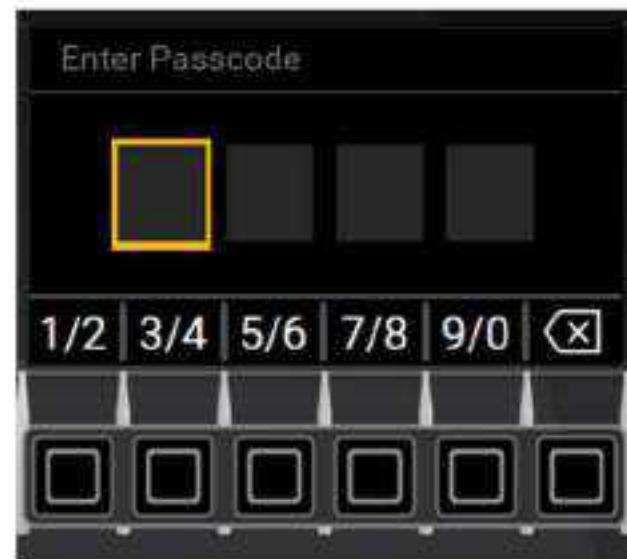


Illustration 276

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.

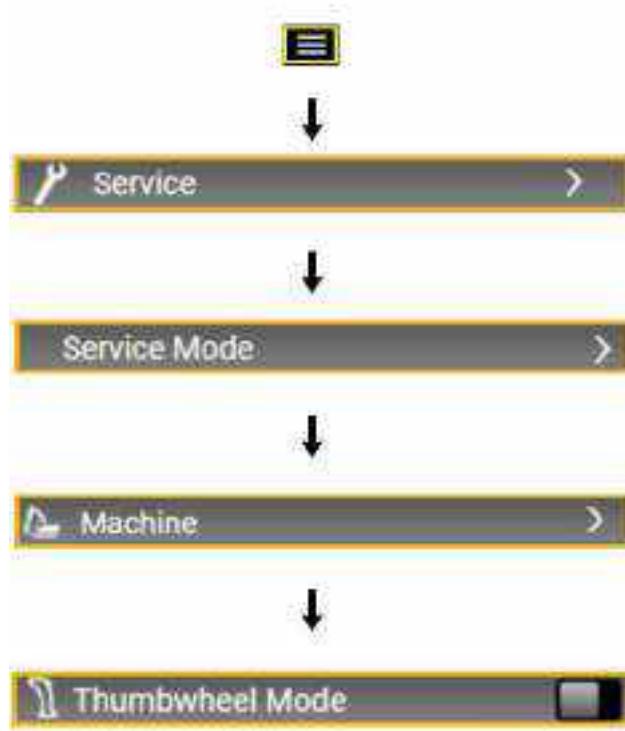


Illustration 277

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).

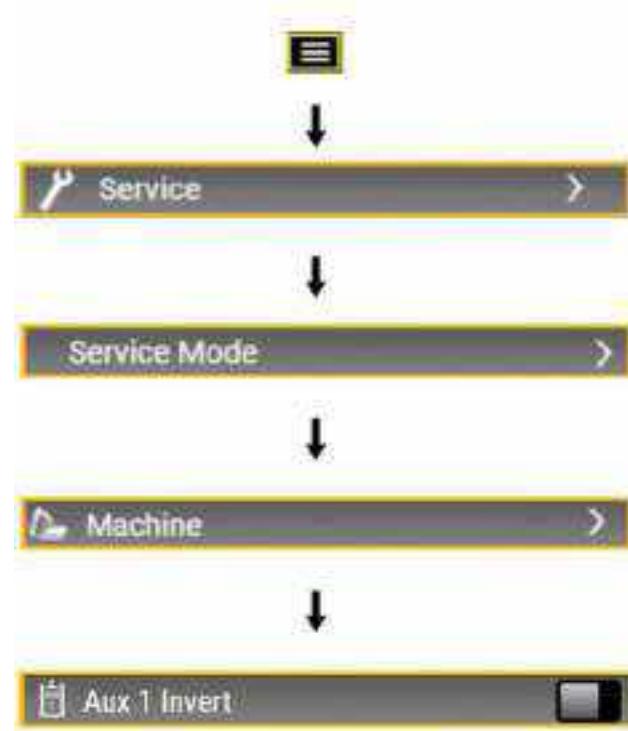


Illustration 279

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 “1111”. 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



Illustration 284

g06345290

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.

Note: 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.

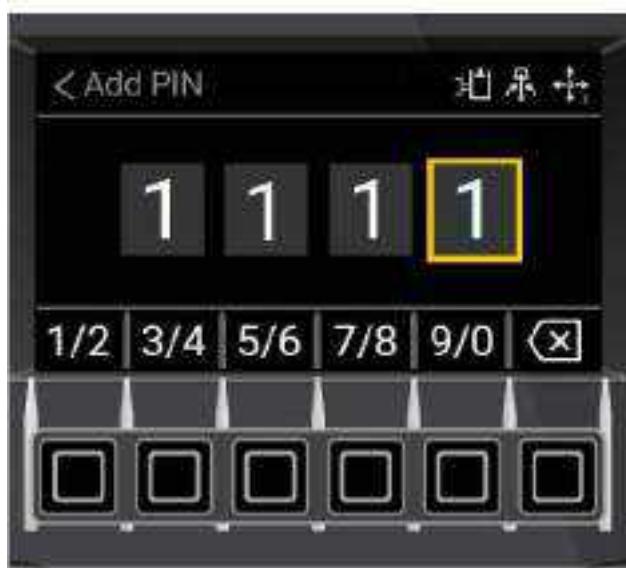


Illustration 285

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

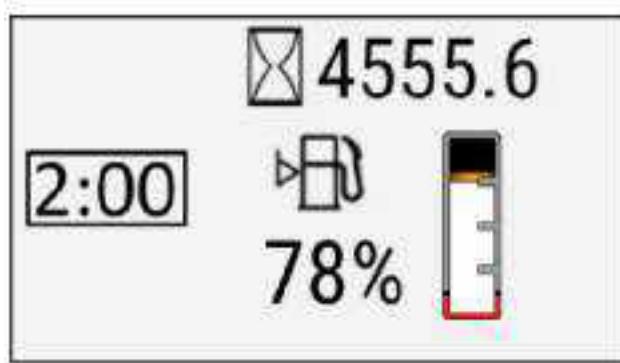


Illustration 293

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.

Right Side Rear View Mirror (1)



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.

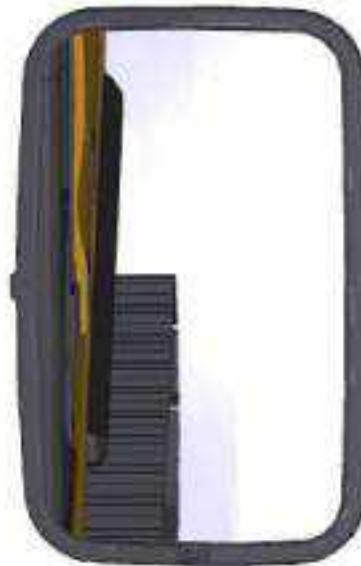


Illustration 296

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.

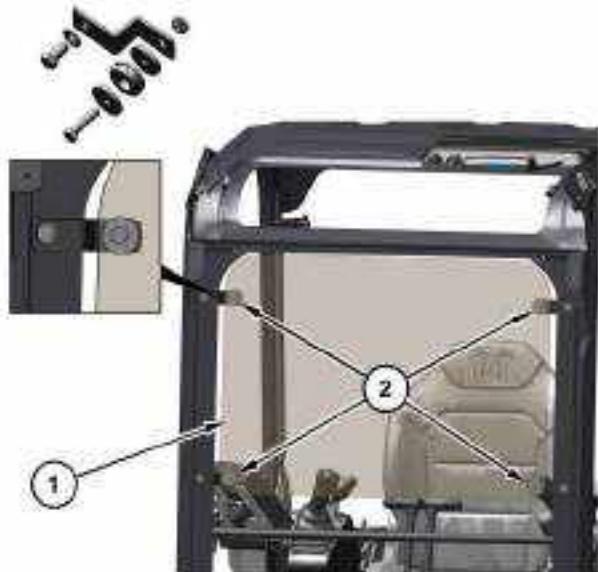


Illustration 298

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.

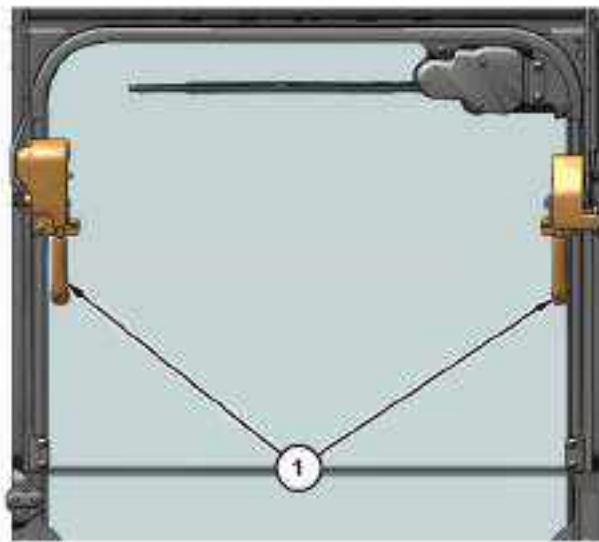


Illustration 299

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.

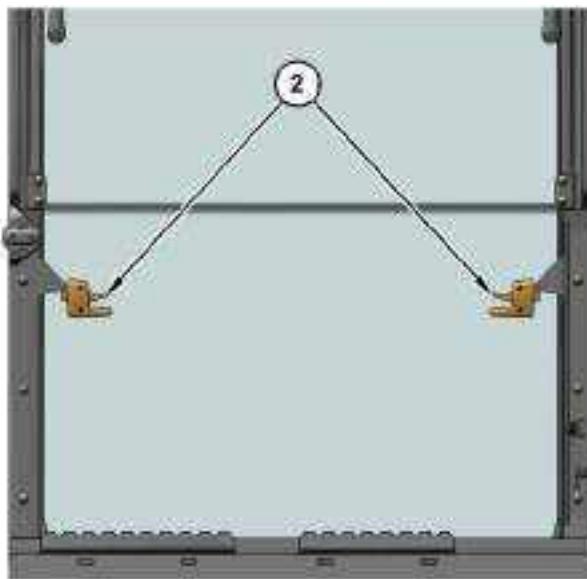


Illustration 300

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.

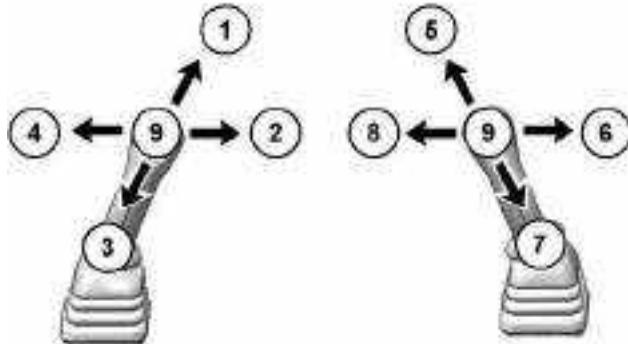


Illustration 301

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.

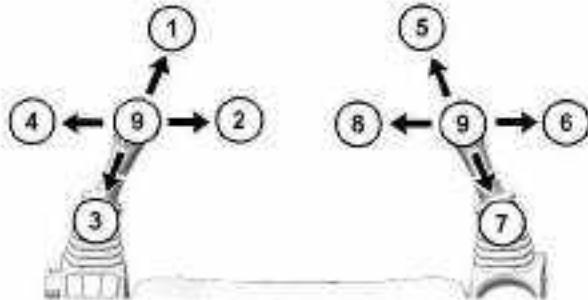


Illustration 303

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.

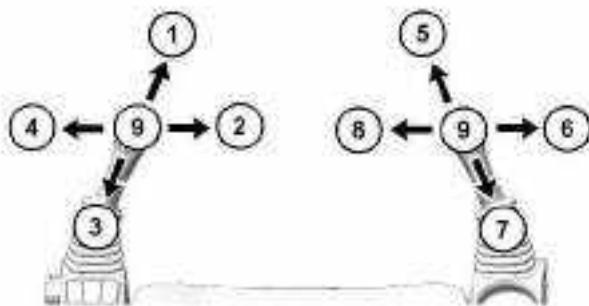


Illustration 304

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)

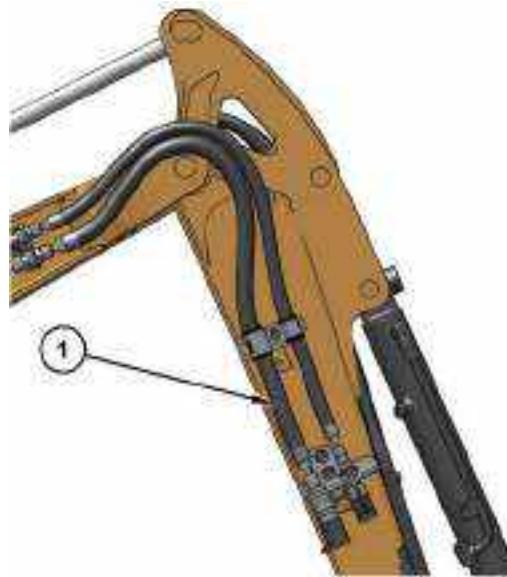


Illustration 305

g06267476

(1) Primary oil feed / return line on right side of stick

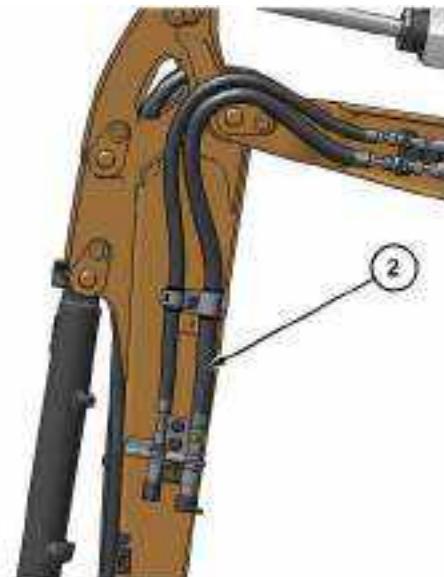


Illustration 306

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:

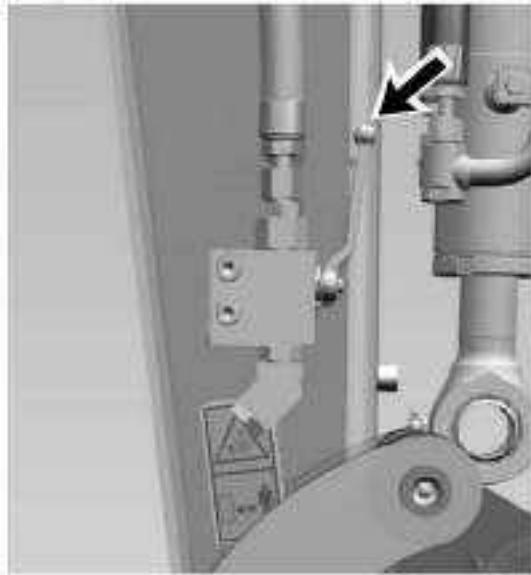


Illustration 307

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)

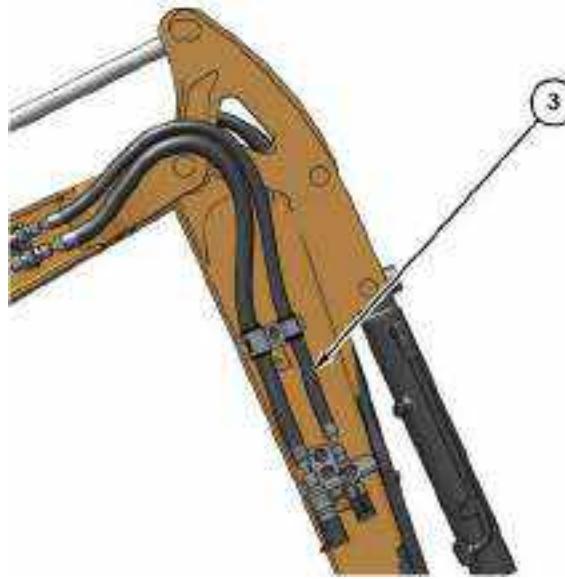


Illustration 308

g06267483

(3) Secondary oil feed / return line on right side of stick

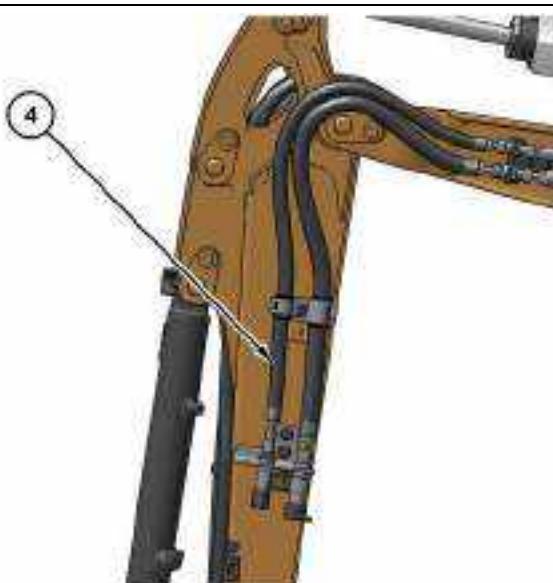


Illustration 309

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)

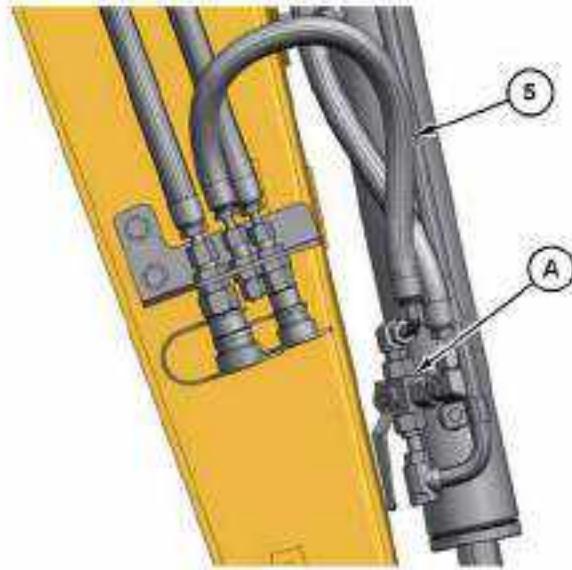


Illustration 310

g06643027

(A) Diverter Valve

(5) Auxiliary oil feed/ return line on right side of stick

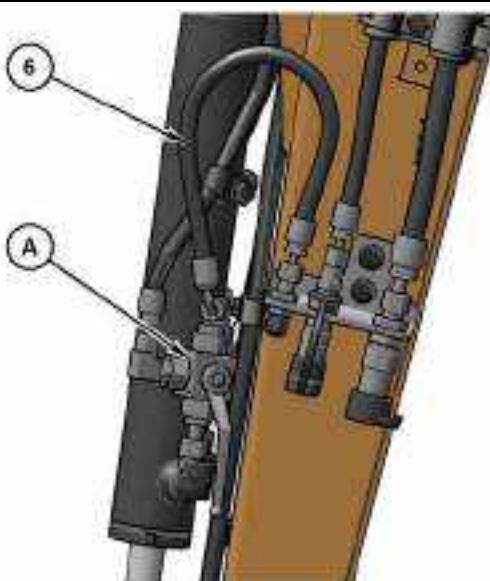


Illustration 311

g06274437

(A) Diverter Valve

(6) Auxiliary oil feed/ return line on left side of stick

Divert 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

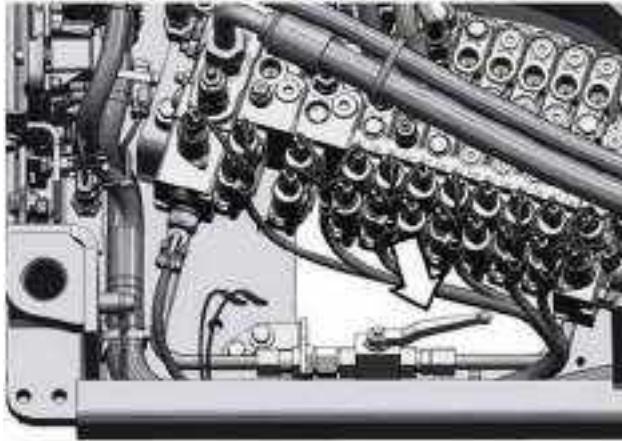


Illustration 313

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

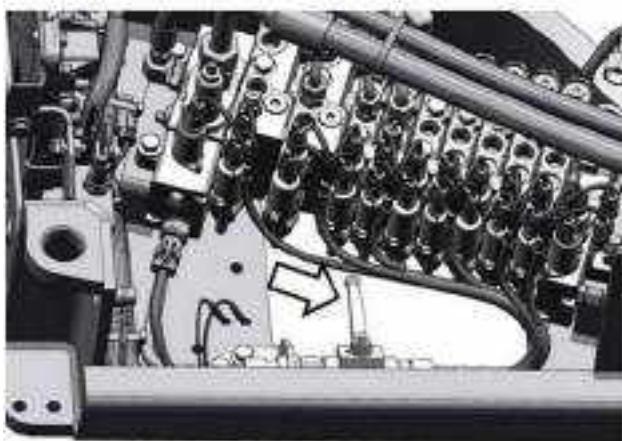


Illustration 314

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)

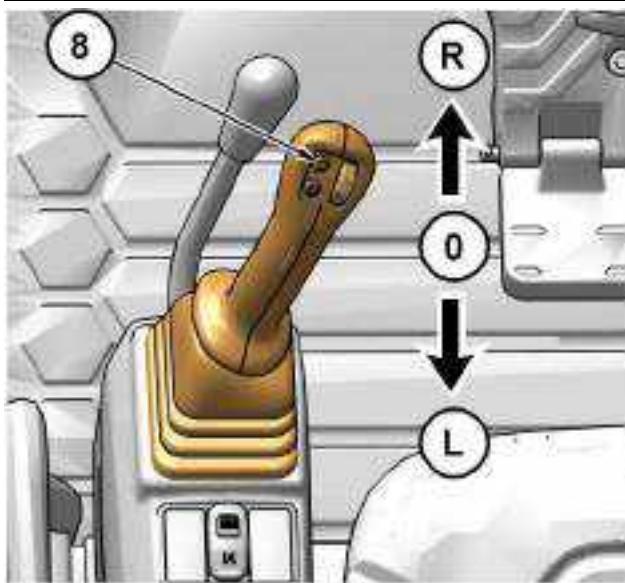


Illustration 316

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.

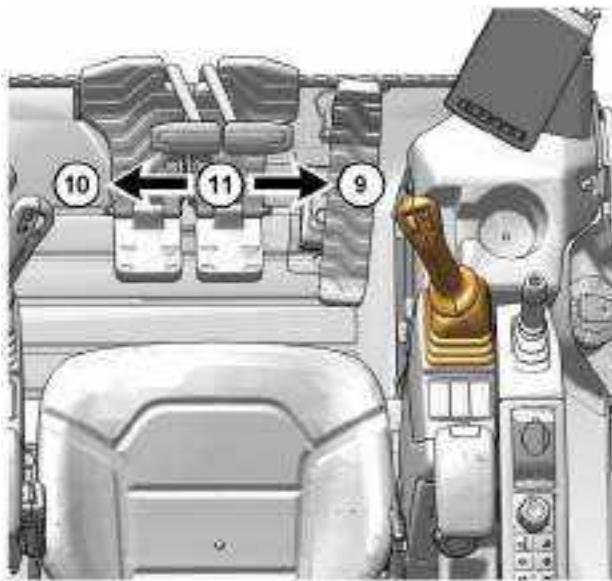


Illustration 317

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.

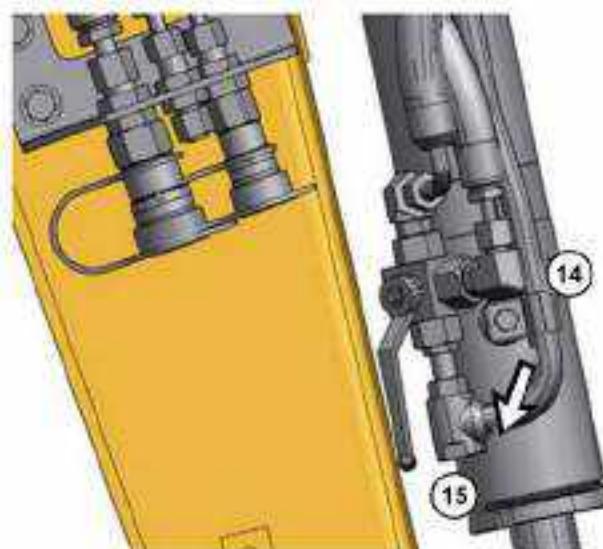


Illustration 318

g06643038

Right Side Diverter Valve

Turn the handle on each diverter valve from position (14) to position (15) to control the bucket.

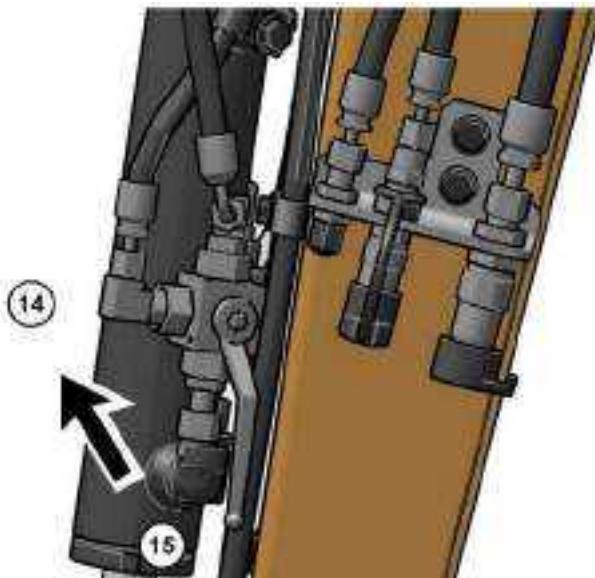


Illustration 319

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

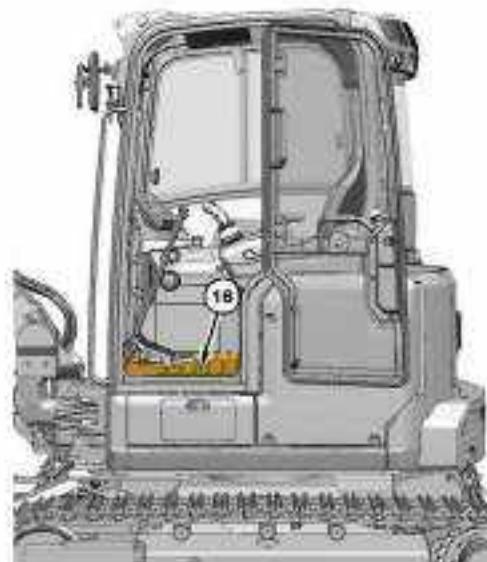


Illustration 321

g06622117

(16) Floor mat

2. Remove the floor mat (16).

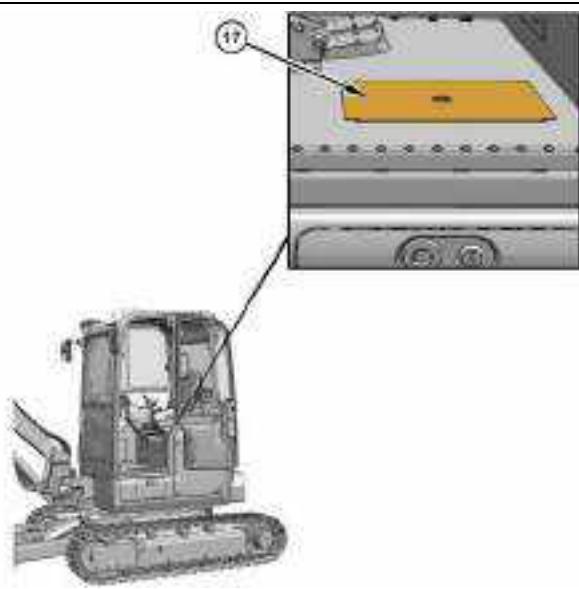


Illustration 322

g06622144

(17) Panel

3. Once the floor mat(16) is removed, remove the panel (17) beneath the floor mat (16).

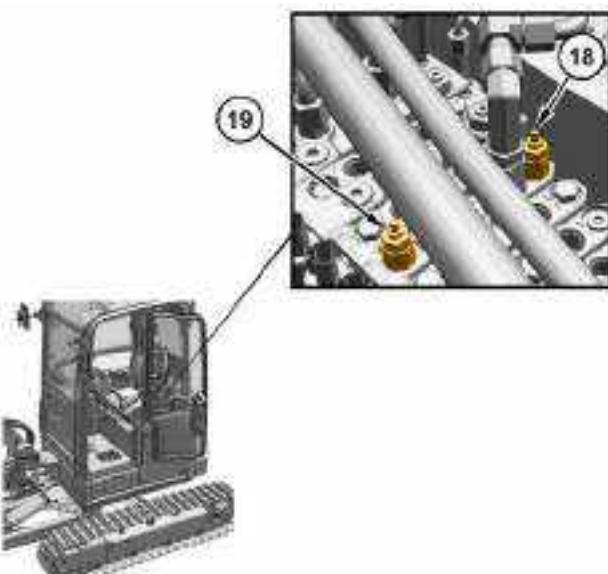


Illustration 323

g06622189

(18) Adjustable relief valve for Aux 4A
(19) Adjustable relief valve for Aux 4B

4. 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

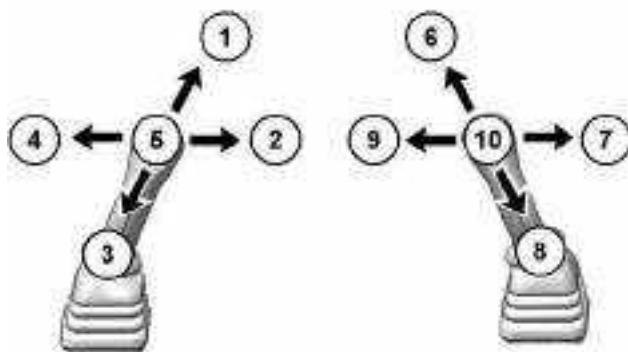


Illustration 324

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

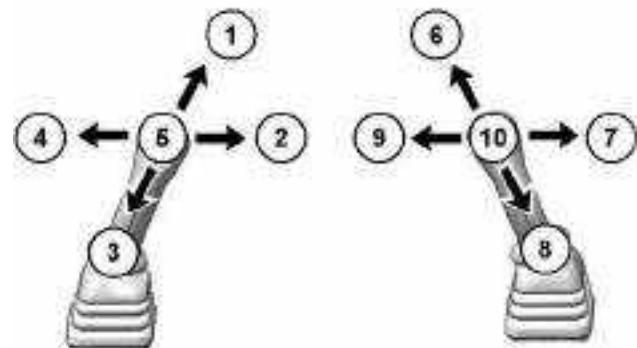


Illustration 325

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.

Operation Section
Joystick Controls Alternate Patterns

Two functions may be performed at the same time by moving the joysticks diagonally.

Mitsubishi Joystick Pattern

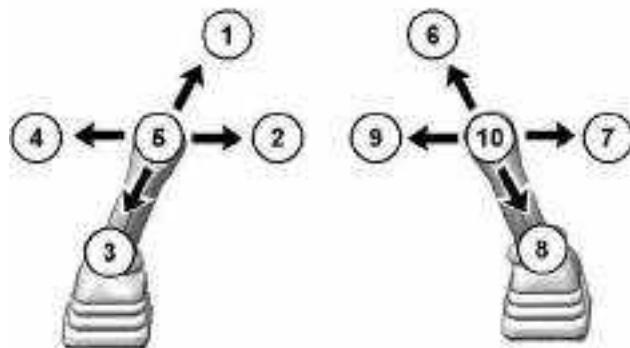


Illustration 326

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

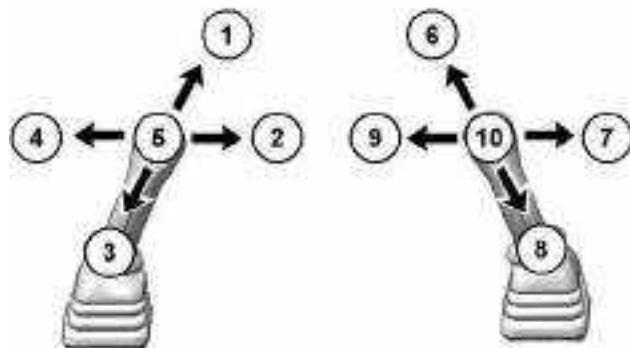


Illustration 327

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

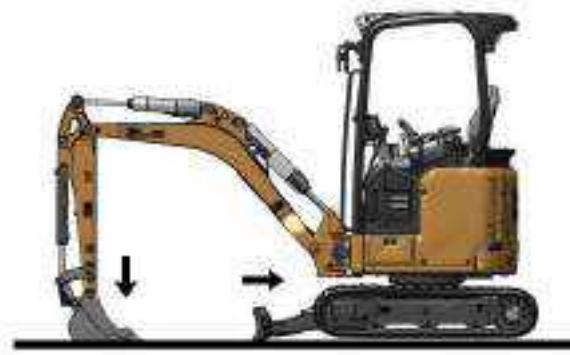


Illustration 329

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.

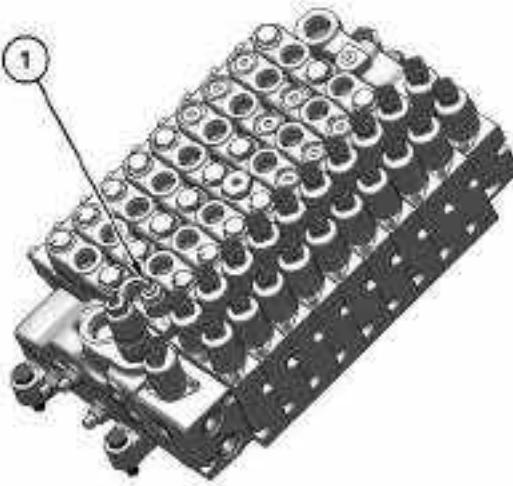


Illustration 330

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.

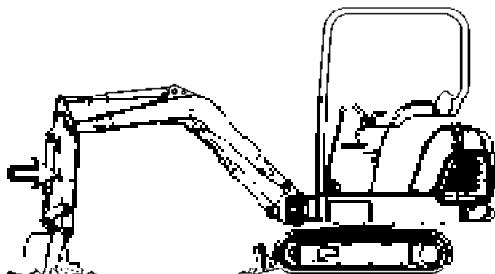


Illustration 331

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.

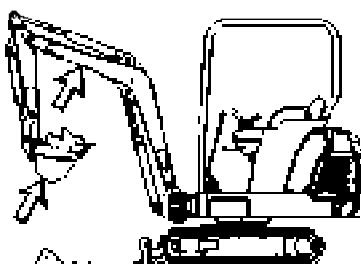


Illustration 332

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.

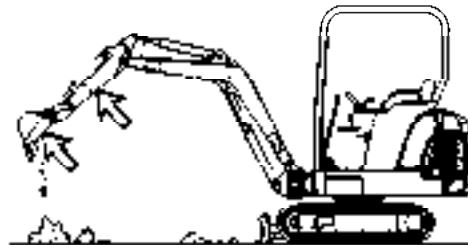


Illustration 333

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.

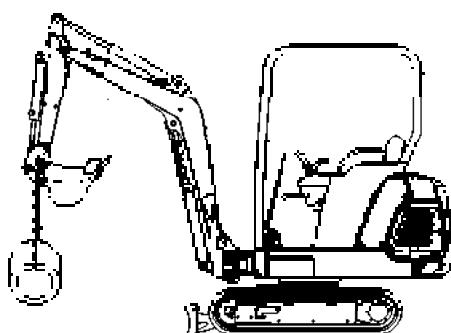


Illustration 334

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

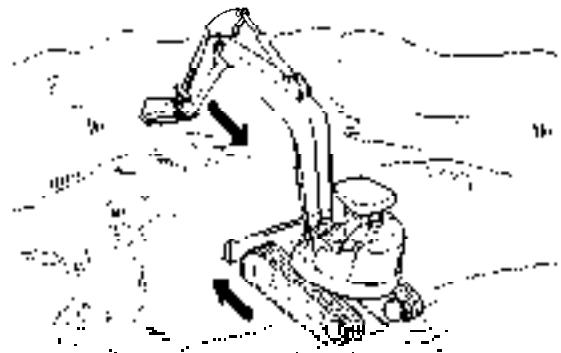


Illustration 336

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.

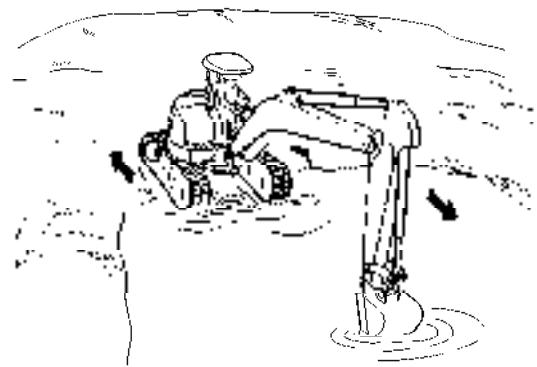


Illustration 337

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.

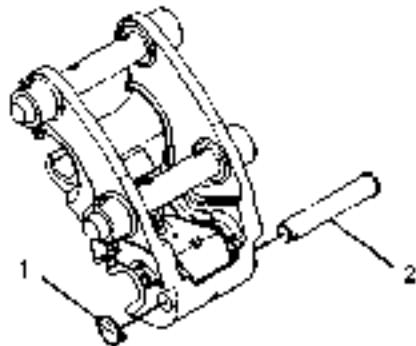


Illustration 339

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.

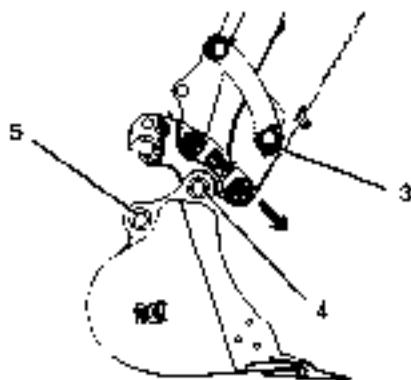


Illustration 340

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.

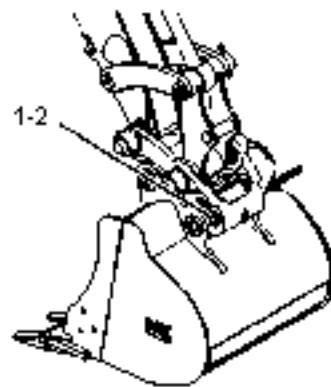


Illustration 341

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)

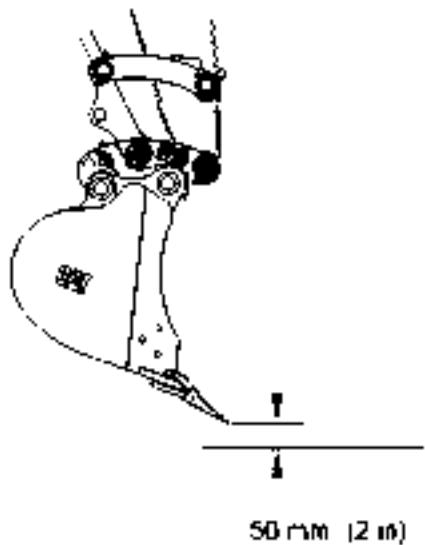


Illustration 342

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.

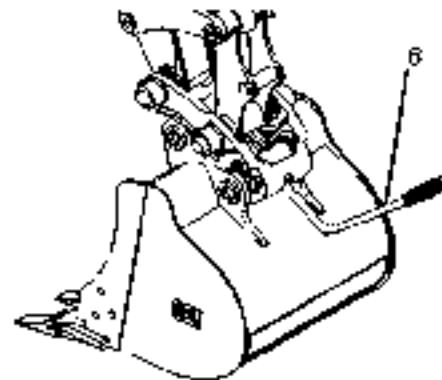


Illustration 344

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.

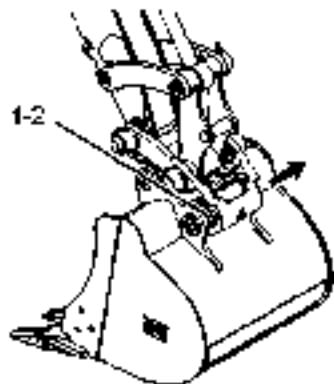


Illustration 343

g02165954

2. Remove lynch pin (1) and safety pin (2) from the quick coupler.

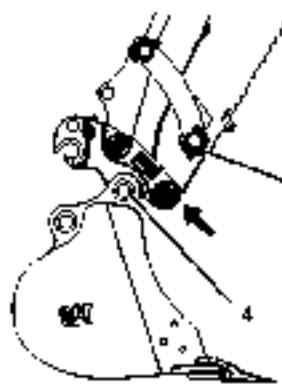


Illustration 345

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

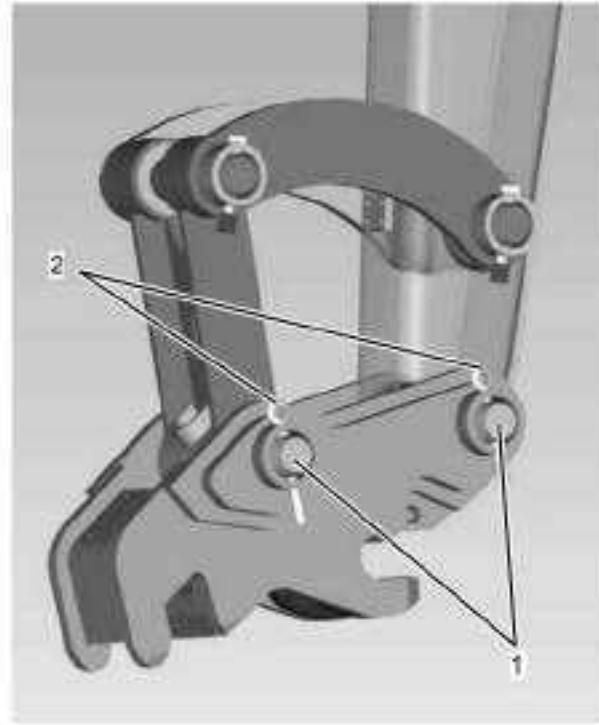


Illustration 346

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.

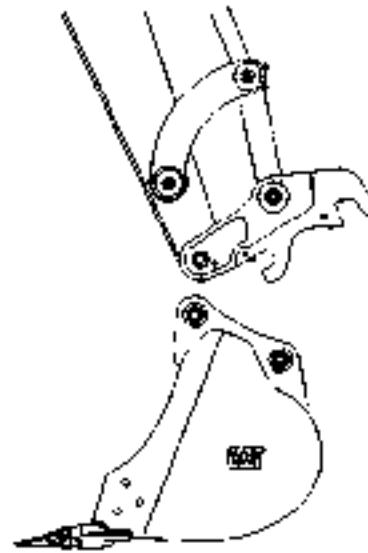


Illustration 347

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.

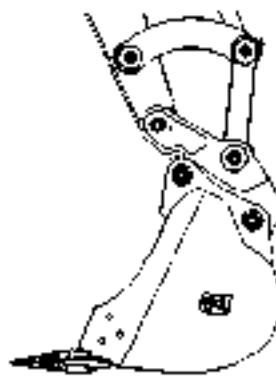


Illustration 348

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.

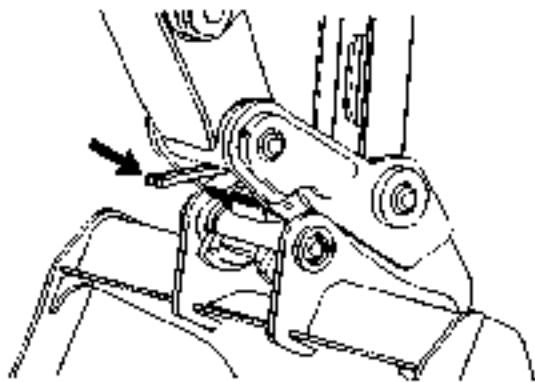


Illustration 349

g02165065

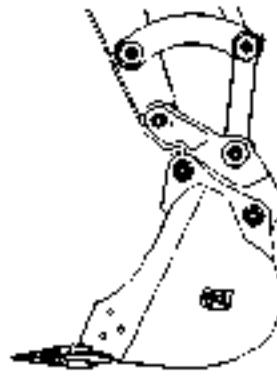


Illustration 350

g02163292

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.

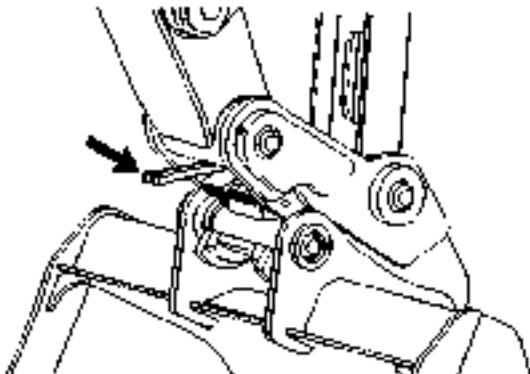


Illustration 351

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.

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.

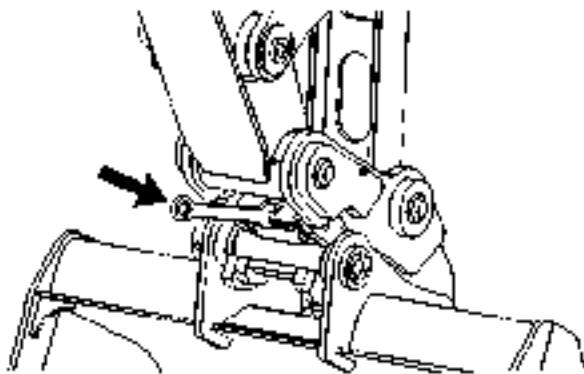


Illustration 352

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.

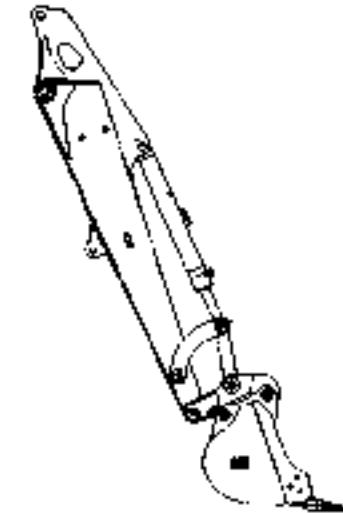


Illustration 353

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

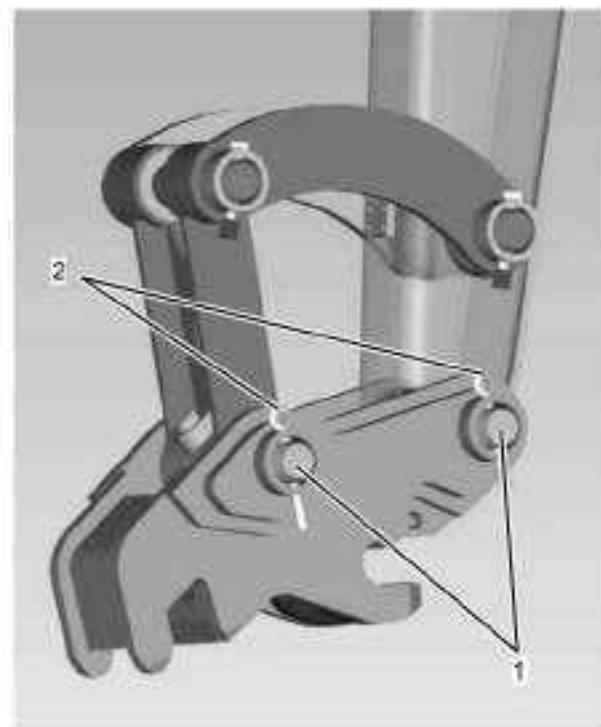


Illustration 354

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.

Operation Section
If Equipped

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

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.

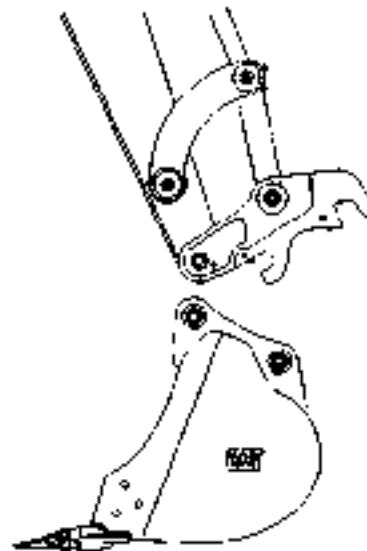


Illustration 355

g02163290

1. Align the Hydraulic Quick Coupler with the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

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.

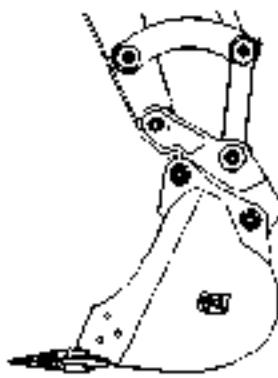


Illustration 356

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.

Operation Section
If Equipped

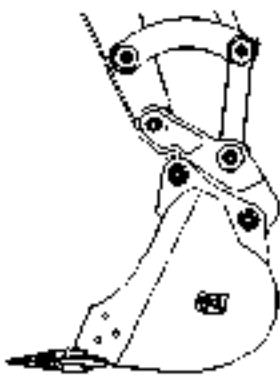


Illustration 357

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.

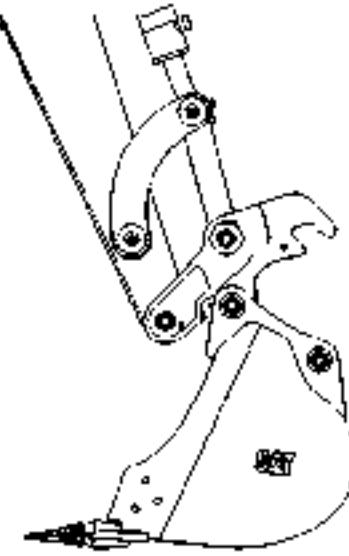


Illustration 358

g02163415

4. Disengage the work tool from the Hydraulic Quick Coupler as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

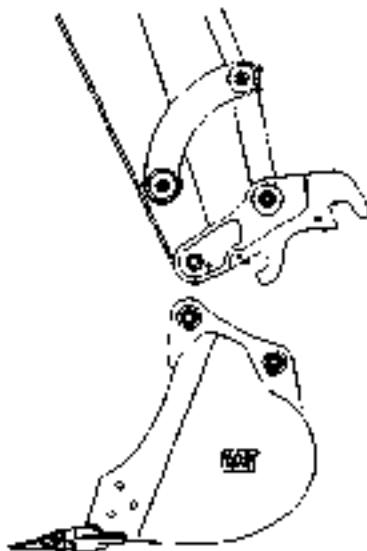


Illustration 359

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.

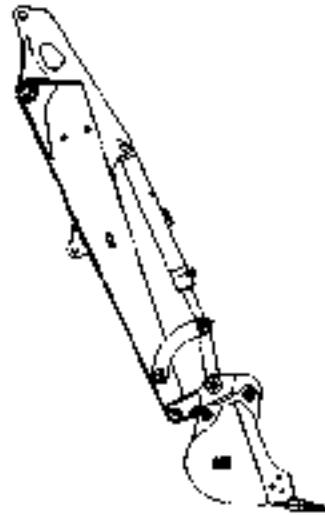


Illustration 360

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.

Operation Section

CW (Single Lock) Quick Coupler (If Equipped)

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.

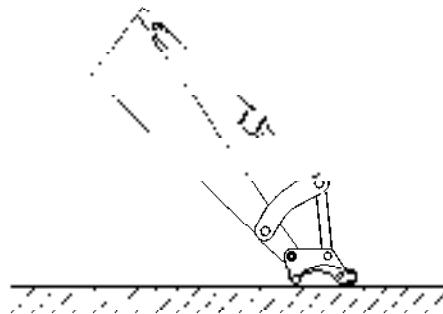


Illustration 361

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.

Operation Section

CW (Single Lock) Quick Coupler (If Equipped)

⚠️ 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.

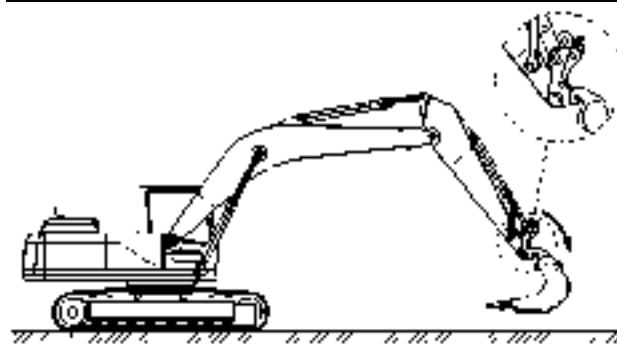
Coupling a Bucket

Illustration 362

g01285027

1. Hook the forward pivot of the quick coupler into the hooks of the mounting bracket.

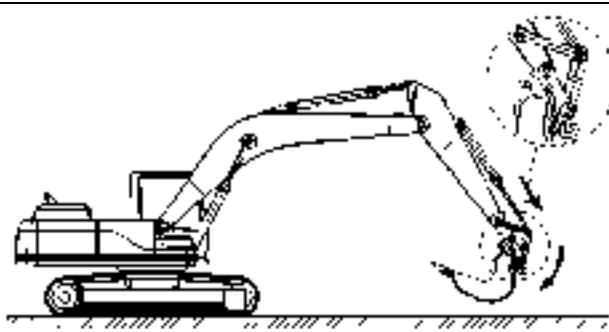


Illustration 363

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.

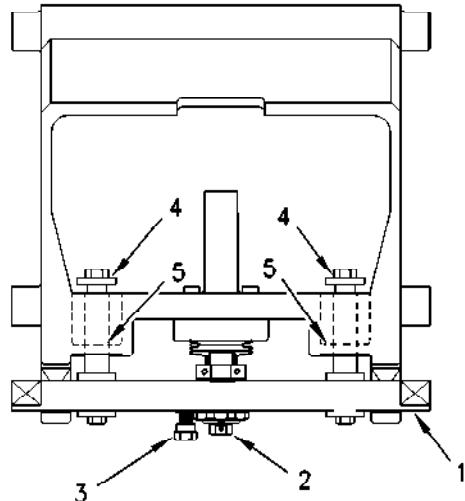


Illustration 364

g00928845

2. To move wedge (1) to the UNLOCKED position, perform the following steps:

Operation Section

CW (Single Lock) Quick Coupler (If Equipped)

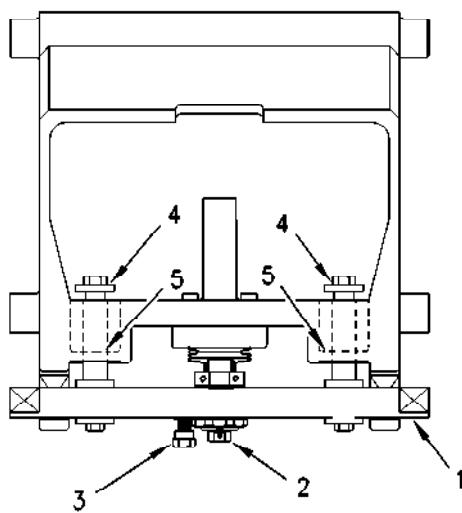


Illustration 365

g00928845

- 3.** Loosen lock bolt (3) until you can turn spindle (2).

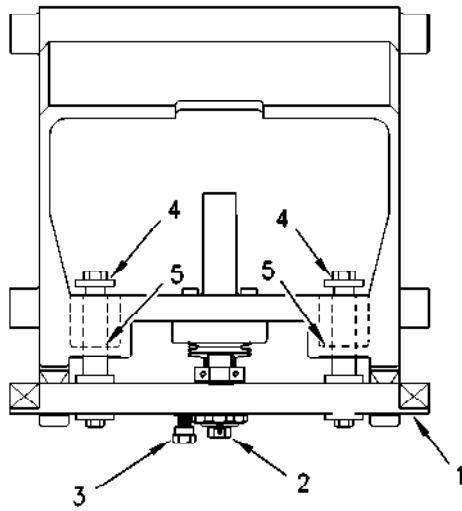


Illustration 366

g00928845

- 4.** Turn spindle (2) until the bolts (4) lightly contact the coupler (5).
- 5.** Position the coupler with the wedge in an UPWARD position.

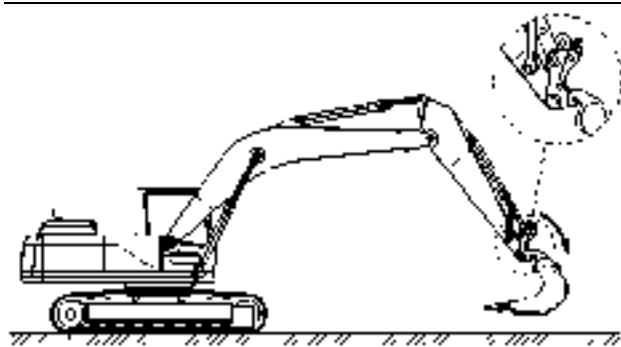
Coupling a Bucket

Illustration 367

g01285027

- 1.** Hook the front pivots into the hooks of the mounting bracket on the work tool.

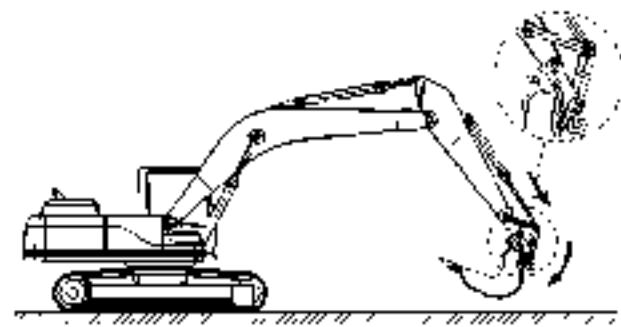


Illustration 368

g01285038

- 2.** Tilt the quick coupler against the work tool by extending the bucket cylinder. Stop the engine of the host machine.
- 3.** Turn the spindle inward. Tighten the spindle.

Note: If necessary, tighten the spindle until the next notch is aligned with the locking bolt.

- 4.** Tighten the locking bolt.

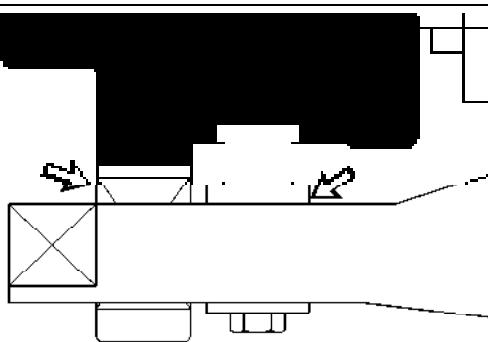


Illustration 369

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 place 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)

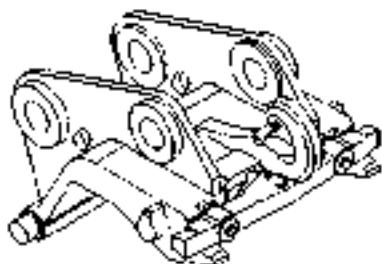


Illustration 370

g03219216

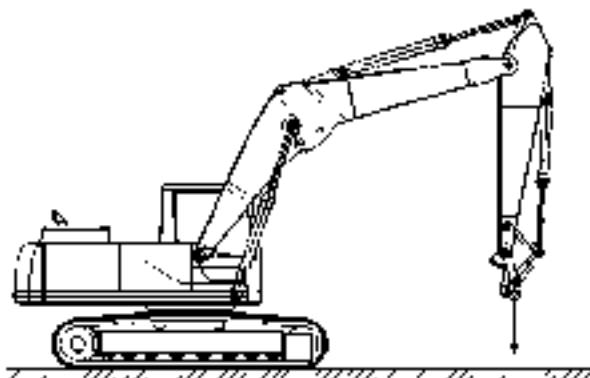


Illustration 371

g01285467

⚠ WARNING

Use an appropriate lifting device that is rated for the specific load. Failure to do so can result in serious injury or death.

- 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.

- Fully extend the bucket cylinder.
- Make sure that the wedge has been retracted or that the wedge has been removed.

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

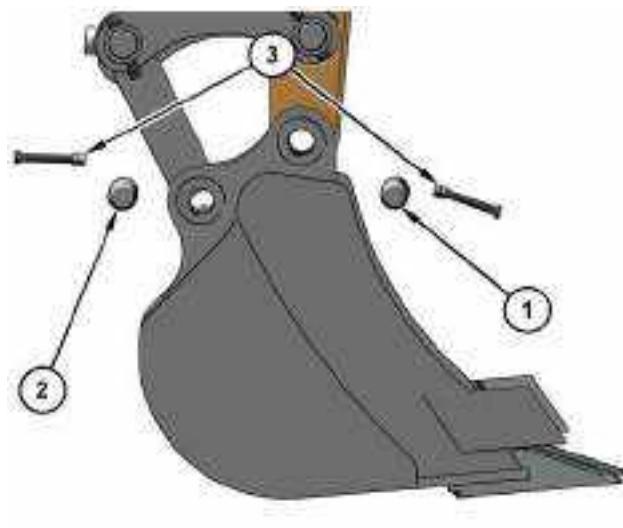


Illustration 372

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

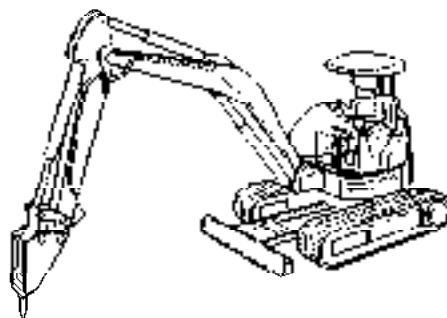


Illustration 373

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.

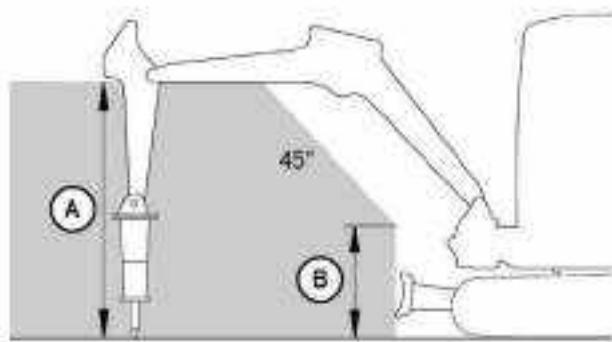


Illustration 374

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.

Reducing the Width of the Blade

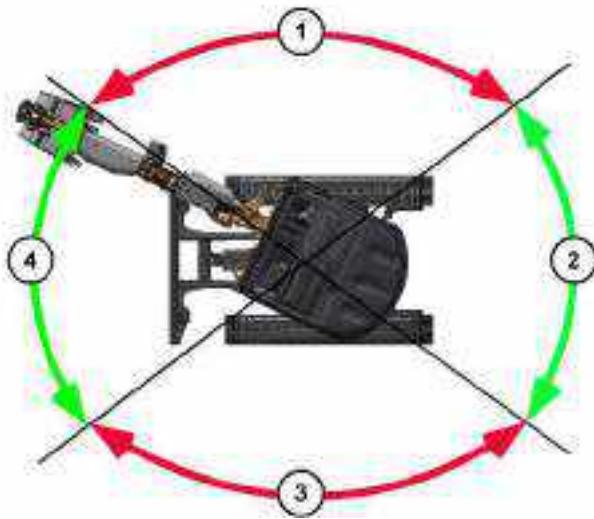


Illustration 376

g06275800

- (1) Incorrect position
- (2) Correct position
- (3) Incorrect position
- (4) Correct position

i07285207

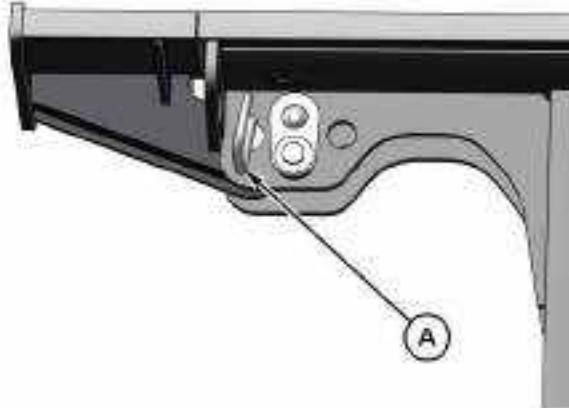


Illustration 377

g06262829

1. Raise the blade to about 1-2 cm (0.39-0.79 inch).
 2. Pull out pins (A) on either side.
-

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).

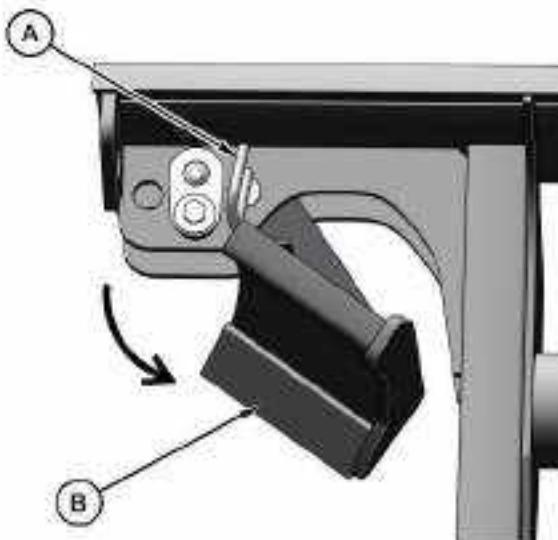


Illustration 378

g06262835

3. Fold in blade extensions (B) on either side.

4. Insert pins (A) on either side.

Increasing the Width of the Blade

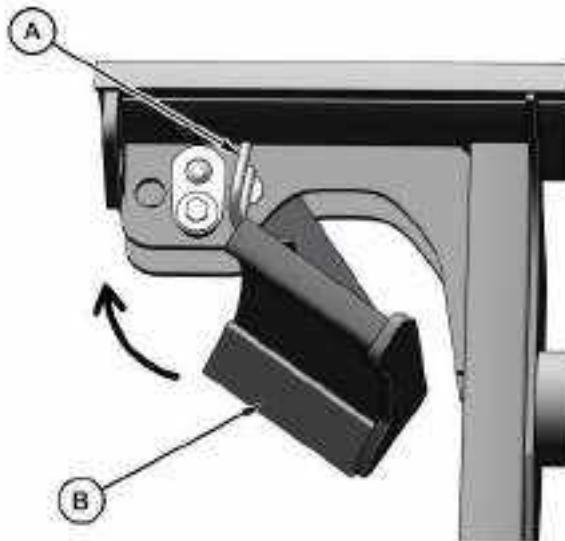


Illustration 379

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.

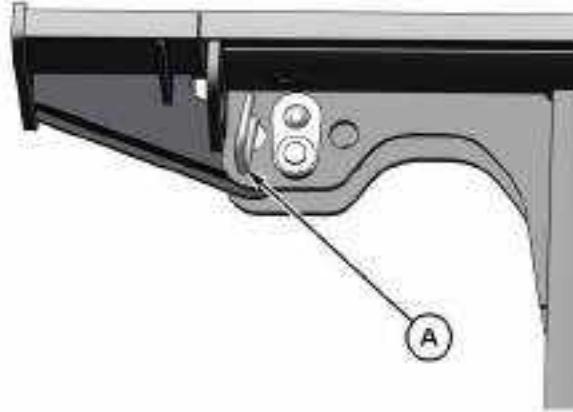


Illustration 380

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.

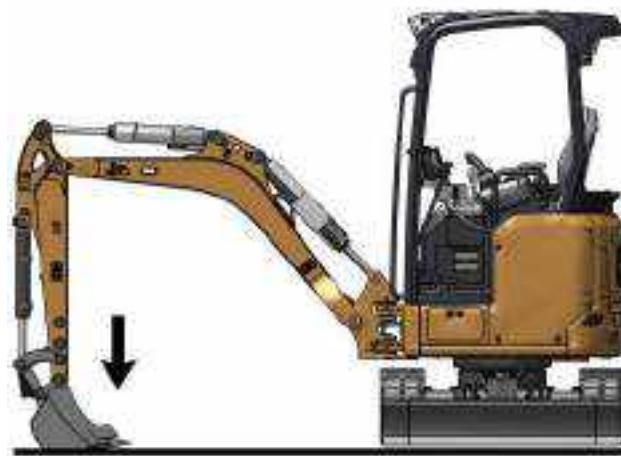


Illustration 384

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.

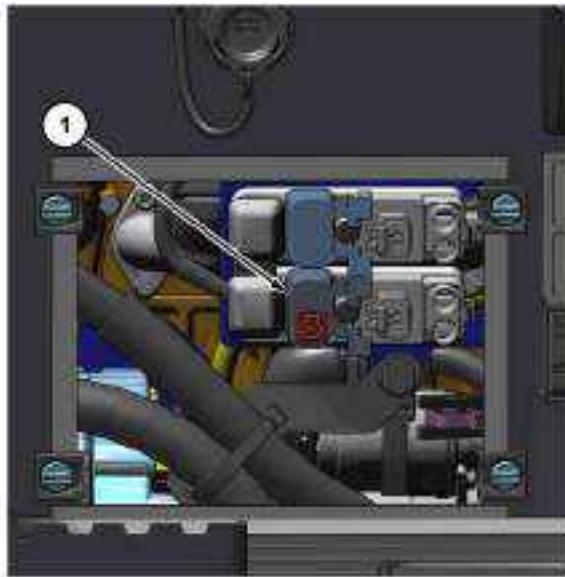


Illustration 387

g06268242

Relay location for sales models 301.5 and 301.7 CR
(1) Engine stop relay

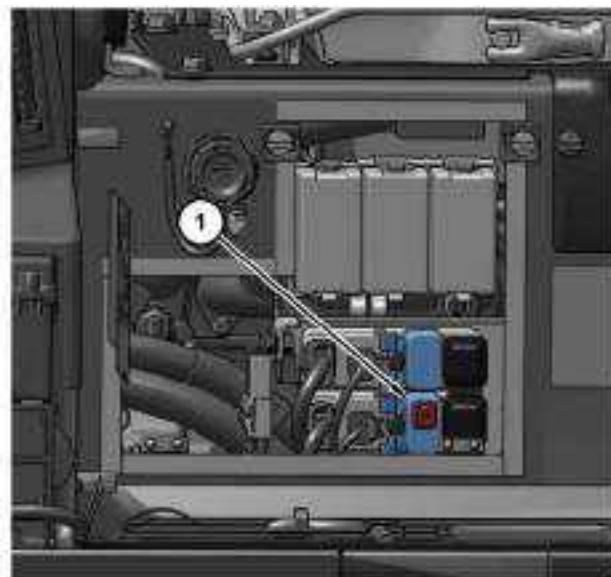


Illustration 388

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

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.

Operation Section
Adjustable Gauge Undercarriage Frame

3. 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

1. Swing the upper structure to position the dozer blade behind the operator.

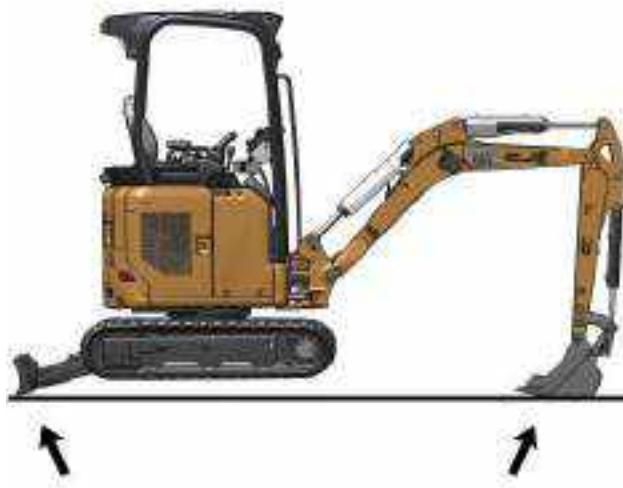


Illustration 390

g06268265

2. 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.

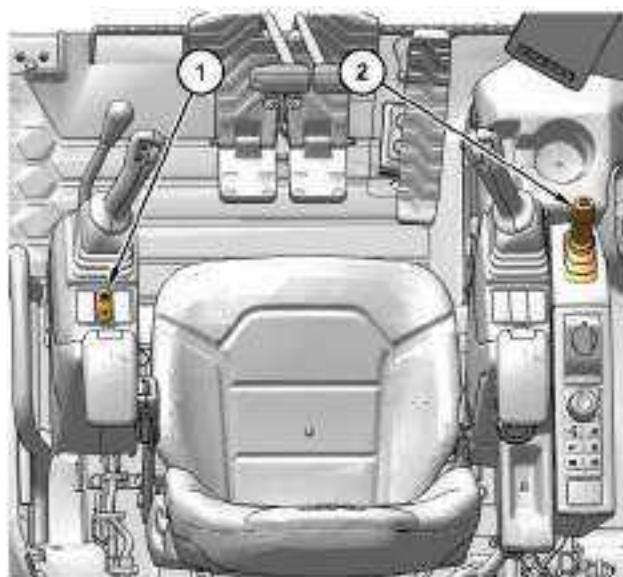


Illustration 391

g06268268

3. Lift and hold switch (1) to control the adjustable gage 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

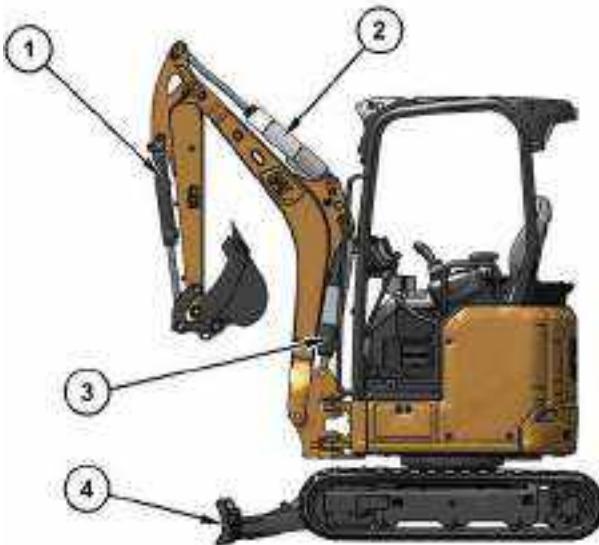


Illustration 392

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.

Operation Section
Lifting and Tying Down the Machine



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



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.

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.

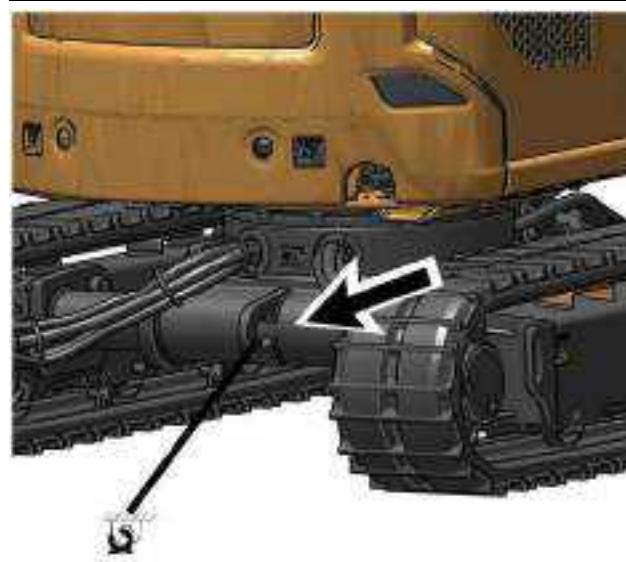


Illustration 397

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

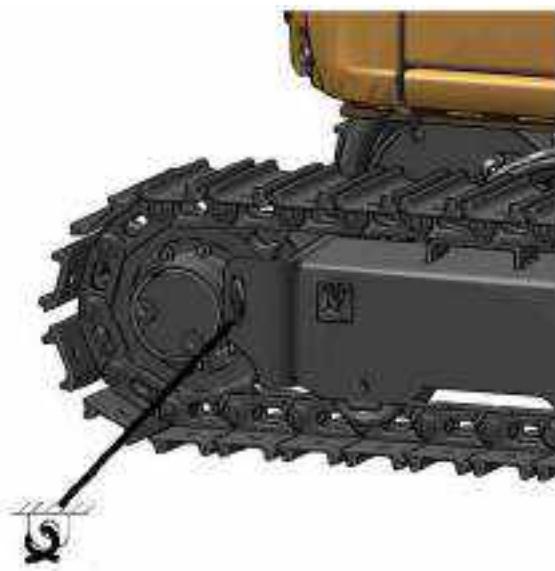


Illustration 398

g06274914

- 10.** Install tie-downs on each side of the tracks.

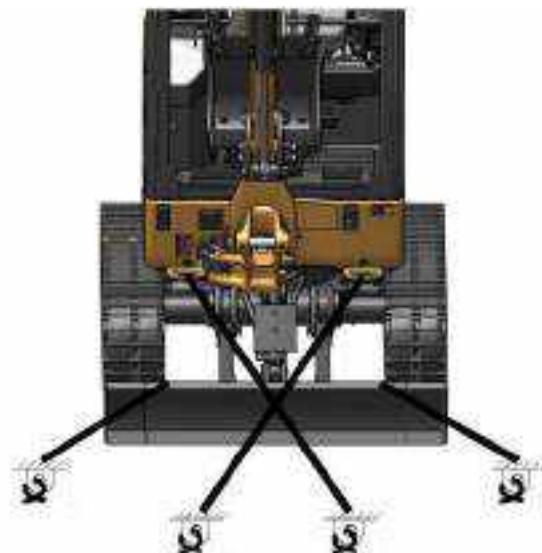


Illustration 399

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.

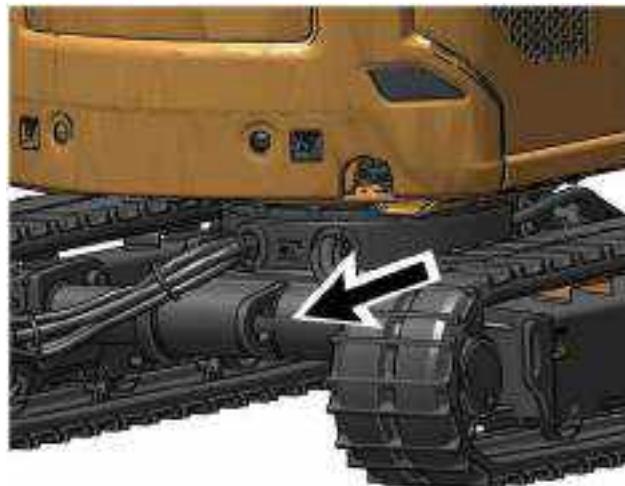


Illustration 401

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 standstill 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.

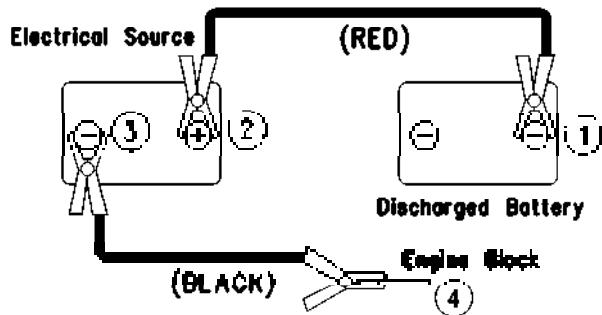


Illustration 402

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.

3. To close the left side door, raise lock bar (A), and replace three screws (B).

Right Side Cover



Illustration 406

g06268535

1. 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.
2. 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

1. Park the machine on level ground and lower the implements



Illustration 407

g06268577

2. Remove front fender covers (C) on the left and right side.

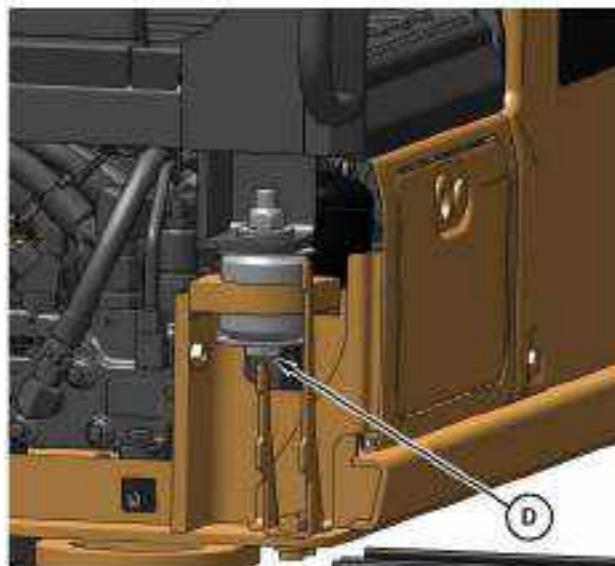


Illustration 408

g06317801

3. 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.

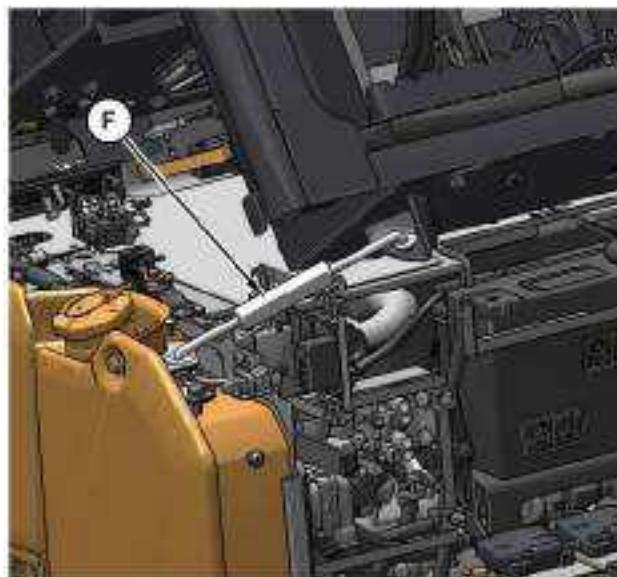


Illustration 411

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)

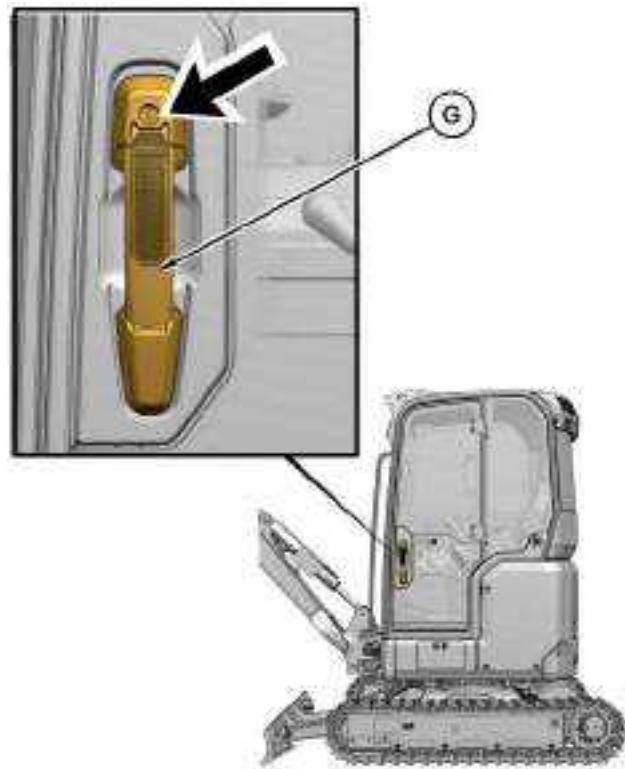


Illustration 412

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 to door, insert the key into the cylinder, rotate to the horizontal position, and remove the key.

Lubricant Viscosities and Refill Capacities

i08704805

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.

Maintenance Section
Fluids Recommendations

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 Cat DEO-ULS SYN Cat ECF-1-a Cat ECF-2 Cat ECF-3 API CF	SAE 30	-20	25	-4	77
		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)

Maintenance Section
Fluids Recommendations

(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)

Maintenance Section
Capacities (Refill)

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: M NH1–Up; J H71–Up	22	5.80	Diesel Fuel
	S/N: H 8X1–Up; R HM1–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.

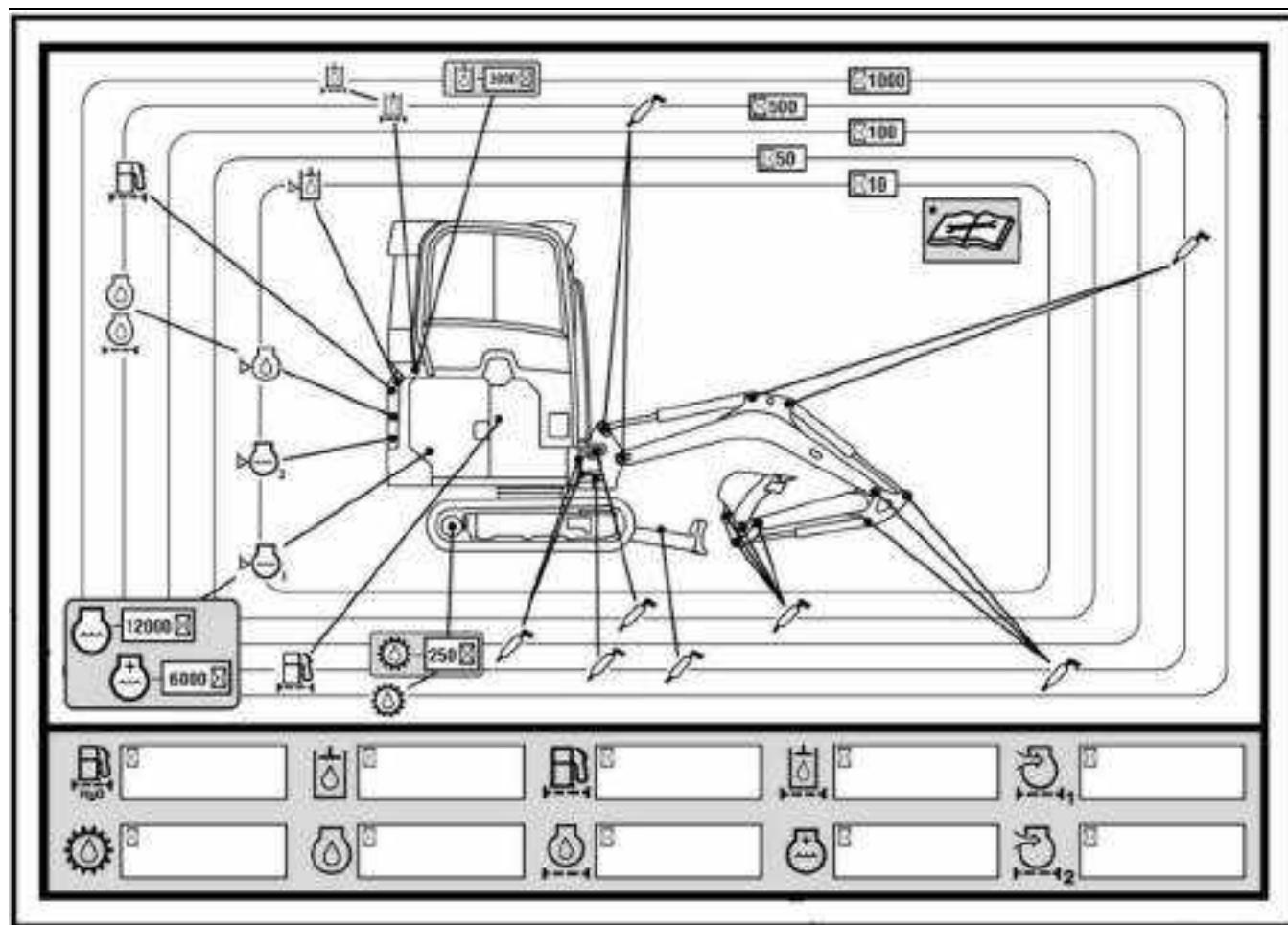


Illustration 414

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- | | | | |
|--|--|--|--|
| | Service hour interval – Hourly interval in which a maintenance procedure should be performed. | | Final Drive Oil – Change the final drive oil. |
| | Coolant level – Check the coolant level. | | Fuel system filter – Replace the fuel system filters. |
| | Cooling system coolant – Add ELC (Extended Left Coolant). | | Grease zerk – Lubricate the designated locations. |
| | Cooling system coolant – Change the ELC (Extended Life Coolant). | | Hydraulic oil level – Check the hydraulic oil level. |
| | Engine oil level – Check the engine oil level. | | Hydraulic oil – Change the hydraulic oil. |
| | Engine oil – Change the engine oil. | | Hydraulic oil filter – Change the hydraulic oil filter. |
| | Engine oil filter – Change the engine 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

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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.

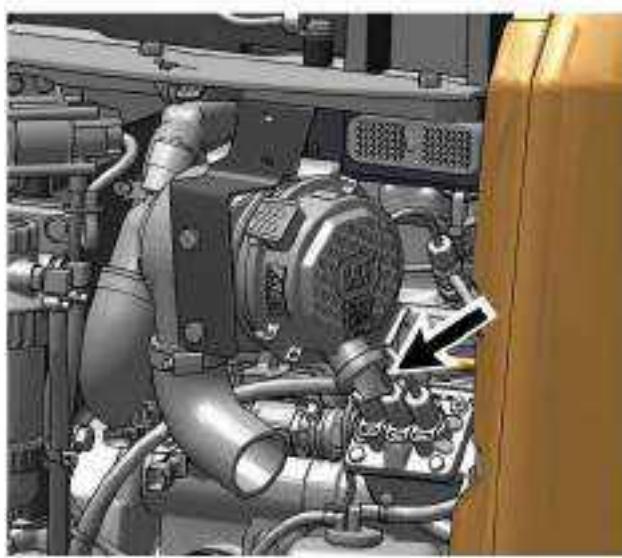


Illustration 415

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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.

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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

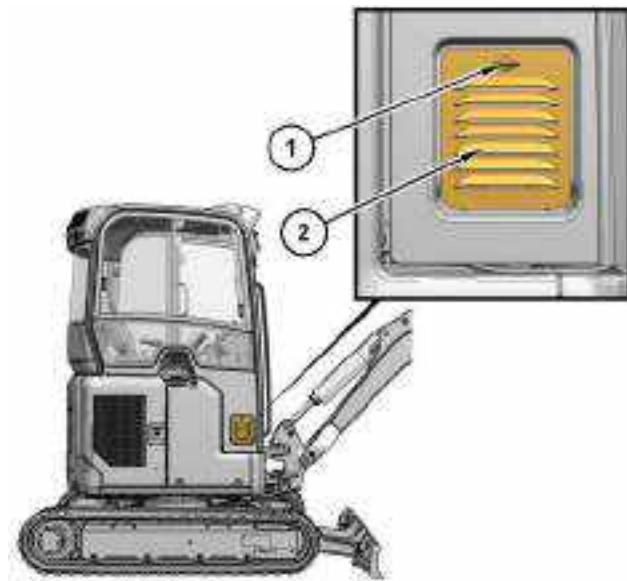


Illustration 416

g06675025

- (1) Knob
(2) Cab intake air filter cover

1. Open cab intake air filter cover (2) using knob (1) provided.

Maintenance Section

Air Conditioner/Cab Heater Filter (Recirculation) - Inspect/Replace

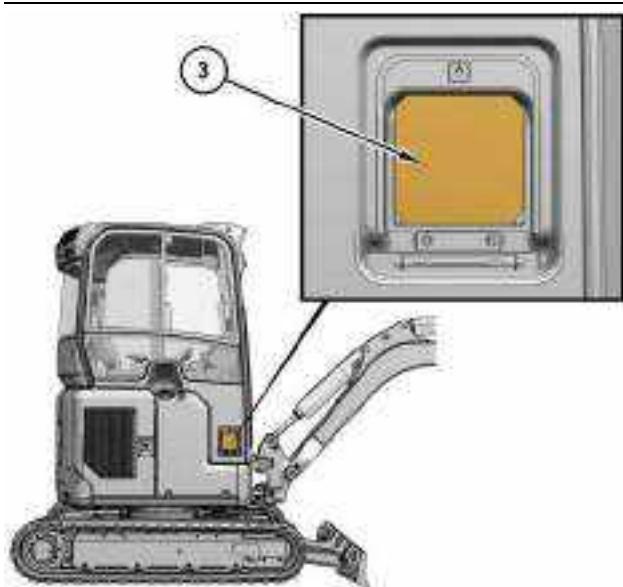


Illustration 417

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

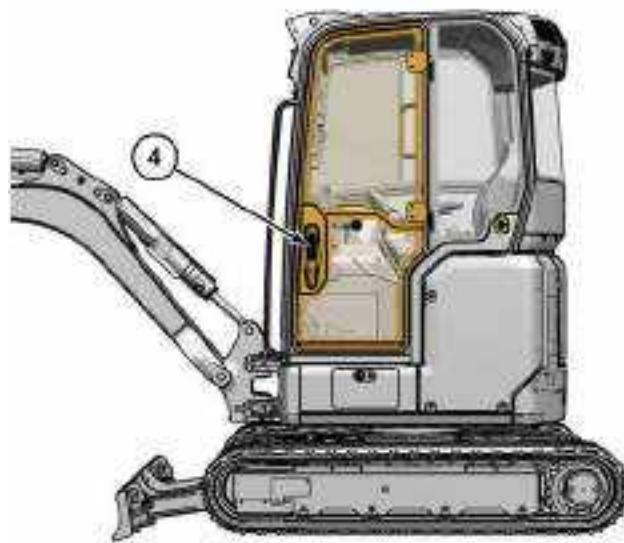


Illustration 418

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(4) Cab door

1. Open cab door (4). Refer to "Access Door and Cover Locations" for more information.

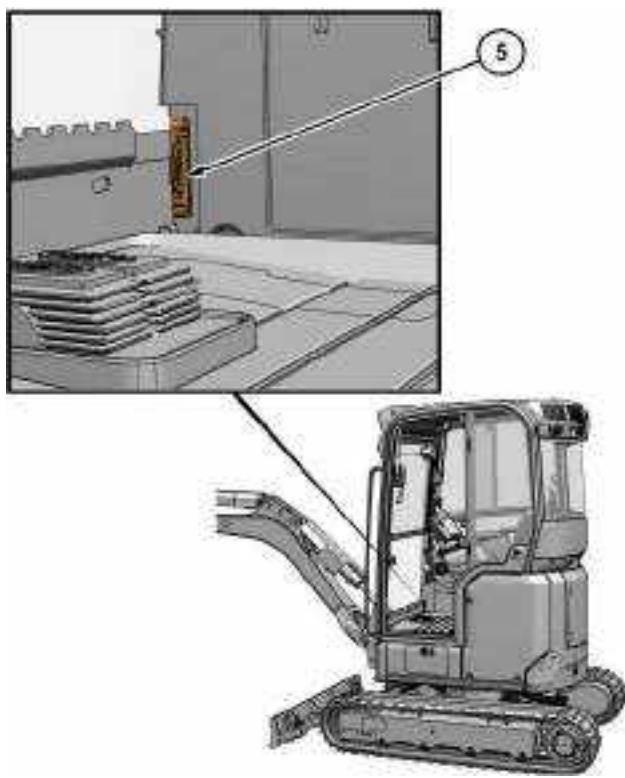


Illustration 419

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Some components removed for better clarity

Location of air conditioner filter element

(5) Air conditioner filter element

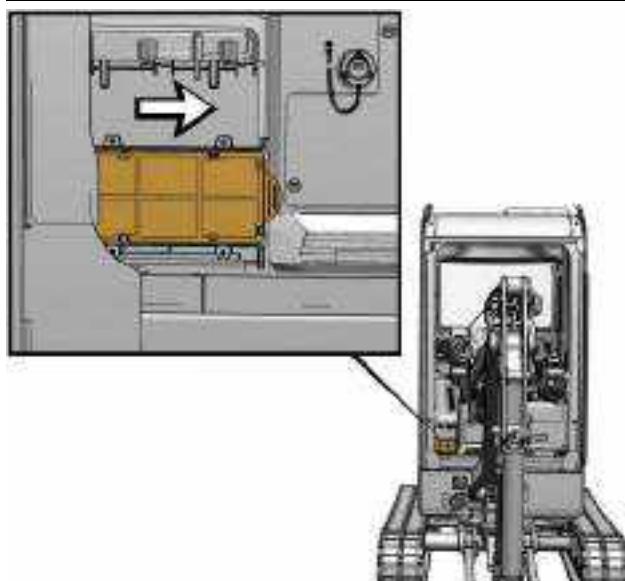


Illustration 420

g06675072

Some components removed for better clarity

Direction to remove 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

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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.

Maintenance Section

Battery or Battery Cable - Inspect/Replace

i07279888

- Recycling facility

i08130170

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

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

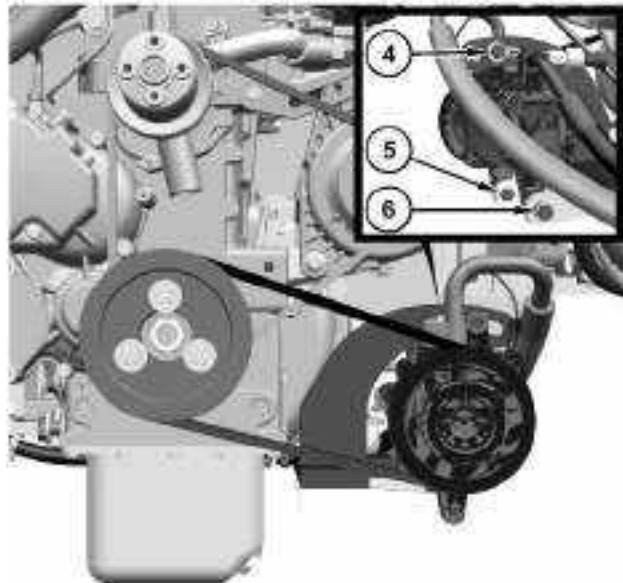
Belt Tension Chart	
Gauge Reading	
Initial Belt Tension⁽¹⁾	Used Belt Tension⁽²⁾
400 to 489 N (90 to 110 lb)	267 to 356 N (60 to 80 lb)

(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.

Maintenance Section
Blade Linkage - Lubricate

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.

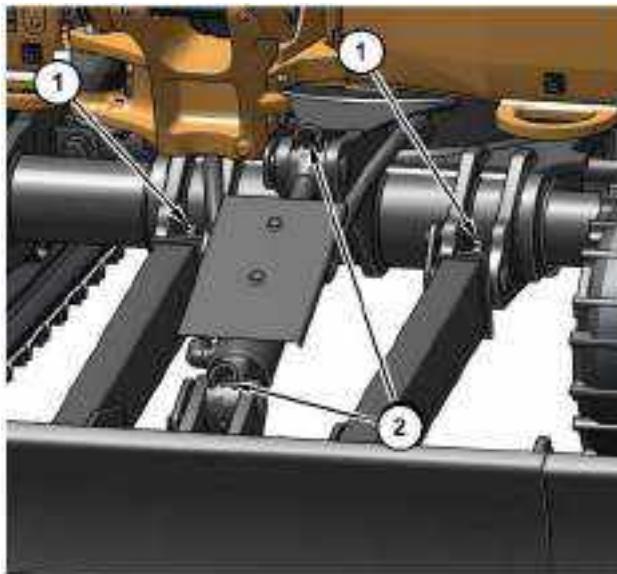


Illustration 423

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.

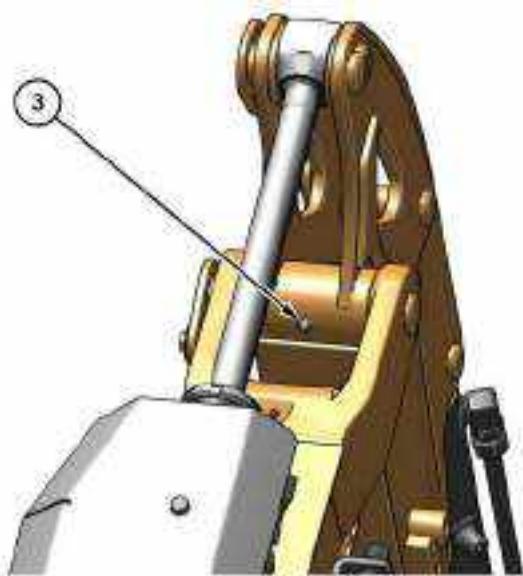


Illustration 426

g06273898

5. Apply lubricant to grease fitting (3) at the stick cylinder pin joint.

i07291711

- 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, 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

Maintenance Section
Boom, Stick, and Frame - Inspect

Boom

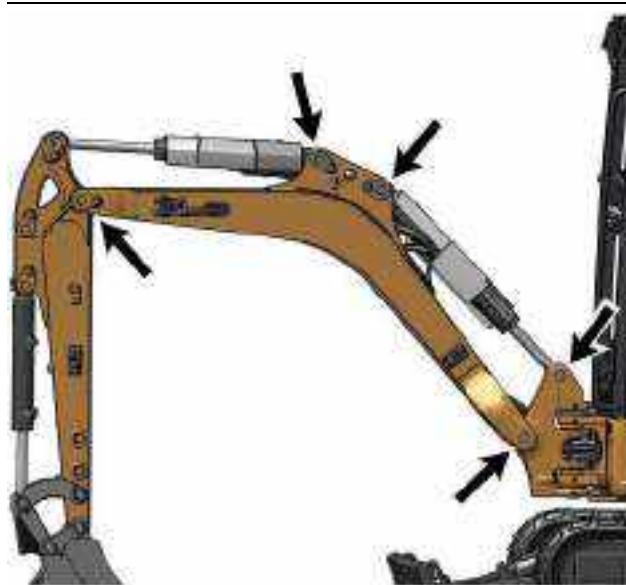


Illustration 427

g06276285

Check all welded joints and check the mounting points for the cylinder.

Blade

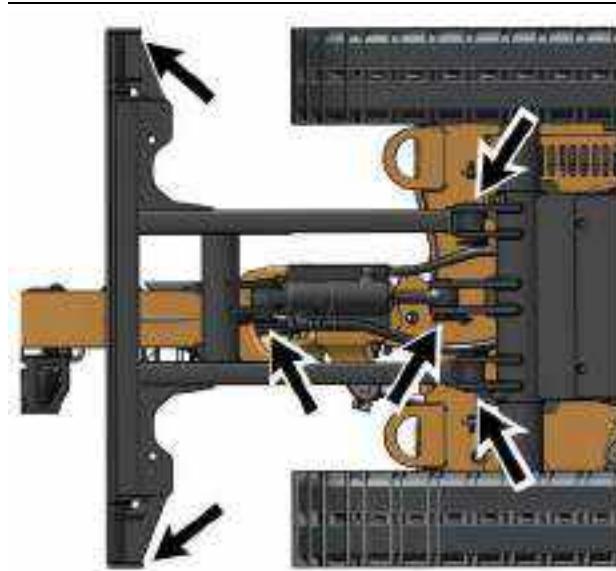


Illustration 429

g06276301

Check all welded joints and check the mounting points for the cylinder.

Stick

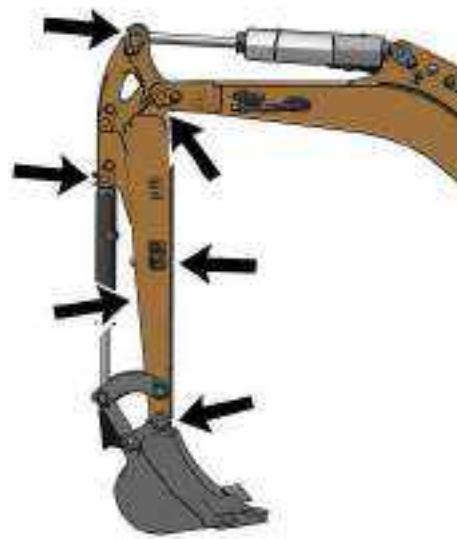


Illustration 428

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.

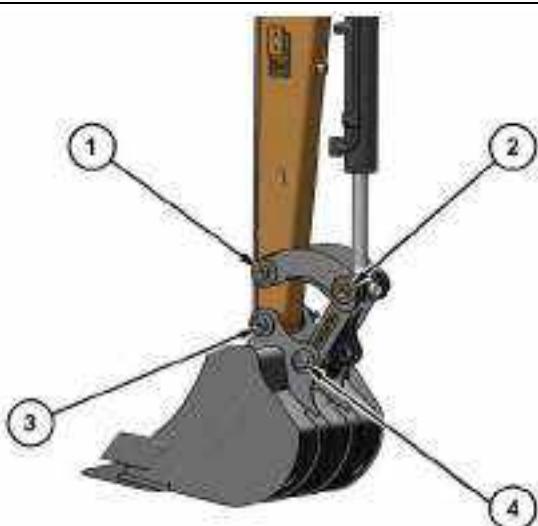


Illustration 433

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

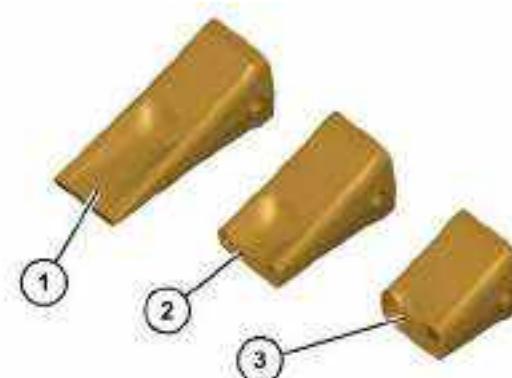


Illustration 434

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.

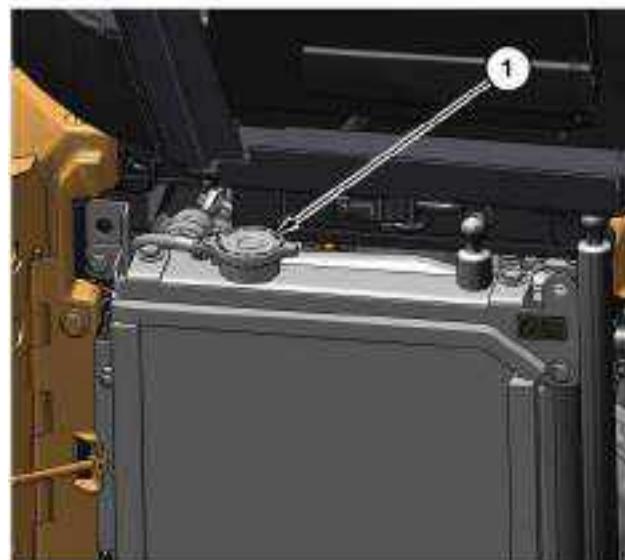


Illustration 436

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.

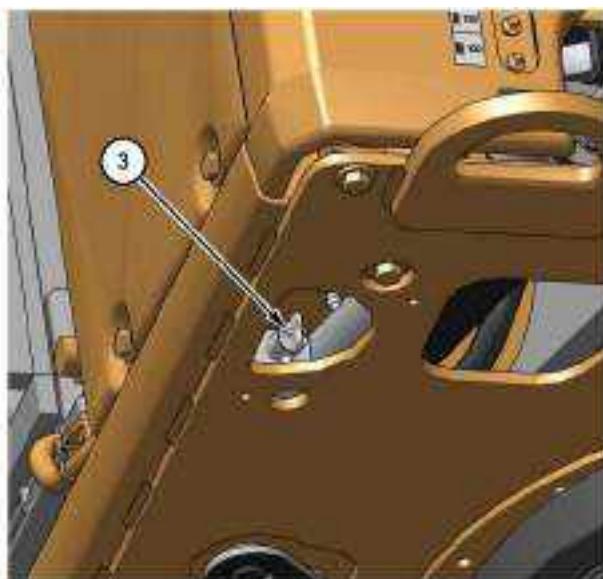


Illustration 438

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).

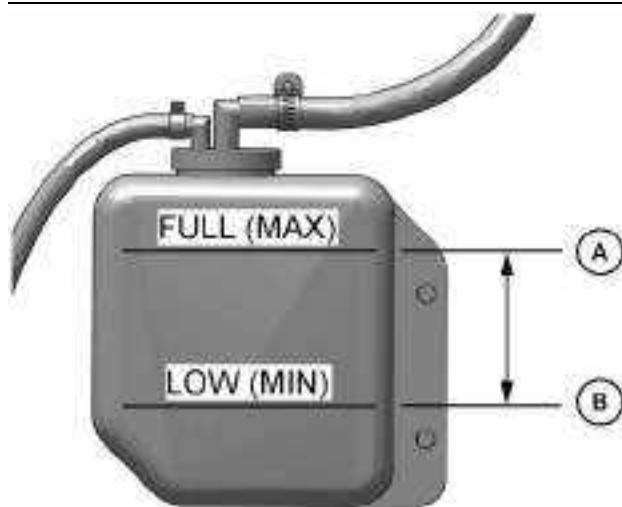


Illustration 439

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 loosen 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.

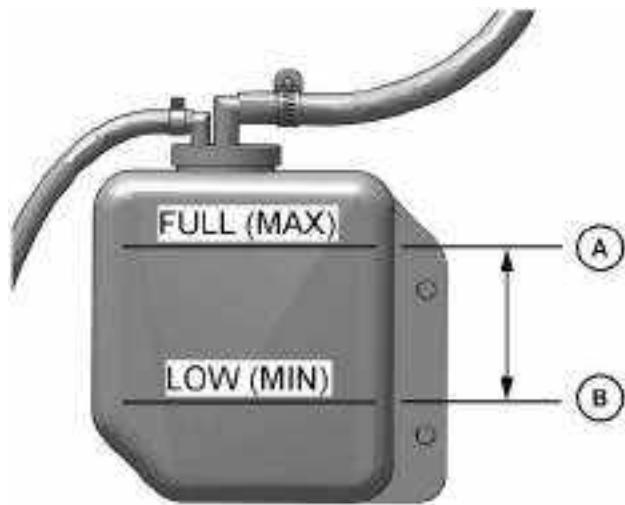


Illustration 440

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.

Maintenance Section

Cooling System Coolant Sample (Level 1) - Obtain

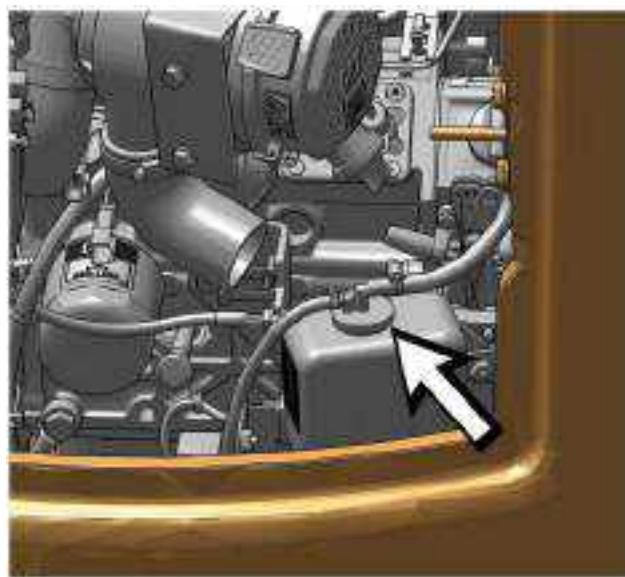


Illustration 441

g06268892

4. If the coolant reservoir is empty, remove the cooling system pressure cap slowly to relieve pressure. Add coolant to the radiator.

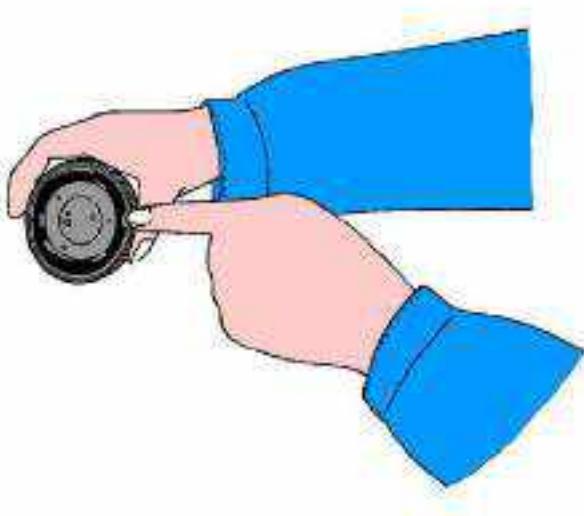


Illustration 442

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.

i07296023

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 contamination 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.

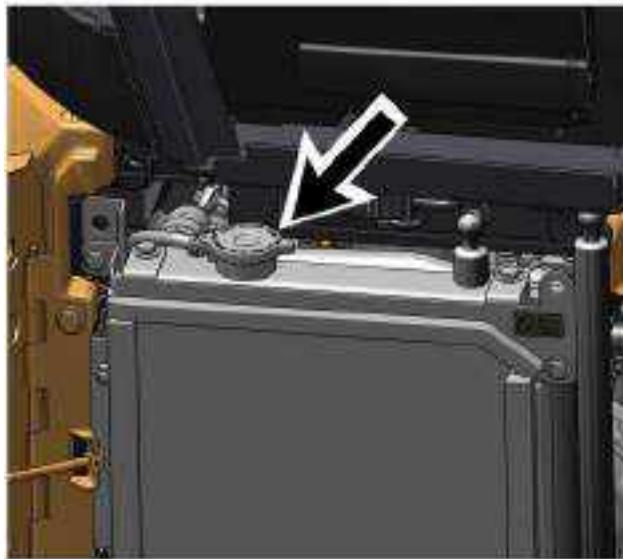


Illustration 443

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.

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.

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.

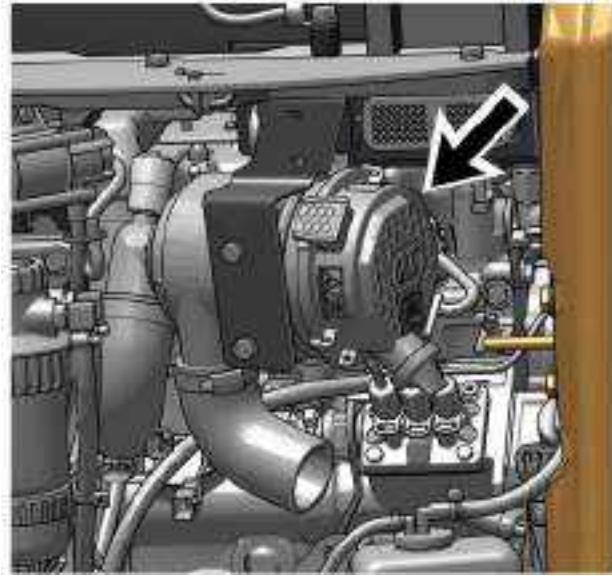


Illustration 447

g06276763

2. Unclamp the access cover and remove the access cover to the air cleaner.

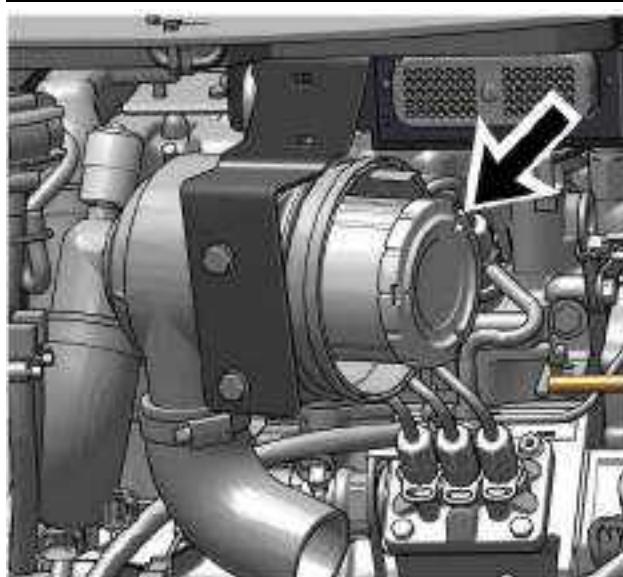


Illustration 448

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".

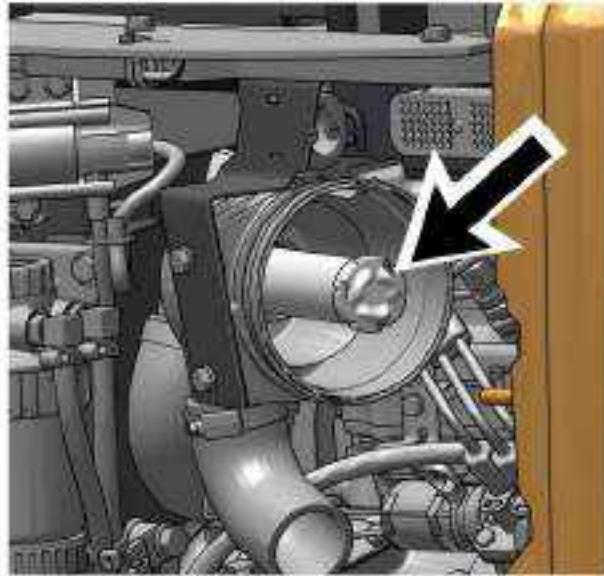


Illustration 449

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.

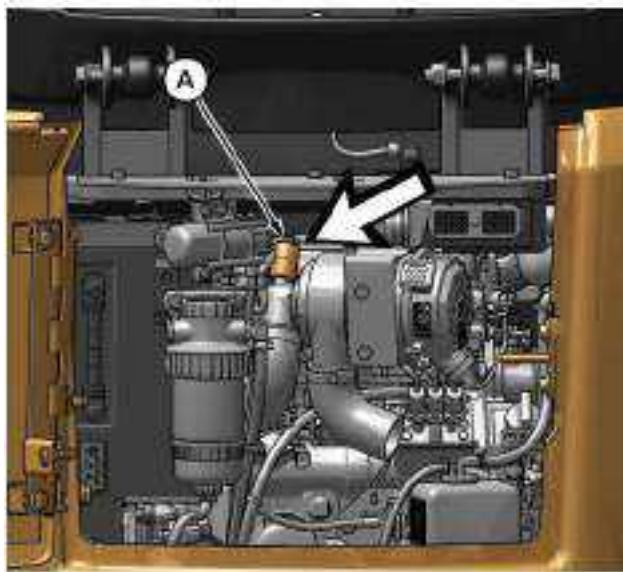


Illustration 450

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.
3. Close the rear access door.

Note: See the Operation and Maintenance Manual, "Engine Air Filter Element - Replace".

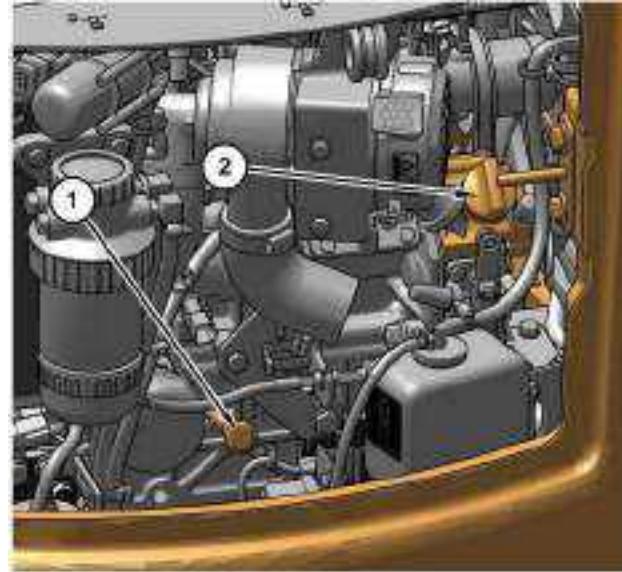


Illustration 451

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.

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.

Maintenance Section
Engine Oil Sample - Obtain

i07297308

Engine Oil Sample - Obtain

SMCS Code: 1000-008; 1000; 1348-008; 1348-554-SM; 7542-554-SM; 7542-554-OC; 7542-008

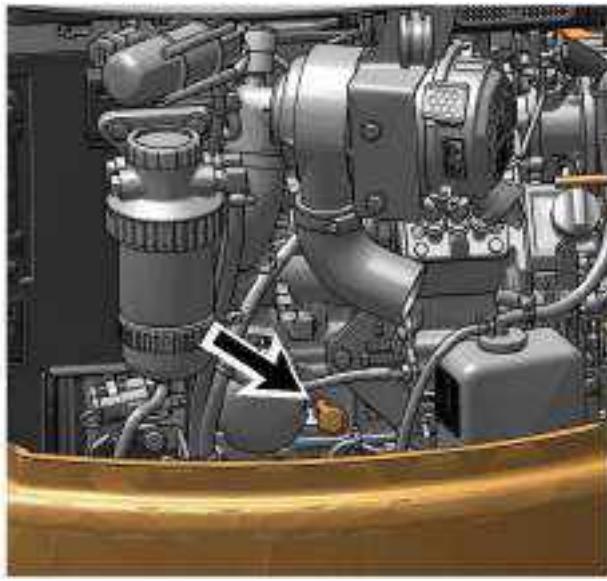


Illustration 452

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

- 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.

4. Clean crankcase drain plug (1). Inspect the seal for damage. If damaged, replace the seal.
5. Install crankcase drain plug (1).

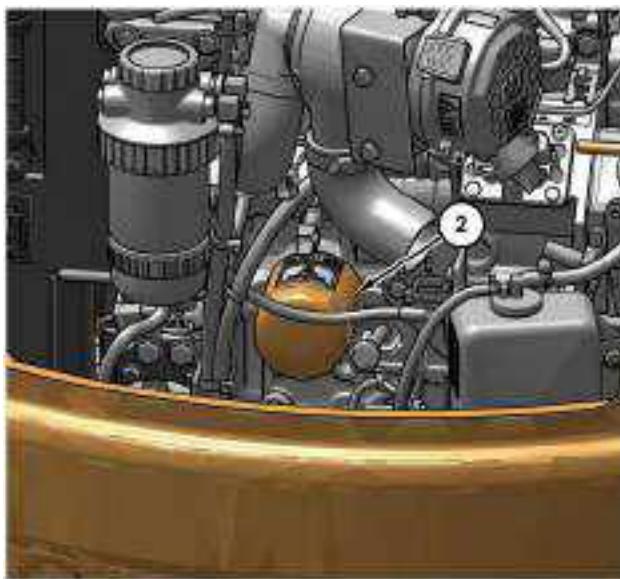


Illustration 455

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.

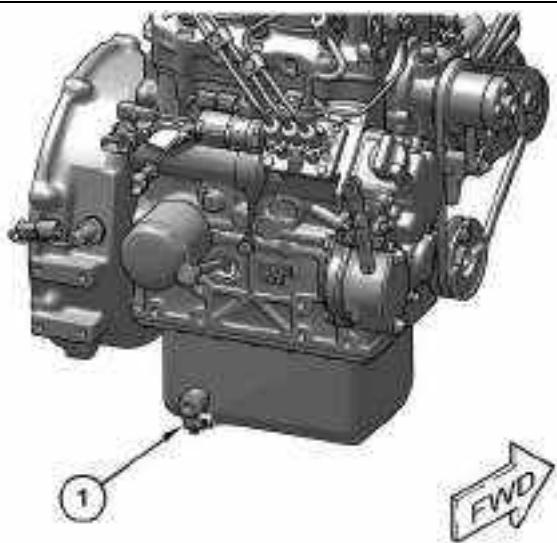


Illustration 454

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.

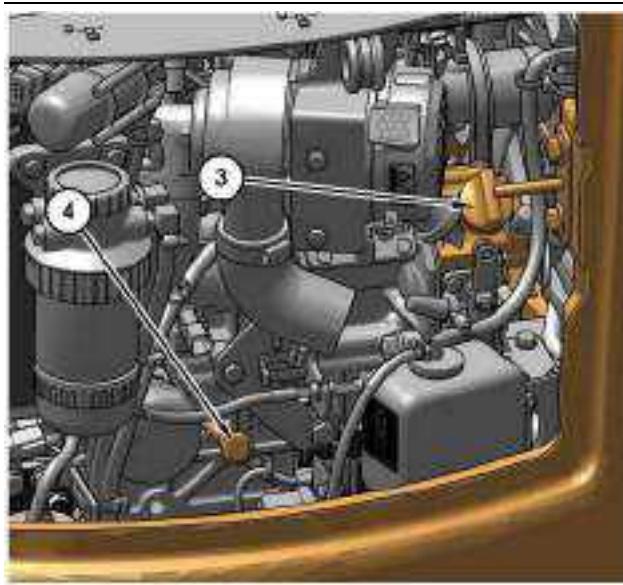


Illustration 456

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

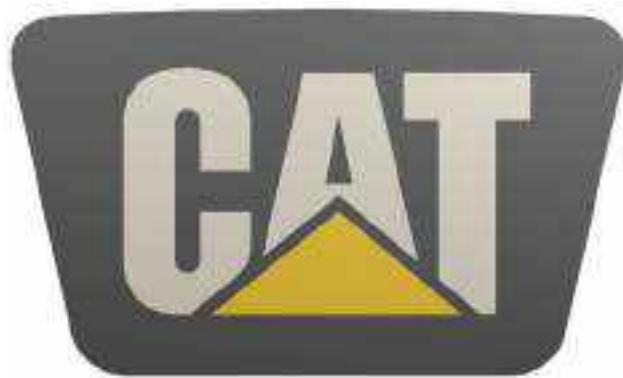


Illustration 458

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.

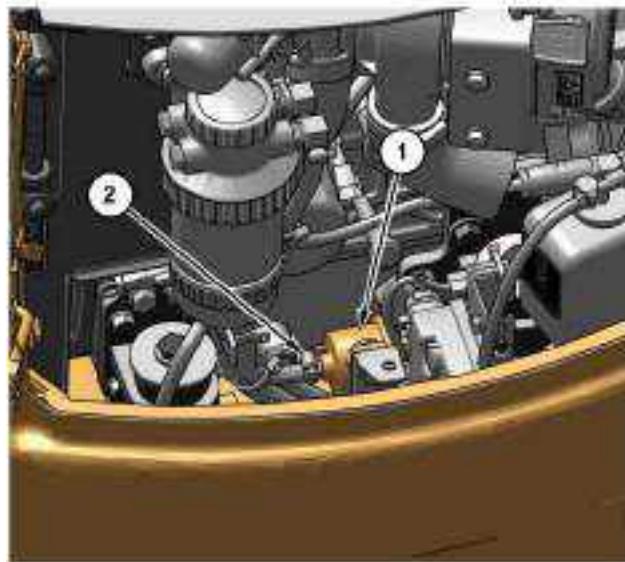


Illustration 462

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.

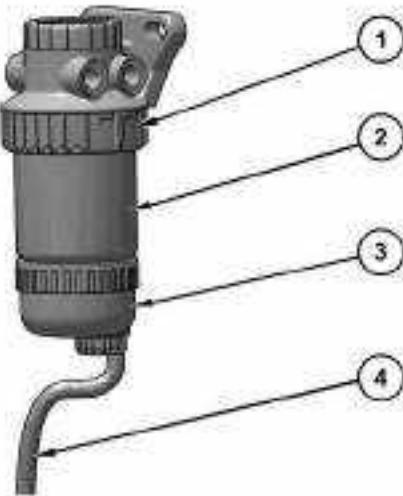


Illustration 463

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.

Maintenance Section
Fuel System Water Separator - Drain

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).

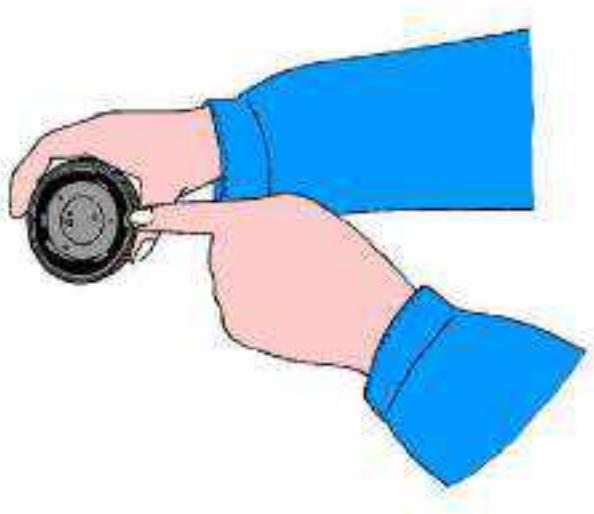


Illustration 466

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

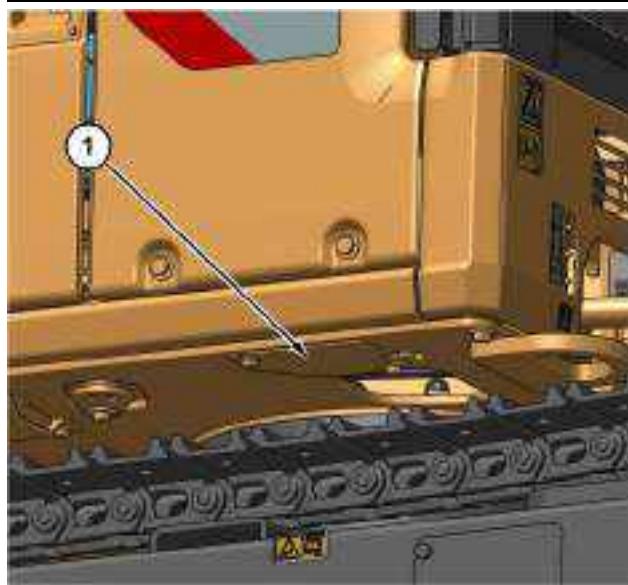


Illustration 467

g06317865

1. Remove guard (1) under the fuel tank to access the drain hose.

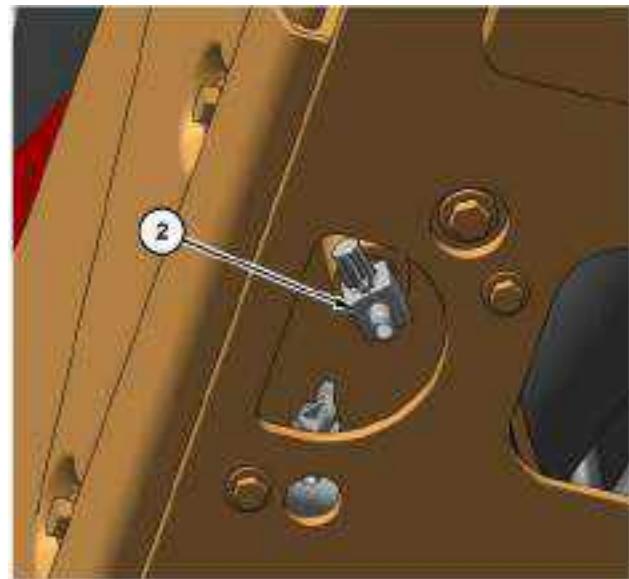


Illustration 468

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.

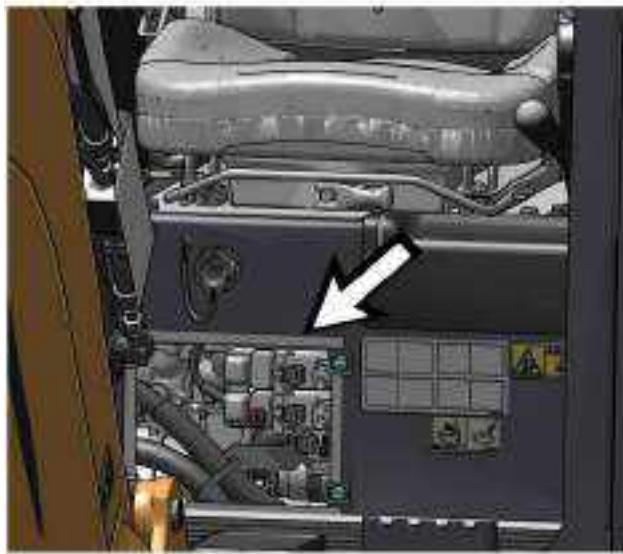


Illustration 469 g06273207
Fuse and relay locations for 301.5 and 301.7 CR

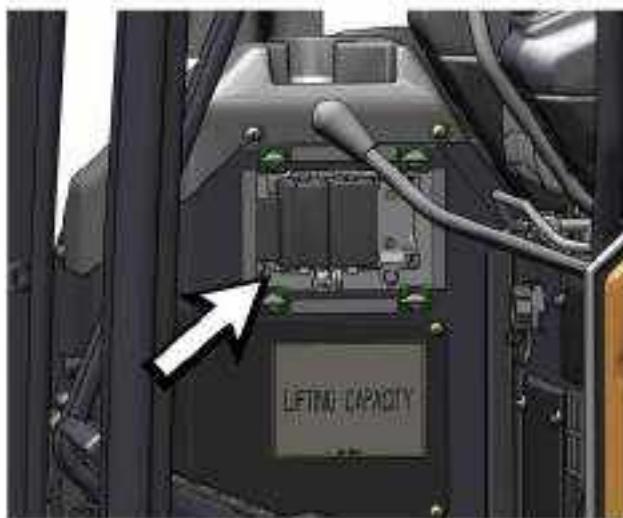


Illustration 470 g06273205
Fuse and relay locations for 301.5 and 301.7 CR

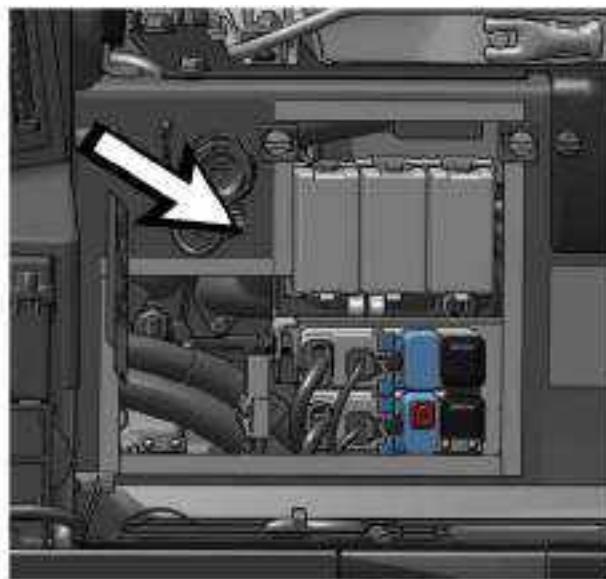


Illustration 471 g06318395
Fuse and relay locations for 301.6, 301.8, and 302 CR

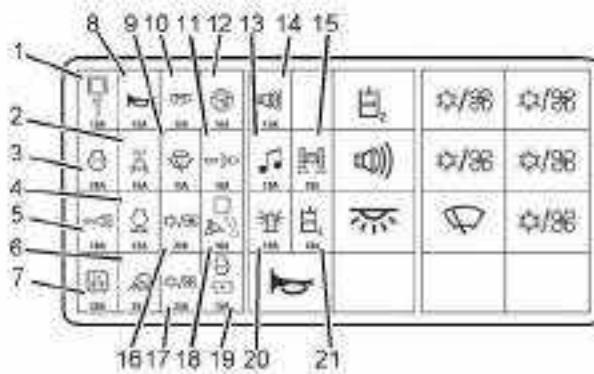


Illustration 472 g06318200

- (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

Relays

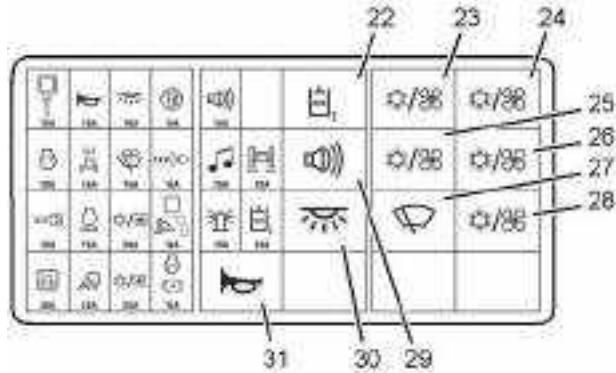


Illustration 473

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

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".

Maintenance Section
Hydraulic System Oil - Change



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).

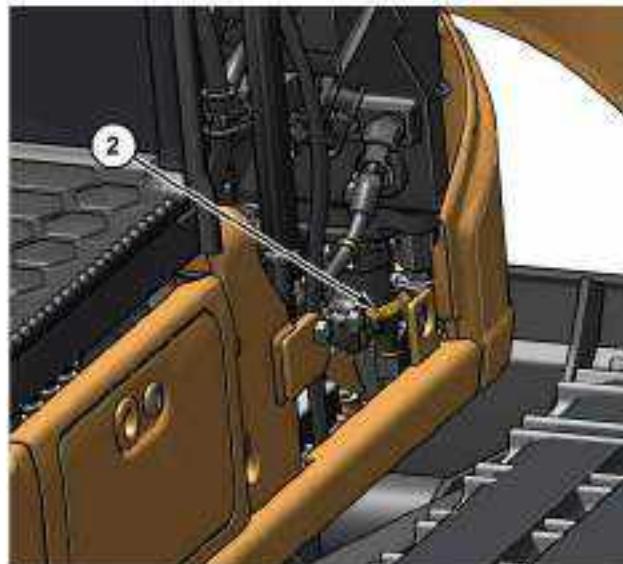


Illustration 476

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".

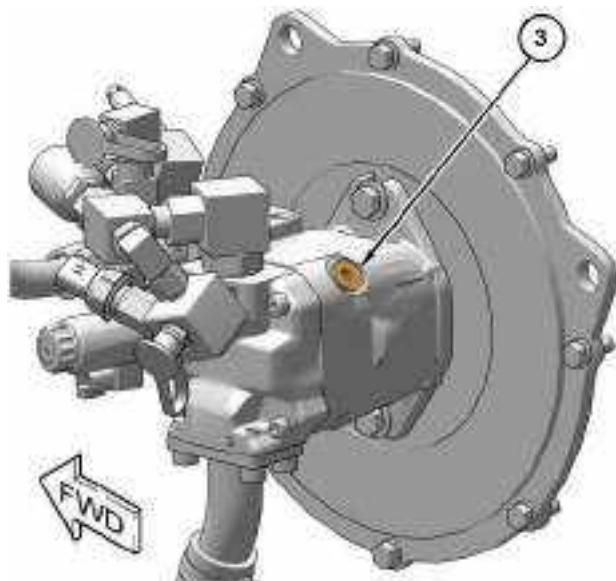


Illustration 477

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 $80 \pm 12 \text{ N}\cdot\text{m}$ ($59 \pm 9 \text{ lb ft}$).

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".

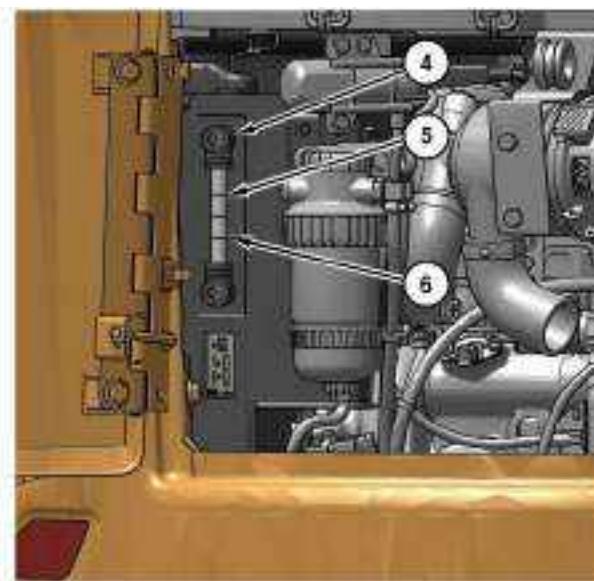


Illustration 478

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".

Maintenance Section

Hydraulic System Oil Filter (Return) - Replace

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".

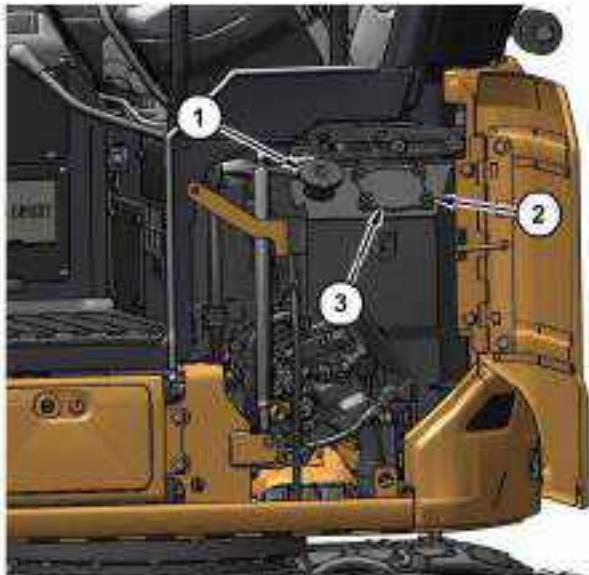


Illustration 479

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.

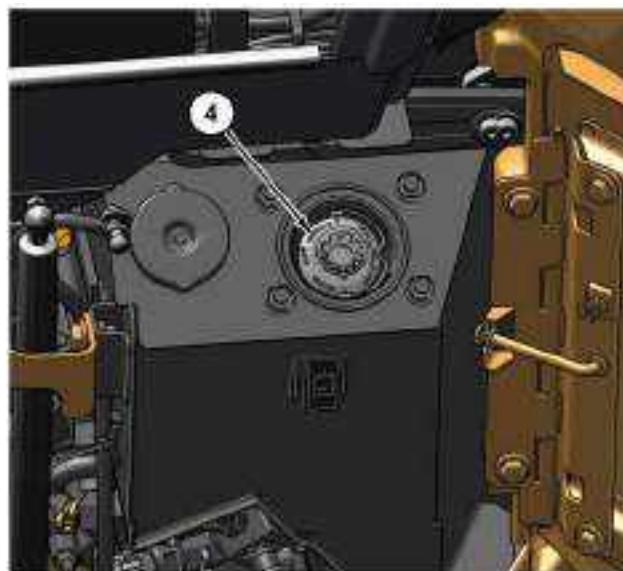


Illustration 480

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.

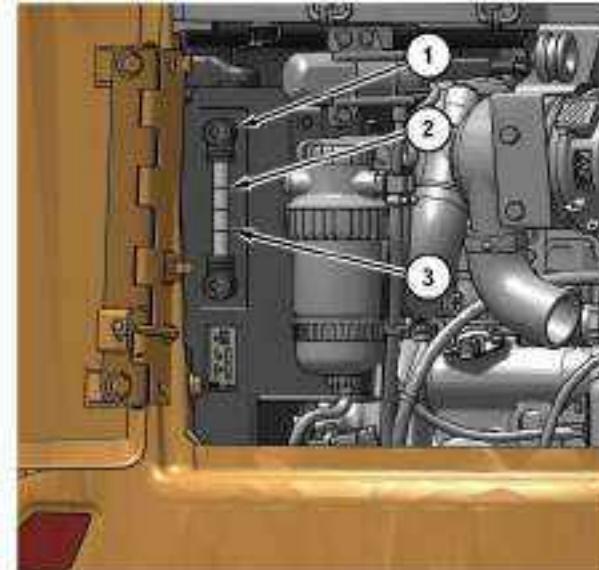


Illustration 482

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.

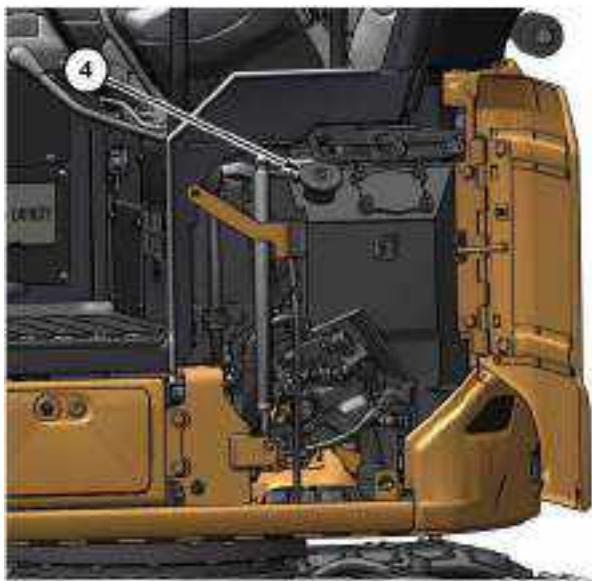


Illustration 483

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.

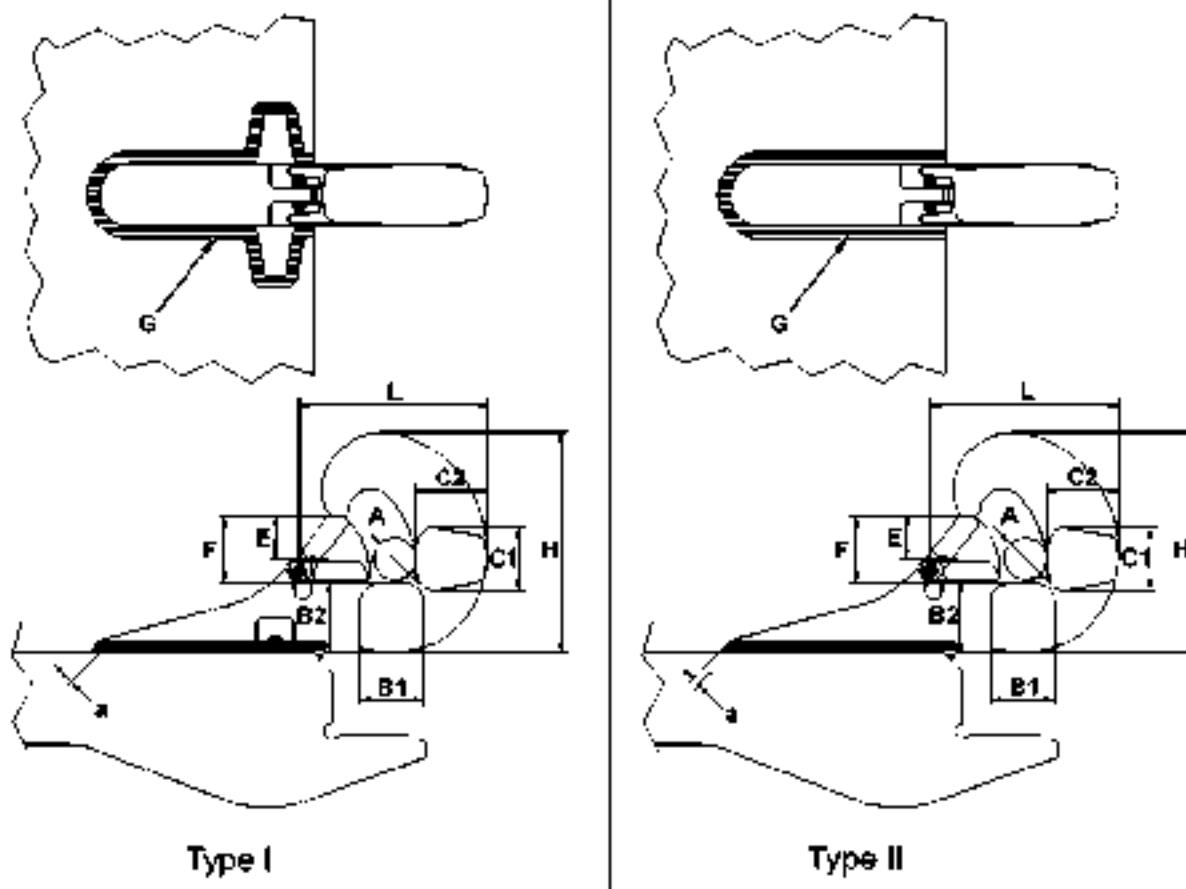


Illustration 485

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

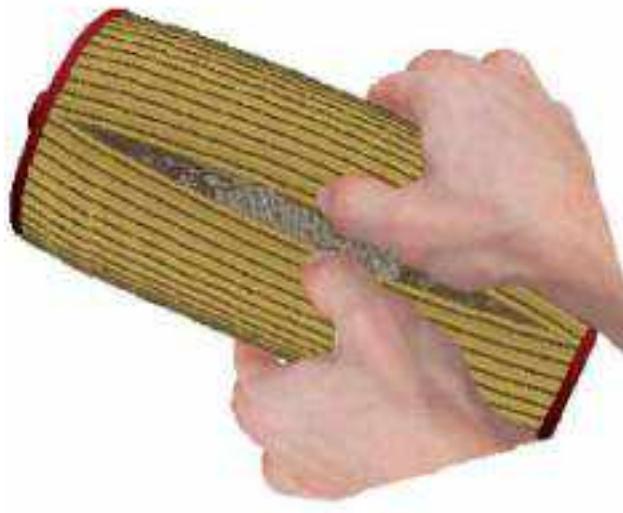


Illustration 486

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

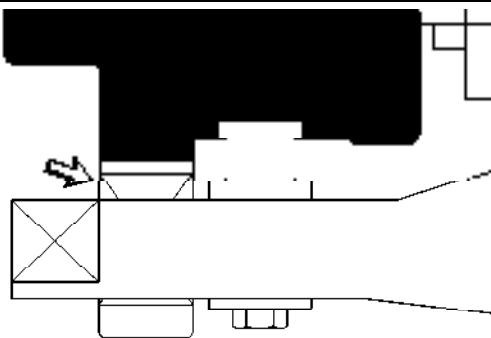


Illustration 487

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.

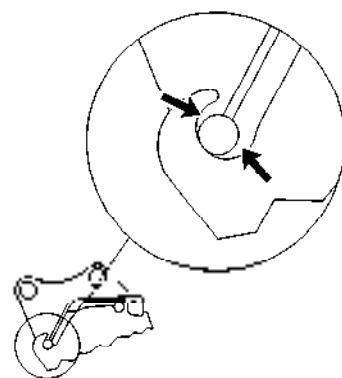


Illustration 488

g00584389

2. Check if there is play between the quick coupler and the mounting bracket. Contact your Caterpillar dealer.

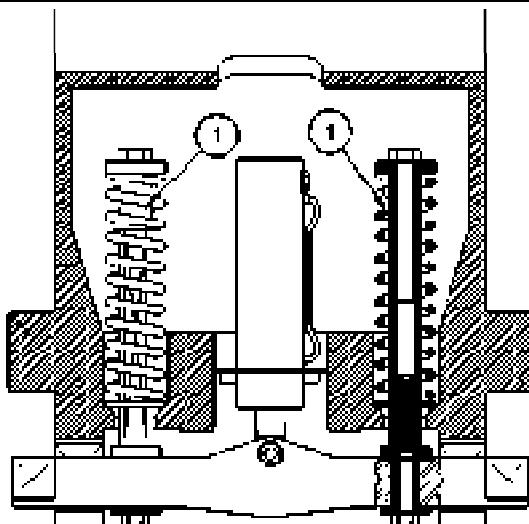


Illustration 489

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

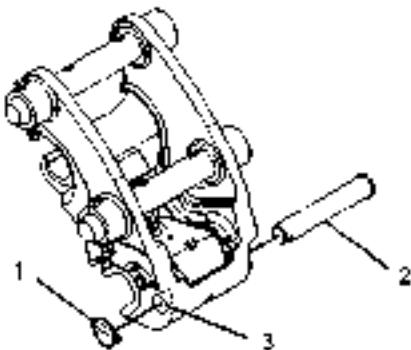


Illustration 490

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.

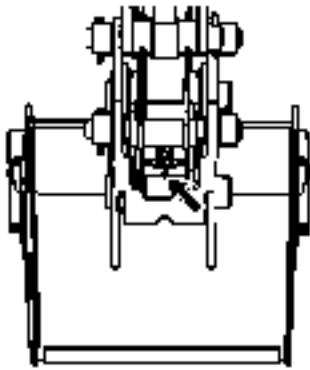


Illustration 491
Typical example

g01167510

3. Apply grease to the fittings of the quick coupler.

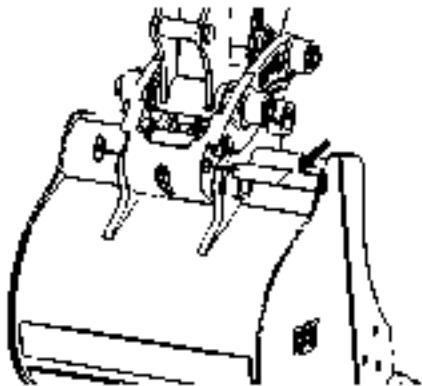


Illustration 492
Typical example

g01167518

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.

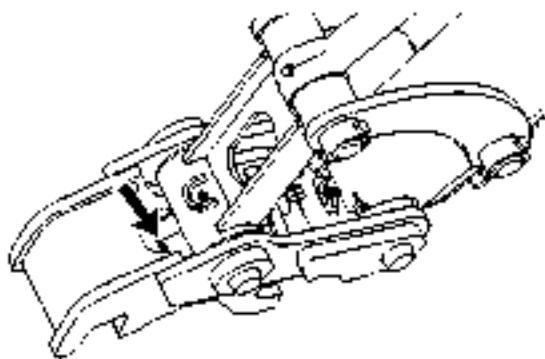


Illustration 493
g03681390

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

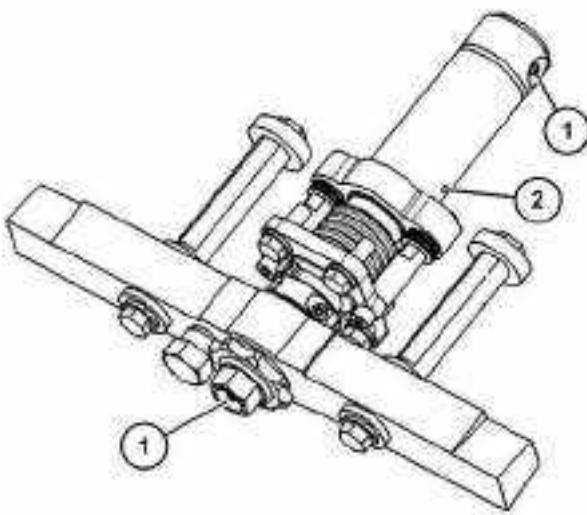


Illustration 494

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.



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.

i07284663

Radiator Core - Clean

SMCS Code: 1353-070

1. Open the right side access door.

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).

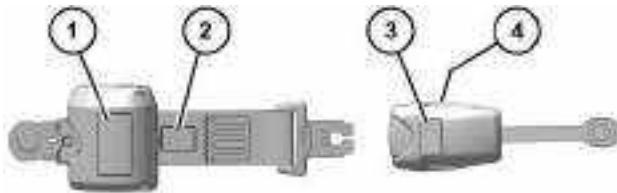


Illustration 497

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.

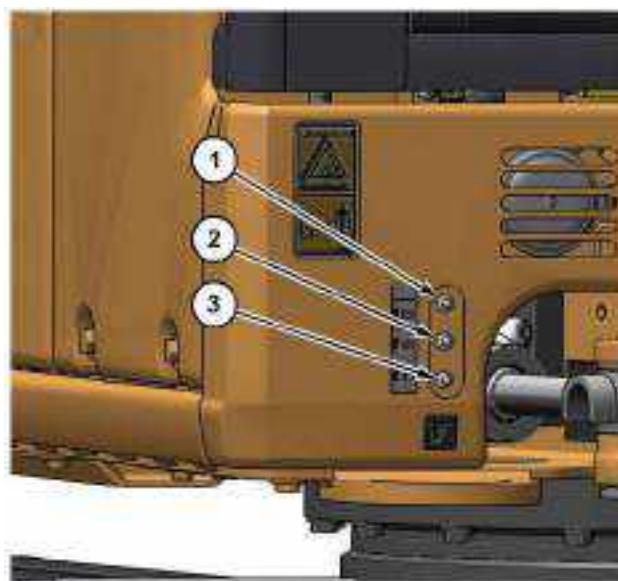


Illustration 499

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°.

Maintenance Section
Track Adjustment - Adjust

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.

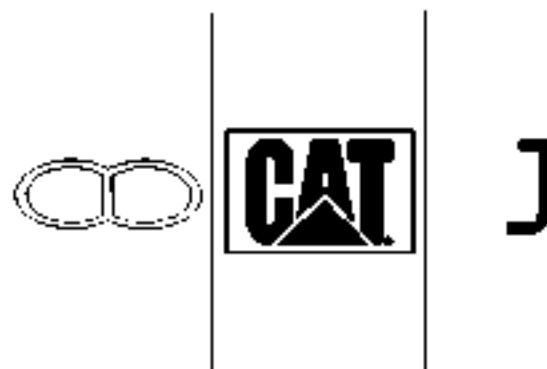


Illustration 505

g03731778

Various track joint marks

Maintenance Section
Travel Alarm - Test

- 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.

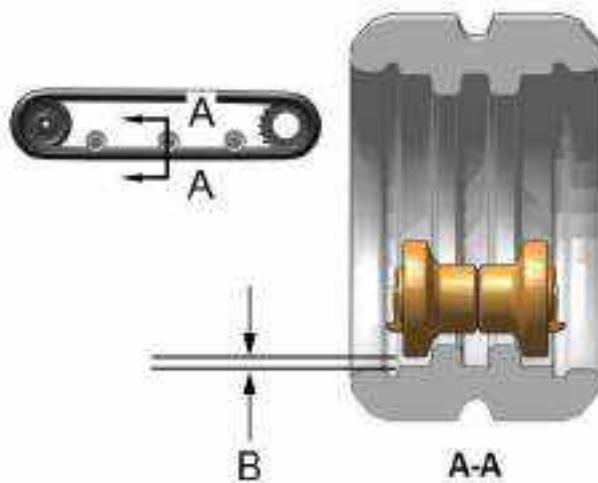


Illustration 506

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.

- Start the engine. Lower the hydraulic lockout control to the UNLOCKED position.
- Raise the work tool. Make sure that there is adequate overhead clearance.

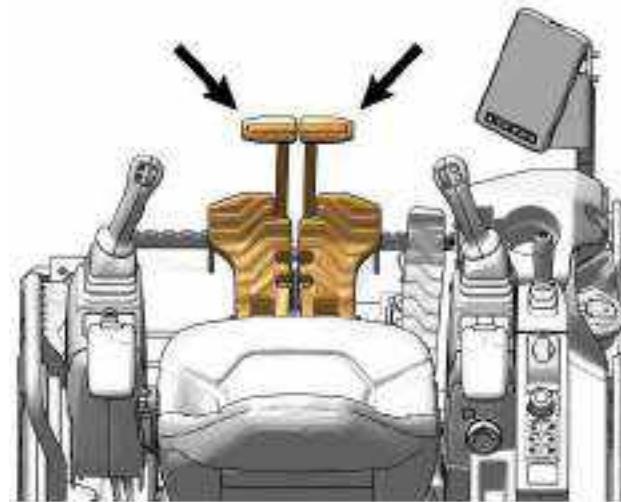


Illustration 507

g06274089

- Use the travel levers to move the machine forward. The travel alarm should sound.
- Release the travel levers to stop the machine.
- Use the travel levers to move the machine backward. The travel alarm should sound.
- 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

3. Close the filler cap (1).

i01048717

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.

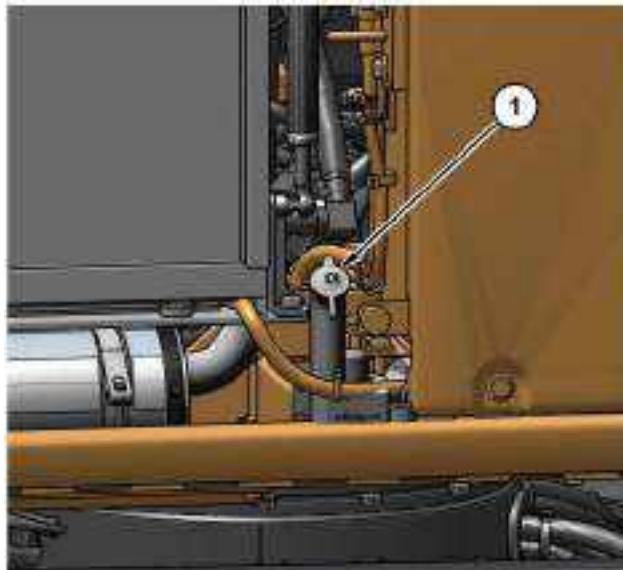


Illustration 508

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.

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: _____

	<u>Dealer Contact</u>	<u>Phone Number</u>	<u>Hours</u>
Sales:	_____	_____	_____
Parts:	_____	_____	_____
Service:	_____	_____	_____

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